

**Influence of Difference Exercise Anaerobic Interval Methods Against The Results of The Shooting Ratio of Underbasket Height and Long Limbs****Agni Herarta Anindya Satria^{1✉}, Sugiyanto², Agus Kristiyanto³**Prodi Ilmu Keolahragaan Program Pascasarjana, Universitas Sebelas Maret Surakarta, Indonesia¹²³**Article History**Received April 2017
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Anaerobic Interval Exercise Method; The Ratio of Height and Long Limbs; Shooting Underbasket

Abstract

The purpose of this research is to know (1) the difference between the influence of the ratio of anaerobic interval exercise 1:3 exercise, anaerobic interval and the ratio of 1:5 against shooting underbasket results, (2) the difference between the ratio shooting results underbasket height: long legs and high ratio of height: long limbs are low, (3) the influence of the interaction between exercise anaerobic interval ratio and the ratio of height: the length of the limbs results shooting underbasket. This research uses experimental methods with a 2 x 2 factorial design. Based on the results of the analysis of the data shows that: (1) there is a significant influence on the differences between the ratio of anaerobic interval exercise 1:3 exercise anaerobic interval and the ratio of 1:5 against results shooting underbasket, p value < 0, 05. Influence of exercise anaerobic interval with the ratio of 1:5 has better results than an anaerobic interval workout with a 1:3 ratio with average results respectively 9 and 8, 43, 43. (2) no difference shooting results significant underbasket between height ratio: the ratio of height and limb length height: long limbs, p value < 0.05. Results of shooting underbasket earned by the sample with a ratio of height: the length of the limb with a low category better than the sample with a ratio of height: long limbs with high category with average results each 19.14 and 16.67. (3) there is the influence of the interaction between exercise anaerobic interval ratio and the ratio of height: the length of the limbs results shooting underbasket, p value < 0, 10.

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INTRODUCTION

Was a complex game included his movement that is made up of the combined elements of a coordinated motion neatly so it takes quite a long time to master the basic techniques of the game was right. Priest Sodikun (1992:18) "was the basic techniques can be distinguished into: techniques of throw and catch, dribble, shoot or shooting technique, technique pivots or pivot engineering and lay up shot". Of some of the basic techniques of the game was on top of the most dominant in the game was is throwing a catch (passing & eye-catching), dribble (dribbling) and shoot the ball (shooting).

According to Danny Kosasih (2008:50-52) shot is divided into five kinds, i.e. a lay up shot, set and jump shots, free throw shot, three point shot, and the hook shot.

The goal was in the game is to create the right shots and got a number on every occasion, which is a requirement of that squad was declared the winner. According to Machfud Irsyada (1999:14) that in accordance with the primary purpose of the games was itself i.e. inserting the ball as much as possible to your opponent's basket with a sportive manner in accordance with the agreed rules. The success rate of a person entering the ball into the basket can be affected by habits and a good shooting technique mastery.

Required proportion of proper exercise to improve shooting underbasket. In practice, application of the principles of compulsory exercises note, namely sustainable, overload, the load increases, individual and reversibilitas.

In shooting exercises, problems encountered underbasket teachers is determining the magnitude of the ratio used. Fox and Matthew (1981:262) said the ratio between work and rest in practice speed was 1:3. However, the employment ratio and the rest 1:3 and 1:5 for short intervals is an exercise to develop the endurance (Rushall and Pyke, 1992:210). Shooting is shooting techniques underbasket done quickly and repeatedly recurring, so obviously the element of speed and endurance is dominant in its implementation. Based on this theory, need to research experiments aim to know the increase results from the exercise ratio underbasket shooting interval anaerobic 1:3 and 1:5.

Shooting underbasket divided into 3 stages: prefix, repulsion, while in the air, and landing are performed to the maximum and repetitive. The series of movements that are affected by the performance of the muscles, joints, and bones in the limbs as pengungkitnya. The long limb, in

Biomechanics was able to do the leap over and over again quickly, but still efficient in energy use so that the suspected individual is very helpful in doing the shooting underbasket. The individual must be able to maximize the length of tungkainya to produce a high leap closer to the basket, and efficient in energy use so that it is able to improve the results of shooting underbasketnya.

The students at the University of Surakarta Development Shoots can not achieve maximum results in the lecture Was theory and practice of stage 2, this is demonstrated with at least students who pass the test of shooting underbasket. Addressing this, it is necessary to consider the approaches and methods of the exercise of the right to produce a better underbasket shooting, then the authors conducted a study entitled "the influence of Difference Exercise Anaerobic Interval Methods against the results of the Shooting Ratio of Underbasket Height length of limbs". Based on the background of the problem, identification of the problems and limitations of problem then the problem can be formulated as follows:

1. Is there any difference between the ratio of influence of anaerobic interval exercise 1:3 exercise anaerobic interval and the ratio of 1:5 against shooting underbasket results?
2. Is there a difference between shooting results underbasket height ratio: the ratio of height and limb length height: length of low limbs?
3. Does the influence of the interaction between exercise anaerobic interval ratio and the ratio of height: the length of the limbs results shooting underbasket?

Based on the above problems then the purpose of this research is to find out:

1. the difference between the ratio of influence of anaerobic interval exercise 1:3 exercise anaerobic interval and the ratio of 1:5 against shooting underbasket results?
2. The difference in results between underbasket shooting height ratio: the ratio of height and limb length height: length of low limbs?
3. The influence of the interaction between exercise anaerobic interval ratio and the ratio of height: the length of the limbs results shooting underbasket?

The Study Of Theory

The game Was the game's team is a game was played by two good squads of both men and women who each team consists of five players. Played on a rectangular field with a certain size aimed at inserting the ball towards the opponent's basket and holding opponents to not enter the ball. The victory of a team is determined by the

number of balls that are put into the opponent's basket (Perbasi, 1990:2).

Basic techniques of Basketball Sodikun Priest (1992:47) elaborated on the elements contained in the basic skills of the game was composed of: the technique of throwing and catching the (passing), dribble Technique (heel), shoot (shooting), motion Technique pivots (pivot), lay up shoot, Merayah.

Shooting Underbasket

Shooting underbasket is a very important shot (fundamental) was in the game. The basic technique is underbasket shooting in the game that was easy to do because it is close to the basket, but difficult to learn, more so for students who have not skilled.

An effective method of exercise to improve the results of the shooting interval exercise method is underbasket anaerobic, because according to the characteristics of the underbasket shooting done quickly and requires great endurance in order to minimize the fatigue which can reduce results. About interval exercise, there are two basic elements must be taken into account, i.e. the ratio between working time and rest periods.

In General, the sport was using 60% of ATP-PC + LA, LA-20% oxygen and 20% oxygen. As for shooting underbasket, work activities with high intensity within 30 seconds, the energy used is the ATP-PC + DINING table according to Fox, Bowers, and Foss (1993:290; 306). So a test shooting underbasket includes activities that use the energy of ATP-PC system + DINING. Fox, Bowers, and Foss (1993:33) say that thinning the number of PCs and resintesa process of ATP occurs in less than 3 minutes. Of that, taken to the conclusion that the ATP-PC system + LA take place within a maximum of 3 minutes. To provide break time, exercise can be stopped or continued with intensity or lower the load. Therefore, the main purpose of exercises to improve shooting achievements underbasket aimed at the development of the energy system of ATP-PC and plus the development of LA.

Exercise

According to Bompa (1990:3), training is a systematic activity in a long time is increased progressively and that leads to the individual traits of human physiological and psychological functions needed to achieve the objectives that have been determined. According to Fox, Bowers, and Foss (1998:288) principles in the exercise program is knowing the main energy system that is used to perform an activity and through

the principle of overload (overload) for putting together a workout program that will develop an energy system that is specialized in sports.

According to Bompa (1990:34) there are two things that perl note in principle of specificity, namely; (1) conduct training exercises in accordance with the specific characteristics of sport, (2) perform exercises to develop special biomotorik ability in sports. Soekarman (1987:60) suggested that the exercise had to be specifically to increase the strength or the energy systems that are used in sport is required. According to Pyke, Robert, Woodman, Telford, and Jarver (1991:119) the exercises should be directed specifically towards the energy system or muscle fibers are used, also associated with special motor skills improvement. Exercise program undertaken must be specific, tailored to the goals to be achieved in the sport.

An increase in the granting of the load should be done progressively and gradually. Progressive load exercise means always increases, from beginning to the end of the exercise. The quantitative nature of the exercise load is, the burden of training can be a heavy burden that must be lifted, the number of repetitions set, long a break per set, speed, frequency per week, and so on. For other sport athletes, certainly bahanlatihannya also will be different, for the purpose of training any different. Sprinter 100 meter athlete practicing in order to run the soonest possible. High jumper athlete training goal is to jump as high as-in height. While the athletes pelempt Javelin train with hopes to throw a lembig as far as possible. With the demikin it can be understandable that why athlete sprinter 100 meters the main exercise does not load erupa lifting weights (dumbbell) seberat-beratnya, but speed, mileage or duration of practice run in a day. The burden of the exercise can be an approximate percentage of intensitas exercises, what percentage of the load be taken at the beginning of exercise exercise and what percentage of its increase.

In principle, each individual is different one by the other. Similarly, in practice, each individual also has a different kemampuanyang. The benefits of exercise will be more meaningful and useful when training programs are planned and implemented on the basis of the characteristics and conditions of the individual athlete. Therefore, the individual characteristics of the atlet should participate in drawing up the latihanyang program is considered to be executed. Related to this, according to Harsono (1998, 112-113) suggests that factor-faktorseperti age, gender, body benuk, maturity, educational background, length of practice, the level of physical freshness,

psychological traits, and others all must come into consideration in drawing up an exercise program.

Physical ability that is owned by a person not settled, it can be changed according to the activity carried out. The liveliness of a person doing exercise or physical exercise can improve physical ability, rather inactivity or without exercise will menibulkan one's physical abilities decline. According to Soekarman (1987:60) said that, every workout results if not kept then it will be back as before. Based on this principle, physical exercise must be done regularly and continuously.

A coach should consider aspects that a component of the exercise. As mentioned by Bomp (1990:75) "efficiency of an exercise is a result of; time is used; distance traveled and number of repetitions (volume); load and its velocity (intensity); as well as the frequency of appearance (density).

Energy Systems

Principal source of energy in meeting the needs of the everyday muscle activity is ATP. ATP stored in muscle glycogen and in limited quantities, are able to be generated through the process of resintesa ATP through the materials that are available in the body. The main source of energy is carbohydrates, then fats and proteins. In a State of low carb eksersi fat burning, play an important role. ATP can be used as muscular activity energy in three ways, two of which are anaerobic, i.e. energy system ATP-PC system and energy ATP-PC + DINING.

The energy of ATP-PC system + LA is anaerobic energy system which is a continuation of the ATP-PC system. The difference is the resintesa of ATP occurs through the process of Glycolysis in blood, glycogen is broken down into ATP and pyruvate. Pyruvic acid lactic acid would be in the absence of oksigen. This is the end result of anaerobic energy system. The lactic acid that builds up in the muscle will cause fatigue in the muscles.

Interval Workouts

Interval workout is a series of repeated physical exercise system and punctuated the break. Due to anaerobic interval workout consists of activity (anaerobic) and rest (aerobic), then the speed will increase.

An effective exercise program is an exercise program tailored to the energy system. While the energy system identified from time and intensitasnya.

The ratio between working time and rest in practice participate determine the outcome of

practice. Determination of the ratio can change the purpose of the exercise.

Anaerobic interval workout with a 1:3 ratio is the ratio of 1 to 3 to work time and rest periods. For example, do the shooting underbasket for 30 seconds, then istirahatnya 3 times 30 seconds that is 90 seconds. In practice shooting underbasket, per Deuteronomy was done with submaksimal up to a maximum effort. When you are finished directly calculated istirahatnya until break time is running out, the sample immediately prepared to do Reps next.

Exercise Anaerobic Interval Ratio

1) ratio of Anaerobic Interval Workout 1:3

Anaerobic interval workout with a 1:3 ratio is the ratio of 1 to 3 to work time and rest periods. For example, do the shooting underbasket for 30 seconds, then istirahatnya 3 times 30 seconds that is 90 seconds. In practice shooting underbasket, per Deuteronomy was done with submaksimal up to a maximum effort. When you are finished directly calculated istirahatnya until break time is running out.

The ratio of anaerobic interval workout 1:3 interval is an exercise with rest periods are not enough to restore the ATP-PC, so fatigue began to arise due to the buildup of lactic acid in the blood and muscles. If this is done continuously, then exercise anaerobic interval with the ratio of 1:3 have turned into a exercise endurance.

2. Anaerobic Interval Exercise Ratio) 1:5

Anaerobic interval workout with a 1:5 ratio is the ratio of 1 to 5 for work time and rest periods. For example, do the shooting underbasket for 30 seconds, then istirahatnya 5 times 30 seconds that is 150 seconds. In practice shooting underbasket, per Deuteronomy was done with submaksimal up to a maximum effort. When you are finished directly calculated istirahatnya until break time is running out, the sample immediately prepared to do Reps next.

Height: Ratio Length Of Limbs

Height and long limbs is one of the areas of study of physical anthropology. The role of physical anthropology or anthropobiologis in sports is not new. According To T. Jacob (1991:1) since the Olympic Games of 1928, and on almost every Olympics thereafter always carried out research anthropobiologis on athletes from various sports.

The ideal body shape in accordance with sport learned is one of the terms in sports achievement. Sajoto (1988:11) States one of the as-

pects in order to achieve progress in the biological aspects of sports is covering the structure and posture, namely: 1) size height and long limbs, 2) large size, width and weight, 3) form the body. Human limbs are divided into upper and lower limb limbs, so the ratio of height and long limbs are biomekanika allegedly can improve results shooting underbasket.

The role of the ratio of the Height: the length of Limbs in Shooting Underbasket

On shooting underbasket, size height and long limbs, as well as the type of stature becomes very important and can contribute to the achievement. Height was instrumental in the sport was, so the higher bodies, the ease in entering the ball to the basket. The long limb size gives a lot of advantages in doing shooting underbasket. Unequal length will give you a better system of levers rather than shorter limbs. A system of levers by the long limb will result in a stronger repulsion, can bring the body higher and closer to the basket. His long limbs produces a larger cross-sectional area, so as to narrow the space motion of doing shooting underbasket, so as to save time. Thus, it has the size of a long limb and supported by regular exercise will then be retrieved results shooting underbasket.

METHOD

The research method used was experimental research method with a 2 x 2 factorial design. This research is to know the interactions between exercise anaerobic interval ratio is the ratio of height: length limbs to increased results shooting underbasket.

Population and sample the study's son is a student semester V Department of Education University of health and Sports Development 2014/2015 year Surakarta Shoots. The technique used is the sample random sampling to select samples that add up to 60 students. The overall student population numbers Son semester V Department of Education University of health and Sports Development 2014/2015 year Surakarta Shoots is approximately 240 students.

RESULTS AND DISCUSSION

The first hypothesis in this study stated that "there is a difference between the ratio of influence of anaerobic interval exercise 1:3 exercise anaerobic interval and the ratio of 1:5 against shooting underbasket results". The results of the analysis of variance for Anaerobic Interval Exercise Ratio obtained Fhitung of 10.715 with sig-

nificance of 0.002. Because of the significance of price Fhitung for Anaerobic Interval Exercise Ratio smaller than 0.05, then alternative hypothesis was accepted and the zero hypothesis was rejected. Score average Shooting exercise anaerobic interval ratio underbasketkelompok 1:3 (10.7) larger than average score Shooting exercise anaerobic interval ratio underbasketkelompok 1:5 (9.10). Thus, the first hypothesis in this study can be accepted.

The second hypothesis in this study stated that "there is a significant difference between shooting results underbasket ratio height: long legs and high ratio of height: length of low limbs". The results of the analysis of variance for height ratio: long limbs obtained Fhitung of 6.094 with significance of 0.017. Because the price of the significance of Fhitung to height Ratio: long leg smaller than 0.05, then alternative hypothesis was accepted and the zero hypothesis was rejected.

The third hypothesis in this study stated that "there are differences of Shooting underbasketsiswa of antaraRasio interaction Anaerob1 Interval Workouts: 3 and 1:5 with height ratio: long limbs categories high and low". The results of the analysis of variance for the interaction of Anaerobic Interval Exercise Ratio and the ratio of height: length limbs obtained Fhitung of 4, 320dengan the significance of 0.042. Because the price of the significance of Fhitung for Anaerobdan Interval Exercise Ratio interaction ratio height: long leg smaller than 0.05, then alternative hypothesis was accepted and the zero hypothesis was rejected.

CONCLUSIONS

Based on the results of the research and the results of data analysis that has been done, the conclusion can be obtained as follows:

1. There is a difference significant influence between the methods of anaerobic interval exercise ratio and 1:3 ratio 1:5 anaerobic intervals against the ability of shooting underbasket. The method of interval anaerobic exercise 1:5 influence ratio better than anaerobic interval workout 1:3 method against the ability of shooting underbasket.
2. There's a difference between shooting underbasket ability student who has a high ratio of body: long limbs "high" and "low". Students with a high ratio of body: long limbs, the category "low" has the capability of shooting better than underbasket student with height ratio: long limbs category "high".

3. There was a significant interaction between influences the method of interval anaerobic exercise and the ratio of height: the length of the legs against the ability of shooting underbasket.
 - a. Students who have a high ratio of body: long limbs category "high" is more suitable if using the method of interval anaerobic exercise ratio 1:5.
 - b. the student who has a high ratio of body: long limbs category "low" is more suitable if using the method of interval anaerobic exercise ratio 1:3.

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