JUARA: Jurnal Olahraga
E-ISSN 2655-1896 ISSN 2443-1117
https://doi.org/10.33222/juara.v7i2.1847

The Effect Of Nicotine On Cardiovascular Endurance

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Info Artikel

Article History.

Received 20 February 2022

Approved 25 May 2022

Published 01 June 2022

Keywords:

Nicotine, Cardiovascular Endurance, Cigarettes

Abstract

The problem raised in this study is whether nicotine affects the cardiovascular endurance of the Athlete Category FIK UNM students. At the same time, the purpose of this study was to determine the effect of nicotine on the cardiovascular endurance of FIK UNM students in the Athlete category. This type of research is quantitative research using the method of comparison or comparison. The variables related to this study were smoking habits and cardiovascular endurance. The number of samples used in this study was 40, whereas the sample selection technique used the purposive sampling technique. The research location was held at the Faculty of Sports Science, Makassar State University. Data collection techniques using the Harvard Step Test to see the ability of cardiovascular endurance in the sample. The data analysis technique used is normality test analysis, homogeneity test and unpaired t-test or comparison test. The data testing results showed a significant value of cardiovascular endurance in the non-smoking sample group compared to the smoker sample group value of 0.002 < 0.05. The mean value of cardiovascular endurance in the non-smoking sample group was 1.0773, more significant than the mean value for the smoking sample group. This study concludes that there is a substantial difference in the effect of nicotine on cardiovascular endurance in the athlete category of FIK UNM students, where the cardiovascular endurance of students who do not smoke is better than the group of students who smoke even though they are both active athletes.

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INTRODUCTION

The shift in lifestyle, especially in urban areas, almost does not provide an option to have a quality lifestyle (Syafei et al., 2021; Ramadan et al., 2020). An unhealthy diet and lack of exercise are risk factors for high blood cholesterol levels (Ramadan et al., 2020: Bahri et al., 2017). Without realizing it, high cholesterol levels slowly but surely accumulate in the blood vessels, which in turn

causes several diseases such as coronary heart disease and stroke (Shanty, 2011).

Smoking habits where nicotine indirectly enters the respiratory tract (Bass et al., 2004; Teychenne et al., 2020). The other impact of nicotine on the body is the emergence of calcification in the respiratory tract and blood circulation. Calcification in the respiratory tract can reduce the ability of the alveoli to absorb oxygen (Brauer, 2004; Zheng et al., 2020; Sartono et al., 2020). The ability of the alveoli and lungs to decrease, and then the oxygen absorbed will be reduced to affect muscle work. Calcification in the circulatory tract can cause cholesterol to accumulate so that it can be exposed to the risk of heart disease. It can cause atherosclerosis caused by damage to artery walls by carbon monoxide (CO) (Motl & Sandroff, 2020).

Physical fitness is a measure of whether a person is said to be healthy or not. Fitness is needed by every age level, from children to the elderly. Physical fitness means the ability of a person's body to carry out daily work without causing significant fatigue (Barth Vedøy et al., 2020).

Physical fitness has the function of developing the ability to work for anyone to complete their work tasks correctly without experiencing significant fatigue (Wilson & Barnett, 2020). Factors that affect physical fitness, namely: 1) Age: Each individual's physical fitness is very different from one another, one of which is age. The physiological function capacity of children increases until it reaches a maximum at the age of 25-30 years; then, there will be a decrease in the functional capacity of the whole body. However, if each individual always exercises, fitness conditions will be maintained, and the decline in physiological function will not decrease drastically (inhibited) (Correia et al., 2020); 2) Gender: Boys' physical fitness is almost the same as girls' at and up to puberty. However, after puberty, boys usually have a much greater value. One of the factors is muscle mass and triglycerides (fat) which are found in women more in proportion to the production of female hormones (Barkley et al., 2020); 3) Genetics: Affects cardiopulmonary capacity, posture, obesity, haemoglobin/blood cells and muscle fibres (Mizera & Horváth, 2002); 4) Food: High endurance when consuming high carbohydrates (60-70%). If physical activity is carried out, the remaining carbohydrate reserves (glycogen) can be broken down again using glucose. A high-protein diet significantly enlarges muscles, and for sports that require strength, large muscles (Arnold, 1989); 5) Healthy Lifestyle: The level of CO inhaled will reduce the value of VO2 max and the absorption of oxygen into the alveoli, which affects the endurance of the lungs. In addition, according to Perkins' research, the nicotine contained in cigarettes can increase energy expenditure and reduce appetite (Kusuma, 2009; Ramadan et al., 2020).

When it comes to athletes, of course, the level of physical fitness is above humans

in general. One of the factors that an athlete must always maintain is endurance. Endurance is generally divided into 2, namely general endurance and exceptional endurance. General endurance is usually related to the heart and lungs' ability to support physical activity over a long period. General endurance (cardiovascular endurance) is the body's ability to carry out continuous activities in an aerobic state for a relatively long time (Nala, 2011). Without good general endurance, the individual will not be able to move optimally in daily life (Santika, 2015).

METHODS

The design of this research is to use a quantitative research type (Ramadan & Juniarti, 2020) with a comparative or comparison method. The variables in this study were smoking habits and cardiovascular endurance. The population in this study were all students of FIK UNM. The research sample was selected through a purposive sampling technique to select students in the athlete category, both smokers and non-smokers. The number of samples in this study was 40 samples. The data collection technique was carried out by testing the ability of cardiovascular endurance using the Harvard step test. This study's hypothesis or quick answer is "There is a significant effect of Nicotine on Cardiovascular Endurance in Athlete Category FIK UNM students".

FINDINGS AND DISCUSSION

Findings

One of the assumptions that must be met for parametric statistics to be used in research is that the data must follow a normal distribution. To find out the distribution of Cardiovascular Endurance data for FIK UNM students in the athlete category, a normality test was carried out using the Shapiro-Wilk test.

Table 1 Normality Test

Variable	Group	Statistics	P	α	Ket.
Cardiovascular Endurance	Do not smoke	0,962	0,806	0,05	Normal
Cardiovascular Endurance	Smoke	0,912	0,294	0,05	Normal

The homogeneity test aims to determine whether the variation of some data from the population has the same variance (homogeneous) or not. The homogeneity test used is the Levene Test. Results of Homogeneity Test Analysis for Cardiovascular Endurance and Blood Lipids FIK UNM Students

The hypothesis proposed in this study needs to be tested and proven through empirical data obtained in the field through tests and measurements of the variables studied. Then the data will be processed statistically. Hypothesis testing was carried out with an Unpaired Sample T-Test to see the effect of Nicotine on Cardiovascular Endurance in Athlete category FIK UNM students.

Table 2 Hypothesis test results

Variable	N	Statistics	Mean	Mean Difference	Sig	α
Cardiovascular Endurance	20	Do not smoke	1,0773	0,0597	0,002	0,05
Cardiovascular Endurance	20	Smoke	1,0176			

Discussion

The results of statistical analysis showed a significant effect of Nicotine on Cardiovascular Endurance in the Athlete category of FIK UNM students. If it is associated with the underlying theory and framework, then the results of this study are appropriate and support several theories from the results of previous research.

If you look at the data from Cardiovascular Endurance, it can be seen that Cardiovascular Endurance is in an outstanding category (Jacob et al., 2020). If you look at the category, this should not be a problem with the effects of nicotine they consume. Because if the category has outstanding endurance, it means that their physical fitness is still maintained. However, if it is associated with the theory proposed by (Kusuma, 2009); 2020), In point 1, it is explained that the capacity of children's physiological functions increases until it reaches a maximum at the age of 25-30 years. There will be a decrease in the functional capacity of the whole body. The average age in the sample is still below 30 years, indicating that the physiological function in the sample is still at its top condition (Iskandar & Ramadan, 2019). So that their smoking activity has not had a significant effect on their bodies because their bodies are in top condition to counteract the harmful effects of nicotine. In addition, the intense sports activities can be a factor in why their Cardiovascular Endurance is still in the outstanding category (Chang et al., 2021). The study results on the effect of nicotine on cardiovascular endurance of FIK UNM students showed a pretty significant comparison. That is, although all samples are in the category of outstanding cardiovascular endurance, there are differences between samples consuming nicotine (smoking) and samples not consuming nicotine (not smoking) (Teychenne et al., 2020). The average value of

the sample which does not smoke shows a better value than the sample that smokes. From this, we can see that nicotine affects cardiovascular endurance in FIK UNM students who consume nicotine (smoking).

Back to the theory (Kusuma, 2009), the fifth point is that nicotine CO levels inhaled will reduce the value of VO2 max and oxygen absorption into the alveoli, affecting lung endurance (Brown & Lee, 2004). In addition, the nicotine contained in cigarettes can increase energy expenditure and reduce appetite. If it is associated with the research conducted, it means that the sample who consumes nicotine (smoking) starts to get the disturbance or effect given by the consumption of nicotine. This can be in the form of reduced VO2 Max ability of the lungs to absorb oxygen due to high levels of CO that is also inhaled by smoking samples. This impacts their cardiovascular endurance ability, which is not better than a sample of students who do not consume nicotine.

CONCLUSION

Based on the analysis of the data and the discussion presented, it can be concluded that there is a significant comparison of the effects of nicotine on cardiovascular endurance in the athlete category of FIK UNM students. The average value indicates that the non-smoking group has better cardiovascular endurance than the smoking group.

The suggestions that can be recommended from the results of the research carried out are 1) By knowing that nicotine hurts cardiovascular endurance, it is hoped that the community and students can be more open in their understanding so that they can avoid consuming nicotine (smoking); 2) By knowing that nicotine hurts cardiovascular endurance, it is hoped that athletes who are still active do not consume nicotine (smoking) in order to be able to produce maximum performance; 3) By knowing that nicotine hurts cardiovascular endurance and it is hoped that the coach will be able to provide education and monitoring to athletes to stay away from nicotine (smoking).

ACKNOWLEDGMENTS

Thanks to the Rector of Universitas Negeri Makassar, Dean of the Faculty of Sports Science, Department of Sports Education, and all lecturers of Sports Education who have provided both material and moral support so that this research can be completed.

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