



The Differences in Pulse Frequency in Male Tobacco Smokers and Non-Smokers Aged 20-60 Years

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Abstract: Indonesia has become the 3rd ranked country with the highest number of active smokers at 61.4 million after China and India. Cigarettes are an addictive substance that causes withdrawal syndrome or addiction both physiologically and psychologically which causes a decline in a person's mental health and quality of health. This study aims to determine the difference in pulse frequency in male tobacco smokers and non-smokers aged 20-60 years. The research was conducted on 60 people in Barembeng Village, Gowa Regency. Data collection using questionnaires. Data were analyzed using the Chi-Square Test. The results of this study showed that the largest number of respondents were respondents who did not smoke and had a normal pulse, 22 people (36.07%) and respondents who actively smoked and had a bradycardic pulse, 6 people (10%), respondents who actively smoked and 5 people (8.30%) had normal pulses, 14 people (23.30%) actively smoked and had tachycardic pulses. Respondents who did not smoke and had a bradycardic pulse were 6 people (10%), and respondents who did not smoke and had a tachycardic pulse were 7 people (11.70%). The results of the correlation test obtained a value of $p = 0.003$, which shows that there is a relationship between smoking and pulse rate in male tobacco smokers and non-smokers aged 20-60 years.

Keywords: Pulse; Smoke; Tobacco

Introduction

Health is an important thing to pay attention to because health status in adulthood is generally determined from then on. Risky behavior generally begins in the teenage phase. Even though excellent health status is found during adolescence, a number of teenagers have been detected suffering from non-communicable diseases or NCDs. According to Lawrence Green quoted by Kholid, behavior is influenced by three main factors, namely predisposing factors which include knowledge, attitudes, traditions, and community beliefs; possible factors which include facilities and infrastructure; and strengthening factors which include community leaders, religious leaders, and health workers (Oktaviani et al., 2019; Wijayanti et al., 2017).

Cigarettes are an addictive substance that causes withdrawal syndrome or addiction both physiologically

and psychologically which causes a decline in a person's mental quality, especially students who are known as the nation's next generation (Hikmah, 2017). According to a survey from the World Health Organization (WHO) in 2008, one-third of the world's population, especially adults, were smokers. The world death rate due to smoking reaches 500 million people per year. Every six seconds, there is one death due to smoking. Smoking is one of the trigger factors for heart disease, osteoporosis, lung cancer, reproductive disorders, diabetes, and stomach disease (Fitria et al., 2013).

Indonesia has become the 3rd ranked country with the highest number of active smokers at 61.4 million after China and India (Kemenkes, 2015). This incident resulted in more than 97 million Indonesians who do not smoke is exposed to cigarette smoke and almost 225,000 people killed every year because of cigarettes and as many as 43 million children, 11.4 million of them aged 0-4 years (Kemenkes, 2015). Data Riskesdas (2013) shows

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that the smoking behavior of people aged 15 years and over has not decreased from 2007 to 2013, tends to increase from 34.2% in 2007 to 36.3% in 2013, likewise, smokers aged 10-14 years were found to have increased by 1,4% of 6154 children then the proportion of smokers in Indonesia is 29.3%. The proportion of smokers currently is highest in the Riau Islands with 27.2 percent daily smokers and 3.5% occasional smokers (Susi et al., 2019).

Smoking is defined as the activity of smoking tobacco. Smoking is not just limited to cigarettes. The use of other tobacco products such as cigars, cangklong, hand-rolled cigarettes, and chewing tobacco (susur, nginang) is also included in the broad definition of smoking. Increasingly modern, many cigarette factories make filter cigarettes their main tobacco cigarette product (Depkes, 2013). Cigarettes, cylindrical paper objects measuring between 70 and 120 millimeters long, with a diameter of about 10 millimeters containing a mixture of chopped tobacco, cloves, and several flavorings, have for many years been one of the best-selling commodities on the market.

Cigarettes are an object that is very well known in this world. Understandably, cigarettes can be purchased in various places, from roadside kiosks to luxury shopping centers (Angga et al., 2021; Farabi et al., 2017). Now, cigarettes have become a part of human life, they have even become something that cannot be separated from the lives of those who enjoy them. Cigarettes are a symbol of masculinity, gallantry, strength, courage, and toughness (Riksanto et al., 2021).

According to Silverthorn (2014) the pulse is a rapid pressure that occurs when the left ventricle pushes blood into the aorta which can be felt as a pulse. According to the medical dictionary, the pulse is a rhythmic pulsation in the arteries that can be felt, explaining that the pulse is a pressure wave that can be felt at any point in the arteries located near the surface of the skin. The artery that is usually palpable is the radial artery at the wrist (Singh, 2013). Pulse frequency provides information about the work of blood vessels and circulation. Meanwhile, according to Guyton et al (2012), the pulse is a wave that is palpable in the arteries when blood is pumped out of the heart (Tradiga, 2015).

This pulse is easily felt at a place where the artery passes in front of the wrist. Blood that is pushed towards the aorta not only moves forward in the blood vessel but also creates a pressure wave that travels along the artery. The pressure wave stretches the artery walls along its journey and the stretch can be felt as a pulse (Tradiga, 2015).

Events that occur in the heart start from the beginning of the heartbeat to the next heartbeat, which is called the cardiac cycle. Each cycle begins with the

spontaneous generation of an action potential in the sinus node, this node is located on the superior lateral wall of the right atrium near the entry point of the superior vena cava and the action potential travels from here at high speed through both atria and then through the A-V bundle to the ventricles. This situation causes the atria to contract before the ventricles contract. So, the atrium works as a precursor pump for the ventricles and the ventricles pump blood into the vascular system through the aorta in the systole phase (Sherwood, 2011). The normal pulse rate is 72 times per minute. In general, the higher the pulse rate per minute, the more blood is pumped (Guyton et al., 2012). The aim of this research is to determine the difference in pulse frequency in male tobacco smokers and non-smokers aged 20-60 years.

Method

Types of Research

The type of research carried out is research using observational analytics, that is connecting dependent and independent variables with a cross-sectional design. This research design is used to examine an event at the same time (one time). The independent variable in this research is smoking and the dependent variable is pulse rate.

Place and Time of the Study

This research was carried out in Barembeng Village, Gowa Regency. This research will be carried out from September 2020 to November 2020.

Population

The population in this study was the people of Barembeng Village, Gowa Regency.

Samples and Sampling Techniques

The sample in this research is part of the entire object studied and is considered to represent the entire population. In other words, a sample is a population that meets inclusion and exclusion criteria. The selection criteria are: Inclusion Criteria, Male, aged 20-60 years, Smoking or not smoking tobacco, Exclusion Criteria, Passive smoking, Ex-smoker, and not willing to take part in the research. The sampling method in this research was by using the total sampling method and a total of 51 samples were obtained.

How to Collect Data

The data collection method uses primary data, namely data taken directly from respondents using questionnaires and pulse measurements.

Data Analysis

Univariate analysis was carried out on each variable to obtain an overview of the distribution of each variable studied. Bivariate analysis was carried out to determine the relationship between independent variables and related variables separately. Then the statistical test used is chi-square to find out whether the two are related or not.

Result and Discussion

General Description of the Population/Sample

Research has been conducted on differences in pulse frequency in male tobacco smokers and non-smokers aged 20-60 years. Data collection for this research was carried out in September 2020–October 2020 in Barebeng Village, Gowa Regency. Data was obtained from filling out questionnaires regarding smoking habits and directly checking the pulse. The data that has been collected is then arranged in a master table using the Microsoft Excel program. From this master table, the data is then transferred and processed using the SPSS program on a computer device and then presented in the form of a frequency table or cross table.

General Description of the Research Location

This research was conducted in Taipajawaya Hamlet, Barebeng Village, BontonompoAnalysisisen Gowa District, South Sulawesi Province.

Analysis

Some of the variables examined in this research are smoking variables and pulse rate variables. Sampling was carried out using the simple random sampling method so that a minimum sample of 51 samples was obtained. The research results are presented in a table accompanied by the following explanation.

Univariate Analysis

Distribution of respondent characteristics based on age characteristics

Based on Table 1, it was found that the largest number of respondents were aged 20-24 years with 22 samples (36.6%). Furthermore, the minimum sample age is 20 years and the maximum sample age is 60 years.

Table 1. Distribution Based on Demographics

Age	Frequency	Percentage (%)
20-24	22	36.60
25-29	19	31.70
30- 35	15	24.90
40-45	2	3.40
50-60	2	3.40
Total	60	100

Smoker Classification Distribution

Based on table 2, it was found that 25 respondents actively smoked (41.70%) and 35 respondents who did not smoke (58.30%).

Table 2. Smoker Classification Distribution

Classification	Frequency	Percentage
Smoker (Active)	25	41.70%
Non- smoker	35	58.30%
Total	60	100%

Pulse Distribution

Based on table 3, the results showed that 12 respondents experienced bradycardia (20%) and 27 respondents (45%) experienced bradycardia and 21 respondents experienced tachycardia (35%).

Table 3. Pulse Distribution

	Frequency	Percentage
Bradycardia	12	20%
Normal	27	45%
Tachycardia	21	35%
Total	60	100%

Bivariate Analysis

The results obtained from table 4 show that the largest number of respondents were respondents who did not smoke and had a normal pulse as many as 22 people (36.7%) and respondents who actively smoked and had a bradycardic pulse as many as 6 people (10%), respondents There were 5 people who actively smoked and had a normal pulse (8.3%), 14 people (23.3%) actively smoked and had a tachycardic pulse. There were 6 respondents who did not smoke and had a bradycardic pulse (10%), 7 respondents who did not smoke and had a tachycardic pulse (11.7%).

Table 4. Differences in Pulse Frequency in Male Tobacco Smokers and Non-Smokers Aged 20-60 Year

	Bradycardia	Normal	Tachycardia	Total	P Value
Active Smoking (%)	6 (10)	5 (8.30)	14 (2.30)	25 (41.70)	0.003
Non-smoker (%)	6 (10)	22 (36.70)	7 (11.70)	35 (58.30)	
Total (%)	12 (2)	27 (45)	21 (35)	60 (100)	

In Indonesia, the number of deaths from diseases caused by smoking reaches 300 thousands per year. Nearly 60 percent of deaths in Indonesia are caused by

non-communicable diseases (NCDs) caused by smoking, such as stroke, hypertension, and heart disease, the numbers of which are now increasing. WHO

in 2014 informed that Indonesia had achieved an increase in cigarette consumption with more than 6 million people per year passive smokers who had died from diseases resulting from smoking habits (Yuliana et al., 2017).

Based on the results of Table 4, it is found that there is a relationship between differences in pulse frequency in male tobacco smokers and non-smokers aged 20-60 years. This can be seen from the value ($p=0.003$). This is in line with research conducted by Adibah who examined the influence of blood pressure on smoking among male student's class of 2007, FK USU in 2010 which showed that the factor related to blood pressure was the number of cigarettes smoked ($p=0.0001$) (Latifah, 2013).

Another study conducted by Sulvianan regarding the analysis of the relationship between lifestyle and blood pressure in 2008 at IPB showed a significant relationship between the number of cigarettes smoked and blood pressure ($p = 0.45$; $r = 0.523$) (Latifah, 2013). Nurhikmah's research entitled The Relationship between Long Smoking and the Degree of Hypertension in Rannaloe Village, District. Bungaya District. Gowa obtained a value of $P=0.042$ (<0.05) which shows that there is a significant relationship between the duration of smoking and the degree of hypertension so that it can be concluded from this study that the longer the respondent smoked, the higher the level of hypertension (Hikmah, 2017).

The earlier someone smokes, the more difficult it is to stop smoking. Cigarettes also have a dose-response effect, meaning that the younger you smoke, the greater the effect. If smoking behavior begins in adolescence, smoking can be related to the level of atherosclerosis. The risk of death increases due to the amount of smoking and the earlier age at which smoking begins (Latifah, 2013). As in research conducted by Apriana Kurniati in Semarang regarding smoking habits, the number of cigarettes can affect blood pressure with $Pvalue = 0.0001$ because blood vessels will be influenced by the number of cigarettes consumed so that there will be an increase in blood pressure (Latifah, 2013).

Conclusion

Based on the results of research that has been carried out regarding differences in pulse frequency in male smokers and non-smokers aged 20-60 years and the discussion in the previous chapter, it can be concluded that there is a difference in pulse frequency in male smokers and non-smokers aged 20-60 years and from 61 respondents from the community in Barembeng Village, Gowa Regency, it was discovered that 45% of respondents had a normal pulse.

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Author Contributions

Author contributions include Mohammad Basri and Nur Ilham in collecting data and analyzing data. Rosdiana Syakur wrote the original draft focusing on methodology and writing review.

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Conflicts of Interest

The authors declare no conflict of interest

References

- Angga, Y., & Elon, Y. (2021). Hubungan Kebiasaan Merokok Dengan Tekanan Darah. *Jurnal Kesehatan Komunitas*, 7(1), 124-128. <https://doi.org/10.25311/keskom.Vol7.Iss1.861>
- Depkes, R. I. (2013). *Riset Kesehatan Dasar Nasional 2013*. Kepala Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. Retrieved from https://komnaspt.or.id/wp-content/uploads/2020/12/Riset_Riskesda-2013_Balitbang-Kemenkes_2013.pdf
- Farabi, A. F., Afriwardi, A., & Revilla, G. (2017). Hubungan Kebiasaan Merokok dengan Tekanan Darah pada Siswa SMK N 1 Padang. *Jurnal Kesehatan Andalas*, 6(2), 429. <https://doi.org/10.25077/jka.v6i2.716>
- Fitria, F., Triandhini, R. I. N. K. R., Mangimbulude, J. C., & Karwur, F. F. (2013). Merokok dan Oksidasi DNA. *Sains Medika: Jurnal Kedokteran Dan Kesehatan*, 5(2), 113. <https://doi.org/10.30659/sainsmed.v5i2.352>
- Guyton, arthur C., & Hall, john E. (2012). *Buku Ajar Fisiologi Kedokteran*. Jakarta: EGC.
- Hikmah, N. (2017). *Hubungan lama merokok dengan derajat hipertensi di Desa Rannaloe Kecamatan Bungaya Kabupaten Gowa* [Fakultas Kedokteran dan Ilmu Kesehatan UIN Alauddin Makassar]. Retrieved from <https://core.ac.uk/download/pdf/198218637.pdf>
- Kemenkes, R. I. (2015). *profil kesehatan Indonesia 2015*. Jakarta: Kemenkes RI.
- Latifah, F. (2013). *Hubungan Kebiasaan Merokok dengan Profil Tekanan Darah pada Mahasiswa Tingkat III. Jurusan Teknik Informastika UIN Sunan Gunung Djati Bandung*.

- Oktaviani, N., Avianty, I., & Mawati, E. D. (2019). Faktor-Faktor yang Berhubungan dengan Perilaku Merokok pada Mahasiswa Pria di Universitas Pakuan Bogor Provinsi Jawa Barat Tahun 2018. *PROMOTOR*, 2(1), 44–53. <https://doi.org/10.32832/pro.v2i1.1788>
- Riksanto, R., El Furqan, D. F., Amalia, C., Syamsir, N., & Padmawijaya, G. (2021). Pengaruh Ekstrak Lidah Mertua (*Sansevieria trifasciata*) dalam Menurunkan Kadar Karbon Monoksida Akibat Asap Sidestream Rokok Filter. *Al-Iqra Medical Journal : Jurnal Berkala Ilmiah Kedokteran*, 4(2), 71–83. <https://doi.org/10.26618/aimj.v4i2.6810>
- Sherwood, L. (2011). *Fisiologi Manusia dari Sel ke Sistem*. Jakarta: EGC.
- Silverthorn. (2014). *Fisiologi Manusia: Sebuah Pendekatan Terintegrasi*. Jakarta: EGC.
- Singh, A. S. A. L. J. (2013). *Efek Merokok pada Tekanan Darah dan Kebugaran Mahasiswa Fakultas Kedokteran Universitas Sumatera Utara, Medan* [Universitas Sumatera Utara]. Retrieved from <https://repository.usu.ac.id/handle/123456789/19950>
- Susi, & Ariwibowo, D. D. (2019). Hubungan antara kebiasaan merokok terhadap kejadian hipertensi essensial pada laki-laki usia di atas 18 tahun di RW 06, Kelurahan Medan Satria, Kecamatan Medan Satria, Kota Bekasi. *Tarumanagara Medical Journal*, 1(2), 434–441. Retrieved from <https://journal.untar.ac.id/index.php/tmj/article/view/3854>
- Tradiga, E. (2015). *Perbedaan Rerata Denyut Nadi dan Tekanan Darah Sebelum dan Sesudah Gilir Jaga Malam Pada Mahasiswa Kepaniteraan Klinik di Rumah Sakit Muhammadiyah Palembang Tahun 2015* [Program Studi Kedokteran Universitas Muhammadiyah Palembang]. Retrieved from <http://repository.um-palembang.ac.id/id/eprint/672/>
- Wijayanti, E., Dewi, C., & Rifqatussa'adah, R. (2017). Faktor-faktor yang Berhubungan dengan Perilaku Merokok pada Remaja Kampung Bojong Rawalele, Jatimakmur, Bekasi. *Global Medical & Health Communication (GMHC)*, 5(3), 194. <https://doi.org/10.29313/gmhc.v5i3.2298>
- Yuliana, T., Hartoyo, M., & Nurullita, U. (2017). Perbedaan Tekanan Darah Berdasarkan Status Merokok (Studi di Rusun Rawa Sawah Besar Kaligawe Semarang). *Karya Ilmiah STIKES Telogorejo*, 6. <http://ejournal.stikestelogorejo.ac.id/index.php/ilmukeperawatan/article/view/655/653>