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The Effect of Punch Bag Training on Mawashi-Geri Kick Speed in Raja Karate's Students

Rizki Andri Ansyah[1]
[1] *Universitas PGRI Palembang, Indonesia*
**Corresponding author: rizkiandriansyah4074@gmail.com*

Abstrak

Penelitian ini meneliti pengaruh latihan tendangan sasaran menggunakan punching bag terhadap kecepatan tendangan Mawashi-Geri pada atlet Dojo Raja Karate, dengan fokus pada pengembangan keterampilan dan penerapan pendidikan. Sampel terdiri dari 20 peserta yang dipilih melalui saturated non-probability sampling. Program latihan berlangsung selama 16 pertemuan, dengan pretest dan posttest untuk mengukur peningkatan performa. Hasil pretest menunjukkan total skor 254, sedangkan posttest mencapai 455, menunjukkan peningkatan signifikan. Analisis statistik menggunakan uji t berpasangan menghasilkan t-hitung 25,960, melebihi t-tabel 2,085, dengan probabilitas signifikan <0,05. Rata-rata skor pretest 12,71 meningkat menjadi 22,75 pada posttest, mencerminkan peningkatan rata-rata 10,04 poin. Hasil ini menunjukkan bahwa latihan punching bag secara terstruktur secara signifikan meningkatkan kecepatan tendangan Mawashi-Geri. Secara akademik, penelitian ini memberikan bukti penting untuk integrasi latihan berbasis keterampilan dan performa dalam kurikulum olahraga dan bela diri, mendukung perencanaan pedagogis, pengembangan modul latihan praktis, serta evaluasi kemajuan peserta didik secara terukur.

***Kata kunci*:** *Mawashi-Geri, Latihan Punching Bag, Kecepatan Tendangan, Pendidikan Jasmani, Kurikulum Bela Diri*

Abstract

This study examines the effect of punching bag target kick training on the speed of Mawashi-Geri kicks among athletes at the Raja Karate Team Dojo, emphasizing skill development and educational applications. The study involved 20 participants selected using saturated non-probability sampling. The training program was conducted over 16 sessions, with pretest and posttest measurements to evaluate performance improvement. Pretest results totaled 254, while posttest scores reached 455, showing a substantial increase in kicking speed. Statistical analysis using a paired t-test yielded a t-count of 25.960, surpassing the t-table value of 2.085, with a significance probability below 0.05. The mean pretest score of 12.71 increased to 22.75 post-intervention, reflecting an average improvement of 10.04 points. These results demonstrate that structured punching bag training significantly enhances Mawashi-Geri kick speed. Academically, the study provides evidence for integrating skill-specific, performance-based exercises into martial arts and physical education curriculum, supporting measurable student progress, pedagogical planning, and the development of practical training modules that improve athletic performance.

Keywords: Mawashi-Geri, Punching Bag Training, Kick Speed, Physical Education, Martial Arts Curriculum.

1. INTRODUCTION

Sport is a form of human movement behavior that involves structured physical activity with specific goals and directions, making it relevant not only for personal health but also for learning and character development (Fahrizqi, Mahfud, & Yuliandra, 2020). Sport is an activity aimed at training the body to maintain health, improve physical fitness, and develop discipline, mental resilience, and social skills. Sports are understood not merely as physical activity, but as a means within physical education aimed at fostering overall individual development. Through sports, students can enhance motor skills, physical fitness, knowledge, and socio-emotional attitudes, while simultaneously cultivating healthy and

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active lifestyle habits in a sustainable manner (Iswanto & Widayati, 2021). Beyond physical benefits, sports serve as an educational medium for character building, personality development, and the holistic cultivation of individual potential (Khairuddin, 2017). Sport engages the mind, body, and soul in an integrated and systematic way, fostering the development of physical, cognitive, social, and cultural potential in individuals (Law No. 11, 2022). Physical education, sports, and health for elementary school children serve to enhance physical fitness while also developing motor skills, health knowledge, and socio-emotional attitudes. These activities help children establish active and healthy lifestyle habits from an early age, supporting their overall growth and development (Sudarsinah, 2022). Physical education for early childhood is an educational process aimed at enhancing children's motor skills, physical fitness, as well as cognitive and emotional development. Through structured and enjoyable sports activities, children can develop fundamental movement skills, adopt an active lifestyle, and build health awareness from an early age, which plays a crucial role in their overall growth and development (Nugraha, 2015). In Indonesia, various sports are implemented as part of educational and extracurricular programs to support achievement and holistic development.

Karate, as a branch of martial arts, is widely used not only for self-defense but also for developing physical and mental skills. Integrating martial arts into physical education helps students develop self-regulation, discipline, and physical skills while supporting cognitive and socio-emotional growth (Yu, Houlbert, & Mantuhac, 2024). A curriculum that includes martial arts training is designed not only to enhance motor skills but also to cultivate cognitive and socio-emotional competencies, enabling students to manage themselves, focus, and interact effectively within the context of physical education (Yu, Houlbert, & Mantuhac, 2024). Training programs in karate emphasize strikes, kicks, and defensive techniques, while also fostering discipline, focus, and resilience among practitioners. Such programs have educational value, as they can be integrated into physical education curricula to enhance students' physical fitness, character development, and cognitive-motor skills (Herlina, Burhan, Ashari, & Nulhadi, 2023). The development of martial arts in physical education curricula for compulsory schooling focuses on enhancing students' physical abilities and skills while integrating structured learning programs (Liu, Nirantranon, & Hongsaenyatham, 2023).Karate, a Japanese martial art, has been widely adopted in schools and sports academies as both a competitive sport and a pedagogical tool. Karate, meaning "empty hand," teaches self-defense using bare hands while also promoting discipline, focus, and ethical conduct. Philosophically, karate encourages students to cultivate a "clean mirror" mentality, cleansing selfishness and negative thoughts to enhance learning, self-awareness, and moral development (Kurniawan, 2021). Thus, karate serves not only as physical training but also as an educational medium for character building, cognitive skill development, and social-emotional learning, aligning with holistic educational objectives. Achievements in sports serve as benchmarks for the effectiveness of training centers (dojos), with national performance influencing international reputation (Aguss & Yuliandra, 2021). Karate athletes are expected to attain both national and international success.

For example, at the 2021 Southeast Asian Games, Indonesian karate athletes won four gold, eight silver, and two bronze medals, ranking second in ASEAN (Wikipedia, 2022). However, in the World Karate Federation U-21 and junior events, Indonesia ranked 19th, highlighting gaps in training, competition scheduling, and athlete development (WKF, 2022). (Zemková, 2017) reported that resistance training markedly enhances the muscles' ability to generate explosive force and rapid contractions, which in turn improves performance in movements that require both speed and power, such as kicks in martial arts. (Aguilera &

Jowett, 2018) practicing kicks aimed at a specific target can significantly increase an athlete's kicking speed, highlighting the effectiveness of task-oriented training in enhancing neuromuscular coordination and technique.

From an educational perspective, effective karate training requires integrating physical conditioning, technical mastery, strategy, and tactical execution. Many Indonesian athletes face challenges due to incomplete training programs, where technical drills are emphasized but physical preparation and structured curricula are limited. This gap affects consistent skill acquisition and peak performance. At the Dojo Raja Karate Team, athletes struggle with performing mawashi-geri kicks efficiently. Academic training programs can incorporate structured exercises, such as punching bag target drills, to enhance kick speed and precision. Repeated practice on punching bags not only strengthens technical skill but also supports curriculum-based learning outcomes in physical education, martial arts pedagogy, and performance evaluation, demonstrating the practical application of theory in skill development. Other experimental studies in karate have examined the effect of structured training methods on kick performance, demonstrating significant improvements in kick speed after intervention protocols (e.g., SAQ training and plyometric training), providing supporting evidence for structured skill training in martial arts (Widyasmara & Setiawan, 2024).

Mawashi Geri techniques are considered in three main categories based on the target and execution: low (Gedan), middle (Chudan), and high (Jodan) levels. Each level requires proper body rotation, hip movement, and balance to deliver effective and powerful kicks. (Hariri & Sadeghi, 2018). The Mawashi Geri, or roundhouse kick, is one of the fundamental striking techniques in Karate. This kick involves a circular motion of the leg aimed at the opponent's body or head, combining speed, power, and precise timing. Proper execution requires rotating the hips, maintaining balance, and keeping the supporting foot firmly grounded to generate maximum force. Irawan, F. A., Jannah, S. P., Permana, Nurrachmad & Anam, 2021). In Mawashi Geri training using a target box, most students perform the kick with insufficient speed. Their movements tend to be slower than expected, which reduces the effectiveness and power of the technique. This may be caused by a lack of proper hip rotation, limited flexibility, or insufficient explosive leg strength. Therefore, specific speed and power drills are necessary to improve the students' kicking performance (Cakrawijaya, 2021). Mawashi Geri is a basic roundhouse kick in Karate. It is performed by swinging the leg in a circular motion to strike the opponent's body or head. This technique requires good hip rotation, balance, and speed to produce an effective and powerful kick (Wulandari & Sujarwo,2023). The Mawashi-Geri technique is often felt strongly by the opponent due to its power and speed. This roundhouse kick relies on proper hip rotation, lower limb coordination, and balance to generate maximum force and effectiveness in performance (Udara, 2021).

The term "punching bag" refers to a training tool used as a target to improve athletes' punching performance, enhancing strength, speed, accuracy, and neuromuscular coordination during technique-specific practice (Adriani, Rismayanthi, Ciptadi, & Jurek, 2025). A 2025 study examining karate athletes found that performing heavy bag thrust exercises significantly improved arm muscle strength, demonstrating a greater effect than resistance band training (Differences in the Effects of Heavy Bag Thrust and Resistance Band Training on Arm Muscle Power in Karate Athletes, 2025). Kick speed was quantified as the athletes' measured kicking performance before and after skipping training, with results indicating significant improvements (Saputra & Purbodjati, 2022). A fast kick refers to an athlete's ability to execute a crescent kick in a shorter duration, from the initiation of the movement until the foot reaches the target or final position (Fajar Dwi Saputra, Setianingrum, & Utomo,

2023). A fast kick can be defined as an athlete's capacity to perform a sickle kick more rapidly, encompassing the entire motion from the very beginning of the movement until the foot makes contact with the intended target or settles into its final position. This skill reflects not only the speed of execution but also the coordination and control required throughout the kicking motion.

2. METHOD

This type of research is a quantitative experimental study. The research design used is a one-group pre-test-post-test design, which is an experimental study conducted on only one randomly selected group. An experimental study is a research design aimed at examining the effect of a specific intervention on certain outcomes (Fadlin Al Farhans, Mesnan, & Simatupang, 2024). Experimental design is a method used to test the effect of an intervention on outcomes, ensuring that observed changes such as improved sabit kick speed are caused by the applied training (Sudirman & Hasyim, 2023).

A one-group pretest–posttest design is a type of pre-experimental research in which a single group of participants is measured on the dependent variable before and after an intervention (pretest and posttest) to assess the effect of the treatment without using a control group. This design allows researchers to compare performance changes attributable to the intervention within the same group of subjects (Sugiyono, 2017). Quantitative data, which consists of numerical values, serves as the foundation for systematically analyzing measurable phenomena in research. This type of data allows researchers to apply statistical techniques to identify patterns, test hypotheses, and determine relationships between variables. In educational and sports research, quantitative data can include metrics such as performance scores, reaction times, frequency of behavior, or physiological measurements. By collecting numerical data, researchers are able to evaluate the effectiveness of interventions, compare groups, and draw objective conclusions that are replicable and generalizable.

For instance, in experimental studies, such as those examining the impact of training programs on Mawashi-Geri kick speed, quantitative data enables precise measurement of pretest and posttest performance, providing evidence-based insights into skill development and training efficacy (Aida, Hermina, & Norlaila, 2025). No stability or clarity tests were conducted on the group's condition before treatment. Research using an experimental design (one group pre test–post test) has also been conducted to examine the impact of a drill exercise on Mawashi Geri kick speed in junior karate athletes, showing statistically significant gains following targeted training (Manullang & Tambunan, 2020).

3. RESULT AND DISCUSSION

Result

This study was conducted to determine the effect of Punching Bag Target Kick training on mawashi-geri kick speed among Dojo Raja Karate Team athletes. The results are based on pretest and posttest data from Dojo Raja Karate Team athletes. The results are described below.

Table 1. *Mawashi-Geri Kick Speed Measurement Results for Dojo Raja Karate Team Athletes.*

No	Nama	Jenis Kelamin	Test Kecepatan Tendangan		Selisih
			Pretest	Posttest	
1.	**ABR**	Male	15	25	10
2.	**AD**	Male	13	22	9
3.	**AHD**	Male	13	23	10
4.	**ARN**	Female	14	24	10
5.	**ARM**	Female	14	22	8
6.	**ASF**	Female	12	21	9
7.	**EA**	Female	11	20	9
8.	**FAD**	Male	13	22	9
9.	**FAR**	Male	13	22	11
10.	**ILR**	Male	12	25	13
11.	**KHA**	Male	12	23	11
12.	**NAD**	Female	12	22	10
13.	**NAT**	Female	11	24	13
14.	**NAU**	Female	12	23	11
15.	**SAF**	Female	14	20	6
16.	**SHA**	Female	11	22	11
17.	**THA**	Female	13	23	10
18.	**ZAI**	Male	12	21	9
19.	**ZID**	Male	12	25	13
20.	**ZINE**	Male	15	24	9
Total			**254**	**455**	
Mean			**12.7**	**22.75**	
St. Deviasi			**1.22**	**1.55**	
Min			**11**	**20**	
Max			**15**	**25**	
Total Mean Value Difference					**10,05**
Improving Mawashi-Geri Kicks					**50,8%**

The table above shows that the athletes' performance improvement is considered good. This can be seen from the individual tests. The average pretest score was 254 with a mean of 12.7 and a standard deviation of 1.22. Meanwhile, the posttest score was 455 with a mean of 22.75 and a standard deviation of 1.55. The overall difference in mean scores was 10.05. The table above shows that the pretest and posttest results for the Dojo Raja Karate Team athletes' mawashi-geri kicks are in the "good" category. This can be illustrated in the following diagram:

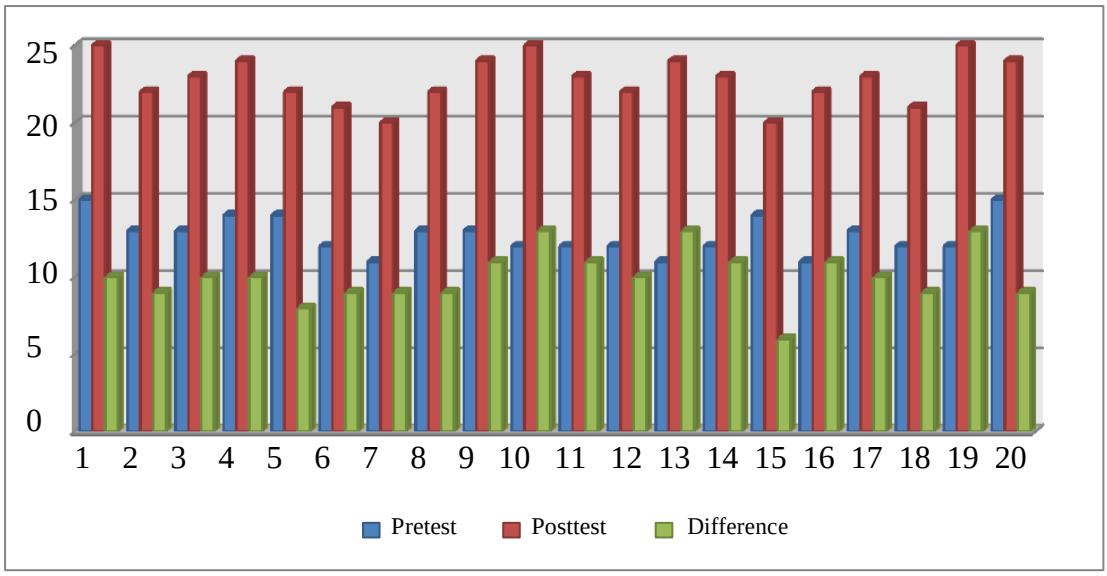

Figure 1. *Bar Chart*

Based on the diagram above, the average pretest effect of punching bag target kick training on mawashi-geri kick speed was 12.7, increasing to 22.75 after the punching bag training treatment.

Normality Test

A normality test is conducted to determine whether the sample data obtained comes from a normally distributed population. normality testing is defined as a statistical assessment performed to check whether a dataset follows a normal distribution, which is a key assumption for many conventional statistical methods used in medical research (Bokhari,& Ali, 2025). Normality testing is described as a statistical procedure used to assess whether sample data come from a normal distribution, which is a key assumption behind many parametric statistical methods such as t-tests and ANOV (Mishra & Keshri,2019). If the data is normally distributed, parametric tests are used; if it is not, non-parametric tests are used. The Liliefors test was used to test the normality of the data in this study, using the IBM SPSS Statistics for Windows software. *17.*

Table 2. *Results of Normality Test Calculation*

Tests of Normality

Kelas		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
Hasil	Pretest	.217	20	.014	.909	20	.062
	Posttest	.140	20	.200*	.936	20	.202

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

From the table above, the results of the Liliefors Normality Test are: Pretest 0.14 > 0.05, indicating a normal distribution of the data. The results of the Liliefors Posttest 200 > 0.05, indicating a normal distribution of the data.

Homogeneity Test

The homogeneity test is conducted to test the hypothesis of the variables. In this study, the researcher used the Paired Sample t-Test using SPSS 17.0 software. The *homogeneity test* (test of variance homogeneity) refers to a procedure used to assess whether the variances—or the spread of outcomes across multiple data groups are equal or consistent. In statistical analyses such as the *t-test* or *ANOVA*, a key assumption is that the response variances in each group are comparable (Zhou, Zhu, &Wong, 2023). The criteria are: if the Pretest value is > 0.05, the data is considered homogeneous; conversely, if the Posttest value is < 0.05, the data is considered non-homogeneous. This is done to determine whether the research data is homogeneous. This test is performed in the Paired Sample t-Test analysis.

Table 3. *Results of the Homogeneity Test Calculation*

Data	Levene Statistic	Df1	Df2	Sig.	Keterangan
Posttest	1.341	1	38	.254	Homogen

The table above shows that the Posttest Sig. value is greater than the 0.05 level (1.341 > 0.05), so the data with a significant level can be concluded as homogeneous. Because all data are homogeneous, data analysis can proceed.

Hypothesis Testing (T-Test)

This study aims to determine whether or not training using a punching bag has an effect on mawashi-geri kicking speed. The *t-test* is described as a statistical method used when the population variance is unknown and one aims to test a hypothesis about the population mean based on sample data. In this situation, the *t-test* uses the sample standard deviation and the Student's *t* distribution to account for the uncertainty arising from a limited sample size(Rajić, 2026). Based on the analysis requirements test results, the data in this study are normal and homogeneous. Therefore, the data analysis used to test this hypothesis was a t-test using paired samples. The hypothesis tester used SPSS 17.0 software. The results of the t-test are shown in the table below:

Table 4. *Results of Hypothesis Calculation (t-Test)*

Paired Samples Test

Paired Differences							
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	Df	Sig. (2-tailed)

Pair 1 Pretest - Posttest	-1.00500E1	1.73129	.38713	-10.86027	-9.23973	-25.960	19	.000

Based on the table above, the pretest and posttest results were analyzed using a t-test. The calculated t-value was 25.960, with a df of 19 obtained from the N-1 formula, and the t-table at a significance level of 0.05 was 2.085. To determine whether the effect of punching bag target kick training on mawashi-geri kick speed can be seen in the significance value above. (2-tailed) < 0.05 (0.000 < 0.05), it can be concluded that the hypothesis is accepted. Therefore, it can be stated that punching bag target kick training has an effect on mawashi-geri kick speed performed at the Raja Kaate Team Dojo.

Table 5. *Improvement in Kicking Results*

Variabel	Mean	Mean Different	Persentase Peningkatan
Pretest	12.7	10.05	50.8%
Postest	22.75		

Based on the calculation above, the difference in the overall average score is 10.05, which is obtained by subtracting the average posttest score from the average pretest score. This is then calculated to increase the overall kicking results by 51%. This is obtained based on the results of the average pretest score = 12.7 divided by the maximum score of 25, then multiplied by 100%, resulting in a score of 50.8%.

Discussion

This study implemented a structured training intervention using a punching bag to examine its effect on improving mawashi-geri kicking speed among athletes of the Dojo Raja Karate Team. The athletes participated in a programmed exercise regimen consisting of 16 training sessions, followed by pretest and posttest measurements to evaluate performance changes. The findings indicated that punching bag training significantly improved mawashi-geri kicking speed, demonstrating the effectiveness of target-based and repetitive training in enhancing motor performance and neuromuscular coordination. Target-focused training has been shown to improve striking velocity and technical efficiency by enhancing muscle activation and movement precision (Aguilera & Jowett, 2018). Similarly, punching bag and resistance-based training provide external resistance and realistic targets, which contribute to increased muscular strength, coordination, and technical accuracy in martial arts performance (Adriani et al., 2025). The statistical analysis using a paired sample t-test revealed a calculated t-value of 25.960, which exceeded the t-table value of 2.085, with a significance level of 0.000 (< 0.05), indicating that the null hypothesis was rejected and the alternative hypothesis was accepted. This confirms that punching bag target kick training has a statistically significant effect on improving mawashi-geri kick speed, consistent with experimental quantitative research approaches that measure treatment effectiveness through pretest-posttest comparisons (Aida et al., 2025; Sugiyono, 2017). The results also showed a positive improvement percentage of 50.8%, indicating that structured and systematic training programs produce greater performance gains than previous or unstructured training methods. These improvements were further supported by intrinsic athlete motivation, the tactical

importance of mawashi-geri kicks in scoring during competition, and adequate training facilities provided by coaches. Previous research also emphasizes that resistance-based and sport-specific training enhances explosive performance and movement speed through neuromuscular adaptation and improved muscle power (Zemková, 2017; Hadjarati et al., 2022). Therefore, punching bag training can be considered an effective and practical training method for improving kicking speed, provided that it is implemented in a structured, supervised, and progressive manner to ensure optimal performance development and continuous improvement.

4. CONCLUSION

This study concludes that punching bag target kick training has a significant positive effect on improving the speed of mawashi-geri kicks among athletes of the Dojo Raja Karate Team. Based on the pretest and posttest results conducted over 16 training sessions, the calculated t-value (25.960) was greater than the t-table value (2.085), with a significance level of 0.000 (< 0.05), indicating that the alternative hypothesis was accepted. The training resulted in a 50.8% improvement in kick speed, demonstrating that structured and programmed punching bag training is more effective than previous training methods. The improvement was also supported by factors such as athletes' motivation, the importance of mawashi-geri in competitions, and adequate training facilities. The implications of this study suggest that punching bag training can be used as an effective method by coaches and instructors to enhance athletes' kicking speed and overall performance through structured and supervised programs. Future research is recommended to involve larger and more diverse samples, examine additional performance variables such as accuracy and power, compare punching bag training with other training methods, and investigate the long-term effects of such training to provide more comprehensive insights into karate training effectiveness.

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