



Differential Effect of Single Leg Tuck Jump With Depth Jump On Increasing Limb Muscle Power In Futsal Players at SMAN 15 Makassar

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ABSTRACT

This study aims to determine the difference in the effect of Single Leg Tuck Jump and Depth Jump on Increasing Limb Muscle Explosive Power in Futsal Players at SMA Negeri 15 Makassar with a sample of 18 people who fit the inclusion criteria, randomized into 2 groups, namely treatment group I given Single Leg Tuck Jump and treatment group II given Depth Jump. This study uses a vertical jump test to measure the explosive power of the leg muscles. The type of research used by the researcher is experimental research using a Quasi Experiment design. In this study, the pre-test-post-test two-group design method was used. Based on the analysis of the paired-sample t-test in the treatment data group I, the value of $p = 0.000$ was obtained. Treatment data group II obtained a p -value = 0.000. The data above for treatment groups I and II show that there is a significant effect of Single Leg Tuck Jump and Depth Jump. Then, based on the independent t-test, the p -value = 0.003, which means that there is a significant difference between treatment group I and treatment group II. This study concludes that the provision of Single Leg Tuck Jump exercises is more effective than Depth Jump exercises to increase leg muscle explosive power in futsal players.

Keywords: Single Leg Tuck Jump; Depth Jump; Muscle Explosive.

INTRODUCTION

Sport has an important role in making the name of an institution, and country proud. Every player who has practised is required to make improvements, and improve his performance. Every coach always tries his best so that the players he trains achieve the highest possible performance. One way is to do the exercises effectively and efficiently. The purpose of the exercise is to improve the physical fitness of a player with one of the selected activities to increase the skills and knowledge of a player. For players who have a good physique, the resulting performance is also good, so one of the

improvements is done by providing training that is following their respective sports. (Pratiwi et al., 2018).

One of the most popular sports in society today is futsal. Currently, futsal in Indonesia is growing rapidly, with the number of futsal fields in various cities and corners of the country proving that the Indonesian people love the game of futsal. Futsal is a ball game played by two teams, each consisting of five people. The goal is to get the ball into the opponent's goal, by manipulating the ball with the feet (Hermans & Engler, 2011). In futsal sports elements of the body, and fitness is needed to support the appearance and also play in a match ranging from speed, strength, endurance, balance, flexibility, agility, coordination, accuracy, reaction and explosive power. These fitness components are needed when competing to achieve maximum performance (Widnyana et al., 2015).

One of the most important components in sports, especially futsal is muscle explosive power. The explosive power of leg muscles can be interpreted as the ability of leg muscles to carry out activities quickly and strongly to generate power to overcome the given load (Dewi et al., 2018). Element explosive power is an important element in kicking during the game because a strong and accurate kick is also influenced by good muscle power. When doing a hard kick, it takes strong leg muscle power to reach the target and good accuracy. In addition, muscle explosive power also plays a role when making sudden changes in motion such as stopping and changing the direction and speed of running. However, the decrease in muscle power also affects the decrease in strength and accuracy in shooting. This is because the explosive power factor of the leg muscles has a significant relationship to shooting accuracy (Rahmi et al., 2020).

Based on the results of observations made on futsal players at SMA Negeri 15 Makassar, of all players 10 futsal players do not have the maximum muscle power value, especially for futsal players who have just joined this team, as a result when participating in a match the team's performance is not good. maximum in achieving the expected goals when competing. The decline in the explosive power of muscles for these players is a serious problem because, in addition to having an impact on the decline in the abilities of the players and teams, it is also an obstacle in developing team achievements in participating in futsal championships and tournaments.

One form of exercise that aims to increase muscle explosive power is plyometric training. Plyometric training is a form of exercise that can be used to improve the biomotor fitness of athletes, including muscle strength and explosive power. Plyometric training is a muscle explosive power training program with the characteristics of using

very strong and fast muscle contractions and is a combination of isometric exercises or utilizing muscle contractions when lengthening, isotonic or utilizing muscle contractions when shortening and isokinetic or by utilizing muscle contractions with a combination of lengthening and shortened (Fauzi, 2016). In addition, because plyometric exercises are performed with the characteristics of using very strong and fast muscle contractions it is appropriate to be a form of exercise to increase muscle explosive power (Booth & Orr, 2016).

Many forms of plyometric training can be given to increase the explosive power of a futsal player's leg muscles. Some that can be applied in this research are Single Leg Tuck Jump and Depth Jump. Single-Leg Tuck Jump is a plyometric exercise that uses one leg when jumping up (Higgins, 2011). In the study, the single-leg tuck jump plyometric exercise was included in the type of high-intensity plyometric exercise and this type of plyometric exercise was effective in increasing the vertical jump in soccer players (Shankar et al., 2012).

In in-depth jump plyometric exercises, the loading used is in the form of dynamic loading due to the jumping process during the exercise. This load, will cause hypertrophy in the muscles and result in increased muscle strength. In in-depth jump training, the height of the box or box used to perform exercises as high as 40 cm has a significant effect on increasing explosive power in the leg muscles (Thomas et al., 2009).

Seeing the importance of plyometric training on changes in muscle explosive power in futsal games. So the types of plyometric exercises that will be applied by researchers are Single Leg Tuck Jump and Depth Jump as exercises that will be aimed at changing muscle explosive power in the SMAN 15 Makassar futsal team. Therefore, researchers are interested in conducting this study to know the Differences in the Effects of Plyometric Exercise Single Leg Tuck Jump and Depth Jump on Increasing Limb Muscle Explosive Power in Futsal Players.

METHOD

This research is a quasi-experimental research with a pretest-posttest two-group design. There are 2 sample groups, group 1 is given a single leg tuck jump exercise, and group 2 is given a depth jump exercise. In this study, the population used was all 18 players of the futsal team of SMA Negeri 15 Makassar. At the implementation stage, the researchers selected the research population, namely futsal players at SMA Negeri 15

Makassar based on predetermined inclusion and exclusion criteria, so that later research samples were obtained. Then the researchers conducted random allocations to each sample by randomizing the sample into treatment group 1 and treatment group 2. Before being given treatment, each sample was measured for the explosive power of the leg muscles using a vertical jump test as pre-test data. After being given treatment according to a predetermined dose, the researchers re-measured muscle explosive power as post-test data in the study.

Pre-test and post-test data in each group will be analyzed, and post-test data between groups will also be analyzed to see differences in effectiveness. The results of the research will be presented in the form of tables and narratives, as well as reviewed in the discussion, then conclusions are made.

RESULTS AND DISCUSSION

Based on the results of the SPSS calculation, it was obtained that the mean age of treatment group 1 was 16.78 ± 0.833 years and the mean age of treatment group 2 was 16.78 ± 0.667 years. This shows that the average sample belongs to the adolescent age, both in treatment group 1 and treatment group 2.

Table 1.
Average Vertical Jump Test

Sample Group	Mean and Standard Deviation		
	Pre Test	Post Test	Difference
Treatment Group 1	34.56 ± 4.304	44.33 ± 4.610	9.78 ± 1.986
Treatment Group 2	33.56 ± 3.167	40.33 ± 4.062	6.78 ± 1.641

Based on the table above, the average value of the Vertical Jump Test in treatment group 1 is 34.56 ± 4.304 and post-test 44.33 ± 4.610 with a mean difference of 9.78 ± 1.986 , which means that there is an increase in muscle explosive power legs after giving the Single Leg Tuck Jump exercise.

In treatment group 2 the average value was obtained namely the pre-test of 33.56 ± 3.167 and post-test of 40.33 ± 4.062 with a mean difference of 6.78 ± 1.641 , which means that there is an increase in leg muscle explosive power after giving the Depth Jump exercise.

Table 2.
Vertical Jump Test Mean Difference Test Before and After Intervention
In Treatment Group 1 and Treatment Group 2

Data Group	Pre-test	Post-test	T	P
Treatment Group 1				

Mean	34.56	44.33	-14,770	0.000
Standard Deviation	4,304	4,610		
Treatment Group 2				
Mean	33.56	40.33	-12,387	0.000
Standard Deviation	3,167	4.062		

Based on the table above, in treatment group 1, the results of the paired sample t-test were obtained, namely the p-value <0.05, which means that giving the Single Leg Tuck Jump exercise can increase the explosive power of the leg muscles in futsal players. In treatment group 2, the results of the paired sample t-test were obtained, namely the p-value <0.05, which means that the provision of Depth Jump training can increase the explosive power of the leg muscles in futsal players.

Table 3.

Difference test mean difference in Vertical Jump Test between treatment groups 1 and treatment group 2

Data Group	Treatment Group 1	Treatment Group 2	T	P
Mean	9.78	6.78		
Standard Deviation	1,986	1,641	3,493	0.003

Based on the table above, the test results obtained independent sample t is p-value < 0.05 which means that there is a difference in the effect of Single Leg Tuck Jump with Depth Jump on increasing leg muscle explosive power in futsal players. Thus, based on the results of testing the hypothesis above, it can be concluded that the Single Leg Tuck Jump plyometric exercise is significantly more effective than the Depth Jump plyometric exercise to increase leg muscle explosive power in futsal players.

Single-Leg Tuck Jump is a plyometric exercise that uses one leg when jumping up. When jumping, the bent leg is directed to the chest after which it lands on the same foot and continues to jump again quickly (Higgins, 2011). In the application of the Single Leg Tuck Jump exercise, it is carried out alternately on both legs. In this exercise, the performance process of the stretch-shortening cycle occurs (Donald A. Chu & Gregory D. Myer, 2013).

In a study, it has been proven that giving a single leg tuck jump exercise is effective in increasing muscle power. In terms of implementation, it uses one of the legs so that in doing the jumping motion, the suspended load is greater. In addition, the dynamic loading that occurs causes the muscles to contract more strongly (Rusli, 2012). With this, it will cause hypertrophy in the muscles besides that, the speed of the muscles will also increase. An increase in muscle strength and speed will affect muscle explosive power (Putu et al., 2013).

The depth jump exercise is an exercise that aims to increase the explosive power of the leg muscles. This exercise begins by standing on a box as a tool used in this movement. This is followed by a downward movement with one foot in the direction of stepping in front of the box, then supporting with both feet and then trying to jump as high and fast as possible and ending with the position of both feet resting on the surface (Mcclenton et al., 2008).

In increasing leg muscle explosive power, depth jump exercises have a significant role. In in-depth jump training, the process of increasing muscle explosive power goes through a fast and short amortization phase, namely from eccentric to concentric motion (Mcclenton et al., 2008). The depth jump also utilizes the proprioceptive and elastic properties of muscle tissue to produce maximum energy, by stimulating mechanoreceptors to help increase muscle recruitment in a short time. Then the muscle spindle and Golgi tendon organs prepare the proprioceptive system during the depth jump process. Then the central nervous system receives this information to contract muscle tone so that in this condition it increases efficiency and strength in the muscles which affects increasing muscle power (Markovic & Jaric, 2007).

Several studies have also shown that depth jump exercises affect muscle explosive power. The depth jump exercise has a significant effect on increasing explosive power in the leg muscles. It is also explained that the height of the box used in the training process influences the great emphasis on the hip, knee and ankle muscle groups. This causes the muscles in the legs to contract or work stronger (Thomas et al., 2009).

Both the Single Leg Tuck Jump exercise and the Depth Jump exercise affect increasing the explosive power of the leg muscles as measured using the vertical jump test. The difference between the two plyometric training methods lies in the implementation technique. In the single-leg tuck jump, it is more dominant to use a pedestal with one leg when making a jump and is trained alternately. The depth jump is focused on jumping from the top of the box followed by a pedestal with both legs when making a jump. So it can be seen from the two single-leg tuck jumps that get a bigger load when resting than the depth jump.

CONCLUSIONS AND SUGGESTIONS

One of the most important components in sports, especially futsal is muscle explosive power or power. Therefore, it is important to maintain or increase muscle

power in a futsal player so that performance in the game is maximized. Plyometric training is a form of exercise that can be used to improve the biomotor fitness of athletes, including muscle explosive power. By providing single-leg tuck jump and depth jump exercises, both can increase the explosive power of a futsal player's leg muscles. However, with the single-leg tuck jump exercise, the increase in muscle explosive power was significantly more than the depth jump. Such improvement efforts must be accompanied by a planned, systematic, and personal training program with full supervision or consultation from the trainer. In addition, athletes must focus on maintaining their training to maximize their fitness to perform optimally in every match.

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