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Smoking as a major risk for heart disease in the covid-19 pandemic: A case-control study

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Abstract

Heart disease, which is on the rise, particularly in developing countries like Indonesia, is the leading cause of mortality worldwide. Pandemic COVID-19 should cause concern for those who currently have cardiovascular disease as it may exacerbate their condition. This study aims at investigating how dietary and lifestyle factors influence the prevalence of heart disease during the Covid-19 pandemic. This study is analytical research embracing the case-control approach. There were up to 118 patients with heart disease in the population comprising 30 respondents from the control group and 30 from the case sample. The sample was withdrawn by accidental sampling and interviews. The findings of this study indicated a significant relationship between smoking and heart disease with an OR of 4.929 (p=0.004), suggesting that smokers have a five-fold increased risk of acquiring heart disease when compared to non-smokers. The frequency of heart disease is significantly influenced by the pattern of physical activity (p-value 0.007) and diet (p-value 0.018). Yet, coffee consumption have no significant relationship with the prevalence of heart disease (p-value 0.108 OR 0.419). It is preferable to give up on cigarettes. If quitting proves to be challenging, other options could include progressively lowering intake, engaging in regular exercise and consuming a lot of fruits and vegetables. It is also highly advised to maintain a healthy diet and undergo regular check-ups so that any health issues can be detected early and treated as necessary.

Keywords: Smoking; Physical activity; Diet; Drinking coffee; Heart disease

1. Introduction

Heart disease attacks people of all ages, genders, and socioeconomic levels. People who reside in cities are more likely to suffer heart disease than those who live in villages. Heart disease can lead to complications in the kidneys, eyes, nerves, and stroke. The prevalence of heart disease will rise as a result of lifestyle changes (1). In 2019, there were 2403 patients with heart disease at Antam Medika Hospital in Jakarta, this number fell to 458 in 2020; and then rose to 1003 in 2021 [2]. Age, gender, and heredity are non-modifiable risk factors for heart disease. Preventable risk factors for heart disease include obesity, physical activity, diet, alcohol use, stress, hypertension, smoking, high blood sugar, and dyslipidemia [3],(4).

According to research by Merti James (2017), smoking, physical exercise, and eating habits have an impact on coronary heart disease. Whereas Marniati (2009) stated that smoking increases the risk of coronary heart disease (henceforth CHD), and concluded that in order to control CHD, three lifestyle factors need to be addressed: smoking, coffee consumption, and stress management [5]. In 2020, residents of the special capital region of Jakarta, abbreviated DKI Jakarta, participated in sport were 2,095,485 people, a 77% drop from 2019. Smokers made up 26% of the population in DKI Jakarta who spent an average of 10.3 cigarettes per day or 72 cigarettes per week [4]. The purpose of this study was to analyze how lifestyle choices affected the prevalence of heart disease during the Covid-19 pandemic.

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2. Material and methods

This type of research is analytic with a case control design. The study population was 118 outpatients suffering from heart disease in January 2022. In this study, there were 30 new cases of heart disease patients, and there were 30 cases of non-cardiac surgical polyp patients in the control group. Patients who received their first heart disease diagnosis fell within the inclusion criteria, whereas those who were completely incapacitated by their condition were excluded. An accidental sampling technique was used in this study. Chi-Square analysis was performed in the data analysis to determine the odds ratio for the likelihood of developing heart disease (OR).

3. Results and discussion

3.1. Frequency distribution of smoking habits, physical activity, eating patterns, and coffee consumption

Table 1 Frequency Distribution of Smoking Habits, Physical Activity, Eating Patterns, and Coffee consumption

Variable	Group				Amount	
	Case		Control			
	n	%	n	%	n	%
Smoke						
Tall	18	60.0	7	23.3	25	41.7
Low	12	40.0	23	76.7	35	58.3
Physical Activity						
Not good	24	80.0	14	46.7	38	63.3
Well	6	20.0	16	53.3	22	36.7
Dietary habit						
Not healthy	22	73.3	13	43.3	35	58.3
Healthy	8	26.7	17	56.7	25	41.7
Drinking coffee						
Light	8	26.7	14	46.7	22	36.7
Heavy	22	73.3	16	53.3	38	63.3
Amount	30	100	30	100	60	100

Table 1 shows that among the case group, 18 respondents (60%) have high smoking habits, compared to 23 respondents (76.7%) in the control group who have low smoking habits. In the case group, 24 respondents (80%) engage in poor physical activity, while 16 respondents (53.3%) in control group engage in good physical activity. 22 respondents of the case group (73.3%) have an unhealthy diet, while 17 respondents (56.7%) in the control group have the healthiest eating patterns. In addition, 22 respondents (73.3%) in the case group tend to have heavy coffee consumption habits, compared to 16 respondents (53.3%) in the control group.

3.2. The relationship between smoking habits, physical activity, diet, coffee consumption

Table 2 shows 18 respondents (60%) in the case group and up to 7 respondents (23.3%) in the control group, who smoke regularly. p-value of 0.004 is observed, demonstrating a significant relationship between smoking and heart disease. The odds ratio (OR) for smoking is 4,929, indicating that smokers are 5 times as likely to get heart disease than non-smokers. Poor physical activity is reported by up to 24 respondents (80%) in the case and up to 14 respondents (46.7%) in the control, with a p-value of 0.007 showing a correlation between physical activity and heart disease. The odds ratio (OR) for physical activity is 4,571, meaning that compared to individuals with healthy physical activity habits, those who regularly engage in physical activity have a roughly 4.6-times higher chance of developing heart disease.

There are 22 respondents (73.3%) who report leading an unhealthy eating lifestyle, compared to 13 respondents (43.3%) in the control group; this indicates that there is a significant relationship between diet and heart disease (p-value 0.018). The odds ratio for the diet is 3,596, which means that people with a poor diet are 3.6 times more likely to have heart disease than those with a healthy diet. With an established p-value of 0.108, it can be concluded that there is no correlation between coffee consumption and the prevalence of heart disease. Respondents with a lifestyle of light coffee consumption in the case were 8 respondents (26.7%) and in the control group were 14 (46.7%). The odds ratio (OR) for coffee consumption in this study is 0.416, indicating that it is not a risk factor for heart disease.

Table 2 The Relationship between Smoking Habits, Physical Activity, Diet, Coffee Consumption with Heart Disease

Variable	**Heart disease**				**Amount**		**P**	**OR**
	Case		**Control**					
	n	**%**	**n**	**%**	**n**	**%**		
Smoke								
Yes	18	60.0	7	23.3	25	41.7	0.004	4.929
Not	12	40.0	23	77.7	35	58.3		
Physical Activity								
Not good	24	80.0	14	46.7	38	63.3	0.007	4,571
Well	6	20.0	16	53.3	22	36.7		
Dietary habit							0.018	3.596
Not healthy	22	73.3	13	43.3	35	58.3		
Healthy	8	26.7	17	56.7	25	41.7		
Drinking coffee							0.108	0.416
Light	8	26.7	14	46.7	22	36.7		
Heavy	22	73.3	16	53.3	38	63.3		
	30	100	30	100	60	100		

The findings of this study confirm that there is a relationship between smoking behavior and the incidence of coronary heart disease during the COVID-19 pandemic (p-value 0.004 and OR 4.929). This study is consistent with those of earlier studies, such as Pasedan Citra Sintya Pracilia (2018) who found that smoking habits and the incidence of CHD are influenced by one another [6], smoking habits have been associated with an increased risk of CHD [7], as well as an increased risk of hypertension (0.035) (8). This study obtains OR 4,929, which indicates that smokers have a five-fold higher chance of developing heart disease than non-smokers. According to earlier studies, smoking is the biggest risk factor for developing hypertension (OR=6,647) [9]. The majority of this research was obtained in the case group having a high smoking lifestyle of up to 60%. According to Ardiansyah M. (2012), the catecholamines in cigarettes, such as nicotine, are stimulated to be released, which raises heart rate and catecholamine levels. This results in vasoconstriction and raises the risk of coronary heart disease.

In this study, it was discovered that 23 respondents (or 77.7%) in the control group had a low smoking lifestyle, proving that the smoking lifestyle in the case was higher than that in the control group. This appears to support a study by Ram Poudel, et al (2022) who confirm that smoking greatly increases the likelihood of cardiovascular events, the severity of the disease, and death in people with SARS-CoV-2 [10]. Smoking is a risk factor for CHD; smokers may have a dosage effect, meaning that the earlier in life they start smoking, the greater their risk of developing coronary heart disease [11]. Finding an alternative to smoking, cutting back gradually, engaging in regular physical activity, eating enough of fruits and vegetables while quitting, and seeking for alternatives to cigarettes are a few of the suggested strategies for addressing smoking habit.

The results showed a p value of 0.007 and an OR of 4.571, indicating a relationship between physical activity and heart disease at the timeframe of the COVID-19 pandemic. According to earlier study, like that of Valerie Elma Tappi et al.

(2021), there is a relationship between physical activity and the risk of coronary heart disease (CHD) [12] and a relationship between physical activity and the risk of hypertension (p = 0.042). [13]. The prevalence of CHD is higher in the group that do not engage in heavy physical activity or engage in heavy physical activity (p=0.00); physical activity has an impact on the incidence of CHD [14]. Therefore, cardiovascular disease is less likely to affect someone who is physically active. Cardiovascular health will improve with the promotion of 20 minutes per day of exercise [15].

According to the study's findings, the case group denotes the highest levels of low physical activity (up to 80%), which is consistent with Patryani's (2016) notion that a sedentary lifestyle increases the risk of coronary heart disease (CHD) by 2.2 times. The covid-19 pandemic era is a risk factor for this lack of activity since it prevents people from exercising or engaging in other activities outside the home. This study confirms earlier studies' findings that there is a relationship between diet and heart disease (p-value 0.018 and OR 3.596), including those by Roza Marlinda, et al. (2013) who reported that eating habits and CHD are related [16] and Marniati, et al. (2019) who found a correlation between diet and the incidence of CHD [5]. In this study, 73.3% of the cases have eating habits that are harmful on average. Diet is one of the risk factors for CHD; as the body needs food and drink to be able to convert it into energy, consuming unhealthy foods and beverages over an extended period of time will result in heart disease. The consumption of fruits and vegetables has positive effects on heart health [17].

The p-value for this study is 0.108 (>0.05 and OR 0.416), indicating that there is no effect between drinking coffee and heart disease in the Covid-19 pandemic era. This is consistent with Eriza's findings (2021) that there is no effect between coffee consumption and CHD [18]. The frequency of hypertension has no correlation with coffee consumption (p=0.750) yet coffee drinking has been associated to being protective against CHD [19].

This study revealed that 73.3% of cases and 53.3% of controls, respectively, had a heavy coffee consumption lifestyle. The findings suggest that the risk factors for coffee use may also contribute to other degenerative diseases like heart disease. According to research by Michelle Brust et al. (2022), optimizing lifestyle behavior includes changes in self-concept and the affective effects of both, in addition to lifestyle behavior in general, physical activity, and dietary patterns [20].

4. Conclusion

There is a significant influence between smoking habits (p-value 0.004, OR 4.929), physical activity habits (p-value 0.007, OR 4.571), eating patterns (p-value 0.018, OR 3.589) and the incidence of heart disease. There is no effect between drinking coffee (p-value 0.108, OR 0.419) with the incidence of heart disease. It is preferable to give up on cigarettes. If quitting proves to be challenging, other options could include progressively lowering intake, engaging in regular exercise and consuming a lot of fruits and vegetables. It is also highly advised to maintain a healthy diet and undergo regular check-ups so that any health issues can be detected early and treated as necessary.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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