The Correlation Level of Stress at the Start of Pandemic Covid-19 Related to the Frequency of Relapse in Coronary Heart Disease Patients

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Abstract

Background: Respiratory syndrome of coronavirus 2 (SARS-CoV-2) causing (COVID-19) disease that has reached pandemic levels. Patients who have coronary heart disease have been identified as highly increased morbidity and mortality while suffering from COVID-19. In addition, patients with coronary heart disease are also suffering with stress. Usually, stress can cause the body to release hormones that can impact your heart to beat faster.

Methodology: The design of this research used cross-sectional design which consists of Perceived Stress Scale (PSS-10). This cross sectional study employed instrument on the independent variable and one-question questionnaire on the dependent variable. This research was conducted to determine the correlation of level of stress during the pandemic COVID-19 related through the frequency of relapse in coronary heart disease patients at Indonesian Red Cross Hospital Bogor. Moreover, the research samples in this study are 33 coronary heart disease patients. Then, the data analysis techniques used univariate and bivariate analysis was studied within test statistic through Kendall's tau.

Conclusion: In conclusion, the research results showed that 33 respondents reported 28 (84.8.8%) respondents with moderate covid-19 pandemic stress levels, and there are 17 (51.5%) experienced moderate recurrence. Based on the results of cross tabulation, the data were obtained from 33 respondents there are 17 (51.5%) respondents with moderate stress levels for the COVID-19 pandemic and moderate recurrence frequency. In conclusion, the results of statistical tests obtained that *p* value 0.006 (*p* value <0.05), which means that *Ha* is accepted and *Ho* is rejected. So that, these research results highlight the serious acute impact of stress level during COVID-19 pandemic and the frequency of recurrence in coronary heart disease patients.

Keywords: *Coronary heart disease, Relapse, Stress*

Introduction

Non-communicable diseases as heart disease are leading causes of death globally. In 2015, The World Health Organization (WHO) has estimated that non-communicable disease (NCDs) account for about 70% off all global deaths. So that, there are 39,5 million from 56,6 deaths. Which is 45% are caused by heart and blood vessel disease, around 17,7 million from 39.5 million deaths. However, in 2018 Ministries of Regional Health Research shows that the prevalence of heart disease based on doctor's diagnosis in Indonesia around 1,5% with the highest prevalance ranking, and the prevalance in West Java 1,6%.[1]

In 2014, The Indonesian Sample Registration System showed that coronary heart disease was 12% of all the highest cause of death in Indonesia. Based on the data from Indonesian Health Care and Sequrity Agency (BPJS) that an increase in health costs for coronary heart diseasefrom year to year. Furthermore, in 2016 artery coronary heart disease spend Social Insurance Administration Organization funds amounting to 7,4 trilllion and then increased in 2018 through 9,3 trillion. In addition, Robert stated that depression may be as emerging significant risk factor that caused coronary heart disease (CHD).[2] This shows the large burden on the state to overcome coronary heart disease (CHD) which should be contolled by indetifying the risk factors.[3]

Consequently, COVID-19 has a respiratory illness that is the dominant clinical manifestation of cardiovascular disease. According to the Study that conducted by Shi, et al. in Wuhan among 416 COVID-19 patients, reported that out of 57 patients died caused of COVID-19, around 19.7% had cardiovascular injuries. Then, amount 4.1% having a heart failure, 5.3% consisting cardiovascular disorders especially for stroke, and 10.6% experiencing coronary heart disease.[4] However, the impact of COVID-19 related quarantine includes stress disorder, confusion and frustration. Stresses are highly prevalent common terms used to describe the current situation, experience, and symptoms in a person's life while pandemic COVID-19 outbreak.[5]

During the COVID-19 outbreak, additional stresses also caused by longer quarantine duration, frustration, financial loss and stigma. In case, Mattioli et al., stated that during outbreak people are fearful of falling sick or dying themselves. These negative feelings are in line with unhealthy lifestyle and they are associated with the risk of developing coronary heart disease.[6]

The statement above also associated with the research that conducted by Lesperance, most of studies discussed depression become an important disorder that increase of cardiovascular events. Sometimes, Stress or depression which can be impact among patients with coronary heart disease (CHD). Research evidence showed that the prevalence of depression in patients with heart failure reached more than 20%.[7] On the other hand, Kubzansky suggested variables that are commonly regarded as factor of stress includes depression, anxiety, lack of social support, acute and chronic life events.[8] In short, stresses become a negative predictor for improvement of coronary heart disease.[9]

Based on the preliminary study that conducted at Indonesian Red Cross Hospital in Bogor through patients medical record data there are 109 diagnosed with coronary heart diseases during the period of January to December 2019. It has recently been reported from google form that out of 5 patients diagnosed with coronary heart diseases. There were 4 patients experienced stress, and 3 of them experienced recurrence of two twice in the last 1 month. So that this research will be conduct to determine the relationship level of stress at the start of pandemic COVID-19 related through the frequency of relapse in coronary heart disease (CHD) patients

at Indonesian Red Cross Hospital Bogor.

Methodology

The research methods were gathered descriptive analytic method with cross-sectional design. Descriptive analytic method is a research contains the aim to describe various events that will occur in the present with factual data rather than inference. The sample of this study was 33 patients with coronary heart disease. These patients drawn from all the patients admitted were coronary heart diseases, and unconscious condition willing to fill in the google form. The sample criteria used in the study are patients who had decreased consciousness and were unwilling to answer google form. This study may view the following examples for sampling, the questionnaires were administered twice. For he first one after the number of samples is known, then steps are taken for the first respondent who is given code 1, the next sample number is coded 2, and so on until all the samples are fulfilled by 33 respondents.

The researchers submit a research permit issued by Wijaya Husada Health Institute Bogor and submitted to the head of the Indonesian Red Cross Hospital, Bogor Education and Training Hospital. After that, the researcher met the head of the internal medicine in patient room to ask for permission and explained the instruments to be used for the research and asked for help to collect the cell phone numbers of coronary heart disease patients or their family members for filling out the questionnaire form for stress levels and the frequency of coronary heart disease recurrence.

Consequently, the respondent data technique used in this study is a google form questionnaire which contains identity, the Perceived Stress Scale (PSS-10) questionnaire. The ordinal dispatch scales for the COVID-19 pandemic stress level are categorized through the Kendall Tau statistical test.There are as follows:

1. Mild stress (total score 1-14)
2. Moderate stress (total score 15-26)
3. Severe stress (total score> 26)

To see the frequency of recurrence in patients with coronary heart disease, they are categorized into:

1. ≤ 1: Low
2. 2 : Moderate
3. ≥ 3: High

Research Results

This research was held in August 2020 for 5 days through google form. It has been reported that the average respondents were 45-72 years old which are female respondents reached 22 (66.7%), educational background are 25 respondents (75.8%), and did not have a history of being active smokers, then 22 respondents had no history coronary heart disease in their family.

Table 1
Results of the Covid 19 Pandemic Stress Level

Covid 19 Pandemic Stress Level	Total	Precentage (%)
Mild stress	5	15,2
Moderate stress	28	84,8
Total	33	100

Based on Table 1, it can be seen that most of the respondents with a moderate level of stress for the COVID-19 pandemic were 28 (84.8 percent) of respondents.

Table 2
The Distribution of Frequency of Coronary Heart Disease Recurrence

Frequency of coronary heart disease Recurrence	Total	Precentage (%)
Low	1	3
Moderate	17	51,5
High	15	45,5
Total	33	100

From the table above, it can be seen that most of the respondents with the

recurrence frequency of coronary heart disease in the moderate category, namely 17 (51.5 percent) of respondents.

Table 3
Correlation between Covid 19 Pandemic Stress Level and Recurrence Frequency in Coronary Heart Disease Patients at Indonesian Redcross Hospital, Bogor City

No.	Covid 19 Pandemic Stress Level	Frequency of coronary heart disease Recurrence						Total		P-Value
		Low		Moderate		High				
		F	%	F	%	F	%	F	%	
1.	Mild stres	0	0	0	0	5	15,2	5	15,2	0,006
2.	Moderate stres	1	3	17	51,5	10	30,3	28	82,8	
	Total	1	3	17	51,5	15	45,5	33	100,0	

The table above shows that, around 33 respondents, which 17 (51.5%) of respondents with the COVID-19 pandemic stress level were in the moderate category, and the frequency of coronary heart disease recurrence was in the moderate category (1 time in 1 month).

Discussion

A. Stress level during COVID-19 pandemic

Based on the data from table 1 that frequency distribution of the COVID-19 pandemic stress level in coronary heart disease patients at Indonesian Red Cross Hospital Bogor in 2020 are 33 respondents that most of them had moderate stress levels showed 28 patients (84.8%). The results of the study above are in line with Andrew Steptoe (2012) which entitled "stress and cardiovascular disease". There were from 160 respondents with 68 respondents, 42.5% mostly experienced stress.[10] In addition, stress can prohibit the heart muscle to pump. If this happens, patients can experience similar symptoms such as a heart attack or shortness of breath. Patients who are not careful about managing their stress properly, it can have detrimental effect on their cardiovascular health. However, that the risk factors of coronary heart disease (CHD) are determined through the interaction of two or more risk factors, including: Non-modifiable risk factors. Includes: Heredity, age, gender, and controllable factors (modifiable risk factors) include: *dyslipidemia*, high blood pressure, smoking, diabetes mellitus, overweight, obesity, and stress. Therefore, patients with coronary heart disease that have high levels of stress which is related to COVID-19, the treatment must be taken and serious complications.[11]

Another cause for stress will be impact through their emotional, worrying about something. Stress can also come from less dramatic causes like everyday obligations and pressures that make you feel that you are not in a control. Another studies from Blumenthal et al., suggest that the high levels of control from long-term of stress can be increase blood cholesterol, and blood sugar pressure. These are common risk factors for coronary heart disease. Meanwhile, to reducing the risk of coronary hear disease patient can improve mental and physical health.[12]

These research results showed that all respondents those severe coronary heart diseases are 33 respondents. Most of them had experienced stress with different levels of stress. The data are related to the perceived stress scale 10 questionnaire through google form that the respondents

in the question stated that they felt nervous and stressed due to the COVID-19 pandemic, around 22 respondents reached (66.7%) that had a family history of coronary heart disease. It means stress can effect on regulation of immune and influence depression and the patient will be easy to candidate for a coronary.

B. Recurrence frequency

Based on the Table 2 regarding the frequency distribution of recurrence in coronary heart disease patients at Indonesian Red Cross Hospital, Bogor in 2020, it can be concluded that most of the respondents with the frequency of recurrence of coronary heart disease in the moderate category, namely 17 (51.5 percent) of respondents.

According to Müller et.al, that coronary heart disease (CHD) is a heart disease that caused by blockages in the coronary arteries.[13] In addition, acute blockage that occurs due to atherosclerotic in the walls of the coronary arteries, thus blocking blood flow to the heart muscle tissue and not all attacks start suddenly with severe pain. However, Petra stated that stress increases the incident of coronary heart disease. In short, poor cardiovascular, acute emotional stress can trigger coronary heart disease events in patients.[14]

C. The Correlation between the COVID-19 Pandemic Stress Level and the Frequency of Recurrence in Coronary Heart Disease Patients

Based on the data from Table 3 it showed that the bivariate analysis regarding the relationship between COVID-19 pandemic stress and recurrence in coronary heart disease patients at Indonesian Red Cross Hospital, Bogor Hospital in 2020, there are 33 respondents. Around 17 respondents reached (51.5%) with moderate COVID-19 pandemic stress levels and recurrence frequency in the medium category. The research results of the Kendall tau statistical test obtained a *p* value of 0.006 which means that there is a relationship between the level of stress stress level of during pandemic COVID-19 and the frequency of recurrence in coronary heart disease patients at Indonesian Red Cross Hospital Bogor. In addition, this research is in line with the study conducted by Andrew Steptoe (2012) entitled "Stress and cardiovascular disease". The results of this study indicate that stress is an independent predictor of complications in patients with acute myocardial infarction during intensive care with *a* value of 0.03 so that there is a relationship between the effect of stress on complications of acute disease infection complications during intensive care.[10] Stress both physically and mentally is a risk factor for CHD (Coronary Heart Disease), because it has an influence on the onset of coronary heart diseases. The steps that can make the blood flow through a certain path within us. Our bodies always respond to stressful situations that can help us to survive.[15]

According to the theoretical analysis proposed by Carney (2001), there is a relationship between stress and the frequency of acute myocardial infarction, where stress can activate bone marrow stem cells which in turn produce excess white blood cells called leukocytes. These white blood cells can collect on the inside of the arteries, causing thickening of the artery walls caused by plaque buildup. Here the cells release enzymes that soften the connective tissue and result in disruption of plaque so this is a typical cause of coronary heart disease recurrence. Leukocytes are one of the causes besides factors such as high cholesterol, smoking, and genetic traits that also contribute to the risk of heart attack.[16]

From the results of the study above, it can be said that between the theory and research results that affect the level of stress of COVID-19 pandemic with the frequency of coronary heart

disease patients at Indonesian Red Cross Hospital, Bogor the *P* Value = 0.006 is lower than *a* (= 0.05), which means that there is a relationship. In short, the independent variable and the dependent variable, the results of the stress level of the COVID-19 pandemic in 19 patients were obtained, namely from the frequency of recurrence as much as 2 times a month consisting of ages = 45 years. This is one of the risk factors for coronary heart disease, namely age. In addition, researchers argue that age there are risk factors for coronary heart disease patients that consisting of smoking, obesity and a family history of coronary heart disease.

Conclusion

From this research result, it can conclude that there is a relationship between the stress level through COVID-19 pandemic and the frequency of recurrence in coronary heart disease patients at Indonesian Red Cross Hospital Bogor, West Java, Indonesia.

Ethical Clearance: Ethical permission is not required, therefore cannot be obtained.

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