

# The Waist Flexibility and Reaction Speed to Sickle Kicks of Pencak Silat Perisai Diri Athletes

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## ABSTRAK

*Tendangan sabit merupakan salah satu teknik bela diri pencak silat yang harus dikuasai oleh atlet untuk memperoleh point dalam pertandingan. Hanya saja kenyataan dilapangan menunjukkan bahwa teknik tendangan sabit yang ditunjukkan oleh atlet belum maksimal. Kelenturan pinggang dan kecepatan reaksi menjadi salah satu faktor yang menentukan keberhasilan tendangan atlet. Adapun tujuan dari penelitian ini adalah untuk mengetahui pengaruh kelenturan pinggang, dan kecepatan reaksi terhadap tendangan sabit atlet pencak silat Perisai Diri. Penelitian ini tergolong kedalam jenis penelitian kuantitatif dengan menggunakan desain penelitian korelasi dengan metode asosiatif kausal. Populasi dalam penelitian ini adalah 35 orang, pengambilan sampel dilakukan menggunakan teknik probability sampling dengan jumlah sampel akhir adalah 35 orang. Data dikumpulkan dengan menggunakan pengukuran terhadap ketiga variabel. Untuk kelenturan pinggang di tes dengan flexiometer, kecepatan reaksi dengan whole body reaction, sedangkan kemampuan tendangan sabit diukur dengan tes kemampuan tendangan sabit. Data dianalisis dengan regresi ganda dua prediktor. Berdasarkan hasil analisis data menunjukkan bahwa Kelenturan pinggang secara signifikan berpengaruh positif terhadap ketepatan tendangan sabit dan kecepatan reaksi secara signifikan berpengaruh positif terhadap ketepatan tendangan sabit. Berdasarkan hasil tersebut maka dapat disimpulkan bahwa kelenturan pinggang dan laju reaksi secara signifikan berpengaruh positif terhadap ketepatan tendangan sabit atlet Pencak Silat Perisai Diri.*

## ABSTRACT

Sickle kick is a Pencak silat martial arts technique that athletes must master to gain match points. It is just that the reality on the ground shows that the crescent kick technique shown by athletes could be more optimal. The flexibility of the waist and the reaction speed is one factor that determines the success of an athlete's kick. This study aimed to determine the effect of waist flexibility and the speed of reaction to sickle kicks by Perisai Diri pencak silat athletes. This research belongs to quantitative research using a correlation design with causal associative methods. The population in this study was 35 people. The sample was taken using the probability sampling technique, with the final sample size being 35 people. Data was collected using measurements of the three variables. The flexibility of the waist was tested with a flexiometer. The reaction speed was a whole-body reaction. In contrast, a sickle kick ability test measured the crescent kick ability. Data were analyzed with two predictors and multiple regression. Based on the data analysis results, waist flexibility has a significantly positive effect on the accuracy of sickle kicks, and reaction speed has a significantly positive effect on the accuracy of sickle kicks. Based on these results, it can be concluded that waist flexibility and reaction rate significantly positively affect the accuracy of sickle kicks of Pencak Silat Perisai Diri athletes.

## 1. INTRODUCTION

Coaching and development in a sport is part of an effort to improve sports performance, but achieving this requires a thorough digestion through an integrated, systematic, and continuous coaching system (Hambali et al., 2020; Sutopo et al., 2021). One of the sports that is growing rapidly in Indonesia is the sport of Pencak Silat. Pencak silat is a branch of martial arts that uses hands and feet to defend itself (Carolin et al., 2020; Triprayogo et al., 2020). The use of hands and feet is properly packaged using the

rules and ethics of self-discipline, so Pencak Silat greatly benefits social life (Hartati et al., 2019). As a martial art that is synonymous with the use of the feet as a means of attack, pencak silat has many variations of kicks ranging from kicks that are easy to learn and master to kicks that are difficult for athletes to learn and master (Herdiman et al., 2022; Syamsuramel et al., 2019). The sickle kick is an example of a kick technique that is quite difficult to learn and master. This kicking technique uses one leg, the trajectory is from the side, and the impact is on the instep (Bakhtiar & Irawan, 2023; Lamusu & Zulkifli, 2021). Five other aspects must be considered in doing sickle kicks, including the pedestal, step, snap, body position, and final motion (Kamarudin & Zulrafi, 2020; Tofikin & Sinurat, 2020). The sickle kick skill will be able to give players high points so they can win (Ashari et al., 2021; Rosmawati et al., 2019).

However, the observations and interviews conducted with the coaches of Pencak Silat Perisai Diri Semen Padang showed that the sickle kicks performed by these athletes were still not good even though they had practiced sickle kicks. The ability of their kicks can be seen from their kick techniques which are easy to catch and rarely even get value, especially on sickle kicks. The sparring partners and trials outside the area prove it. From these results, a fighter's kick is inefficient, easy to catch, and then dropped by the opponent. The results of these observations indicate that the sickle kick of the Semen Padang Pencak Silat Shield athlete is not as expected. It means that many athletes still have problems doing sickle kicks. It is caused by many factors that affect sickle kick skills, such as; Waist flexibility, which can affect the kicks taken, where the strong and weak kicks are caused by good waist flexibility. Waist flexibility is the main determinant of success in kicking in the shortest possible time because it generates propulsion at varying levels during the sickle kick (Sukron, 2021; Zona et al., 2021).

Another factor that can help the success of an athlete's crescent kick is reaction speed. Because simple reaction time is considered an important ability for all sports, one is martial arts, especially visual stimulation, to perform sickle kicks (Kamarudin et al., 2023; Siswara & Mardius, 2021). Reaction speed is described as the time interval between the presentation of an unanticipated stimulus and the start of a person's response to being able to kick, where reaction speed also represents the individual's time to make a decision and initiate action, which is considered one of the most important measures of performance in many situations such as when executing a sickle kick (Arba'i et al., 2022; Fauzi et al., 2021; Kurdi & Qomarrullah, 2020). Reaction stimulation can come from hearing, sight (visual), or hearing and touch (Pratiwi & Prayoga, 2019). In the reaction speed, the shorter the time achieved, the higher the reaction rate.

Several previous studies revealed a direct positive effect of hand reaction speed on forehand topspin ability in table tennis athletes (Suwo, 2019). The results of other studies also revealed a difference in the effect of high and low reaction speeds on the ability to receive the takraw serve in sports students (Wiyaka et al., 2020). The next study revealed a significant contribution between waist flexibility and straight kick speed in Pencak Silat Perguruan athletes (Rifki et al., 2022). Based on some of the results of these studies, it can be seen that waist flexibility and reaction speed positively influence athletes' abilities. In previous studies, no studies specifically discussed the effect of waist flexibility and the speed of reaction to sickle kicks of Pencak Silat Perisai Diri athletes. So this research is focused on this study to know the effect of waist flexibility and the speed of reaction to sickle kicks of Pencak Silat Perisai Diri athletes.

## 2. METHOD

This research belongs to the type of research. This type of research is a quantitative research using correlation research designs with causal associative methods. The population in this study were Pencak Silat Perisai Diri Semen Padang athletes who were still active, as many as 35 people. Sampling in this study was carried out using the probability sampling technique, which is based on consideration of the goals set by the researcher so that only 35 active athletes can collect data. To obtain information about the influence of the variables proposed specifically for the sport of pencak silat, the data collected in this study is primary data taken from test respondents. The instruments used in data collection were test instruments consisting of a flexiometer to measure waist flexibility, whole-body reaction to measure reaction speed, and sickle kick to hand back to measure sickle kick. The data obtained in the study were then analyzed using descriptive statistics examined to describe the general abilities of waist flexibility, reaction speed, and crescent kick to assess the conceptual relationship between the proposed variables, namely utilizing the IBM SPSS software. Significance was determined at the p level < 0.05.

### 3. RESULTS AND DISCUSSION

#### Results

We are testing the hypothesis, which states that there is an influence between the flexibility of the waist contributing to the sickle kick of Pencak Silat Perisai Diri Semen Padang Athletes, simple linear regression analysis using the SPSS 25 for Windows program as shown in [Table 1](#) and [Table 2](#).

**Table 1.** Analysis of Variance (ANOVA) Simple Linear Regression Test Results on the Effect of Waist Flexibility (X1) on Sickle Kick (Y)

	Model	Sum of Squares	Df	Mean Square	F <sub>count</sub>	F <sub>table</sub>
1	Regression	445.905	1	445.905	5.076	1.80
	Residual	2898.837	33	87.844		
	Total	3344.743	34			

**Table 2.** Variable R Square Waist Flexibility (X1) to Sickle Kick (Y)

Model	R	R Square	Adjusted R Square	Std. The error in the Estimate
1	0.365 <sup>a</sup>	0,133	0.107	9.372

The data in the table above shows that the percentage influence of the independent variable on the dependent variable is called the coefficient of determination, which is the result of squaring R. From the output above, R Square is 0.133, which implies that the influence of the independent variable (waist flexibility) on the dependent variable (sickle kick) is of 13.3%. In comparison, other variables influence the remaining 86.7%. Furthermore, to test the hypothesis, which states that there is an influence between reaction speed contributing to the sickle kick of Semen Padang Pencak Silat Self Defense Athletes, simple linear regression analysis uses the SPSS 25 for Windows program as shown in [Table 3](#) and [Table 4](#).

**Table 3.** Analysis of Variance (ANOVA) Simple Linear Regression Test Results on the Effect of Reaction Speed (X2) on Sickle Kick (Y)

	Model	Sum of Squares	Df	Mean Square	F	F <sub>table</sub>
1	Regression	447.281	1	447.281	5.094	1.80
	Residual	2897.462	33	87.802		
	Total	3344.743	34			

**Table 4.** R Square Reaction Speed Variable (X2) to Sickle Kick (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.466 <sup>a</sup>	0.217	0.107	9.370

The table above explains the percentage of influence of the independent variable on the dependent variable, which is called the coefficient of determination, which is the result of squaring R. From the output above, R Square is 0.134, which implies that the effect of the independent variable (reaction speed) on the dependent variable (sickle kick) is 21.7%. In contrast, other variables influence the remaining 78.3%.

#### Discussion

Based on the study results, the flexibility of the waist affected the sickle kick of Semen Padang Pencak Silat Athletes. The waist's flexibility is one factor in doing sickle kicks ([Wijaya et al., 2022](#)). Good lower back flexibility will affect the speed and quality of the sickle kick ([Hartati et al., 2019](#)). Therefore, attention to the flexibility of a fighter's waist must be a point of attention for the coach to improve the production of good sickle kicks. In several sports, the ability to generate and transfer explosive power is a key element of success. Evaluate various expressions of strength and explosiveness and the factors contributing to them. Therefore, the flexibility of the waist is very important to improve movement performance in sports ([Carolyn et al., 2020](#); [Triprayogo et al., 2020](#)). Several field tests assessing explosive power have been used to provide feedback to athletes on their performance ([Herdiman et al., 2022](#); [Syamsuramel et al., 2019](#)). Some of the most commonly used tests to assess lower body strength and speed are vertical ([Kamarudin & Zulrafi, 2020](#); [Tofikin & Sinurat, 2020](#)). Then, performing crescent kicks

in silat has been suggested as an appropriate method for assessing the total body, which is related to waist flexibility in athletes (Ashari et al., 2021; Rosmawati et al., 2019) because it is assessed that the flexibility of the waist is integrated with the movement and specifically for sports performance such as doing sickle kicks.

Good flexibility can adapt to external loads, minimizing injury (Sukron, 2021; Zona et al., 2021). In contrast, musculotendinous stiffness is a factor intrinsic to injury. Therefore, flexibility affects the rotation of the waist and legs when doing sickle kicks. Likewise, a Silat athlete needs reaction speed in the frequency of fast kicks. Reaction speed benefits a Silat athlete because the maximum reaction will make it easier for athletes to get points in matches (Kamarudin et al., 2023; Siswara & Mardius, 2021). Speed is a body movement done quickly in a relatively short time. The faster the kick reaction is carried out, the better the results are obtained (Pratiwi & Prayoga, 2019). Reaction speed is a quality that allows starting a kinetic response as soon as possible after receiving a stimulus (Arba'i et al., 2022; Fauzi et al., 2021). The ability of a fighter requires fast movement speed. It refers to the results of the fighter's performance. A good response from a fighter will determine how fast the fighter's movement in kicking is produced. If the fighter has a good and fast response, the reaction speed produced by the fighter will be faster. This will positively affect the quality of sickle kicks performed by fighters.

Physical abilities, including reaction time, are needed for an athlete to perform a sickle kick perfectly. The sickle kick technique is usually used after a punch attack (Pratiwi & Prayoga, 2019). So, before a fighter's opponent performs a perfect block against a punch, it is immediately followed by a kick technique such as a sickle kick. Therefore the role of reaction speed is needed. The element of reaction speed in pencak silat martial arts is needed in punching, kicking, and blocking. The results obtained in this study align with previous studies, which also revealed a direct positive effect of hand reaction speed on forehand topspin ability in table tennis athletes (Suwo, 2019). The results of other studies also revealed a difference in the effect of high and low reaction speeds on the ability to receive the takraw serve in sports students (Wiyaka et al., 2020). The next study revealed a significant contribution between waist flexibility and straight kick speed in Pencak Silat Perguruan athletes (Rifki et al., 2022). Based on some of the results of these studies, it can be seen that waist flexibility and reaction speed positively influence athletes' abilities.

#### 4. CONCLUSION

Based on the data analysis and discussion results, It was concluded that waist flexibility and reaction rate significantly positively affected the accuracy of sickle kicks in Pencak Silat Perisai Diri athletes. Physical abilities, including reaction speed, are needed for an athlete to perform a sickle kick perfectly.

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