

The Effect of Plyometrics Exercises on Sabbit Kick Speed in Pencak Silat Athletes

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Abstract

Background and aim. Pencak silat requires athletes to master effective kicking techniques, particularly the crescent (sickle) kick, which depends on speed and explosive leg power. However, observations at Pat Ban Bu Air Tawar school indicate that athletes' sickle kick speed is still relatively low due to limited specific training methods. Therefore, this study aimed to examine the effect of plyometric training on improving the speed of the sickle kick in pencak silat athletes.

Methods. This study employed an experimental method using a one-group pretest–posttest design. The research was conducted over approximately one month involving 9 athletes selected through total sampling. Data were collected using a sickle kick speed test before and after treatment. Data analysis included normality testing using the Lilliefors test and hypothesis testing using a paired sample t-test at a significance level of 0.05.

Results. The results showed an increase in sickle kick speed after the implementation of plyometric training. The pretest mean score was 24.44, while the posttest mean increased to 25.89. The hypothesis test indicated a significant effect ($t = 4.39 > t \text{ table} = 1.85$), confirming that plyometric training contributed to improving athletes' kicking speed.

Conclusions. Plyometric training has a significant effect on increasing the speed of the sickle kick in pencak silat athletes. This training method can be recommended as an effective approach to enhance explosive leg power and improve overall athletic performance.

Keywords: *Pencak Silat; Plyometrics Exercise; Sickle Kick Speed.*

1. Introduction

Achievement sports require great participation from all angles in the implementation of training and the advancement of sports achievements, both from the interests and talents of athletes, from coaches with structured and systematic training preparation methods, and in addition the government with steps to find skilled athletes through continuous competitions and competitions as well as infrastructure facilities with the help of technological advances that support (Hidayat & Witarasyah, 2020). Of the many sports that have been achieved, pencak silat is one of the sports that is quite popular among some people in Indonesia. Pencak silat is also a popular sport in Indonesia and even in the world, this can be seen from pencak silat schools and various activities carried out in competitions such as competitions between

schools, between agencies, between regions, and others. In achieving achievements, athletes must be able to dominate all parts of pencak silat, such as kicks, punches, pushes, dodges, punches, cuts and falls. Of the different basic methods, the kicking strategy is one of the procedures commonly used by athletes both in defending themselves against enemies and types of pencak silat matches. For example, the number of matches, singles, doubles and teams (Nurul Ihsan et al., 2018).

In the foot attack technique in pencak silat, kicking is a requirement that a martial artist must have. By learning the correct kick technique, it must be helped by good conditions, tactics, techniques and mentality in making kicks, then the ability to kick will make the kick effective and on target. An athlete is required to master the correct

and accurate kicking technique. Because the most dominant kick technique is used by athletes. A crescent kick is a kick that crosses the inner half of the circle, with a focus on all parts of the body, with the back of the foot (Nusufi, 2015). Saat dalam melakukan tendangan sabit membutuhkan unsur kecepatan. An ability to carry out a Movement with short and consecutive times is the definition of speed. Speed in the sickle kick is so important both during the match (match), the athlete is recommended to have a good speed so that when the signal sounds, then in short he also makes a kick / target attack on the opponent.

In the sport of pencak silat, apart from the element of speed in doing a sickle kick, of course, it also requires muscle explosiveness. "The tangible manifestation of muscle explosiveness is reflected in the ability that can be seen from the output carried out by utilizing power and speed. Examples are in jumps and kicks" (Irawadi, 2017). However, the need for explosive power in each sport is very

2. Materials and Method

This study uses an experimental method (treatment or treatment) with a type of comparative research. (Sugiyono, 2017) "The experimental method is one of the research methods used to find the impact of certain treatments on others under controlled conditions". Experimentation is often interpreted to see the consequences of a certain treatment. This study uses a design from the research, namely One-Group Pretest- Posttest Design (Sugiyono, 2017). This research was carried out at the training field of the Pat Ban Bu Air Tawar pencak silat school, carried out for approximately one month. The population in this study is pencak silat athletes at the Pat Ban Bu Air Tawar pencak silat school consisting of 10 athletes. The number of samples studied in this study was 9 athletes. The samples to be taken in this study use the total sampling technique. (I. Aziz, 2016) stated that "total sampling is all or all members of the population used as research samples".

3. Results and Discussion

Results

Based on the results of the initial test data of the speed of the sickle kick from 9 athletes at the Pat Ban Bu Air Tawar school, before being treated with plyometrics training, the average value of the calculation (mean) was 24.44 and the standard

different. This fact results in the view that the form of exercise carried out must be the provisions of the sport being studied (Maulana & Wijaya, 2018). To get good explosive power, it must be supported by a training method, namely *the plyometrics training method*. Plyometrics exercises are activities or exercises with the intention of combining development between speed and power to create explosive movements" (Anggara & Yudi, 2019). The authors argue that *plyometrics* training is a form of exercise used to improve the explosive power of leg muscles. Where this form of *plyometrics* exercise is more towards the necessary leg muscle function in accordance with the expected training goals. With the problem of low speed of the sickle kick in pencak silat athletes at Pat Ban Bu Air Tawar school. So this study was directed to see if there was an effect of *plyometrics* training on the speed of the sickle kick in pencak silat athletes at Pat Ban Bu Air Tawar school.

To obtain data, two measurements were taken, namely pre-test (before treatment) and post-test (after treatment). The research will be carried out for 16 meetings, for treatment of samples 8 times a week. Data collection was carried out by carrying out a sickle kick speed test. The data will be processed to test temporary conjectures (hypotheses). Before testing the hypothesis, testing the analysis requirements is first carried out in relation to the normality of distribution. For this situation, a lilliefors normality test is carried out (Sudjana, 1989). After testing the analysis requirements, hypothesis testing is carried out. The hypothesis was tested by means of a different mean analysis technique (t-test) related or dependent sample. Then, data processing is also carried out by means of computer assistance through an excel program.

deviation was 1.59. Then the highest score was obtained which was 28 and the lowest score was 23. Furthermore, the distribution of data results in the initial test of sickle kick speed before being

treated with forms of plyometrics exercises, can be seen table 1.

Table 1. Distribution of the Results of the Scythe's Kick Speed Pre Test

Interval class	Absolute Frequency	Relative Frequency	Category
<22,06	0	0%	Less Than Once
22,07-23,65	3	33%	Less
23,66-25,24	5	56%	Keep
25,25-26,83	0	0%	Good
>26,84	1	11%	Very good
	9	100%	

Based on the results of the final test data of sickle kick speed from 9 athletes at Pat Ban Bu Air Tawar school, after being treated with plyometrics training, the mean value was 25.89, the standard deviation was 1.76. Then the highest score was obtained which was 29 and the lowest score was 24. Furthermore, the distribution of data results in the final test of the speed of the sickle kick after being treated with the forms of plyometrics exercises, can be seen in table 2.

Table 2. Distribution of Post Test Data Results Scythe Kick Speed

Interval Classes	Absolute Frequency	Relative Frequency	Category
<23,24	0	0%	Less Than Once
23,25-25,01	3	33%	Less
25,02-26,77	4	44%	Keep
26,78-28,53	1	11%	Good
>28,54	1	11%	Very good
		100%	

The results of the initial test of sickle kick speed in pencak silat athletes at Pat Ban Bu Air Tawar school by utilizing the forms of plyometrics exercises prepared with a sample of 9 athletes obtained an average score of 24.44 and a standard

deviation of 1.59. Then the average score of the final test (Post test) was 25.89 and the standard deviation was 1.76. The results of the hypothesis test can be seen in Table 4 below.

Table 3. Summary of the Results of the Scythe's Kick Speed Hypothesis Test

Speed Dollyeo Chagi	Mean	SD	count	ttable	Test Results	Ket
Pre-test	24,44	1,59				H0
		1,76	4,39	1,85	Signifikan	rejected and Ha
Post-test	25,89					Accepted

Discussion

Based on the results of the hypothesis test analysis, the price of (4.39) > ttable (1.85) was obtained at the significance level of $\alpha = 0.05$ in the number of samples totaling 9 athletes. Thus, it can be concluded that Ho was rejected and Ha was accepted. By giving plyometrics training, it can

have a significant influence on the speed of the sickle kick in pencak silat athletes at Pat Ban Bu Air Tawar school. (Hariono et al., 2017) stating that kicking is an exertion of energy or effort by using legs and legs as components of the attack." A crescent kick is a kick that crosses the greater half

of the inner circle, with a focus on all parts of the body, with the back of the foot" (Nusufi, 2015). In other words, the technique in the sickle kick is a step in arranging attacks on the opponent. In its implementation, the sickle kick can be used with one leg, both the left and right legs."(Ibrahim & Maidarman, 2018). (N Ihsan et al., 2017) "speed is the ability to perform an action or reach a certain distance in a short period of time". This means that it refers to the ability to move the body as quickly as possible through a certain distance. "In other words, the element of speed is used in almost all sports and games that are contested" (Hidayat & Witarsyah, 2020). From the above statement, it tends to be overlooked that speed in the sickle kick is very important in the preparation of skills (singles, pairs and mixed), especially in the game, an athlete must have the speed so that the cue begins to sound, thus briefly also giving the predetermined attack kicks. To be able to do a good and correct scythe kick, one must need strength and speed called explosive power. (Ayalon et al., 1974) revealing that traditionally, the term explosive power has been used to define the type of activity that requires relatively short all-out muscle effort. A skill of power quickly and briefly in order to gain the best momentum on the target with an explosive movement is the definition of explosive power (Ridwan & Sumanto, 2017).

To create explosive movements, a training method called plyometric exercises is given. Training is an effort carried out by athletes to provide the best results according to the purpose of training. Overall, training must be in accordance with the athlete's capacity according to the athlete's condition and adjust to the existing conditions (Mardela & Rahman, 2017). (Bishop et al., 2009) Plyometrics exercises are a means to encourage muscles to reach maximum strength quickly and serve to increase explosive-reactive power through a variety of movements. "Plyometrics training is a specialized, high-intensity training method that aims to increase sports-specific explosiveness and the rate of force development" (Hall et al., 2016). (Oktaviani & Donie, 2020) states that "Plyometrics exercises are characterized as fast and vigorous exercises that utilize energy storage and build muscle action during periods of muscle withdrawal during exercise". (M. A. Aziz & Yudi, 2019) stated that "Plyometric exercises, movements are performed at a certain speed of movement including stretch reflexes with muscles ready to

contract back to their original state". Basically, plyometrics training is given through jumps and jumps, either jumping on the spot, jumping forward using one or two legs, with or without instruments that must be carried out properly and correctly" (Dinata & Arwandi, 2019). (Oktavianus et al., 2018) stated that "The function of plyometrics training can be said to help in increasing energy because it is important and needed for some achievement in achieving achievements".

Based on the above statement, the author argues that plyometrics training is a form of exercise used to improve the explosive power of leg muscles. Where this form of plyometrics exercise is more towards the necessary leg muscle function in accordance with the expected training goals. From the results of the study, it shows that there is an increase in the speed of the sickle kick in pencak silat athletes at Pat Ban Bu Air Tawar school, this is because in this study, the researcher provided forms of plyometrics exercises given during 16 meetings in accordance with the training program that had been prepared in advance and referred to the principles of training. In addition, each exercise begins with a warm-up (stretching and jogging), core exercises include jump in place and Side-to-side barrier tuck jump. Furthermore, at the end of each exercise, a cooling exercise is given. The training process carried out by the athlete is carried out repeatedly and systematically, as well as the physical loads are regular, directed, and gradually increased. So that by providing plyometrics training, it can provide an increase in the speed of the sickle kick to athletes at the Pat Ban Bu Air Tawar school.

4. Conclusion

It can be concluded that the results of the research that have been conducted by the authors of this study show that the influence of plyometrics training significantly affects the speed of the sickle kick in pencak silat athletes at Pat Ban Bu Air Tawar school. Plyometrics exercises are an activity/exercise used to increase the explosive power of the leg muscles. In this study, only a few forms of exercise were used, namely jump in place and Side-to-side barrier tuck jump. This is in line with the research conducted by Siska Madya Oktaviani with the same independent variables but different bound variables. This article is only limited to research conducted using several forms of plyometrics exercises. Therefore, it is hoped that

in the future further research will be carried out on

plyometrics exercises.

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