

## Analysis speed kickmawashigeriathletes karate Developed By Provforki Aceh In 2022

Muhammad Iqram<sup>1</sup>, Sukardi Putra<sup>2</sup>, Nyak Amir<sup>3</sup>, Mansur<sup>4</sup>, Amiruddin<sup>5</sup>,  
Abdurrahman

<sup>1</sup> (UniversitasSyiah Kuala, Banda Aceh, Indonesia)

<sup>2</sup> (UniversitasSyiah Kuala, Banda Aceh, Indonesia)

<sup>3</sup> (UniversitasSyiah Kuala, Banda Aceh, Indonesia)

<sup>4</sup> (UniversitasSyiah Kuala, Banda Aceh, Indonesia)

<sup>5</sup> (UniversitasSyiah Kuala, Banda Aceh, Indonesia)

---

### ABSTRAK

**Background:** This research is motivated by the declining performance of the Aceh karate sport in the last three years. This is crucial and must be considered, for the first time the Aceh karate athletes did not qualify for the highest event in Indonesia, namely the Papua PON 2020. Mawashigeri is a kicking technique opponent horizontally. This kick is very powerful because it utilizes the rotating energy of the body. It is very important to get the greatest strength by rotating the hips quickly (Rahayu, 2017). The purpose of this study was to determine the kicking speed of Mawashi Geri Karate Athletes assisted by PengprovForki Aceh Year 2022.

**Materials and Methods:** This research uses a quantitative approach to analytical research with a descriptive method. The population in this study were karate athletes assisted by PengprovForki Aceh. as many as 14 athletes who were also used as research samples. The instrument used in this research is a camera EOS 600D, Tripod Kamera, Laptop, Software Kinovea.

**Results:** The results of the analysis of Mawashi Geri 's kicking speed for Athletes fostered by PengprovForki Aceh is that the averagelinear speed of the prefix kick is 0.12 m/s. the average linear speed of the mid- kick is 14.7 m/s. the average linear velocity of the impact kick is 4.04 m/s. and Average Kicking Speed of Mawashi Geri Trained Karate Athletes PengprovForki Aceh is 26.5 m/s.

**Keywords:** Movement Analysis, Speed, Mawashi Geri, Karate, Athletes Assisted by PengprovForki Aceh.

---

Date of Submission: 20-08-2022

Date of Acceptance: 04-09-2022

---

### I. Introduction

Simbolon (2020:50), stated that Karate is a sport that can form physical, mental, emotional and spiritual endurance and can build a sportsmanship attitude for those who learn it. The martial art of karate basically has the same principle, namely to protect yourself and protect yourself not to start a fight or to hurt people. This is possible because the appearance of karate is firm, efficient, logical and simple. Firm because it is regulated by a standard code of ethics based on a strong disciplinary doctrine that forms a kind of semi - hierarchical structure military (Wahid, 2007; 1).

There are two types of movement components that are competed in karate, namely kata and kumite. According to Wahid (2007:75) the word is a series of several kihon that were arranged through a long process in the past into a special form that has a value of beauty, high philosophical meaning, and is arranged by a standardization in its application, according to Simbolon (2014:3), kumite literally means " a meeting of hands ".

In karate, punches and kicks are developed to an advanced level, namely the level where an athlete can move to punch and kick quickly and precisely (Rahayu:2020). Mawashi Geri kick is a circular kick technique with a target around the waist. Mawashi Geri kick in According to Sutojo (1996:98), almost 70 % of karate techniques use kick techniques, and the power of the kick is approximately five times greater than the power of the punch. Despite having great strength, kicks are less agile.

Mawashi Geri 's kicking ability is influenced by various factors such as physical condition, technique, and mentality. Physical condition is one of the most important factors because to be able to do this technique well, it must also be supported by good physical conditions. According to Syafruddin (2011:36) The elements of the physical condition are endurance, strength, power, speed, flexibility, agility, balance, and coordination)". According to the researcher, in performing the Mawashi Geri kick, the elements of physical condition that must be considered are Speed, Explosive Power, and Angle".

Mawashi Geri kicks are usually used by karateka when they are trailing their opponent's points, and to catch up points and turn things around to be ahead. But for karateka with high quality and experience, the Mawashi-Geri kick technique is used to collect as many points as possible from his opponent. However, Mawashi -Geri's kick is very difficult to get to the right target, because the target position that gets a high score is the head away from the kicking foot compared to attacking with a punch.

One of the serious problems faced is that there are many factors that make Mawashi-Geri's kick not right on target expected by karateka in a karate match, including the basic technique of Mawashi-Geri kicks that are not correct, speed, explosive power, flexibility, experience, and power concentration as well as the angle of the kick affect this kick. Mawashi Geri kicks are usually used by karateka when they are trailing their opponent's points, and to catch up points and turn things around to be ahead.

The problem that occurs at this time is the lack of knowledge about technological sophistication, trainers and teachers should be able to perform analysis using a biomechanics approach and assisted by software that can analyze movement, one of which is the Kinovea software. According to Lukman (2013) states that "biomechanics" is the study of the mechanics of human body motion, when biomechanics is applied in sports, it can correct and analyze mistakes made by athletes.

From the description above, it can be described that speed is an element that is quite influential in the sport of Karate, especially for sports achievements. To achieve high performance, certain physical characteristics and techniques are required in accordance with the demands of the sport that is followed. Therefore researchers are interested in raising problems and analyzing these things in this scientific paper, where the researchers will take the title "Analysis of the Kick Speed of Mawashi Geri Karate Athletes Assisted by Pengprov Forki Aceh in 2022".

## **II. Prosedur Penelitian**

This research uses the type of research analysis quantitative approach with descriptive method. The population in this study were karate athletes assisted by Pengprov Forki Aceh. as many as 14 athletes who were also used as research samples. The instruments used in this study were the EOS 600D Camera, Tripod Camera, Laptop, Software Kinovea.

Data collection techniques are methods or activities that will be carried out when collecting research data. Data collection techniques are methods or activities that will be carried out when collecting research data. The instruments used in collecting research data are: 1) Mawashi Geri Kick Test, and 2) Software Kinovea. Understanding Software Kinovea Guzman-Valdivia et al. (2013) stated that video or photo editing applications to slow down the motion of a person's exercise so that an analysis of their movements can be carried out, whether they are exercising or being observed is called the Kinovea software.

Data Analysis Techniques After getting the video recording results, the next step is to analyze the video that has been obtained by describing the video recording using the Kinovea software. Understanding Software Kinovea Guzman-Valdivia et al. (2013) stated that video or photo editing applications to slow down the motion of a person's exercise show so that the movement can be analyzed either during training or observed with Kinovea software. The program facilities available on this software are:

1. Dv Import: transfer clips from digital cameras or Handcams to a computer.
2. Dv export: transfer clips from computer to camera.
3. Player: play image or video clips, slow motion frame by frame or full screen.
4. Analyzer: analyzing other movements in terms of body segments, movement trajectories, speed, time and distance, this facility can also compare the performances of two athletes.

## **III. Research Results and Discussion**

### **Research Results**

In this chapter, a description of the data from the research that has been carried out will be presented. Based on the results of the research data obtained with 1 handy camera that can be rotated and made into several video clips or images. The results of the Mawashi-Geri kick motion recordings of the research subjects were then entered into the computer. After It was carried out measurements related to speed, using the Analyze performance facility in the Kinovea Software program, the video clip can be analyzed.

The results of this study were analyzed according to the needs of the panelists. There is one aspect that is analyzed in this study, namely: Kick Speed of Mawashi Geri. From this 1 aspect, the speed calculation is carried out using m/s (meters/ second) units. The results of the analysis can be seen in table 4.1 below:

Tabel 4.1 Results of Analysis of Mawashi Geri's Kick Speed Athletes Assisted by the Forki Aceh Provincial Government Through Kinovea Software

No.	Nama	Kick Speed (m/s)	Linear Speed (m/s)		
			Prefix	Middle	Regarding Impact
1.	Muhammad Thawakal	29,7 m/s	0,06 m/s	18,91 m/s	3,40 m/s
2.	RizkyAnanda	38,9 m/s	0,60 m/s	17,65 m/s	8,32 m/s
3.	PunggaZalzabilaWiranda	29,2 m/s	0,09 m/s	15,73 m/s	1,34 m/s
4.	Ulyana	27,3 m/s	0,06 m/s	12,76 m/s	5,39 m/s
5.	M. Imam	29,4 m/s	0,06 m/s	14,46 m/s	7,56 m/s
6.	Sultan Hafidz	34,0 m/s	0,09 m/s	16,08 m/s	4,43 m/s
7.	NajlaSyakira	23,3 m/s	0,06 m/s	10,41 m/s	5,22 m/s
8.	LuthfiaAlini	19,5 m/s	0,06 m/s	14,49 m/s	3,06 m/s
9.	Ari Setiawan	24,5 m/s	0,06 m/s	14,00 m/s	1,00 m/s
10.	Muhammad Farid Ramli	26,0 m/s	0,06 m/s	16,15 m/s	3,93 m/s
11.	RikiRonaldi	22,9 m/s	0,23 m/s	15,20 m/s	3,08 m/s
12.	Latifah Hanum	16,9 m/s	0,19 m/s	13,04 m/s	3,10 m/s
13.	Amira Nufidah	24,6 m/s	0,07 m/s	14,33 m/s	3,15 m/s
14.	Dian HariadiBerutu	25,6 m/s	0,07 m/s	13,08 m/s	3,69 m/s
<b>Rate - Rate</b>		26,5 m/s	0,12 m/s	14,7 m/s	4,04 m/s

Table 4.2. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka Muhammad Thawakal's (Body Mass 71 Kg).

No.	Variable	KickMawashi-Geri	Ket
1.	Time(s)	0,068 s	Binaan KONI
2.	Distance (m)	2,02 m	
3.	Body Weight (kg)	71 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	18,91 m/s	
6.	Target Hit Instantaneous Speed	3,40 m/s	
7.	Kick Speed (m/s)	29,7 m/s	

Tabel 4.3. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka RizkyAnanda (Body Mass 71 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,058 s	Binaan KONI
2.	Distance (m)	2,18 m	
3.	Body Weight (kg)	71 kg	
4.	Kick Start Speed	0,60 m/s	
5.	Mid Kick Speed	17,65 m/s	
6.	Target Hit Instantaneous Speed	8,32 m/s	
7.	Kick Speed (m/s)	38,9 m/s	

Tabel 4.4. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaPunggaZalzabilaWiranda (Body Mass 53 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,064 s	Binaan KONI
2.	Distance (m)	1,87 m	
3.	Body Weight (kg)	53 kg	
4.	Kick Start Speed	0,09 m/s	
5.	Mid Kick Speed	15,73 m/s	
6.	Target Hit Instantaneous Speed	1,34 m/s	
7.	Kick Speed (m/s)	29,2 m/s	

Tabel 4.5. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaUlyana (Body Mass 43 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,072 s	Binaan KONI
2.	Distance (m)	1,97 m	
3.	Body Weight (kg)	43 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	12,76 m/s	
6.	Target Hit Instantaneous Speed	5,39 m/s	
7.	Kick Speed (m/s)	27,3 m/s	

Tabel 4.6. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaM. Imam (Body Mass 55 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,072 s	Binaan KONI
2.	Distance (m)	2,12 m	
3.	Body Weight (kg)	55 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	14,46 m/s	
6.	Target Hit Instantaneous Speed	7,56 m/s	
7.	Kick Speed (m/s)	29,4 m/s	

Tabel 4.7. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaSultan Hafidz (Body Mass 87 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,064 s	Binaan KONI
2.	Distance (m)	2,18 m	
3.	Body Weight (kg)	87 kg	
4.	Kick Start Speed	0,09 m/s	
5.	Mid Kick Speed	16,08 m/s	
6.	Target Hit Instantaneous Speed	4,43 m/s	
7.	Kick Speed (m/s)	34,0 m/s	

Tabel 4.8. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaNajlaSyakira (Body Mass 50 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,084 s	SMAKON
2.	Distance (m)	1,96 m	
3.	Body Weight (kg)	50 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	10,41 m/s	

6.	Target Hit Instantaneous Speed	5,22 m/s	
7.	Kick Speed (m/s)	23,3 m/s	

Tabel 4.9. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka Luthfia Alini (Body Mass 46 Kg).

No.	Variabel	Kick Mawashi-Geri	KET
1.	Time(s)	0,092 s	SMAKON
2.	Distance (m)	1,80 m	
3.	Body Weight (kg)	46 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	14,49 m/s	
6.	Target Hit Instantaneous Speed	3,06 m/s	
7.	Kick Speed (m/s)	19,5 m/s	

Tabel 4.10. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka Ari Setiawan (Body Mass 52 Kg).

No.	Variabel	Kick Mawashi-Geri	KET
1.	Time(s)	0,080 s	SMAKON
2.	Distance (m)	1,96 m	
3.	Body Weight (kg)	52 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	14,00 m/s	
6.	Target Hit Instantaneous Speed	1,00 m/s	
7.	Kick Speed (m/s)	24,5 m/s	

Tabel 4.11. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka Muhammad Farid Ramli (Body Mass 60 Kg).

No.	Variabel	Kick Mawashi-Geri	KET
1.	Time(s)	0,074 s	SMAKON
2.	Distance (m)	1,93 m	
3.	Body Weight (kg)	53 kg	
4.	Kick Start Speed	0,06 m/s	
5.	Mid Kick Speed	16,15 m/s	
6.	Target Hit Instantaneous Speed	3,93 m/s	
7.	Kick Speed (m/s)	26,0 m/s	

Tabel 4.12. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri Karateka Riki Ronaldi (Body Mass 50 Kg).

No.	Variabel	Kick Mawashi-Geri	KET
1.	Time(s)	0,084 s	SMAKON
2.	Distance (m)	1,93 m	
3.	Body Weight (kg)	50 kg	
4.	Kick Start Speed	0,23 m/s	
5.	Mid Kick Speed	15,20 m/s	
6.	Target Hit Instantaneous Speed	3,08 m/s	
7.	Kick Speed (m/s)	22,9 m/s	

Tabel 4.13. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaLatifah Hanum (Body Mass 48 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,092 s	SMAKON
2.	Distance (m)	1,56 m	
3.	Body Weight (kg)	48 kg	
4.	Kick Start Speed	0,19 m/s	
5.	Mid Kick Speed	13,04 m/s	
6.	Target Hit Instantaneous Speed	3,10 m/s	
7.	Kick Speed (m/s)	16,9 m/s	

Tabel 4.14. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaAmira Nufidah (Body Mass 49 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.	Time(s)	0,080 s	SMAKON
2.	Distance (m)	1,97 m	
3.	Body Weight (kg)	49 kg	
4.	Kick Start Speed	0,07 m/s	
5.	Mid Kick Speed	14,33 m/s	
6.	Target Hit Instantaneous Speed	3,15 m/s	
7.	Kick Speed (m/s)	24,6 m/s	

Tabel 4.15. Data Recapitulation Analysis of Kicking Speed Mawashi-Geri KaratekaDian HariadiBerutu(Body Mass 56 Kg).

No.	Variabel	KickMawashi-Geri	KET
1.		0,076 s	SMAKON
2.	Distance (m)	1,95 m	
3.	Body Weight (kg)	56 kg	
4.	Kick Start Speed	0,07 m/s	
5.	Mid Kick Speed	13,8 m/s	
6.	Target Hit Instantaneous Speed	3,69 m/s	
7.	Kick Speed (m/s)	25,6 m/s	

#### IV. Discussion

Results of Analysis of Mawashi Geri's Kick Speed for Karate Athletes Assisted by the Forki Aceh Provincial Government through Kinovea Software. Of the 14 subjects analyzed the average linear speed of the prefix was 0.12 m/s. the average linear speed of the mid-kick is 14.7 m/s. the average linear velocity of the impact kick is 4.04 m/s. and Mawashi Geri's average kicking speed for the Forki Aceh Provincial Karate Athletes is 26.5 m/s.

In accordance with the data from the analysis above, it can be said that the Mawashi -Geri Karate Athlete assisted by the Forki Aceh Province's fastest kick at the Mawashi -Geri kick speed was in RizkyAnanda 's karate with a speed of 38.9 m/s which was obtained at a time of 0.058 s. with a distance of 2.18 m, and for kicks the slowest Mawashi-Geri was in Latifah Hanum's karate with a speed of 16.9 m/s which was obtained in 0.072 s with a distance of 1.97 m. As for the speed of the mid- kick hitting the target, the fastest is Muhammad Thawakal 's karateka with a speed of 18.91 m/s, and the slowest for the mid- kick speed of hitting the target is karate. NajlaSyakira with a speed of 10.41 m/s and the fastest target for the impact kick speed was RizkyAnanda karate with a speed of 8.32 m/s, and the slowest for the target impact kick speed was Ari Setiawan karate with a speed of 1,00 m/s.

According to data from the National Karate athletes, the SEA Games XXXI Vietnam 2021 match officially started after the opening ceremony was held at Mỳnh Stadium, Hanoi, Thursday (12/05/2022). The results of the analysis of Mawashi Geri's kick speed for Karate athletes of the Indonesian national team through the analysis of the Kinovea Software from 5 subjects that the researchers analyzed can be explained as follows: The speed of Mawashi Geri's kick in Ari Saputra karate is 58.3 m/s which is obtained at a time of 0.036 s, with a distance 2.10 m. Mawashigeri's kick speed on karateka Joshua Kandou is 56.5 m/s which is achieved in 0.038 s,

with a distance of 2.15 m. Mawashigeri's kick speed in Hutapea Cliff karateka is 54.5 m/s which is obtained in 0.040 s, with a distance of 2.18 m. Mawashigeri's kick speed in Cok Istri Agung karateka is 49.7 m/s which is obtained in a time of 0.040 s, with a distance of 1.99 m. Mawashigeri's kick speed in Ceyco Georgia karate is 47.4 m/s in 0.042 s, with a distance of 1.98 m.

Based on the discussion of the results of Mawashi Geri 's kick speed test from 14 samples, it can be seen that the results of this study are very influential from the results of the time obtained and the distance of Mawashi Geri's kicks, in line with the opinion of Sukadiyanto (2011: 116-117) Speed contains elements there is distance travel time and travel time to the stimulus that appears. In other words, speed is the ability of a person 's ability to respond to stimuli in the form of motion in the shortest possible time.

Mawashi Geri's kick speed is obtained from the distance of the kick to the target divided by the time interval required for the kick to reach the target, in this case the kick distance is the distance that appears in the two-dimensional image from the analysis of the Kinovea software program, and is measured from the tip of the foot at the time of shooting. the beginning of the body movement until it reaches the specified target. And the time lapse of the kick is the length of the kick or the interval of time it takes when the prefix of the foot will poke until it reaches the target target.

The results of this study can be compared with previous studies involving martial arts with the Mawashi Geri Kick movement. This study found that the range of movement speed of Mawashi Geri kicks in athletes assisted by the Aceh Provincial Government in the sport of Karate in 2022; Mawashi Geri's Kick speed is 16.9 m/s to 38.9 m/s, indicating the speed level is lower than the Kick Speed of Mawashi Geri Athletes in Jombang Regency in 2016, namely Mawashi Geri's Kick Speed of 15.1 m/s to 73.7 m/s (Nenggar, 2016). In line with the results of research conducted by Teguh Andibowo (2018), in his journal has shown that the analysis of kick motion Mawashi-Geri showed results for Inkai Athletes in Wonogiri Regency in 2018, the speed of Mawashi Geri's kicks was 13.5m/s to 76.2m/s.

From the data that has been described about the analysis of Mawashi Geri's kick speed in the Karate-do sport, it can be said that the speed of Mawashi Geri's kicks carried out on the Aceh Provincial Pengprov Assisted athletes is still in the medium speed category, so it is very necessary to improve and increase Mawashi Geri's kick speed Athletes assisted by the Aceh Provincial Government through training programs can increase Mawashi Geri's kick speed, improve movements that are still a lot wrong and are very necessary for understanding technology for coaches and athletes.

## V. Conclusion

As the end of writing this thesis, the writer will give a conclusion from the presentation of the data above and this conclusion will be the answer to the problems studied by the author. The conclusion is as follows:

The results of the analysis of Mawashi Geri's kicking speed for Karate Athletes assisted by the Forki Aceh Provincial Government through Laptops, Cameras and Kinovea Software are in the medium speed category. Of the 14 subjects analyzed the average linear speed of the prefix was 0.12 m/s. the average linear speed of the mid-kick is 14.7 m/s. the average linear velocity of the impact kick is 4.04 m/s. and Mawashi Geri's average kicking speed for the Forki Aceh Provincial Karate Athletes is 26.5 m/s.

In accordance with the data from the analysis above, it can be said that the Mawashi-Geri Karate Athlete assisted by the Forki Aceh Province's fastest kick at the Mawashi-Geri kick speed was in Karateka Rizky Ananda with a speed of 38.9 m/s which was obtained at a time of 0.058 s. with a distance of 2.18 m, and for Mawashi-Geri's kick the slowest is Latifah Hanum's karateka with a speed of 16.9 m/s which is obtained in 0.072 s with a distance of 1.97 m. As for the mid-kick speed hit the target, the fastest is Muhammad Thawakal karate with a speed of 18.91 m/s, and the slowest for the mid-kick speed hit the target is Najla Syakira karate with a speed of 10.41 m/s. The fastest impact target was Rizky Ananda's karate with a speed of 8.32 m/s, and the slowest for the impact of the impact target was Ari Setiawan's karate with a speed of 1.00 m/s.

Based on the results of this study, the following recommendations will be given:

Improving the movement of Mawashi Geri's kicks, the coaches are expected to be able to provide constructive direction and criticism to their students. Paying attention to the maximum movement of the *Mawashi-Geri* kick, the angle of movement is very influential, it should be assisted by paying attention to the speed of the kick that is good and correct in performing the Mawashi-Geri kick. So as to provide maximum results for Mawashi-Geri kicks in Karate. To produce a Mawashi-Geri kick which is good when kicking the foot which is used as a kick when starting to be lifted facing the left side or lifting the foot starting from the side.

## Bibliography

- [1]. Guzman-Valdivia, C.H., A. Blanco-Ortega, M.A. Oliver-Salazar and J.L. Carrera-Escobedo, 2013. Therapeutic motion analysis of lower limbs using kinovea. *Int. J. Soft Comput. Eng.*, 3: 359-365.
- [2]. Lukman dan Ningsih, N. (2013). *Asuhan Keperawatan pada Klien dengan Gangguan Sistem Muskuloskeletal*. Jakarta : Salemba Medika
- [3]. Metty Putry Rahayu. "Hubungan Daya Tahan Kekuatan Otot Perut Dan kelentukan Togok Dengan Tendangan Mawashi geri Balai Kota Padang". 2017 : 1.

- [4]. Musfiqon. 2012. Pengembangan Media Belajar Dan Sumber Belajar. Jakarta : Prestasi Pustakakarya.
- [5]. Nenggar, Aditya H. 2014. "Analisis gerak tendangan mawashi-geri cabang olahraga karate pada atlet forkikabupaten jombang". *Bravo's Journal*, 2(4); 193-207. Diperoleh dari <http://ejournal.stkipjb.ac.id/index.php/penjas/article/view/267>
- [6]. Rahayu, M, N. (2020). Pembelajaran Beladiri Karate. Edisi Pertama. UPI Sumedang Press. Sumedang.
- [7]. Roni Fajar Simbolon & David Siahaan. (2020). Pengembangan Instrumen Tes Kecepatan Tendangan Mawashi Geri Pada Cabang Olahraga Karate. *Jurnal Prestasi* Vol, 4 No. 2, Desember. h.52-5
- [8]. Sukadiyanto (2011). Pengantar Teori dan Metodologi Melatih Fisik. Bandung: CV. Lubuk Agung.
- [9]. Syafruddin. (2011). Ilmu Kepeleatihan Olahraga Teori dan Aplikasinya Dalam Pembinaan Latihan. Padang: UNP Press Padang
- [10]. Simbolon. (2014). Latihan dan Melatih Karateka. Yogyakarta: PT. Griya Pustaka
- [11]. Suboto, J. B. 1996. Teknik Oyama KARATE Seri Kihon. Jakarta: PT Elex Media Komputindo.
- [12]. Wahid, A. (2007). Sebuah Tinjauan Alternatif Terhadap Aliran Karate-Do Terbesar Di Dunia. Jakarta: PT. Raja Grafindo Persada.

Muhammad Iqram, et. al. "Analysis speed kick mawashi geri athlete karate Developed By Provforki Aceh In 2022." *IOSR Journal of Sports and Physical Education (IOSR-JSPE)* 9(5), (2022): pp. 01-08.