

The Effects of Active Recovery in Sprint Training on the Endurance of Women's Volleyball Athletes Aged 12-14 Years at Yuso Club Yogyakarta

Danang Wicaksono¹, Wasiman¹

¹*Sport Coaching Department, Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Yogyakarta, Indonesia*

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Abstract: This research aimed to examine the effect of active recovery in sprint training on increasing the endurance in young women's volleyball athletes aged 12-14 years. The benefits of this research were to provide understanding and knowledge about training models and to find new methods of physical training for women's volleyball athletes aged 12-14 years and interrelation between fitness components. This research was conducted in the form of experiment with "one-group pretest and posttest design" as its research design. The research subjects were women's volleyball athletes aged 12-14 years with a total of 24 athletes. The instrument used was multistage fitness test (MFT). The data analysis used the t-test technique (paired sample t-test). The conclusion of the research showed that there was an effect of active recovery from sprint training on the endurance of women's volleyball athletes aged 12-14 years. Earned t-count value (6.260) > t-table (1.71) means that t-count value was greater from the t-table. The result of the pretest and posttest values described before had a significant difference. The posttest value was better than the pretest and the endurance of athletes was increased after being given the exercise program.

1 INTRODUCTION

Improving achievement especially in sports may require a quite long period of time. Training starts at early age and must be done periodically to eventually reach the top of certain practiced sports. Furthermore, performance in sports should be improved from earlier stage to get the most out of it in the future. The term latihan is derived from English, meaning: practice, exercise and training (Sukadiyanto, 2011). Latihan from the word practice is an activity aims to enhance sport skills and utilize the sport equipment based on the sport's goals and needs. From the word exercise, latihan means daily routines aiming to improve the quality of body organs so that it is easy for the athletes to execute their movement. Latihan from the word training means the application of sport skills improvement plan involving theoretical and practical content, methods and implementation principles based on the goals and objectives aimed.

One of the most crucial factors to reach excellence in sport is physical condition, beside technique and tactic control as well as mental

condition. The component of physical condition is a whole package of the component of physical fitness. It is one of the indispensable prerequisite in improving performance. Physical condition is one of the essential requirements for athletes to improve their performance, to the point that it becomes the basis of their starting point in sport achievement (Sajoto, 1995). Components of physical condition are described as follows: strength, endurance, speed, explosive power, flexibility, balance, coordination, agility, accuracy and reaction. Endurance may refer to a physical condition or situation where it can last for a long period of time. An athlete is considered having a great endurance when he hardly feels tired or is able to keep moving when he gets tired, or else, he performs without catching over fatigue after completing a task. The impact of endurance training is changes in skeletal muscles. In addition, according to an introductory book of theory (Bowers and Fox, 1988) and physical training methodology (Sukadiyanto, 2011), important changes that occur in muscles include: myoglobin concentration, burning of carbohydrates and fats, liver glycogen deposits, phosphagen deposits and size and amount

of muscle fibers. Thus, the effect of exercises on endurance covers increase in muscle and stamina.

The description above emphasizes on how stamina in physical condition system affect every branch of sport. Without good physical condition, athletes cannot put up with exercises or fight in tournament. Based on the observation during micro lecture, PPL, internship in Yuso volleyball club Yogyakarta, the athletes' stamina was still considered low since they felt worn out after using a little amount of power for just an hour. As explained above, there are several methods to improve stamina such as continuous training, fartlek, interval training, long running, long swimming, sprint training and cross country. Aerobic capacity is determined by organs' ability inside the body to transport oxygen throughout the whole body tissues. Oxygen transport and circulation system improvement is one of the goals of stamina training. Athletes who possess a good aerobic capacity may recover themselves in a jiffy and withstand an intense training in longer term. Thus, stamina/aerobic capacity is determined by: (a) Lungs as a place to transfer oxygen, (b) Blood (Erythrocytes and Hb) oxygen carriers, (c) Blood vessels in the body, (d) Heart that controls blood flow, (e) Mitochondria in muscle cells, and (f) Mitochondria that increases stamina.

Sprint training is a short-term running exercise done repeatedly with high intensity. The principle of sprint training is given maximum load in a short term, repeated for several times. Active recovery is given during the interval between sets and sessions by doing basic technique such as lower passing and upper passing. The goal is to make sure that the athletes are still in training zone and to improve basic technique of passing, especially when the ball touches the hand. Sprint training is held in a flat lane. It improves the ability of the body to get into activities. Based on the characteristic, sprint training improves anaerobic capacity, especially muscle strength, speed and power, as well as endurance, with the energy system of ATP-PC (Alactacid).

Yuso volleyball club Yogyakarta is a sport club located in the Special Region of Yogyakarta with members of certain age group and ability in volleyball game. Based on the observation during micro lecture, PPL, internship in Yuso volleyball club Yogyakarta, athletes' stamina was still considered low since they felt tired after using a little amount of power for just an hour. The given training was less attractive and boring for the athletes. The typical sprint training was done unwillingly and less variative. After a deeper observation via the coaches, it was found that they

had not learnt what training works better for athletes' stamina improvement, especially for women athletes whose stamina had not yet been put into test.

This research aimed to learn the effect of active recovery in sprint training on the endurance of women's volleyball athletes aged 12-14 years. Thus, the researcher eagerly studied about "The Effects of Active Recovery in Sprint Training on the Endurance of Women's Volleyball Athletes Aged 12-14 years at Yuso Club Yogyakarta".

2 RESEARCH METHODOLOGY

2.1 Type of Research

This research is an experimental research that used a one-group pretest-posttest design.

2.2 Place and Time of the Research

The research took place in YUSO volleyball club Yogyakarta, held in the volleyball field of SMK Negeri 2 Yogyakarta, AM Sangaji Street, Cokrodiningratan, Jetis. The research was held from August 9th to September 15th 2018. The treatment was performed for 16 times with a cycle of 3 times per week (Tuesday, Thursday and Saturday at 3 pm-end).

2.3 Research Subject

The research subject was a total of 24 Yuso club women's volleyball athletes aged 12-14 years. The sampling technique used was a purposive sampling with the criteria of: (1) Women's volleyball athletes aged 12-14 years, (2) able to participate in all training programs that had been arranged during 16 meetings, (3) had been in training for at least 6 months, (4) had a minimum of 13.4 to 22.1 VO₂Max.

2.4 Operational Definition of Variable Research

2.4.1 Dependent Variable

Dependent variable in this research was the stamina of women's volleyball athletes aged 12-14 years. Stamina may refer to a physical condition or situation where it can last for a long term. An athlete is considered having a great stamina when she hardly feels tired or is able to keep moving when she

gets tired, or else, she performs without catching extreme fatigue after completing a task.

2.4.2 Independent Variable

Independent variable in this research was an active recovery in the sprint training. It is a continuous movement of lower or upper passing during interval of the sprint training. The exercise was an integrated exercise with efficient time consumption. This training program aimed to improve stamina, speed and even volleyball technique.

2.5 Forms of Training (Experiment)

(1) The training method used was sprint interval training.

(2) The distance was 35 meter long.

(3) Maximal intensity or as fast as possible.

(4) Active recovery in a set for three minutes and between sets for five minutes using lower or upper passing.

(5) As the sample reached the finish line, the athlete went back to start jogging and take the ball and do the lower and upper passing.

(6) The total of repeated sprint in a set was between 10 to 16 times, divided into three to four sets.

(7) The first to fourth exercise used 4-3-3 pattern. The fifth to eighth exercise used 4-4-4 pattern. The ninth to 12th exercise used 4-4-3-3 pattern and the 13th to 16th used 4-4-4-4 pattern.

(8) Ahead of set two, set three or set four, the athletes were checked for heart rate frequency with a target above 120. Those who did not meet the target were monitored so that the next recovery they would be more active.

(9) The first duration of sprint training was 1.5 minutes while the last duration was 2 minutes.

(10) The volume of twelve to sixteen times running, or the first exercise was 32.5 minutes to 53 minutes.

(11) The overall practice time of playing volleyball was two hours. Warm-up session consisted of warming up, sprint training and technical training followed by the game. Warm-up exercises, techniques and the game were not monitored.

(12) All samples outside the sprint training period were assumed practicing the same load of exercise.

2.6 Data, Instrument, and Technique of Data Collection

This experimental research used a one-group pretest-posttest design. The instrument used for the pretest and posttest was multistage fitness test (MFT).

The sample of stamina taken using the multistage fitness test (MFT) are mentioned as follows:

2.6.1 Equipments of the stamina testing

(a) A flat, non-slippery field or surface with a minimum length of 22 meters, (b) Tape recorder (music player), (c) MFT audio cassette, (d) Meter, (e) Boundary mark or cone, (f) Stopwatch, (g) Biodata assessment sheets and stationery.

2.6.2 Preparation

(a) Measure a distance of 20 meters and mark at the end with a cone or another sign, (b) Insert the MFT cassette into the tape recorder, (c) Make sure that the cassette tape has curled back to the start.

2.6.3 Test Administration Procedures

(a) Check the timeliness before turning on the audio player and then insert the available tape. Some instructions along with a brief explanation regarding the testee are available in the cassette tape. After that, the cassette issued a single "beep" sign at several regular intervals. The testees were expected to get to the opposite end to coincide with the time the first "beep" sound was made. Then the testee must continue to run at a set speed, with the aim of getting to one of both ends coincided with the sound of the next "beep".

(b) After one minute, the time interval between the two "beep" sounds will decrease, so the running speed must be increased. Running speed in the first minute is called level 1, the speed in the second minute is called level 2, and so on. Each level went on to level 21. The end of each run back and forth is marked by a single "beep" sound, while the end of each level is marked by the sound of "beep" three times in a row as well as commentary from the recording. It is important to know that the running speed at the beginning of this multi-stage running test is very slow. At level 1, within 9 seconds the testees must have completed 20 meters-long running for once.

(c) The testee must always place one foot exactly at or behind the 20th meter mark at the end of each run. If the testee reached one end of the running limit before the next "beep" sound, the testee must

turn around (by leaning on the turning axis of the foot) and wait for the "beep" sound signal then resumed running and adjusted the running speed to the next level.

(d) All testees must continue running as long as possible until they were no longer able to keep up with the speed that had been set, so the testee must voluntarily withdraw from the test. In some cases, the trainer conducting the test stopped the testee if she started to lag behind the expected step. If the testee failed to reach the distance of two steps before the edge when the "beep" sound came on, the testee was still given the opportunity to continue running twice in order to regain the necessary steps before being withdrawn. This multistage fitness test is maximal and progressive, meaning that it is quite easy in the beginning, but it is increasing and getting more difficult towards the last moment. To obtain good results, the testees must put their best effort while undergoing this test, and therefore the testee must try to reach the highest level possible before the test ended.

2.7 Data Analysis Technique

Before testing the hypothesis, it is necessary to test the prerequisites as parametric statistics. The researcher needs to make sure that the data analyzed must be normally distributed. For this reason, it is necessary to conduct a normality test, in addition to the homogeneity test of the data which aims to help better the analysis (Arikunto, 2006). Kolmogorov-Smirnov Test with the help of SPSS 16 was used for testing the normality of data distribution. Homogeneity was sought by the F test from the pretest and posttest data using SPSS 16 assistance. Data analysis in this study was carried out by comparing the pretest and posttest data after the training. If the value of t-count were smaller than the value of t-table, H_0 (Hypothesis 0) is accepted and if the t-count were greater than the value of t-table then H_0 is rejected. In this study, the t-test used SPSS 16.

3 RESULT AND DISCUSSION

This research aimed to study the effect of active recovery in sprint training on women's volleyball athletes aged 12-14 years.

The result of the test is shown below:

Table 1: Statistics of research on the stamina of women's volleyball athletes aged 12-14 years.

Description	Pretest	Posttest
Average	17.54	18.1
Median	17.4	18.5
Mode	17.1	18.5
Std. Deviation	2.36	2.22
Minimum	13.4	13.9
Maximum	22.1	22.6

Based on the results of the analysis of the t-paired sample t-test on the endurance data of female athletes aged 12-14 years, the t-value (6.260) > t (2010) was obtained. Research Procedure A table (1.71), and a p value (0.000) < 0.05, these results indicated that the t-value is greater than t-table. The results of the pretest and posttest described above have different results. The posttest results showed better results or an increase in athletes' endurance than the pretest results. Thus, it can be assumed that "there is an effect of active recovery in sprint training program on the endurance of women's volleyball athletes aged 12-14 years".

4 CONCLUSIONS

Based on the result and discussion of this research, it can be concluded that there is a significant effect from active recovery in sprint training on the endurance of women's volleyball athletes aged 12-14 years. From the t-test, there was a significant difference between pretest and posttest data p value of (0.000) < 0.05. The average score of VO2 Maks posttest was 0.919, better than the VO2Maks pretest score of 0.808.

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