

Effect of Energy Drink Consumption of Aerobic Endurance

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Abstract— The purpose of this study was to determine the effect of the consumption of energy drinks on the ability of aerobic endurance. This type of research is quasi-experimental research design, one group pretest-posttest design. Samples numbered 24 people. The instrument used to measure the ability of aerobic endurance is the Cooper test and data analysis techniques dependent sample t-test. The results showed $t = 1.23 < t_{table} 1.75$, it can be concluded that the consumption of energy drinks do not have a significant influence on the improvement of aerobic endurance capacity.

Keywords—energy drink, aerobic endurance

I. INTRODUCTION

The energy drink has been popular in Indonesia more than 20 years, including in western Sumatra and especially for students of the faculty of sport science Universitas Negeri Padang. Various kinds of brand products are freely available in the community with the packaging and a different flavor variants, besides energy drinks are sold freely on the market has a relatively low price making it more affordable for the community. Due to the relatively cheap price, and is believed to enhance the physical ability to make products energy drinks are in great demand by the public. An average of 10.4 million liters of energy drinks in production every year [1], Almost all energy drink has the same claim that it can improve the physical condition, so a lot of people who consume energy drinks with the hope of improving the physical condition especially aerobic endurance. Students of the faculty of sport science are part of society who consumed the energy drinks and some students consume energy drinks to increase the physical ability to be able to carry out all daily activities with the maximum. The number of students who consume energy drinks that need to watch out because there is no real evidence of the benefits provided by the energy drinks to increase physical abilities, especially the ability of aerobic endurance. Although some students said that the effect of these drinks can be felt immediately as endurance increases, the body is more fresh and various other effects felt by students. It is still seen as the assumptions given by the students, and therefore the need to do research to uncover the truth of the information given, the goal is that students know exactly the effect given by the energy drinks to increase aerobic endurance capacity.

Energy drinks

Energy drinks are branded beverages produced by the factory and distributed freely among the people with the variant flavors and different colors. energy drink is a refreshing drink containing sugar and caffeine [2], According to [1] Energy drinks are typically added with a substance that can improve the physical abilities. Energy drinks contain various active substances such as caffeine, taurine, inositol, ginseng and others [3],

There are some substances that are usually found in energy drinks is:

1. Caffeine, is a crystalline compound with a main constituent is a protein derived by name purine xanthine [4], This compound has merit as analgesics to reduce pain. Caffeine is used to stimulate the central nervous system and the heart muscle and relaxes smooth muscle, especially bronchus. With consume caffeine, it can reduce drowsiness and fatigue, and can stimulate thought faster, but will be reduced in work that requires delicate skills and numeracy [3],

2. taurine

Taurine is a non essential amino acid that is derived from the synthesis of methionine and cysteine, [3], Taurine can be obtained from eggs, yeast, fish, meat and milk and many other sources. Taurine serves to stabilize the membranes of the brain and also helps in the comings and goings of potassium, sodium, calcium and magnesium into the cell.

3. inositol

Inositol is an isomer of glucose in the body that can be turned into glucose [3], Inositol functions in cell growth.

4. ginseng

Ginseng is derived from ginseng root extract. Ginseng works to normalize blood sugar, stimulates immune function.

Aerobic Endurance

Aerobic endurance is the ability of the body associated with the process of taking, transporting and using oxygen, Hazeldine in [5], Aerobic endurance is also called cardiovascular fitness [6], Endurance aerobics consisted divided into 2 [7] that is.

- (1) General Aerobic Dynamic endurance

Endurance general aerobic dynamic is the ability to overcome fatigue in a dynamic work involving 1/6 to 1/7 of the overall main characteristics adari skeletal muscle aerobic endurance is situated on muscle

contraction in skeletal muscle Part of that work dynamically.

(2) General Aerobic Endurance Static

Endurance aerobic static common is the ability to overcome fatigue in endurance public static work static muscle length does not change, but in static muscle contraction.

II. RESEARCH METHODOLOGY

This type of research is a quasi-experiment in order to determine the impact that energy drinks to increase aerobic endurance capacity. The study design one group pretest-posttest design. The population of 40 people. Samples were selected using purposive sampling technique with consideration of the samples in this study were only students who consume energy drinks. The instrument used to measure aerobic endurance is the ability to use the test copert run 2,4km. Data analysis techniques by using different test sample dependent.

III. RESULT

1. Data Description

Measurements in this study was done 2 times that before being given a given energy drinks and energy drinks after. To see the influence exerted by the energy drink. The measurement results are as follows:

a. Data Pre Test

Based on measurements that have been done on 24 samples before given energy drinks gained an average of 14.54, 13.44 and the median standard deviation of 3.73. Full results of the pre-test data measurements in Table 1.

Table 1. Data Pre Test

Class Interval	Frequency		Kategory
	Absolute	Relative (%)	
> 15.31	8	33.33	Very Poor
12.11-15.30	8	33.33	Poor
10.49-12.10	8	33.33	Average
09.41-09.48	0	0.00	Good
08.37-09.40	0	0.00	Very Good
< 08.37	0	0.00	Excellent
Amount	24	100	

Table 1 shows that 8 (33.33%) students have the ability aerobic endurance on the score of > 15.31 to kategory very poor, and 8 (33.33%) with aerobic endurance capabilities at an interval of 12.11-15.30 with a poor category, and 8 (33.33%) with aerobic endurance capabilities at an interval of 10.49-12.10 kategory average and no student who has the ability aerobic endurance at intervals 9.41-9.48 and 08.37-09.40 and <08.37.

b. Data Post Test

Based on measurements that have been made against 24 people after the sample is given energy drinks gained an average of 13.12, and the median 12.24, standard deviation of 2.84. Full results of the test measurement Post data in Table 2.

Table 2. Data Post Test

Class Interval	Frequency		Kategory
	Absolute	Relative (%)	
> 15.31	6	25.00	Very Poor
12.11-15.30	8	33.33	Poor
10.49-12.10	10	41.67	Average
09.41-09.48	0	0.00	Good
08.37-09.40	0	0.00	Very Good
< 08.37	0	0.00	Excellent
Amount	24	100	

Table 2 displays that 6 people (25.00%) students have the ability aerobic endurance on the score of >15.31 to kategory very poor, and 8 (33.33%) with aerobic endurance capabilities at intervals of poor category 12.11-15.30, and 10 (41.67 %) with aerobic endurance capabilities at intervals of average category 10.49-12.10 and no student who has the ability aerobic endurance at intervals of 09.41-09.48 and 08.37-09.40 and <08.37.

2. Test requirements analysis

Before the data analysis necessary to test requirements analysis consisted of tests of normality and homogeneity.

a. Normality test

Homogeneity test carried out by using test lilifors to both sets of data, based on the normality test result that the data in this study normal distribution for Lo each smaller group of L_{table} . The normality test results shown in Table 3:

Table 3. Test of Normality

Group	$L_{observation}$	L_{table}	Information
Pre Test	0.1225	0173	Normal
Post Test	0.1208		

b. homogeneity test

To test the homogeneity of the data is done by using test F, of the test obtained by the variance of data pre-test 13.90 and variance of data posttest 8.04 F_{count} 1.73 and the value of F_{table} at α 0.05 is 2.00 so F_{count} 1.73 < F_{table} 2.00 and it can be concluded that the data comes from variances homogeneous. Hasi homogeneity test can be seen in Table 4.

Table 4. Test Homogeneity

Group	variance	F_{count}	F_{table}	Information
pre Test	13.90	1.73	2.00	Homogeneous
Post Test	8.04			

3. Hypothesis test

In accordance with the design penelitain one group pre-post test design, the test hypothesis by using statistical test t dependent sample. Based on the analysis performed, obtained t of 1.23 and ttable at 0.05 α gained 1.75, so t 1.23 < ttable 1.75 then the hypothesis is rejected, in other words that energy drinks do not provide a significant impact on the ability increased aerobic endurance. The results of the analysis can be seen in Table 3 below:

Table 5. Research Hypothesis Testing

Group	Average	t_{count}	t_{table}	Information
pre Test	14.54	1.23	1.75	not significant
Post Test	13.12			

IV. DISCUSSION

From the information that has been described in the above results, it can be seen that the average initial ability is at 14.54 (14 minutes 54 seconds) and average ability of the end of 13.12 (13 minutes 12 seconds) means an increase in travel time of 1.43 (1 minute 43 seconds), so it can be said that energy drinks give effect to aerobic endurance ability, but based on the statistical test result that the increase in the consumption of energy drinks is not significant.

Rejection of the hypothesis could happen because in addition believed to have a positive impact on the body, taurine found in energy drinks can also be oxidants in the body such as that delivered by Chesney in [8] thus increasing the ability of physical konfisi especially aerobic endurance is not the case.

Energy drinks proved unable to improve aerobic endurance significantly, although some samples have increased, but based on statistical analysis of data can be said that the increase is not significant, it suggests that the beliefs of some students and the community to an increase in physical abilities, especially aerobic endurance after consuming energy drinks are not entirely correct. Increased physical condition that had been perceived by the public after consuming energy drinks likely only psychological effects provided by the energy drinks because people are influenced by ads that aired on television and because there has not yet been measured physical abilities especially aerobic endurance before and after consuming energy drinks the. Supposedly upgrades expected physical condition is done in a safe way is not by way of instant, like physical exercise regularly, set the time for rest and attention to the nutritional value of food dikosumsi. If the increase is carried out only by consuming energy drinks then feared to substances contained in energy drinks can have a negative effect on the body.

V. CONCLUSION

Based on the discussion that has been described above, it could be concluded in this study is the consumption of energy drinks do not provide a significant impact on the increase in the ability of the physical condition, especially aerobic endurance.

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