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## Psychology and Lifestyle Related to Coronary Heart Disease Incidence

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### ABSTRACT

Coronary heart disease is a disease of the coronary arteries that narrows or blocks the coronary arteries caused by the process of atherosclerosis. A preliminary study conducted by researchers in outpatients at the PTPN X Hospital of Jember showed that the prevalence of coronary heart disease was quite high, as evidenced by the medical record data that new outpatient coronary heart disease from year to year showed a fluctuating pattern. In 2015 it amounted to 22.6%, in 2016 amounted to 15.95% and in 2017 it increased dramatically by 29.07%, sufferers consumed foods that were high in fat, then consumed excessive coffee, smoked at a young age and some sufferers experiencing stress due to competition in the world of work. The purpose of this study was to determine the psychology and lifestyle relationship to coronary heart disease in outpatients at the PTPN X Hospital of Jember. This research was quantitative with analytic observational method with case control design. The sample was 57 in outpatients at PTPN X Hospital of Jember who were taken by systematic random sampling. Logistics regression was used to analyze data. The results there were relationship of stress (p-value: 0.003), depression (p-value: 0.006) and physical activity (p-value: 0.009) to coronary heart disease.

**Keywords:** Psychology, Lifestyle, Coronary heart disease

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### INTRODUCTION

#### Background

Coronary heart disease is a disease of the coronary arteries that narrows or blocks the coronary arteries caused by the process of atherosclerosis. Impaired coronary artery narrowing results in reduced blood flow and oxygen leading to the heart resulting in angina syndrome, myocardial infarction, sudden cardiac arrest that can cause death<sup>(1)</sup>. One of the risk factors for coronary heart disease is smoking. Smoking can result in increased myocardial load due to stimulation of hormone catecholamines and decreased oxygen consumption. Toxic chemicals such as nicotine and carbon monoxide which are sucked through cigarettes then enter the blood, which can damage the endothelial lining of arteries and result in atherosclerosis<sup>(2)</sup>. Lack of physical activity is at risk for coronary heart disease. People who lack physical activity can cause blood flow in the collateral blood vessels and coronary arteries to decrease so that blood flow to the heart decreases<sup>(3)</sup>.

In addition, coffee consumption has an effect that is not good for health. Coffee contains caffeine by increasing heart rate and increasing blood pressure<sup>(4)</sup>. Another factor at risk for coronary heart disease is stress. Sources of stress can come from within the individual such as inferiority, sadness, excessive worry, anger, anxiety, negative feelings and frustration. In addition, stress comes from outside the individual such as physical activity, high temperatures, pollution and noise. These symptoms can increase heart rate, digestive disorders, increased blood pressure and increased adrenaline and non adrenaline hormones, which will interfere with fat metabolism which can increase levels of high Low Density Lipoprotein<sup>(5)</sup>. Prolonged stress results in depression. Someone who is depressed, there is an imbalance of neurotransmitters or levels of serotonin in the body, so that someone looks moody and not powerful. Decreased serotonin levels associated with changes in platelet adhesions. This person who experiences depression can cause sticky platelets in the heart blood vessels<sup>(6)</sup>.

The prevalence of coronary heart disease in outpatients at the PTPN X Hospital of Jember shows a fluctuating pattern. From preliminary studies conducted by patients consuming foods high in fat, consuming excessive coffee, smoking from a young age and some experiencing stress due to competition in the world of work, with the incidence of coronary heart disease, further studies are needed to analyze factors associated with coronary heart disease in outpatients at PTPN X Hospital of Jember.

**Purpose**

The purpose of this study is to analyze the relationship between psychology (stress and depression) and lifestyle (coffee consumption, cigarette consumption, physical activity) to the incidence of coronary heart disease in outpatients at the PTPN X Hospital of Jember.

**METHODS**

The research method used was observational analytic. The research design was case control. This research was conducted in outpatients at the PTPN X Hospital of Jember. The population of the case were all outpatients of coronary heart disease in outpatients at PTPN X Hospital of Jember. The control population were outpatients who did not suffer from coronary heart disease. Case samples were outpatients of coronary heart disease in the past year that met the inclusion and exclusion criteria. The control samples were outpatients who examined cardiac ulcer and were not diagnosed with coronary heart disease in outpatients at the PTPN X Hospital of Jember. The number of cases and control group samples were 57:57. The sampling technique was systematic random sampling. The data needed in this study were primary data and secondary data. Data collection techniques were filling out the questionnaire, interview and observation. Data analysis techniques was logistic regression. The time of the study began on June 1, 2018.

**RESULTS**

**Distribution of Incidence of Coronary Heart Disease based on Individual Characteristics**

Table 1. Distribution of the incidence of coronary heart disease based on individual characteristics

Individual characteristics	The incidence of coronary heart disease			
	Case		Control	
	Frequency	Percentage	Frequency	Percentage
Age				
35-45 year	9	15.79	10	17.54
46-55 year	13	22.81	14	24.56
56-65 year	19	33.33	17	29.82
≥66 year	16	28.07	16	28.07
Total	57	100	57	100
Gender				
Male	26	45.61	28	49.12
Female	31	54.39	29	50.88
Total	57	100	57	100
Genetic				
Exist	35	61.40	31	54.39
Non-exist	22	38.60	26	45.61
Total	57	100	57	100

Table 1 shows that in the case and control groups, the majority of respondents were 56-65 years old, female. Based on heredity, most of the case groups had families with a history of coronary heart disease, while the majority of the control group had no family with a history of coronary heart disease.

**Distribution of the Incidence of Coronary Heart Disease based on Psychology**

Table 2 shows that in the case group, most of them experienced moderate stress, while most of the control group did not experience stress. In the case group, most of them experienced severe depression, while the majority of the control group did not experience depression.

Table 2. Distribution of the incidence of coronary heart disease based on psychology

Variable	Category	Incidence of coronary heart disease			
		Case		Control	
		Frequency	Percentage	Frequency	Percentage
Stress	No stress	12	21.05	25	43.86
	Light	15	26.32	16	28.07
	Moderate	16	28.07	10	17.54
	Severe	14	24.56	6	10.53
	Total	57	100	57	100
Depression	No depression	11	19.30	22	38.60
	Light	10	17.54	14	24.56
	Moderate	13	22.81	10	17.54
	Severe	17	29.82	7	12.28
	Very severe	6	10.53	4	7.02
Total	57	100	57	100	

**Distribution of the Incidence of Coronary Heart Disease based on Lifestyle**

Table 3. Distribution of incidence of coronary heart disease based on lifestyle

Variable	Category	Incidence of coronary heart disease			
		Case		Control	
		Frequency	Frequency	Frequency	Frequency
Consumption of Coffee	Never consume	33	57.89	36	63.16
	Light	13	22.81	12	21.05
	Moderate	8	14.04	8	14.04
	Severe	3	5.26	1	1.75
	Total	57	100	57	100
Consumption of cigarettes	Not smoker	33	57.89	32	56.14
	Light smoker	8	14.04	11	19.30
	Moderate smoker	12	21.05	8	14.04
	Heavy smoker	4	7.02	6	10.53
	Total	57	100	57	100
Physical activity	Mild	24	42.11	12	21.05
	Moderate	19	33.33	20	35.09
	Severe	14	24.56	25	43.86
	Total	57	100	57	100

Table 3 shows that in the case group and the control group, most of them did not consume coffee, most of each group did not smoke. Most of the case group members did mild physical activity, while the control group did severe physical activity.

**Relationship between Stress to the Incidence of Coronary Heart Disease**

Table 4. Relationship between stress and incidence of coronary heart disease

Stress	Incidence of coronary heart disease				p-value.	B	Exp (B)
	Case		Control				
	Frequency	%	Frequency	%			
No issue	12	21.05	25	43.86	0.003	0.542	1.720
Light	15	26.32	16	28.07			
Moderate	16	28.07	10	17.54			
Severe	14	24.56	6	10.53			
Total	57	100	57	100			

Table 4 shows that there was a relationship between stress and the incidence of coronary heart disease with (p-value = 0.003). The odd ratio was 1.720 which means that stress is 1.720 times at risk of causing coronary heart disease.

**Relationship between Depression and the Incidence of Coronary Heart Disease**

Table 5. Relationship between depression and the incidence of coronary heart disease

Depression	Incidence of coronary heart disease				p-value	B	Exp (B)
	Case		Control				
	Frequency	%	Frequency	%			
Normal	11	19.30	22	38.60	0.006	0.415	1.514
Light	10	17.54	14	24.56			
Moderate	13	22.81	10	17.54			
Severe	17	29.82	7	12.28			
Very severe	6	10.53	4	7.02			
Total	57	100	57	100			

Table 5 shows that there was a relationship between depression and the incidence of coronary heart disease (p-value = 0.006). The odd ratio was 1.514 which means that depression is 1.5 times the risk of coronary heart disease.

**Relationship between Coffee Consumption and the Incidence of Coronary Heart Disease**

Table 6. Relationship between coffee consumption and the incidence of coronary heart disease

Consumption of Coffee	Incidence of coronary heart disease				p-value	B	Exp (B)
	Case		Control				
	Frequency	%	Frequency	%			
Never consume	33	57.89	36	63.16	0.444	0.169	1.184
Light	13	22.81	12	21.05			
Moderate	8	14.04	8	14.04			
Severe	3	5.26	1	1.75			
Total	57	100	57	100			

Table 6 shows that there was not a relationship between consumption of coffee and the incidence of coronary heart disease (p-value = 0.444).

**Relationship between Cigarette Consumption and the Incidence of Coronary Heart Disease**

Table 7. Relationship between cigarette consumption and the incidence of coronary heart disease

Cigarette consumption	Incidence of coronary heart disease				p-value	B	Exp (B)
	Case		Control				
	Frequency	%	Frequency	%			
Not smoker	33	57.89	32	56.14	0.927	0.017	0.983
Light smoker	8	14.04	11	19.30			
Moderate smoker	12	21.05	8	14.04			
Heavy smoker	4	7.02	6	10.53			
Total	57	100	57	100			

Table 7 shows that there was not a relationship between consumption of cigarette and the incidence of coronary heart disease (p-value = 0.927).

**Relation of Physical Activity to the Incidence of Coronary Heart Disease**

Table 8 shows that there was a relationship between physical activity and the incidence of coronary heart disease with (p-value = 0.009).



Table 8. Relation of Physical Activity to the Incidence of Coronary Heart Disease

Physical activity	Incidence of coronary heart disease				p-value	B	Exp (B)
	Case		Control				
	Frequency	%	Frequency	%			
Light	24	42.11	12	21.05	0.009	0.634	0.53
Moderate	19	33.33	20	35.09			
Severe	14	24.56	25	43.86			
Total	57	100	57	100			

### DISCUSSION

Stress is associated with the incidence of coronary heart disease. Respondents experienced various problems including being easily swayed when faced with problems, caring for stroke-affected husbands and sick parents, then death of spouses, close sibling deaths, a decrease in health experienced by family members, often having difficulty sleeping and often experiencing pain such as headaches and back. In line with research conducted by Sudayasa et al., (2014), which states that stress is associated with coronary heart disease<sup>(7)</sup>. Stress tends to make someone ignore a healthy lifestyle, such as smoking, consuming various foods that tend to be unhealthy. These various things make stress a source of various diseases including coronary heart disease. A person's body's response to stress can also increase the risk of coronary heart disease. This response can trigger the body to release adrenaline. The adrenaline hormone will increase heart rate, breathing, and blood pressure<sup>(8)</sup>. The source of stress comes from individuals such as inferiority, sadness, excessive anxiety, anger, anxiety, negative feelings and frustration. Besides that stress can also come from outside the individual eg physical activity, food, high temperature, pollution and noise. Stress symptoms can increase heart rate, digestive disorders, blood pressure and adrenaline and non-adrenaline hormones. If that happens, the adrenal hormone that comes out will interfere with fat metabolism resulting in high levels of Low Density Lipoprotein (LDL)<sup>(5)</sup>.

Depression is associated with the incidence of coronary heart disease. Respondents experienced various problems including often experiencing despair, blaming themselves, feeling disappointing others, contemplating past sins, complaining of difficulty each night sleeping, experiencing agitation or restlessness, tension and worry, headaches and nausea. In line with research conducted by Jackson, states that symptoms of depression directly affect the physiology of the body through mechanisms such as hormone pathways, inflammatory processes in the arteries, and increased risk of blood clots<sup>(10)</sup>. At the time of depression there is an imbalance of neurotransmitters or serotonin levels in the body, so that someone looks moody and not powerful. Decreased serotonin levels are associated with changes in platelet adhesions. This makes depressed people have a tendency towards sticky platelets in the heart blood vessels<sup>(11)</sup>.

Coffee consumption is not associated with the incidence of coronary heart disease. It is possible for many respondents to be female who do not have coffee consumption habits. In line with research conducted by Yadi et al., 2013, which stated that coffee was not associated with coronary heart disease. Coffee has benefits as an anti-inflammatory which indirectly has benefits for heart health. anti-inflammatory contained in coffee can inhibit the occurrence of inflammation in the heart blood vessels caused by the accumulation of cholesterol in the blood vessels of the heart, so that it can inhibit the occurrence of atherosclerosis in the heart arteries<sup>(3)</sup>. Cigarette consumption is not associated with coronary heart disease. It is possible for many respondents to be female who do not have smoking habits. This research is not in line with other studies which state that cigarette smoke can increase carbon monoxide in the blood which binds to hemoglobin by transporting oxygen, so the heart works harder to produce energy<sup>(13)</sup>. Nicotine plays a role in coronary atherosclerosis and thrombosis by increasing free fatty acids and increasing thrombosis aggregation through stimulation of catecholamines<sup>(5)</sup>.

Physical activity is related to coronary heart disease. Respondents carried out mild physical activities such as watching TV, worship, lying down, sweeping, sitting, washing dishes, walking slowly and on the other hand respondents consumed foods that were high in fat such as shrimp, meat and coconut milk. Sedentary lifestyle is a lifestyle in which physical activity is very minimal or lacking, while the mental workload is maximal or heavy. Today's eating behavior has changed from the consumption of traditional foods to the consumption of instant modern foods and kebaratan which contain lots of fat, cholesterol, sugar, salt, and preservatives<sup>(5)</sup>. This research is in line with the research of Nababan D (2008), which states that people who do light activities have a risk of 2.25 times suffering from coronary heart disease<sup>(12)</sup>. A person's risk of suffering from coronary heart disease will be very high if light activities are accompanied by smoking and consuming high-fat foods<sup>(3)</sup>. Physical inactivity can cause an increase in blood cholesterol and low visceral fat accumulation and vascular inflammation which in turn insulin resistance and atherosclerosis resulting in the development of coronary heart disease<sup>(13)</sup>.

## CONCLUSION

Based on the results of the study it can be concluded that stress, depression and physical activity are related to coronary heart disease, while coffee consumption and consumption of cigarettes are not associated with the incidence of coronary heart disease, this is possible for many respondents who are female who do not have the habit of consuming coffee and cigarettes. therefore it requires effort to change diet, regular physical activity with exercise, control stress well so as to reduce the incidence of coronary heart disease.

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