

# The Effect of Resistance Bands Rubber Spring Exercise on the Front Kick Speed of Adolescent *Pencak Silat* Women

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**Abstract** This study was aimed to determine the effect of weight training using rubber Resistance Bands to increase the front kick speed of young women *pencak silat* athletes. This type of research was a quasi experiment. The population of this study was all young women athletes. Samples were taken using a total sampling technique with a sample of 20 young women athletes aged 18 from *Tapak Suci Rejang Lebong*. The instruments and data collection techniques used a front kick test for 10 seconds. The results were determined that weight training using rubber Resistance Bands increased the speed of the front kick with a contribution of 17.8%. From the results of this research it can be concluded that weight training using rubber Resistance Bands of color red (heavy 25-30 lbs) increased the speed of the front kick of young women athletes of *Pencak silat Tapak Suci in Rejang Lebong* where obtained  $t-h = 3.90 > t-table = 1.73$  at the significance level  $\alpha = 0.05$ . This color's resistance bands as an important point part in choosing peak a high speed kick. It is recommended for coaches to train the athlete's kicks by exercising using red rubber resistance bands of young athletes aged 18.

**Keywords** Resistance Bands, Speed, Front Kick, Silat

## 1. Introduction

The front kick is the mainstay kick for most fighters, this is because the stages are easy to do and master but quite difficult to anticipate, it is different with the T kick [1], although it is classified as a kick that is difficult to anticipate by the opponent, but the stages of doing it and learning are also in the category that is difficult to master, and there is also a sickle kick which is the easiest kick to master or learn, but the sickle kick is very easy to anticipate by opponents and easy to read movements [2].

*Pencak silat* is an original martial art sport from Indonesian nation that has developed into a sport of achievement. Similar to other achievement sports, *pencak silat* requires coaching to be able to develop the talents and achievements of the athletes it fosters with the aim of getting maximum and satisfying achievements. *Pencak silat* is a martial art sport that has often made Indonesia proud in international championships. The sport of *pencak silat* was developed according to technological advances in the field of sports.

*Pencak silat* is one of the subjects [3] in the Physical Education curriculum (from Elementary School, Junior High School, Senior High School, to Higher Education).

The physical condition component is a serious concern for teachers/trainers in the preparation of training/teaching programs because they are the main support in every training/learning activity [4], [5]. Structured and planned learning activities must be carried out in every athlete's activity because they form the body's development [6], in learning activities have an initial portion of training (learning) which is more emphasized on physical conditions [7]. Other studies suggest that the physical and physiological states of athletes are supporting factors to determine the quality of athletes' performance in a sport (Bridge *et al.*, 2014).

At the *Tapak Suci Rejang Lebong Pencak silat* college, the front kick technique is one of the most frequently used techniques [8], the basic front kick technique has been mastered by most athletes but is not optimal, especially in kick speed [2], [9], the athlete's lack of front kick speed to attack the opponent's defense This is because many of the influencing factors are not fully owned by the fighters, such as: the physical condition of athletes who are not good, there are still many, athletes who are not disciplined in practically [10], it still lacks of knowledge or understanding of the components that must be met in achieving maximum performance [1], [11], the technique carried out by athletes is not perfect, there is no written training program in carrying out the training method, and the lack of effectiveness in implementing the exercise program with video [12].

This is evidenced by the participation of researchers during training at the *Tapak Suci Rejang Lebong pencak silat* college. In principle, the method is a way or all activities that are planned to be used in achieving goals, so it needs to be arranged in the form of an exercise program, considering that each training method has limitations on its merits and weaknesses, the better the training method the more effective it is in achieving the training objectives. The weight training method using rubber resistance bands [13] [14] is an exercise method that researchers hope to find out whether it is effective or not in increasing the speed of the front kick of the young *pencak silat* athlete in *Tapak Suci, Rejang Lebong* district, and from the results of this study it is hoped that it can be a solution or method that can be used as a step. Anticipatory measures for coaches and athletes to increase the kick speed of *pencak silat* athletes in the future, especially in front kick of athletes [1].

Speed is one aspect of the ability needed in certain sports. Speed is the ability to perform similar movements in a row in the shortest possible time, or the ability to cover a distance in the shortest possible time [15]. Front kick / straight [1] is a kick [16] that uses the tip of the foot (base of the toe) with a straight leg, the front kick aims forward at the target by straightening the leg to the toe. The part of the foot that is hit when kicking is the base of the inside of the toes, the position of the body facing the target [1].

The spring force can be called a spring that is pulled and then we release it, the spring will return to its original shape or position and this is what is meant by the spring force.

Springs also have unique properties, namely elastic properties or elasticity, elasticity itself is the ability of an object (rubber) [17], [18] to return to its original shape as soon as the external force exerted on the object is removed (released). Bullani [19] states that resistance training can be done to develop not only strength, but also endurance, and speed.

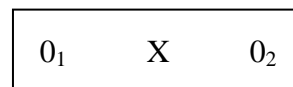
Resistance Bands are exercise equipment made of rubber that is useful for adding weight to the workout movement you are doing. There are 3 special training methods used to increase speed, one of which is the training method by adding weight to the athlete's body when moving as quickly as possible. Suitable exercises to develop strength and speed are resistance exercises whose implementation can push, lift, or pull a certain load.

## 2. Method

The type of research used is experimental research, research that is recognized as the most scientific research of all types of research, because researchers manipulate treatments that cause something to happen [20]. In experimental research [21], researchers try to control all factors except treatment, if other factors can be controlled, researchers can assume that changes in the dependent variable are caused by independent variables.

The design in this study, namely the Pre-Experimental design, was so named because it followed the basic experimental steps, but failed to include a control group, in other words, single groups were frequently studied but no comparisons with non-treatment groups were made [22]. Sample with total sampling 20 participants athletes young woman of age 18 *Tapak Suci Rejang Lebong*.

Research design using one group pre-test and post-test:



Information:

O1: Pre-test (Before being given treatment)

X: Treatment Drill Resistance bands Red (25-30lbs)

O2: Post-test (After being given treatment)

Data collection sample techniques in this study, which carried out two tests [23], namely the initial test and the final test on the athletes who were selected as samples. This data analysis was carried out by comparing the ability of the pre-test and post-test of the front kick [5], experiments on the determined *Tapak Suci pencak silat* athletes, this analysis used the t-test.

## 3. Results and Discussion

### Results

Before testing the proposed hypothesis, a prerequisite

test for data analysis is carried out, namely the normality test of each data from the variables. The normality test of the data from the variables is carried out using the Liliefors test. From the results of normality testing for the pre-test data for the sample group that was given weight training treatment using rubber Resistance Bands, the score  $L_o = 0.1159$  with  $n = 20$ , and  $L_{tab}$  at the significant test level = 0.05 obtained 0.190 which is greater than  $L_o$ . So it can be concluded that the front kick speed data from the weight training pre test using rubber weight Resistance bands red colors comes from a population that is normally distributed [24].

Furthermore, from the results of normality testing for post-test sample data given weight training treatment using Resistance Bands rubber, the score  $L_o = 0.1281$  with  $n = 20$ , and  $L_{tab}$  at the significant test level = 0.05 obtained 0.190 which is greater than  $L_o$ . So it can be concluded that the front kick speed data from the post test weight training using Rubber Resistance Bands comes from a population that is normally distributed.

After the normality test was carried out on the two groups of data, then a homogeneity test was carried out to see if the two data were homogeneous or not. The homogeneity test was carried out using the formula F. The results of the homogeneity test for the pre-test and post-test data for the sample group were given weight training treatment. It is using rubber Resistance Bands obtained a score of  $F_{count} = 1.057$  and  $F_{table} = 2.168$ .  $F_{table}$  is greater than  $F_{count}$ , so it can be concluded that the two data are homogeneous.

The results of the t-test analysis stated that there was an effect of weight training using foot weights in the form of Rubber Resistance Bands (X) on the front kick (Y) of

young female *pencak silat* athletes at the Tapak Suci college. This is based on the results of the t-test analysis (table 1), which obtained  $t_{result} = 3.90 > t_{table} = 1.73$  at the significance level = 0.05, it can be concluded that there is a significant effect of weight training using rubber Resistance Bands on front kicks in athletes [25]. *Pencak silat* for young women at the *Tapak Suci Rejang Lebong* college. The contribution given by kick speed training using rubber resistance bands [26] from the calculation results of the correlation test and the contribution of product moment is 33.5%.

**Table 1.** Summary of results (t test) of weight training using Rubber Resistance Bands

Dk= (N-1)	$t_{count}$	$t_{table}$ $\alpha = 0,05$	Conclusion
19	3,90	1,73	Significant

The ability of the front kick in weight training using rubber Resistance Bands red color (25-30lbs) [27] muscular strength before being given treatment to the sample, a pre-test of the speed of the front kick was carried out with the acquisition of a variety of front kicks. In the initial test of 20 samples, the highest number of kicks was 17 kicks, and the lowest number of kicks was 9 kicks, after being treated to 20 samples young women athletes at the age of 18 with weight training using rubber resistance bands red color according to the exercise program. It can be concluded that, drill programme as well as the skills athletes effect appeared [28]. Then a final test (post test) of front kick speed was carried out with the highest kick acquisition of 19 kicks and the lowest kick of 11 kicks.

**Table 2.** Frequency of the results of the Pre-test and Post-test of FRONT kick speed before and after weight training using Rubber Resistance Bands red color

Scale Limit	Pre test		Post test		Category
	Frequency				
	Amount	Percentage	Amount	Percentage	
	0	0%	5	25%	Very well
16 sd 17	7	35%	8	40%	Well
13 sd 15	8	40%	4	20%	Enough
11 sd 12	3	15%	3	15%	Not enough
<10	2	10%	0	0%	Not much
Total	20	100%	20	100%	

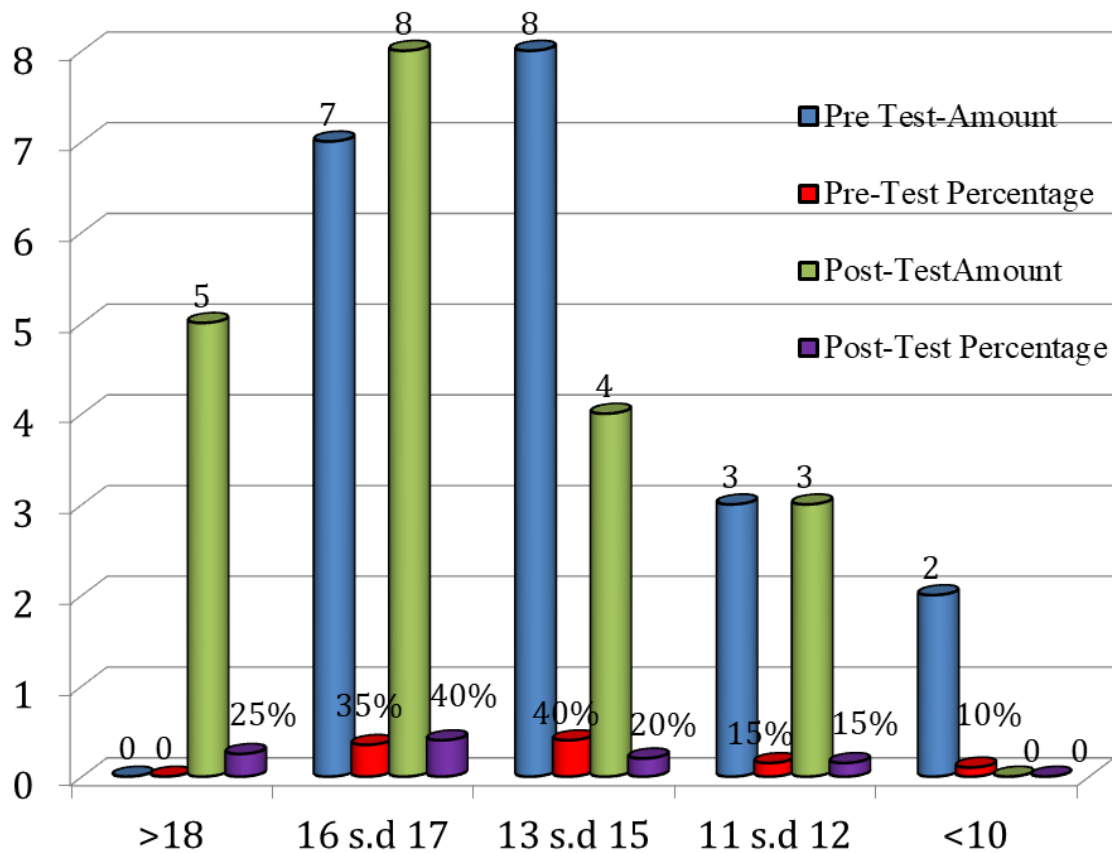


Figure 1. Histogram of the results of the Pre-test and Post-test of front kick speed

Based on Table 2 and Figure 1 above the frequency of the Pre-test and Post-test data, the Pre-test results from 20 samples were 2 people had a front kick speed of 10 (less than once), 3 people had a front kick speed of 11-12 (less), 8 people had a front kick speed of 13-15 (moderate), 7 people had a front kick speed of 16-17 (good), and no one has a front kick speed of 18 (very good). Based on the average score of the front kick speed level, it obtained 14 second.

While the post-test data above, the results were obtained from 20 samples, none of which had a front kick speed of 10 (less than once), 3 people had a front kick speed of 11-12 (less), 4 people had a front kick speed of 13-15 (moderate/moderate), 8 people had a front kick speed of 16-17 (good) and 5 people had a front kick speed of 18 (excellent). Based on the score, the average front kick speed level is 16 times (kick).

The data above shows that the athlete's front kick speed is not the same before and after being given weight training using rubber resistance bands. This is based on the average acquisition of the athlete's front kick speed in the initial test, while the average acquisition of the athlete's front kick speed in the final test after weight training using Resistance Bands is 16 times, meaning that there is an increase in average kick speed of 2 kicks.

## 4. Discussion

Based on the results of research conducted in the field, weight training using Rubber Resistance Bands which are used to increase the speed of the front kick, obtained the overall results of the study and was seen from the classification table for the front kick speed of the young female *pencah silat* athlete *Tapak Suci Rejang Lebong* in good category.

From the t-test analysis that has been carried out, it can be proven that weight training using rubber resistance bands affects the speed of the front kick, because rubber resistance bands red colors (25-30lbs) are one type of resistance exercise that can increase speed [29]. This is also evidenced by a similar results study of weight training research using leg weights / ankle weights, it can increase the speed of front kicks, the results show that there is an effect of weight training method on the speed of the sickle kick. Rubber tires have an effect on increasing the speed, results of differences in the effect of rubber resistance band choose colors and consistent exercise training [30] target front kick, and leg length, in increasing the speed of the sickle kick. In this study, the treatment of weight training using rubber resistance bands was carried out on young female *pencah silat* athletes at the *Tapak Suci Rejang Lebong* college.

Based on the measurement of the front kick test, the average speed of the initial front kick of the young female 18 age of *pencak silat* athlete *Tapak Suci Rejang Lebong* was 14 kicks. Furthermore, given treatment in the form of exercise using leg weights with rubber resistance bands then a final test was carried out using the same instrument. From these measurements, the results showed that the average front kick of the female youth *pencak silat* athlete *Tapak Suci Rejang Lebong* changed to 16 kicks.

## 5. Conclusions

Based on the results of the study, it can be concluded that there is an effect of weight training using rubber Resistance Bands on increasing front kick speed. Thus it can be concluded that weight training using rubber Resistance Bands can increase the speed of the front kick of the young female *pencak silat* athlete *Tapak Suci Rejang Lebong*.

In accordance with the conclusions and results of the research above, it is recommended for coaches to train the athlete's kicks by exercising using rubber Resistance Bands Red (Heavy 25-30 lbs) as leg weights to increase the speed of the front kick of the juvenile *pencak silat* athlete in *Tapak Suci Rejang Lebong*. As well as paying attention to other factors such as strength, technique, accuracy, reaction time, concentration, motivation and spirit of athletes. It is recommended for athletes to exercise regularly and continuously because it will have an effect on increasing the speed of the front kick and also pay attention to other factors. For further researchers who are interested in conducting further research or similar research, it is recommended to increase the number of samples and other variables that are supporting factors for increasing speed, such as strength, technique, muscle elasticity and reaction time. Research specifically provides resistance bands according to age groups

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