

The Effect of Dumbbell Swing Exercise Method to the Arms Muscle Strength of Petanque Athletes

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Abstract—The study aims at finding out the effect of dumbbell swing to the arms muscle strength of Petanque sports training athletes in Bekasi. The method of the study was experimental method. The population of the study was 15 sports training athletes in Bekasi, in which 8 athletes of sports training was chosen as the sample of the study. The sampling technique was purposive sampling. Purposive sampling technique is a sampling which taken with specific purpose or intention. The result of the study showed that there was a significant effect of Dumbbell Swing exercise method to the arms muscle strength of Petanque sports training in Bekasi before and after the treatment. It was proven from the t-test, it was obtained $t_{value} = 11,58$ at $alpha\ 5\%$ or $(\alpha) = 0,05$. The conclusion of this study is that there is a significant improvement of the arm muscles strength because of the continuity of the exercise for 14 times in the Dumbbell swing exercise

Keywords— *Dumbbell Swing exercise method, Petanque, and sport training athletes in Bekasi*

I. INTRODUCTION

In the near future, Petanque sports will become one of sports that will be contested in the four-year event, the Regional Sports Week (PORDA) that will be held in 2018 in Bogor, West Java. Therefore, central KONI (Indonesian National Sports Committee) in west Java asked KONI Bekasi to hold a training camp to all selected athletes of Petanque sports in order to join the regional sports event.

In the sport training camp, there are some aspects that need to be concerned including technique, strategy, mental, and physical aspects of the athletes in order to get the maximum performance. In achieving maximum performance, athletes often face some problems, one of them are arm muscle strength problem when pointing and shooting.

One of ways to train the arm muscle strength of Petanque athletes is by doing Dumbbell Swing exercise method. The target of Dumbbell Swing exercise are the strength of chest muscle, shoulders muscle, abdominal muscle and arms muscle. Dumbbell Swing is an exercise that is done by standing with feet shoulder width apart, holding dumbbell with two hands and knees slightly bent, then swinging the dumbbell down between your legs, then swinging the dumbbell up align with the chest.

Based on researchers' observation, the arm muscle strength of Petanque sport training athletes in Bekasi was not adequate enough. It was seen when the athletes were doing shooting and pointing in a distance. The thrown boule while doing pointing was still far from the jack. Moreover, the throwing boule while shooting were not able to hit the opponent's boule directly. This finding is reinforced by the result of the arm muscle strength test of Petanque sport training athletes in Bekasi using Hand Dynamometer device that they were in the low category level. This result is based on the physical test result of the sport training athletes in Bekasi held by Indonesian National Sports committee (KONI) in Bekasi at the end of December 2016.

Based on the statements of problems above, the researchers are interested in conducting a research on the effect of dumbbell swing exercise method to the arms muscle strength of Petanque sports training athletes in Bekasi. Petanque is one of boules games that aims at throwing a metal ball closer to a wooden ball called cochonnet and the legs position should be in a small circle. This games is usually played in hard soil or smooth soil, but can be also played in grass, sand, or other soil surfaces [5]

The equipment of Petanque consists of 1) Boule, made of metal with diameter of min 7.05 cm – max. 8cm with weight range from 650 gram – 800 gram. 2) Jack, made of wood with diameter of 30 mm. 3) Meter gauge for 1 meter, 5 meter, and 10 meter. 4) Circle with diameter of 50 cm. 5) Petanque area, based on FIPJP rule, the standard of Petanque area for national and international competition is 15 meter x 4 meter, it can be played on clay soil or rock soil, it is not recommended to use grass area or concrete area.

A. Basic technique of playing Petanque Game

Pointing is a technique that aims at bringing the metal ball or boule close to the wooden ball (jack). There are three kinds of pointing technique namely *Rolling Point*, *Half Lobe Point*, and *High Lobe Point*. Shooting is a technique that aims at bringing the opponent's metal ball or boule of the far from the wooden ball or jack (target ball). There are three kinds of shooting namely *Full Iron Shot*, *In Front Shot* and *Rolling Shot*. The number of players that competed in Petanque sports

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C. How to Play Petanque

A toss coin is done to determine which team plays first. The team who win the toss start drawing the circle on the ground with the diameter of 35-50 cm. All players should throw their boules from the circle, by both feet stepping on the ground. The first player throws the jack to the 6-10 meter distance, at least 1 meter from the boundary. The player who throw the jack, then throw the first boule. Then the opponent players throw the boule as well. The closest boule is said to win for a while, and the opponent should throw the boule until close to the jack or close to the opponent's boules.

The game continues, players from the team who won the previous game, mark a new circle around the previous finish point of the jack, and throw the jack for the new game. The game ends, the point can give score when both of teams do not have boules anymore, or when the jack out of the game arena. The winning team get 1 point to every boules that close to the jack from the best boules placed by opponent. If the jack is thrown away from the game arena, there is no score point, except only one team still have boules which has not been thrown. The winner is the team who get 13 winning points first.

D. The Concept of Exercise Method

According to [5] the term of exercise comes from three words in English that contains several meanings such as: practice means activity to improve the skills of sports using various equipment that suitable to the goal and need of the sport; exercise means the main tool in the daily exercise to improve the quality of the human system organ function to facilitate the athletes in perfecting their movement; and training means a process of completing sports abilities that contains theoretical and practical theory, how to use methods, rules of implementation with scientific approach, the implementation of planned and regular training principles so that the goals of exercise can be achieved on time.

The general goals of the exercise are to apply and have conceptual skills and abilities and reveal the potential skills of athletes to reach the top of the achievement, while the specific goal of exercise is to improve the ability and readiness of athletes to reach the achievements. The main goal of the

exercise is to help athletes to improve their skills of their achievement as maximum as possible. To achieve this exercise there are four aspects that need to be concerned, such as: (1) physical exercise, (2) technical exercise, (3) tactic exercise and (4) mental exercise.

The exercise method based on James Tangkudung and Wahyuningtyas Puspitorini (2012: 46) is a lesson to develop the exercise, in which the word method is used for the conditions of the material activity. In selecting and defining methods, it depends on factors such as general goals, specific tasks, the specificity of the sports, the physical and mental maturity of the athletes, and the level of ability as well. Thus, determining the exercise method is expected to be able to improve the ability of athletes both physically (technical and skills) and psychologically (strategy and tactics), there are some various methods: (1) continual methods (2) repetition method, (3) variable method, (4) interval method, and (5) competition method.

E. The Concept of Dumbbell Swing

Dumbbell is a kind of free lifting tool that is used in weight training. This tool can be used in single way or in pairs by holding it one by one. *Swing* is a style of throwing a punch like swinging a hand from a distance. Dumbbell Swing according to [5] is a form of strength training that does not need *gym machine* tools or load or weight from outside of the body (*external resistance*). Chest muscles, shoulder muscles, abdominal muscles and arm muscles are the targeted muscles when doing *dumbbell swing*. How to do:

1. stand with your feet shoulder width apart
2. hold the dumbbell by using both hands
3. the knees are slightly bent
4. then swing the dumbbell down between your legs
5. lastly swing the dumbbell up again next to your chest

F. The Arm Muscle Strength

Strength according to Ismaryati (2006: 111) is the power of muscle contraction that is reached in a maximum effort. This maximum effort is done by a muscle or group of muscles to overcome a load.

According to [7] physiologically, muscle strength is the ability of a muscle or group of muscles to perform a maximum contraction towards resistance or load. Or it can be defined that muscle strength is the ability of the muscles to generate a tension against a load. Mechanically, muscle strength is defined as *force* that can be produced by a muscle or group of muscles in a maximum contraction.

Muscle according to Setiabudi Budiyo (2013: 5) is a connective network that has a main task to contract. It is used to move the parts of the body both consciously and unconsciously. About 40% of our weight body is muscle. The human body has more than 600 skeletal muscles. Muscles have thin and long cells. Muscles work by converting fat and glucose into movement and heat energy. Muscles have 3 types, there are smooth muscle, skeletal muscle and cardiac muscle.

According to the Indonesian Dictionary (2010: 720) arm is a part of human body from the wrist to the shoulder. While the arm according to Ucup Yusup, et al (2009: 43) has a function as a means of motion, it can attract, encourage moving, throwing objects and so on. The arms (right and left) are arranged by one upper bone, one inner arm bone, one radius bone, eight arm bones, five hand bones, and fourteen finger bones.

From the explanation above, it can be concluded that arm muscle strength is the ability of a muscle or group of muscles in contracting. It is done consciously or unconsciously which is achieved in a maximum effort to attract, push, and move objects.

II. METHOD

The method which is used in this study is experimental research. Experimental research is a research that is conducted by giving treatment to the sample, until the result is obtained whether there is a change or not [4]. Population is the overall subject of the study. The population of this research is 15 Athletes of Petanque Sport Training in Bekasi [4]. The sampling technique in this study is *purposive sampling* technique. It is a sampling technique with a specific purpose. The sample of this study is a part of the population that meets the criteria, while the criteria are: 1) male, 2) percentage of attendance 90%, and 3) willing to follow the treatment for 14 meetings. Based on these criteria, there are 8 athletes of Bekasi Petanque Sport Training were obtained.

The period of time of this study is four months and the data collection will be on July 10, 2017 to July 27, 2017 with 5 times exercises in a week. The research takes a place in Petanque Field, ISLAMIC UNIVERSITY 45, Bekasi. This is a place to train the Athletes of Bekasi Petanque Sport Training. This study uses *One-Group Pretest-Protest Design*. The experimental research was conducted in one experimental group without any comparison groups. In this test, there will be a pretest so that the data which is obtained by the researcher is more accurate.

O1 X O2

Fig. 2. Research Design

Information:

O1 : *Pretest* or Initial Test Value

X : Treatment

O2 : *Post Test* or Final Test Value

The instrument in this study is the Pull Dynamometer tool. The purpose of this test is to measure the components of arm muscle strength. The researcher only guides the test and records the score.

The study uses Pull Dynamometer test [7] with the following procedures; the purpose of this test is to measure the strength of the hand muscles in pulling the load, the tool that is used to do the Pull Dynamometer test is the Hand Dynamometer. the procedure to conduct the test is to stand

upright with the legs stretched and the view straight ahead. The hand holds the Pull Dynamometer tool with both hands in front of the chest. Arms and hands are straight with shoulders.

III. RESULTS AND DISCUSSION

The description of the processing data results from the *Dumbbell Swing* exercise that conducted on 8 samples in this study is presented as follows:

TABLE I. DESCRIPTION OF TEST RESULT DATA

Treatment	Statistic	Test Results		Enhancement
		Initial	Final	
<i>Dumbbell Swing</i>	Amount	226	266	38
	Average	28,25	33,25	4,75
	S	3,41	3,37	1,17

From the table above shows that the strength of arm muscle can be increased by giving *Dumbbell Swing* exercises. It can be seen from the average of Hand Dynamometer initial test before the treatment given that is 28.25. Then, the average becomes 3.37 after *Dumbbell Swing* exercise has given.

TABLE II. SUMMARY OF THE DATA NORMALITY TEST RESULTS

Data	N	\bar{X}	S	Lcount	Ttable	Conclusion
Initial Test	8	28,25	3,41	0,284	0,285	Normal Distribution
Final Test	8	33,25	3,37	0,1765	0,285	Normal Distribution

Based on the normality test results that is performed on the Hand Dynamometer test data at Lcount = 0.284, the value is smaller than the rejection limit at the *alpha* significance level of 5% or 0.05 which is 0.285. Thus, the Hand Dynamometer test data from 8 samples are normally distributed.

TABLE III. HYPOTHESIS TESTING OF THE TEST RESULTS

B	SB	Dk	Tcount	ttable	Conclusion
4,75	1,17	7	11,58	2,36	Rejected Hypothesis

Based on the test results of the research hypothesis testing shows that *Dumbbell Swing* exercises have a significant effect in increasing the strength of arm muscle, this is shown from tcount = 11.58 which is greater than ttable = 2.36 then the null hypothesis (Ho) is rejected. It means that *Dumbbell Swing* exercises truly give a significant effect on the enhancement of arm muscle strength.

After doing the *Dumbbell Swing* exercise, there is an increase in the strength of the athletes' arm muscle of Petanque sport training in Bekasi with an average 4.75 of increase. The enhancement of the strength of the athletes' arm muscle of Bekasi Petanque sport training is good. The results can be shown from the t test that is obtained t count = 11.58 at *alpha* 5% or (α) = 0.05.

There is an increase in the strength of arm muscle due to *continuous* training on *Dumbbell Swing* exercises. In this exercise, there are 12 meetings. The training load is done in stages in every exercise. The principle of exercise intensity that always increases in accordance with the training program is used in the *Dumbbell Swing* exercise so that the athletes' muscles of Petanque sport training are able to adapt first to the treatment given to avoid the severe muscle damage.

IV. CONCLUSION

Based on the results of the study it can be concluded that *Dumbbell Swing* exercises have a significant effect on the strength of the athletes' arm muscle of Petanque sport training in Bekasi with the results of t count = 11.58 at *alpha* 5% or (α) = 0.05.

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