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The Influence of Leg Muscle Strength On The Anticipation of Takedown Slam Techniques In Athlete Tapak Suci Brebes District

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ABSTRAK

This study aims to determine the effect of leg muscle strength on the ability to anticipate takedowns in martial arts athletes in Tapak Suci Brebes Regency. Upper limb muscle strength plays an important role in maintaining body stability and balance when facing a slam attack. This study used a quasi-experimental method with a one-group pretest-posttest design. The research subjects consisted of 16 active pencak silat athletes. The research instruments included a wall sit test to measure leg muscle strength and an expert-validated takedown anticipation scoring rubric. Data analysis was performed using a paired sample t-test and a simple linear regression test using SPSS. The results showed a significant increase in leg muscle strength and the ability to anticipate the takedown technique after treatment, with a significance value ($p < 0.001$). The regression results showed a correlation coefficient (R) of 0.638 and a coefficient of determination (R^2) of 0.407, which means that 40.7% of anticipation ability is influenced by leg muscle strength. The significance value in the ANOVA test of 0.008 (<0.05) indicates that the regression model is significant. Thus, it can be concluded that leg muscle strength has a significant influence on takedown anticipation ability.

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INTRODUCTION

Pencak Silat is deeply rooted in Indonesian culture and serves as a symbol of national identity. Pencak silat is a martial art rooted in Indonesian culture and involves evasive and offensive techniques to defend oneself from an opponent's attack, both with and without weapons. (Arumdhani et al., 2024). Pencak Silat is not only used for self-defence, but also as a way to maintain health, develop character, and preserve cultural traditions (Sasmita et al., 2023). Along with time, Pencak silat is not only for art but has developed into an achievement sport and is competed in various national and international championships (Khoirul & Setiawan, 2022). There are two categories that are competed in pencak silat, namely the sparring category and the art category (Tofikin et al., 2024).

The sparring category is a category that features two fighters from different angles. Both face each other using elements of defence and attack, namely deflecting/

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dodging/hitting/attacking targets and knocking down opponents using techniques and tactics to compete to get the most points. (IPSI, 2025). In the sparring category, there are points that are assessed, namely in kicks given point 2, slams or techniques to drop opponents given point 3 and punches 1 point. (Setyawan & Setiawan, 2022). An athlete's success depends on the development of specific physical attributes (speed, agility, strength) and technical skills (kicking, parrying, striking and knocking out opponents) adapted to the demands of the competition (Wulandari et al., 2024).

The basic techniques of pencak silat include: stance, posture, steps, defence techniques, attack techniques, damping, falls / slams, catches, and basic techniques for resistance to slams (Sudiana & Spyanawati, 2023). Falling techniques, especially slams/takedowns, are the dominant techniques in modern competition because slams are the highest scoring aspect of the game (Saputro et al., 2024). According to Soo et al., (2018), A takedown is an attempt to knock an opponent down with a certain technique, such as a slam, sweep, or scissors, so that the opponent falls and cannot maintain a standing position. This technique is used both in attack and when counter-attacking. Therefore, anticipation of takedown techniques in pencak silat is very important to prevent your opponent from knocking you down and maintaining your defensive position (Mistar et al., 2025).

To anticipate takedowns from opponents, lower extremity muscles, especially strong leg muscles, are needed as a foundation in maintaining stance and body stability. According to Mistar et al., (2025), One of the main factors that support success in anticipating slams is stance, where the strength of the thigh muscles plays a major role in maintaining balance, stability, and endurance of the lower body which functions as the main support in defense techniques against pushes, catches, and opponent slams. The leg muscles are the centre of the lower body movement that is very instrumental in maintaining body stability, especially when standing, walking, running, jumping, and performing defensive movements such as stance in pencak silat (Bompa & Buzzichelli,2019).

In line with the previous description, leg muscle strength has a crucial role in anticipating takedown techniques, so training is needed to increase leg muscle strength. Strength is one of the elements of physical condition that is very important in sports because it can help improve components such as speed, agility and accuracy. (Chan, 2012). In martial arts sports, leg muscle strength functions to maintain body balance, hold weight when standing, and control lower body movements when receiving attacks or collisions. (Zaifi, 2023). To achieve the best results in performance sports, the application of coaching models and the preparation of training plans must be guided by the principles and theories of correct, planned, layered and sustainable training (Nugroho et al., 2023). The role of a coach is vital in the implementation of sports coaching. A coach greatly influences the results and performance of athletes when running an exercise program (Labib & Setiawan, 2023).

Observations and systematic observations carried out in training sessions show a deficiency in the mastery of basic techniques. The ability to anticipate takedowns from most athletes still have difficulty in mastering these basic techniques. Researchers identified a lack of leg muscle strength as the basis for forming a strong stance. At the

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BREBES PORKAB event in December 2024, researchers found that of the 16 athletes who competed, most of the success rates in resisting takedown attacks were still relatively low, and of the many attempts, only a few times were successfully anticipated. However, this can be overcome by involving upper limb muscle strength training as a basis for forming a strong stance. The main focus of this research is to examine the anticipation technique of slams (takedowns) on Tapak Suci Brebes athletes. This research focuses on experimental tests, namely the leg muscle strength training method. This study aims to determine the extent to which leg muscle strength affects the improvement of takedown anticipation ability in Brebes Regency Tapak Suci athletes.

METHODS

This study adopted a quantitative approach to the quasi-experimental method with a one-group pretest-posttest design that used one group of subjects without a control group. The research was conducted at Padepokan Tapak Suci Brebes Regency in September - October 2024. The research subjects consisted of 16 adult athletes who were actively registered with a purposive sampling technique.

The leg muscle strength test uses a wall sit test with a minute count score. The takedown anticipation test was developed using a scoring rubric by the coach and validated by 3 experts (expert judgment) who are certified trainers or pencak silat academics. Test Implementation Guidelines: (1) Athlete are asked to face a simulation of a slam from an opponent (takedown from the front), (2) each athlete makes 5 attempts using a single leg takedown, (3) Each attempt is scored by the judges based on the scoring rubric, (4) The scores for each aspect are summed up and averaged, (5) the test is repeated if the hand slips from the grip to the body protector, both anticipation hands hold the knee or body protector. Both tests were conducted pretest and posttest.

The data that has been obtained will be processed using statistical formulas by testing the truth of the hypothesis and the conclusion. Data analysis in quantitative research requires the use of statistical formulas or statistical assistance programs (Kotronoulas et al., 2023). The data will be processed using the SPSS application, with the stages of descriptive statistics, then conducting prerequisite analysis before conducting hypothesis testing, including normality tests using the Shapiro-Wilk test. Then conduct a paired samples t-test and finally test the hypothesis using a simple linear test.

Table 1.
Takedown Anticipation Assessment Rubric

No	Indikator	Score
1	Can hold a pose for 3 seconds without wavering or losing balance	5
2	Can hold a pose but changes position or loses balance	4
3	Can maintain a pose but one of the supports (hands or knees) touches the mat or falls but remains under control	3
4	Two supports (two hands or feet) touch the mat or (one hand and one knee) touch the mat	2
5	Cannot hold a pose for less than 2 seconds	2
6	Touches the mat or falls immediately out of control	1

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RESULTS AND DISCUSSION

RESULT

The results of the pretest and posttest of leg muscle strength (wallsit) and takedown anticipation of Brebes Regency Tapak Suci athletes are as follows **:**

Table 1.
Descriptive Statistics

Statistic	Pretest Wallsit	Posttest Wallsit	Pretest Anticipation	Posttest_Anticipation
Minimum	.88	1.30	2.00	3.40
Maximum	2.17	2.75	3.60	4.40
Mean	1.3698	1.9867	2.7500	3.8625
Std.Deviation	.36809	.38548	.53914	.30741
N	16	16	16	16

The pretest results of wall sit ability showed an average of 1.37 seconds with a minimum value of 0.88 and a maximum of 2.17 seconds, and an average posttest value of 1.99 seconds, with a range between 1.30 to 2.75 seconds. Meanwhile, the results of the slam anticipation ability at pretest had an average of 2.75 with a minimum value of 2.00 and a maximum of 3.60 and an average at posttest of 3.86 with a minimum value of 3.40 and a maximum of 4.40.

Normality Test

The data normality test uses the Shapiro-wilk. The rule used to determine whether a distribution is normal or not is that if the significance value is greater than 0.05 (sig> 0.05) then it is normal, and if the significance value is less than 0.05 (sig < 0.05) then the data is said to be abnormal.

Table 1.
Normality Test

Tests of Normality	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Wallsit	.209	16	.059	.913	16	.129
Postest Wallsit	.130	16	.200*	.970	16	.838
Pretest Anticipation	.235	16	.019	.898	16	.076
Posttest Anticipation	.143	16	.200*	.939	16	.331

The results of the normality test can be compared with the basis for decision making, namely, if the test results are> 0.05, then the data can be assumed to be normally distributed. Based on Table 2, the normality test results for the pre-test wall sit value are 0.129> 0.05, and the post-test value is 0.838> 0.05. While the results of the normality test of the takedown anticipation pre-test are 0.076> 0.5 and the post-test value is 0.331> 0.5 With that the variables in this study as a whole are included in the category of normally distributed data, so that parametric testing can be continued with hypothesis testing using the Paired Sample T-test to be able to see differences in data distribution.

Paired Samples T-test

The results of the paired sample t-test refer to the significance value (2-tailed) <0.05; then H0 is rejected and Ha is accepted. if the significance value (2-tailed) >0.05, then H0 is accepted and Ha is rejected. The findings of this research correlation test are shown in the following table **:**

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Table 2.
T-Test of Pre-test and Post-test wallsit

	Paired Differences					t	df	Sig.	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided P	Two-Sided P
Pretest Wallsit – Posttest Wallsit	.61687	.29304	.07326	-.77303	-.46072	-8.420	15	<.001	<.001

Table 4.
T-Test of Pre-test and Post-test Takedown Anticipation

	Paired Differences					t	df	Sig.	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided P	Two-Sided P
Pretest_Anticipation - Posttest_Anticipation	-1.11250	.43799	.10950	-1.34589	-.87911	-10.160	15	<.001	<.001

Based on the results of the paired sample t-test, it is known that there is a significant difference between the pretest and posttest values on the leg muscle strength variable. The average posttest value increased by 0.61687 minutes compared to the pretest, with the t-test result (15) = -8.420 and a significance value of $p < 0.001$. Similarly, on the takedown anticipation ability variable, there was an average increase of 1.11250 points, with $t(15) = -10.160$ and $p < 0.001$. These results indicate that the treatment provided had a highly significant effect on improving both leg muscle strength and takedown anticipation ability.

Hypothesis Test Results

A simple linear regression test is conducted to determine the effect of one independent variable on one dependent variable in a linear manner. The analysis results will display the R value, R Square, ANOVA, and regression coefficient. If the significance value (Sig.) in the ANOVA table and the regression coefficient <0.05, it can be concluded that there is a significant influence of variable X on variable Y. In addition, the regression equation will be formed based on the constant value and the variable X coefficient. The results of the Simple Linear Regression in this study can be seen in Table 5 as follows:

Table 5.
Simple Linear Regression of thigh muscle strength (wallsit) variable (X) and Takedown Anticipation variable (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.638[a]	.407	.365	.24503

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.577	1	.577	9.610	.008[b]
	Residual	.841	14	.060		
	Total	**1.418**	**15**			

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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.852	.332		8.596	<.001	2.140	3.563
	Posttest_Wall sit	.509	.164	.638	3.100	.008	.157	.861

Based on the results of a simple linear regression test using the SPSS application, a correlation coefficient (R) value of 0.638 was obtained, which indicates a fairly strong relationship between the Posttest_Anticipation and Posttest_Wallsit variables. The coefficient of determination (R Square) of 0.407 means that 40.7% of the variation in anticipation ability can be explained by leg muscle strength (wallsit), while the remaining 59.3% is influenced by other factors outside the model.

The ANOVA test results show a significance value (Sig.) of 0.008 <0.05, which means that the regression model used is significant. Thus, there is a real influence between Posttest_Wallsit on Posttest_Anticipation. The regression equation formed is: Y = 2.852 + 0.509X, which means that each one-unit increase in the Posttest_Wallsit score will increase the Posttest_Anticipation score by 0.509 units. Because the significance value for the Posttest_Wallsit variable is 0.008 <0.05, it can be concluded that this variable has a significant effect on takedown anticipation ability.

Discussion

Strength is the ability of a muscle or muscle group to produce maximum force in a short time against a load or resistance. According to (Bompa & Buzzichelli, 2019). Good muscle strength not only improves the ability to lift or push weights but also helps reduce the risk of injury and improves body stability and coordination. This is needed as a foundation to perform takedown anticipation techniques in pencak silat. Kraemer & Ratamess, (2004) state that lower limb muscle strength is essential in resisting external loads and maintaining posture in defensive activities. The thigh muscles, specifically the quadriceps and hamstrings, play a major role in generating force, supporting stability and maintaining body balance during physical contact or sudden changes in direction of motion.

From this statement, it can be concluded that the anticipation of motor stimuli is determined by the readiness of the muscles and nervous system in responding to stimuli that come suddenly. With adequate muscle strength, especially in the thighs, the body can react faster and more stable. (Schmidt et al., 2018). This study shows that there is a significant influence of thigh muscle strength on takedown anticipation ability. This is evidenced by the significance value of p = 0.008 (p < 0.05) and the regression coefficient value (B) of 0.509, with an R Square of 0.407, which means that 40.7% of the anticipation ability of the slam can be influenced by thigh muscle strength. Meanwhile, the remaining 59.3% is influenced by other factors such as motor reflexes, balance, competition experience, and other psychomotor factors. This shows that thigh muscle strength has a positive contribution to the anticipation of takedowns in Tapak Suci Brebes athletes.

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This result is in line with the findings (O'Donovan et al., 2006), which states that hard-style martial arts practitioners have greater leg and trunk muscle strength compared to non-athlete individuals, and exhibit faster motor reaction times. In martial arts contexts such as pencak silat, fast reaction times are necessary to respond to an opponent's attack techniques, including takedowns or slams. This finding is supported by (Ilyas et al., (2024), which emphasizes that the ability to anticipate in pencak silat matches, especially against slam attacks (takedowns), is very important so that athletes do not lose fall points. This readiness requires stability and strength of the lower muscles, especially the thigh muscles, to maintain balance and fight back during physical contact with the opponent.

Research by Arwin & Ilahi, (2021) in wrestling athletes showed that leg muscle strength was positively correlated with the effectiveness of defence against takedown attacks. This shows that leg muscle strength can increase the ability to anticipate slams in martial arts sports that require high stability. Based on the above findings, it can be said that athletes with high leg strength are better able to withstand falling movements and maintain balance.

CONCLUSIONS

Based on the discussion above, it can be concluded that leg muscle strength has an important role in improving the ability to anticipate takedowns in martial arts athletes. The results showed a significant influence of thigh muscle strength on this ability, with a contribution of 40.7%. Good thigh muscle strength, especially the quadriceps and hamstring muscles, helps maintain stability, balance and motor response when facing a slam attack. This finding is corroborated by previous research, which confirms that leg muscle strengthening training is essential to support defensive performance in martial arts. Therefore, pencak silat training programs need to emphasize thigh muscle strengthening to increase the effectiveness of the anticipation of the opponent's slamming techniques.

REFERENCES

Arumdhani, U. S., Setiawan, I., Hartono, M., & Billiandri, B. (2024). Pengembangan media pembelajaran pencak silat siswa tunarungu di Kabupaten Grobogan. *Indonesian Journal for Physical Education and Sport*, *5*(2), 657–665. https://journal.unnes.ac.id/journals/inapes

Arwin, A., & Ilahi, B. R. (2021). Kontribusi Kekuatan Otot Tungkai dan Kelenturan Pinggang Terhadap Hasil Bantingan Kayang dalam Olahraga Gulat. *SPORT GYMNASTICS: Jurnal Ilmiah Pendidikan Jasmani*, *2*(1), 14–23.

Bompa, T. O., & Buzzichelli, C. (2019). *Periodization-theory and methodology of training*. Human kinetics.

Chan, F. (2012). Strength Training (Latihan Kekuatan). *Cerdas Sifa*, *1*(1), 1–8. https://online-journal.unja.ac.id/index.php/csp/article/view/703

Ilyas, M. F., Arifin, S., Dirgantoro, E. W., Studi, P., Jasmani, P., Peratndingan, P., & Tanding, K. (2024). *Jurnal Ilmiah STOK Bina Guna Medan TERHADAP PERATURAN SILAT TERBARU KATEGORI TANDING TAHUN 2022 SATUI UNDERSTANDING OF THE LATEST COMPETITION CATEGORY IN 2022 SILAT ATHLETES ' Jurnal Ilmiah STOK Bina Guna Medan*. *12*, 0–8.

IPSI. (2025). *peraturan pencak silat 2025* (Vol. 16, Issue 2).

Khoirul, I., & Setiawan, I. (2022). Pengembangan Model Latihan Jatuhan Pencak Silat Di Ekstrakurikuler Tingkat SMP Kota Semarang. *Indonesian Journal for Physical Education and Sport*, *3*(2), 461–468. https://doi.org/10.15294/inapes.v3i2.59122

Kotronoulas, G., Miguel, S., Dowling, M., Fernández-Ortega, P., Colomer-Lahiguera, S., Bagcivan, G., Pape, E., Drury, A., Semple, C., Dieperink, K., & Papadopoulou, C. (2023). An Overview of the Fundamentals of Data Management, Analysis, and Interpretation in Quantitative Research. *Seminars in Oncology Nursing*, 151398. https://doi.org/10.1016/j.soncn.2023.151398

Kraemer, W. J., & Ratamess, N. A. (2004). Fundamentals of Resistance Training: Progression and Exercise Prescription. *Medicine and Science in Sports and Exercise*, *36*(4), 674–688. https://doi.org/10.1249/01.MSS.0000121945.36635.61

Labib, Y. M., & Setiawan, I. (2023). Pembinaan Prestasi Atlet Pencak Silat di Kabupaten Pemalang. *Indonesian Journal for Physical Education and Sport*, *4*(1), 137–145. https://doi.org/10.15294/inapes.v4i1.51877

Mistar, J., Lubis, J., & Pelana, R. (2025). *BIBLIOMETRIC ANALYSIS : ANTICIPATION OF THE TUG FALL TECHNIQUE PENCAK SILAT BASED ON VOSVIEWERS* (Issue Icsspeh 2024). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-354-2

Nugroho, S. N., Setiawan, I., Pendidikan, J., Kesehatan, J., & Rekreasi, D. (2023). Indonesian Journal for Physical Education and Sport Pembinaan Prestasi Pencak Silat Persaudaraan Setia Hati Terate Ranting Suradadi Kabupaten Tegal Tahun 2021. *Indonesian Journal for Physical Education and Sport*, *4*, 245–252. https://journal.unnes.ac.id/sju/index.php/inapes

O'Donovan, O., Cheung, J., Catley, M., McGregor, A. H., & Strutton, P. H. (2006). An investigation of leg and trunk strength and reaction times of hard-style martial arts practitioners. *Journal of Sports Science and Medicine*, *5*(CSSI-1), 5–12.

Saputro, E. N., Setiakarnawijaya, Y., & … (2024). IMPROVING THE SKILL OF ANTICIPATING FALLING PULLS USING "GUNTINGAN" ON PENCAK SILAT ATHLETES (Study Action Research at PPLM DKI Jakarta). *Gladi: Jurnal Ilmu …*, *15*(02), 241–257. https://journal.unj.ac.id/unj/index.php/gjik/article/view/45730

Sasmita, K., Barlian, E., & Padli, P. (2023). Pencak Silat Wajah Budaya Bangsa Indonesia. *Journal on Education*. https://doi.org/10.31004/joe.v5i2.935

Schmidt, R. A., Lee, T. D., Winstein, C., Wulf, G., & Zelaznik, H. N. (2018). *Motor control and learning: A behavioural emphasis*. Human kinetics.

Setyawan, A., & Setiawan, I. (2022). Kondisi Fisik dan Teknik Atlet Pencak Silat Pagar Nusa Kabupaten Temanggung. *Indonesian Journal for Physical Education and Sport*, *3*(2), 449–460. https://doi.org/10.15294/inapes.v3i2.60635

Soo, J., Woods, C., Arjunan, S., Aziz, A., & Ihsan, M. (2018). Identifying the performance

characteristics explanatory of fight outcome in elite Pencak Silat matches. *International Journal of Performance Analysis in Sport*, *18*, 973–985. https://doi.org/10.1080/24748668.2018.1539381

Sudiana, I. K., & Spyanawati, N. L. P. (2023). *Keterampilan dasar pencak silat*. PT. RajaGrafindo Persada-Rajawali Pers.

Tofikin, M. P., Hendryanto, F., & Siska, M. P. (2024). *PENCAK SILAT (Peraturan Pertandingan IPSI Tahun 2022)*. PT Penerbit Qriset Indonesia.

Wulandari, S., Widiastuti, & Widyaningsih, H. (2024). THE EFFECT OF KICK SPEED, AGILITY, AND CONFIDENCE ON THE ACHIEVEMENT OF YOUNG PENCAK SILAT ATHLETES IN WEST SUMATRA. *Gladi : Jurnal Ilmu Keolahragaan*. https://doi.org/10.21009/gjik.153.05

Zaifi, F. (2023). THE EFFECT OF LEG MUSCLE STRENGTH, BALANCE AND INTELLIGENCE, TOWARDS THE LEARNING OUTCOMES OF PENCAK SILAT EMPTY-HANDED SINGLE ARTISTIC. *Jurnal Inovasi Olahraga*. https://doi.org/10.53905/jiojurnal.v3i01.1