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THE EFFECT OF GIVING SOY FLOUR AND *LUNGES* EXERCISES ON THE ABILITY OF KICK SPEED IN FRONT OF PENCAK SILAT ATHLETES OF THE CENTER FOR EDUCATION AND SPORTS TRAINING (PPLP) OF WEST SUMATRA

Rully Effendi[1], Wilda Welis[2]
Universitas Negeri Padang[1,2]
rullyeffendi17@gmail.com, wildawelis@fik.unp.ac.id

Abstract
This study aims to find out the effect of soy milk flour and lunges training on the ability of kick speed in front of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra. This study was conducted from June until October 2021. The type of this research was a pseudo experiment with the research population was all pencak silat athletes from sports education and training center (PPLP) students of West Sumatra, which amounted to 14 people. The sample of these 14 people was taken based on the total sampling techniques. The instrument in the study used a test of the forward kick speed ability to measure the front kick. The data analysis technique was done by testing one way anava with a significant level = 0.05. From the analysis of data, the researcher found the results; $\bar{x}$ *Pree Test is 15.36, Central Data is 18.86, and Post Test is 23.14. The results of statistical tests have an effect on the provision of soy milk flour and lunges training on the ability of kicking in front of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra, with a* $\alpha <$ *of 0.05.*

Keywords: *Soy Milk, Lunges, Front Kicks*

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Correspondence author: Wilda Welis, Universitas negeri padang, Indonesia. E-Mail: wildawelis@fik.unp.ac.id
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INTRODUCTION

Sport is an activity that is useful for increasing physical fitness. In addition, sports can also build character, personality, discipline, sportsmanship, and the ability to think and develop achievements in sports achievements. Indonesia has one sport that has become the culture of this country, namely Pencak Silat. Through sports achievements, countries in the world will know that the Indonesian nation is capable of excelling in the field of sports. Pencak Silat is the result of Indonesian human culture to maintain, maintain, exist and the integrity of the surrounding environment, in order to achieve harmony in life to increase faith and piety (Bangsa & Semarang, 2012). Individual sports have a

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higher level of self-confidence than team sports (Nopiyanto & Dimyati, 2018). Pencak silat has four aspects, namely an integral and inseparable unit, horses, tanks, punches and kicks (Lubis, 2004). The basic kick technique is one of the techniques that produces an important score or point. However, this kick is difficult for athletes to master, one of which is a straight forward kick.

A straight front kick is an attack that uses the right or left leg. The position of the kick is in front of the body, with the position of the body is facing forward, and the correct implementation of the fulcrum also affects the muscles of the lower limbs and lower leg muscles (Siswara & Mardius, 2021). Muscles that have contraction during a kick are the rectus femoris, vastus lateralis, vastus medialis muscles. When the leg kicks, it is pulled quickly after a kick, and the muscles that play a role are the biceps femoris, semimembranosus, semitendinosus, and gluteue maximus muscles. Other supporting muscles that have contraction while kicking are the iliopsoas muscle, pectineus, tensor fascie latae, adductor longus, and soleus.

If the front kick is not done well, it might caused by lack of muscle strength and low food regulation and good nutritional intake, such as protein. According to (Welis, 2008), "food regulation for athletes is an important factor to achieve optimal achievement". A kind of exercise that can increase the muscle strength is lunges, supporting by meals that contain proteins such as soy milk. Protein has many functions, and one of them is to produce actin and myosin which are beneficial for the improvement of muscle cells and muscle constriction strength. Lunges exercise is a type of exercise that has the same form of exercise to strengthen the muscles of the legs (Astuti & Jatmiko, 2020). Soy milk is a processed milk which the main ingredient is soy juice. The appearance looks like cow's milk, but it is made from soy milk extract. Soy protein is a complete protein, meaning it contains all the amino acids needed by the body in the right proportions and amounts to meet the human need for the growth, maintenance, and repair of living tissues (David, 2015).

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METHOD

This research used pseudo-experimental research methods. Experimental method is a way to find a causal relationship between two factors by eliminating other factors that can interfere. Experiments are always conducted in order to see the consequences of a treatment (Arikunto, 2002). The variables in this study were free variables, that are; soy milk flour (X1), exercise lunges (X2), and bound variables that are the ability of the speed of the front kick (Y).

This study used the design of one group of pre-test-post-test design, that is one group of experiments that measured its dependent variable (pretest), and given the stimulus (treatment) for 16 times of meeting with 4 times frequency in one week. The research that was done to PPLP athletes of West Sumatra was a 5-set exercise with 6 repititions. After doing the treatment for 8 times, the researcher measured the middle data (midtest), then continued the treatment for 9-16 times, and measured again the dependent variable (post test) without a comparison group with soy milk 30 minutes after treatment. Population is the entire subject of the study (Arikunto, 2002), and the population in this study was all pencak silat athletes who trained in PPLP Sumbar. There are 14 people; 7 boys and 7 girls. The sample is the entire population studied (Arikunto, 2002), and the sample in this study was the entire population of athletes who is amounted to 14 people.

RESULT AND DISCUSSION

Characteristitk Subject

The subject in this study was pencak Silat athletes of The Center for Education and Training of Student Sports (PPLP) of West Sumatra. The characteristics were taken from age, weight, height, and front kick using tests of the kicking ability of pencak silat athletes. Based on the analysis of the data, the researcher obtained the following results:

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Table 1. Characteristics of the Subject

Characteristic	Min	Max	Average	Standard Deviation
Height (cm)	153	173	166	5,87
Weight (kg)	46	74	60	9,01
Age (tahun)	16	18	17,14	0,53
BMI	17,10	25,86	21,55	2,60

In table 1, the characteristics of subjects have the average height of 166 cm, average weight of 60 kg, average age of 17 years, and average body mass index (BMI) of 21.55.

Data Description

Based on the data that has been obtained and collected, the researcher analyzed and discussed it in this study. The data was described based on the purpose and hypothesis of the previously stated research. Based on the results of measurements that have been done, that is the ability of the front kick speed of Pencak Silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra, the researcher obtained preliminary data (pre-test), middle data (mid-test) and final data (post-test). The table below shows the overall description of the data:

Table 2. Distribution data on front kick capabilities

Data	Number of samples	Data on Front Kick Capability of PPLP SUMBAR Athletes			
		Mean	SD	Max	Min
Pretest	14	15,36	1,78	18	11
Midtest	14	18,86	2,65	22	13
Posttest	14	23,14	2,07	26	20

1. Pree Test Data Forward Kick Speed Capability

Before giving the treatment of samples with the provision of soy flour and lunges training, the researcher first gave a test of the front kicking speed of pencak silat athletes of the Center for Education and Sports Training (PPLP) West Sumatra. In the first test of 14 people, the sample obtained the highest score is 18, the lowest score is 11, with the average kick score is 15.36, and the standard

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deviation is 1.78. The distribution of pree-test data on the ability of kick speed in front of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra can be seen in the following table:

Table 3. Distribution of Forward Kick Speed Capabilities Before Being Treated

Category	Son/Daughter Values	Absolute Frequency	Relative Frequency %
Very Well	>25 / >24	0	0
Good	20-24 / 19-23	0	0
Enough	17-19 / 16-18	6	42,8
Less	15-16 / 13-15	5	35,8
Less Once	<14 / <12	3	21,4
Sum		14	100

Based on the table 3, the researcher obtained a result for distribution of forward kick speed capability for pre-test data, that is 42.8%, which belongs to the sufficient category, and 35.8% belong to the lesser category. In the range of <14 / <12, there were 3 people with 21.4% of the sample who belonged to the less category. For more details about the distribution of pre-test data can be seen in figure 1 of the following:

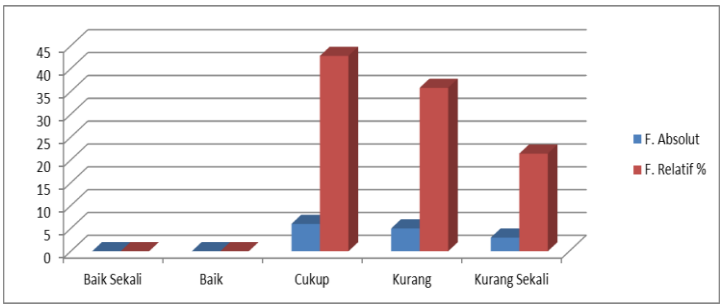

Figure 1. Pre Test Results Of Forward Kick Speed Ability

2. Mid Test Data Forward Kick Speed Capability

After 8 times treatment that given to the samples with the provision of soy flour and lunges training, the researcher took the middle data of the ability the front kick of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra. In the middle data test, the researcher found the highest score is 22, the lowest score is 13, with the average score is 18.86, and the

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standard deviation is 2.65. The distribution of data on the ability of the kick speed in front of pencak silat athletes of the Center for Education and Sports Training of West Sumatra can be seen in table 4 below:

Table 4. Data Distribution of Forward Kick Speed Capability After 8x Treatment

Category	Son/Daughter Values	Absolute Frequency	Relative Frequency %
Very Well	>25 / >24	0	0
Good	20-24 / 19-23	6	42,8
Enough	17-19 / 16-18	5	35,8
Less	15-16 / 13-15	2	14,3
Less Once	<14 / <12	1	7,1
Sum		14	100

Based on table 4, the researcher obtained the results; (42.8%) belong to the good category, (35.8%) belongs to the sufficient category, and (14.3%) belongs to the lesser category. In the range of <14 / <12, there was 1 sample person (7.1%) who belongs to the category of less once. For more details about the distribution of middle data can be seen in figure 2 as follows:

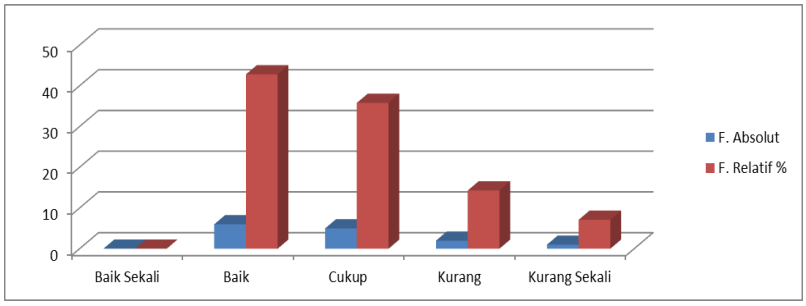

Figure 2. Mid Test Results Of Forward Kick Speed Ability

3. Data Post Test Forward Kick Speed Capability

After giving the treatment to the samples with the provision of soy flour and lunges training on the final test of the ability to kick the front kick of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra, the researcher obtained the result in the final test of 14 people. The results show the highest score is 26, the lowest score is 20, with the average score is 23.14, and the standard deviation is 2.07. The distribution of post test data on

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the ability of kick speed in front of athletes pencak silat Center for Education and Sports Training (PPLP) West Sumatra can be seen in table 5 below:

Table 5. Data Distribution of Forward Kick Speed Capabilities After Treatment

Category	Son/Daughter Values	Absolute Frequency	Relative Frequency %
Very Well	>25 / >24	6	42,8
Good	20-24 / 19-23	8	57,2
Enough	17-19 / 16-18	0	0
Less	15-16 / 13-15	0	0
Less Once	<14 / <12	0	0
Sum		14	100

Based on table 5, the researcher obtained 42.8% in the category of well, and 57.2% in the good category. For more details about the distribution of post test athletes pencak silat Center for Education and Sports Training Students (PPLP) West Sumatra, it can be seen in the following 3 images:

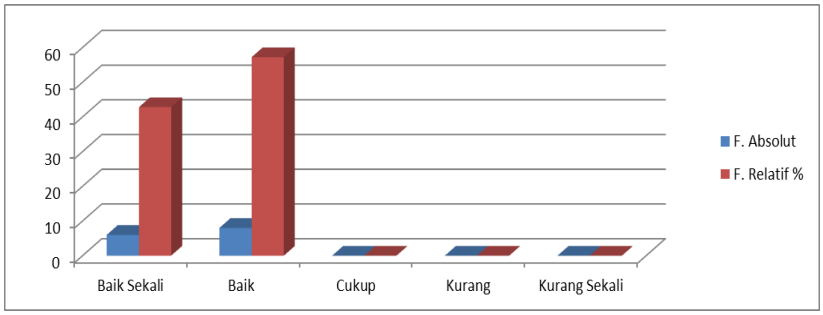

Figure 3. Post Test Results Of Forward Kick Speed Capability

Based on the description of pre-test, midtest and post-test data, it can be seen that the ability of kick speed in front of pencak silat athletes of the West Sumatra Student Sports Education and Training Center (PPLP) is not as same as before treatment, during treatment, and after being given soy flour and lunges training. There was an increase in the average speed of the front kick after being given soy milk flour and lunges exercise from 15.36 (pretest) rose to 18.86 (midtest) and rose to 23.14 (posttest).

Analysis Requirements Testing

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Testing of analytical requirements is a requirement that must be there in one way anova. There are two requirements that must be there before analysis of variance (ANOVA), namely: data normality test and data homogeneity test. The data normality test in this study used the kolmogorf-smirnov one-sample test and the data homogeneity test used the test of homogenity of variances at the significance level of α = 0.05 assisted by the SPSS program. Here's the description:

1. Normality Test

Table 6. Summary of Normality Test Results

Data	Lo	Lt	Conclusion
Pree Test	0,081	0,227	Usual
Mid Test	0,091	0,227	Usual
Post Test	0,099	0,227	Usual

Based on table 6, the results of the overall normality testing of the study data group showed that Lo < Lt, so it can be concluded that all sample groups are from normal distributed populations.

2. Homogenity Test

Table 7. Test homogeneity of variances

Data	X^2 hitung	X^2 tabel (a=0,05)	Conclusion
Pree Test, Mid Test, Post Test	2,15	5,99	Homogeneity

Based on table 7, the results of the overall homogeneity testing of the research data group showed that X^2 calculated < X^2 table, so it can be concluded that all sample groups come from populations that distribute homogeneity.

Hypothesis Testing

The hypothesis in this study shows an influence of soy flour and lunges training on the ability of the front kick speed of pencak silat athletes of the Center for Education and Sports Training (PPLP) of West Sumatra. Hypothesis testing was done using one way anova and assisted by the SPSS program.

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Ho = There is no effect of giving soy flour and lunges training to increase the speed of the front kicking athletes Pencak Silat Center Education and Sports Training students (PPLP) West Sumatra.

Ha = There is an influence of soy flour and lunges training on the ability of kick speed in front of pencak silat athletes of the west Sumatra education and sports training center (PPLP).

1) If, fh > ft = Ho rejected, Ha accepted

2) If, fh < ft = Ho accepted, Ha is rejected

For more details the results of hypothesis testing can be seen in the table:

Table 8. Summary of Anova's One Way Results

variant source	JK	Db	RJK	F_{count}	F_{table} (α=0,05)
escort	425,76	2	212,88		
deep	188,64	39	4,83	44,01	3,24
Total	614,40	41			

Information:
Db = Degree of Freedom
JK = Number of Squares
RJK = Average Number of Squares
Fh = Fcount
Ft = Ftable

Based on table 8, it shows that between rows or Fhitung = 44.01 > Ftabel = 3.24 then Ho was rejected and Ha was accepted, so it can be concluded that the effect of giving soy flour and lunges training on the ability of the front kicking athletes pencak silat center education and sports training center (PPLP) West Sumatra with $\alpha < 0.05$.

Discussion

Sport activities occur in the cooperation of various muscles of the body, that is characterized by changes in muscle strength, muscle flexibility, reaction speed, dexterity, coordination of movement and endurance of the cardiorespiratory system (Gold et al., 2012). "Exercise is an aerobic activity, to improve and maintain the health and endurance of the heart, lungs, blood circulation, muscles, and joints" (Situmorang et al., 2014).

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Pencak silat is a sport that is built from Indonesian culture to maintain the existence and integrity of the environment/natural surroundings, increase faith and devotion to God Almighty (Sucipto, 2001). Pencak silat has four aspects, namely an integral and inseparable unit, horses, tanks, punches and kicks. The basic kick technique is one of the techniques that results in an important score or point, the front kick is an attack that uses the feet and legs (johansyah lubis, 2004). The front kick is an attack technique that uses the base of the inner foot.

If the front kick is not done well, it could be caused by a lack of muscle strength and low food regulation and good nutritional intake, namely protein. According to (Wilda Welis, S.P., 2008), "food regulation for athletes is an important factor to achieve optimal performance". One type of exercise that can increase muscle strength is lunges which is supported by foods that contain protein such as soy milk. Lung exercise is a type of exercise that has the same form of exercise to strengthen the leg muscles (Astuti & Jatmiko, 2020). Soy milk is a processed milk whose main ingredient is soy milk.

According to (Cordier, 2019), lunges training is an exercise that used to build strength in the buttocks, hamstrings, calves, and midsection. According to (Siswara & Mardius, 2021), trained muscles are vastus lateralis, vastus medialis, rectus vemoris, vastus intermedius, bicep vimoris, semitendinosus, semimembranosus and gluteus maximus. According to (GUNAWAN & Jatmiko, 2020), lunges are movements such as walking, but the position of the body remains upright and the view facing forward, the angle of the foot can be bent to reach an angle of 90o. According to (Cronin et al., 2003), the ability to quickly complete a lunge and return to the start or move off in another direction is critical for success. Determining which strength qualities are important predictors of lunge performance. According to (Keogh, 1999), he stated that to train the body to more effectively apply force in the anterior, posterior, and lateral directions, a number of lunge variations can be included in the training program. According to (International & Education, 2017), he stated that endurance exercises train the leg

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muscles. In particular, lunges target the quadriceps and hamstring muscles in the thighs.

Soy milk is a processed milk whose main ingredient is soy milk. Milk is a food that is balanced and has high nutritional value, because it contains food substances such as carbohydrates, proteins, minerals and vitamins (Santoso, 2009). In addition, soy milk does not contain lactose, during the processing of soy milk into soyghurt, soy milk usually undergoes changes in chemical properties (Muchtadi, 1992). According to (Stark et al., 2012), they stated that soy is a vegetable-based protein source that is useful for vegetarians and individuals who are lactose- or casein- intolerant. Soy has a BV of 74 and PDCAAS of 1.00. It indicates that it is not as bioavailable as milk based protein, but contains all EAAs. According to (Chiang et al., 2021), mild resistance exercise is combined with milk or soy milk (400 mL/day) supplementation, also increases hand grip and/or calf circumferences in very old nursing home residents with sarcopenia. Therefore, the combination of exercise and nutritional supplementation have beneficial effects on elevating muscle strength.

According to (Orsatti et al., 2018), intake of high-quality protein sources can increase muscle protein synthesis and muscle mass, as well as increase muscle strength in older adults. According (David, 2015), he stated that soy protein is used as a whole source of protein in daily diet, and it will support normal muscle formation and maintain nitrogen balance in both children and adults. A source of protein containing all essential amino acids is considered a complete protein (Mith, 2006). The metabolism of soy milk that processed in the body will be digested by stomach, small intestine, and pancreas in order to produce actin and myosin which are beneficial for the increase of muscle cells and muscle constriction strength. According to (Kane et al., 2016) protein nutrient intake for athletes greatly affects the daily activities of athletes.

The preparation of a good and programmed exercise program has a good effect on the provision of soy milk flour and lunges exercises given to athletes.

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According to Irawadi (2014), an exercise program is a well-structured set of training activity plans as a guide in practicing for a certain period of time and for certain goals. The leg muscles that are trained can make the quality of the front kick better.

Based on the explanation, the provision of soy flour and lunges exercises are good for pencak silat athletes who want to increase the speed of the front kick. This exercise and soy flour treatment must be planned, programmed and sustainable to give a positive effect in increasing the front kick. It will affect the performance of athletes during the game, so they can achieve maximum achievement.

CONCLUSION

Based on the findings, there is an effect on the provision of soy flour and lunges training on the ability of the front kick speed of pencak silat athletes of the West Sumatra Student Sports Education and Training Center (PPLP) with a $\alpha < 0.05$.

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