3'RD INTERNATIONAL CONFERENCE
ON HEALTH PRACTICE AND RESEARCH
"Interdisciplinary Intervention to Improve Quality of Life for Covid-19 Patient"

Journal homepage: https://www.ichpr3.stikestelogorejo.ac.id/

High Risk Factors In The Event Of Coronary Heart Disease

Felicia Risca Ryandini[a], Anisa Shalma Ginar[a]

[a]Bachelor Degree of Nursing Study Program STIKES Telogorejo, Semarang, Indonesia
(Correspondence e-mail : felicia_riska@stikestelogorejo.ac.id)

ARTICLE INFO

Article history:
Received 17 January
Received in revised form 18 January
Accepted 20 January

Keywords:
Coronary Heart Diseases, Risk Factors

ABSTRACT

Coronary artery disease is a condition of fatty deposits in the coronary arterial vessels of the heart that inhibit blood flow to the heart. Risk factors for coronary heart disease consist of factors that can be modified (history of the disease, lifestyle) and non-modifiable (genetic). The existence of a history of hypertension, diabetes mellitus and smoking lifestyle can affect the incidence of coronary heart disease. The purpose of the research was to analyze modify risk factors in the incidence of coronary heart disease. Research design is quantitative research with a retrospective descriptive design. The population in this research was data on patients with coronary heart disease in the last 1 year of the 2020 period. The population is 242 people. The sampling technique used is quota sampling of 151 respondents. The results of bivariate analysis obtained factors that affect the incidence of coronary heart disease, namely a history of hypertension and diabetes mellitus. There is no association between smoking lifestyle, obesity and physical activity to the incidence of coronary heart disease. The results of multivariate analysis obtained a more dominant risk factor for coronary heart disease events, namely a history of hypertension with a value of p-value < 0.05. Hypertension becomes the dominant factor because high blood pressure continuously causes damage to the arterial vascular system slowly. It is also aggravated the presence of fatty deposits on the walls of blood vessels. This increases the risk of coronary heart disease. Recommendations from the results of this study for further research is that it is hoped that this research can be used as literature on the dominant risk factor data for heart disease that occurs in hospitals.

* *Corresponding author. Felicia Risca Ryandini*
E-mail address: : felicia_riska@stikestelogorejo.ac.id

INTRODUCTION

Coronary heart disease which is also known as coronary artery disease (Coronary Artery Disease) is a condition of the presence of fatty deposits in the coronary arteries of the heart so that it blocks blood flow to the heart. This is called atherosclerosis, which is the occurrence of fatty deposits on the walls of the coronary arteries from a young age to old age. Coronary Heart Disease (CHD) is a form of cardiovascular disease which is the number one cause of death in the world (Nurhidayat, 2011; WHO, 2013; Brunner & Suddarth, 2013).

The World Health Organization (WHO) states that more than 17 million people in the world die from heart and blood vessel disease. In Indonesia, it is reported that CHD (grouped into diseases of the circulatory system) is the main and first cause of all deaths, which is 26.4%. In Central Java, in 2011 the number of cases of coronary heart disease increased to 35,707 cases and the city of Semarang still ranked first with 20,336 cases (Central Java Provincial Health Office, 2012; Ministry of Health, 2014; Indonesian Ministry of Health, 2016; PERKENI, 2019).

The risk factors for coronary heart disease are modifiable and non-modifiable factors. Risk factors for coronary heart disease that cannot be prevented include age, family history, gender. While the risk factors that can be prevented include: hypertension, smoking, stress, cholesterol, diabetes mellitus, and passive activities (Brunner & Suddarth, 2013).

One of the modifiable factors is hypertension. Hypertension is a condition of systolic pressure above 140 mmHg and diastolic pressure above 90 mmHg (Aspiani, 2014). The higher the blood pressure, the harder the heart works. This allows the occurrence of constriction of blood vessels and heart failure. Another factor, namely cholesterol levels in the blood contributes about 45% in increasing the risk of CHD. Smoking is a very strong risk factor for the occurrence of heart disease. The existence of glucose resistance, the glucose in the blood will increase and this will increase blood viscosity. The tendency for atherosclerosis to increase and can lead to coronary heart disease (Abdul, 2014). This is exacerbated if the patient has a smoking lifestyle.

The results of Sumarti's research (2010) explain that CHD patients develop CHD faster than those without DM, because the disease can make heart function not optimal so that they experience heart muscle stiffness. In addition, the risk factors for hypertension also increase the workload of the heart, so that the heart muscle thickens and becomes stiffer.

The American Heart Association (2018) explains that low physical activity is a risk factor for coronary heart disease. Regular physical activity with moderate to heavy intensity can help reduce the risk of heart and blood vessel disease (WHO, 2012. Farahdika, 2015; Abdul, 2014).

The results of previous studies explain that research on Risk Factors is still general, there has been no specific research to look at factors that can only be changed. so that there must be further research, the research takes the title "Modify Risk Factors on the Occurrence of Coronary Heart Disease.

METHODS

This type of research will use quantitative research with a retrospective descriptive design. The population in this study is data on patients with coronary heart disease in the last 1 year of the 2020 period. The total population is 242 people. The sampling technique used is quota sampling with a total of 151 respondents. This research was carried out for 1 month, the research was effective within 25 days with 6 respondents each day examining the data.

RESULTS AND DISCUSSION

Result

Univariate Result

1. Age

Table 1. Age Frequency Distribution of Respondents with Coronary Heart Disease in 2020

Age Category	n	%
26 – 35	26	17.2
36 – 45	34	22.5
46 – 55	32	21.2
56 – 65	32	21.2
> 65	27	17.9
Total	151	100.0

The percentage of respondents with coronary heart disease in 2020, with the age of 26-35 years totaling 26 respondents (17.2%), age 36-45 years totaling 34 respondents (22.5%), age 46-55 years amounted to 32 respondents (21.2%) and aged 56-65 years amounted to 32 respondents (21.2%).

2. Sex

Table 2. Sex Distribution of Respondents with Coronary Heart Disease in 2020

Jenis kelamin	n	%
Female	69	45.7
Male	82	54.3
Total	151	100.0

The percentage of female respondents was 69 respondents (45.7%) and male respondents were 82 respondents (54.3%).

3. Coronary Heart Disease

Table 3. Frequency Distribution of Respondents with Coronary Heart Disease in 2020

CHD	n	%
NSTEMI	51	33.8
STEMI	63	41.7
Angina	37	24.5
Total	151	100.0

The percentage of respondents with NSTEMI 51 respondents (33.8 %), STEMI 63 respondents (41.7 %) and with angina 37 respondents (24.5%).

4. Diabetes Mellitus History

Table 4. Frequency Distribution of Respondents with a History of DM Coronary Heart Disease in 2020

Diabetes mellitus	n	%
Yes	68	45.0
No	83	55.0
Total	151	100.0

Respondents who have a history of diabetes mellitus are 68 respondents (45.0%) and do not have a history of diabetes mellitus are 83 respondents (55.0%).

5. History of Hypertension

Table 5. Frequency Distribution of Respondents with a History of Hypertension in 2020

Hypertension	n	%
Yes	96	63.6
No	55	36.4
Total	151	100.0

Respondents who had a history of hypertension were 96 respondents (63.6%) and 55 respondents had no history of hypertension (36.4%).

6. Smoking Habits

Table 6. Frequency Distribution of Respondents With Smoking in 2020

Smoking habbits	n	%
Yes	41	27.2
No	110	72.8
Total	151	100.0

Respondents who smoked amounted to 41 respondents (27.2%) and did not have/quit smoking amounted to 110 respondents (72.8%).

7. Obesity

Table 7. Frequency Distribution of Respondents with Obesity in 2020

Obesity	n	%
Yes	35	23.2
No	116	76.8
Total	151	100.0

Respondents who were obese were 35 respondents (23.2%) and those who were not obese were 116 respondents (72.8%).

8. Physical Activity

Table 8. Distribution of the Frequency of Physical Activity of Respondents with Coronary Heart Disease in 2020

Physical Activity	n	%
independent	98	64.9
helped	53	35.1
Total	151	100.0

The percentage of respondents whose physical activity is carried out independently is 98 respondents (64.9%) and the number of respondents whose physical activity is assisted is 53 respondents (35.1%).

Bivariate Result

Table 9. The Relationship of Hypertension History With Coronary Heart Disease Incidence

Hypertension History	CHD			Total	*P value*
	NSTEMI	STEMI	Angina		
Ya	16	28	23	67	0,016
	23.9	41.8	34.3	100.0	
Tidak	35	35	14	84	
	41.7	41.7	16.7	100.0	
Total	51	63	37	151	
	33.8	41.7 %	24.5	100.0	

The results of the chi-square test, the p value = 0.016 with a = 0.05 (5%), the p value is smaller than the a value, it is concluded that there is a significant relationship with a history of hypertension with the incidence of coronary heart disease.

Table 10. Relationship History of Diabetes Mellitus With Coronary Heart Disease Incidence

Diabetes millitus	CHD			Total	*P value*
	NSTEMI	STEMI	Angina		
Ya	30	21	17	68	0,025
	44.1	30.9	25.0	100.0	
Tidak	21	48	20	83	
	25.3	50.6	24.1	100.0	
Total	51	63	37	151	
	33.8	41.7	24.5	100.0	

The Relationship of Smoking Habits With The Incidence Of Coronary Heart Disease

Smoking Habits	PJK			Total	*P value*
	NSTEMI	STEMI	Angina		
merokok	10	21	10	41	0,261
	24.4	51.2	24.4	100.0	
Tidak	41	42	27	110	
	37.3	38.2	24.5	100.0	
Total	51	63	37	151	
	33.8	41.7	24.5	100.0	

The results of the chi-square test, the p value = 0.025 with a = 0.05 (5%), the p value is smaller than the a value, it is concluded that there is a significant relationship with a history of diabetes mellitus with the incidence of coronary heart disease.

The results of the chi-square test, obtained p value = 0.261 with a = 0.05 (5%), p value is greater than a value, it is concluded that there is no significant relationship between smoking habits and the incidence of coronary heart disease

Table 11. Relationship between obesity and coronary heart disease

Obesitas	PJK			Total	*P value*
	NSTEMI	STEMI	Angina		
obesitas	14	11	10	35	0,370
	40.0	31.4	28.6	100.0	
Tidak	37	52	27	116	
	31.9	44.8	23.3	100.0	
Total	51	63	37	151	
	33.8	41.7	24.5	100.0	

The results of the chi-square test, the p value = 0.370 with a = 0.05 (5%), the p value is greater than the a value, so it can be concluded that there is no significant relationship between obesity and the incidence of coronary heart disease.

Table 12. Relationship between physical activity and coronary heart disease

physical activity	PJK			Total	*P value*
	NSTEMI	STEMI	Angina		
independent	34	42	22	98	0.727
	34.7	42.9	22.4	100.0	
helped	17	21	15	53	
	32.1	39.6	28.3	100.0	
Total	51	63	37	151	
	33.8	41.7	24.5	100.0	

The results of the chi-square test, the p value = 0.727 with a = 0.05 (5%), the p value is greater than the a value so that it is concluded that there is no significant relationship between physical activity and the incidence of coronary heart disease.

Multivariate Analysis

Multivariate analysis in this study using logistic regression before testing simultaneously, it is necessary to test bivariate analysis of the independent variables that have been associated with the dependent variable. Where the requirement to continue multivariate analysis p value must be < 0.05. The final result of the chi-square test was obtained risk factors with p value <0.05, namely a history of hypertension and a history of diabetes mellitus.

CHD		B	Sig	Exp (B)
NSTEMI	Intercept	0.873	0.058	
	DM	0.063	0.897	1.064
	Hipertensi	-1.256	0.010	0.285
STEMI	Intercept	1.453	0.001	
	DM	-0.915	0.053	0.400
	hipertensi	-1.045	0.025	0.352

The results of the multivariate test analysis with logistic regression testing of the two independent variables in the two groups of dependent variables simultaneously obtained p value for the history of diabetes mellitus variable, in the NSTEMI group > 0.05 (0.897) and in the STEMI group the p value > 0.05 (0.053). Variable history of hypertension obtained p value in the NSTEMI group < 0.05 (0.010) and the STEMI group p value < 0.05 (0.025). The results of this analysis can be concluded that the more dominant risk factors for coronary heart disease are respondents with a history of hypertension.

Discussion

The results of the chi-square test showed that there was a significant relationship between a history of hypertension and the incidence of coronary heart disease because the p value of 0.029 was smaller than the value of a = 0.05 (5%). This is in accordance with the research of Marleni and Alhabib (2017) that hypertension will increase the workload of the heart, so that the heart muscle thickens and becomes stiffer. Thus, the heart cannot work properly. The arteries experience hardening caused by fatty deposits on the walls which is often called atherosclerosis. Progressively narrows the lumen of the blood vessels, thereby narrowing the lumen contained in the blood vessels causing CHD. Hypertension is one of the major risk factors for the development of atherosclerosis. hypertension is associated with the development of atherosclerosis which in turn contributes to the development of myocardial infarction.

Mild or severe hypertension will contribute to the occurrence of cardiovascular disease. So it can be said that the more severe the hypertension, the greater the risk posed to cardiovascular disease (Rilantono, 2013). The results of the study show that the dominant risk factor that affects coronary heart disease is from the largest to the smallest the strength of the relationship is hypertension (Ghani & Susilawati, 2016).

The results of the chi-square test concluded that there was a significant relationship between a history of diabetes mellitus and the incidence of coronary heart disease, because the p value of 0.009 was smaller than the a value of 0.05 (5%). This is in accordance with the theory of Lewis, et al. (2011) which states that the incidence of coronary heart disease increases 2-4 times greater in people who have a history of diabetes mellitus, because someone with DM tends to be more likely to experience tissue degeneration and dysfunction. endothelium.

According to Framingham's theory in the Directorate of Non-Communicable Disease Control (2011). Patients with diabetes mellitus experience a process of thickening of the basement membrane of the capillaries and coronary arteries, this results in a narrowing of blood flow to the heart. The wider the narrowing of blood flow to the heart, the greater the risk of developing CHD in DM.

The results of the chi-square test concluded that there was no significant relationship between smoking habits and the incidence of coronary heart disease, because the p value of 0.629 was greater than the value of a = 0.05 (5%). The results of this study are not in line with the research of Nelwan (2017) that smoking is associated with the incidence of coronary heart disease and is not in line with Sholeh's research (2017) that the prevalence of CHD is higher in smokers compared to nonsmokers.

The risk of coronary heart disease in smokers depends on the number of cigarettes used per day, not on the length of time a person smokes. Smoking plays a role in worsening the condition of coronary artery disease through various ways, namely inhaling smoke will increase blood carbon monoxide (CO) levels. This causes the oxygen supplied to the heart to decrease, and the heart to work harder to produce the same amount of energy.

The results of the chi-square test analysis concluded that there was no significant relationship between obesity and the incidence of coronary heart disease, because the p value of 0.421 was greater than the value of a = 0.05 (5%). The results of this study are in line with Nafsi's research (2017) that there is no significant relationship between obesity and the incidence of coronary heart disease with p value = 0.103. The condition of a person who is obese does not always have an increased risk of cardiovascular disease. Although a person's body is in a state of obesity, but if the person has good metabolic health, then the person will not have a risk for heart disease.

The results of the chi-square test, concluded that there is no significant relationship between

physical activity and the incidence of coronary heart disease because the p value of 1,000 is greater than the value of a = 0.05 (5%). The results of this study are not in line with research by the American Heart Association (2018) that low physical activity is a risk factor for coronary heart disease.

Regular physical activity with moderate to vigorous intensity can help in reducing the risk of heart and blood vessel disease. Physical activity is categorized as sufficient if a person does physical exercise or sports for 30 minutes every day or at least 3-5 days a week. (Ministry of Health RI, 2011). Researchers argue that low or passive activity can increase the risk of CHD. When implementing a healthy lifestyle such as regular exercise is expected to reduce the risk of CHD. . Regular exercise that is aerobic (walking, running, swimming, riding a bicycle) can improve the ability of the heart and lungs.

The results of statistical analysis using logistic regression test showed that the dominant risk factor for coronary heart disease at the Tugurejo Semarang general hospital was a history of hypertension.

The results of this study are in line with research by zahrawardani (2013) that the more dominant risk factor for coronary heart disease is a history of hypertension with the highest OR value (OR = 5.127). increased resistance to pumping blood from the left ventricle that over time can cause dilatation and heart failure as a result of overcompensation. Atherosclerosis process that continues to occur with age continues, the myocardial oxygen supply will decrease and angina or myocardial infarction occurs.

This study is in line with Fadika's research (2015) where a history of hypertension greatly influences the incidence of coronary heart disease. Continuously high blood pressure causes damage to the arterial system slowly. The arteries are hardened due to fatty deposits on the walls. Increased systemic blood pressure due to hypertension increases resistance to pumping blood from the left ventricle, so that the workload of the heart increases. (Marliana, 2013).

CONCLUSION

There is a significant relationship between a history of hypertension, history of diabetes mellitus and the incidence of coronary heart disease. Smoking has no significant relationship with the incidence of coronary heart disease because the p value (0.261) that is obtained is greater than the p value (0.05). There is no significant relationship between obesity and the incidence of coronary heart disease because the p value (0.373) is greater than the a value (0.05).

There is no significant relationship between physical activity and the incidence of coronary

heart disease (p value = 0.727). And the more dominant risk factor for coronary heart disease is the risk factor for a history of hypertension where in the two groups the dependent variable is the p value < 0.05.

REFERENCES

Abdul.(2014). Kesehatan holistic volume 9. Jakarta : EGC

Adisasmita, Rahardjo. (2011). Pengelolaan Pendapatan Dan Anggaran Daerah. Yogyakarta: Graha Ilmu

Al Fajar, Kemal. (2015). Hubungan Aktivitas Fisik dan Kejadian Penyakit Jantung Koroner di Indonesia : Analisis Data Riskesdas 2013. Jakarta : Fakultas Kedokteran dan Ilmu Kesehatan Universitas Islam Negeri Syarif Hidayatullah Jakarta. Skripsi tidak dipublikasikan.

American Heart Association (AHA). 2015. Heart disease and stroke statistics – at-a-glance

Aspiani, R.Y.(2014). Buku Ajar Asuhan Keperawatan Gerontik. Jakarta: trans info media

Brunner and Suddarth. (2010). Buku Ajar Keperawatan Medikal Bedah,edisi 8 volume 2. Jakarta : EGC.

Iskandar, Hadi A, Alfridsyah. (2015). Faktor Risiko Terjadinya Penyakit Jantung Koroner pada Pasien Rumah Sakit Umum Meuraxa Banda Aceh (Risk factors of coronary heart disease in Meuraxa hospital of Banda Aceh). J AcTion Aceh Nutr J. 2017;2(July 2015):32–42.

Kementrian Kesehatan RI. 2013. Riset Kesehatan Dasar 2013. Jakarta: Kementrian Kesehatan RI.

KemenKes RI. 2018. Riset Profil Kesehatan Kementrian Kesehatan Republik Indonesia.

Kurniadi dan Nurrahmani, (2014). Stop Diabetes, Hipertensi, Kolesterol Tinggi, Jantung Koroner. Yogyakarta: Istana Media

Morrys, Jonna M, Jerzy Bellwon, Stefan Hofer, Andrzej Ryn Krewicz, Maran Grochala.(2016). Quality of Life in Patient with Coronary Heart Disease After Myocardial Infarction and With Ischemic Heart Failure. PubMed Centre. Vol.10

Pradono J, Werdhasari A. (2018). Faktor Determinan Penyakit Jantung Koroner pada Kelompok Umur 25-65 tahun di Kota Bogor , Data Kohor 2011-2012. Bul Penelit Kesehat. 2018;46(1):23–34.

Price.S & Wilsosn.L, (2016). Patofisiologi: Konsep Klinis Proses-Proses Penyakit. Jakarta: EGC

Riskesdas. 2018. Prevalensi Penyakit jantung Koroner, 3, 1–4.

Saparina, (2010). Analisis Faktor Risiko Penyakit Jantung KoronerDi RSUP Dr. Wahiddin Sudirohusodo Makassar. Program Pascasarjana Universitas Hasanuddin Makassar. Tesis dipublikasikan.

Wijaya.(2013). Keperawatan Medikal Bedah: Keperawatan Dewasa Teori Dan Contoh Askep. Jakarta : EGC

World Health Organization, 2012, Cardiovascular diseases (CVDs) , (http://www.who.int/mediacentre/fact sheets/fs317/en/index.html).

WHO, (2016). Cardiovascular Diseases.World Health Organizlation. Diperoleh 2 juni 2020

Yulianti, T., Kosasih, C. E., & Emaliyawati, E. (2012). Gambaran Kualitas Hidup pasien Acute Coronary Syndrome di Poliklinik Jantung Rumah Sakit Al Islam Bandung. Universitas Padjajaran, 1.

Zheng, C. et al. (2020) 'Covid-19 pandemic brings a sedentary lifestyle in young adults: A cross-sectional and longitudinal study', International Journal of Environmental Research and Public Health. MDPI AG, 17(17), pp. 1–11. doi: 10.3390/ijerph17176035.