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The Effect of Walking Lunges and Squat Side Kick Exercises on Mawashi Geri Kick Speed in Inkanas Karate Athletes Aged 13-15 Years, UNM Makassar Branch

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ABSTRACT

The purpose of this study was to compare the effectiveness of double-leg hurdle jumps and single-leg hurdle jumps in increasing the shooting speed of soccer players at SMPN 3 Bontomarannu. This study aimed to determine the effect of walking lunges and squat side kick exercises on the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years at the UNM Makassar branch. This study is an experimental study. The population of this study was 24 Inkanas karate athletes aged 13-15 years at the UNM Makassar branch. The research sample was 24 Inkanas karate athletes aged 13-15 years at the UNM Makassar branch. The data analysis technique used inferential testing on t-test statistics. The results of the study showed that 1) there was an effect of walking lunges training on the speed of mawashi geri kicks in Inkanas karate athletes aged 13-15 years at the UNM Makassar branch. This can be seen from the results of the analysis obtained a t-value of -8.074 with a probability (sig) = 0.000 smaller than 0.05. 2) there is an effect of squat side kick training on the speed of mawashi geri kicks in Inkanas karate athletes aged 13-15 years at the UNM Makassar branch. This can be seen from the results of the analysis obtained a t-value of -12.318 with a probability (sig) = 0.000 smaller than 0.05. 3) there is an effect of walking lunges and squat side kick training that is better on the speed of mawashi geri kicks in Inkanas karate athletes aged 13-15 years at the UNM Makassar branch. This can be seen from the results of the analysis obtained a t-value of -1.381 with a probability (sig) = 0.040 smaller than 0.05. In addition, seen from the average difference between the two exercise groups where the average value is 25.75 (walking lunges exercise) and 28.50 (squat side kick exercise). Conclusion Squat side kick exercise is better than walking lunges exercise on mawashi geri kick speed in INKANAS karate athletes aged 13-15 years, UNM Makassar branch.

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INTRODUCTION

Karate is a branch of martial arts that not only emphasizes self-defence techniques but also strong physical and mental development (Rahman et al., 2021). In karate, kicking is one of the most important elements, because it can determine the success of an athlete in a match (Chaabène et al., 2018). One of the most basic and frequently used kicks is Mawashi Geri, which is a circular kick performed by lifting the leg and rotating the body to hit the opponent with the outside of the foot (Koropanovski et al., 2020). This technique requires not only physical strength but also good coordination of movement and stable balance (Quinzi et al., 2021).

In the 13-15 age group, karate athletes are in a critical phase in the development of motor skills and basic techniques (Sterkowicz-Przybycień et al., 2018). At this age, children experience rapid physical growth, and their ability to learn and master new techniques is very high (Lloyd et al., 2022). Therefore, this period is a very important time to build a foundation of skills that will support them in the future, both in karate and in other sports (Nugroho, 2021). In this context, proper training can help karate-ka develop strength, speed, and accuracy in kicking, especially Mawashi Geri (Syafruddin & Aziz, 2020).

However, a major challenge arises because not all coaches have the same understanding of effective training methods for this age group (Tirtawirya et al., 2019). Some coaches may still apply training techniques that are not appropriate for the physical and mental developmental stages of children. For example, if the training is too hard or not varied, children can get tired quickly, get frustrated, or even get injured (Widiastuti & Hutapea, 2018). Therefore, coaches need to design a training program that not only focuses on technique but also considers the psychological and physiological aspects of children (Wijaya & Adisasmita, 2020).

Through a more holistic approach, coaches can optimize the development of Mawashi Geri kicks, paying special attention to basic techniques, muscle strengthening, and balance and coordination exercises (Zago et al., 2022). In this way, athletes will not only be more physically prepared but also more confident in facing challenges in the ring. A good training program at this age will not only form competent athletes but also create a love for the sport of karate that they can carry into adulthood (Wijono & Rasyid, 2021).

Initial observations at the UNM Makassar Branch showed that the portion of training still used punches as a point collector rather than kicks, even though the points obtained with punches when compared to kicks were much higher than those obtained using kicks (Ihsan et al., 2023). Many karate athletes aged 13-15 years still have difficulty executing the Mawashi Geri kick properly. This kick, which is one of the basic techniques in karate, requires a combination of several physical and technical elements (Beneke et al., 2019). Some of the problems identified include lack of motor coordination, limited flexibility, and low leg muscle strength, all of which are very important for optimal kicking (Prihartini & Kusumawardani, 2020).

Poor motor coordination can result in an inability to effectively align leg, body, and hand movements, resulting in inaccurate kicks (Herdiyana & Prakoso, 2020). In addition, limited flexibility can inhibit the range of motion, which makes kicks less powerful and risks

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causing injury (VencesBrito et al., 2019). Low leg muscle strength is also a problem because, without adequate strength, athletes cannot generate the power needed to execute kicks properly. These three factors are interrelated and contribute to the difficulties athletes experience in mastering the Mawashi Geri kick (Cynarski & Lee-Barron, 2018).

Although various efforts have been made to improve the quality of kicks, research on specific effective training methods is still limited. In this context, two interesting training methods to note are Walking lunges and Squat Side Kicks (Loturco et al., 2020). Both of these methods are believed to have the potential to improve the quality of Mawashi Geri kicks through the development of strength, flexibility, and motor coordination aspects (Tabben et al., 2022).

Walking lunges are bodyweight exercises performed by moving forward and backwards and up and down in place. This movement is a variation of the static lunge, where you walk forward after lunging with one leg (James et al., 2018). This exercise not only helps athletes understand the correct movement mechanics but also strengthens the muscles involved in the kicking process. On the other hand, Squat Side Kicks aim to increase leg muscle strength and body stability which are essential in kick execution (Maulidina & Ray, 2020). Although both methods show promising potential, to date there has been no comprehensive study examining their effects in depth on improving the quality of Mawashi Geri kicks.

This experimental study aims to fill this gap by analyzing the effect of Walking lunges and Squat Side kicks on the Mawashi Geri kicking ability of Inkanas karate athletes aged 13-15 years at the UNM Makassar Branch. Through a scientific approach, it is hoped that this study can provide both theoretical and practical contributions to the development of karate training methods, especially in efforts to improve the quality of kicks in the beginner age group (Paruntu et al., 2020).

The significance of this study lies in its potential to produce more measurable and effective training methods. By understanding the specific effects of each training method, coaches can design programs that are more targeted and in accordance with the needs of athletes (Sadowski et al., 2019). This study is expected to not only provide new insights for coaches and athletes but also contribute to the development of karate sports as a whole, especially for the younger generation who are in the learning process. Therefore, this study aims to analyze and compare the effect of Walking lunges and Squat Side kicks in improving the quality of Mawashi Geri kicks in Inkanas karate athletes aged 13-15 years at the UNM Makassar Branch.

Based on the facts above, the researcher proposes the title "The Effect of Walking Lunges and Squat Side Kick Exercises in Improving the Quality of Mawashi Geri Kicks in Inkanas Karate athletes aged 13-15 years at the UNM Makassar Branch".

METHODS

Experimental research is a type of research that aims to test the cause-and-effect relationship between certain variables through controlled interventions (Arga et al.,

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2024). To evaluate the squat side kick and walking lunges exercises in karate, quantitative research methods can be used to objectively measure the impact of the exercises. In this approach, researchers can design an experimental study in which a group of karate athletes are divided into two groups: one group performs squat side kick exercises, while the other group performs walking lunges. Before and after the training period, researchers can measure performance variables, such as muscle strength, endurance, and kicking technique using standard measuring instruments. Analysis of the data obtained will provide information about the effectiveness of each exercise in improving karate athlete skills.

The Inkanas UNM branch located on Jalan Pettarani, Makassar, South Sulawesi, was the location of the research. The number of samples used in this study was a quota sampling of 22 athletes.

Instruments are tools for collecting data. The quality of a study is determined by the quality of the data collected (Adam Mappaompo et al., 2024). Effective testing is obtained at the beginning of the experiment as initial data and at the end of the experiment as final data according to the instrument used (Arga, 2025).

Mawashi Geri Kick Instrument

a. Purpose: To Measure the Ability of the Mawashi-Geri Kick.

b. How to Implement:

When kicking, it must be felt that all body strength is channelled into the kick. The hips are fully utilized, and the rotation of the supporting leg and the kick must be adjusted. But immediately pull the kicking leg quickly and prepare the position for the next technique. The kicking leg throw forms a curved path like an arc from the outside to the inside. The target of the kick is in front or slightly to the side. The tip of the sole or the back of the foot is used to hit the opponent's face/head, neck, chest, and side of the body. For this Mawashi-Geri kick to be effective, the hips and supporting leg must be rotated strongly, quickly and precisely on target. The correct distance and on target. The speed of the kick must be adjusted so that the opponent is unable to avoid or block the kick.

c. Assessment: Kick speed, kick angle and target accuracy.

To answer the hypothesis question, namely to find out the difference between the pretest and posttest in each group, the Paired Sample T-Test formula can be used with the help of SPSS 25.

RESULTS AND DISCUSSION

Result

From the entire series of research activities on the Effect of Walking Lunges and Squat Side Kick Exercises in Increasing the Speed of Mawashi Geri Kicks carried out by the Walking Lunges and Squat Side Kick exercise groups, each group consisting of 12 Inkanas UNM karate athletes, all the data needed in this study can be obtained.

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Descriptive Analysis

Table 1.

Results of Descriptive Analysis of Mawashi Geri Kick Speed Data on INKANAS Karate Athletes Aged 13-15 Years, UNM Makassar Branch

Statistik	Latihan			
	Walking lunges		Squat side kick	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Sample (n)	12	12	12	12
Mean	21.25	27.75	21.83	28.50
Median	21.00	25.00	21.50	28.00
Standard Deviation (s)	4.11	4.18	4.26	5.48
Variance	16.93	17.47	18.52	30.09
Range	14	14	14	17
Minimum	17	20	17	22
Maximum	31	34	31	39

Initial trial data of mawashi geri kick speed of walking lunges training group with 12 samples, obtained an average value of 21.25 times with a standard deviation of 4.11 times a median value of 21.00 times, and a variance value of 16.93 times. The range value was obtained 14 times from the minimum data difference of 17 times and a maximum of 31 times. Initial test data of mawashi geri kick speed of the squat side kick training group with 12 samples, obtained an average value of 21.83 times with a standard deviation of 4.26 times a median value of 21.83 times, and a variance value of 18.15 times. The range value was obtained 14 times from the minimum data difference of 17 times and a maximum of 31 times.

The final test data of the walking lunges exercise group of 12 samples, obtained an average value of 25.75 times with a standard deviation of 4.18 times a median value of 25.00 times, and a variance value of 17.47 times; the range value was obtained 14 times from a minimum data difference of 20 times and a maximum of 34 times. The final test results of the mawashi geri kick speed of the squat side kick exercise group showed an average of 28.50 times, a median of 28.00 times, a standard deviation of 5.48 times, and a variance of 30.09 times in 12 samples. The range value was obtained 17 times from a minimum data difference of 22 times and a maximum data difference of 39 times.

Table 2

Normality Test of Mawashi Geri Kick Speed Data for INKANAS Karate Athletes Aged 13-15 Years, UNM Makassar Branch

Variable	Kolmogorov-Smirnova		
	Statistic	df	Sig.
Pretest Walking Lunges	0,178	12	.200*
Posttest Walking Lunges	0,155	12	.200*
Pretest Squat Side Kick	0,151	12	.200*
Postest Squat Side Kick	0,175	12	.200*

Based on the normality test table above, it is obtained that in the walking lunges exercise group of 12 samples, the results of the normality test of the initial test data for the speed of the Mawashi Geri kick were obtained from the Lillefors value of 0.178 with a

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probability value of 0.200 greater than the α value of 0.05. This shows that the results of the initial test of the speed of the mawashi geri kick of the walking lunges exercise group are normally distributed. In the walking lunges exercise group of 12 samples, the results of the normality test of the final test data for the speed of the mawashi geri kick were obtained from the lillefors value of 0.155 with a probability value of 0.200 greater than the α value of 0.05. This shows that the final results of the speed of the mawashi geri kick of the walking lunges exercise group are regularly distributed.

The initial test data of mawashi geri kick speed in the squat side kick training group of 12 samples were known to be normally distributed based on the results of the normality test obtained from the lillefors value of 0.151 with a probability value of 0.200 greater than α 0.05. The results of the normality test were obtained from the lillefors value of 0.175 with a probability value of 0.200 greater than α 0.05 for the final test data of the mawashi geri kick speed in the squat side kick training group of 12 samples. This shows that the results of the final test of mawashi geri kick speed in the squat side kick training group are regularly dispersed.

Table 3.
Results of the homogeneity test of the speed of the mawashi geri kick on INKANAS karate athletes aged 13-15 years, UNM Makassar branch

Variable	The speed of the mawashi geri kick			
	Levene Statistic	df1	df2	Sig.
Walking Lunges	0.055	1	22	0.817
Squat Side Kick	1.170	1	22	0.291

Based on the homogeneity test above, the data obtained with a significance value of 0.817 and 0.291, the data is said to be homogeneous data. With the provision that the significance value is greater than 0.05.

Hypothesis Testing

The t-test results were used for treatment for approximately two months in the walking lunges training group and the squat side kick training group in INKANAS karate athletes aged 13 to 15 years, UNM Makassar branch, evaluated using the t-test results. The following is a summary of the results of the t-test analysis of the research data of INKANAS karate athletes aged 13 to 15 years, UNM Makassar branch:

Table 4.
Results of the t-test analysis of the walking lunges training group for INKANAS karate athletes aged 13-15 years, UNM Makassar branch

Variabel penelitian	t-observasi	P-value	α
Walking lunges exercise group	-8.074	0.000	0.05

Based on Table 4 summary of the t-test results of the initial and final test data of the mawashi geri kick speed of the walking lunges exercise group on INKANAS karate athletes aged 13-15 years, UNM Makassar branch, it can be obtained: The t-count value is -8.074 with a significant value of 0.000 which is smaller than the α value of 0.05. So Ho is

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rejected, and H1 is accepted, which means that there is an effect of giving the walking lunges exercise group treatment on increasing the mawashi geri kick speed.

Table 5.
Results of the t-test analysis of the walking lunges training group for INKANAS karate athletes aged 13-15 years, UNM Makassar branch

Model		Mean	N	Std. Deviation
Pair 1	Walking lunges initial test	21.25	12	4.115
	Walking lunges final test	25.75	12	4.181

Based on Table 5, it is interpreted that the effect of the walking lunges exercise group treatment on increasing the speed of the mawashi geri kick can be interpreted from the difference in average values before and after treatment. Where the average value before treatment was obtained at 21.25 times, while after treatment the average value was obtained at 25.75 times. So the effect of the walking lunges exercise group treatment when viewed from the range of average values experienced an increase in influence of 4.5 times.

Table 6.
Results of the t-test analysis of the squat side kick training group on INKANAS karate athletes aged 13-15 years, UNM Makassar branch

Research variables	t-observasi	P-value	α
Squat sidekick exercise group	-12.318	0.000	0.05

Based on the table above, the summary of the t-test results of the initial and final test data of the squat side kick training group on INKANAS karate athletes aged 13-15 years, UNM Makassar branch, can be obtained: the t-count value is -12.318 with a significant value of 0.000 which is smaller than the α value of 0.05. So Ho is rejected, and H1 is accepted, meaning that there is an effect of the squat side kick training group treatment on increasing the speed of the mawashi geri kick.

Table 7.
Results of the t-test analysis of the squat side kick training group for INKANAS karate athletes aged 13-15 years, UNM Makassar branch

Model		Mean	N	Std. Deviation
Pair 1	Tes awal squat side kick	21.83	12	4.26
	Tes Akhir squat side kick	28.50	12	5.48

Based on Table 7, it can be interpreted that the effect of the squat side kick exercise group treatment on increasing the speed of the mawashi geri kick can be interpreted from the difference in average values before and after treatment. Where the average value before treatment was obtained at 21.83 times, while after treatment the average value was obtained at 28.50 times. So the effect of the squat side kick exercise group treatment when viewed from the range of average values experienced an increase in influence of 6.66 times.

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Table 8.
Results of ANOVA of Walking Lunges and Squat Side Kick Exercise Groups on INKANAS Karate Athletes Aged 13-15 Years, UNM Makassar Branch

Research variables	t-observasi	P-value	α
Group exercise walking lunges and squat side kicks	-1.381	0.181	0.05

Based on Table 8 summary of the t-test results of the final test data of the walking lunges and squat side kick exercise group on INKANAS karate athletes aged 13-15 years grumbling UNM Makassar can be obtained: an observation value of -1.381 with an significant value of 0.181 is smaller than the α value of 0.05. So Ho is rejected H1 is accepted which means there is a difference in the treatment of the walking lunges and squat side kick exercise groups on the speed of the mawashi geri kick.

Table 9.
Average Value of Walking Lunges and Squat Side Kick Training Group for INKANAS Karate Athletes Aged 13-15 Years, UNM Makassar Branch

Model		Mean	N	Std. Deviation
The speed of the mawashi geri kick	Walking lunges	25.75	12	4.181
	Squat side kick	28.50	12	5.486

Based on Table 9, it can be interpreted that there is a difference in the influence of the walking lunges and squat side kick exercise groups on increasing the speed of the mawashi geri kick. This can be interpreted from the difference in the average value after treatment. Where each average value after treatment of the walking lunges exercise group was obtained at 25.75 times. And the squat side kick exercise group was obtained at 28.50. So the difference in influence can be explained that the squat side kick exercise group is better when compared to the walking lunges exercise group of INKANAS karate athletes aged 13-15 years, UNM Makassar branch.

Discussion

The effect of walking lunges training on the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch.

There is a significant effect of walking lunges training on increasing the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch. According to the results of the t-test of the mawashi geri kick speed data in INKANAS karate athletes aged 13-15 years, UNM Makassar branch, the observation value obtained was -8.074 with a significant value of 0.000 smaller than the α value of 0.05, meaning that there was a significant effect after being given the walking lunges training group treatment. The increase in the speed of the mawashi geri kick can be proven by the average value before and after treatment, each obtained 21.25 times: 25.75 times. With the results of the study showing an increase in the average value of 4.5 times, after the walking lunges training treatment was carried out on INKANAS karate athletes, the UNM Makassar branch aged 13-15 years was significant. Furthermore, looking at the average value of the mawashi geri kick speed in INKANAS karate athletes from the UNM Makassar

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branch aged 13-15 years after treatment for approximately two months, there was a significant difference. Thus, the difference in the average value of the mawashi geri kick speed in INKANAS karate athletes from the UNM Makassar branch aged 13-15 years was significant.

Walking lunges training is a training that has the potential to improve the quality of kicking techniques in karate so that INKANAS karate athletes aged 13-15 years from the UNM Makassar branch will have an increase in the speed of mawashi geri kicks. So each stage of training is carried out repeatedly according to the instructions in the training, so that it helps in forming movement patterns and speed according to the momentum and strength formed in doing kicks in karate, especially mawashi geri.

This shows that in walking lunges training, the focus is on paying attention to the effectiveness of kicks through optimal steps, complex movement coordination, body weight transfer mechanisms and efficient body positions. The walking lunges training method, among others, proposed by Abidin, M.Z (2019) and Gunawan J (2020), explains that walking lunges training has the potential to improve the quality of kicking techniques in karate, especially mawashi geri kicks.

The results of research by Irianto and Issomudin Rovi (2019) show several benefits of walking lunges training in improving the quality of kicks for karate athletes, such as the speed of kick execution, movement accuracy and body stability during kicks. This indicates that walking lunges training can train muscles and the nervous system which have the potential to provide faster movements, increase movement accuracy through coordination and body position when kicking and can maintain balance in performing more complex movement combinations. Furthermore, according to Hadi (2007), training is a systematic process of practising or working, which is done repeatedly, with increasing training load or work day by day. So walking lunges training which is aimed at improving the quality and speed of mawashi geri kicks greatly contributes to the development of karate athletes as a whole to achieve optimal performance and better technical skills.

Thus, walking lunges training in achieving increased quality or speed of mawashi geri kicks will have an impact in the form of increased leg strength and flexibility, as well as improved coordination and balance in INKANAS karate athletes aged 13-15 years, UNM Makassar branch. Although in its implementation there are still some who are not optimal in performing mawashi geri kicks, such as the angle of knee bend in performing the kick.

The effect of squat side kick training on the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch.

There is a significant effect of squat side kick training on the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch. According to the results of the t-test of the initial test data and the final test of the squat side kick training group in INKANAS karate athletes aged 13-15 years, UNM Makassar branch, an observation value of -12.318 can be obtained with a significant value of 0.000, which is smaller than the α value of 0.05. Because the significant value is smaller than α 0.05, it

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means that there is a significant effect after the squat side kick training group is given treatment. To prove that there is an increase in the speed of mawashi geri kicks, it can be proven by the average value before and after the treatment, each of which is 21.83: 28.50. with the results of the study showing an increase in the average value of 6.66 times, after the squat side kick training treatment was given to INKANAS karate athletes aged 13-15 years, UNM Makassar branch, it is significant. It can be explained that squat side kick training has a positive effect on improving the quality or speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar Branch. Squat side kick training is an exercise to strengthen the leg and hip muscles, such as the quadriceps, hamstring, gluteal and adductor muscles which in an integrated manner increase flexibility and muscle endurance. According to Rodriguez et al. (2023) define Squat Side Kick as a complex training method that integrates several important elements in developing athlete skills, especially in martial arts such as karate.

Squat sidekick training is an exercise that integrates elements of strength, coordination and stability as well as techniques in martial arts in developing leg strength in INKANAS karate athletes aged 13-15 years, UNM Makassar Branch, then do it repeatedly starting from the starting position, squat preparation by inhaling and bending the knees to doing a side kick, then returning to the squat position. According to McGill (2016), squats are one of the most fundamental exercises in developing leg strength, which serves to strengthen major muscles such as the quadriceps, hamstrings, and glutes. So with squat side kick exercises, you can maintain stability efficiently and effectively in improving the quality or speed of mawashi geri kicks. Nur Sodikin and Andika Windi (2018) also highlighted that developing leg muscle strength through exercises such as Squat Side Kicks can improve athlete performance in martial arts. Reviewed from sports physiology according to Hairy (2003) environmental sports physiology explains changes in function caused by a single exercise or exercise that is done repeatedly or to increase physiological responses to intensity, duration, frequency of exercise, environmental conditions, and individual status. Changes in function caused by repeated exercise result in increased muscle tissue growth.

Comparison of walking lunges and squat side kick exercises on mawashi geri kick speed in INKANAS karate athletes aged 13-15 years, UNM Makassar branch.

The results of the final test analysis of the walking lunges and squat side kick training groups on INKANAS karate athletes aged 13-15 years, UNM Makassar branch, can be obtained an observation of -1.381 with a significant value of 0.181 smaller than the value of α = 0.05, meaning that there is a difference in the influence of the walking lunges training group compared to the squat side kick which is better. Meanwhile, to prove the difference in the walking lunges and squat side kick training groups on the speed of the mawashi geri kick in INKANAS karate athletes aged 13-15 years, UNM Makassar branch, it is proven by the average value in each group. For the walking lunges training group, the average value obtained was 25.75, and the squat side kick training group obtained an average value of 28.50. These results indicate a difference in the average value, where

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the squat side kick training group has the largest average value (28.50) compared to the walking lunges training group (25.75). So it can be stated that the squat side kick training group is better when compared to the walking lunges training group. The difference in the improvement of the quality or speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch, using walking lunges and squat side kick exercises is seen in the training process. In the process of both forms of walking lunges and squat side kick exercises, each uses the target speed of mawashi geri kicks as training material, but the characteristics of the exercises are different in each training group. Where walking lunges exercises will be seen to focus on strength, flexibility and leg coordination. The squat side kick exercises carried out are seen to focus on increasing the speed and accuracy of kicks according to the series of movements performed. The squat side kick exercise form is better than the walking lunges exercise form in terms of improving the quality or speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch because in terms of implementing the exercise, the squat side kick exercise group is carried out by increasing the stability of movement so that it can maintain balance and transition various kicking techniques repeatedly when compared to the walking lunges group which also helps athletes maintain balance and coordinate movements in a complex way but is not effective in strengthening the muscles that support kicking in INKANAS karate athletes aged 13-15 years, UNM Makassar branch. Based on the facts above, it shows that squat side kick exercises have a significant effect on improving the quality or speed of mawashi geri kicks, which are better. Where each group is given training to improve the quality or speed of mawashi geri kicks. However, the difference in the results of improving the quality or speed of mawashi geri kicks shows that squat side kick exercises are more effective than walking lunges.

CONCLUSION

1. There is an effect of walking lunges training on the speed of mawashi geri kicks in INKANAS karate athletes aged 13-15 years, UNM Makassar branch.
2. There is an effect of squat side kick training on the speed of mawashi geri kicks in INKANAS karate athletes aged 13 - 15 years, UNM Makassar branch.
3. There is a significant difference in the effect between the walking lunges training group, compared to the squat side kick training group which is better for the speed of mawashi geri kicks in INKANAS karate athletes aged 13 - 15 years, UNM Makassar branch.

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