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The Relationship Between Illinois Agility Test and Crescent Kick Speed in Pencak Silat Athletes

Yosep April Widiyanto[1]*, Fajar Syamsudin[2]

[1]Affiliation and full address of the author(s), city, country

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Abstract

This study aims to determine the relationship between Illinois Agility Test scores and sickle kick speed among Pagar Nusa athletes in Semarang Regency. This study employed a quantitative approach with a correlational design and involved 20 athletes selected through purposive sampling. Agility was measured using the Illinois Agility Test, while scissor kick speed was measured based on the number of kicks in 10 seconds. Data analysis was performed using descriptive statistics, the Shapiro-Wilk normality test, and correlation tests. The results of the study showed a significant negative correlation between Illinois Agility Test scores and sickle kick speed ($r = -0.845$; $p = 0.000$). The coefficient of determination (R^2) of 0.714 indicates that agility accounts for 71.4% of the speed of a scissor kick. The shorter the time it takes to complete the Illinois Agility Test, the higher the athlete's kicking speed.

✉ Corresponding author :
E-mail: yosepaprilwidiyanto@gmail.com

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INTRODUCTION

Pencak silat is one of Indonesia's indigenous martial arts that has evolved into a competitive sport. This sport not only incorporates elements of self-defense but also embodies cultural values, art, and character education. In pencak silat competitions, athletes are required to possess strong technical skills and be in optimal physical condition. Strong technical skills must be supported by adequate physical conditioning so that athletes can perform at their best during competitions. Therefore, physical fitness is a crucial aspect in improving the performance of pencak silat athletes.(Astutik & Setiawan, 2022).

According to Mihmidati & Wahyudi (2021) The term "pencak silat" derives from the word "pencak," which refers to a martial art characterized by dance-like movements and rhythmic patterns, performed according to specific rules. Meanwhile, "silat" is the essence of pencak and is used for defensive combat or self-defense against enemies. The martial art of pencak silat can be found in various countries, such as Malaysia, Brunei, the Philippines, Singapore, and southern Thailand.

One technique frequently used in pencak silat matches is the crescent kick. The crescent kick is a kicking technique performed with a circular motion toward the opponent's target. An analysis of National Student Sports Week (POPNAS) matches shows that the sickle kick is the most commonly used technique, accounting for 26.66% of all techniques compared to other techniques. Therefore, mastering this technique is one of the key factors in scoring points during a match (Syamsudin et al., 2023). This technique is often used because it offers a good opportunity to score points during a match (Izzulhaq & Syafii, 2023). The success of a roundhouse kick depends not only on technical skill but is also influenced by various physical factors. Athletes who can execute a roundhouse kick quickly and accurately will have a better chance of winning the match. An analysis of the Pencak Silat matches at the 20th National Sports Week (PON) in Papua shows that the crescent kick was the most frequently used technique, accounting for 20.46% of all techniques (Setiadi et al., 2022) . Kicks are the most commonly used technique in pencak silat matches and are worth more points than punches, so kicking skills must be developed to the fullest extent possible (Diono & Jatmiko, 2021) .

The speed of a sickle kick is a crucial component of pencak silat because it affects the effectiveness of attacks and the chances of scoring points in a match. This speed is essential because it makes it difficult for opponents to anticipate the direction of the attack. The faster a kick is executed, the greater the likelihood of hitting the intended target. The results of a biomechanical analysis of pencak silat athletes also show that the speed of a sickle kick is influenced by motor coordination and the ability to perform efficient movements, which contribute to the success of kicking techniques in competition (Syaifullah & Lingsir Maghribi, 2023). Kicking speed is influenced by various factors, such as muscle strength, motor coordination, balance, and agility (Jamal et al., 2024). In addition, leg length and leg muscle strength also contribute to the kicking speed of pencak silat athletes, so these factors need to be taken into account when designing a training program.(Waluyo & Eko Sudarmanto, 2023). Research on plyometrics in pencak silat athletes shows that improvements in several aspects of physical fitness can significantly enhance the crescent kick (Hayati & Endriani, 2021) .

Agility is one of the components of physical fitness that plays a key role in supporting pencak silat athletes' ability to perform crescent kicks (Tofikin & Sinurat, 2020) . In the martial art of pencak silat, agility plays a crucial role in helping athletes execute offensive and defensive moves. Athletes with good agility will find it easier to shift their body position when facing an opponent and to position themselves before launching an attack. These skills are necessary for the Movement to operate effectively and efficiently. Improving agility through side-step drills has a positive effect on pencak silat athletes' ability to perform sickle kicks. (Adeyansyah et al., 2022) . In addition to side-step drills, structured agility training has also been shown to improve the agility of pencak silat athletes, thereby helping to enhance their technical performance during competitions. (Effendi et al., 2025). These findings are supported by (Illah et al., 2024) which states that Speed, Agility, and Quickness (SAQ) training can significantly improve the kicking speed of pencak silat athletes.

One of the tools frequently used to measure agility is the Illinois Agility Test. This test involves running along a specific course that requires athletes to change direction quickly. This

ability to change direction is crucial in pencak silat because athletes must transition effectively between offensive and defensive movements. Agility, as measured by the Illinois Agility Test, is strongly correlated with the physical performance of pencak silat athletes (Ilham et al., 2025). Test results are based on the time it takes an athlete to complete the course; the shorter the time, the better the athlete's agility. The use of the Illinois Agility Test in various sports studies also shows that this test is capable of providing an objective assessment of an athlete's ability to change direction (Tofikin & Sinurat, 2020).

METHODS

This study employed a quantitative approach with a correlational design to determine the relationship between Illinois Agility Test scores and sickle kick speed among Pagar Nusa pencak silat athletes in Semarang Regency. The study was conducted in April 2026 and involved 20 active athletes aged 17–22 years who were selected using a stratified sampling method. Agility was measured using the Illinois Agility Test, while crescent kick speed was measured based on the number of kicks performed in 10 seconds. All athletes warmed up before taking the test. The data were analyzed using descriptive statistics, the Shapiro-Wilk normality test, and Pearson's product-moment correlation test at a 5% significance level. The coefficient of determination (R^2) was calculated to determine the extent to which agility contributes to crescent kick speed.

RESULTS AND DISCUSSION

This study was conducted on 20 Pagar Nusa pencak silat athletes in Semarang Regency. Before performing the correlation analysis, the data were described based on the respondents' characteristics, including age, height, and weight. Next, descriptive statistical analysis, a normality test, and a product-moment correlation test were conducted.

Table 1. Respondent Characteristics

Variable	Mean ± SD	Minimum	Maximum
Age (years)	19,20 ± 1,28	17	22
Height (cm)	168,45 ± 5,78	158	178
Weight (kg)	61,80 ± 6,25	51	74

Table 1 shows that the average age of the respondents was 19.20 years, with an age range of 17–22 years. The average height of the athletes was 168.45 cm, while the average weight was 61.80 kg. These characteristics indicate that all respondents were in the productive age group and were actively participating in the pencak silat training program.

Table 2. Descriptive Statistics for the Results of the Illinois Agility Test and Scissor Kick Speed.

Variable	Mean ± SD	Minimum	Maxsimum
Illinois Agility Test (seconds)	16,84 ± 0,90	15,20	18,20
Crescent Kick Speed (kicks/10 seconds)	21,00 ± 2.297	16	26

According to **Table 2**, the average score on the Illinois Agility Test was 16.84 seconds, with the fastest time being 15.20 seconds and the slowest 18.20 seconds. Meanwhile, the average rate of sickle kicks was 21 kicks in 10 seconds, with a peak of 26 kicks, with a minimum of 16 kicks. A structured approach to improving athletes' sickle kick skills.

Table 3. Results of the Shapiro-Wilk Normality Test

Variable	Statistic	Sig.	Notes
Illinois Agility Test	0,961	0,582	Normal
Kick speed crescent moon	0,952	0,426	Normal

Based on the results of the Shapiro-Wilk normality test in **Table 3**, the p-values for the Illinois Agility Test and the sickle kick speed were 0.582 and 0.426, respectively. Both values are greater than 0.05, so it can be concluded that the data for both variables are normally distributed. Therefore, the analysis of the relationship can proceed using Pearson's product-moment correlation test.

Table 4. Hasil Uji Korelasi Product Moment

Variable	R Count	Sig. (p)	Notes
Illinois Agility Test with Speed scythe kick	-0,845	0,000	A very strong relationship

The results of the product-moment correlation test showed a value of r = -0.845 with a significance level of 0.000 ($p < 0.05$). This indicates a significant correlation between the results of the Illinois Agility Test and the speed of the sickle kick performed by Pagar Nusa pencak silat athletes in Semarang Regency. This relationship is negative, meaning that the shorter the time it takes to complete the Illinois Agility Test (the better the athlete's agility), the higher the athlete's sickle kick speed.

In addition, the coefficient of determination (R^2) was found to be 0.714, indicating that agility accounts for 71.4% of the speed of a scissor kick. Meanwhile, the remaining 28.6% is influenced by other factors, such as lower-body muscle strength, overall muscle strength, motor coordination, balance, flexibility, and technical skill.

This study aimed to determine the relationship between the results of the Illinois Agility Test and the speed of the sickle kick among Pagar Nusa pencak silat athletes in Semarang Regency. Based on the results of the analysis using Pearson's product-moment correlation test, the r value was found to be -0.845, with a significance level of 0.000 ($p < 0.05$). The results show that there is a significant and very strong correlation between Illinois Agility Test scores and scythe kick speed. The correlation found was negative, meaning that the shorter the time taken to complete the Illinois Agility Test—or the higher an athlete's agility level—the higher the scythe kick speed. Conversely, the longer it takes to complete the Illinois Agility Test, the fewer sickle kicks a person can perform in 10 seconds.

Agility is a person's ability to quickly change the direction and position of their body without losing balance. In the martial art of pencak silat, agility plays a crucial role when athletes change positions, evade an opponent's attacks, and prepare their bodies before launching an attack (Urbaningrum & Rahim, 2023). Athletes with good agility can coordinate their body movements more effectively, making their sickle kicks faster, more stable, and more accurate. Therefore, agility is one of the physical components that significantly contributes to the success of the sickle kick technique in a match.

The results of this study are consistent with Rosmawati et al., (2019) This indicates that there is a significant relationship between agility and the speed of sickle kicks in pencak silat athletes. This study explains that athletes with good change-of-direction skills tend to be able to perform faster and more effective sickle kicks. The consistency of the findings in this study suggests that agility is an important factor associated with the ability to perform sickle kicks in pencak silat athletes. The findings of this study also support the results of the research Ihsan et al., (2022) which states that agility is one of the components of physical fitness that contributes to the quality of kicks performed by Pencak Silat athletes. The findings of this study are also supported by (Syamsudin et al., 2023) which reported that the crescent kick is the most frequently used technique in competitive Pencak Silat matches, accounting for 26.66% of all techniques. The prevalence of the crescent kick indicates that this technique plays an important role in scoring points. Oleh karena itu, atlet harus dalam kondisi fisik yang baik terutama dalam hal kelincahan agar dapat melakukan tendangan dengan cepat dan efektif selama pertandingan. Therefore, improving kicking quality by developing physical fitness components particularly agility is a crucial aspect of athlete development. Athletes with

good change-of-direction skills tend to be able to execute kicking techniques more quickly and effectively.

The findings of this study are also supported by Tofikin & Sinurat, (2020) which states that agility is related to the kicking techniques of pencak silat athletes. Athletes who can move and change direction quickly will find it easier to achieve the ideal body position before kicking, making their technique more efficient. Measuring agility using the Illinois Agility Test can provide an objective assessment of athletes' ability to change direction, which is related to technical performance in pencak silat.

Based on the research findings, the coefficient of determination (R^2) was 0.714, indicating that agility accounts for 71.4% of the speed of scissor kicks performed by Pagar Nusa pencak silat athletes in Semarang Regency. This suggests that a significant portion of the athletes' ability to perform scissor kicks is influenced by their level of agility. The remaining 28.6% is influenced by other factors not examined in this study, such as lower-body muscle strength, motor coordination, balance, flexibility, and mastery of kicking technique. Thus, improving the speed of the scissor kick is not achieved solely through agility training but must also be supported by a comprehensive program of other physical exercises.

The findings of this study have practical implications for pencak silat training groups, particularly at Pagar Nusa in Semarang Regency. Training programs should not only focus on mastering kicking techniques but also incorporate structured agility drills, such as stair drills, shuttle runs, zigzag runs, and cone drills. This is in line with (Turner et al., 2021) This explains that agility training designed to meet the specific movement demands of a sport (sport-specific agility training) can effectively improve athletes' ability to change direction and their overall performance. This exercise can improve athletes' ability to change direction, their coordination, and their balance, which is expected to increase the speed of their scissor kicks during matches. These findings also support the development of various pencak silat training programs based on technical characteristics, thereby enhancing the quality of athlete development and performance (Mardius et al., 2024)

CONCLUSION

Based on the research findings, it can be concluded that there is a significant negative correlation between the results of the Illinois Agility Test and the speed of the sickle kick performed by Pagar Nusa pencak silat athletes in Semarang Regency ($r = -0.845$; $p = 0.000$). The higher an athlete's agility, the faster their sickle kick. Agility accounts for 71.4% of sickle kick speed, making it one of the key components of physical fitness developed in training programs for pencak silat athletes. These findings suggest that improving agility through structured training can help enhance athletes' performance in the sickle kick. Therefore, the Illinois Agility Test can be used as an evaluation tool to measure athletes' agility levels and as a basis for developing more effective training programs to improve the sickle kick technique and the performance of pencak silat athletes.

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All authors contributed equally to the conceptualization, methodology, data collection, analysis, and drafting of the manuscript. All authors have read, revised, and approved the final manuscript for publication.

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AI USAGE STATEMENT

The authors used Grammarly solely for grammar checking and language refinement during the preparation of this manuscript. No generative AI tools were used for data collection, analysis, or content creation. All scientific findings and conclusions were generated and verified entirely by the authors.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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