

VO2MAX ANALYSIS ABC RUNNING DRILL WITH TRAINING MASK METHOD USING ANDROID BASED

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Abstract : The purpose of this study was to analyze the effect of ABC Running Drill using Training Mask on increasing Vo2max Android-based. From the research objective, the researcher used the Pretest-Posttest Experiment Design. The research method used is the research and development (RnD) model from Borg and Gall. Population this research is beginner athletes, members of the Unit Kegiatan Mahasiswa (UKM) Track and Field STKIP Muhammadiyah Kuningan totaling 10 people, the sampling technique uses total sampling technique. The research test instrument used to collect data is the 2400 Meter run test (Cooper Test). After getting the data and obtaining it then the data is input into the system to be used as a database on the application, the android application can be downloaded link bit.ly/PDPDickyReva. To analyze the research data using SPSS Version 26, the results of the processing of the Hypothesis Test using the Pearson formula obtained the following data: There is a significant effect after the ABC Running Drill training process using the Training Mask (sig.) $0.00 < 0.05$ so it can be concluded that the ABC Running exercise Drill using a Training Mask has a significant effect on increasing vo2max in Track and Field UKM STKIP Muhammadiyah Kuningan.

Keywords: ABC Running, Training Mask, VO2max, Android.

INTRODUCTION

In sports and science and technology cannot be separated from each other, this aims to achieve the highest achievement assisted by IT to facilitate the analysis of athlete fitness. Therefore, android-based applications to support this sport must be applied properly. The use of IT aims to improve the quality of human resources, especially in strategic sectors, especially in the field of sports. The development of sports science and technology has been confirmed in Law no. 3 of 2005 concerning the National

Sports System, in particular Article 74 [1]. Furthermore, it is further clarified in PP No. 16 of 2007 especially in Chapter IX Article 74 [2]. This study is urgently needed by athletes and coaches with the strategic issue raised, namely the limited human resources of sports practitioners in terms of reviewing the condition of athletes (VO2max) based on android applications to see the development of abilities and fitness of athletic athletes. Implementation was carried out on adolescent athletic athletes in Kuningan Regency. Problems found based on observations made by researchers found data



that 1) Trainers have not used android-based applications.

To control the athlete's VO₂max status, 2) The coach has not fully implemented IT in the athlete's training program process, 3) the need for VO₂max analysis in athletes based on an android application that can be easily accessed via a smartphone, This research focuses on the ABC Running Drill training method using mask training mask to find out whether there is an increase in VO₂max resulting from the exercise program that is applied or inputted to data that can be accessed on the android application which can then be used as a reference for the coach to determine the athlete's VO₂max development, through this research proposal by novice lecturers (PDP). specifically conducting in-depth research on VO₂max analysis of athletic athletes based on big data on the android platform. This research is very much done to measure the readiness of athletes in the upcoming championships and to analyze the athlete's development so that the coach can easily control whether the athlete experiences an increase in his VO₂max or decreases, besides that the role of the coach in implementing IT in the training program is not fully used because the role in this android application is highly expected by the coach. The detailed specifications are as follows:

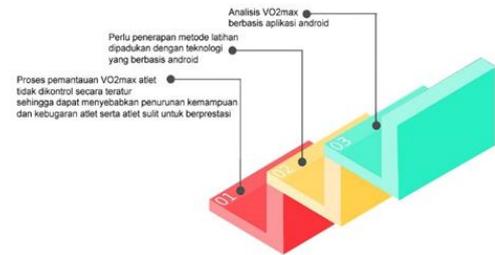


Figure 1. Specification

A. ABC Running Drill

Athletic Basic Coordination Running or commonly known as ABC Running is a movement coordination exercise hands and feet to increase speed, agility, and good coordination between hands and feet to maximize results in running. There are several ABC Running movements including High Knee Skips, Butt Kicker, Ankle Drill, Skipping's, High Knee Running, Foreleg Extension Marching, Straight Leg Running, High Knee Bounce Skips, Ankle Bounce, and Bounding. Exercise rather than ABC Running is a coordination exercise between the legs and hands that varies with systematic movements with easy to hard movement stages. ABC running training method is one of the training programs that are arranged systematically in which there are elements of running and jumping techniques and varied movements performed at low, medium, and high volumes and intensities, so this exercise is highly recommended by athletic trainers for included in the training program because the exercise movement is simple and can be done in a place that is not wide and can develop coordination of movements.

(Setyantoko, 2019). In athletics, speed and acceleration are inseparable units in running and are factors supporting the ability to run, both of these factors have an important role and both can be trained with basic movements using the ABC Running technique. For athletes running short distances, speed and acceleration are needed to record a good time by moving the body position quickly from the ground start line to finish line. Sprinting is an ability that is characterized by a process garis finish. move body position from one place to another quickly (Dwi, 2018).

B. Training Mask

Special sports masks or commonly called training masks are masks that are specifically designed to support sports activities that can increase VO₂max capacity. The Elevation Training Mask 2.0 (ETM) purportedly simulates altitude training and has been suggested to increase aerobic capacity (VO₂max), endurance performance, and lung function (Porcari, 2016). According to Porcari elevation training mask can provide the effect of high-intensity exercise to increase aerobic capacity (VO₂max), endurance performance, and lung function.



Figure 2. Training Mask

Using this tool if can increase a person's VO₂max capacity because it has been trained using a training mask so that with this training the respiratory system or aerobic capacity (VO₂max) can be increased, the increase in VO₂max can improve athletes' running performance so that they can continue to excel with training methods plus the use of masks. Elevation Training Masks© (ETM) claims to stimulate cardiorespiratory fitness improvements like training at altitude (Biggs, 2017).

C. VO₂max

The aerobic capacity of athletes is an important element of success in sports achievements. It is generally considered the best indicator of cardiorespiratory endurance and athletic fitness. Body fat percentage affects VO₂ max and thus the cardiovascular status of the athletes (Shete, 2014). According to Shete, the aerobic capacity of an athlete is an important element in the success of sports achievement. Basically considered the best indicator of cardiorespiratory endurance and athletic fitness. Body fat percentage affects the VO₂ max as well as the cardiovascular status of

the athletes. VO₂max is an important determinant of the athlete's achievement, because with the capacity

High VO₂max and supported by programmed physical exercise can improve athlete performance. Running performance in athletics is influenced by physiological factors, therefore, athletic runners are very dependent on high aerobic capacity or in maximal oxygen uptake (VO₂ max) when running, in the first time starting to run up to 10 minutes VO₂max plays an important role in running, VO₂max is shown to be the physiological variable that correlates best with performance in competitions lasting between 4 and 10 minutes (Støa, 2010). According to Støa VO₂max proved to be the most important physiological variable related to oxygen capacity performance in competitions lasting between 4 and 10 minutes. Aerobic capacity (VO₂max) is a strong predictor of health and fitness and is considered a key physiological measure in the healthy adult population (Bennett, 2016), according to Bennet Aerobic capacity (VO₂max) is a strong factor for health and fitness and is considered a physiological measure This statement is in line with research on athletes if health and fitness factors are improved, of course, the VO₂max capacity will increase so that athletes will not feel significant fatigue, if cardio is trained properly athletes can also reduce lactic acid.

which is not good for the athlete's condition, so that the body condition can be fit with the intensity of a short time because of the effects given when training VO₂max.D. Aplikasi Android Vo₂max Atlet

Exercise data can be both quantitative and qualitative and can be collected on a large scale from various sources such as biometric data, films or videos, historical medical reports, VO₂max condition data. The system of big data android Vo₂max athletes can be used to collect various biometrics (physiological, kinematic, and kinetic data) and track data as athletes. This application, it focuses more on the athlete's VO₂max data which outlines the athlete's physical condition. According to Wilkerson Sports, data can be both quantitative and qualitative and can be collected on a large scale from a variety of sources such as biometric data, films or videos, historical medical reports, on-field or on-route positional tracking data, weather and crowd behavioral. Wearable microelectronic mechanical (MEM) systems can collect a range of biometric (physiological, kinematic,c and kinetic data) and geospatial tracking data as athletes physically move through space during sporting activities (Wilkerson, 2016).

METHODS

This research is a Beginner Lecturer Research (PDP) which adapts from Borg and

Gall development research which is modified into six stages consisting of 1) Research, 2) design development, 3) Early test, 4) Focus Group Discussion (FGD), 5) Product Revision, 6) Dissemination. In detail can be seen in the following figure:

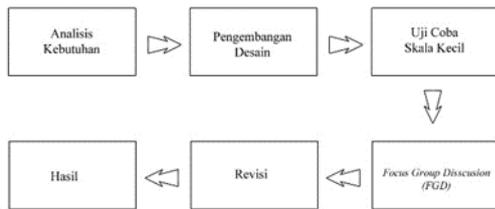


Figure 3. Model Design

Based on the picture, the 3 stages of the research flow are as follows: 1. Analysis of the needs is a preliminary study step, 2. Design Development This stage develops the design of the big data android application that contains the athlete's VO2max, 3. Small-scale Trial Small-scale trial using 3 physical trainers and 10 students, 4. Focus Group Discussion (FGD) The FGD stage was attended by 3 sports and IT experts, 3 trainers and researchers. 5. Revision, The next stage is the revision of the results of the Focus Group Discussion (FGD).

RESULT AND DISCUSSION

From the analysis of the data obtained by the researcher, the following data were obtained:

1. Research data statistics

Table 1. Statistic

		Statistics	
		Pretes	Postes
N	Valid	10	10
	Missing	0	0

Mean	12.8960	11.9840
Median	13.1450	12.2500
Mode	12.33	10.48*
Std. Deviation	.83751	.76301
Variance	.701	.582
Range	2.89	2.81
Minimum	11.46	10.48
Maximum	14.35	13.29
Sum	128.96	119.84

From the data table above, it is obtained that the mean value of the pretest is 12.8960 while for the post-test average the value is 11.9840, for the median value of the pretest is 13.1450 while the post-test is 12.2500, the value that often appears in the pretest. ie 12.33 while the posttest is 10.48, the standard deviation of the pretest is 0.83751 while the posttest is 0.76301, the highest score is 11.46 posttest and 10.48 posttest, the lowest score is 14.35 and posttest is 13.29, the total score from the pretest which is 128.96 while the posttest is 119.84. The conclusion from the data results means that there is a difference between pretest and posttest so it can be concluded that there is an increase after being given treatment

2. Normality Test

This test aims to see the distribution of the group given treatment to draw conclusions whether the data is normally distributed or not. The results of normality testing can be seen in the following table:

Table 2. Normality Test

One-Sample Kolmogorov-Smirnov Test

		Pretes	Postes
N		10	10
Normal Parameters ^{ab}	Mean	12.8960	11.9840
	Std. Deviation	.83751	.76301
Most Extreme Differences	Absolute	.187	.226
	Positive	.150	.171
	Negative	-.187	-.226
Test Statistic		.187	.226
Asymp. Sig. (2-tailed)		.200 ^{cd}	.157 ^c

From these tests, the significance value of Asymp was obtained. Sig. (2-tailed) pretest 0.200 and post-test 0.157, the value is greater than 0.05 or $0.200 > 0.05$ and $0.157 > 0.05$, meaning that the data can be drawn conclusion that all data are normally distributed.

3. Homogeneity Test

Table 3. Homogeneity Test

One-Sample Test						
Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VO2max	49.668	9	.000	11.98400	11.4382	12.5298

From the data above, the Sig value of $0.000 < 0.05$ means that it can be concluded that the population is homogeneous.

4. Hypothesis Test

Hypothesis testing is an inferential statistical calculation that has the intention of drawing conclusions about a population

based on data obtained from the population sample.

Table 4. Hypothesis Test

		Symmetric Measures			
		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Interval by Interval	Pearson's R	.980	.010	14.083	.000 ^c
	Spearman Correlation	.888	.126	5.449	.001 ^c
N of Valid Cases		10			

From the data in table 4. With the Pearson formula, a significance value of 0.000 is obtained, meaning $0.000 < 0.05$, it can be concluded that the ABC Running Drill exercise using a Training Mask has a significant effect on increasing vo2max in the Athletic Student Activity Unit STKIP Muhammadiyah Kuningan.

CONCLUSION

Based on the research data obtained, it can be concluded that the ABC Running Drill exercise using a Training Mask can increase VO2max in beginner athletic athletes who are members of the Athletic Student Activity Unit STKIP Muhammadiyah Kuningan

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