

Received: 2 December 2023, Accepted: 9 January 2024

DOI: <https://doi.org/10.33282/rr.vx9il.71>

## Effectiveness of Reaction Speed Training in Improving Scythe Kick Ability in 15–21-Year-Old Pencak Silat Athletes

Muhammad Sulfa<sup>1)</sup>, Johansyah Lubis<sup>2)</sup>, Taufik Rihatno<sup>3)</sup>, Widiastuti<sup>4)</sup>, Samsudin<sup>5)</sup>, M. Awaluddin<sup>6)</sup> Muh. Jamil Abdullah<sup>7)</sup> Aisyah Rusdin<sup>8)</sup>

<sup>1)</sup> Universitas Cahaya Prima, Bone, INDONESIA

[muhammadsulfasport@gmail.com](mailto:muhammadsulfasport@gmail.com)

<sup>2)</sup> Physical Education Department, Postgraduate Universitas Negeri Jakarta, INDONESIA

[johansyah.sport@unj.ac.id](mailto:johansyah.sport@unj.ac.id)

<sup>3)</sup> Physical Education Department, Postgraduate Universitas Negeri Jakarta, INDONESIA

[trihatno@unj.ac.id](mailto:trihatno@unj.ac.id)

<sup>4)</sup> Physical Education Department, Postgraduate Universitas Negeri Jakarta, INDONESIA

[widiastuti@unj.ac.id](mailto:widiastuti@unj.ac.id)

<sup>5)</sup> Physical Education Department, Postgraduate Universitas Negeri Jakarta, INDONESIA

[samsudin@unj.ac.id](mailto:samsudin@unj.ac.id)

<sup>6)</sup> Universitas Cahaya Prima, Bone, INDONESIA

<sup>6)</sup> Universitas Cahaya Prima, Bone, INDONESIA

[Muh.jamil.2023@student.uny.ac.id](mailto:Muh.jamil.2023@student.uny.ac.id)

<sup>6)</sup> Sipatokkong Mambo University, Bone, INDONESIA

[aisyahrudin1@gmail.com](mailto:aisyahrudin1@gmail.com)

### Abstract

This study aims to (1) Find out the effect of pencaksilat reaction speed training on the ability of sickle kicks for pencaksilat athletes aged 15-21 years, (2) Find out the effect of conventional physical training on the ability of sickle kicks for pencaksilat athletes aged 15-21 years, (3) Find out the difference in reaction speed training with traditional / conventional physical training on the ability of sickle kicks for pencaksilat athletes aged 15-21 years. The research subjects amounted to 60 athletes of BKMF pencaksilat UNM and UKM Pencak Silat Unhas aged 15-21 years. The sample was divided into 2 groups, namely group 1 totaling 30 people and group 2 totaling 30 people and given different treatments for 8 weeks. Group 1 was given speed reaction training and group 2 continued to do conventional physical exercise. This research instrument uses a speed reaction test instrument that has been validated by experts and a 10-second sickle kick ability test. Data were analyzed using the Wilcoxon test to determine the difference between before and after training in both groups and the Mann-Whitney test to test the difference in sickle kick ability in both groups. The results of this study indicate that (1) there is an effect of reaction speed training on the sickle kick ability of 15-21 year old pencaksilat athletes with a significance value of 0.000, (2) there is an effect of conventional training on the sickle kick ability of 15-21 year old pencaksilat athletes with a significance value of 0.010, and (3) there is a difference between reaction speed training and conventional physical training on the sickle kick ability of 15-21 year old pencaksilat athletes with a significance value of 0,000. The conclusion of this study explains that reaction speed training is better than conventional physical training to improve the sickle kick ability of 15–21-year-old martial arts athletes.

**KeyWords:** *Reaction Speed, Sickle Kicking Ability, Pencak Silat*

### Introduction

One of Indonesia's ancestral heritages in the form of sports is pencaksilat. Pencaksilat has been recognized by the UNESCO world body as an intangible world cultural heritage originating from Indonesia. pencaksilat is also a unifying symbol of the Indonesian nation in reflecting Indonesian culture (Martha et al. 2020). Various age groups, male and female, are attracted to this sport. Pencaksilat competitions start in elementary schools, junior high schools, high schools, and colleges. This shows that the Indonesian government pays attention to pencaksilat. Pencaksilat is a sport that every district or province must participate in national championships such as POPNAS,

POMNAS, KEJURNAS, POPROV, and PON.

In the pencak silat sport match consists of two categories, namely the sparring category and the art category. The most important category to win the match is to utilize limbs such as arms and legs to get as much value as possible. For the sparring category, the sparring number is adjusted according to body weight. The values calculated in the sparring category are based on the techniques used, such as punching, kicking, and falling techniques. The art category consists of several numbers, namely single, double and team. Pencak silat in the sparring category is a match that features two fighters from different angles. Both face each other using rules with elements of defense and attack, namely deflecting, dodging, avoiding, attacking targets, and knocking down opponents using tactics and fighting techniques, endurance stamina and fighting spirit, using step patterns that utilize a wealth of moves to get the most value (Lubis and Wardoyo 2016). This means that every fighter is required to have good physical abilities, strategic techniques, and tactics and *mumpuni* during the match to achieve maximum achievement targets in a match and apply the principles of competition principles to minimize the occurrence of injuries during the match.

Pencak silat is a martial arts sport in which there are elements of attack using feet and hands as well as defense and avoidance in obtaining points aimed at achieving victory which is a martial art inherited from Indonesian ancestors (Hidayat and Haryanto 2021). Attacking and defending is something that must be owned by pencak silat athletes, this will determine the quality of a pencak silat athlete. Defense such as dodging, avoiding opponents to anticipate the opponent's attack, is the main key in the concept of pencak silat matches. In addition, it is clearly emphasized that the value of attacking is something that must be owned by pencak silat athletes. The attacking movement is not just a martial arts athlete kicking or punching, but what underlies this movement is how a martial arts athlete can do what and when the type of punch or kick is used (Iswana and Siswantoyo 2013).

In terms of achievement, an athlete, or a person who follows pencak silat martial arts must diligently and maximally train the physical components that support their achievements. In the physical component there are three things that are important for martial arts athletes, namely reaction action, coordination, and speed (Alfin Adam 2022). These three things are closely related to some of the techniques needed in martial arts, namely stance techniques, kicks, punches, blocks, evasions, catches and slams. Each of these basic techniques must be mastered by fighters to perform well, a good reaction will benefit athletes in attacking either through kicks or punches. In addition, with a good reaction the athlete is not easily attacked because he is quick to respond using his stance. Pencak silat is one of the sports that requires speed (Haqiyah et al. 2023), speed is one of the biomotor components that plays a major role in achievement (Bhakti Wiyata Muhammad 2022). Speed in pencak silat is also needed in anticipating an opponent's attack. Reaction speed is one of the physical elements that must be trained continuously in martial arts (Siregar, Soegiyanto, and Rustiadi 2021). Good reaction speed, especially to visual stimulation, is very important in martial arts sports because this will help athletes earn points. (Cojocariu 2011).

(Atan and Akyol 2014) said Reaction time is defined as the time that elapses between receiving an immediate and unexpected stimulus and reaction given to it, however, reaction time changes based on factors such as age, gender, condition, fatigue, high altitude, alcohol, nicotine, and use of psychotropic substances.

reaction speed is divided into two types, namely: a) single reaction speed is the speed of reaction in which the direction and target are known, b) compound reaction speed is the ability of an athlete to make a movement due to stimuli that are not yet known in the direction and target in the shortest possible time (Supriyanto 2023). Reaction speed is related to the speed of action or response of a person in receiving and responding to a stimulus or stimulus. The faster a person's reaction, the faster the action or response will be given. The speed of reaction is related to the sharpness or sensitivity of the receptor (stimulus receiver). Receptors are recipients of stimuli or impulses. Meanwhile, what acts as a receptor is the sense organ. In this case, the receptors are the eyes and ears. The sharper or more sensitive the receptor, the faster it will send a signal to the brain and will be immediately processed and transmitted to the body to respond to the stimulus (Wiyaka, Daulay, and Adikahriani 2020).

One of them is the repeated reaction training method, which involves repeating various types of movements using acoustic (auditory) signals, second is the part method, which involves changing the type of exercise, and third is the sensory method, which involves utilizing sensory nerves to feel and distinguish time intervals of one per ten seconds or one per hundred seconds (Syafuruddin 2013).

The researcher found that when coaches conducted attack and defense drills using reaction speed in pencak silat, they seemed to deliver material that did not interest athletes. In addition, the coach only practiced reaction speed by opening the lid of the *pecing* when kicking and practicing the catch his partner kicked, and his partner caught him.

Observations showed that sparring category pugilists used conventional techniques for reaction speed training. An additional finding was that the drills used relied solely on intuition. What is remembered at the time is also practiced. In addition, coaches interviewed simultaneously stated that the lack of a guidebook for training reaction speed for sparring category pugilists has led to limitations in providing a menu of sparring category reaction speed training. Youth pencak silat athletes will find reaction speed training ineffective, difficult, boring, and prone to

injury if left unchecked. This will prevent athletes from reaching the peak of their abilities (Ghaberi 2011).

This is what prompted the researchers to create reaction speed training for 15- to 21-year-old pencak silat athletes. As far as they are aware, no research has examined reaction speed training for martial arts athletes of this age. Thus, researchers want to help the physical condition of martial arts athletes of this age by creating a reaction speed training program that can improve their reaction speed.

**Material & methods**

This study is experimental research designed with pretest and posttest groups. The study was conducted in the gymnastics hall of FIK UNM. The training program lasted for eight weeks and was conducted three times a week, on Monday, Wednesday, and Friday. The study involved athletes of BKMF Pencak Silat BEM FIK UNM and UKM pencak silat Unhas aged between 15 and 21 years. A total of 60 martial arts athletes aged between 15 and 21 years were divided into two treatment groups with 30 subjects each. Treatment group 1 performed reaction skills training that combines general, special, and game reaction skills, and treatment group 2 performed physical training with conventional methods.

The implementation of the study begins with data collection by conducting a pretest by measuring reaction speed using a reaction speed test research instrument that has been validated by experts, namely reaction speed (the tool works for 10 seconds, then the highest number in time to punch and kick) and a 10-second sickle kick ability test (Lubis and Wardoyo 2016). After the pretest for group, one is given treatment in the form of a reaction speed training program, while group two is not given a reaction speed training program or continues to do conventional physical exercise. The training was carried out for 8 weeks and the frequency of training was 3 times a week.

Table 1. Pencak silat reaction speed training

No	Special Reaction Speed Training Variations	amount	Rep	Set	Rest
1	Action-reaction drill Movement 1	10 seconds	6-8	3	2-3 minutes
2	Action-reaction drill Movement 2	10 seconds	6-8	3	2-3 minutes
3	Reaction action drill Movement 3	10 seconds	6-8	3	2-3 minutes
4	Attack clap exercise 1	10 seconds	6-8	3	2-3 minutes
5	Attack clap exercise 2	10 seconds	6-8	3	2-3 minutes
6	Attack clap exercise 3	10 seconds	6-8	3	2-3 minutes
7	Practice ready to face and attack 1	10 seconds	6-8	3	2-3 minutes
8	Practice ready to face and attack 2	10 seconds	6-8	3	2-3 minutes
9	Practice ready to face and attack 3	10 seconds	6-8	3	2-3 minutes
10	Combination slam reaction action drill	10 seconds	6-8	3	2-3 minutes
11	Circling combination reaction action drill	10 seconds	6-8	3	2-3 minutes
12	Combination scissor's reaction drill	10 seconds	6-8	3	2-3 minutes
13	Direct defense attack practice with slams	10 seconds	6-8	3	2-3 minutes
14	Kick speed vs punch speed drills	10 seconds	6-8	3	2-3 minutes
15	Kick speed vs catch speed drill	10 seconds	6-8	3	2-3 minutes
16	Mirror training 2 (Shadow training)	10 seconds	6-8	3	2-3 minutes
17	Training with match simulation	10 seconds	6-8	3	2-3 minutes
18	Catch instinct training with panching pads	10 seconds	6-8	3	2-3 minutes
19	Kick instinct training with panching pad	10 seconds	6-8	3	2-3 minutes
20	Panching pad catch instinct training combined with slams	10 seconds	6-8	3	2-3 minutes

The posttest was carried out by measuring the reaction speed using a research test instrument, namely the speed reaction test, namely the reaction speed test, which is a tool that works using electricity to turn on the sensor system on the props, lights as a sign of the sensor imposition area, The tool works for reaction speed for 10 seconds. The tool works for reaction speed for 10 seconds, then the most number in time to punch and kick within 3 repetitions, The height of the tool can be adjusted with a portable pole, Every lamp that lights up and is touched in the sensor area will automatically get a value of 1 which will be displayed on the monitor, If the touch is not located and does not hit the sensor area then it does not get a value, the lights turn on randomly/randomly. the lights will turn off automatically and change to another lamp after being touched until time runs out. The data analysis technique performs descriptive statistical analysis, Wilcoxon text, and Mann Whitney test where all data processing is done with computer assistance using the SPSS 21 for windows application.

**Results**

This research aims to see the effectiveness of reaction speed training for pencaksilat athletes aged 15 to 21 years. The results of data analysis in this study can be seen as follows.

**Table 1. Description of subjects by gender**

Gender	Experimental Group (EG)		Control Group (CG)	
	f	%	f	%
Male	23	77	23	77
Female	7	23	7	23
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

Table 1 shows the description of subjects based on gender, which shows that the Experimental Group (EG) and Control Group (CG) have a balanced number of subjects, namely 23 men (77%) and 7 women (23%).

**Table 2. Description of crescent kick ability**

Description	Experimental Group (EG)		Control Group (CG)	
	Pretest	Posttest	Pretest	Posttest
<i>Mean</i>	15.1	23.8	14.3	15.2
<i>Std. Deviation</i>	1.9	1.4	1.8	2.7
<i>Min</i>	11	18	11	12
<i>Max</i>	19	25	19	26
<b>p (Wilcoxon test)</b>	<b>0.000</b>		<b>0.010</b>	

Table 2 shows a description of the sickle kick ability of both the Experimental Group and the Control Group. The Experimental Group showed an increase in sickle kick ability from pretest (M = 15.1) to posttest (M = 23.8). Likewise, the Control Group showed an increase in sickle kick ability from pretest (M = 14.3) to posttest (M = 15.2). Although both groups experienced an increase, the increase experienced by the Experimental Group was higher with a significance difference between KE (p=0.000) and KK (0.010).

**Table 2. Description of crescent kick ability**

Group	N	Mean Rank	p (Mann Whitney test)
KE	30	44.1	0.000
KK	30	18.6	

In answering the hypothesis, researchers conducted an analysis using mann-whitney to determine the difference in sickle kick ability between the experimental group and the control group. The results obtained are presented in table 2 which shows that there are significant differences in martial arts athletes aged 15-21 years between the experimental group and the control group (p = 0.000). This means that reaction speed training given to martial arts athletes aged 15-21 years can improve sickle kick ability compared to conventional training. This can also be seen based on the mean rank score of the two groups, where the Experimental Group (M = 44.1) is higher than the Control Group (M = 18.6).

**Discussions**

Reaction speed training for pencaksilat athletes aged 15-21 years was created by researchers to help improve the physical condition of Pencaksilat athletes. This exercise was created based on the physical condition needs of martial arts athletes aged 15-21 years. This reaction keceptan exercise is very suitable to be used to improve high achievement, namely with reaction speed to achieve the best time results in a match. (Widiastuti and Pd 2011) say reaction speed is the quality that allows the organism to start a kinetic reaction as quickly as possible after receiving a stimulus. Therefore, reaction speed can also be defined as the ability of a tool organism to respond to a stimulus as quickly as possible to achieve optimal results.

Pencaksilat athletes need reaction speed training because the movements made to carry out attacks quickly and precisely require reaction speed to anticipate attacks from opponents. During a match, punches and kicks delivered by fast-arriving opponents are impulses that require action, such as parrying or dodging opponents to counterattack, hit, and kick the right target. Engagement in reaction to incoming attacks can lead to inaccurate anticipation, resulting in imperfect or undirected punches or kicks, failing to catch the opponent's limbs, and

dropping, or stepping out of line when cornered.

To train reaction speed can be done by providing stimulus in the form of hearing, sight, and touch to athletes to react. Auditory stimuli can be in the form of whistles, claps, or other sounds. Vision stimulation can be in the form of raising hands or cones, throwing the ball towards the athlete to be caught or hit. While tactile stimulation can be done by touching the back athlete so that the athlete cannot see and hear. reaction speed training should not be excessive, it must be in accordance with the athlete's condition and the training program applied. If the reaction speed training for athletes is too excessive, it is feared that an injury will occur to the athlete (Siregar et al. 2021).

## Conclusions

This is the success of the training program in the form of reaction speed training for martial arts athletes aged 15-21 years to increase the reaction speed of martial arts athletes aged 15-12 years given by the coach, namely for 18 meetings conducted during training sessions every week 3 times a meeting, namely every Monday, Wednesday, and Friday. The results of the researcher's observations during providing reaction speed training for 15–21-year-old martial arts athletes experienced an increase in motivation, enthusiasm, and a great desire when physical exercise took place compared to conventional physical exercise.

## References

- Alfin Adam<sup>1</sup>, Hendro Wardoyo<sup>2</sup> dan Tirto Apriyanto<sup>3</sup>. 2022. "Pembuatan alat bantu latihan reaksi pada pencak silat kategori tanding manufacture." *Sport coaching and education* 6(1).
- Atan, Tülin, dan Pelin Akyol. 2014. "Reaction Times of Different Branch Athletes and Correlation between Reaction Time Parameters." *Procedia - Social and Behavioral Sciences* 116:2886–89. doi: 10.1016/j.sbspro.2014.01.674.
- Bhakti Wiyata Muhammad, Nuraini sri dkk. 2022. "Metode Pengembangan Alat Bantu Latihan Kecepatan Reaksi Hindaran Kategori Ganda Pada Pencak Silat." *Jurnal Cakrawala Ilmiah* 1(7):2–3.
- Cojocariu, A. 2011. "Measurement of reaction time in Qwan Ki Do." *Biology of Sport* 28(2):139–43. doi: 10.5604/947454.
- Ghaberi, Tahmasebi &. 2011. "The effect of motivational self-talk on reaction time." *Procedia - Social and Behavioral Sciences* 29:606–10. doi: 10.1016/j.sbspro.2011.11.282.
- Haqiyah, Aridhotul, Dindin Abidin, Kadek Heri Sanjaya, Albert Wolter Aridan Tangkudung, Dani Nur Riyadi, Wahyu Dwi Lestari, Wyke Kusmasari, dan Yulingga Nanda Hanief. 2023. "Reaction speed exercises and eye-hand coordination on the gyaku zuki chudan punch speed." *Journal of Physical Education and Sport* 23(4):850–56. doi: 10.7752/jpes.2023.04108.
- Hidayat, Syarif, dan Arief Ibnu Haryanto. 2021. "Pengembangan Tes Kelincahan Tendangan Pencak Silat." *Jambura Journal of Sports Coaching* 3(2):74–80. doi: 10.37311/jjsc.v3i2.11338.
- Iswana, Bayu, dan Siswantoyo Siswantoyo. 2013. "Model Latihan Keterampilan Gerak Pencak Silat Anak Usia 9-12 Tahun." *Jurnal Keolahragaan* 1(1):26–36. doi: 10.21831/jk.v1i1.2343.
- Lubis, Johansyah, dan Hendro Wardoyo. 2016. *Pencak Silat*. Jakarta: PT Raja Grafindo Persada.
- Martha, Hafizh Eka, Tiara Radinska Deanda, S. Sn, dan M. Ds. 2020. "Perancangan Animasi Sprite Karakter Untuk Mempresentasikan Character Sprite Animation Design for Presenting Basic." 7(2):895–902.
- Siregar, Zulfikar, Soegiyanto Soegiyanto, dan Tri Rustiadi. 2021. "Reaction Speed Training Sensor Aids Development for Taekwondo." *Journal of Physical Education and Sports* 10(3):223–31.
- Supriyanto, S. 2023. "Metode Latihan dan Kecepatan Reaksi Terhadap Kemampuan Smash." *Prosiding Seminar Nasional Pascasarjana ...* 813–17.
- Syafuruddin. 2013. *Kepelatihan Olahraga Teori dan Aplikasinya dalam Pembinaan Olahraga*. Padang: UNP Press.
- Widiastuti, W., dan M. Pd. 2011. "Tes dan pengukuran olahraga." *Jakarta: PT. Bumi Timur Jaya*.
- Wiyaka, Ibrahim, Dicky Edwar Daulay, dan Adikahriani Adikahriani. 2020. "Perbedaan Pengaruh Metode Pembelajaran Dan Kecepatan Reaksi Terhadap Kemampuan Menerima Servis Sepaktakraw Pada Mahasiswa Pko Fik Unimed." *Jurnal Prestasi* 4(2):60. doi: 10.24114/jp.v4i2.22118.