

## Effect of Weight Training and Leg Length on the Sickle Kick Speed in Male Students Extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang

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### Abstract

This study discusses the effect of weight training and leg length on crescent kick speed. The objectives of this study are (1) to analyze the differences in the effect of rubber tire weight training and the ankle weight on the sickle kick speed, (2) analyzing the difference in effect between the long limbs and short legs to the sickle kick speed, (3) analyze the interaction between tire rubber weight training and the ankle weight and leg length in increasing the sickle kick speed. The method used in this study is an experiment with a 2x2 factorial design. The population in this study were all male extracurricular students of Senior High School Bina Jaya Palembang. Sampling in this study used total sampling technique. From two-way ANOVA testing shows that all three hypotheses are accepted. The first hypothesis reads "there is a difference in the effect of rubber weight training and ankle weight on the sickle kick speed in male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang" is acceptable, because it has a Sig. = 0.000 < 0.05. The second hypothesis which reads "there is a difference in influence between the length of the limb and the speed of the sickle kick of male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang" was also accepted, because it has a Sig. = 0.026 < 0.05. The third hypothesis which reads "there is an interaction between tire rubber weight training, ankle weight and leg length in increasing the sickle kick speed in male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang" is acceptable, because it has a Sig. = 0.032 < 0.05. The results showed a difference in the effect of rubber tire weight training, and leg length on the sickle kick speed and there was an interaction between weight training and leg length in increasing the sickle kick speed.

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## INTRODUCTION

Cahyono (2017) education has an important role related to the maintenance and improvement of the life of a society, especially bringing the younger generation in fulfilling their obligations and responsibilities in the community. School education needed by students, in maintaining physical and fitness is physical education. This is in line with Government Decree Number 23 of 2013 that physical education is to shape the character of students so that they are physically and mentally healthy and foster a sense of sportsmanship. Also, Lutan, Ibrahim, Suherman, and Saputra (2002) also suggested that physical education is an education that actualizes human activities in the form of attitudes, actions and works to be formed, filled and directed towards personal wholeness following the ideals of the nation. One means of physical education to achieve health, recreation, and achievement is *Pencak Silat*. *Pencak Silat*, whose form is a demonstration, and exercises all moves, and martial arts techniques carried out intact, and explicit about maintaining or improving fitness, dexterity and physical endurance (Sucipto, 2008).

Lubis (2014) *Pencak Silat* is one of the indigenous cultures of the Indonesian people, which is highly believed by its warriors, and martial arts experts that the Malay community is currently using this martial art since prehistory. Therefore, *Pencak Silat* needs to be preserved. One way to protect *Pencak Silat* is by introducing *Pencak Silat* through schools with extracurricular activities.

Hariono (2006) biomotor components needed in the *Pencak Silat* sport are speed, endurance, flexibility, strength, coordination. Manullang, Soegiyanto, and Sulaiman (2014) speed is the ability of muscle reactions characterized by changes between contraction and relaxation to reach the maximum frequency. Hariyadi (2003) several techniques must be learned in the *Pencak Silat* sport, including horses, tide attitude, steps, defense techniques, attack techniques, attenuation, fall techniques, catching

techniques, kickback techniques, defense techniques against kickback.

Hariyadi (2003) attack technique is one of the important techniques. Attack techniques are all types of attack techniques that are carried out using hands and feet. The attack using feet is a kick. According to Nugroho (2005) kick technique is the technique most often used in matches around 47%. Based on field observations, the technique most often used during matches is a sickle kick.

Hariyadi (2003) a sickle kick is a kick that has a semicircular trajectory inward, and the way it works is similar to a sickle, which is swung from the outside to the inner side. Situmeang (2010) suggests that the movement of turning the waist is the basis of a movement to produce strength and speed in each technique.

From the observations of researchers at Senior High School Bina Jaya Palembang participants who participated in extracurricular activities were 28 people. Based on student achievement data and sickle kick speed tests obtained from the trainer, it was seen that only 21.43% of students had sufficient categorized sickle kick speeds, while others were less.

This is one of the causes of the achievement of students who participate in *Pencak Silat* is less prominent, especially for the competition for both men and women. The lack of sickle kick speeds made the opponent can avoid easily. Based on the above problems, the researchers are interested in making a form of research related to the martial arts sport, especially at the sickle kick speed.

In achieving sickle kick speed, it takes a smart idea and idea from a trainer to determine the right type of training and create an exercise program that is suitable for the abilities of students or athletes. Weight training is the right way to increase the speed of the sickle kick, where a systematic process of using a burden that is only used as a tool to add not only strength but also speed in achieving specific goals is weight training.

Pratama, Rahayu, and Kusuma (2017) weight training is an exercise that uses weights, both isometric training, isotonic, and isokinetic.

Harsono in Pranata, Yarmani, and Sugihartono (2017) suggests that weight training is a systematic process of using a burden where the burden is only used as a tool to increase muscle strength to achieve specific goals, such as improving physical condition, health, strength, speed, achievement in sports. Weight training to be applied in this study is ankle weight training, and tire rubber weight training, ankle weight training is an exercise that uses a tool or object consisting of cloth that has been filled with iron powder. Paja, Refiater, and Tumbal (2014) said that ankle weight training could improve kick results. Tire rubber weight training is a type of weight training that is elastic and not only can increase strength but can also increase speed. According to Martens in Pranata, Yarmani, and Sugihartono (2007) resistance training can be developed not only strength but also endurance, power and speed" means that resistance training can be done to develop not only strength but also endurance and speed.

## METHODS

This study used an experimental method with a factorial 2x2 design. This method is testing the effect of one or more variables on other variables. In this study, the attribute variable was the length of the leg, with measurements being made to find out the long limbs and short legs. The population in this study were all male students of extracurricular at Senior High School Bina Jaya Palembang, namely 28 students. Sampling in this study used total sampling technique so that in this study, the sample used all male students of extracurricular at Senior High School Bina Jaya Palembang.

## RESULTS AND DISCUSSION

Before being given treatment for ankle weight and rubber tire weight training for male students of Senior High School Bina Jaya, the length of the limb was measured. The results of measurements of the length of the limbs were then ranked and divided into two groups, namely group A with long limbs, and group B with short

limbs. The group will be treated with tire rubber weight training with long legs ( $A_1B_1$ ), and short legs ( $A_1B_2$ ). The group was treated with ankle weight training with long limbs ( $A_2B_1$ ), and short legs ( $A_2B_2$ ).

After the training program is carried out, then proceed with the post-test test and get the post-test results. Based on the results of the post-test test of students with long legs, those who were trained using the ankle weight experienced an increase in kick speed of 6.84%, while those trained by using rubber tires increase of 3.69%.

In students whose legs were short after being given rubber tires training increased by 6.06%, while those trained by using the ankle weight increased by 6.94%. The data shows that through ankle weight training, and tire rubber has increased with an increase of 4.99%.

The normality test of the data in this study used Kolmogorov-Smirnov Normality test with IBM SPSS. It is stated that the data is normally distributed if the sig value is more significant than 0.5. The results of normality test data can show that data for long limbs with tire rubber training with a value of 0.165 significance of data exceeds 0.05 which means data is normally distributed, and data for short limbs with tire rubber training also shows that data of short limbs with rubber tire weight training with the value is 0.200 the significance of the data exceeds 0.05 which means the data is normally distributed.

Likewise, kick data for long legs with ankle weight training with a value of 0.200 significance data exceeds 0.05 which means data is normally distributed and kick data for short legs with ankle weight training with a value of 0.121 significance of data exceeds 0.05 which means data is normally distributed.

After testing the data normality, the researcher conducted a homogeneity test to examine the distribution of data from the four variants originating from a homogeneous population. The following are the results obtained using IBM SPSS (Table 1).

Tests null hypothesis of equal population covariance matrices. Table 1 can be seen that the Sig. Box's M of 0.408 greater than 0.05 means that  $H_0$  is accepted and  $H_1$  is rejected. It was

concluded that the data came from a homogeneous population.

**Table 1.** Homogeneity Test Results

Box's M	3.100
F	0.966
Approx. df <sub>1</sub>	3
df <sub>2</sub>	1036.800
Sig.	0.408

After the data is declared normal and homogeneous through the normality test and data homogeneity, the researcher conducts two-

way ANOVA test (Factorial 2x2). From the results of testing using IBM SPSS (Table 2).

Examination of two-way ANOVA also shows that the type of ankle weight and rubber tire training has a Sig. = 0.000 < 0.05. Then the first hypothesis which reads there is a difference in the effect of rubber weight training, and the ankle weight on the speed of the sickle kick of male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang 2018/2019 can be accepted.

**Table 2.** Two-way ANOVA test

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	.020 <sup>a</sup>	3	.007	9.755	.000
Intercept	7.409	1	7.409	10901.368	.000
Type of exercise	.013	1	.013	18.403	.000
Leg length	.004	1	.004	5.645	.026
Type of exercise * leg length	.004	1	.004	5.216	.032
Error	.016	24	.001		
Total	7.446	28			
Corrected total	.036	27			

Dependent variable: kick speed  
 R squared = .549 (Adjusted R Squared = .493)

This is in line with the opinion of Pranata, Yarmani, and Sugihartono (2017) who stated that weight training using rubber tires, gives a better effect, and significantly increases the speed of the punch. Also, Cahyani (2015) also suggested that weight training using foot ballast, had a significant influence on increasing dollyo chagi's kick ability in male taekwondo athletes.

Thus it can be concluded that there are differences in the effect of rubber weight training and ankle weight on the sickle kick speed in male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang academic year 2018/2019.

Also, the calculation of two-way ANOVA shows that the leg length has a Sig. = 0.026 < 0.05. Then the second hypothesis which reads there is a difference of influence between the length of the limb to the speed of the sickle kick of male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang in academic year 2018/2019 can be accepted. This result is in line with the opinion of Weda, and Harmono (2018) who suggested that the longer the limbs, the farther kicks on extracurricular students.

Thus it can be concluded that there is a difference in influence between the length of the limb to the speed of the sickle kick of male students extracurricular *Pencak Silat* in Senior High School Bina Jaya Palembang in academic year 2018/2019. The interaction between rubber weight training and ankle weight and leg length has a Sig. = 0.032 < 0.05. Then the third hypothesis is acceptable, meaning that there is an interaction between the type of exercise and the length of the leg. This is supported by the opinion of Saputra, and Imanudin (2017), who suggest that weight training and rubber have a significant influence on speed and arm power.

Thus it can be concluded that there is an interaction between tire rubber weight training, ankle weight and leg length in increasing the sickle kick speed in male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang in academic year 2018/2019.

## CONCLUSION

From the results of these studies, it can be concluded that: (1) there are differences in the effect of tire rubber weight training, and the ankle

weight on the sickle kick speed in male students extracurricular *Pencak Silat* activities at Senior High School Bina Jaya Palembang in academic year 2018/2019, the use of ankle weight training is better in increasing students' sickle kick speeds compared to the use of tire rubber weight training, (2) there are differences in the effect of leg length on the sickle kick speed in male students extracurricular *Pencak Silat* activities at Senior High School Bina Jaya Palembang in academic year 2018/2019, students with long legs have a better kick speed compared to students who have short legs, (3) there is an interaction between tire rubber weight training, ankle weight and leg length in increasing the sickle kick speed in male students extracurricular *Pencak Silat* at Senior High School Bina Jaya Palembang in academic year 2018/2019 there is an interaction between the type of exercise and the length of the leg.

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