



Contribution Of Body Reaction Time Speed to the Speed of the Crescent Kick of the Melati Sakti School, Pekalongan City

Original Article

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Indonesia**Abstract.****Background**

Standard attack techniques used in pencak silat include kicks, punches, falls, and sweeps. Among these techniques, kicks are more often used in matches because they are more valuable than punches.

Objectives

The purpose of the study was to determine whether there was a relationship between the body's reaction speed and the speed of the sickle kick of the Melati Sakti Pekalongan martial arts school.

Methods

the method used in this study was quantitative with a cross-sectional approach. The sample in the study was 42 martial artists from the Melati Sakti Pekalongan City, who were selected using the total sampling technique. The instruments used consisted of a sickle kick speed test, namely by kicking the pacing box for 1 minute, and a body reaction speed test using a running reaction test. Data analysis techniques included descriptive analysis, normality test, and Spearman rank test, which were processed using the SPSS version 22 program.

Results

The Spearman Rank correlation test results obtained a significance value of 0.025 ($p < 0.05$) and a correlation coefficient value of 0.345.

Conclusion

There is a significant relationship between the body's reaction speed and the results of the sickle kick in the Melati Sakti Pekalongan City martial artists.

Keywords: Pencak silat, body reaction speed, crescent kick.

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INTRODUCTION

Sports are a series of physical activities carried out in a planned, structured, and systematic manner to improve individual fitness (Islam et al., 2025; Kristiono et al., 2024). This sports activity is not only oriented towards physical fitness alone but also includes other important aspects such as mental health, motor skills, and the development of social values. In practice, sports can be done individually or in groups, and each form significantly contributes to the perpetrators' physical and psychological development (Islam., et al., 2024; Myśliwiec et al., 2025).

According to , sports can optimize the function of body organs, strengthen the cardiovascular system, improve posture, and improve muscle coordination and flexibility (Gould et al., 2023; Nugraha et al., 2020). This activity is also known to stimulate the release of endorphins, which play a role in improving mood, reducing stress, and encouraging the creation of emotional balance (Atmaja et al., 2025). Sports can build social interaction, improve teamwork, and instill the values of sportsmanship, discipline, and responsibility (Abdullah, 2023; Hasan et al., 2024).

One of Indonesia's traditional sports, the cultural heritage of our ancestors, is pencak silat (Nubatonis et al., 2024; Nugraheningsih & Sari, 2018). Pencak silat, a form of martial arts, stands as a significant cultural heritage of Indonesia's ancestors, embodying traditional values and practices passed down from generation to generation (Ariyadi et al., 2024; Warthadi et al., 2022). This art form of pencak silat functions as self-defense and as a way to connect individuals with the cultural roots and identity of the Indonesian nation (Setiadi et al., 2024; Wahyu Putra & Siswantoyo, 2018). The form of movement in Pencak silat is designed with a purpose: directed, controlled, and coordinated (Herlina et al., 2024;

Setiadi et al., 2024). This movement includes four interconnected aspects: mental-spiritual, self-defense, sports, and art (Syahri, 2019).

In a pencak silat match, a silat athlete must demonstrate a stance, a balanced step pattern, and various attack and evasion techniques before returning to the stance. Standard attack techniques used in pencak silat include kicks, punches, falls, and sweeps. Among these techniques, kicks are more often used in matches because they are more valuable than punches. Punch attacks are given a point with a value of 1, while kicks get a value of 2. If a silat athlete avoids an opponent's attack while launching a kick that hits a legitimate target, the athlete will get a score of 1+2 (Sudiana, 2021).

The crescent kick is one of the techniques that can be used during a match and is a form of attack in pencak silat (Amrizal, 2024). Kicks made during a match must be on target and fast so that the opponent cannot easily anticipate the attack (Palgunadi et al., 2021). With consistent and accurate kicking skills, the chances of getting points are greater, thus dominating the course of the match (Mohamed et al., 2013). A good kick is a kick that is difficult for the opponent to read, anticipate, or catch (Yarmani & Japriansyah, 2017).

A study by Saphie et al. (2019) showed that pencak silat athletes with more kicks showed aggressiveness in competing and superiority in strategy and mastery of techniques. Kicks often produce higher points than punches if they hit the opponent accurately (Rusdiani et al., 2024). In pencak silat, there are several types of kicks, including straight, crescent, side, and back kicks. (Rahayu, 2020).

One of the important factors in sports is speed. Speed plays an important role in determining an athlete's performance when attacking and defending (Islam, Husein, Abadi, et al., 2024). The body's reaction speed is one of the fundamental components in martial arts that plays an important role in the effectiveness of an athlete's defense and attack. This term refers to an athlete's ability to respond to stimuli from physical attacks and tactical situations in combat with precise movements quickly (Baibikov, 2023; Indu et al., 2022). The advantage of athletes who have high reaction speed is being able to respond to opponent attacks appropriately, maintain balance and good defensive positions, and take advantage of gaps in the opponent's defense to launch effective counterattacks (Baibikov, 2023; Trofin et al., 2022).

From the initial observation, Perguruan Melati Sakti in Pekalongan City is one of the places for training pencak silat athletes, and it is active and consistent in developing the technical abilities of its athletes through routine training programs. The training activities periodically cover various aspects of basic pencak silat skills, including kicking, punching, dodging, and physical endurance techniques. One of the techniques that is the focus of the training is the crescent kick, an important movement in the match because it can produce high points if done correctly and quickly.

Despite the good training program, it was found that the speed of the crescent kick among the athletes showed quite a striking variation. Some athletes could perform the crescent kick quickly and precisely, while others appeared slower and less consistent. This difference raises the suspicion that other factors influence kicking performance besides the technical aspects and training frequency alone.

Based on the background above, it is necessary to research whether the speed of the body's reaction affects the results of the crescent kicks of the martial artists at the Melati Sakti School in Pekalongan City.

METHOD

The method used in this study is a quantitative method with a cross-sectional approach. The study sample comprised 42 martial artists from Melati Sakti College, Pekalongan City, selected using the total sampling technique. The instruments used consisted of a sickle kick speed test, namely by kicking a packing box for 1 minute, and a body reaction speed test using a running reaction test (Kridasuwarmo, 2018). Data analysis techniques include descriptive analysis, normality test, and Spearman rank test, which were processed using the SPSS version 22 program

RESULTS AND DISCUSSION

This study aims to determine the relationship between body reaction speed and the results of crescent kicks in martial artists from the Melati Sakti School, Pekalongan City.

Table.1 descriptive analysis

Descriptive statistics					
Variables	Min	Max	Mean	SD	
Body reaction speed	.11	.99	.437	.228	
The speed of the sickle kick	12	23	18.85	2.09	

Based on the results of the descriptive analysis in Table 1, it is known that the body's reaction speed has a minimum value of 0.11 seconds, a maximum value of 0.99 seconds, with an mean of 0.437 seconds, and a standard deviation of 0.228. This shows a significant variation in body reaction speed among the athletes, with some athletes having swift reactions while others are still slow. Meanwhile, in the variable of the sickle kick speed, a minimum value of 12 kicks per minute and a maximum of 23 kicks per minute, with an mean of 18.85 kicks per minute and a standard deviation of 2.09 was obtained.

Table 2 Normality Test

Variables	Statistics	Df	Sig	Information
Body reaction speed	.906	42	.002	Not normal
Crescent Kick Speed	.929	42	.012	Not normal

Based on the results of the normality test in Table 2, it is known that the body reaction speed variable has a significance value of 0.002, and the sickle kick speed variable has a significance value of 0.012. Both values are smaller than the significance level of 0.05 ($p < 0.05$), so it can be concluded that the data on both variables are not normally distributed.

Thus, this study's analysis of the relationship between variables cannot use parametric tests, but non-parametric tests must be used. Therefore, the Spearman Rank correlation test tests the relationship between body reaction speed and sickle kick speed.

Table 3 Spearman Rank Hypothesis Test

Spearman's rho		
Correlation Coefficient		.345
Sig		.025
N		42

Based on the analysis results in Table 3, the correlation coefficient value is 0.345, with a significance value of 0.025 ($p < 0.05$). These results indicate a significant relationship between the speed of body reaction and the speed of the sickle kick in the Melati Sakti School athletes in Pekalongan City. The correlation value in the range of 0.20–0.39 indicates that the strength of the relationship is included in the weak category but still shows a positive direction of the relationship. This means that the faster the athlete's body reaction, the higher the speed of the sickle kick that can be performed.

The results of the Spearman rank hypothesis test showed a significant relationship between body reaction speed and the results of the sickle kick. The direction of the relationship found was positive, with the strength of the relationship being relatively weak. According to Yusradinafi et al. (2022), the body's reaction speed reflects the ability of the central nervous system and musculoskeletal system to respond quickly to stimuli, which is necessary in performing explosive movements such as sickle kicks. Athletes with high reaction speeds tend to have a shorter latency time between the appearance of the stimulus and the motor response so that they can perform kicks with faster and more efficient execution times. This makes them superior in competitions requiring instant responses to opponent movements (Ali et al., 2022).

This study's results align with research conducted by Hilmy and Adi (2021), which states that executing a crescent kick requires a combination of explosive strength, speed, and complex body

coordination. High reaction speed allows athletes to transition faster from the preparation phase to the kick execution phase. This makes reaction time an important component in supporting the effectiveness and efficiency of the crescent kick movement in pencak silat.

The crescent kick is one of the techniques in pencak silat that requires a combination of speed, coordination, muscle strength, and precise timing. The time required to initiate kicking after receiving a stimulus highly depends on the body's ability to respond quickly. A silat athlete with good reaction speed will experience a shorter latency, so the kick can be executed more quickly and efficiently (Hanas, 2020).

Individuals with fast reactions can time their kicks more precisely, optimize energy transfer from the lower extremities, and reduce movement delays in athletes with slow reactions (Syaifullah & Lingsir Maghribi, 2023). Biomechanically, the performance of the sickle kick also depends on the synchronization of movement between the primary muscles (such as the quadriceps, hamstrings, and gluteus maximus) with the stabilizer and postural muscles. Athletes with low reaction speeds tend to experience delayed muscle activation or less optimal motor coordination, resulting in slower and less powerful kicks. Conversely, more efficient motor activation in the group with high reaction speeds allows for greater leg momentum and angular velocity when performing the sickle kick (Bakhtiar & Irawan, 2023).

It can be concluded that martial artists with high reaction speeds generally have shorter latency times, more optimal motor coordination, and the ability to transfer energy efficiently. This allows them to move from the preparation to the execution phase more quickly, resulting in faster, stronger, and more targeted kicks. Conversely, low reaction speeds tend to inhibit the effectiveness of kicks due to delayed muscle activation and lack of movement synchronization.

CONCLUSION

There is a significant relationship between the body's reaction speed and the results of the sickle kick in the Pencak Silat athletes from Perguruan Melati Sakti, Pekalongan City. The results of the statistical test show that the faster an athlete's body reaction, the better the performance of the sickle kick produced. Although the strength of the relationship found is relatively weak, this finding still shows that the body's reaction speed is one of the factors that can affect the ability of the sickle kick technique.

However, it is important to note that although reaction speed contributes to the speed of the sickle kick, this variable is not the only determining factor. Technical performance in Pencak silat is multifactorial. Other components such as leg muscle strength, joint flexibility, balance, basic techniques, and competition experience also greatly affect the final result of a kick. Thus, a holistic training approach needs to be applied so that technical ability development does not rely only on one aspect.

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AUTHOR CONTRIBUTION STATEMENT

The Author Contributions Statement can be up to several sentences long and should briefly describe the tasks of individual authors. Please list only 2 initials for each author, without full stops, but separated by commas (e.g. JC, JS). In the case of two authors with the same initials, please use their middle initial to differentiate between them (e.g. REW, RSW). The Author Contributions Statement should be included at the end of the manuscript before the References.

CONFLICT OF INTEREST AND FUNDING

There is no conflict of interest

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