

The Effect of Circuit Training on Increasing Agility Students in Extracurricular Participants of Sejahtera SMA Surabaya

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Abstract

This study aimed to determine the effect of circuit training on agility and the vital capacity of the lungs. This study was a quasi-experiment study with nonrandomized pretest posttest control groups design. The subject of this study were 50 male participants of extracurricular football at SMP Negeri 4 Negara in academic year 2012/2013. Agility was measured by using dogging run, while the vital capacity of the lungs was measured by using spirometer and the data was analyzed by independent t-test with significance of (α) 0,05 by using SPPSS 16.0. The result of analysis data by using independent t-test showed that circuit training affected the improvement of agility and the vital capacity of the lungs with significance value for agility was 0.000 and 0.000 for the vital capacity of the lungs. From the result of analysis data could be concluded that circuit training affected the improvement of agility and the vital capacity of the lungs. It is suggested for the coach, teacher and athlete to use circuit training as one alternative in improving agility and the vital capacity of the lungs.

Keywords

circuit training; improvement; agility



I. Introduction

The biomotor component or biomotor element is the basic ability of physical movement or physical activity of the human body. Most of these biomotor abilities are hereditary or genetic. In sports, there are 10 components or biomotor elements, namely: strength, endurance, explosive power, speed, agility, accuracy, flexibility, reaction speed, balance, coordination (Nala, 2001: 1). Every human being generally has one of the most dominant biomotor components to rely on. One example of the agility of each individual must have agility that is different from other individuals, as well as other biomotor components. Physical activity is an inseparable part of the life of living things, ranging from simple to very complex activities. As a living creature, humans need physical activity as an effort to maintain the existence of their lives. Every individual in his life must be doing physical activities both intentionally and unintentionally, because physical activities are carried out with diverse and diverse purposes. (Sulaiman, et al. 2020)

Football in general must have the agility to move from one position to another and must also have good respiratory endurance to play 2 x 45 minutes. Respiratory endurance is closely related to the vital capacity of the lungs. The vital capacity of a person's lungs is different, if someone has a good vital lung capacity, the respiratory endurance of a person will be good too. In general, all forms of training methods can increase the vital capacity of the lungs, but the size of the increase in a person's vital lung capacity depends on the training method used and the intensity and duration of the training used. the background of the researcher placing more emphasis on agility is because good agility is one of the factors that determines a person can play soccer properly and correctly, with good agility

someone will easily pass the opponent, both movement with the ball and movement without the ball. Likewise with the vital capacity of the lungs, a person can play up to 2x45 minutes depending on the oxygen consumption obtained. The more the lungs accommodate oxygen, the respiratory endurance of the person will be good too. Agility someone can play up to 2x45 minutes it depends on the oxygen consumption obtained. The more the lungs accommodate oxygen, the respiratory endurance of the person will be good too. Agility is the ability of the body or limbs to perform

position changes as quickly as possible in a short time (Juliantine, 2007: 3.20). While the vital capacity of the lungs is the amount of air or the volume of oxygen that we can breathe in and then exhale (Giri Wiarto, 2012: 9). The vital capacity of the lungs is closely related to respiratory endurance because it is the respiratory system, heart, lungs, and blood vessels whose ability or work efficiency is improved to be able to supply oxygen to the muscles to produce energy and then expel the rest of the metabolic products out of the body such as carbon dioxide gas. from the muscles out of the body through the lungs.

From the initial observations made by researchers both by interview and directly on extracurricular soccer participants at SMA Sejahtera Surabaya, it was found that several problems were found, such as, in every inter-school football championship and porsenijar which was followed by SMA Sejahtera Surabaya, it never once won a champion in the past 5 years. , namely from 2010-2011 not a single award could be achieved, even though If you look at the previous journey, the soccer team of SMA Sejahtera Surabaya has always entered the final round in every football competition event, whether it's porsenijar or matches involving high school students. The last time the Sejahtera Surabaya High School football team entered the final was at the Porsenijar in 2012 after that the Sejahtera Surabaya High School football team seemed thirsty for champions. The extracurricular coaches also seem confused about their students' performance which continues to decline even though the training carried out is almost the same as the previous training.

See problem As mentioned above, the circuit training method is a solution to increase a person's agility and vital lung capacity. According to Juliantine (2007: 3.25), circuit training is a training program with various types of workloads that are carried out simultaneously and continuously with interspersed breaks at the change of these types of workloads. Meanwhile, according to LANKOR (2007: 62) circuit training is training using several posts arranged in such a way as to increase the overall strength of the athlete's body. The selection of the type of training load in circuit training must be adjusted to the aspects that are the general objectives of the circuit training to be achieved. Circuit training is carried out in an area that has been determined to have several posts, for example 7 posts. In each post, the implementation must be carried out in the form of certain exercises. Activities in each post are developments for all components of physical fitness.

II. Research Method

This research is an experimental study that aims to determine whether there is a consequence of something imposed on the research subject. The type of experimental research used is quasi-experimental (quasi-experimental).

In a study, sometimes for one reason or another, randomization cannot be carried out, on the other hand randomization can be carried out but the control group cannot be obtained. The research design used in this study is: The Non Randomized Control Group

Pretest Posttest Design” (Kanca, 2010: 94). Kanca (2010: 55) defines research design as a plan on how to collect, present, and analyze data to give meaning to the data effectively and efficiently.

Based on design In this study, the research was carried out as follows: The research subject (S) was given an initial test or pre-test (T1), namely a dogging run test to measure the subject's agility, while to measure the vital lungs using a spirometer, this aims to determine the initial ability so that the intensity of exercise is given according to the maximum ability of each subject. Based on the initial test results, subject study were grouped into two research groups through the ordinal pairing method, namely the peak group (K1) and the control group (K2). The treatment group (K1) was given circuit training (x), and the control group (K2) was not given special treatment (0) only adjusted to their daily activities. The treatment group (K1) was given treatment for 4 weeks or 12 meetings. After the training program ended, a final test or post-test (T2) was held with a dogging run test to measure the subject's agility and a spirometer to measure vital lung capacity.

This research was conducted in the field of Baluk village, Negara sub-district, Jembrana district, which is 100 meters from SMA Sejahtera Surabaya. The reason the researchers conducted field research in Baluk Village was because the field conditions were good enough to carry out a research.

This research was conducted 4 weeks or 12 meetings with a training frequency of 3 times a week, namely Tuesday, Thursday, and Saturday, from April 29 until May 26, 2022. According to Bompa, (2009:203), this training is held 3 times a week, aiming to provide opportunities for the body to adapt to the training load it receives. The research subjects in this study were male students participating in soccer extracurricular at SMP Negeri 4 Negara. The total number of research subjects is 50 people.

From the total number of research subjects which amounted to 50 people, two groups were formed, namely the treatment group with a total of 25 people and the control group with a total of 25 people. The formation of this group was carried out after obtaining data from the results of the initial test (pre test). The initial tests given were a dogging run test for agility and a spirometer test to measure the vital capacity of the lungs. The research subjects were divided into 2 groups using the ordinal pairing technique, namely the division of groups based on the ranking of the pre-test results to obtain groups with relatively the same ability.

1. Samples are ranked based on initial test results
 2. Then the sample was divided into 2 groups, namely:
 - a. Group 1 group
Leg press weight training treatment. (K1)
 - b. Group 2 group
Control. (K2)
- Division of Group Members Based on Ordinal Pairing

Group 1 (K1)	Group 2 (K2)
1	2
4	3
5	6
8	7
next	next

The treatment group (K1) was given circuit training for 4 weeks (12 training sessions and excluding pre-test and post-test). While the control group (K2) was still present in the implementation of the study but was not given special treatment, it was only given conventional treatment which is often done by the community in general in the form of sports games to maintain fitness physical.

2.1 Data analysis technique

Before conducting data analysis several requirements that must be met are the data normality test and the data homogeneity test.

To test the normality of the data using the Lilliefors Kolmogorov-Smirnov test with the help of the SPSS 16.0 program at a significance level of $\alpha = 0.05$. The decision-making criteria if the significant value obtained $>$, then the research subject is normally distributed, whereas if the significant value obtained is $<$, then the research subject is not normally distributed (Candasa, 2010: 237).

The homogeneity test of the data in this study used the Levene test with the help of SPSS 16.0 at a significance level (α) of 0.05. The decision-making criteria if the Levene significance value $>$, then the subject comes from the same or homogeneous population while if the Levene significance $<$, then the subject comes from an unequal or heterogeneous population (Candasa, 2010: 290).

If the subject comes from the same or homogeneous population, a hypothesis test will be carried out.

Test the hypothesis in this study using an independent t-test instrument. The independent t-test instrument was used to test the difference between the two mean independent subjects (Candiasa, 2010:66). The research data tested were the results of the agility and vital lung capacity gain scores of each group at a significance level of $\alpha = 0.05$.

This hypothesis was tested with the help of SPSS 16.0 at a significance level (α) of 0.05. In the decision-making criteria, if the significance $<$ means that there is a significant effect of the treatment given, whereas if the significance $>$ means that there is no effect of the treatment given.

III. Result and Discussion

The analysis of the research results for the research dependent variable shows an increase in the average value (mean) for each variable. From the description of the agility variable data the treatment group and control group experienced an increase in the average value flat. The pre-test score of the treatment group had an average of 8.04 and the average post-test score of 7.68, thus the mean score of the treatment group increased by 0.36 sec. While the control group for the agility variable experienced an increase in the average value of 8.09 for pre-test and 7.96 for post-test thus the control group experienced an increase of 0.13 sec. From the pre-test and post-test data obtained different data (gain score) which will be analyzed to test the research hypothesis.

For the vital lung capacity variable, there was also an average increase in both the control group and the treatment group. The treatment group experienced an average increase of 0.70 from the pre-test average of 1.59 to 2.29 at the post-test. While the control group experienced an average increase of 0.29 from the pre-test 1.57 to 1.86 at the time of post-test. From the pre-test and post-test data obtained different data (gain score) which will be analyzed to test the research hypothesis.

Tests for the normality of the research data were carried out on the gaint-score data from the agility and vital capacity data of the lungs. The data will be normally distributed if the calculated significance value of the tested data is greater than (sig > 0.05). From the results of the normality test, the following data can be obtained:

Table 1. Normality test results

Data source	Kolmogorov-smirnov			
	Statistics	df	Sig	Information
Agility				
1 Treatan	0.088	25	0.200	Normal
2 Control	0.164	25	0.82	Normal
Vital Capacity Lung				
s-lungs				
1 Treatan	0.152	25	0.142	Normal
2 Control	0.160	25	0.097	Normal

The homogeneity test of the data was carried out on the agility gaint-score and vital lung capacity variables. at a significance level (α) of 0.05. From the results of the homogeneity test, the following values are obtained:

Table 2. homogeneity test results data

	Test value	df 1	df 2	Sig	Note:
Agility Vital Lung Capacity	3,604	1	48	0.064	Homogeneity Homogeneity
	0.146	1	48	0.704	

Hypothesis testing was carried out by independent t-test with the help of SPSS 16.0 program at a significance level (α) of 0.05. The research hypothesis is accepted if the t-test value has a significance less than (Sig < 0.05). Meanwhile, if the calculated significance value is greater than (Sig > 0.05), the research hypothesis is rejected. The data tested were the gain score data for the treatment group and the control group for agility and vital lung capacity. From the results of independent t-test obtained t-value as follows:

Table 3. independent t-test results agility data

Data source	t _{count}	df	Sig
Agility	13,692	48	0.000

Table 4. independent t-test results for vital lung capacity data

Data source	t _{count}	df	Sig
Vital capacity lungs	9,450	48	0.000

From the table above, it shows the effect of the given training on increasing agility and vital lung capacity in research subjects. The increase in the treatment group was due to by providing circuit training trainingfor 4 weeks 12 times of training. While the increase in the control group was caused by an increase in sports activities carried out by all research subjects during the activity.

IV. Conclusion

Circuit training training has an effect on increasing the agility and vital capacity of the lungs of male students participating in the extracurricular activities of SMA Sejahtera Surabaya in the 2022/2023 academic year.

For sports coaches, sports coaches, physical education teachers and athletes and other sports players, it is recommended that they use circuit training as an alternative in increasing agility and vital lung capacity.

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