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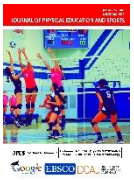

The Effect of Plyometric Training Method and Leg Flexibility toward Side Kick Speed on Male Fighter of Terlat Sakti Club Bengkulu

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Abstract

This research was motivated by lack of explosive power on male fighters of Pencak Silat Terlat Sakti Club Bengkulu, which resulted in the lack of maximum speed in doing a side kick. The purpose of this study was to find out and analyze: the differences in the influence of single-leg hurdle hop and single-leg bounding plyometric exercises towards the speed of side kick, the differences in the influence between fighters who have high and low leg flexibility towards the speed of side kick, and the interactions between plyometric exercises and leg flexibility towards the speed of side kick. This study uses an experimental design with a 2x2 factorial design. The data analysis technique uses Analysis of Variants (Anova) with a significance level (α) of 0.05. The independent variables of this study are the plyometric exercise. High and low leg flexibility considered as attribute variables and the dependent variable is the speed of side kick. The results of this study reveal that: there is a difference in the speed of the side kick on the fighter given in single-leg hurdle hop training with the fighter given in single leg bounding training, there is a difference in side kick speed on fighters who have high leg flexibility with fighters who have low leg flexibility. Thus, it can be concluded that plyometric exercises, as well as leg flexibility, significantly influence the side kick speed on male fighters of Pencak Silat Terlat Sakti Club Bengkulu.

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INTRODUCTION

There are many types of sports that are popular among Indonesian people, one of which is Pencak Silat martial arts. Pencak silat is a martial art rooted in the Malay family and is part of the Indonesian culture, which must be preserved (Ariesbowo, 2008).

Pencak silat, as an authentic Indonesian martial art, has been recognized as one branch of the traditional sport that has developed overseas. The popularity of Pencak Silat has contributed to the development of research interest in the field of martial arts in recent years. This is evidenced by many scientific journals in the field of martial arts published and displayed at the Sports Congress (Vertonghen, and Theeboom, 2010).

Sumantri, Sulaiman, and Nasuka (2016) say that Pencak Silat martial arts is a self-defense system that has a unique movement that involves all components of the human body through a series of basic techniques in the form of lines, punches, kicks, catches, falls and locks. Along with the development of the times, Pencak silat, especially as a martial art, has basic or fundamental techniques. According to Nugroho (2001) basic techniques are the foundation where the movements are still easy and simple whereas Hariono, Rahayu, and Sugiharto (2008) states that the basic motion of Pencak Silat is the movement that underlies the fighter after knowing the basic attitude to perform dynamic movements namely the eight directions of the wind, steps, and pattern of steps.

According to Lubis, and Wardoyo (2016) there are eight basic techniques in Pencak Silat including; Easel, tide attitude, step pattern, groin, attack, catch, lock, and fall. As one part of the basic techniques of limb/foot attack, the kick is one of the important aspects that must be mastered by the fighter to get the score when competing.

According to MUNAS II Persinas ASAD (2005) the kick that was assessed in the Pencak Silat match was a kick that hit the body of a target which was the body part except the neck up and genitals. Kicks that are allowed in the matching category are of several kinds, including; front/ straight kicks, crescent kicks, back kicks, double kicks, *jejag* kicks, and side (T) kicks.

Side (T) kick as one of the most frequently used kick techniques, is very effective for carrying out long-range attacks because the range on this kick is longer than other kicks (Nugroho, 2017). A fighter who has a good and fast side (T) kick technique, can easily get points from opponents when competing.

The speed of the side (T) kick in Pencak Silat requires practice following the conditions and development of the previous technique. Nacleiro, Moody, and Chapman (2013) says that the increased knowledge in sports science today has produced different criteria for organizing training programs that are often dominated by the tendency to design exercises based on specific adaptations and achieved results during the training process.

A fighter that has good leg speed and strength will be easier to kick. The combination of strength and speed or direction of maximum muscle force with maximum speed will produce power (Widiastuti, 2011). According to Sukadiyanto (2005) power is the product of speed and strength. This means that by giving proper power training to the fighter automatically, it will also increase their speed and strength in doing side (T) kicks.

Power training needs to be done well and correctly because it will affect and increase the biomotor component including strength, speed, muscle endurance, coordination, explosive power, flexibility and agility (Harsono, 2018). One type of training method that can increase explosive power to support side (T) kick speed is the Plyometric training method.

According to Chu, and Mayer (2013) plyometric training is a training program that is used to develop strength and speed for elite fighters. A fighter needs to have the power of the limbs to survive so that the production of leg power can be maximal and have high intensity. Short-term plyometric exercises can increase the explosive power of the limb muscles and speed (Chelly, Ghenem, Abid, Hermassi, Tabka, and Shephard, 2010) increase biomotoric freshness, strength, speed, and power (Karyono, 2016) and

are effective in increasing the strength and power of fighters (Pietraszewski, and Rutkowska-Kucharska, 2011).

Plyometric exercises that will be used in this study are single-leg hurdle hop and single-leg bounding. Single leg hurdle hop is the exercise of jumping forward using one foot and continuously passing the predetermined obstacles with a strong and fast explosive while the single-leg bounding is a movement to jump forward as high and as far as possible by using the legs alternately and the position of the knee as close as possible to the chest.

Side (T) kick speed is also inseparable from the influence of leg flexibility. The flexibility of the legs of a fighter is determined by the extent of the narrow space of the joint. Flexible, elastic, and regular limb movements have a positive impact on kicks. According to Irianto (2004) the quality of flexibility is influenced by joint structure, the quality of tendon and ligament muscles, age, and temperature. As support for the kicking motion, higher leg flexibility will provide a relatively better advantage compared to lower leg flexibility.

Based on the results of observations and preliminary measurements carried out by the researchers, it was found that the lack of explosive power of the male fighters of the Pencak Silat Terlat Sakti Club in Bengkulu resulted in a lack of speed in performing side (T) kicks. Therefore, the objectives to be achieved in this study were to determine the effect of the plyometric training method and leg flexibility toward the speed of side (T) kicks of male fighters at the Pencak Silat Terlat Sakti Club Bengkulu. The results of this study are expected to be a reference material for further research in developing training methods to increase the speed of doing kicks in Pencak Silat. So that the speed of the kick technique can develop well so that the achievements of Pencak Silat are increasing.

METHODS

This study used an experimental method with a 2x2 factorial design. The data analysis technique uses Analysis of Variant (ANOVA) at a significance level (α) of 0.05. The independent variables in this study are the single-leg hurdle hop training method and single-leg bounding. High and low leg flexibility defect as attribute variables and the dependent variable is side (T) kick speed. The population in this study were 37 male fighters from Pencak Silat Terlat Sakti Club Bengkulu. The sampling technique used purposive sampling technique by carrying out leg flexibility test using a side split test with a sample of 20 fighters.

Retrieval of data in this study through initial tests and final tests or pre-test and post-test by performing a side (T) kick speed test. In this study, treatment was given for 16 meetings.

RESULTS AND DISCUSSION

The hypothesis testing of the research is based on the results of data analysis and interpretation of the analysis of variance. To find out the difference, a two-way ANOVA test is needed. The ANOVA summary results show significant differences, as shown in the following table 1.

Table 1. The Result of Two-way Annova Test

Source	df	Mean square	F	Sig.
Corrected model	3	543,089	65.831	.000
Intercept	1	.000	.000	1.000
Plyometric exercises	1	731.743	88.699	.000
Leg shape	1	698.972	84.727	.000
Plyometric exercises * Leg shape	1	198.553	24.068	.000
Error	16	8.250		
Total	20			
Corrected total	19			

Hypothesis 1 states that there is a significant difference in effect between the single-leg hurdle hop and single-leg bounding training methods on the side (T) kick speed tested using the ANOVA test and obtained F_{value} = 88.699 with a significance value of 0.000. The results of this calculation are consulted with table F with the numerator dk = 1 (b-1) and denominator (kb (n-1)) with a significance level of 0.05 obtained F_{table} = 3.59, because F_{value} = 88.699 > F_{table} = 3.59 with a significance level of 0.000 < 0.05 then H_a which reads: "there is a significant difference in influence between the method of single-leg hurdle

hop training and single-leg bounding" was accepted.

Hypothesis 2 states that there is a difference in the effect of high and low limbs on the speed of the side (T) kick on male fighters of Pencak Silat Terlat Sakti Bengkulu, which was tested using ANOVA test and obtained F_{value} = 84.727 with a significance value of 0.000. The results of this calculation are consulted with table F with the numerator dk = 1 (b-1) and denominator (kb (n-1)) with a significance level of 0.05 obtained F_{table} = 3.59, because F_{value} = 84.727 > F_{table} = 3.59 with a significance level of 0.000 < 0.05 then H_a which reads: "there is a difference in influence between high and low leg flexibility toward the speed of side (T) kicks on male fighters of Pencak Silat Terlat Sakti Club Bengkulu " was accepted.

Hypothesis 3 states that there is an interaction between the plyometric training method and leg flexibility toward the speed of side (T) kick on male fighters of Pencak Silat Terlat Sakti Club Bengkulu, the ANOVA test, F_{value} = 24.068 with a significance value of 0.000. The results of this calculation are consulted with table F with the numerator dk = 1 (b-1) and denominator (kb (n-1)) with a significance level of 0.005 obtained F_{table} = 3.59, because F_{value} = 24.068 > F_{table} = 3.59 with a significance level of 0.000 < 0.05. So H_a which reads "there is an interaction between the plyometric training method and limb determination on the speed of sidekicks (T) male fighters of Pencak Silat Terlat Sakti Club Bengkulu" was accepted.

Plyometric exercise is the exercises that are suitable for improving power and side (T) kick speed because plyometric training is one type of exercise that is fast and explosive, which is a combination of strength, power, and speed as stated by Chu, and Mayer (2013) that plyometric training is considered as an exercise program used to develop strength, power, and speed for elite athletes.

Kumar (2015) states that plyometric training is a specific job for increasing explosive power. This is a training method that is suitable for use in conjunction with other power development methods in a complete training program to improve the relationship between maximum strength and explosive power.

The interaction between the method of plyometric training and leg flexibility towards the side (T) kick speed is caused by the form of training on single leg hurdle hops and single-leg bounding having the same movement pattern that is exercising leg muscle strength. This is related to the side (T) kick speed test, which emphasizes a strong and fast explosive during the implementation. Even though leg flexibility is one of the biomotor components inside (T) kick movement, but if the leg power is not properly trained, the speed of doing a side (T) kick will not be maximal.

A trainer must be good at choosing which training method is appropriate to be applied during exercises. Based on the above explanation, there is an interaction between plyometric training method and leg flexibility toward the speed of side (T) kick. A fighter who has high or low leg flexibility is more likely to be given a single leg hurdle hop training to increase side (T) kick speed rather than single-leg bounding training method.

CONCLUSION

Based on the results of the analysis and discussion above, it can be summarized as follows: There is a significant difference in effect between plyometric training method single-leg hurdle hop and single-leg bounding toward the speed of side (T) kick on male fighters of Pencak Silat Terlat Sakti Club Bengkulu. There is a significant difference in influence between the fighter who has high and low leg flexibility toward the speed of side (T) kicks on male fighters of Pencak Silat Terlat Sakti Club Bengkulu. There is an interaction between the plyometric training method and leg flexibility toward the speed of side (T) kicks on male fighters of Pencak Silat Terlat Sakti Club Bengkulu.

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