

# ASSOCIATION BETWEEN MEDICATION ADHERENCE AND QUALITY OF LIFE AMONG PATIENTS WITH CORONARY ARTERY DISEASE DURING PANDEMIC COVID-19 AT PRIVATE HOSPITAL TYPE A BANDUNG-INDONESIA

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## ABSTRACT

*The prevalence of coronary artery disease (CAD) is increasing and becomes a major health problem nowadays. CAD has an impact on various aspects of the sufferer's life, both physical, psychosocial, and spiritual which affect the patient's Quality of Life (QOL). The main effort that can be done to maintain or improve the quality of life is with the patient's medication adherence. The existence of social restrictions during the COVID-19 pandemic has become a current issue regarding access to treatment of patients with CAD in hospitals so it has not been depicted regarding medication adherence and quality of life of patients with CAD during the pandemic, especially in Indonesia. This study aims to analyze the association between medication adherence and the quality of life of patients with CAD during the COVID-19 pandemic. The study method used is analytical observational with a cross-sectional approach. Primary data were collected from patients with CAD who were outpatient at the Cardiology Clinic of Private Hospital Type A in Bandung, Indonesia with accidental sampling technique. The study was conducted in January 2022 with the minimum sample being 70 respondents (Slovin formula). Data collection uses The Modified-Morisky Adherence Scale-8 (MMAS-8) questionnaire to assess medication adherence and the Seattle Angina Questionnaire-7 (SAQ-7) Questionnaires to assess the quality of life of patients with CAD. The statistical test is Chi-Square. The result showed that 34 (48.6%) respondents had low medication adherence and 43 (61.4%) respondents had good QOL. There was an association between medication adherence and QOL (p-value 0.009). Adhering to treatment can improve the quality of life of patients with CAD.*

**Keywords:** medication adherence; coronary heart disease; quality of life

## 1. BACKGROUND

CAD is a heart disease caused by narrowing of the coronary arteries, which can be caused by the process of atherosclerosis or spasm, or both (Rahmat et al., 2020). CAD has a high prevalence in the population with a high impact on morbidity and mortality. Based on data from the World Health Organization (2020), CAD is the leading cause of death worldwide,

accounting for 16% of the world's total deaths. Since 2000, the largest increase in deaths has occurred due to this disease, from 2 million to 8.9 million deaths in 2019.

The prevalence of CAD based on a doctor's diagnosis in Indonesia is 1.5% with the highest prevalence being North Kalimantan Province (2.2%), Yogyakarta Special Region (2%), Gorontalo (2%). Apart from these three

provinces, there are also 8 other provinces with a higher prevalence compared to the national prevalence. The eight provinces include Aceh (1.6%), West Sumatra (1.6%), DKI Jakarta (1.9%), West Java (1.6%), Central Java (1.6%), East Kalimantan (1.9%), North Sulawesi (1.8%) and Central Sulawesi (1.9%) (Ministry of Health of the Republic of Indonesia, 2019).

Data from National Health Coverage also shows an increase in health costs for patients with CAD in Indonesia from year to year. In 2014, CAD spent funds of 4.4 Trillion Rupiah, then increased to 7.4 Trillion Rupiah in 2016 and continued to increase in 2018 by 9.3 Trillion. This shows the large burden of the state on the treatment of CAD, which should be controlled with medication adherence and risk factor control (Ministry of Health of the Republic of Indonesia, 2019).

## 2. METHODS

In this study, the researchers used an observational analytical research design with a cross-sectional approach. Primary data were collected from patients with CAD who were outpatient at the Cardiology Clinic of Santosa General Hospital with accidental sampling technique. The study was conducted in January 2022. The minimum sample is 70 respondents, calculated using the Slovin formula.

This study used The Modified-Morisky Adherence Scale-8 (MMAS-8) questionnaire to assess medication adherence. This questionnaire is a short measuring tool and has been validated ( $r$  count [ $> 0.373$ ]  $>$   $r$  table [0.30]) and Cronbach's alpha test  $> 0.6$ . which can be used to identify medication adherence of patients with CAD. This

CAD is an acute and life-threatening disease but requires continuous and massive treatment and lifestyle adjustments throughout the patient's life. Prevention of symptoms and to prevent recurrence of heart attacks, patients must adhere to treatment to avoid complications and possible worsening (Lee et al., 2018; Murray, 2004).

Medication adherence affects the quality of life of patients with CAD, 19 out of 48 respondents (39,6%) had low medication adherence and had poor QOL, there was an association between medication adherence and QOL ( $p$ -value 0.003) (Aslamiyah et al., 2019), and research on the quality of life in patients with CAD in Indonesia has not been widely carried out, especially during the pandemic, which is still not clearly illustrated so that further studies are needed regarding the association between Medication Adherence and Quality of Life of Patients with CAD during the COVID-19 pandemic.

questionnaire consists of 8 questions. Score interpretation  $\geq 8$  (high compliance), score 6- $<$ 8 category of moderate compliance, and score  $< 6$  categories of low compliance (Shalansky et al., 2004; Chaliks 2012).

This study also used the Seattle Angina Questionnaire-7 (SAQ-7). Questionnaires were used to assess the quality of life of patients with CAD. This questionnaire is standardized and consists of 7 question items (3 items for the physical limitation domain, 2 items for the angina frequency domain, and 2 items for the quality of life domain). Score each item from worst to best patient status ranging from 1 to 6 for the physical limitation domain, 1 to 6 for the angina frequency domain, and 1 to 5 for the quality of life domain). Interpretation of poor quality of life

score (< 50), good quality of life (50-74), and very good quality of life (75-100) (Chan et al., 2014).

In this study, the variables were described through univariate analysis and bivariate analysis. Univariate analysis is presented using tables and frequency distributions and interpreted according to the results obtained. While the bivariate analysis aims to determine the significant relationship between the two variables. The statistical test used is Chi-Square.

### 3. RESULTS

#### Characteristics

Table 1 shows that the mean age of patients with CAD was 60.11 years, the gender of most of the male, 46 respondents (65.7%). Most of the education was senior high school, with 35 respondents (50.0%). Most of the time suffering from CAD was > 1

year, 45 respondents (64.3%). Most of the patients who did not experience yet stent procedure were 37 respondents (52.9%).

#### Medication Adherence

Table 2 shows the result of medication adherence with score interpretation  $\geq 8$  (high compliance), score 6-<8 category of moderate compliance, and score < 6 categories of low compliance. This study found 34 respondents (48.6%) had low compliance.

#### Quality of Life

Table 3 shows 2 categories, interpretation of poor quality of life score (< 50) and good quality of life (50-74). This study found 43 respondents (61.4%) had good QOL.

Table 1. Demography Characteristics

Characteristics	Mean	CI95%	n	%
Age	60.11	58.00-62.23		
Gender				
Male			46	65.7
Female			24	34.3
Education				
Elementary school			6	8.6
Junior high school			6	8.6
Senior high school			35	50.0
Diploma			10	14.3
Bachelor			13	18.5
Length of Suffering				
$\leq 1$ year			25	35.7
$> 1$ year			45	64.3
Stent Procedure				
None			37	52.9
Done			33	47.1
			70	100

Table 2. Medication Adherence

Medication Adherence	n	%
Low	34	48.6
Moderate	17	24.3
High	19	27.1
Total	70	100.0

Table 3. Quality of Life

Quality of Life	n	%
Poor	27	38.6
Good	43	61.4
Very Good	0	0
Total	70	100.0

Table 4. Association between Medication Adherence and Quality of Life

Adherence	Quality of Life				p value
	Poor		Good		
	n	%	n	%	
Low	18	52.9	16	47.1	0.009
Moderate	7	41.2	10	58.8	
High	2	10.5	17	89.5	
Total	27	38.6	43	61.4	

**Association between Medication Adherence and Quality of Life**

Table 5 shows the result of bivariate analysis using the Chi-Square test, p-value 0.009 which means there is a significant association between medication adherence and QOL.

**4. DISCUSSION**

The result of a recent study (table 2) shows that 34 respondents (48.6%) had low adherence. The previous study also found that medication adherence affects the quality of life of patients with CAD, 19 respondents (39,6%) had low medication adherence (Aslamiyah et al., 2019),

The term adherence has taken on two related meanings: (1) a specific research measure for the regularity with which patients take their medicines, typically expressed as a proportion or percentage of prescribed days and (2) a more general definition perhaps best exemplified by a World Health Organization (WHO) report, “the extent to which a person’s behavior-taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider”.

The WHO report on medication adherence goes on to describe five categories of factors that affect medication adherence: patient-related factors, socioeconomic factors, health team and system factors, therapy-related factors, and condition-related factors

(Levy et al., 2018; Maharani et al., 2019).

Patients' information, convictions, desires, and demeanors related to a given medicine can have a solid impact on their adherence. Fear of side impacts and destitute understanding of a medication's significance are common patient-related components in the non-adherence (Levy et al., 2018; Yulianti et al., 2012).

In some cases, characteristics of the therapy itself can deter patient adherence. This includes but is not limited to patients' experience with adverse effects. Some patients choose not to take medicines simply because of a perceived decrement in their quality of life with having to do so (Levy et al., 2018; Rahmat et al., 2020).

Recent data from the instrument, we found most respondents have ever forgotten to take the medicine, have ever stopped medication without telling the doctor while taking medication because they felt more unwell, and symptoms when did not appear they decide to stop the medication.

Patients' knowledge, beliefs, expectations, and attitudes related to a given medication can have a strong effect on their adherence. Fear of side effects and poor understanding of a medication's importance are common patient-related factors in non-adherence. The extent to which these factors are modifiable is the subject of debate. On the one hand, one interesting study showed a negative correlation between statin adherence and media coverage of statin side effects, suggesting that patient attitudes about statins are easily modified. This seemed to be especially true at the time of statin initiation (Levy et al., 2018).

The result of the study (table 2) also shows that 17 respondents (24.3%) had moderate adherence and 19

respondents had high adherence (27.1%). Respondents were already given information/education about their treatment by health care professionals. A recent study by Thomson, (2020) found that while patients with CAD on average had a poor understanding of their drug regimen, roughly 95% of them expressed interest in learning more about their medications via educational activities. Through education, may perform better when offered in tandem with other interventions that reinforce the skills learned, such as reminders.

In some cases, characteristics of the therapy itself can deter patient adherence. This includes but is not limited to patients' experience with adverse effects. Some patients choose not to take medicines simply because of a perceived decrement in their quality of life with having to do so. Other aspects of therapeutic regimens that can deter adherence include complexity of the regimen, previous treatment failures, and lack of experience of the therapy's beneficial effects. For example, as it pertains to complexity, both multi-compartment dose administration aids (pill boxes) and giving patients longer prescriptions for cardiac secondary prevention medications at hospital discharge seems to increase the likelihood of persistence among elderly patients. Recent advances in strategies for alleviating adverse effects and simplifying drug regimens are reviewed in this section (Levy et al., 2018).

Table 3 shows that 43 respondents (64.1%) had good QOL. The previous study also found that 29 respondents (61.4%) had a good QOL (Aslamiyah et al., 2019). QOL is an individual feeling about health and well-being such as physical ability, psychological status, social function,

independence (Ananda, 2016; Lee et al., 2018).

QOL can be whether a person feels satisfied or not about various aspects of their life (Ekasari, et al, 2018). The domain of quality of life consists of 7 question items (3 items for the physical limitation domain, 2 items for the angina frequency domain, and 2 items for the quality of life domain). In patients with CAD, the Seattle Angina Questionnaire (SAQ) systematically quantifies patients' angina symptoms, functional limitations because of angina, and the impact that angina has on perceptions of their quality of life.

Among those with CAD, it is very important to assess the quality of life because the treatment process must be carried out for life and the impact of the disease results in limitations in activities and if it gets worse, complications can occur (Chan et al., 2014).

Quality of life measurement can be used to assess the effect of treatment from the patient's perspective, help doctors and nurses, and patients decide on different treatment steps, provide information to patients about the effects of frequent treatments, monitor treatment progress. As in deciding to do revascularization with consideration of age and risk. Quality of life study in post PCI patients is a good (Rahmat et al., 2020). This recent study found 33 respondents (47.1%) were already conducted stent procedures.

Table 3 also shows 27 respondents (38.6%) had poor QOL. Some factors that influenced the result are medication adherence and revascularization procedure. We found in this study, almost half of respondents with low medication adherence category (48.6%) did not undergo stent procedure (52.9%).

Association medication adherence with QOL of patients with CAD, in table 4 shows the results of the Chi-Square test analysis, with the resulting p-value 0.009, which means that there is a significant association between medication adherence and QOL on patients with CAD. These findings can be influenced (table 4), most patients with high medication adherence, had good QOL, as many as 17 respondents (89.5%). Patients with moderate adherence had good QOL as many as 10 respondents (58.8%) and patients with low adherence, had poor QOL as many as 18 respondents (52.9%).

Coronary Heart Disease (CHD) or known by other terms Acute Coronary Syndrome (ACS) is a major cardiovascular problem because it causes high hospitalization rates and high mortality rates.(Smeltzer et al., 2010). Most CHD is an acute manifestation of atheromatous plaques of coronary arteries that are torn or ruptured due to changes in plaque composition and thinning of the fibrous cap that covers the plaque. This event will be followed by the process of platelet aggregation and activation of the coagulation pathway to form a thrombus rich in platelets (white thrombus). This thrombus will occlude the coronary arteries, either totally or partially; or become microemboli that occlude more distal coronary vessels. In addition, there is the release of vasoactive substances that cause vasoconstriction, thereby worsening coronary blood flow disorders (*Indonesian Heart Association*, 2018).

Reduced coronary blood flow causes myocardial ischemia. The oxygen supply is stopped for approximately 20 minutes causing the myocardium to undergo necrosis (myocardial infarction / IM).

Myocardial infarction is not always caused by complete occlusion of a coronary artery. Subtotal blockage accompanied by dynamic vasoconstriction can also cause ischemia and necrosis of heart muscle tissue (myocardial). In addition to necrosis, ischemia also causes impaired contractility of the myocardium due to hibernating and stunning processes (after ischemia is gone), as well as ventricular dysrhythmias and remodeling (changes in ventricular shape, size and function). In some patients, CHD occurs because of dynamic obstruction due to local spasm

of the epicardial coronary arteries (Prinzmetal's angina). Coronary artery narrowing, without spasm or thrombus, may result from the progression of plaque formation or restenosis after percutaneous coronary intervention (IKP). Several extrinsic factors, such as fever, anemia, thyrotoxicosis, hypotension, tachycardia, can trigger CHD in patients who already have atherosclerotic plaques (Indonesian Heart Association, 2018; Smeltzer et al., 2010).

## 5. CONCLUSION

There was significantly association between medication adherence and QOL. Adhering to treatment can improve the quality of life of patients with CAD. Increasing awareness of medication adherence programmes through monitoring is needed to reduce the prevalence of complication of CVD events. It is worth noting that patient teaching, through education and behavioral strategies, may perform better when offered in tandem with other interventions that reinforce the skills learned, such as reminders. Patients' adherence to medication is in many ways dependent on the health system's ability to adequately support and engage patients. Furthermore, providing primary preventive approaches to ensure that people with low CVD risk retain that status should be a focus for policy-makers at the national level.

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