

## Relationship Of Daily Life Management With Coronary Artery Disease Severity at Aceh Regional General Hospital, Indonesia

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### Abstract

**Background:** Coronary Artery Disease (CAD) Is A Non-Communicable Disease As The Leading Cause Of Death Globally. Narrowing Or Blockage Due To Atherosclerosis Plaque Accumulation In CAD Patients Can Result In Various Complications Such As Heart Attack And Sudden Death. The Number Of CAD Patients Undergoing Coronary Angiography As The Basis For Stenting Continues To Increase. The Purpose Of The Study Was To Determine The Relationship Between Daily Life Management With CAD Severity.

**Materials And Methods:** This Study Used A Cross Sectional Study Design On 146 CAD Patients Who Had Undergone Coronary Angiography/Percutaneous Coronary Intervention (PCI) In The Last 6 (Six) Months, From December 2022 To May 2023 And Selected By Accidental Sampling. Data Collection Using Coronary Artery Disease Self-Management Scale (CSMS) And Syntax Score Obtained From The Results Of Domentation Studies Through Patient Medical Records. Data Were Analyzed Using Descriptive And Inferential Statistics.

**Results:** The Results Of The Analysis Showed That Daily Life Management ( $P=0.000$ ;  $OR=5.334$ ) Is Related To CAD Severity.

**Conclusion:** Good Daily Life Management Will Reduce The Severity In CAD Patients.

**Keywords:** Daily Life, Management, Severity, CAD

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### I. Introduction

Non-communicable diseases, also known as chronic diseases, tend to last for long periods of time and are the result of a combination of genetic, physiological, environmental and behavioral factors [1].

Coronary artery disease (CAD) is a type of cardiovascular disease that is not contagious and is the leading cause of death and loss of Disability Adjusted Life Years (DALYs) globally. A large number of CAD problems occur in low- and middle-income countries with nearly 7 million deaths and 129 million DALYs each year. In 2021 CAD accounted for 8.9 million deaths and 164.0 million DALYs [2].

Daily life management, a dynamic process in which patients actively manage healthy daily living habits independently, has a close relationship with severity in CAD patients. Patients with CAD often have poor daily life management skills, this also happens in CAD patients who have had a stent [3].

Unhealthy lifestyle behaviors, such as lack of physical activity, smoking, excessive alcohol consumption, obesity as well as an unhealthy diet are risk factors for CAD severity. Effective daily life management can change unhealthy lifestyles to healthier ones in CAD patients [4].

This study aims to determine the relationship between Daily life management and CAD severity.

### II. Materials and methods

**Study Design:** Cross-Sectional Study

**Study Location:** This research was conducted in one of the hospitals in Aceh.

**Study Duration:** March 28 to May 19, 2023.

**Sample size:** 146 CAD patients who had undergone coronary angiography/PCI.

**Sample size calculation:** the population of CAD patients who have undergone coronary angiography/PCI in the last 6 (six) months, from December 2022 to May 2023

**Subjects & selection methods:** The sampling technique used is *accidental sampling*

**Instrument:** Data collection on daily life in CAD patients who have undergone coronary angiography/PCI using the *Coronary Artery Disease Self-Management Scale (CSMS)*, specifically for questions about *daily life management* which consists of 08 questions. Alternative answers consist of never = 1, almost never = 2, sometimes = 3, often = 4 and always = 5. CSMS has a total scale reliability index value of 0.913 and the reliability coefficient for retesting of each dimension is 0.718–0.900. Meanwhile, data on the severity of CAD was collected based on the *syntax score* obtained from the results of the documentation study through the *patient's medical record* to measure the severity of CAD for the last 6 (six) months.

**Inclusion criteria:**

1. CAD patients who have undergone coronary angiography/*percutaneous coronary intervention (PCI)*
2. The patient is in a stable state and *compos mentis* consciousness.
3. Patients who agree to be examined
4. Cooperative can read and write and hearing well

**Exclusion criteria:**

1. Patients who are experiencing shortness of breath, chest pain and impaired mobility
2. Patients who do not agree to be examined.

**Procedure methodology**

The research procedure was carried out after obtaining ethical permission from the hospital (No.038/ETIK-RSUDZA/2023). Samples are selected by accidental sampling technique. The study data collection was carried out by waiting for CAD patients who had undergone coronary angiography/*percutaneous coronary intervention (PCI)* in the *Catheterization Laboratory (Cath Lab)* and Heart Poly until the number of samples was met. Data collection was assisted by five enumerators, namely 2 nurses who worked in the *Catheterization Laboratory (Cath Lab)* room and 3 nurses who worked in the Heart Poly to collect data with guided interview techniques, and record skunder data from *patient medical records*.

**Statistical Analysis**

Data were analyzed using descriptive statistics *chi-square test* and *binary logistic regression*

**III. Result**

**Table 1. Demographic Characteristics**

No	Characteristic	Frequency	Percentage
1	Age (mean; sd)	58,6; ± 9.9	
	Young Adults: 19–40 years	9	6,2
	Middle Adult:>40–65 years	101	69,2
	Senior : > 65 years old	36	24,7
2	Gender		
	Man	115	78,8
	Woman	31	21,2
3	Recent Education		
	Tall	64	43,8
	Intermediate	71	48,6
	Basis	11	7,5
4	Work		
	Civil servants	21	14,4
	Pensioner	24	16,4
	Self employed	48	32,9
	Farmer	29	19,9
	IRT	24	16,4
5	Income		
	≥Rp,3,280,000	45	30,8
	<Rp,3,280,000	101	69,2
6	Marital Status		
	Marry	119	81,5
	Divorce Life	3	2,1
	Divorce Dead	24	16,4
7	Family type		
	<i>Nuclear family</i>	130	89,0
	<i>Extended family</i>	16	11,0
8	Health Insurance		
	ASKES	45	30,8
	BPJS	101	69,2

Table 1 shows that of the 146 CAD patients who had undergone *coronary angiography/PCI* treatment, the average age was 58.6 years (sd= ±9.9), 115 people (78.8%) were men, 71 people (46.8%) had secondary education, 48 people (32.9%) worked as self-employed people, 101 people (69.2%) earned <Rp,3,280,000, 119 people (81.45%) Married, 130 (89.0%) are nuclear families, 101 (69.2%)

**Table 2. CAD Patient Health Condition Overview**

No	Characteristic	Frequency	Percentage
1	Long suffering from CAD disease		
	≤ 5 years	29	19,9
	> 5 years	117	80,1
2	Number of <i>stents</i>		
	≤ 2 <i>Stent</i>	80	54,8
	> 2 <i>Stent</i>	66	45,2
3	Stenting in emergencies		
	Yes	20	13,7
	Not	126	86,3
4	Long since the installation of the first <i>stent</i>		
	≤ 2 Years	80	54,8
	> 2 Years	66	45,2
5	Postoperative/action symptoms		
	None	145	99,3
	Discomfort	1	0,7
6	Comorbidities		
	Diabetes	82	56,2
	Hypertension	32	21,9
	Diabetes and Hypertension	25	17,1
	Other (history of stroke, TIA, AKI)	7	4,8
7	Total Cholesterol		
	Usual	49	33,6
	High Limit	85	58,2
	Tall	12	8,2
8	Body Mass Index		
	BB Less	1	,7
	BB Normal	19	13,0
	Fat	79	54,1
	Obesity	47	32,2

Table 2 shows that the health condition of CAD patients who have undergone *coronary angiography / PCI* treatment, it is known that as many as 117 people (80.1%) suffered from CAD > 5 years, 80 people (54.8%) had ≤ 2 stents, 126 people (86.3%) had *stents* not in emergency conditions, 80 people (54.8%) had ≤ 2 years since the first *stent*, 145 people (99.3%) had no postoperative symptoms, 82 people (56.2%) had diabetes as a comorbidity, 85 people (58.2%) each had total cholesterol values in the high limit category and 79 people (54.1%) in the obese category.

**Table 3. Overview of Daily Life Management and Severity in CAD Patients**

No	Variable	Frequency	Percentage
1	<i>Daily Life Management</i>		
	Excellent	97	66,4
	Good	28	19,2
	Enough	19	13,0
	Bad	2	1,4
2	CAD severity		

No	Variable	Frequency	Percentage
	Low	130	89,0
	Keep	16	11,0

The results of the analysis in Table 3 showed that of 146 CAD patients who had undergone *coronary angiography/PCI* treatment, as many as 140 people (63.3%) carried out *daily life management* very well. Furthermore, as many as 191 people (86.4%) had CAD severity in the low category.

**Table 4. The Relationship of Daily Life Management to CAD Severity**

Daily Life Management	CAD severity						p-value
	Low		Keep		Total		
	f	%	f	%	f	%	
Very Good/ Good	122	97,6	3	2,4	125	100,0	0,000
Quite/Bad	8	38,1	13	61,9	21	100,0	

The results of the analysis in table 4 show that *daily life management* (p = 0.000) is related to the severity of CAD that has undergone *coronary angiography/PCI*.

#### IV. Discussion

##### CAD severity

CAD still remains one of the leading causes of premature death and is associated with a risk of recurrent cardiovascular disease events, such as myocardial infarction, with the highest risk of recurrent events during the first year [5]. The results of this study described in Table 3 found that 89.0% of CAD patients had undergone *coronary angiography/PCI* treatment, having CAD severity in the low category. These results certainly have shown good service by the hospital and also the behavior of CAD care management by patients at home which is also good.

Various sociodemographic factors can affect the severity of CAD, such as age, gender and education. The results of the study shown in Table 1 found that the sociodemographic characteristics of CAD patients were an average age of 58.6 years (sd = ±9.9), 78.8% were male, 48.6% had a secondary education (graduated from high school or equivalent) and 30.8% had income below UMP (<Rp,3,280,000).

The results of the study are in accordance with those conveyed by Rodgers, et al. (2019), namely older populations are very susceptible to cardiovascular disease. Age is an independent risk factor for cardiovascular disease in adults, but this risk must be accompanied by additional factors, including frailty, obesity and diabetes. These factors are known to complicate and increase risk factors for heart disease associated with increasing age. Gender is another cardiovascular disease risk factor in aging adults, given that older women are reported to be at greater risk of cardiovascular disease than men of the same age [6].

Age plays an important role in decreased cardiovascular function, resulting in an increased risk of cardiovascular disease in older adults. The prevalence of cardiovascular disease has also been shown to increase with age, in both men and women, including the prevalence of atherosclerosis, stroke and myocardial infarction. *The American Heart Association (AHA)* reports that the incidence of cardiovascular disease in both men and women is >40% in 40-59 years of age, >75% in 60-79 years of age and >86% in over 80 years of age [7].

Socioeconomic factors such as income, occupation and education level contribute to the risk of adverse cardiovascular disease events in the general population. Socioeconomic status has a strong inverse relationship with cardiovascular disease risk factors such as CAD in high-income countries [8]. Research conducted by Kelli et al. (2019) also concluded that low educational background is an independent predictor in CAD patients who have undergone *angiography/PCI* [9].

The severity of CAD is also influenced by the patient's health condition during the disease. The results of research on the description of the health condition of CAD patients who have undergone *coronary angiography / PCI* procedures, as illustrated in Table 2 show that 80.1% have suffered from CAD > 5 years, 54.8% have been installed ≤ 2 rings, 56.2% have diabetes as a comorbidity, 58.2% have high total cholesterol values and 54.1% are overweight. Health factors related to the severity of CAD can be controlled. Risk factors that can be controlled (modified) are high blood pressure (hypertension), high blood cholesterol levels, smoking, diabetes and being overweight or obese [10].

Furthermore, Pfisterer et al. (2020) say that the link between diabetes and cardiovascular disease is very strong because diabetes increases the risk of CAD two- to fourfold [11]. It is estimated that about 80% of patients with diabetes die from ischemic CAD disease. Further, obesity and advanced glycation end products in diabetic patients also have higher levels of subclinical inflammation and develop endothelial dysfunction. The combination of hypercholesterolemia, inflammation, and endothelial dysfunction is a key mechanism involved in the initiation and progression of CAD disease [12]. The results of the research and discussion that have been described can be

concluded that most of the characteristics and health conditions in CAD patients support the increase in the severity of CAD disease.

### **The relationship of *daily life management* with CAD severity.**

Daily habits or lifestyle greatly affect the health of the individual. Lifestyle has been shown to influence the risk of CAD severity in patients who have irreversible CAD risk factors [2]. The results of this study described in Table 3 showed that 66.4% of CAD patients performed very well (*daily life management*). Furthermore, in table 4 CAD patients who carried out *daily life management* very well / well, 97.6% experienced low CAD severity. Based on these results, it can be concluded that there is a significant relationship between *daily life management* and the severity of CAD in patients who have undergone *coronary angiography / PCI*.

The conclusion statement of this study is in accordance with a study that says that there is a relationship between self-management behavior in everyday life and the incidence of CAD. However, most CAD patients who have undergone *coronary angiography/PCI* have low average self-management scores. The results of *the Self-management behavior* study in CAD patients according to Zhu et al. (2022) daily life management has the highest average score [13]. While in other studies found that aspects of *daily life management* are most often not adhered to by CAD patients, where most CAD patients do not adhere to healthy living behaviors, especially physical activity, maintaining a healthy diet and weight loss [14].

A healthy lifestyle, modifying risk factors and medication adherence are essential to prevent death and recurrence in individuals with CAD. Previous studies have revealed preventive effects of lifestyle modifications including smoking cessation, healthy diet and exercise on mortality among patients with CAD. Another systematic review also reported that quitting smoking can reduce the risk of death and myocardial infarction in CAD patients by 30% [15].

The severity of CAD that is low in relation to *daily life management* in this study can be influenced by the level of education and duration of experiencing CAD. The results of this study showed that 48.6% of CAD patients had a secondary education and 80.1% had CAD for more than five years. The level of education acts as a mediator of the relationship between lifestyle and health. This means that individuals with a healthy lifestyle will have good health if motivated by higher education [16].

The length of time patients suffer from CAD is associated with frequent exposure to information about healthy lifestyle management. CAD patients who are exposed to information about a healthy lifestyle will be more guarded against experiencing repetitive CAD. Information about a healthy lifestyle can be obtained through health education or through health literacy. In CAD disease management, lower health literacy is associated with poor outcomes. Key aspects of health literacy are associated with behavioral and psychological risk factors for CAD patients [17].

Healthy lifestyle behaviors that can reduce the risk of CAD severity have been widely proven through various studies. Risk reduction through behavior in CAD patients plays an important role in mediating health conditions after coronary angiography/PCI procedures. However, many patients with CAD after coronary angiography/PCI lack critical knowledge about the role that can be played in changing self-management behavior for the better after PCI, one of which is by maintaining healthy physical activity [18].

Based on the results of this study and the discussion that has been described, it can be concluded that good daily life management will affect the severity of CAD. Increased non-compliance in carrying out good daily life management will increase the severity of CAD.

## **V. Conclusion**

The results of this study can be concluded that *daily life management* is associated with severity in CAD patients undergoing *coronary angiography*. *Good daily life management* will reduce the severity in CAD patients. It is important for CAD patients to modify their lifestyle to be healthier by not smoking, healthy diet and exercise and adhering to a treatment program.

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