

The Effect of Leg Press and Leg Extension with One Leg Hop Progression and Double Leg Hop Progression to the Strength Leg Muscles and Power of Leg Muscles

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Abstract: The purpose of this research was to analyze about: (1) to analyze the results of the effects of exercise leg press and leg extension to leg muscle strength; (2) to analyze the results of the effects of exercise leg press and leg extension to leg muscle power; (3) to analyze the results of the effects of exercise one leg and double leg hop progression the leg muscle strength; (4) Analyzing the results of the exercise one leg and double leg progression the leg muscle power; (5) To analyze the effect of the difference between the exercise leg press and leg extension with one leg and double leg hop progression the leg muscle strength; (6) To analyze the effect of the difference between the exercise leg press and leg extension with one leg and double leg hop progression the leg muscle power. Target this research was student class of 2014 Sports Coaching Education State University of Surabaya with a total sample of 42 people.

Keywords: Exercise, leg press, leg extension and leg muscle

1. INTRODUCTION

Sport is a necessity for humans. Considered a necessity because humans are creatures in motion. Humans in carrying out their activities are never separated from the process of motion, because there is no life without movement. In its implementation, sport is universal because sports can be done by all levels of society. So big is the role of sports in human life, so that sports can be used as a means of achieving achievement.

According to Law No. 3 of 2005 concerning the National Sports System is to maintain and improve health and fitness, human achievement and quality, instill moral values and noble morals, sportsmanship, discipline, strengthen and foster national unity and integrity, strengthen national resilience, and promote dignity, dignity and honor nation.

According to Roesdiyanto and Budiwanto (2008: 17) training is a process of improving the quality of athletes consciously or to achieve maximum performance by being given physical and mental loads regularly, directed, gradually, increasing and over and over again in time. According to Sukadiyanto and Muluk (2011: 6) is the application of a plan to increase the ability to exercise which contains material, theory, practice, methods, and implementation rules in accordance with the goals and objectives to be achieved. Then Venerando in Roesdiyanto and Budiwanto (2008: 17) states that systematic repeated training aims to achieve better skills.

Physical condition is very important to be considered in every sports and is prioritized, because

physical condition is one of the most important elements for achieving maximum achievement. The main purpose of physical preparation for training is to increase the athlete's functional potential and develop bio motor abilities to the highest standards. The development of physical training in each exercise program is carried out through general physical stages, special physical preparation and building a high level of bio motor ability (Bompa 2009: 61).

Weight training is a form of exercise used to strengthen specific muscles that are needed to increase endurance and physical condition of athletes (Setijono, Matuankotta, and Hasan, 2001: 48). Weight training is a form of exercise that is quite numerous and varied. Researchers will still only use two forms of exercise, namely leg press and leg extension. The reason the researchers chose the two forms of exercise is based on the fact that these exercises dominate the formation of leg muscle strength and leg muscle power. Research from Rafan (2013) states that weight training can increase leg power.

Plyometric is a form of training that allows muscles to reach their maximum strength in the shortest possible time. Chu (1998: 5) over time, almost all sports use a form of plyometric training, especially to increase strength, speed and power. Muscle power according to (Kusnanik et al, 2011: 125) is defined as the product of strength (force) and speed (velocity). According to Chu (1998: 5), plyometric training is a form of training that allows muscles to reach maximum strength in the shortest possible time.

Plyometric training is a form of exercise that is quite numerous and varied, the researchers will still only use four forms of exercise, namely one leg hop progression and

double leg hop progression. The reason the researchers chose the four forms of exercise was based on the fact that these exercises dominate the formation of leg muscle strength and leg muscle power. Based on the results of research (Milic, et al, 2008) stated that plyometric exercises can have an effect on leg muscle strength. Chelly (2010) states "Plyometric training program improved the explosive power of leg muscles and performance level" here it is clear that this plyometric training program can increase explosive power while research by Sankarmani, et al. (2012) states that plyometric and weight training can increase muscle strength and power.

Based on the background description above, the researcher wants to provide an alternative exercise to improve physical condition specifically in increasing leg muscle strength and leg muscle power in male students of the 2014 State University of Surabaya Coaching Education. Leg hop progression and double leg hop progression on leg muscle strength and leg muscle power.

2. RESEARCH METHODS

This type of research is quantitative research using quasi experimental methods (quasi experimental). This research design uses Matching-only design. This plan does not use random as a way of inserting subjects into or with others based on certain variables (Maksum, 2012: 100).

The design of the research is described as follows.

	<i>Pretest</i>	<i>Treatment</i>	<i>Posttest</i>
M	T1 ₁	X ₁	T2 ₁
M	T1 ₂	X ₂	T2 ₂
M	T1 ₃	-	T2 ₃

Table 2.1. Research Design (Maksum, 2012: 100)

Information:

M: Matching

T1₁: Group 1 pretest leg muscle strength and leg muscle power

T1₂: Group 2 pretest leg muscle strength and leg muscle power

T1₃: Group 3 pretest leg muscle strength and leg muscle power

T2₁: Group 1 posttest leg muscle strength and leg muscle power

T2₂: Group 2 posttest leg muscle strength and leg muscle power

T2₃: Group 3 posttest leg muscle strength and leg muscle power

X₁: Leg press and leg extension exercises

X₂: One leg hop progression and double leg hop progression
- : Conventional Exercises

In this study, there are two variables that underlie this research. In the explanation (Maksum, 2012: 30) that

variables are classified into independent variables and dependent variables. Independent variables are variables that influence. This research uses simple random sampling technique. Simple random sampling is a sampling technique that provides equal opportunities for individuals who are members of the sample (Maksum, 2012: 55). In this study, the random technique that the researcher used was a lottery, namely the population was taken into a sample by writing the names of the 138 male students put in a place to be shaken. After shaking then taken one by one until a sample of 42 students was obtained.

The type of data that will be collected in this study is a test of leg muscle strength and jump height of the two types of exercise in each group. Then the test results will be recorded and calculated based on the group and type of exercise applied. Data analysis used descriptive statistical techniques and analyzed with the help of a computer program SPSS (Statistical Program for Social Science) 20.0.

3. RESULTS AND DISCUSSION

1) Group I (leg press and leg extension)

The results of the calculation of the paired t-test on the provision of one leg hop progression and double leg hop progression exercises by looking at the Sig. (2-tailed) 0.000, it can be concluded that H0 is accepted and Ha is rejected because of the Sig. 0.000 <value $\alpha = 0.05$. In other words, there is a significant effect of the provision of leg press and leg extension exercises on the increase in leg muscle power in male students of sports coaching education state University of Surabaya class of 2014.

2) Group II (one leg hop progression and double leg hop progression)

The results of the calculation of the paired t-test on the provision of one leg hop progression and double leg hop progression exercises by looking at the Sig. (2-tailed) 0.000, it can be concluded that H0 is accepted and Ha is rejected because of the Sig. 0.000 <value $\alpha = 0.05$. In other words, there is a significant effect of the provision of one leg hop progression and double leg hop progression exercises on the increase in leg muscle power in male students of sports coaching education state University of Surabaya class of 2014.

3) Group III (Control)

The results of the calculation of the t-test paired t-test in the provision of control group training by looking at the Sig. (2-tailed) 0.000, it can be concluded that H0 is accepted and Ha is rejected because of the Sig. 0.000 <value $\alpha = 0.05$. In other words, there is a significant effect of the control group on the increase in leg muscle power in the sports coaching education state University of Surabaya class of 2014, although the effect is not too big.

According to Setiawan, 2005 (in Setyawan, 2010: 16), "says that the ability of muscles to contract in order to generate tension against a resistance". From this theory, it is very clear that there is a significant effect of leg press and

leg extension exercises on leg muscle strength and leg muscle power.

These results provide clear evidence that leg press and leg extension are a form of exercise with a focus on increasing leg muscle strength and leg muscle power, which in fact can have a greater effect on male students of sports coaching education state University of Surabaya class of 2014.

There is a difference in the influence of leg muscle strength and leg muscle power where the leg press and leg extension exercises are better than the one leg hop progression and double leg hop progression exercises this happens because in the leg press and leg extension exercises the muscle contraction in the legs increases 2 times compared to the muscle contraction in the one leg hop progression and double leg hop progression exercises. When looking at the basis of "power, namely the product of speed and strength" (Bucher, 2009: 260). Based on this theory, it is known very clearly that the amount of strength is directly proportional to the amount of power, meaning that if the strength increases, the power will also increase.

Thus, when doing the movement, the work of the leg muscles will also be heavier so that the workload of the leg muscles in the leg press and leg extension exercises is heavier than the one leg hop progression and double leg hop progression exercises. The impact is that the leg muscle stress has increased twice in the leg press and leg extension exercises, thus the leg press and leg extension exercises are heavier in giving weight to the leg muscles. Therefore, the increase in leg muscle strength and leg muscle power between leg press and leg extension exercises with one leg hop progression and double leg hop progression hurdles is different, where the leg muscles in the leg press and leg extension groups have increased 2 times more.

Based on the results of the exercise and the mean test, it is stated that the leg press and leg extension exercises give better results than the one leg hop progression and double leg hop progression exercises on leg muscle strength and leg muscle power in male students of sports coaching education state University of Surabaya class of 2014. This can be seen from the leg press and leg extension training process which is done with a heavier process, while the one leg hop progression and double leg hop progression are a little easier. From the significant test results using the post hoc test, it states that there is no significant difference in the effect of the results of giving leg press and leg extension exercises on leg muscle strength and leg muscle power in male students of sports coaching education state University of Surabaya class of 2014. This is in line with what Johnson (2012:4) said that plyometric training is a type of exercise that is used to increase strength and explosive power. The results of a study conducted by Sankarmani, et al (2012) showed a more significant increase using plyometric training on the explosive power of leg muscles than ordinary weight training.

Weight training exercises can also increase leg muscle power and strength. Research from Hoffman (2012:

71) weight training is a sport modality which is well-known for its role in increasing performance by increasing muscle strength, power, and speed, hypertrophy, muscle endurance, motor performance, balance and coordination. According to Chandler and Brown (2008: 279) that "Weight training is a common type of strength training to develop strength and size of the skeletal muscles. Meanwhile, Rahimi, et al (2005) stated that weight training has an effect on muscle strength and power. The literature review above shows that weight training can also increase power and strength, especially in the legs.

4. CONCLUSION

Based on the results of the research and discussion described in the previous chapters, several research conclusions can be drawn as follows:

1. There is a significant effect of the leg press and leg extension exercise program on leg muscle strength
2. There is a significant effect of the leg press and leg extension exercise program on leg muscle power
3. There is a significant effect of the one leg hop progression and double leg hop progression training program on leg muscle strength
4. There is a significant effect of the one leg hop progression and double leg hop progression training program on leg muscle power
5. There is a difference in the effect of leg press and leg extension exercises with one leg hop progression and double leg hop progression exercises on leg muscle strength. Leg press and leg extension exercises gave a better effect than the one leg hop progression and double leg hop progression exercises and the control group on the increase in leg muscle strength.
6. There is a difference in the effect between leg press and leg extension exercises with one leg hop progression and double leg hop progression exercises on leg muscle power. Leg press and leg extension exercises gave a better effect than the one leg hop progression and double leg hop progression exercises and the control group on the increase in leg muscle power.

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