

The Contribution of The Leg's Power, Body Balance, and Leg Muscle Flexibility to Front Kick Speed of Young Men Fighter, Tapak Suci Hermitage Banjarnegara Regency

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Abstract

The Purpose: (1) To find out and analyze the significant relationship between leg strength to the speed of the front kick. (2) To find out and analyze a significant relationship between the balance of the body against the speed of the front kick. (3) To find out and analyze the significant relationship between limb muscles flexibility to the speed of front kick. This research method is a triple correlation. Variables are divided into two namely independent variables: leg strength, body balance, and flexibility of leg muscles. While the dependent variable is the speed of Pencak Silat front kick. Population: A number of 72 male fighters from Tapak Suci in Banjarnegara Regency. The data collection technique uses tests and measurements, namely the standing board jump, dynamic balance, split front, and front kick speed test. Data analysis using multiple regression. Result: (1) There is a contribution of leg strength to the speed of the front kick in pencak silat martial arts. Proven from the results of the analysis obtained a contribution of 40.53%, (2) There is a contribution to the balance of the speed of the front kick in pencak silat martial arts. Proven from the results of the analysis obtained a value of the contribution of 50.74%, (3) There is a contribution of flexibility in the limb muscles to the speed of the front kick in pencak silat. This is proven from the results of the analysis obtained value of the contribution of 8.72%, (4) There is a contribution of leg strength, balance, and flexibility of leg muscles with the speed of front kick in pencak silat martial arts. Proven from the results of the analysis obtained the value of the contribution of 40.31%.

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INTRODUCTION

Pencak Silat is a martial art originating from Indonesia and is a recognized martial art sport in the world. Pencak Silat has currently competed in various national and international sports competitions. Pencak Silat martial arts is not only a sport but also a reflection of preserving Indonesian culture which must be preserved and defended from dangers that threaten the safety and survival of its life, Pencak Silat is strongly influenced by the philosophy, culture, and personality of the Indonesian nation, as stated by Lubis (2004) that: Pencak Silat is one of Indonesian original cultures, warriors, and Pencak Silat experts believe that Malay society created and used these martial arts since pre-history. Because at that time humans had to face harsh nature for the purpose of defending themselves against wild animals. Pencak Silat is a self-defense system inherited by ancestors as an Indonesian culture so it needs to be preserved and developed (Kriswanto, 2015). In the end, humans develop self-defense moves, among others, kicks, punches, avoidance, locking, and slamming. The complete definition of Pencak Silat was made by the IPSI Executive Board together with BAKIN Sucipto (2001) as follows: Pencak Silat is the result of Indonesian human culture to defend or maintain existence (independence) for the environment in order to increase faith and piety to the Almighty God. This statement is considered appropriate because if viewed from its characteristics, Pencak Silat involves physical implementation.

Mukholid (2004) describes the noble values of Pencak Silat from the aspect of sports, namely: (1) practicing and implementing Pencak Silat as an Indonesian culture that reflects noble values, (2) improve achievement, (3) upholding solidarity, (4) never give up, (5) able to master and control themselves, (6) have a sense of responsibility and personal and social discipline.

The Indonesian Pencak Silat Association (PPSI) in the city of Banjarnegara has developed several Pencak Silat colleges, one of which is the Pencak Silat Tapak Suci. The college was founded on July 31, 1963, under the name of the

Muhammadiyah men's holy campus and became a member of IPSI in 1972. Based on observations, Tapak Suci hermitage in Banjarnegara has scored athletes in various events at the regional, provincial, national and international levels. The achievements that have been achieved over the past 5 years include the 2014 Belgian Open championship Alih Yutika Nanda 1st place winner of the Women's Championship, Tapak Suci national championship 2014 in Solo, Yan Azizi Zulkarnaen won second place in the men's G class, Bangun Novebrian 1st place in men's B class, Lukman Judge won 3rd place in F men's class, Siti Rosidah won 2nd place in women's B class, the 17th Pencak Silat world championship 2016 in Bali, Galang Tri Widya Putra won the first class B men's. (Source: daily coach Didi Waluyo Jati, on February 19, 2018).

One technique in martial arts is an attack, using a foot called a kick if it succeeds in achieving the target, without being blocked, defeated, caught or kicked, it will get point 2 (Nugraha, 2014). According to Johansyah (2004) kick techniques are divided into several types including: front kick, *tusuk* kick, *kepret* kick, *jejag* kick, *gajul* kick, T kick, *celorong* kick, back kick, *kuda* kick, *taji* kick, *sabit* kick, *baling* kick, bottom kick, and *gejig* kick. However, not all kicks are used in matches. Seeing the effectiveness of motion, not all kicks can be used as fighters in matches. Ineffective and efficient kicks will hamper fighters in gaining value in matches. So that it can be concluded that not all effective kicks are used in matches. To learn these motion skills, a good physical condition is needed. Sajoto (1995), physical condition is a whole unit of components that cannot be separated, both the increase and maintenance. Components of physical conditions include: (1) strength, (2) endurance, (3) explosive power, (4) speed, (5) the flexibility of leg muscles, (6) body balance, (7) coordination, (8) agility, (9) accuracy, (10) reaction.

Kick is an important element in Pencak Silat because of kicking is the dominant element. Front kick technique movement, arm movement greatly determines the height and impact of the target and is influenced by the amount of force

used to kick (UNY National Sports Seminar, 2014). The object of the study in this study was a front kick. The front kick gets a special position in Pencak Silat. Because front kick is a technique that is often used to start or overtake an opponent's attack and is considered very efficient for short-range attacks and less risk of being pushed aside by opponents and having higher points 2 + 2 points compared to just 1 hit +1 point. Characteristics of coaching on the holy site in Banjarnegara are more prioritizing attacks with legs (kicks) or in other words attacks focused on the feet. There are several opinions about the front kick technique. Lubis (2004) explains that "The front kick is an attack that uses one leg and the trajectory to the front with the position of the body facing forward, with the base of the inner toes, with the aim of the heart and chin." By itself, the technique is much related to the position and position of the opponent. If we launch a kick, the foot will stand or rest on one leg and requires good leg power, balance, flexibility and kick speed.

According to Soedarminto (2008) suggests that: "the limbs consist of the upper limbs and lower limbs, the upper limbs consist of the groin to the knee, while the lower limbs consist of the knee to the leg". In the Pencak Silat sport, the use of variations in the legs consists of: back of the foot, soles of the feet, toe, feet, and ankles. To achieve all these various forms of movement are with good practice, directed, organized and programmed. Special kick exercises in the process need to pay attention to the various ways in which the kick is carried out, including the components of leg power. Power is the ability of the muscles are able to overcome prisoners or burdens in carrying out sports activities (Suharno, 1992), whereas according to Sukadiyanto (2005) defines strength in physiology, strength is the ability of neuromuscular to overcome external load resistance and internal loads. The sportsman level's power is affected by the circumstances: short muscle length, muscle size, far nearby the load point with the fulcrum, level of fatigue, red or white muscle type, muscle potential, utilization of muscle potential, techniques and abilities of muscle contraction.

Balance is a person's ability to maintain the stability of the body both in a static position and in a dynamic motion position where balance is also very important in doing a movement because in good balance, someone is able to coordinate movements and in some dexterity. As stated by Harsono (1988) that "balance is related to coordination of, and in some skills also with agility". Thus to maintain balance in the front kick, the movements carried out the need to be well coordinated in an effort to control all movements. In doing a kick it can be ascertained that the body is in motion so that the balance in question is the dynamic balance, in this study, it is intended that the balance of the limbs to maintain body position is very influential in determining the good and bad of the kick performed.

According to Irianto (2002) flexibility is a skill to make movements through a wide range. Another term that is often used in conjunction with muscle flexibility is elasticity, which is the muscle skill to change size to lengthen or shorten. The skill of limited flexibility can also lead to poor mastery of technique and low achievement, also blocking the speed and endurance of the muscles because the muscles must work hard to overcome the stages in a movement. Good limb muscle flexibility can be achieved if the joints in the body show skills and ease in moving smoothly according to their functions. So that the flexibility of leg muscles plays an important role because in daily activities or exercise.

Speed is the ability of the athlete's organism to make motion changes and maintain balance in a relatively short time. In this study, it was explained that the intended speed is the speed of the front kick in carrying out an attack. For that, the front kick speed is considered very urgent to be verifiable in this study because kicks that do not have speed have the potential to be risked to be captured and then slammed by the opponent. Whereas according to Sukadiyanto (2011) in general, the factors that affect speed are determined by heredity, reaction time, strength (ability to overcome ballast loads), technique, muscle elasticity, muscle type, concentration, and will. Moving on from the explanation of the

problems that have been raised, it is necessary to prove scientifically through research. For this reason, the researcher will conduct a research entitled "Contribution of leg strength, body balance and flexibility of limb muscles to the speed of the front kick of a young man's fighter in Banjarnegara Regency in 2018".

METHODS

This research is a quantitative study using a correlational method. The method used in this study is the triple correlation method that chooses the contribution of leg strength, body balance and flexibility of leg muscles to the speed of front kick in martial arts athletes in young men in Tapak Suci hermitage Banjarnegara. Triple correlation is a relationship together between X_1 , X_2 , and X_3 with Y (Sugiyono, 2015).

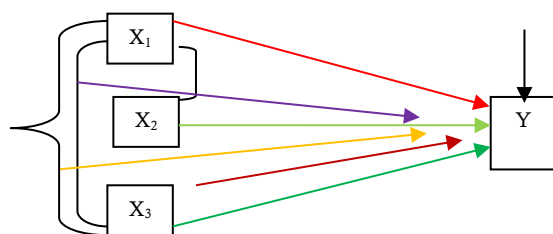


Figure 1. Independent Variable with Triple Correlation and One Dependent Variable

Information :	
X_1	: Leg strength
X_2	: Body balance
X_3	: Flexibility of leg muscles
Y	: Front kick speed
X_1 to Y	:
X_2 to Y	:
X_1 to Y	:
X_1 and X_2 to Y	:
X_1 and X_3 to Y	:
X_2 and X_3 to Y	:
X_1, X_2 and X_3 to Y	:

The population is a generalization area consisting of objects or subjects that have certain qualities and characteristics that have been determined by a researcher to be studied and then a conclusion will be drawn according to Sugiyono (2015). The population in this study were 72 male teenage fighters consisting of 4 training branches including, Banjarnegara city, Wanadadi sub-

district, Punggelan sub-district, and Wanayasa sub-district.

The sample in this study was 72 male teenage fighter in Tapak Suci hermitage, Banjarnegara Regency which consists of four training branches including, Banjarnegara city, Wanadadi sub-district, Punggelan sub-district, and Wanayasa sub-district. The fighter has at least competed at the district level. The researcher took the sample by means of total sampling technique, namely the sampling technique with the researcher taking data from all samples of 72 fighter.

A research instrument is a tool that is selected and used in activities to collect data so that the activity becomes systematic and results are obtained (Suharsimi, 2006). In this study, the data collection used survey methods with test and measurement techniques. The measuring instruments used are Standing Board Jump, Dynamic Balance, Front Split, and front kick speed instruments (Johnson & Nelson, 1986).

The normality testing of the data in this study uses the Kolmogorov-Smirnov test with the help of the SPSS 15.0 program at the significance level $\alpha = 0.05$. Decision criteria if the significance value is obtained $> \alpha$, then the research subject is normally distributed, if a significant value is obtained $< \alpha$, then the research subjects are not normally distributed (Sudjana, 1992).

The homogeneity test of the data in this study is Levene test with the help of SPSS 15.0 program at the significance level (α) = 0.05. Decision criteria if the significance value is calculated $> \alpha$, then the variation of data is homogeneous whereas if the significance value is calculated $< \alpha$, then the variation of the data is not homogeneous (Sudjana, 1992).

Hypothesis testing uses an analysis of variance (ANOVA) 2-lane design with the help of the SPSS 15.0 program. An alternative hypothesis is accepted if the ANOVA test value has a significance value smaller than α ($\text{sig} < 0.05$). Whereas if the calculated significance value is greater than α ($\text{sig} > 0.05$), the alternative hypothesis is rejected (Sudjana, 1992).

RESULTS AND DISCUSSION

The results of the research and discussion will be presented, among others: research results data, analysis prerequisite test, and hypothesis test Description analysis to find out an overview of various variables. Data that can be described include the following.

Table 1. Descriptive Test Results

	N	Minimum	Maximum	Mean	Std. deviation
Leg strength	72	2.24	2.50	2.3458	0.05816
Body balance	72	60.00	95.00	77.9167	9.84922
Limb flexibility	72	0.00	30.00	11.2917	8.63083
Front kick speed	72	17.00	25.50	21.0347	2.04410
Valid N (listwise)	72				

Based on the results of calculations with SPSS in table 1, we can see the strength of the limbs in young male athletes in Tapak Suci Hermitage Banjarnegara, an average of 2.3458 with the highest value of 2.50, the lowest value of 2.24 and the standard deviation of 0.5816. Leg strength was measured using Standing Board Jump. The description of the results of the research is presented in the frequency distribution.

With the formula looking for many classes = $1 + 3.3 \text{ Log } N$; range = maximum value - minimum value; and class length by formula = range / many classes, (Sugiyono, 2015). The frequency distribution of limb strength scores can be shown in the diagram as follows.

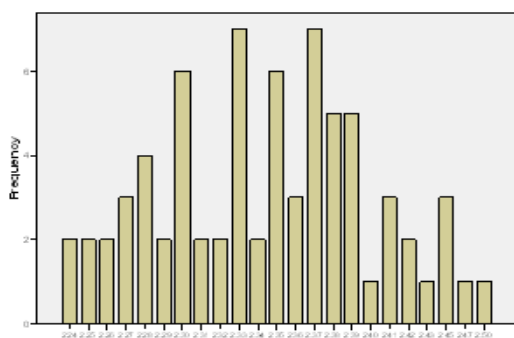


Figure 1. Leg Strength Diagram

The results of the descriptive analysis are known for the variable body balance in young male athletes in Tapak Suci hermitage Banjarnegara, an average of 77.9167 with the highest value of 95.00, the lowest value of 60.00

and standard deviation of 9.84922. Body Balance is measured using Dynamic Balance. The description of the results of the research is presented in frequency distributions with the formula of looking for many classes = $1 + 3.3 \text{ Log } N$; range = maximum value - minimum value; and class length by formula = range / many classes, (Sugiyono, 2015). The frequency distribution of body balance variable scores can be shown in the diagram as follows.

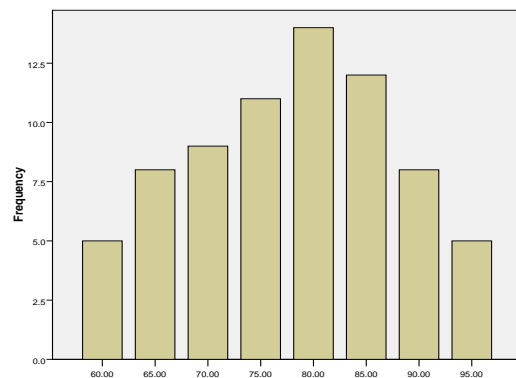


Figure 2. Body Balance Diagram

The flexibility of leg muscles in young male athletes in Tapak Suci Banjarnegara, the average is 11.2917 with the highest value of 30.00, the lowest value of 0.0 and the standard deviation of 8.63083. The flexibility of limb muscles was measured using Split Front. The description of the results of the research is presented in frequency distributions with the formula of looking for many classes = $1 + 3.3 \text{ Log } N$; range = maximum value - minimum value; and class length by formula = range / many classes, (Sugiyono, 2015). The frequency distribution of the variable scores for limb muscle flexibility can be shown in the diagram as follows.

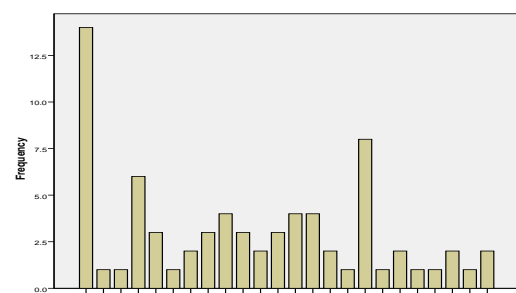


Figure 3. Leg Muscle Flexibility Diagram

The measurement of the front kick speed in this study was to use a speed measurement test for Pencak Silat front kick. Descriptive analysis results are known for the front kick speed variable obtained by the average value of 21.0347, the highest value of 25.50, the lowest value of 17.00, and the standard deviation of 2.04410. Front kick speed is measured using the front kick speed instrument Description of the results of this research is presented in frequency distribution with the search formula. Many athletes have participated in minimal competitions at Pencak Silat district level = $1 + 3.3 \text{ Log } N$. Diagram of kick speed variable frequency distribution front is as follows.

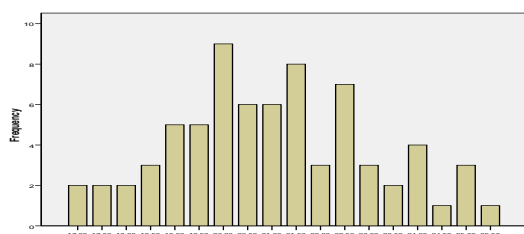


Figure 4. Kick Speed Diagram

The normality test of the data in this study used the Kolmogorov-Smirnov method. The results of the data normality test performed on each group of analysis were carried out with the SPSS Version 15.0 for Windows software with a significance level of 5% or 0.05. The full results are presented in the attachment page. The summary data is presented in the table as follows.

Based on the results of the analysis listed in table 2, it can be seen that the data of each variable is the variable leg strength, body balance, and flexibility of leg muscles and the speed of the front kick in young male athletes in Tapak Suci Hermitage Banjarnegara, the distribution is normally distributed because it has the value of Kolmogorov-Smirnov with significance > 0.05 , namely the significance of leg power 0.796, significance of body balance of 0.206, significance of limb muscle flexibility of 0.387 and significance of front kick speed of 0.712 so that it can be continued with parametric tests.

Table 2. Normality test

N	Leg strength		Body balance			
	72	72	Sig.	Statistic	df	Sig.
Normal Parameters(a,b)	Mean	50.0003	.200*	.881	5	.314
	Std. deviation	9.99970	.200*	.881	5	.314
Most extreme differences	Absolute	.076	.200*	.881	5	.314
	Positive	.076	.161	.883	5	.325

The next prerequisite for fulfilling the analysis is to test the variance homogeneity of the data. Test the variance homogeneity of the data to test the data variance similarity of each variable. The results of the homogeneity test of the study using the chi-square test using the computer assistance program SPSS for Windows Release 15 obtained results as listed in table 3.

Table 3. Homogeneity Test

	Levene statistic	df ₁	df ₂	Sig.	Explanation
Leg strength	1.013	15	54	.457	Homogen
Body balance	1.329	15	54	.218	Homogen
Limb flexibility	.998	15	54	.470	Homogen

Based on the chi-square test as listed in table 3, it can be seen that the data variance of each variable is the variable leg strength, body balance, and limb muscle flexibility and the speed of front kick in young male athletes Tapak Suci Hermitage is homogeneous because the value of χ^2 value has a significance > 0.05 . Leg strength significance of 0.457, the significance of body balance is 0.218, the significance of limb muscle flexibility is 0.470. Thus the data of the independent variable with the dependent variable is homogeneous that can be continued with parametric tests.

Linearity test is a test to find out whether between predictors (variable leg strength, body balance, and limb muscle flexibility and speed of Pencak Silat front kick) have a linear relationship or not to the criteria (the speed of Pencak Silat front kick). Tests are carried out by analysis of variance techniques. Tests are carried out by analysis of variance techniques. Test criteria are declared linear if the results of $F_{\text{value}} X_1, X_2$ and X_3 have a significance greater than the error limit of 5%. The results of the linearity test of data using the computer assistance program SPSS for Windows Release 15 obtained results as listed in table 4.

Table 4. Data Linearity Test Results

Variable	F _{value}	Sig.	α	Explanation
X ₁ -Y	0.895	0.595	0.05	Linier
X ₃ -Y	1.264	0.286	0.05	Linier
X ₂ -Y	0.829	0.677	0.05	Linier

The linearity test results of the data in table 4 above show that between predictors (leg power variables, body balance, and limb muscle flexibility) have a linear relationship to the criteria (the speed of Pencak Silat front kick) is shown from the F_{test} results which obtain significance greater than 0.05.

Table 5. Variable Multiple Regression Analysis

Variables entered	Variables removed	Method
X ₃ , X ₁ , X ₂		Enter

The correlation value or relationship (R) is 0.363 and it is explained that the percentage effect of the independent variable on the dependent variable is called the coefficient of determination which is the result of R squared. From the output obtained the coefficient (R²) of 0.125 which implies that the influence of the independent variable (Trust) to the dependent variable is 12.5% while the remaining 87.5% is influenced by other variables.

Table 6. Model Summary

R	R square	Adjusted R square	Std. error of the estimate
0.635 ^(a)	0.403	0.377	7.89452

In this section to explain whether there is a real or significant contribution between independent variables or trust (X₁₂₃) to the dependent variable or participation (Y) from the output, it can be seen that F_{value} = 7.044 with the level of significance (probability of 0.000 < 0.05, regression can use the example of predicting the dependent variable or participation.

Table 7. Coefficients

Model	Unstandardized coefficients		Standardized coefficients		t	Sig.
	B	Std. error	Beta	b		
(Constant)	6.916	6.588			1.050	0.298
Leg strength	0.345	0.107	0.345		3.236	0.002
Body balance	0.408	0.096	0.408		4.245	0.000
Tingkat flexibility	0.109	0.107	0.109		1.018	0.312

In this section, the Coefficients table in column B constant (a) is 6.916, while the value of

the independent variable or trust (b) is 0.345, 0.408 and 0.109. So the regression equation can be written $Y = a + bx$ or $6.916 + 0.345 - 0.408 - 0.109$. Can be explained as follows: the constant of 6.916 states that if there is no value of the X₁₂₃ independent variable or trust then the value of the independent variable or participation is 6.916. Then the X₁₂₃ regression coefficient of 0.345, 0.408 and 0.345 states that every addition to the value of the independent variable X₁₂₃ or trust, then the constant value increases by X₁ = 0.345, X₂ = 0.408 and X₃ = 0.345.

CONCLUSION

From the results of the research and discussion about the relationship between leg power, body balance, and limb muscle flexibility to the speed of the front kick on a young man's fighter in Tapak Suci hermitage Banjarnegara can be summarized as follows: (1) There is a relationship between leg strength and the speed of the front kick of a male teenager's fighter in Tapak Suci hermitage Wanadadi, Banjarnegara Regency. Evident from the results of the analysis obtained a contribution of 40.53%, (2) There is a relationship between the balance of the body and the speed of the front kick on the boys' fighter in Tapak Suci hermitage Wanadadi, Banjarnegara Regency. Evident from the results of the analysis obtained a value of the contribution of 50.74%. (3) There is a relationship between limb muscle flexibility with the speed of the front kick on the young male fighter in Tapak Suci hermitage Wanadadi, Banjarnegara Regency. Evident from the results of the analysis obtained a value of contribution of 8.72%. (4) There is a relationship between leg power and body balance simultaneously to the speed of the front kick on the young male fighter in Tapak Suci hermitage. (5) There is a relationship between leg power and limb muscle flexibility simultaneously to the speed of the front kick on the young male fighter in Tapak Suci hermitage. (6) There is a relationship between body balance and limb muscle flexibility simultaneously to the speed of the front kick on a young male fighter in Tapak Suci hermitage.

Together, there is a relationship between leg strength, body balance, leg muscle flexibility with a front kick speed on a young man's fighter in Tapak Suci hermitage Wanadadi, Banjarnegara Regency. Evident from the results of the analysis obtained the value of the contribution of 40.31%.

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