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Biomechanical Analysis of *Mawashi-Geri* Kick Motion on Kenshi Shorinji Kempo Jambi Province

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ABSTRACT: In randori Shorinji Kempo, various variations of attacks are used to get a high number of scores. Mawashi-Geri is the kick most often used by kenshi. Mawashi-Geri has the privilege of a certain randori due to her strong capacity to obtain higher match score scores. The purpose of this study is to collect accurate information and data about the examination or analysis of the speed, precision, biomechanics of Mawashi-Geri kicks, angles of body segments, as well as how to perform them. The subjects of this study were four athletes with different amounts of body weight. This research was conducted using descriptive research type analysis with qualitative and quantitative methods. A qualitative approach was used to describe the biomechanical phase of the Mawashi-Geri kick. While the quantitative approach using the Kinovea software program is related to measuring the angle of body parts, the speed of motion of the Mawashi-Geri kick biomechanics, measurements and calculations are presented systematically to facilitate understanding and drawing conclusions. From the results of research and discussion as well as expert judgment decisions, it can be concluded the speed, accuracy and angle of body segments, it can be said that the kick of Mawashi-Geri kenshi Shorinji Kempo Jambi province with the fastest biomechanical average speed is kenshi B Kicking biomekanics with the first speed is 24m/s, for Mawashi-Geri's slowest biomechanical kick is kenshi A's biomechanics from the second kick, at a speed of 13.5m/s. As for the speed of hitting the target momentary kick with one kick, the biomechanical speed of the first kick kenshi C is 76.2m/s, and the slowest is the biomechanical kenshi A fourth kick, which has a speed of 45.8 m/s. The results of angular analysis of each segment's body of the subject during the biomechanical process of the Mawashi-Geri kick showed the angle of the leg opening between and 128,2 and 142,8 degrees. And the angle of inclination of the body is between 146.0 and 158.9 degrees. The angle of rotation of the pedestal leg is between 119.4 and 178.9 degrees, and the biomechanics of the hip and foot to kick in between 96.3 and 135.6 degrees. Based on the results of the analysis, it can be concluded that excessive angles have little effect on the biomechanics of Mawashi-Geri's kick slowdown. However, with the angle of inclination of the body and the rotation of the footrest, as well as the biomechanical rotation of the hips and feet when kicking, the angle of the leg opening will be more optimal.

KEYWORDS: Analysis, Biomechanics, Kick Motion, Mawashi-Geri, Shorinji Kempo.

I. INTRODUCTION

Shorinji Kempo is a martial art whose philosophy comes from ancient Buddhism and its basic techniques come from ancient Chinese martial arts. Shorinji Kempo was founded in Japan by Doshin So in 1947 as a self-development and training system based on Shaolin Kungfu (So &; Yuuki, 2017). The practice method is based on the philosophies of "spirit and body are inseparable" and "self-development and spiritual rejuvenation". In addition, Shorinji Kempo is known to have three benefits, namely "self-defense, mental training and improving health". Shorinji Kempo has many skills in his set of defense techniques, but demonstrations known as "embu," are the most common. It is usually done with bare hands and barefoot, by two people called "kumi-embu." At the time of embu, first one person attacks while the other defends, then the roles are reversed, and the technique is immediately repeated, as well as for the fighting technique in Shorinji Kempo commonly known as randori (Sumida S et al., 2012).

There are two classes of techniques in Shorinji Kempo activities, called "Goho" and "Juho". The Goho technique is generally considered a 'hard' technique in Shorinji Kempo. Goho's technique involves using body movements to avoid attacks, blocking to

deflect punches or kicks, and retaliating to prevent further attacks. Instead of resisting with force, blok deflects blows, or serves as a cover to protect the body.

In contrast, Juho's technique uses movement to unbalance the attacker, and takes advantage of the momentum of the attack, and is considered a 'soft' technique in Shorinji Kempo. The juho technique is applied when someone is caught or pinned by an attacker, and consists of throws, locks and pins, as well as elusive movements. Goho and Juho's judgment considers attack, as well as defensive movement, and counterattack. Attitudes and attitudes are also very important and taken into consideration during assessment (Wali, C. N, 2021).

Shorinji Kempo is categorized as a dentoukyougi martial art, and is a traditional Japanese martial art with a long history and contains elements of Japanese culture. (Samukawa, 2015: 2). Like Shorinji Kempo, Judo and other martial arts skills, Shorinji Kempo regularly competes in championships at the regional and national levels. Shorinji Kempo has many advantages, not only teaching physical aspects such as fighting skills, but also emphasizing discipline, mentality, traits, and other characteristics (Moore, B., et al 2019). In addition, Shorinji Kempo also contains deep philosophical aspects, so that by studying kempo, the mind, soul and fitness will grow and develop as a whole (Moore, B.W, 2023). Furthermore (de Moraes Fernandes, F., et al 2017) point out that martial arts are currently practiced by boys and girls, children and adults, and several societies with different goals. The term Shorinji Kempo is interpreted as follows, Sho means small, Rin means forest, Ji means temple, Ken means fist, Po means way or way of life (Shorinji Kempo Kyu-IV PB-PERKEMI Textbook).

On February 2, 1966, Shorinji kempo founded by Utin Syahraz, an Indonesian youth who studied and trained in Japan, followed by Indra Kartasasmita and Ginanjar Kartasasmita was officially established in Indonesia with the roles of the four people, and finally the Shorinji Organization was formed Kempo Indonesia is known as PERKEMI (Indonesian Kempo Martial Arts Brotherhood). Perkemi is also a full member of the World Federation of Shorinji Kempo Organizations or WSKO (World Shorinji Kempo Organization), and is centered in Tadotsu temple, Japan (Wali, C.N. 2023).

Kicking (Geri) is one of Shorinji Kempo's basic techniques and plays an important role in Kempo matches. The Mawasi geri kick is a forward kick technique in which individuals kick with a knee jerk from the side to the front using pads on the front leg or instep. Mawashi-Geri is a kick technique that is difficult to learn because in addition to having strength, kenshi must also have flexibility so that Mawashi-Geri's kicks can be done correctly and perfectly (Damrah, et al 2019). The advantage of this kick is its technique that can score ten points in competitions or matches. 10 points is the highest score in a kempo game, but many kenshi apply Mawashi-Geri's kick imperfectly when using this kick, to his own detriment (Paruntu, G.S., et al 2020).

Mechanics is a branch of science within the field of physics that studies the motion and change of the shape of materials, followed by mechanical disturbances called forces (Dorsckhy, E., et al., 2023), and then (Kimmel, M., &; Rogler, C.R., 2019) considers biomechanics as the study of internal and external forces acting on the human body and the consequences of the forces generated.

In sports, mechanics is nothing but the basic rules that determine the mechanics and physics of an athlete's movements while performing certain motor skills (Ramstead, M.J., 2023). Therefore, a good understanding of biomechanics, particularly shorinji kempo martial arts movements, is helpful for designing training or teaching program content aimed at developing and improving specific skills (Yan, S., et al 2022). This understanding is also needed later when analyzing sports performance, which can provide positive information to correct the errors displayed (Hakim, H., et al 2023).

Seeing any incorrect movement requires movement analysis, will be visible and must be corrected immediately to obtain correct movement coordination (Matuszewska &; Syczewska, 2023). Because the right movement produces more value in its execution. Based on the discussion above, in terms of kinematics and biomechanics, the angles of the body segments associated with the Mawashi-Geri kick are hip abduction, external rotation of the hip, and lateral flexion of the trunk or spine (Uppal, A. K., &; Goswami, J., 2020). The ideal range of hip abduction is 30 degrees, the Range of Motion of the external rotation of the hip is 90 degrees, and the Range of Motion of lateral flexion of the body is 75-85 degrees (Arora, K., & Wolbring, G., 2022). However, the range of motion of each joint can be expanded through flexibility exercises (Bushman, B. A., 2016).

II. METHOD

In accordance with the questions that have been described, this research was conducted using a type of descriptive analysis research with qualitative and quantitative methods. That is to analyze and present facts systematically according to the symptoms of the problem so that it is easier to understand and draw conclusions (Kumari, S.K.V., et al., 2023). To describe the study, researchers need to conduct the following research design:

The study subjects were kenshi shorinji kempo in Jambi Province, with men's weights of -55 kg, -60 kg, -75 kg and -84 kg. All four subjects in the study performed best in Mawashi-Geri's kicks. Here are some of the criteria of the subject of study:

1. Good Mawashi-Geri kick.

2. Behaves well and is full of vigor.
3. Have full awareness and fighting spirit (Bushido).
4. Correct distance and perform movements precisely.

The results of the four research sources will be given to three expert judgment judges, theorist and technical expert Shorinji Kempo, referee expert and coaching expert to provide decision making and input to identify the wrong or insufficient position for Kenshi to play on Mawashi-Geri's kick (Furley, P., et al., 2023).

In this study, the Kinovea software program was used. To obtain the data analyzed with the Kinovea program, supporting tools are needed to collect the data (Nor Adnan, N.M., et al., 2018). The tools needed include a training mat / field, kick target (punching bag), handy camera, digital camera, tripod, meter, paper, whistle, and stationery.

III. RESULT AND DISCUSSION

A. Result

In this chapter, the results of the data study are obtained using 2 portable cameras that can be rotated and converted into several video clips or pictures. Footage of the subject's Mawashi-Geri kicks was then fed into a computer. After that, measurements of the angle of the body segment, speed, angle of leg span, angle of inclination of the body, angle of rotation of the kick leg, and angle of rotation of the support leg are measured. Video clips can be analyzed using the Performance Analysis tool in the Kinovea software program (Puig-Diví, A., et al., 2019).

Table 1. Data Analysis of Mawashi-Geri Kenshi A Kick (Weight -55 Kg)

No	Variable	*Mawashi-Geri* kick				
		I	II	III	IV	V
1	Average Time (s)	0,052	0,056	0,052	0,048	0,052
2	Distance(m)	0,78	0,76	0,76	0,74	0,81
3	Average Speed (m/s)	15	13,5	14,6	15,4	15,6
4	Target Instantaneous Time(s)	0,008	0,012	0,012	0,012	0,010
5	Target Instantaneous Wear Distance (m)	0,51	0,57	0,60	0,55	0,51
6	Target instantaneous imposition speed (m/s)	63,7	47,5	50	45,8	51
7	(foot opening/span angle)	$142,8^0$	$147,5^0$	$130,8^0$	$151,2^0$	$151,2^0$
8	(angle of inclination of the body)	$148,7^0$	$147,3^0$	$139,7^0$	$134,5^0$	$140,0^0$
9	(rotational angle of fulcrum foot)	$142,8^0$	$147,5^0$	$130,8^0$	$151,2^0$	$151,2^0$
10	(angle of rotation of the hip and kick leg)	$96,3^0$	$97,8^0$	$89,6^0$	$80,8^0$	$83,6^0$
11	Target Accuracy	Do not	Do not	Do not	Do not	Do not

Table 2. Data Analysis of Mawashi-Geri Kenshi B Kick (Weight -60 Kg)

No	Variable	*Mawashi-Geri* kick				
		I	II	III	IV	V
1	Time(s)	0,040	0,056	0,052	0,052	0,052
2	Distance(m)	0,96	0.96	0,90	0,88	0,90
3	Average Speed (m/s)	24	17,1	17,3	16,9	17,3
4	Target Instantaneous Imposition Time (s)	0,008	0,012	0,008	0,012	0,012
5	Target Instantaneous Wear Distance (m)	0,54	0,58	0,54	0,58	0,61
6	Target instantaneous imposition speed (m/s)	67,5	48,3	67,5	48,3	50,8
7	α 1 (foot opening/span angle)	$134,9^0$	$138,2^0$	$136,0^0$	$138,7^0$	$139,9^0$
8	(angle of inclination of the body)	$146,0^0$	$148,0^0$	$134,5^0$	$146,6^0$	$146,8^0$
9	(angle of rotation of the pedestal foot)	$119,4^0$	$112,0^0$	$120,7^0$	$112,3^0$	$112,5^0$
10	(angle of rotation of the hip and kick leg)	$115,3^0$	$120,8^0$	$115,0^0$	$116,3^0$	$129,3^0$
11	Target Accuracy	True	True	True	True	True

Table 3. Data Analysis of Mawashi-Geri Kenshi C Kick (Weight -75 Kg)

No	Variable	*Mawashi-Geri* kick				
		I	II	III	IV	V
1	Time(s)	0,052	0,056	0,048	0,048	0,048
2	Distance(m)	0,86	0,88	0,90	0,89	0,89
3	Average Speed (m/s)	16,5	15,7	18,7	18,5	18,5
4	Target Instantaneous Imposition Time (s)	0,008	0,008	0,008	0,008	0,012
5	Target Instantaneous Wear Distance (m)	0,61	0,53	0,50	0,55	0,65
6	Target instantaneous imposition speed (m/s)	76,2	66,2	62,5	68,7	54,1
7	α 1 (foot opening/span angle)	$126,2^0$	$126,7^0$	$132,9^0$	$136,2^0$	$132,2^0$
8	(angle of inclination of the body)	$153,4^0$	$149,8^0$	$158,9^0$	$156,5^0$	$154,9^0$
9	(angle of rotation of the pedestal foot)	$167,1^0$	$167,1^0$	$172,7^0$	$171,3^0$	$176,6^0$
10	(angle of rotation of the hip and kick leg)	$127,8^0$	$123,1^0$	$135,6^0$	$130,9^0$	$140,7^0$
11	Target Accuracy	Do not	Do not	True	True	True

Table 4. Data Analysis of Mawashi-Geri Kenshi D Kick (Weight -84 kg)

No	Variable	*Mawashi-Geri* kick				
		I	II	III	IV	V
1	Time(s)	0,056	0,068	0,048	0,060	0,060
2	Distance(m)	0,91	1,03	0,95	0,95	0,96
3	Average Speed (m/s)	16,2	15,1	19,7	15,8	16
4	Target Instantaneous Imposition Time (s)	0,008	0,012	0,008	0,008	0,012
5	Target Instantaneous Wear Distance (m)	0,56	0,66	0,54	0,59	0,61
6	Target instantaneous imposition speed (m/s)	70	55	67,5	73,7	50,8
7	α 1 (foot opening/span angle)	$123,1^0$	$133,1^0$	$124,9^0$	$128,2^0$	$129,0^0$
8	(angle of inclination of the body)	$150,2^0$	$146,4^0$	$149,5^0$	$153,8^0$	$147,8^0$
9	(angle of rotation of the pedestal foot)	$170,9^0$	$176,3^0$	$178,9^0$	$178,9^0$	$180,0^0$
10	(angle of rotation of the hip and kick leg)	$109,0^0$	$123,4^0$	$120,9^0$	$122,1^0$	$97,5^0$
11	Target Accuracy	Do not	True	Do not	True	True

Table 5. Best Data Analysis Results of Mawashi-Geri Kick Research Subjects

No	Variable	*Mawashi-Geri* kick			
		Kenshi A	Kenshi B	Kenshi C	Kenshi D
1	Time(s)	0,052	0,040	0,048	0,060
2	Distance(m)	0,78	0,96	0,90	0,95
3	Average Speed (m/s)	15	24	18,7	15,8
4	Target Instantaneous Imposition Time (s)	0,008	0,008	0,008	0,008

5	Target Instantaneous Wear Distance (m)	0,51	0,54	0,50	0,59
6	Target instantaneous imposition speed (m/s)	63,7	67,5	62,5	73,7
7	α 1 (foot opening/span angle)	$142,8^0$	$134,9^0$	$132,9^0$	$128,2^0$
8	(angle of inclination of the body)	$148,7^0$	$146,0^0$	$158,9^0$	$153,8^0$
9	(angle of rotation of the pedestal foot)	$142,8^0$	$119,4^0$	$172,7^0$	$178,9^0$
10	(angle of rotation of the hip and kick leg)	$96,3^0$	$115,3^0$	$135,6^0$	$122,1^0$
11	Target Accuracy	Do not	True	True	True

IV. DISCUSSION

Shorinji Kempo is a hard (Goho) and soft (Joho) martial arts sport (Szabó, B., 2013) because it uses physical techniques such as boxing, kicks, blocking and strong moves as well as locks and punches (Pettinen, 2014) Therefore, mastering the basic techniques of shorinji kempo plays an important role in developing the correct skills. The Shorinji Kempo branch of martial arts has two match numbers, Embu and Randori. Embu is a match number used to demonstrate the ability to perform movements that are interrelated in pairs or teams, combining Shorinji Kempo's basic techniques, namely waza, kumi embu, tsuki, uke, geri and uchi and ken into a series of logical movements to form a complete unity (Sanglise, M., &; Saputra, H., 2018). While Randori is a form of fighting through attack and defense, trained in kihon and Shadow in real situations. The success of Shorinji Kempo training is influenced by the cognitive and motor abilities of an athlete, but most are influenced by emotional control (Andrade, A., et al., 2020). Shorinji Kempo exercises also had little effect on cognitive improvement and a greater improvement in the socio-emotional dimension. A kenshi must have good technical skills to become an athlete, in addition to good strength, speed, agility, and stamina (Akhmad et al., 2021). Shorinji Kempo training increases speed, agility and strength. In addition, shorinjin kempo exercises were found to increase cardiovascular endurance levels (Rahman, N. A., &; Siswantoyo, S., 2018).

Kicking (Geri) is one of the basic techniques of shorinji kempo and occupies an important position in kempo. In Shorinji Kempo the kick attack depends on each target and is known by several techniques, namely geri age (direct forward kick to the head), mawashi geri (side kick aimed at the ribs), kinteki geri (pubic kick) and ushiro geri (back kick using kakato) (Kuswahyudi, A.A., 2017). Given the importance of kicks in the game of Shorinji Kempo, Kenshi Dojo Kelapa Kebun Jambi Province trained mawasi geri kick technique.

The Mawasi geri kick is a forward right or left rib/right kick technique that relies on a forward knee jerk to the sole of the foot and instep to the front rib. This kicking technique will be assisted by explosive hip and leg muscles (bursting in motion). To get points in the game, the mawasi geri kick technique must be strong, fast and accurate (Kuswahyudi, A.A., 2017).

The results of the analysis from table 1 can be seen as. Kenshi A made the first Mawashi-Geri kick with a time of 0.052 seconds, the distance of the kick with a target of 0.78m , resulting in a speed of 15m/s. Before the target with a time of 0.008 seconds, the distance to the target was 0.51m, resulting in a speed of 63.7m/s. Furthermore, for the leg opening angle of 145.9 degrees, the body tilt angle of 148.7 degrees, and the rotation angle of the fulcrum leg 142.8 degrees and the angle of rotation of the hip and kick leg 96.3 degrees and not on target on the predetermined target. Kenshi A made Mawashi-Geri's fourth kick with a time of 0.048 seconds, the target kick distance was 0.74 m, resulting in a speed of 15.4m/s. Furthermore, at the speed just before the target with a time of 0.012 seconds, the distance to the target was 0.55 m, resulting in speed 45.8m/sec. Furthermore, for the leg opening angle of 152.5 degrees, the body inclination angle of 134.5 degrees, and the leg rotation angle of 151.2 degrees and the hip rotation angle and foot kick of 80.8 degrees and not on target have been determined. After that kenshi A made Mawashi-Geri's fifth kick with a time of 0.052 seconds, the target kick distance was 0.81m, resulting in a speed of 15.6m/s. Furthermore, at the speed just before the target reached with a time of 0.010 seconds, the distance to the target was 0.51m, resulting in a speed of 51m/s. legs 149.5 degrees, body inclination angle 140.0 degrees, and foot rotation angle 151.2 degrees and hip rotation angle and foot kick 83.6 degrees and not on target.

The results of the analysis and table 2 can be explained, namely kenshi B made the first Mawashi-Geri kick with a time of 0.040 seconds, the distance of the kick with the target was 0.96m, resulting in a speed of 24m/s. Furthermore, at the speed just

before the target with a time of 0.008 seconds, the distance to the target is 0.54m, resulting in a speed of 67.5m/s. Next for the leg opening angle is 134.9 degrees, the body tilt angle is 146.0 degrees, and the angle of rotation of the fulcrum leg is 119.4 degrees and the angle of rotation of the hip and kick leg is 115.3 degrees and on target. And then Kenshi B made the third Mawashi-Geri kick with a time of 0.052 seconds, the target kick distance was 0.90m, resulting in a speed of 17.3m/s. Furthermore, at the speed just before the target reached with a time of 0.008 seconds, the distance with the target was 0.54m, resulting in a speed of 67.5m/s. Next for the leg opening angle is 136.0 degrees, the body inclination angle is 134.5 degrees, and the angle Leg rotation 120.7 degrees and hip rotation angle and foot kick 115.0 degrees and on target. After that Kenshi B made Mawashi-Geri's fifth kick with a time of 0.052 seconds, the target kick distance was 0.90 m, resulting in a speed of 17.3m/s. Furthermore, at the speed just before the target reached with a time of 0.012 seconds, the distance to the target was 0.61m, resulting in a speed of 50.8m/s. Next for the leg opening angle is 139.9 degrees, the body inclination angle is 146.8 degrees, and The angle of rotation of the legs is 112.5 degrees and the angle of rotation of the hips and kicks of the legs is 129.3 degrees and on target predetermined.

When viewed from the figure of the analysis results and table 3 can be explained, Kenshi C made the third Mawashi-Geri kick with a time of 0.048 seconds, the distance of the kick with a target of 0.90m, resulting in a speed of 18.7m/s. Furthermore, at the speed just before the target with a time of 0.008s, the distance to the target is 0.50m, resulting in a speed of 62.5m/s. Next for the leg opening angle of 132.9 degrees, The angle of inclination of the body is 158.9 degrees, and the angle of rotation of the fulcrum legs is 172.7 degrees and the angle of rotation of the hips and kick legs is 135.6 degrees and on target. And then Kenshi C made the fourth Mawashi-Geri kick with a time of 0.480 seconds, the target kick distance was 0.89m, resulting in a speed of 18.5m/s. Furthermore, at the speed just before the target reached with a time of 0.008s, the distance to the target was 0.55m, resulting in a speed of 68.7m/s. Next for the foot opening angle is 136.2 degrees, the body inclination angle is 156.5 degrees, and the footwear rotation angle is 171.3 degrees As well as a hip rotation angle and a foot kick of 130.9 degrees and on target has been determined. After that Kenshi C made Mawashi-Geri's fifth kick with a time of 0.480 seconds, the target kick distance was 0.89 m, resulting in a speed of 18.5m/s. Furthermore, at the speed just before the target reached with a time of 0.012 seconds, the distance to the target was 0.65 m, resulting in speed 54.1 m/s. Next to Then the angle of the leg opening is 132.2 degrees, the angle of inclination of the body is 154.9 degrees, and the angle of rotation of the fulcrum foot is 176.6 degrees and the angle of rotation of the hip of the kick leg is 140.7 degrees and on target.

When viewed from the analysis results and table 4 can be explained, Kenshi D made the second Mawashi-Geri kick with a time of 0.068 seconds, the distance of the kick with the target was 1.03m, resulting in a speed of 15.1m/s. Furthermore, at the speed just before the target with a time of 0.012s, the distance to the target is 0.66m, resulting in a speed of 55m/s. Next for the leg opening angle is 133.1 degrees, The body tilt angle is 146.4 degrees, and the pedestal leg rotation angle is 176.3 degrees and the hip and kick leg rotation angle is 123.4 degrees and on target. And then Kenshi D made the fourth Mawashi-Geri kick with a time of 0.600 seconds, the target kick distance was 0.95m, resulting in a speed of 15.8m/s. Furthermore, at the speed just before the target reached with a time of 0.008s, the distance to the target was 0.59m, resulting in a speed of 73.7m/s. Next for the leg opening angle is 128.2 degrees, the body inclination angle is 153.8 degrees, and the base leg rotation angle is 178.9 degrees and the hip rotation angle and foot kick are 122.1 degrees and right on target has been determined. After that Kenshi D made Mawashi-Geri's fifth kick with a time of 0.600 seconds, the target kick distance was 0.96m, resulting in a speed of 16m/s. Furthermore, at the speed just before the target with a time of 0.012 seconds, the distance to the target was 0.61m, resulting in a speed of 50.8m/sec. Furthermore, for the leg opening angle of 129.0 degrees, the body inclination angle is 147.8 degrees, and the leg rotation angle is 180.0 degrees and the hip rotation angle and foot kick are 97.5 degrees and on target have been determined.

In accordance with the data from the analysis above, it can beseen that the fastest kick of Mawashi-Geri Kenshi Shorinji Kempo Jambi Province with an average speed is on Kenshi B, the first kick with a speed of 24m/s, and for Mawashi-Geri's kick, the slowest is on Kenshi A, the second kick with a speed of 13.5m/s. As for the speed of the momentary kick, the target is Kenshi C, The first kick was at a speed of 76.2m/s, and the slowest for instantaneous kick speed hit by the target was Kenshi A fourth kick at a speed of 45.8m/s. The results of the analysis of the angle of the body segment of the study subjects at the time of Mawashi-Geri's kick were the angle of the leg opening between 128.2 degrees to 142.8 degrees. And at an angle of inclination of the body between 146.0 degrees to 158.9 0. For the angle of rotation of the base leg between 119.4 degrees to 178.9 degrees, and at the angle of rotation of the hip and kick leg between 96.3 degrees to 135.6 degrees.

V. CONCLUSIONS

Mawashi-Geri kick movement in Shorinji Kempo sport with a limb movement profile or body segment angle, it can be said that the fastest Mawashi-Geri Kenshi Shorinji Kempo kick in Jambi Province is on Kenshi B the first kick with a speed of 24m/s, while

for Mawashi-Geri's slowest kick is on Kenshi A's second kick with a speed of 13.5m/s. As for the instantaneous kick speed, the target is Kenshi C, the first kick at a speed of 76.2m/s, and the slowest is Kenshi A, the fourth kick at a speed of 45.8m/s.

The results of the analysis of the angle of the body segment of the study subjects at the time of Mawashi-Geri's kick were the angle of the leg opening between 128.2 degrees to 142.8 degrees. And at an angle of inclination of the body between 146.0 degrees to 158.9 degrees. For the angle of rotation of the legs between 119.4 degrees to 178.9 degrees, and at the angle of rotation of the hips and legs of kicks between 96.3 degrees to 135.6 degrees.

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