



Analysis of Determinants of Covid-19 Incidence in Indonesian National Army Training Soldiers in 2020

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Abstract

Covid-19 is a disease caused by SARS-CoV-2 and is a new type of disease that causes a health emergency in the world. It had declared a pandemic by WHO on March 11, 2020. Covid-19 must be watched out for because of its rapid transmission, with high morbidity and mortality. Everyone got the potential to be infected by the coronavirus, with no exception a military group such as Indonesian National Army/Tentara Nasional Indonesia (TNI). In it, the spread can occur quickly without showing any symptoms, so that it has the potential to cause an outbreak. There were Covid-19 cases was found, as many as 82 soldiers were detected as infected by Covid-19. It could interfere with the main task of the TNI as the front line of military forces in dealing with threats to state sovereignty, maintaining territorial integrity, and safe the Unitary State Indonesian Republic. This research aims to analyze the determinants of the occurrence of Covid-19 in soldiers of a TNI unit who had finished carrying out combat training for one month in 2020. This research is an analytical survey research with a case-control approach. The research population was 400 TNI soldiers who had completed their combat in a forest area in Sumatera. The samples that were successfully obtained based on the inclusion and exclusion criteria are 82 respondents (41 as cases, and 41 as control), with purposive technique using a questionnaire. Data processing used univariate analysis, bivariate analysis, and multivariate analysis. There was a frequency distribution test, rank Spearman correlation test, and ordinal logistic regression test. The results showed a significant influence between health protocol behavioral factors, smoking habits, and blood type on the incidence of Covid-19 with a p-value <0.05. There was no influence between the history of influenza vaccination and the incidence of Covid-19, with a p-value >0.05. The health protocol behavioral variables are the most dominant factors influencing the incidence of Covid-19 in TNI training soldiers.

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INTRODUCTION

A pandemic is an epidemic that spreads to several countries or continents and generally affects large numbers of people. To this day, all parts of the world are still experiencing the phenomenon of the Coronavirus Disease-2019 (Covid-19) pandemic, determined by the World Health Organization (WHO) on March 11, 2020. This disease is caused by the coronavirus which was later known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) or Novel Corona Virus 2019/Novel Coronavirus 2019 (nCoV 2019) (Radhitya et al., 2020).

Less than seven months since the stipulation of the pandemic, on September 20, 2020, WHO data reported a total of 30,675,675 confirmed global Covid-19 cases with 954,417 deaths (CFR 3.1%) in 215 countries infected and 180 countries local transmission. Meanwhile, according to data from the Indonesia Republic Ministry of Health/Public Health Emergency Operations Center (PHEOC), on September 21, 2020, there were 248,852 confirmed cases of Covid-19 spread across 31 provinces out of a total of 34 provinces in Indonesia, with a total of 177,327 recovered cases (71, 3%) and 9,553 cases died (CFR 3.8%).

Mahardhani (2020) in his research stated that not yet the decline in the number of Covid-19 cases in Indonesia is a concern for various parties. Meanwhile, seen from the trend of finding new cases until early September 2020, which is still increasing, more than ten thousand cases per day. This shows that the struggle of the Indonesian people against Covid-19 is getting tougher and longer. In addition, there are asymptomatic cases, namely where the patient does not realize that he has been infected and can transmit it to others. Therefore, vigilance must be emphasized to prevent being infected with this virus. The key to success in overcoming Covid-19 is through preventive movements by practicing a healthy lifestyle, limiting physical contact, and maintaining physical contact distance to break the chain of spread (Li & Luo, 2020).

In addition, the body's resistance to infection also needs to be increased. The principle in increasing endurance is maintaining body fitness and normal weight, maintaining a variety of food intakes with various nutritional content, both macronutrients, and micronutrients. In the body, these various nutrients will work together in harmony to protect the body from infection. In addition,

exposure to the morning sun for 5-15 minutes is important to strengthen the body's defenses (Sumarmi, 2020).

According to Moudy and Syakurah (2020), Coronavirus is transmitted from animals to humans/zoonotic viruses, and coronavirus infections from humans to humans can occur through splashes/droplets and contact with contaminated objects so that transmission will occur more quickly in crowds and densely populated places. For this reason, a large and joint effort is needed to prevent and overcome this Covid-19 pandemic. Efforts that can be made to prevent the spread of infection are by implementing clean and healthy living behaviors, including practicing coughing and sneezing etiquette, washing hands with soap regularly, cooking meat and eggs thoroughly, and avoiding close contact with people who have symptoms. Respiratory diseases such as coughing and sneezing. Based on existing data, the presence of comorbidities or comorbidities. Some of them are hypertension and diabetes mellitus. In addition, it was also reported that male sex and active smokers are risk factors for Covid-19 infection. This greater sex distribution in males is also thought to be associated with a higher prevalence of active smokers. In smokers, hypertension, and diabetes mellitus, it is suspected that there is an increase in the expression of receptors Angiotensin-Converting Enzyme 2 (ACE2). Be other risk factors determined by the Centers for Disease Control and Prevention (CDC) are a history of close contact, including living in the same house with a Covid-19 patient and a history of travel to an infected area (Susilo et al., 2020).

Prasetyo et al. (2020) in his research stated that the factors that influence exposure to Covid-19 infection and Covid-19 prevention measures are behavioral factors and knowledge about Covid-19. Moudy and Syakurah (2020) also mention that maintaining a person's health is influenced by influence, namely behavioral factors and non-behavioral factors. According to B. Bloom, there are three domains of behavior, namely knowledge, attitude, and practice. Meanwhile, according to L. Green, health behavior is influenced by and determined by three factors, namely predisposing factors, enabling factors, and reinforcing factors. Efforts that can be made to prevent the spread of infection are to apply cough and sneeze etiquette, wash hands with soap regularly, and avoid close contact with people who have symptoms of respiratory diseases such as coughing and sneezing (Moudy and Syakurah, 2020).

Several studies have shown that everyone has potentially been infected with the coronavirus, no exception military group. In this group, the spread can occur quickly without showing symptoms so that it has the potential to cause an outbreak. A study by researchers at the Naval Medical Research Center, Icahn School of Medicine at Mount Sinai in July 2020 stated that although male cadet candidates had completed their first two-week quarantine at home, the hectic living conditions during a second quarantine period in military education dormitories is likely to help the rapid spread of the virus while the discipline of wearing masks and practicing social distancing has been implemented and closely monitored. The study found that shared living spaces and joint membership activities were risk factors for transmission. Of the 51 infected cadets, only 5 members (10%) experienced symptoms in the week before testing positive or on the day of testing. All cases were detected through periodic testing and none through daily symptom monitoring (Andrew et al., 2020). Groups at high risk of being infected with the coronavirus include the elderly, chronic disease sufferers, smokers, and vape smokers, men, and people with blood type A (Siagian, 2020).

In Indonesia, the Covid-19 incident also occurred in the military community, namely the Indonesian National Army (TNI). From the results of the author's survey, it is known that there are confirmations of Covid-19 cases in TNI members who have just finished their combat training period. The data shows, from 400 members of the trainees who did Rapid Diagnostic Test (RDT) by the Semarang Port Health Office, there were 97 with reactive results. Furthermore, against 97 members with reactive RDT results plus 102 members with non-RDT reactive which has a factor for certain risks, a Real-Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) swab examination is performed. The results of the RT-PCR examination showed a high incidence of Covid-19, namely positive results were obtained as many as 82 people (40.8% of the examination sample or 20.5% of the population). It is feared that this could interfere with the main task of the TNI as the front line of military power in facing threats to state sovereignty, maintaining territorial integrity and the safety of the Unitary State of the Republic of Indonesia as well as the

special duties of the TNI in Military Operations Other than War (OMSP) as stipulated in Law No. 34 of 2004.

Based on the results of the interview, it was stated that various factors that allowed the transmission of Covid-19, among others, the possibility of asymptomatic cases, training field conditions that do not allow maintaining distance, close contact between TNI soldiers and the community around the training site, disciplined behavior in using masks that are not possible due to strenuous physical activity, insufficient quantity and quality of sleep and poor training field environmental conditions (dry, dusty, and extreme heat). Study This study aims to analyze the factors that influence the incidence of Covid-19 in TNI training soldiers who have finished carrying out combat training so that it will be known exactly what factors influence it.

METHOD

The research was conducted on training soldiers of the Indonesian national army in July 2021. This research is an analytical survey research with a case-control approach. The population of this research is TNI soldiers who have completed combat training in a forest area in Sumatra totaling 400 people. The sample that was successfully obtained was based on the inclusion and exclusion criteria, overall, namely 82 respondents (41 cases, and 41 controls), The sampling technique used is purposive sampling.

The independent variables in this study were health protocol behavior, smoking habits, history of influenza vaccination, and blood type, while the dependent variable used was the incidence of Covid-19 in TNI training soldiers. The research instrument used is a questionnaire. The data analysis in this study was univariate (frequency distribution), bivariate analysis (rank spearman correlation test), and multivariate analysis (ordinal logistic regression test).

RESULTS AND DISCUSSION

Table 1 presents the frequency distribution of the respondent's health protocol behavior variables, smoking habits, history of influenza vaccination, and blood type.

Table 1. Frequency Distribution of Factors Affecting the Incidence of Covid-19 in TNI Soldiers from All Respondents.

Variable	F	%
Health protocol behavior		
Good	27	32.9
Currently	40	48.8
Low	15	18.3
Total	82	100
Smoking habit		
Do not smoke	8	9.8
Light smoker	34	41.5
Medium smoker	40	48.8
Heavy smoker	0	0
Total	82	100
History of influenza vaccination		
Do	15	18.3
Do not do	67	81.7
Total	82	100
Blood group		
A	33	40.2
B	27	32.9
AB	15	18.3
O	7	8.5
Total	82	100

Based on table 1, most of the respondents in this study had moderate health protocol behaviors as many as 40 (48.8%). Judging from smoking habits, most of the respondents are in the category of moderate smokers, namely 40

(48.8%) respondents. Most respondents did not vaccinate against influenza, namely 67 (81.7%) respondents, and most with blood type A as many as 33 (40.2%).

Table 2. Frequency Distribution of Factors Affecting the Incidence of Covid-19 in TNI Soldiers in each group.

Variable	Case		Control	
	F	%	F	%
Health protocol behavior				
Good	6	7.3	21	25.6
Currently	21	25.6	19	23.2
Low	14	17.1	1	1.2
Total	41	50	41	50
Smoking habit				
Not smoke	5	6.1	3	3.7
Light smoker	14	17.1	20	24.4
Medium smoker	22	26.8	18	22.0
Heavy smoker	0	0	0	0
Total	41	50	41	50
Vaccination history influenza				
Do	7	8.5	8	9.8
Do not do	34	41.5	33	40.2
Total	41	50	41	50
Blood group				
A	25	30.5	8	9.8
B	5	6.1	22	26.8
AB	5	6.1	10	12.2
O	6	7.3	1	1.2
Total	41	50	41	50

Table 2 describes the distribution of each variable from each group, where it can be seen that in the case group most of the respondents with moderate category behavior were 21 (25.6%) respondents. Judging from smoking habits, most of them are in the moderate category, namely 22 (26.8%) respondents. Almost all respondents did not have a history of influenza vaccination, namely 34 (41.5%) and

most of them were with blood type A. In control respondents, most of the respondents were in a good category, namely 21 (25.6%). Most of the smoking habits were in the light category. 20 (24.4%) respondents. Most of the history of influenza vaccination did not do that is 33 (40.2). Most of the blood group with blood type B is 22 (26.8%) respondents.

Table 3. Analysis of the factors that Affecting Covid-19 Events to TNI Soldiers.

Variable	Dependent Covid-19 incident				Total	<i>p-value</i>	
	Covid-19		Non-Covid-19				
	<i>f</i>	%	<i>f</i>	%	<i>f</i>		%
Independent							
Health protocol behavior							
Good	6	7.3	21	25.6	27	32.9	0.000
Currently	21	25.6	19	23.2	40	48.8	
Low	14	17.1	1	1.2	15	18.3	
Total	41	50	41	50	82	100	
Smoking habit							
Not smoke	5	6.1	3	3.7	8	9.8	0.049
Light smoker	14	17.1	20	24.4	34	41.5	
Medium smoker	22	26.8	18	22.0	40	48.8	
Heavy smoker	0	0	0	0	0	0	
Total	41	50	41	50	82	100	
History of influenza vaccination							
Do	7	8.5	8	9.8	15	18.3	0.778
Do not do	34	41.5	33	40.2	67	81.7	
Total	41	50	41	50	82	100	
Blood group							
A	25	30.5	8	9.8	33	40.2	0.025
B	5	6.1	22	26.8	27	32.9	
AB	5	6.1	10	12.2	15	18.3	
O	6	7.3	1	1.2	7	8.5	
Total	41	50	41	50	82	100	

Table 3 shows that the variables of behavior, smoking habits, and blood type with a p -value <0.05 , while the variable history of influenza vaccination with a p -value >0.05 . These results can be concluded that behavior, smoking habits, and blood type affect the incidence of Covid-19, while the history of influenza vaccination does not affect the incidence of Covid-19. All research variables were included in the multivariate model analysis. The final result of the model analysis showed that there is one variable that has a strong influence on the incidence of Covid-19, namely the behavioral variable, where the p -value is $0.004 <0.05$.

The results showed that the behavior of health protocols in this study was dominated by categories that moderate as many as 40 (48.8%) respondents. Judging from each group, it is known that in the case group most of the respondents with moderate behavior, in the

control group most of the respondents with good behavior. The results of statistical tests show that behavior has an effect on the incidence of Covid-19 where the p -value shows <0.05 .

Behavior towards health care can affect the occurrence of problems related to health. Community action on health will determine the health condition of the individual concerned. The more responsive a person is to taking health care actions, the faster a person learns to understand proper health care. In this study, most of the respondents were obedient in implementing the Covid-19 health protocol. Respondents have been ordered to wear masks, always wash their hands and maintain a safe distance to prevent the occurrence of Covid-19.

The results of the study are in line with the research of Santoso and Setyawati (2020), which states that community action regarding the prevention of Covid-19 is the key to the implementation in health and community

services. Action is an essential factor that can affect behavior change. Maudy and Syakurah (2020) state that action is all activities or activities carried out by a person, as a reaction or response to external stimuli, which describe their knowledge and attitudes. The better the preventive measures are taken, the smaller the risk of contracting Covid-19.

The results showed that most of the respondents with smoking habits were in the category of moderate smokers namely 40 (48.8%) respondents. Judging from each group, it is known that in the case group most of the respondents with smoking habits are in the moderate category, in the control group most of the respondents are in the light category. Statistical test results show that smoking has an effect on the incidence of Covid-19 where the p-value shows <0.05 .

Smokers have a 14 times higher risk of becoming infected with SARS-CoV-2 and have a worse impact than non-smokers. 58% of the people who have contracted Covid-19 and are in critical condition are men (Vardavas & Nikitara, 2020). Smokers are more prone to have more severe Covid-19 symptoms when compared to nonsmokers. In a study published in *The New England Journal of Medicine*, smokers were 2.4 times more likely to develop symptoms of Covid-19 than nonsmokers. This shows that cigarette consumption is associated with a poor Covid-19 prognosis. Smokers who are exposed to Covid-19 will have a higher risk of serious illness and require treatment in the ICU, use of a ventilator to risk death (Grundy et al. 2020).

SARS-CoV-2, in particular, infects the respiratory system causing mild to severe respiratory damage. The fact that smoking is a risk factor for various disorders of lower respiratory tract infections. Furthermore, there is a close relationship between smoking habits and will worsen the disease if exposed to Covid-19 (Jiang et al., 2020). The relationship between Covid-19 and cardiovascular health is important because cigarette consumption and secondhand smoke exposure are major causes of cardiovascular disease globally. A weak cardiovascular system in a person with Covid-19

who has a history of smoking will make that person more susceptible to experiencing more severe symptoms, and therefore an increased risk of death (Williamson et al., 2020).

Smokers have a higher susceptibility to Covid-19 because smoking means that your fingers (and possibly contaminated cigarettes) are in contact with your lips, increasing the chances of hand-to-mouth transmission of the virus. The European Center for Disease Prevention and Control advises that things that can prevent Covid-19, such as cigarettes and certain drugs can be identified because they can increase the number of severe cases and have an impact on the availability of housing capacity. Smoking cessation is a relevant preventive measure against SARS-Cov-2 (Grundy et al., 2020).

The results showed that most of the respondents did not vaccinate against influenza, namely 67 (81.7%). Judging from each group, it is known that both the case group and the control group did not receive the influenza vaccine. The results of the statistical test showed that the history of influenza vaccination had no effect on the incidence of Covid-19 where the p-value showed >0.05 .

Influenza vaccine is designed to reduce the risk of infection with viruses that cause seasonal flu, giving influenza vaccines can reduce the risk of developing symptoms of severe Coronavirus infection. Symptoms caused by the Coronavirus can vary from mild to severe and lead to death. The weaker a person's immune system is, the more likely it is that the symptoms of Covid-19 will become severe. If a person has the flu, his immune system will be weaker than when he was in good health. If at the same time the person is infected with the Coronavirus, the body's ability to ward off this virus is reduced and the infection can progress to severe (Huang et al., 2021). The results of the study are not in line with the description above where the research that has been carried out shows that a history of influenza vaccination does not affect the incidence of Covid-19.

The results showed, most of the respondents with blood group A as many as 33

(40.2%). Statistical test results show that blood type has an effect on the incidence of Covid-19 where the p-value shows <0.05 . Various studies were conducted to determine the relationship between blood type and the level of risk if exposed to the coronavirus. A study revealed that genes associated with certain blood types influence the severity of infection in Covid-19 patients.

Laboratory tests revealed that a part of the coronavirus called the receptor-binding domain (RBD), which binds to cells to trigger infection directly, also captures a unique molecule associated with blood group A. The molecules, known as antigens, appear in the cells lining the respiratory tract, including the lungs. In theory, the antigen binds to a structure that could help the coronavirus enter and infect airway cells more easily. This data provides the first physical relationship between the coronavirus and blood type A (Wu et al., 2021). Individuals with blood type A tend to be more susceptible to the coronavirus, while those with blood type O are more resistant or have better immune systems. Patients with blood type A show a higher infection rate and develop more severe symptoms (Zietz et al., 2020).

CONCLUSION

The conclusions of this study are: there is a significant influence between behavioral factors, smoking habits, and blood type on the incidence of Covid-19 with a p-value <0.05 . There was no influence between the history of influenza vaccination and the incidence of Covid-19 with a p-value > 0.05 . Behavioral variables are the most dominant factors influencing the incidence of Covid-19. The results of the study can be used as information to further explore other factors that play a role in the incidence of Covid-19. The results of the study can be used as a reference in forming a strategy for changing public health behavior.

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