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THE EFFECT OF PLYOMETRIC EXERCISES (JUMPING LUNGES AND SQUAT JUMP) ON HAPKIDO DOLLYO CHAGI'S KICK POWER CENTRAL LAMPUNG HAPKIDO ATHLETES

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Abstract
This study aims to determine the effect of plyometric training (jumping lunges and squat jumps) on the kick power of hapkido dollyo chagi Central Lampung hapkido athletes. The research method used in this research was a descriptive experiment and the samples used were 40 male Hapkido athletes (aged 16-18 years), Central Lampung, totaling 40 people. The instrument used was the dollyo chagi power test. The research results show that: 1). There is a significant influence from Jumping Lunges training on the kick power of hapkido dollyo chagi Central Lampung hapkido athletes with a percentage increase of 7.6% with a calculated t value > t table, 7.967 > 1.729 which means it is very influential. 2). There is a significant influence from Squat Jump training on the kick power of hapkido dollyo chagi Central Lampung hapkido athletes with a percentage increase of 8.4% with a calculated t value > t table, 11.544 > 1.729 which means it is very influential. So it can be concluded that plyometric exercises (jumping lunges and squat jumps can both be used to increase the power of dollyo chagi in Central Lampung hapkido athletes.

Keywords*: Plyometric, Jumping Lunges, Squat Jump, Hapkido, Dollyo Chagi"s*

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INTRODUCTION

The Hapkido martial arts sport in Indonesia, especially in the Lampung area, is experiencing quite rapid development. All districts/cities in Lampung province have Hapkido administrators and trainers. Where the districts/cities compete with each other to produce outstanding athletes who can bring a good name to their respective districts in the events held. Hapkido has also been included as a martial arts sport which is contested at XXI PON in Aceh-Medan and in the previous PON it also held an exhibition at XX Papua PON 2021. In the Hapkido match there are many categories that are competed in, including, Hyung (Kicks), Hoshinsul (Demonstration). martial arts techniques), Nakbop (jumping

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technique), Daeryun (fighting). In the Daeryun (fighting) category there are several techniques that can be used such as punches, throws, locks and kicks. In Hapkido competitions, Dollyo chagi is one of the most frequently used kick techniques. Dollyo chagi is a basic Hapkido technique that needs to be taken into account because it is a simple, fast and easy technique to perform so many athletes often use it in competitions. Dollyo chagi can be used as a kick attack or counter attack. This kick is a form of semi-circular kick whose power source is body movement, hip throw and leg extension flexion, this kick is often combined with additional movements to form various kick variations. (Yoyok Suryadi, 2002: 34).

Dolyo chagi is a basic kick that an athlete must master from the first time an athlete trains. Inability to master dolyo chagi skills will affect all forms of advanced kicks which are a combination of dolyo chagi kicks. Such as the dolke chagi spinning kick which is a combination of a spinning step with a dolyo chagi, badad chagi counter kick which is a combination of slid back and dolyo chagi. Dolyo chagi also has several advantages and disadvantages as follows: The advantages of the dolyo chagi kick technique are: (1) The technique is simple and easy to master, (2) Can produce great power if done with the correct technique, (3) Easy to combine with other techniques. Meanwhile, the weaknesses of the dollyo chagi kick technique are: (1) Easy to avoid, (2) Easy to catch and slam, (3) Easy to predict when you want to kick.

There are several factors that are very influential in producing quality dollyo chagi kicks, such as technical skills, mental skills and kick power. Technical skills are individual capabilities in carrying out a specific task. The technical skill factor in doing the dollyo chagi kick is also very influential because when doing the kick you have to follow the technique taught and you can't do it carelessly.

Kicking technique that is carried out well and correctly will definitely support the athlete to be able to kick optimally. How to do dolyo chagi is in the following order: (1) Starting with an Ap seogi stance, the leg that hits or hits the target is the

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back leg, lift the back leg and make a circular line with the back leg, (2) Kick using the back leg. ball of foot (ap chuk) and toes folded upwards, (3) Followed by dropping the body with the kicking foot placed in front. In the researchers' observations during training and competitions, the techniques used by athletes were quite good, but more intensive training was needed so that the dolyo chagi kick could be mastered optimally.

Mental is everything related to an individual's thoughts, emotions and cognitive functions. The mental factor is also very influential in performing the dolyo chagi kick because when performing the kick the athlete's mental condition must be in a stable state. An unstable or down mental condition causes the kick not to be optimal so that it can be easily anticipated by the opponent. In the researchers' observations during the competition, the athlete's mental condition appeared to be quite stable, but sometimes at times it was still not stable and there was a need for more mature mental training so that in competition the kicks could come out optimally.

Kick power is a combination of maximum strength and maximum speed of the kick. Kicks, especially dolyo chagi which have power, can not only produce points, but can also have other effects on the opponent. Kicks that have a lot of power often cause injury to the hand that is doing the parry, and other effects can even cause the opponent to lose concentration to carry out a counter attack. A kick that produces points is of course a kick that has a lot of power and is right on target. From the results of the researchers' observations and observations, several athletes who performed dollyo chagi still lacked power and the impact given was still lacking so that their kicks did not come out as points and in fact the kicks they executed were easy to parry and catch because they lacked impact. Some athletes also don't use the correct technique when performing dollyo chagi so that their kicks can't come out optimally and are still easy to parry or catch.

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METHOD

Research methods are a series of methods or activities for carrying out research that are based on basic assumptions, philosophical and ideological views, questions and issues faced (Sukmadinata, 2007: 52). The method used in this research uses a descriptive experimental method, namely a method used to describe or analyze research results and look for the effect of certain treatments on others under controlled conditions. According to Suharsimi Arikunto, the experimental method is a way to look for causal relationships between two or more factors that are deliberately caused by researchers. In other words, experiments are always carried out with the aim of seeing the cause and effect of a treatment. The population in this study were Central Lampung Hapkido athletes. To take samples in this research, the author was guided by the opinion of Arikunto who stated: "Just to estimate, if there are less than 100 subjects, it is better to take all of them so that the research is population research, on the other hand, if the subjects are greater than 100, between 10-15 can be taken. % or 20-25%.

Based on the opinion above, the author took a sample of 20% of the population of hapkido athletes in Central Lampung. Thus, the number of samples in this study was 40 male Hapkido athletes aged 16-18 years and to divide the group into 2 parts, Ordinal pairing was used, which is dividing the group into two with the aim of both having equality or equal abilities (Sugiyono, 2018).

The division of experimental groups was based on kick power ability in the initial test. After conducting the pretest, the initial test results are ranked. The results ranked 1 are placed in group A, the results ranked 2 and 3 are placed in group B, the results ranked 4 and 5 are placed in group A and so on until the end. Thus, before being given treatment, the two groups were groups with equal abilities. After forming 2 groups, group A was given the Jumping Lunges training treatment and group B was given the Squat Jump training treatment. If in the end there is a difference, then this is due to the influence of the treatment given. This research was carried out at Dojang HLTC Seputih Raman, Central Lampung. The research

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was carried out for 5 weeks with 16 meetings and training carried out 3 times. Research variables according to Sugiyono (2017: 38) are anything in whatever form that the researcher determines to be studied so that information about it is obtained, then conclusions are drawn.

From the ready position (ap seogi) the Tester performs dolyo chagi towards the sandsack, the sandsack will swing followed by the movement of the iron cable which is used to measure the time of change in its movement. At the start of the movement, the sandsack will touch the on cable held by the officer, and at a predetermined distance of 0.5 meters the sandsack will hit the wall to which a current-conducting plate has been attached which is connected to the off-stop cable. The swing time of the sandsack is then adjusted to the power table, for example if the sandsack moves for 0.16 seconds then the explosive power of the kick is 62.5 Kg.m/s.

RESULT AND DISCUSSION

This research was conducted with Plyometric training experiments (Jumping Lunges and Squat Jump) on the power results of hapkido dollyo chagi kicks by Central Lampung hapkido athletes. Overall, this activity is carried out in three stages, namely the first is a pre-test activity to determine the initial abilities of the sample, after the data is obtained it is then used to divide the sample into two groups using the ordinal pairing technique which will be given Plyometric exercises (Jumping Lunges and Squat Jump), and finally a post test was carried out. To get an idea of the distribution of the data above, it includes the average, standard deviation, total, maximum value and minimum value. The description of the research data is as follows:

Pre Test and Post Test Results of the Jumping Lunges Training Group

Based on the results of the pre-test and post-test, the power of the dollyo chagi kick in the group given the Jumping Lunges exercise was as follows:

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Table 1. Description of Jumping Lunges Group Data

Data	N	Sum	Average	SD	Max	Min
Pre Test	20	803	40,1	5,091	50	32
Post Test	20	862	43,15	5,323	53	37

In the table above you can see the sum value, average value, standard deviation value, maximum value and minimum value of the results of the pre test and post test power dollyo chagi in the Jumping Lunges group. The average value of the pre-test results is 40.1 with a standard deviation of 5.091, a maximum value of 50 and a minimum value of 32. Meanwhile, the average value of the post-test results is 43.15 with a standard deviation of 5.323, a maximum value of 53 and a minimum value of 37.

Pre Test and Post Test Results of the Squat Jump Training Group

Based on the results of the pre-test and post-test, the Dollyo Chagi kick power in the group given the Squat Jump training was as follows:

Table 2. Description of Squat Jump Group Data

Data	N	Sum	Rerata	SD	Max	Min
Pre Test	20	796	39,8	4,841	48	32
Post Test	20	863	43,15	5,324	50	36

In the table above you can see the sum value, average value, standard deviation value, maximum value and minimum value of the Dollyo Chagi power pre-test and post-test results in the Squat Jump group. The average value of the pre-test results is 39.8 with a standard deviation of 4.841, a maximum value of 48 and a minimum value of 32. Meanwhile, the average value of the post-test results is 43.15 with a standard deviation of 5.324, a maximum value of 50 and a minimum value of 36.

Normality Test

Table 3. Normality test results for jumping lunges and squat jumps

Test	**Class**	**N**	***Sig.***	**Information**
Pretest	Jumping Lunges	20	0,704	Normal
	Squat Jump	20	0,523	Normal
Posttest	Jumping Lunges	20	0,086	Normal
	Squat Jump	20	0,105	Normal

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Based on the normality test above, it is known that the significance value is > 0.05, so it can be concluded that the normality assumption is met.

Homogeneity Test

Table 4. Results of the homogeneity test for jumping lunges and squat jumps

Test	Sig.	Information
Pretest	0,805	Homogen
Posttest	0,132	Homogen

Based on the homogeneity test above, it is known that the significance value is > 0.05, so it can be concluded that the homogeneity assumption is met.

Hypothesis Testing

Table 5. T-Test results

Test	p-value	Information
Pretest	0,825	No Difference
Posttest	0,974	No Difference

Based on the results of the t test above, it is known that the significance value is > 0.05, so it can be concluded that there is no difference in the results.

Simple Regression Analysis with SPSS

Table 6. Effect Test Results By Comparing The Significance Value With A Probability Value Of 0.05

Variable	Significance Value	Probability Value	Inform.
Pre Test Jumping Lunges (X) & Post Test Jumping Lunges (Y)	0,00	0,05	Effect
Pre Test Squat Jump Lunges (X) & Post Test Squat Jump (Y)	0,00	0,05	Effect

Table 7. Effect test results by comparing t count and t table

Variable	t count	t table	Inform
Pre Test Jumping Lunges (X) and Post Test Jumping Lunges (Y)	7,967	1,725	Effect
Pre Test Squat Jump Lunges (X) and Post Test Squat Jump (Y)	11,544	1,725	Effect

DISCUSSION

The discussion of the results of this research aims to provide further interpretation of the results of the data analysis that have been presented. In this study, a significant increase was obtained in the group studied. Both groups, both

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jumping lunges and squat jump training, provided an increase in the power results of dollyo chagi kicks. This is proven by the average post-test score which is greater than the average pre-test score. It is known that the average posttest score for the jumping lunges group is 43.15 and the average pretest score is 40.1 while the average score The posttest average for the squat jump group was 43.15 and the pretest was 39.8.

Referring to these results, it can be stated that there was an increase between the pretest and posttest. The results of data processing also show a significance value of 0.00 in the jumping lunges group, and 0.00 in the squat jump group, so that the results of these two exercises show that there is a significant influence on the power of the dollyo chagi kick because the significance value is <0.05.

The third hypothesis put forward is that there is a significant influence between Plyometric (Jumping lunges) and Plyometric (Squat Jump) training on the kick power of Central Lampung athletes' Hapkido dollyo chagi. Based on data analysis, it was found that there was an average increase between the pretest and posttest for the two exercises of 7.6% for jumping lunges and 8.4% for squat jumps. So it can be concluded that H3 is accepted and HO3 is rejected because it states that there is no significant relationship between Plyometric (Jumping lunges) and Plyometric (Squat Jump) training on the power of the Hapkido dollyo chagi kicks of Central Lampung athletes.

The results of this research are also in line with research conducted by Taheri. E, Nikseresht. A, and Khoshnam. E with the title The Effect of 8 Weeks of Plyometric and Resistance Training on Agility, Speed and Explosive Power in Soccer Players which says that plyometric training can increase power with a significance value of 0.000 <0.05 because the plyometric training method causes an increase in power in the subject with production Rapid strength and speed and nervous system improvement after eight weeks. There are other opinions that are in line according to Stojavonic. E, Ristic. V, and McMaster. D. T (2016) said that the current systematic review shows that plyometric training can improve power

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performance in athletes regardless of age, type of sport and level of competency. Exercise duration also appears to influence the effectiveness of plyometric exercises

CONCLUSION

Research conducted on Central Lampung Hapkido athletes by doing Jumping Lunges and Squat Jump exercises to increase the power of Hapkido dollyo chagi kicks obtained the following conclusions: 1) There is a significant influence of Plyometric Jumping Lunges training on the power results of hapkido dollyo chagi kicks in Central Lampung Hapkido athletes. 2) There is a significant influence of Plyometric Squat Jump training on the power results of hapkido dollyo chagi kicks in Central Lampung Hapkido athletes. 3) Plyometric Training Jumping Lunges and Squat Jumps can both be used in Central Lampung Hapkido training.

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