

PROCEEDING

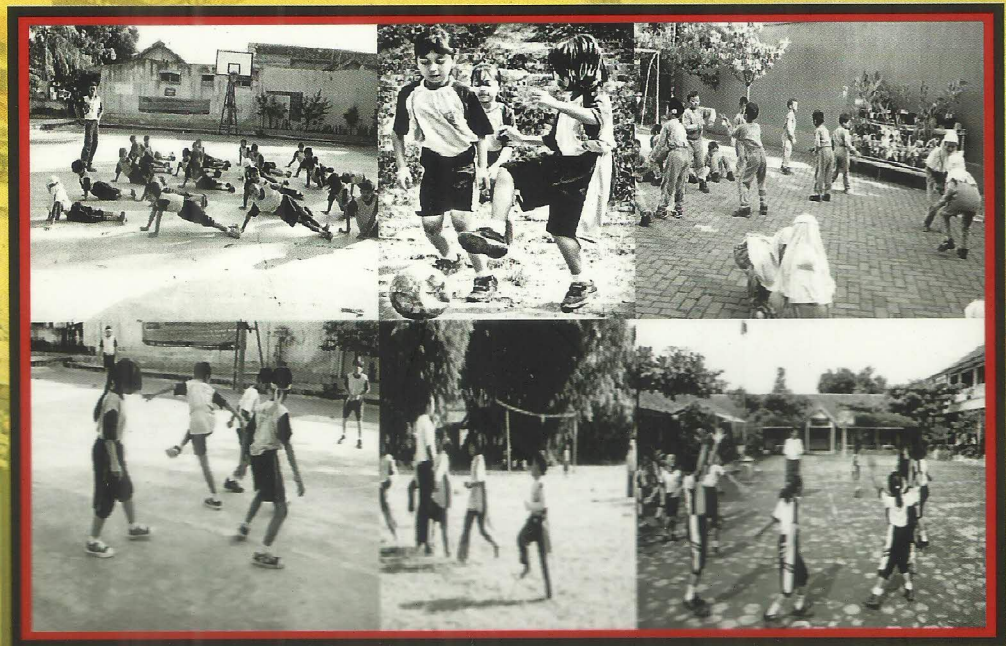
OF

THE 3rd INTERNATIONAL SEMINAR ON SPORT AND PHYSICAL EDUCATION

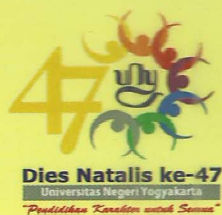
"Striving For World Sport Achievements Through Sport and Physical Education"

Faculty of Sport Science, Yogyakarta State University

Yogyakarta, May 24, 2011



In Cooperation :



Yogyakarta State University



ISORI DIY



Ministry of Youth and Sports
Republic of Indonesia

COMPARISON OF CIRCUIT STRENGTH TRAINING INFLUENCE BETWEEN BLOCK AND NONBLOCK SYSTEMS CONCERNING THE PHYSICAL FITNESS COMPONENTS ON THE BEGINNERS SPRINTER MALE ATHLETES

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ABSTRACT

The purpose of this investigation is to compare the influence of circuit strength training between block and nonblock systems concerning the physical fitness components on the beginner sprinter male athletes. Sample was taken from 60 of 151 targets population using purposive random sampling technique, then divided into two groups treatments by ordinary matching pairing technique based on pretest. The measurement was carried out at the beginning and the end of treatment (training program) concerning to the speed, flexibility, strength, and power of leg muscle. The result of the research based on the pretest-posttest data analysed by t-test showed the significant increases of the both treatment group for all response variables. Comparison of both treatment group based on posttest data showed the significant differences only on 36 meters (40 yard) speed running.

Keywords: *circuit strength training, block and nonblock systems, physical fitness components, leg muscle.*

INTRODUCTION

To achieve high performance ~ sports, especially the number of short distance running (sprint), necessary preparations are mature early and planned on a beginner athlete, in the form of guidance to the basic components of physical fitness, technique, and mental. Mastery of technique and mentality will only succeed if the basic components of an adequate physical fitness have been established (1). Physical Fitness is a readiness and ability of agencies to do their jobs efficiently without causing significant fatigue (2). Basic components of physical fitness must be interested in sprinter beginners are: 1) leg muscle strength, 2) the speed of moving (running), 3) leg muscle power, and 4) flexibility, (3,4,5,6). Each component requires time and special training methods, such as plyometrics training methods to increase muscle power, methods of stretching exercises to improve flexibility, strength training methods to increase muscle strength. To overcome the limitations of time to develop each component of the maximum physical fitness, and overcome boredom in the process of training, then the short distance running coaches usually use the method of strength training circuit (circuit strength training).

Circuit strength training methods are a form of systematic strength training conducted sequentially in a set of exercises and consists of some form of exercise, as well as the time interval workout inter station one to form the next exercise, and involve all muscles, especially the large muscles (7,8). Training system is the system used is usually non-aligned block and the system.

The system block is part of the circuit form of exercise that consists of several different forms of exercise, for the same exercise carried out/ completed one by one according to the number of sets, and there are exercises inter station break. While the non-aligned system is of the form of circuit training consisting of several different forms of exercise undertaken / completed in sequence in accordance with the number of sets, and there is a break antar bentuk exercise. In the block system, the break was not too long, so it is not enough time to recover from fatigue. Less muscle contraction can be maintained steadily because lactic acid accumulation in muscle is

not fully neutralized. Pate (9) states that muscle strength will achieve maximum results when the muscle is stimulated with a load above the threshold excitatory repeatedly in a short time. While the non-aligned system of exercises performed with submaksimum until maximum intensity up, and rest periods inter exercise long enough, that is approximately 3 minutes (10).

METHOD

The study was conducted on 151 people who were given initial test, a test run speed of 36 meters (40 yards), flexibility test of leg muscle, leg muscle strength tests, and tests of leg muscle power. Among the population was taken 30 people as purposive random sample by sample. The chosen sample was divided into two treatment groups, ie groups of systems and system non-aligned bloc. The study was conducted using the design of pretest - posttest. The group was given training block system which were completed before one by one according to the amount of time 20 seconds in 2 sets that have been determined, interspersed with rest 60 seconds, with 10 forms of exercise. For more details can be seen in the picture below.

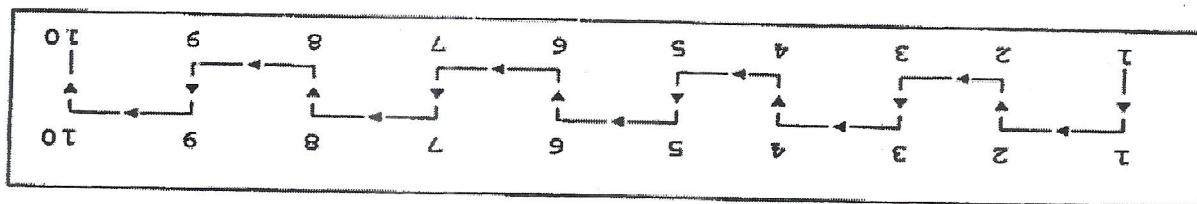


Figure 1. Implementation of Block System

Description:

- exercise -1 : *Leg innervation*
- 2 : *Push-up*
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- 9 : *jump Hurdles (5 hurdle)*
- 10 : *Leg Curl*
- ▲▼▶ : *Practice Directions*
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System of non-aligned group was given exercises in sequence and for every form of exercise completed in accordance with 20 seconds in sets that have been determined, interspersed with rest 60 seconds after completion of the one form of exercise.

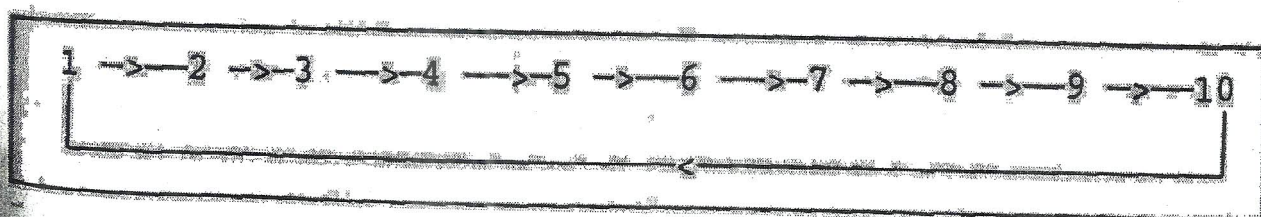


Figure 2. Implementation of the Non-block Systems

Description:

- exercise -1 : *Leg innervation*
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Components of physical fitness parameters measured to compare the effect of exercise between the non-aligned bloc and the system are: the speed with instruments sprint 36 meters (40 yards), leg muscle flexibility with pivot motion trun instrument through an extensive achievement motion, leg muscle strength with a motion instruments leg muscle to contract maximally use the dynamometer, as well as leg muscle power with a standing broad jump test instruments.

Data were analyzed using parametric statistics with the following steps: Normality test with chi-square, test of homogeneity with the Bartlett Test. T-tests conducted to determine the effect and influence of different training systems and the system of non-aligned.

RESULTS AND DISCUSSION

Different test results (t-test) showed that both groups of research subjects have the same initial capacity, both for variables and variable response characteristics, so that in case the influence of the two treatment groups of response variables, solely due to the provision of treatment.

EFFECT OF DIFFERENT TRAINING BLOCK AND NON-BLOCK SYSTEM TO SPEED RUN

Speed can be defined as an ability to move very quickly, while according Nossek (11) speed is a conditional quality that allows a person to act quickly, if given the stimulus. To develop and improve the skills of speed, then the exercise should be performed regularly with the velocity maximum or near maximum. Maximal running speed was developed by running in short distances with a vengeance. This fast-moving skills must be practiced before the athlete becomes fatigued. Thus the recovery time between repetitions and sets of exercises should be adequate enough so that athletes can recover from fatigue.

From the results of different test analysis (t-test) pretest - posttest in the group showed that there was a significant influence on running speed of 36 meters (40 yards) in both treatment groups, with the results for the treatment group block system t to 7.67, while for the treatment group t non-aligned system is 8:00.

From the results of different test analysis (t-test) posttest between groups showed that there are significant differences on the variable running speed of 36 meters (40 yards) caused by treatment with t 2:44.

These results suggest that strength training circuit (circuit strength training) with the system as well as non-aligned bloc can improve running speed of 36 meters (40 yards) significantly, and application in both systems have significant differences.

There is an increasing running speed in accordance with the opinion of Stone (7) that the granting of the right strength training program can improve the performance of athletes and to protect athletes from injury due to exercise. There is an increasing percentage of the average running speed is higher in the non-aligned group is

caused by the constant exercise intensity on every form of exercise, and rest periods are balanced antarulangan the same exercise. While the group block system, constancy in doing one form of exercise can not be maintained, and the rest antarulangan same exercise was too short.

EFFECT OF DIFFERENT TRAINING SYSTEMS ON THE BLOCK AND BLOCK SYSTEM AGAINST LEG MUSCLE

Flexibility can be defined as an ability to perform the movement joints through a wide range of motion. Range of motion of each joint in the body depends on the tendons, ligaments, connective tissue and muscle. Limit the reach of the joints called the final position (10).

Injuries can occur when limbs or muscles are forced to move outside the limits. Flexibility exercises can help reduce the risk of injury by increasing range of motion of joints, especially the hip joint, knee, and ankle.

Flexibility is less to be one cause of motion techniques that are less well so low athlete achievement. Lack of flexibility also hinder the speed and endurance, because the muscles must work harder to overcome resistance towards a long step, especially the muscles of the leg.

Increasing the flexibility of athletes, as well as developing other skills, physical fitness, is a slow process. The addition of range of motion of joints, especially the muscles that support the movement to run, done by stalling until beyond the point of arrest usual. This exercise should be done every day with appropriate exercises. There are two kinds of flexibility are the main form of exercise, namely 1) active stretching exercises, consisting of static stretching exercises on active and dynamic, and 2) passive stretching exercises (1.10).

The result of different test analysis (t-test) in group pretest-posttest shows that there is a significant influence on the variable leg muscle flexibility in both treatment groups, with results for non-aligned system of treatment group t 10:38, and treatment group block system t 8.13.

The result of different test analysis (t-test) posttest between groups showed that there were no significant differences on the variables of leg muscle flexibility due to differences in treatment with t 0.95.

These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can increase significantly the flexibility of leg muscle, and there were no significant differences in the application of the difference between the two systems on the flexibility of leg muscle.

DIFFERENCES INFLUENCE SYSTEM BLOCK AND SYSTEM OF EXERCISE NON-BLOCK ON STRENGTH AGAINST LEG MUSCLE

Muscle strength is defined as an ability or a muscle group to overcome resistance or load. Muscle strength consists of 1) maximal strength, 2) power, and 3) strength endurance. Maximum Strength is the largest power generated by muscle contraction to overcome a burden. This strength is not determined by the speed of a movement carried out or how long the movement can continue, but how big load that can be overcome. Maximum strength can be developed through a form of exercise that involves repetition in small amounts and large load.

From the results of different test analysis (t-test) in group pretest-posttest showed that there was a significant influence on leg muscle strength in both treatment groups, with results for non-aligned system of treatment group t 7:30, and the treatment system of block t 8:38.

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These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can increase leg muscle strength significantly, and there were no significant differences in the application of the difference between the two systems to increase leg muscle strength.

DIFFERENCES INFLUENCE EXERCISE BLOCK AND NON-BLOCK SYSTEM ON LEG POWER MUSCLE

Power is a combination of force and velocity of contraction. The strength of this kind is very important for the numbers that require explosive movements, like running fast (sprint), jump, and throw. Power is developed through repetition weight training with fast and medium loads.

Strength endurance is defined as the ability of muscles to contract continuously in dealing with increasing fatigue. Strength endurance is a combination of strength and duration of movement. Form of exercise for developing strength endurance is given through a fast repetition with light weights.

The result of different test analysis (t-test) in group pretest-posttest shows that there is a significant influence on leg muscle power in both treatment groups, with results for non-aligned system of treatment group t 12.44, and the treatment system of block t 14.92.

The result of different test analysis (t-test) posttest between groups showed that there were no significant differences on the variables of leg muscle power due to differences in treatment with t 1.43.

These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can improve leg muscle power significantly, and there were no significant differences in the application of the difference between the two systems to increase leg muscle power.

CONCLUSION

From the above we can conclude that, both systems form a block and non-block exercise can improve physical fitness components, ie, running speed, flexibility, leg muscle strength, and leg muscle power. From both these systems, the system blocks increasing greater than non-block system so that there is a difference in running speed component, while the other components there is no significant difference.

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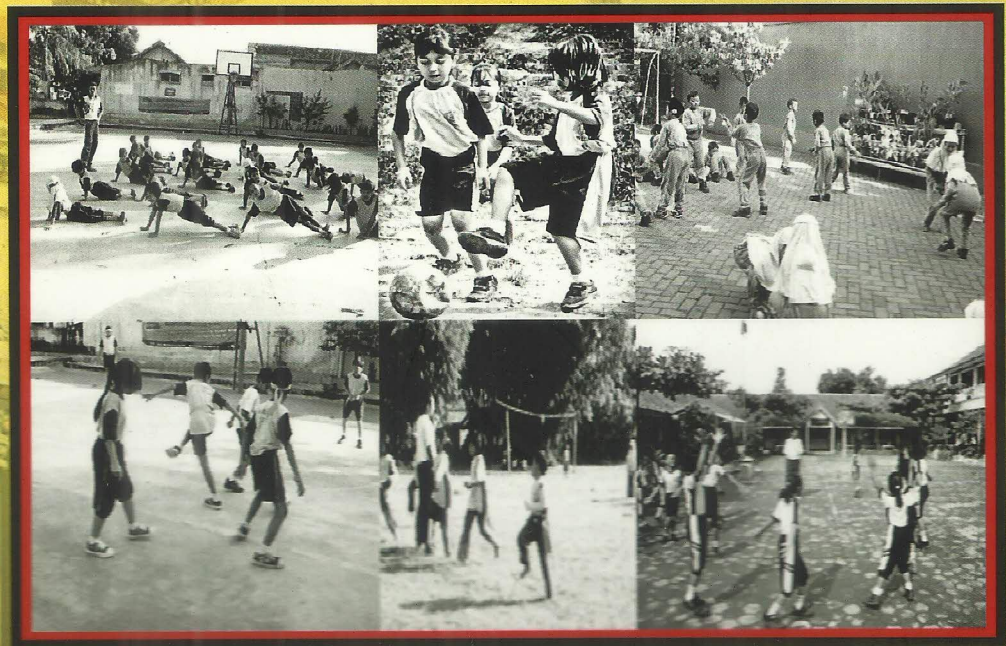
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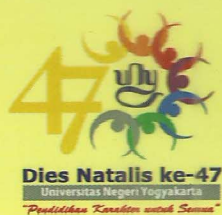
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Keywords: *circuit strength training, block and nonblock systems, physical fitness components, leg muscle.*

INTRODUCTION

To achieve high performance ~ sports, especially the number of short distance running (sprint), necessary preparations are mature early and planned on a beginner athlete, in the form of guidance to the basic components of physical fitness, technique, and mental. Mastery of technique and mentality will only succeed if the basic components of an adequate physical fitness have been established (1). Physical Fitness is a readiness and ability of agencies to do their jobs efficiently without causing significant fatigue (2). Basic components of physical fitness must be interested in sprinter beginners are: 1) leg muscle strength, 2) the speed of moving (running), 3) leg muscle power, and 4) flexibility, (3,4,5,6). Each component requires time and special training methods, such as plyometrics training methods to increase muscle power, methods of stretching exercises to improve flexibility, strength training methods to increase muscle strength. To overcome the limitations of time to develop each component of the maximum physical fitness, and overcome boredom in the process of training, then the short distance running coaches usually use the method of strength training circuit (circuit strength training).

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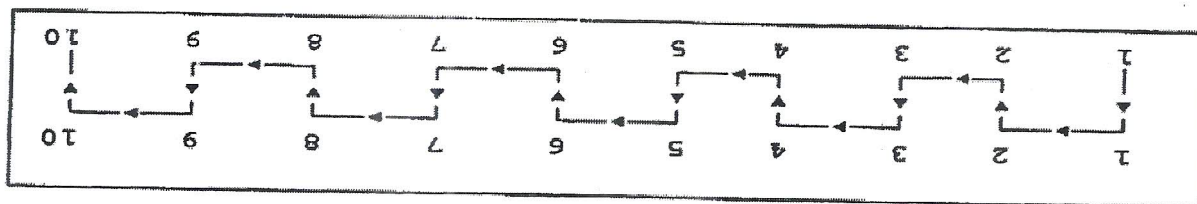


Figure 1. Implementation of Block System

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System of non-aligned group was given exercises in sequence and for every form of exercise completed in accordance with 20 seconds in sets that have been determined, interspersed with rest 60 seconds after completion of the one form of exercise.

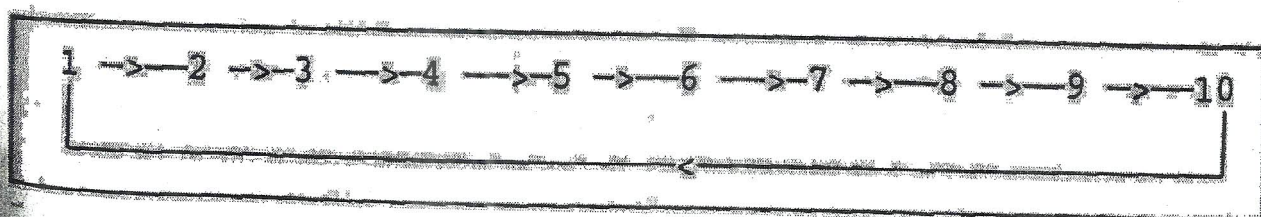


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RESULTS AND DISCUSSION

Different test results (t-test) showed that both groups of research subjects have the same initial capacity, both for variables and variable response characteristics, so that in case the influence of the two treatment groups of response variables, solely due to the provision of treatment.

EFFECT OF DIFFERENT TRAINING BLOCK AND NON-BLOCK SYSTEM TO SPEED RUN

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From the results of different test analysis (t-test) posttest between groups showed that there are significant differences on the variable running speed of 36 meters (40 yards) caused by treatment with t 2:44.

These results suggest that strength training circuit (circuit strength training) with the system as well as non-aligned bloc can improve running speed of 36 meters (40 yards) significantly, and application in both systems have significant differences.

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The result of different test analysis (t-test) in group pretest-posttest shows that there is a significant influence on the variable leg muscle flexibility in both treatment groups, with results for non-aligned system of treatment group t 10:38, and treatment group block system t 8.13.

The result of different test analysis (t-test) posttest between groups showed that there were no significant differences on the variables of leg muscle flexibility due to differences in treatment with t 0.95.

These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can increase significantly the flexibility of leg muscle, and there were no significant differences in the application of the difference between the two systems on the flexibility of leg muscle.

DIFFERENCES INFLUENCE SYSTEM BLOCK AND SYSTEM OF EXERCISE NON-BLOCK ON STRENGTH AGAINST LEG MUSCLE

Muscle strength is defined as an ability or a muscle group to overcome resistance or load. Muscle strength consists of 1) maximal strength, 2) power, and 3) strength endurance. Maximum Strength is the largest power generated by muscle contraction to overcome a burden. This strength is not determined by the speed of a movement carried out or how long the movement can continue, but how big load that can be overcome. Maximum strength can be developed through a form of exercise that involves repetition in small amounts and large load.

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These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can increase leg muscle strength significantly, and there were no significant differences in the application of the difference between the two systems to increase leg muscle strength.

DIFFERENCES INFLUENCE EXERCISE BLOCK AND NON-BLOCK SYSTEM ON LEG POWER MUSCLE

Power is a combination of force and velocity of contraction. The strength of this kind is very important for the numbers that require explosive movements, like running fast (sprint), jump, and throw. Power is developed through repetition weight training with fast and medium loads.

Strength endurance is defined as the ability of muscles to contract continuously in dealing with increasing fatigue. Strength endurance is a combination of strength and duration of movement. Form of exercise for developing strength endurance is given through a fast repetition with light weights.

The result of different test analysis (t-test) in group pretest-posttest shows that there is a significant influence on leg muscle power in both treatment groups, with results for non-aligned system of treatment group t 12.44, and the treatment system of block t 14.92.

The result of different test analysis (t-test) posttest between groups showed that there were no significant differences on the variables of leg muscle power due to differences in treatment with t 1.43.

These results suggest that strength training circuit (circuit strength training) with block as well as non-aligned system can improve leg muscle power significantly, and there were no significant differences in the application of the difference between the two systems to increase leg muscle power.

CONCLUSION

From the above we can conclude that, both systems form a block and non-block exercise can improve physical fitness components, ie, running speed, flexibility, leg muscle strength, and leg muscle power. From both these systems, the system blocks increasing greater than non-block system so that there is a difference in running speed component, while the other components there is no significant difference.

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