

Determinants Of Secondary Prevention Behaviour For Coronary Artery Disease In Aceh Regional Hospital, Indonesia

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Abstract:

Background:

The Behaviour of Coronary Artery Disease (CAD) patients in carrying out secondary prevention are a predictor of recurrence of patients experiencing relapse and rehospitalisation. An increase in cases of recurrence and rehospitalisation needs to be anticipated with well-targeted secondary prevention efforts. By adopting the determinants of the Health Belief Model (HBM), this study identified coronary artery disease secondary prevention behaviours and their determinants in CAD patients at Aceh Regional Hospital, Indonesia.

Materials and Methods:

The research design was a cross sectional study. The study sample was 130 CAD patients, who were selected using the simple random sampling technique. Data collection tools in this study consisted of demographic data questionnaires, Health Belief Related to Cardiovascular Disease (HBCVD) and Coronary Artery Disease Secondary Prevention Behaviour questionnaires. Data were analysed using descriptive statistics, Chi-Square test and multiple logistic regressions.

Results:

The results show a significant relationship between education ($p=0.046$), income ($p=0.023$), perceived susceptibility ($p=0.017$), perceived severity ($p=0.034$) and self-efficacy ($p=0.012$) with coronary artery disease secondary prevention behaviour. The determinants associated with coronary artery disease secondary prevention behaviour included income, perceived susceptibility and self-efficacy, with income was the most dominant determinant factor (OR=2.65 [95% CI: 1.15-6.09]).

Conclusion:

Income level of CAD patients is associated with coronary artery disease secondary prevention behaviour. Appropriate education to increase perceived susceptibility and self-efficacy is needed to support coronary artery disease secondary prevention behaviour.

Key Word: Determinants, Secondary Prevention Behaviour, CAD

Date of Submission: 19-05-2023

Date of Acceptance: 29-05-2023

I. Introduction

Coronary Artery Disease (CAD) ranks first out of 10 diseases that cause death worldwide [1] and is the main cause of death in adulthood [2]. In developed countries such as in the United States and England, the death rate from CAD is declining, but in developing countries it shows the opposite trend [3]. One of the developing countries that show an increase in mortality due to CAD is Indonesia. Data from the 2014 Sample Registration System Survey show the death rate due to CAD was 12.9% in Indonesia, and increased to 13,3% in 2018 [4].

CAD secondary prevention behaviour is an effort made so that individuals who have had CAD do not experience recurrent heart attacks with all their complications [5]. Adherence to secondary prevention behaviour, including pharmacological therapy (to control blood pressure, blood sugar and cholesterol) and modification of a heart-healthy lifestyle with physical activity/exercise, reducing/stopping alcohol and cigarette intake, low-salt and fat diet and stress management, is an integral part of the management of patients with CAD [6][7]. Secondary prevention that is not carried out adequately can cause recurrent heart attacks. Recurrent heart attacks usually occur because patients do not continue treatment (16%), do not regularly carry out health checks and take medication so that the dose is insufficient (32%) and do not control risk factors (48%) [8].

A Previous study conducted on 55 CAD patients at one cardiac polyclinic in Padang showed 92.7% of respondents took medication well, 56.4% did physical activity, 41.8% did not stop smoking, 49.1% did not adhere to the recommended diet, and 40% did not control body weight [9]. Another study conducted on 62 CAD

patients at one heart polyclinic of a heart hospital in East Jakarta showed that 54.8% the surveyed respondents had bad preventive behaviour [10].

The Health Belief Model (HBM) can be used to describe the relationship between behaviour and its' related factors in patients with chronic diseases [11]. The HBM is an ideal framework for interpreting and predicting health-related behaviour [12]. The construct of the model consists of perceived susceptibility, perceived severity, perceived barriers and perceived benefits, cues to action, self-efficacy and other variables (modifying factors) [13]. The success of preventive behaviour in individuals is influenced by beliefs or beliefs and understanding that they are at risk of getting sick because of the disease (perceived susceptibility), that the disease is severe (perceived severity) and affects their lives. They also need to perceive that doing health behaviour will be beneficial (perceived benefits) in reducing the risk of illness or disease severity; they need to see that there are no barriers (perceived barriers) to carry out the behaviour [11].

A Previous report suggests that perceived susceptibility, perceived severity, and self-efficacy are significantly related to medication adherence behaviour [14]. Self-efficacy is reported to be the most influences factor for health behaviour modification through a healthy lifestyle as a CAD secondary prevention behaviour [15]. Low self-efficacy is related to changes in the level of adherence to a healthy lifestyle over time [7]. Cues to actions, perceived benefits and perceived barriers are related to the decision or reason behind attending a cardiac rehabilitation program [16]. It has also been reported that motivation, family support and sources of information as a form of cues to action were associated with the patient's ability to carry out CAD secondary prevention [17]. Other factors/modifying factors related to CAD secondary prevention behaviour show that gender is related to CAD secondary prevention behaviour [18]. Sociodemographic characteristics significantly influence lifestyle modification as part of CAD secondary prevention behaviour [19].

Some of the research results above show a relationship between the variables in the HBM construct and secondary prevention of coronary artery disease which are linked separately, for example only with medication adherence, physical activity and lifestyle modifications. There is also research linking coronary artery disease secondary prevention behaviour as a whole, but has not tested the relationship between variables according to the HBM theory. In addition, there has been no research on the most dominant factor associated with CAD secondary prevention behaviour. Based on this background, this research will identify the determinants of coronary artery disease secondary prevention behaviour according to the HBM construct.

II. Material And Methods

Study Design: Cross sectional study

Study Location: This research was conducted at one regional general hospital in the center region of the Aceh Province, Indonesia.

Study Duration: 1st to 30th March, 2023

Sample size: 130 of coronary artery disease patients

Sample size calculation: The sample size was determined based on the formula Lemeshow et al., [20] with a population of 197 and a 95% of confidence level.

Subjects & selection method: The sample selection used simple random sampling technique.

Instruments: Data collection used a measuring tool in the form of a questionnaire consisting of demographic data questions, the Health Belief Related to Cardiovascular Disease (HBCVD) questionnaire [21], and the secondary prevention behaviour questionnaire for coronary artery disease for the practice aspect refers to the standard KAP questionnaire from AUSAID [17]. A validity and reliability tests of the questionnaires were carried out before the study conducted amongst 30 CAD patients. The value of *Cronbach Alpha* for the HBCVD questionnaire was 0.896 and for the secondary prevention behaviour questionnaire for coronary artery disease was 0.836.

Inclusion criteria: Adult patients with CAD who were undergoing outpatient care at the heart polyclinic of the selected hospital, composmentist awareness, and willing to become a research respondent.

Exclusion criteria: Patients who experienced a decline in their condition they were unable to become respondents in this study, patients who is weak or there is a decrease in consciousness and requires further treatment in an inpatient room so that it is not possible to be involved as a respondent in this study.

Procedure methodology: The researchers conducted direct meetings with respondents at the heart polyclinic. Then it was continued by being given an explanation of information regarding the objectives, benefits, and procedures to be carried out in the study, and then asked for their willingness to become research respondents. For those who were willing to become research respondents, they were asked to sign informed consent forms and then filled out the research questionnaire.

Statistical analysis: After the data was collected, a process of reassure was carried out on the completeness of filling in all parts of the research instrument that had been collected one by one, and no missing data was found, then coding and analysis were carried out. The data analysis used is descriptive statistics, including the frequency and percentage of each variable. Testing for statistical significance to see whether there was a

relationship or not was done using the *Chi-square* test. Multivariate analysis was carried out using multiple logistic regressions.

III. Result

Characteristics of research respondents can be seen in the Table 1 as follow.

Table 1: Sociodemographic Frequency Distribution of CAD Patients (n=130)

Characteristics	f	%
Age		
Early Adult	5	3,8
Middle Adult	125	96,2
Gender		
Male	86	66,2
Female	44	33,8
Education		
Did not attend the middle school	47	36,2
High School to College	83	63,8
Income		
Low	70	53,8
High	60	46,2

Table 1 shows that almost all of the respondents were identified as middle-aged adults (96.2%); the majority were male (66.2%), high school to tertiary education (63.8%), and low income (53.8 %).

Characteristics of respondents' behaviour and its determinants for secondary prevention of Coronary Artery Disease are shown in the Table 2 as follow.

Table 2: Frequency Distribution of Respondents' Secondary Prevention Coronary Artery Disease Behaviour and Its Determinants (n=130)

Characteristics	f	%
CAD secondary prevention behaviour		
Positive	90	69,2
Negative	40	30,8
Perceived susceptibility	80	61,5
Positive	50	38,5
Negative		
Perceived severity		
Positive	84	64,6
Negative	46	35,4
Perceived Benefits		
Positive	81	62,3
Negative	49	37,7
Perceived Barriers		
Positive	75	57,7
Negative	55	42,3
Cues to action		
Positive	72	55,4
Negative	58	44,6
Self-efficacy		
Positive	81	62,3
Negative	49	37,7

Table 2 shows that the majority of the respondents had positive secondary prevention behaviour (69.2%), positive perceived susceptibility (61.5%), positive perceived severity (64.6%), positive perceived benefits (62.3%), positive perceived barriers (57.7%), positive cues to action (55.4%) and positive self-efficacy (62.3%).

The Relationship between the respondents' characteristics and their secondary prevention coronary artery disease behaviors can be seen in Table 3 as follow.

Table 3: The Relationship between characteristics of respondents and secondary prevention coronary artery disease behaviors

Variable	Secondary Prevention Coronary Artery Disease Behaviour			p
	Negative	Positive	Total	

	f	%	f	%	f	%	
Age							
Early Adult	0	0	5	100	5	100	0,323
Middle Adult	40	32	85	68	125	100	
Gender							
Male	27	31,4	59	68,6	86	100	0,988
Female	13	29,5	31	70,5	44	100	
Education							
Did not attend middle school	20	42,6	27	57,4	47	100	0,046
High School to College	20	24,1	63	75,9	83	100	
Income							
High	12	20	48	80	60	100	0,023
Low	28	40	42	60	70	100	
Perceived Susceptibility							
Positive	18	22,5	62	77,5	80	100	0,017
Negative	22	44	28	56	50	100	
Perceived Severity							
Positive	20	23,8	64	76,2	84	100	0,034
Negative	20	43,5	26	56,5	46	100	
Perceived Benefits							
Positive	21	25,9	60	74,1	81	100	0,180
Negative	19	38,8	30	61,2	49	100	
Perceived Barriers							
Positive	20	26,7	55	73,3	75	100	0,322
Negative	20	36,4	35	63,6	55	100	
Cues to Action							
Positive	24	33,3	48	66,7	72	100	0,607
Negative	16	27,6	42	72,4	58	100	
Self-efficacy							
Positive	18	22,2	63	77,8	81	100	0,012
Negative	22	44,9	27	55,1	49	100	

Table 3 show that there is a significant relationship between education (p=0.046), income (p=0.023), perceived susceptibility (p=0.017), perceived severity (p=0.034) and self-efficacy (p=0.012) with secondary prevention behaviour coronary artery disease.

Results of Multivariate analysis to assess the determinant factors of secondary prevention behaviours for CAD are shown in Table 4 as follow.

Table 4: Determinant Factor of Coronary Artery Disease Secondary Prevention Behaviour

Variables	B	p	OR	95 % CI
Income	0,974	0,022	2,649	1,152-6,094
Perceived Susceptibility	0,936	0,023	2,549	1,138-5,706
Self-efficacy	0,938	0,022	2,555	1,143-5,711

Table 4 shows that income, perceived susceptibility and self-efficacy had a significant relationship with CAD secondary prevention behaviour ($p < 0.05$). Table 4 also shows that income is the most dominant determinant associated with CAD secondary prevention behaviour (OR 2.649 [95% CI: 1.152-6.094]), meaning that CAD patients who have high incomes have 2.6 times the opportunity to carry out secondary prevention of coronary artery disease compared to low income.

IV. Discussion

The result of this study shows the relationship between education and coronary artery disease secondary prevention behaviour in CAD patients was statistically significant. This finding is consistent with the results of a study that compared the relationship between demographics and adherence behaviour to CAD secondary prevention efforts, especially on medication adherence, showing that a high level of education is

significantly associated with adherence behaviour ($p=0.010$) [6]. The results of both the *Chi-square* test and the regression analysis show that education level is also associated with adherence to CAD secondary prevention, especially adherence to a heart-healthy lifestyle.

The higher education level of the respondents supports positive behaviour because through better education the knowledge is also better so that it influences individual behaviour. Knowledge obtained from non-formal education such as health counselling or advice given by health workers related to health in CAD patients influences the secondary prevention behaviour of coronary artery disease in these patients.

Additionally, the results of this study show that there was a significant relationship between income and coronary artery disease secondary prevention behaviour, suggesting that income level would positively influence coronary artery disease secondary prevention behaviour. Previous studies have shown the results that are in accordance with the findings in this study where income is significantly related to coronary artery disease secondary prevention behaviour ($p=0.020$) [22]. Monthly income is significantly related to coronary artery disease secondary prevention behaviour ($p=0.004$) [6]. Income is significantly related to lifestyle modification ($p=0.016$), physical activity ($p=0.046$) and dietary compliance ($p=0.035$) as part of coronary artery disease secondary prevention behaviour [19].

The majority of respondents in this study with high incomes (80%) have positive coronary artery disease secondary prevention behaviours. This finding could occur because higher income helps increase access to material resources that assist adherence to coronary artery disease secondary prevention behaviours. In addition, patients with high incomes may find it easier to adhere to a healthy lifestyle, for example, to provide for healthy food needs that are more likely to be met with higher incomes.

Furthermore, the results showed that there was a significant relationship between perceived susceptibility and coronary artery disease secondary prevention behaviour ($p=0.017$), meaning that positive perceived susceptibility would influence positive coronary artery disease secondary prevention behaviour. Previous research is in accordance with the findings in this study, namely that there is a significant relationship between perceived susceptibility and coronary artery disease secondary prevention behaviour, especially in physical activity ($p=0.008$), CAD patients are aware of the risk of disease (perceived susceptibility) and consider themselves are more likely to follow doctor's advice when the possibility/risk of suffering from disease is greater, so adherence to coronary artery disease secondary prevention behaviour is better [14].

In this study, it was found that there is a relationship between perceived susceptibility and coronary artery disease secondary prevention behaviour because CAD patients are generally aware that recurrent heart attacks are fatal and can threaten relationships with people who are important to them, for example CAD patients are heads of households. Then the condition of the disease that he suffers can cause his role as husband and father cannot be carried out properly. CAD patients may also realize that if they have repeated heart attacks then their whole life can change, threatening their relationship with their partners and even resulting in death.

The results showed that there was a significant relationship between perceived severity and coronary artery disease secondary prevention behaviour ($p=0.034$), meaning that positive perceived severity would affect positive coronary artery disease secondary prevention behaviour. The results of previous studies are in accordance with the findings in this study which show that beliefs about the seriousness of the disease (perceived severity) are significantly associated with the patient's ability to maintain functional status in the form of physical activity as a secondary CAD prevention effort ($p=0.010$) [23].

The results of this study indicate that there is a positive relationship between perceived severity and positive coronary artery disease secondary prevention behaviour because CAD patients are aware of the severity and seriousness of their illness so that it encourages patients to behave positively in coronary artery disease secondary prevention as well.

The results showed that there was no significant relationship between perceived benefits and coronary artery disease secondary prevention behaviour ($p=0.180$). A study showed results that were contrary to the results of this study, where perceived benefits were significantly associated with the presence of patients in a cardiac rehabilitation program as a CAD secondary prevention effort ($p=0.010$). If barriers to attendance are reduced, it is possible that participants who might otherwise refuse participation choose to attend rehabilitation and gain similar benefits [24].

In this study, there was no significant relationship between perceived benefits and coronary artery disease secondary prevention behaviour because sometimes the benefits of coronary artery disease secondary prevention behaviour cannot be felt immediately. As a result, patients are reluctant to comply with the recommended behaviour. Non-compliance with a low-fat and cholesterol diet can occur because the effects of consuming foods with high levels of fat and cholesterol do not directly affect these patients. In addition, the habit of consuming foods with high fat and cholesterol content in the living environment may often be unavoidable for CAD patients. Likewise, the benefits of sports activities are also not directly felt by CAD patients, causing reluctance in patients to carry out these activities.

The results showed that there was a significant relationship between self-efficacy and coronary artery disease secondary prevention behaviour ($p=0.012$). Previous studies have shown results consistent with this study, namely self-efficacy is the main predictor that is significantly related to physical activity in CAD secondary prevention behaviour [25]. Self-efficacy is a factor that greatly influences CAD secondary prevention behaviour ($p=0.001$) [26] [27] [28].

In this study, there was a significant relationship between self-efficacy and coronary artery disease secondary prevention behaviour because patients generally have positive beliefs about their ability to perform coronary artery disease secondary prevention behaviour. Expected abilities, for example, consumption of healthy food, remaining consistent in taking medicines according to doctor's recommendations even in the long term, being able to manage stress and carry out activities gradually and safely which will have a positive impact on the health of CAD patients and the expected end result is less chance of recurrent cardiac arrest and rehospitalisation.

Regarding determinant factor for the behaviour of secondary prevention of CAD, the results showed that the determinants of income, perceived susceptibility and self-efficacy had a significant relationship with coronary artery disease secondary prevention behaviour ($p < 0.05$). The most dominant determinant is income ($p=0.022$) with an OR value of 2.649 (95% CI: 1.152-6.094), meaning that CAD patients with high incomes have 2.6 times the chance to carry out secondary prevention of coronary artery disease compared to those with low incomes. .

High income helps increase access to material resources that can support adherence to coronary artery disease secondary prevention behaviours. In addition, high income allows CAD patients to more easily adhere to a healthy lifestyle, for example, to provide healthy food needs that can be more fulfilled supported by higher income. Based on this, in providing health promotion or advice to CAD patients related to coronary artery disease prevention behaviour that requires the support of material resources, it is necessary to pay attention to the patient's economic background [22].

V. Conclusion

The results show that the determinants of income, perceived susceptibility and self-efficacy had a significant relationship with coronary artery disease secondary prevention behaviour ($p < 0.05$). The most dominant determinant is income ($p=0.022$) with an OR value of 2.649 (95% CI: 1.152-6.094). Income level of CAD patients is associated with coronary artery disease secondary prevention behaviour. Interventions that can be carried out by nurses to support coronary artery disease secondary prevention behaviour are in the form of appropriate education that is focused on efforts to increase perceived susceptibility and self-efficacy so that recurrence or recurrent heart attacks are expected to be minimized

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