

## **AEROBIC ENDURANCE (VO2MAX) LEVEL OF PHYSICAL EDUCATION COED IN SRIWIJAYA UNIVERSITY**

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### **Abstract**

This research aims to know aerobic endurance (vo2max) level of physical education coed in sriwijaya university. This research is descriptive quantitative research. The method is engineering test and data measurement aerobic endurance test with bleep to know the level of coed vo2max. The sample is 42 physical education coed of Sriwijaya University. The result shows 14 coed (33%) are excellent, 19 coed (45%) are good, 4 coed (9.6%) are fair, and 5 coed (12%) are poor. Based on presentase, the coed of physical education in Sriwijaya University have a good aerobic endurance (Vo2max) level, only 4 coed have poor aerobic endurance (Vo2max) level. Sugested to physical education program study to increase coed aerobic endurance level thought coaching sport branch at least 2 times a week.

**Key Words:** Aerobic endurance (VO2 max) level, coed, physical education.

### **1. Introduction**

Aerobic endurance (VO2max) level is one of the main modals for a person to do physical activity, the better aerobic endurance (Vo2max) level a person so in practice learning sport will be better too. Every human being has the aerobic endurance (Vo2max) level different based one their daily activity and their own profession. Human activity need physical support, therefore physical support is a basic factors to every human activity. To run daily tasks, at least someone having a minimum of physical ability that always support their activity and it can be better if they have an ability backup.

According to Fox (2000) the aerobic endurance level is the ability of someone to fulfill their duties without excessive feeling tired, and than still having power residual or backup to enjoy their free time and to daily needs. Based on Soekarman opinion (2000), the aerobic endurance (Vo2max) level is willingness and ability to do work or activity, the hightens power work without experienced

exhaustion that means or excessive or the body ability to adjust organs function with physiology limitless through environmental conditions or physical work efficiently without excessive tired. Pate opinion (1990) the level of aerobic endurance (Vo2max) is physical aspect from completely freshness that give ability to a person for running a productive life and can adjust on each load or worthy physical stress.

From some opinion about the level of aerobic endurance (Vo2max) above can be concluded aerobic endurance (Vo2max) level as an ability to discharge their duty properly although in difficult situation, where people who less the physical freshness, will not be able to do. In other words, someone who has good aerobic endurance (Vo2max) level can be interpreted enough have the ability to do their job efficiently without cause significant exhaustion, so that they have the left of their power to fill their free time and the other unexpected tasks. It could be said that the good aerobic endurance (Vo2max) level give someone an ability to running a productive life and could adjust theirselves to many loads (Harsono, 1993).

## **2. Theoretical Background**

### **Aerobic Endurance (Vo2 Max)**

Each cells in human body needs oxygen to change food into ATP (adenosine triphosphate) that ready used by each cells to work, the cell that consume less oxygen is muscle in rest mode. Muscle cells that contracting needs 8 ATP. Consequently the muscle that used for exercise need more oxygen and produce CO<sub>2</sub>. Based on Fox (2000) opinion, the meaning of VO<sub>2</sub> Max is the maximum oxygen volume that can be use in one minutes, besides that Soekarman opinion (2000) VO<sub>2</sub> max is perception of maximum aerobic that draws the maximum oxygen consumed per unit of time by a person during exercise or test, with exercise more and more severe until exhaustion, the measurement called VO<sub>2</sub> Max Volume. That is a level of our body ability that revealed in litres per minute or milliliter/minutes/kg of weight.

Fox (2000) explains VO<sub>2</sub> max is amount of maximum oxygen in mililite, can use in 1 minutes per kilogram of weight. VO<sub>2</sub> max included one of cardiorespiratory endurance indicator or heart lung endurance. It means the bigger of VO<sub>2</sub> max value than cardiorespiratory will be better too. The good cardiorespiratory endurance will impact on good health. There are two method to measure VO<sub>2</sub> max value of someone, that are use method and measurement test through laboratory and field test. Field test usually use a simple tools and easy to do. One of VO<sub>2</sub> max test that can do on field is multistage fitness or bleep test. Since long, Bleep test already very popular among sports coaching, especially in sporting achievement consider this test very easy to do and can be done by many participants at once depending on the execution place of the test therefore saving test time.

### **The Function Of Aerobic Endurance (Vo2 Max)**

The level of aerobic endurance (VO<sub>2</sub> max) is the success key of someone life especially on running their life for example coed activity in learning the practice of sports in the field. There are three important things in the level of aerobic endurance (VO<sub>2</sub>max), namely: a) the level of aerobic endurance (VO<sub>2</sub>max), in terms of muscle, bone, and fat parts, b) the level of aerobic endurance (VO<sub>2</sub>max) in terms of organ function with the efficiency of the cardiovascular system, blood vessels, and respiratory, c) the level of aerobic endurance (VO<sub>2</sub>max) muscle response, in terms of flexibility, strength, speed, and endurance.

The level of aerobic endurance (VO<sub>2</sub>max) that needed for earch person are different, depending on the nature of the physical challanges it faces, a physical education students needs good aerobic endurance (VO<sub>2</sub>max) level for receive the lessons that related to physical activity in college.

The level of aerobic endurance (VO<sub>2</sub>max) that they have and they need very different. Highly dependent on the jobs and professions that are owned. Physical work or exercise in the short term, for example less than 5 minutes is not absolutely need to continue burning through the combustion of oxygen. Organs

such as the heart, circulatory, and pulmonary (respiratory) have to work harder to deliver oxygen to the body parts that are actively working. With enough time to practice encourage the work of heart, circulation, and lungs which can lead to changes for the better on the state of the immune system, especially the heart. Below according to Cox (2000) as a result of the exercise if someone exercising will affect the level of aerobic endurance (VO<sub>2</sub> max) as follows:

- a) Heart work stronger and efficient to pump more oxygenated blood in each pulsation.
- b) Blood circulation become smoothly so food nutrition elements can be easily supplied to all body tissues.
- c) Muscle tension throughout the body, which is becoming stronger.
- d) Respiratory muscles become stronger so as to allow rapid air flow into and out of the lungs.

### **Aerobic Endurance Components (Vo2 Max)**

The level of aerobic endurance (VO<sub>2</sub>max) for students especially Program Study Physical Education is an absolute because their physical activity on college takes good physical condition, the most subject of Physical Education are sports practice field that requires physical aspect. Here are some of the components required in the level of aerobic endurance (VO<sub>2</sub> max):

#### 1) Endurance

Characteristics of muscle endurance by Soekarman (2000), anaerobic endurance or muscle endurance as the ability to perform the maintenance of strong muscle contractions with the provision of energy through anaerobic mechanisms. Durability can also be interpreted muscle contractions in the long term with little power to moderate.

#### 2) Explosive Power

Explosive power is the combination of strength and speed, is the ability to apply force in a short time. While Pate (1990) defines explosive power as the ability of an athlete to overcome a detainee with a high-speed contraction.

3) Speed

According to Cox (2000) speed is the ability to move from one place to another in the shortest time as possible. In terms of mechanics, speed is the speed through the ratio between the place and the time, terms of speed incorporated into three sections: the reaction time, the frequency of moving units per minute, and the speed of moving by the given distance. The relationship between these three factors help to predict performance for each exercise that requires speed.

4) Agility

According Bompa (2009) agility is the ability to change the direction and position of the body quickly and accurately without losing balance. Agility can also be defined as the ability to quickly change directions without losing speed, balance or body control.

5) Flexibility

Flexibility is the ability to perform movements with large amplitude (Bompa, 2009). Flexibility exercises are intended to increase the likelihood of movement in the joints, the wider space movement of the joints more flexible. Besides that, flexibility exercises are stretching and stretching. Stretched and extended are the connective tissue of joints and muscles that relate with the possibility of motion in the joints concerned.

In connection with this definition, the aerobic capacity is a common characteristic of muscular endurance. Individual physiological ability is the adaptability of the body's organs a case of muscles, heart and lungs to an activity within a certain time.

Of the five physical components above the level of aerobic endurance (VO<sub>2</sub> max) will determine the success rate of students in the lecture, especially in teaching practice that requires excellent physical activity.

### **3. Method**

This type of research used in this research is descriptive quantitative research with survey research methods to see the level of aerobic endurance (VO<sub>2</sub> max) with data collection technique using test Bleep. According Sugiono (2009) descriptive quantitative research is a form of research that aimed to describe the phenomena that exist and to obtain information about the status or symptoms. While, survey method according to Arikunto (2006) is to obtain the facts of existing symptoms and seeks the factual information both about social institutions, economic, political, and so forth. Then Arikunto (2006) also adds quantitative research is a research approach that required to strengthen the numbers, ranging from data collection, interpretation of the data, as well as the appearance of the results. In this study will be obtained level of aerobic endurance reference in the preparation of students as coaching sports achievements in Program Study Physical Endurance of Sriwijaya University.

#### **Time and Research Place**

This research was conducted at the Physical Education campus of the University Sriwijaya at Indralaya and Palembang with research period October - November, 2015.

#### **Research Sample**

The sample in this research are 42 coed of Physical Education students in Sriwijaya University.

#### **Data Collection Technique**

According Arikunto (2006), data collection techniques are the ways that used by researchers to obtain the required data. In the use of data collection techniques, researchers need an instrument that aids data collection in order to progress becomes easier. Data collection techniques are used in this research is a form of field test aerobic endurance (VO<sub>2</sub> max) with a bleep test. Bleep tests conducted by running a distance of 20 meters back and forth, which began with a

jog gradually higher and faster until the athlete is not able to follow the rhythm of run time, meaning maximum capacity at the level of the back and forth.

### **Data Analysis Technique**

The collected data were analyzed statistically using the percentage was then calculated by a category the level of aerobic endurance (VO2 max).

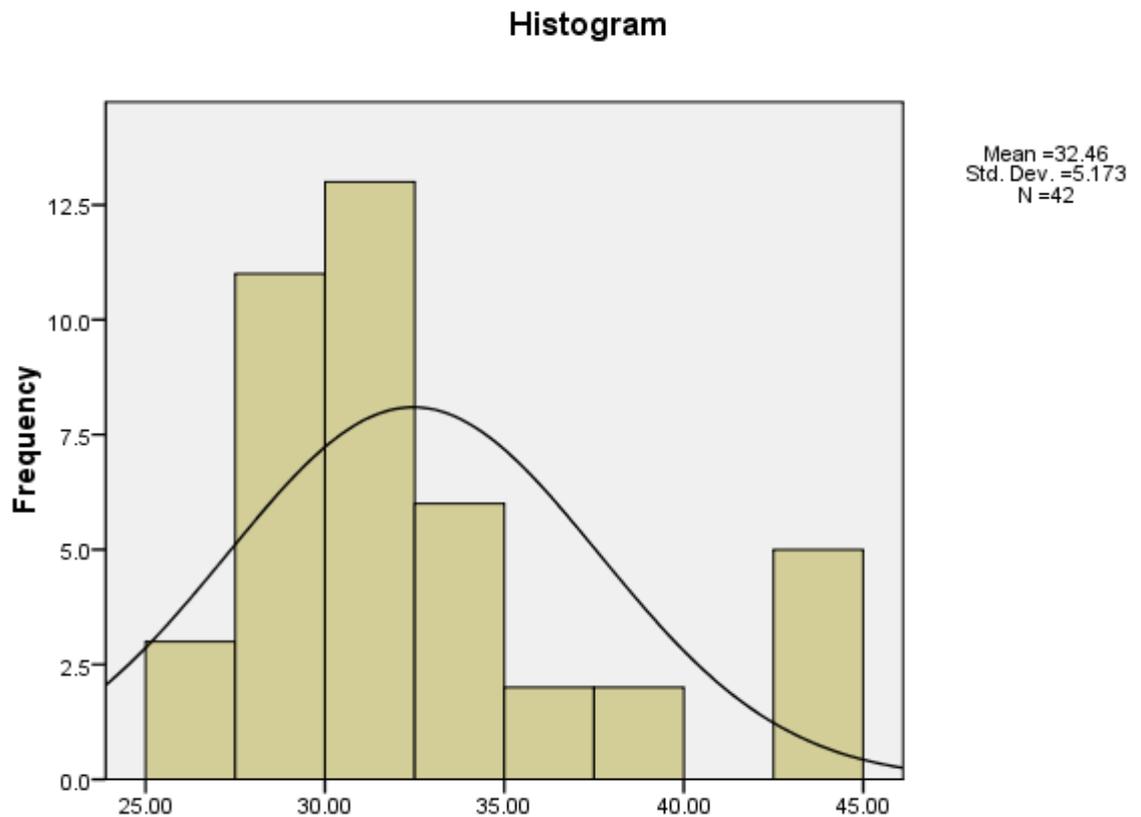
### **4. Result and Discussion**

The test results in this study are described in the form of a frequency distribution data as shown in table 1 below.

**Tabel 1**  
The frequency distribution of test results aerobic endurance (VO2max) level

	VO2 Max	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	26.8	3	7.1	7.1	7.1
	27.6	3	7.1	7.1	14.3
	28.3	6	14.3	14.3	28.6
	29.5	2	4.8	4.8	33.3
	30.2	7	16.7	16.7	50.0
	31	5	11.9	11.9	61.9
	31.8	1	2.4	2.4	64.3
	33.6	2	4.8	4.8	69.0
	34.3	4	9.5	9.5	78.6
	36.4	2	4.8	4.8	83.3
	38.5	2	4.8	4.8	88.1
	43.3	2	4.8	4.8	92.9
	43.9	2	4.8	4.8	97.6
	44.5	1	2.4	2.4	100.0
Total		42	100.0	100.0	

Form table 1 above the results of aerobic endurance (VO<sub>2</sub>max) level test interval 25-30 amounted to 14 people approximately 33.3 percent with excellent category. Interval 30-35 amounted to 19 people approximately 45.3 percent with good category, while the interval 35-40 amounted to 4 people approximately 9.6 percent with fair category and interval 40-45 amounted to 5 approximately 12 percent with poor category. From the data frequency distribution table 1 above can be described into the histogram below:



The results of aerobic endurance (VO<sub>2</sub> max) level

From the test results of aerobic endurance (VO<sub>2</sub> max) level above can be concluded that coed aerobic endurance (VO<sub>2</sub> max) level with excellent category amounted to 14 people, while with good category amounted to 19 people, with fair category amounted to 5 people and with poor category amounted to 4 people, therefore the drawn conclusion the coed of Physical Education Sriwijaya University has a good aerobic endurance

(VO2 max) level category.

Based on the results of aerobic endurance (VO2 max) level test to 42 Physical Education female students of Sriwijaya University included on good category. According to Bompa (2009) the main of maintaining aerobic endurance (VO2 max) level is with repeatedly do physical exercise and to improve the defense in order to increase strength, speed, flexibility and muscle endurance, physical exercise is also aimed to achieve the biological adjustment in order to activity can be displayed optimally. Then the results Iyakrus (2013) that the the level of aerobic endurance (VO2 max) exercise is a major component in preparing the body to face the activities of daily activities.

The results of this study are consistent with the opinion of Brown, T. (2009) that the energy metabolism system as aerobic sourced from carbohydrates, fats and also from the breakdown of proteins that produce energy, which are used when making exercise that endurance need fairly long duration. Therefore, the athletes that participate in the events needs endurance should has a good ability to supply oxygen to the body so that the process of energy metabolism as aerobic can run perfectly.

## **5. Conclusion and Remark**

Aerobic endurance (VO2 max) is the maximum amount of oxygen in milliliters, which can be used in one minute per kilogram of body weight. Aerobic endurance (VO2 max) is one indicator of cardiorespiratory endurance or heart lung endurance. There are two methods to measure someone aerobic endurance (VO2 max) value, there are using method and measurements test through laboratory and than through field test. Laboratory tests have the high accuracy value but to perform this test need high cost and not everyone has the test tools if compered with field test. One of aerobic endurance (VO2 max) test that can be use in the field is a multistage fitness test or bleep test.

From the data analysis of the research test to 42 female students can be concluded that the level of aerobic endurance (VO2 max) coed Physical Education

Sriwijaya University as follows : 14 coed are excellent, 19 coed are good, 5 coed are fair, and 4 coed are poor. Accordingly it can be suggested :

1. Keep the improvement of aerobic endurance (VO<sub>2</sub> max) Physical Education students through increased volume and intensity during sports performance coaching.
2. Spread the course of practice in sports studies program, need to be analyzed and adapted to the needs and increased levels of aerobic endurance (VO<sub>2</sub> max) students, as well as an increase in extra-curricular sports activities or sports coaching achievements.

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