

ABC Running Exercise in Increasing VO₂ Max on Students of Football Extracurricular on Secondary High School

Arif Hidayat

*Sports Education, University of Bina Darma Palembang, South Sumatra 30662, Indonesia
arif.hidayat@binadarma.ac.id*

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Abstract: The purpose of this research is to find out how big the influence of ABC running exercise to increase VO₂ max. This research is a type of experimental research. In this study the population is students at football extracurricular, SMA Negeri 2 Lais, the number of samples of this study were 30 students with Nonprobability Sampling by using a saturated sampling technique in which all the population used as a sample. Data collection techniques used initial and final test techniques. The statistical test used to analyze the data in this study is t test. Based on the research results obtained t test results show $t_{value} = 14,921 > t_{table} = 2.048$. Thus, reject the hypothesis H_0 and accepts H_a means there is an influence of running ABC training on the increase in VO₂ max in students extracurricular football in SMA Negeri 2 Lais. Furthermore it can be concluded that the running ABC training can increase VO₂ max.

1 INTRODUCTION

Exercise is a series of organized and planned exercise that a person consciously takes to improve his functional ability. Physical performance in soccer depends on various characteristics. Specifically, endurance, strength, speed, power and agility must all be well developed in order to achieve a high performance level in soccer. Soccer match activities cover a range of intensities from low through moderate to high. Hence, a well-developed aerobic energy delivery system is important as it can assist players to maintain high-intensity and total work, and also help them to adjust the distance covered at low intensities so they perform at higher intensities when the game demands.[I]

There are ten components of physical condition used in sport such as strength, endurance, muscular power, speed, flexibility, agility, coordination, balance, accuracy and reaction (reaction) [XII]. Of the ten physical conditions above, they have differences in terms of virtue in every sport depending on the needs required. This will lead to different forms of exercise used.

Through these soccer activities the teenagers get a lot of benefits, both in physical growth, mental and social. Football at the present time is not just as a recreational sport and leisure time but has become a sport of achievement. So no wonder if in the game of football game, players are required for highest

achievement. High performance can only be achieved with systematically planned and continuous exercises accompanied by professional supervision and professional guidance. As applied in SMA Negeri 2 Lais through extracurricular activities of football as an effort to develop the potential of the students themselves.

Modern football is highly energetically demanding, and the ability to perform repeated high-intensity work is of importance for the players. Furthermore, the most successful teams perform more high-intensity activities during a game when in possession of the ball [V]. Physical endurance in the game of football as one of aerobic exercise should be strong. Aerobic conditions relate to efforts to increase the strength, power, agility, agility or body movement skills that are indispensable in the sport of football [IX].

Improvements in VO₂max have been associated with improved soccer performance during competition (i.e., distance covered, average work intensity, involvement with the ball)[VII]. In doing sports, football will involve various organs of the body that is heart, blood circulation, and breathing. The heart has a very important role that is to supply blood throughout the body. Blood circulation will increase during exercise and this is for body metabolism. Blood circulation plays an important role to provide O₂ through the lungs. So the vital capacity of this lung plays a role in determining one's ability in doing physical activity, while VO₂

max is the fastest tempo where one can use oxygen during exercise. Training at any intensity above ~ 60% of VO2max is likely to improve maximal oxygen uptake in healthy adults. While the lack of a positive effects of increasing training intensity on the increase in VO2max suggests minimum additional benefit to higher intensity training, it is important to highlight the fact that higher intensities of training induced adaptations following the bottom lower training session doses and total training volumes [XI].

To improve the VO2 max program, training should be done carefully, systematically, regularly and always on the rise, following the principles and methods of accurate practice in order to achieve the expected goals. Thus an alternative training that can be used and applied in improving VO2 max is the Running ABC practice. ABC Running Exercise is one of the basic exercises that should be done by athletic athletes because it covers all leg exercises. Running ABC is divided into agility, balance, co-ordinate run. ABC Running Exercise is used to improve endurance in football athletes because the ABC Running exercise has a very high intensity. This is based on the work of stamina at anaerobic levels of high intensity, so that the supply or oxygen intake is not sufficient to provide the work required by the muscles, due to insufficient oxygen supply, anaerobic work will always result in oxygen-debt owed. Aerobic capacity is especially important in the stages of recovery. It represents the ability to perform work over a longer period of time in conditions of aerobic metabolism. [III]

Based on the observation in SMA Negeri 2 Lais, that there are still many findings of some students, that they have less body resistance, this is seen from the ease of students experiencing fatigue and lack of ability students play football within 2 x 45 minutes. Based on the background of the above problems researchers interested in conducting research on the issue with the title “The influence of ABC Running exercise terhadap increasing VO2 max in students ekstrakurikuler football in SMA Negeri 2 Lais”.

Increasing the VO2 Max training program should be done carefully, systematically, regularly and always on the rise, following the principles and methods of accurate practice in order to achieve the expected goals. Thus an alternative training that is used and applied in increasing VO2 Max is circuit training. Running ABC is a run in it combined with Agility Balance Coordination, which serves to train one's agility, balance, and coordination. This exercise is an exercise that unites the agility, balance and coordination of a person in one armed

movement. The emphasis of this exercise is its systematically polarized and systematically movement from easy to difficult movements, from slow to fast movements.

Within the realm of endurance exercise, most attention has been focused on exercise limitation as a manifestation of energy dependence, the ceiling of performance capacity being considered linked to depletion of substrate (i.e., glycogen) and/or the limits of oxygen delivery. Compared with other candidate determinants, the latter is readily assessed by a direct “yardstick” (measurement of maximal oxygen uptake [VO2max]), the greatest rate of oxygen utilization recorded during a progressive exercise test. VO2max is closely linked to endurance performance in both children and adults, and increased values accompany athletic training; hence, it is not illogical to conclude, as evident in standard texts, that “peak VO2 limits the capacity to perform aerobic exercise [I].

2 METHODS

2.1 Types of Research

Research to obtain optimal results should use appropriate research methods. This type of research is quantitative research because the data will be obtained in the form of numbers that will be analyzed by statistical calculation (Sugiyono, 2015: 13).

2.2 Research Design

The method used in this research is the experimental method in the form of Quasi Eksperiment. With consideration of the difficulty of controlling all variables that affect the variable being studied, then the researcher chose Quasi Eksperimen. The design of this study is pretest-posttest. Draw the research design as follows:

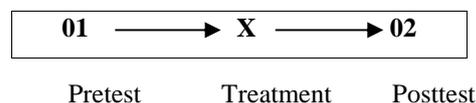


Figure 1: Research Design (Sugiyono, 2015:42).

In this research the test is done twice as much as pretest (before) and posttest (after) treatment (treatment). The difference between pretest and

posttest is assumed to be the effect of treatment, so the result of treatment is expected to be known more accurately, because there is a comparison between the conditions before and after treatment. Treatment given in this research is with the form of Running ABC training.

2.3 Sample dan Sampling Techniques

The sample selection was done by Nonprobability Sampling by using saturated sampling technique. So the sample in this study is all students who follow extracurricular activities of soccer sport which amounted to 30 students.

Table 1: Research Sample.

NO	Gender	Amount
1	Male	30

(Source: SMA Negeri 2 Lais Year 2016)

2.4 Data collection Technique

2.4.1 Test

The test used in this study aims to obtain data on maximal oxygen volume values (VO₂ max). Using the Multistage Fitness Test.

2.4.2 Observation

Observations used in this study aims to determine the places and samples that will be used as research.

2.4.3 Research Instruments

Instrument used in this research is *Multistage fitness test* (Run back and forth).

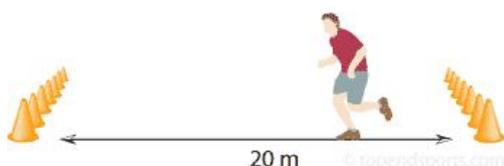


Figure 2: Multistage Fitness Test. (Source: Ismaryati, 2011:80).

2.4.4 Data Analysis Technique

Test Prerequisite Analysis, The prerequisite test in this study is using the normality test that aims to determine whether the data is normally distributed or not. The normality test as follows:

- a. Normality Test

- b. Homogeneity Test

2.4.5 Hypothesis Testing Research

Hypothesis testing is used to determine whether or not a significant influence of the exercise is given. Hypothesis test is done by t test.

3 RESULTS AND DISCUSSION

3.1 Results

3.1.1 Description of Research Data

Description of research data serves to facilitate research data. Description of research data include pretest and posttest data from experiments conducted. The research results obtained after the pretest and posttest as follows:

3.1.2 Pretest Data Result

VO₂max extracurricular football participants of SMA Negeri 2 Lais at a minimum score of 35.00, a maximum value of 50.20, a mean value of 42.08, a median value of 41.90 and a standard deviation of 3.90: d can be seen in Figure 3.

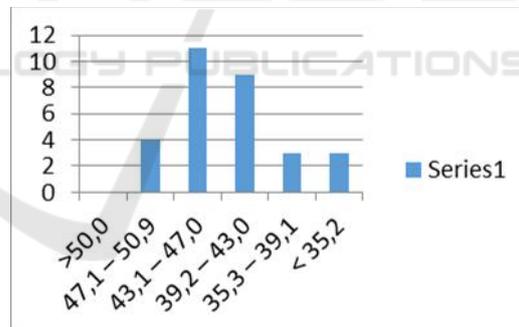


Figure 3: Histogram Pretest Results.

3.1.3 Hasil Data Posttest

The result of Post-test data description of VO₂max extracurricular soccer participants of SMA Negeri 2 Lais obtained minimum score 40,50, maximum value 56,00, mean 49,09, median 49,45 and deviation standard 4,15. The frequency distribution obtained can be seen in Figure 4:

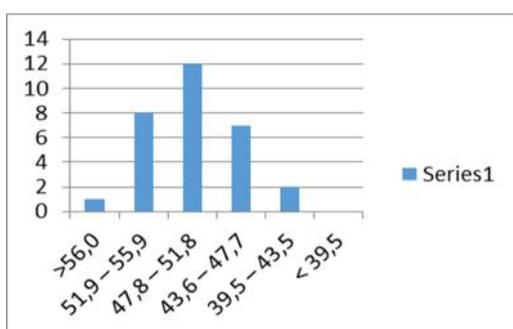


Figure 4: Histogram Hasil posttest.

3.1.4 Uji Normalitas

Normality tests are performed to test whether the sample comes from a normally distributed population or not. Statistical analysis using Kolmogorov-Smirnov test one sample was performed with SPSS 21.0 program. The distributions to be tested for normality are two pretest and posttest data. After the calculation of the normality test of the test participants data obtained results in Table 2:

Table 2: Normality Test Data.

Data	Significance Level (P)	Conclusion
Pretest	0,157	Data is normally distributed
Posttest	0,105	Data is normally distributed

Data obtained from the results of pretest and posttest of extracurricular football participants of SMA Negeri 2 Lais as shown table 2 above, it appears that the pretest and posttest results have a significance level of more than 0.05 this means the data pretest and posttest normally distributed.

3.1.5 Homogeneity Test

Homogeneity test aims to determine whether the sample comes from the same variance or not. Homogeneity test in this research is done through F test by using SPSS 21.0 program. The result of pretest and posttest data analysis can be seen in table:

Table 3. Homogeneity Test Data.

Data	Significance Level (p)	Conclusion
Pretest and posttest	0,259	Homogeneous

Berdasarkan tabel 3. Data Uji Homogenitas, diketahui memiliki taraf signifikansi (p) sebesar 0,259 artinya $p > 0,05$. Maka dapat disimpulkan data pretest dan posttest memiliki varians yang homogen.

3.1.6 Hypothesis Testing

Analysis of data used to answer the proposed hypothesis that there is no influence of running ABC training on the increase of VO2max of football extracurricular participants of SMA Negeri 2 Lais in 2016, that is by doing t-test.

Table 4: Uji-t.

Group	Mean	Mean Difference	thitung	ttabel	Sig.
Pretest	42,08	7,017	14,921	2,048	0,000
Posttest	49,09				

The results of data analysis can be seen that the value of t count of 14.921 with a significance value of 0.000. Then the value of tcount is compared with ttabel at 5% significance level, so it's obtained the ttabel equal to 2,048. This shows that the tcount is bigger than ttabel ($14,921 > 2,048$). When compared with a significance value of 0.000 smaller than the significance of 0.05 ($0.000 < 0.05$), then the hypothesis in this study is declared acceptable. This means that there is a significant influence of ABC running training on increasing VO2max of football extracurricular participants at SMA Negeri 2 Lais in 2016.

Furthermore, to know the increase in students' VO2max of football extracurricular participants at SMA Negeri 2 Lais Year 2016, can be known through calculation of differences in average pretest and posttest average. Based on the above table it can be seen that the percentage increase in students' VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016 is amounted to 16.68%.

3.2 Discussion

Based on the results of data analysis on the hypothesis in the study, it is known that there is a significant influence of the running exercise ABC to increase the VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016. This is shown from the value of t count that is greater than t table ($14,921 > 2,048$) with the significance value of 0.000 is smaller than the significance of 0.05 ($0.000 < 0.05$).

The result of data analysis is known that the mean value on posttest is bigger than pretest ($49,09 > 42,08$). That is, ABC running exercise is effectively

applied to increase the VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016. Furthermore, to determine the percentage increase in the VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016, the calculated (Mean difference / mean pretest x 100%) is (7.017 / 42.08 x 100%).

Table 5: Increased Percentage Calculation.

Mean Pretest	Mean Posttest	Mean Difference (Mean Posttest-Mean Pretest)	Persentase (Mean Df/Mean Pretest x100%)
42,08	49,09	7,017	16,68 %

Based on the results of percentage calculations obtained results that increase the VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016 of 16.68%. Based on the results of data analysis above it can be concluded that efforts to increase VO2max through the exercise running ABC give an influence in the increase in the VO2max of football extracurricular participants SMA Negeri 2 Lais.

The importance of VO2max in soccer sports has a major influence in appearance when the game of football takes place. With good pulmonary heart resistance, a septic player will not experience fatigue in play and is able to optimize the techniques they have.

4 CONCLUSIONS

Based on the results of data analysis, hypothesis testers and discussions that have been stated in the previous chapter, the conclusions in this study obtained results that show tcount larger than t table (14.921 > 2.048) thus there is influence of exercise Running ABC to increase the VO2max of football extracurricular participants SMA Negeri 2 Lais Year 2016. The importance of VO2max in soccer sports has had a major influence in appearances while playing football. With good pulmonary heart resistance a septic player will not quickly experience fatigue in play and be able to optimize techniques owned.

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