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The Influence of Lunges and Rubber Load Exercises on Ap Chagi Kick Speed in UNTAD Taekwondo Club (UTC) Athletes

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ABSTRACT

The purpose of this study was to determine whether there was an effect of lunges training and rubber loads on Ap Chagi kick speed in UNTAD Taekwondo Club athletes who were the samples in this study. The method used in this research is an experimental method with a two-group pretest-posttest design. The research location is in the Mayor's Field. The population of this study was 20 athletes, so that the sampling was carried out using total sampling technique. Based on the calculation results, I found that: (1) There is an effect of Lunges training on Ap Chagi Kick Speed in UNTAD Taekwondo Club Athletes. With a t count value of 7,359 > t table of 2,262 (2) There is an effect of Rubber Load training on Ap Chagi Kick Speed in UNTAD Taekwondo Club Athletes with a t count value of 9,000 > t table of 2.262 (3) there is a difference in the effect of Lunges Exercise and Rubber Load on Ap Chagi Kick Speed in UNTAD Taekwondo Club Athletes. Evidenced by the increase between the pre-test and post-test Lunges is 3.520 with a mean deviation of 0.3300. While the Rubber Load obtained an increase between the pre-test and post-test was 3.800 with a mean deviation of 0.3000. Conclusion 1). There is an effect of Lunges training on Ap Chagi kick speed in UNTAD Taekwondo Club athletes with an increase of 3.4% 2). Rubber load on Ap Chagi kick speed on UNTAD Taekwondo Club athletes with an increase percentage of 3.5%. 3). There is a difference between lunges and rubber weights on the speed of Ap Chagi kicks in UNTAD Taekwondo Club athletes by 0.1%).

Introduction

Sport is a healthy lifestyle that must be used to, because by doing sports that are right and good can improve physical fitness. In addition to maintaining fitness, sports also support the achievement of achievements in all fields, especially in the field of sports. Physical activity is one of the factors that can affect individual physical fitness (Huwaida et al., 2022). By exercising, our body's fitness condition is maintaining so that it can achieve maximum performance results. Physical fitness is a person's readiness to make adjustments to physical loads by doing daily work without experiencing significant fatigue (Destriana et al., 2022). The benefits of physical fitness for the body are that it can prevent various diseases such as heart, blood vessels and lungs, thereby increasing the overall quality of life. With a fit body, life becomes passionate and fun. Physical fitness does not only describe health, but is more a way of measuring individuals performing their daily activities. I divided physical fitness

into two categories, namely skill-related fitness and health-related fitness. Health component fitness includes cardiorespiratory fitness, body composition, flexibility, muscle strength and muscle endurance. While physical fitness related to skills includes: (a) speed, (b) strength, (c) balance, (d) agility, (e) coordination (Apriyanto, 2020).

Speed is one aspect of ability that is needed in certain sports. Speed is the ability to perform similar movements successively in the shortest possible time, or the ability to cover a distance in the shortest possible time. Speed is a person's ability to make movements in walking, running to achieve the shortest possible time for the best possible results (Triono et al., 2022). Speed in taekwondo is the ability to kick in the shortest possible time. Taekwondo in the Kyokrugi category, speed is the ability of an athlete to attack, counter, dodge, and parry as quickly as possible with the right timing and accuracy (ICES, 2021).

Taekwondo is a martial arts sport from Korea and has become famous in the world since 2000 as a sports Olympiad (Sabatini et al., 2022). Taekwondo is a martial art from Korea which is also the national sport of Korea. Taekwondo, which is written Tae Kwon Do by default, is a branch of martial arts originating from Korea. The word Taekwondo comes from three syllables in Korean, namely tae which means hitting or smashing with the feet, kwon means hitting with the hands or fists, do which is the same system or method. So, the combination of the three gives rise to the notion that Taekwondo is a way to defend yourself using your bare feet and hands (Darmanto, 2017). So, Taekwondo can be freely translated as the art of hands and feet or walking or the way of feet and fists. The popularity of taekwondo has caused this art to take many forms. Like many other martial arts, taekwondo is a combination of fighting techniques, self-defense, sports, exercise, entertainment, and philosophy.

The basics of taekwondo are formed from a combination of various offensive and defensive movement techniques that use body parts to face opponents (Nur Ahmad Muharram & Puspodari, 2020). The basic techniques of Taekwondo movements use more leg skills for standing fighting, but do not teach hand movements. Hand movements are also taught, but only 20 percent. In a match, spinning kicks, front, ax, side are the most widely used. The kick technique is very dominant in the martial arts of taekwondo, I must even admit that taekwondo is very well known for its superiority in kick techniques (Hidayat et al., 2019). The basic techniques that every taekwondo must learn are stance techniques, punches, kicks and blocks (Gatot Sugiarto & Rizaldi, 2020). Taekwondo has some basic kicks to master, such as the Dollyo Chagi, Deol o Chagi, Ap Chagi, and Yeop Chagi kicks (Riski & Sugiyanto, 2021).

There are various types of Taekwondo kick techniques, one of which is the Ap Chagi kick or commonly called the forward kick (Gerakan et al., 2016). Ap Chagi kick is a kick that is done with one leg raised and kicked forward, to be able to maximize the speed of the Ap Chagi kick in a match, physical training is needed which is oriented towards strength, flexibility, endurance and leg muscle speed, power. Of the five physical components mentioned above, speed is one of the physical components mentioned above, speed is one of the physical components that is very important in achieving achievement. Increasing speed was difficult, a maximum of 30% of one's base speed or even not being able to increase.

Taekwondoin ability depends on the training process carried out because training is one way to increase the ability to function physiologically and psychologically.

Lunges exercise is a form of exercise to build leg muscle strength or leg formation exercises (Widhiyanti et al., 2023). Physically, this exercise is needed because it involves a wide area of the muscles. I performed this lunge exercise with free weights, and is relatively difficult to perform, because it requires balance. This exercise strengthens the hamstrings and gluteal muscles and improves movement control. Lunges are the movement of stepping forward with the knees bent to form a 90° angle by the forelegs or hind legs, with the body upright and the hands at the sides of the body (Imbang, 2014). his lunge exercise is done with free weights, and it is relatively difficult to lunge because it requires balance.

Rubber weight training is a method of weight training that is often used to develop leg and leg strength. The characteristic of rubber-loaded exercises is that I aimed them at the legs to make kick movements with rubber as a burden tied to the ankles. Therefore, rubber training is a movement pattern that involves leg muscle strength and speed. This form of exercise is intended to develop the strength and speed of the leg muscles in order to be able to perform Ap Chagi kicks quickly, especially in the leg swings when kicking. Kick speed can be increased using weight training, namely by training the rubber tire spring force (Kumite et al., 2019).

Based on the observations during the observation, there were several facts that some of the Taekwondo club athletes were unable to perform the Ap Chagi kick movements perfectly. This is caused by several factors, namely: physical, tactical and mental factors and not the strength of the foot pedestal to kick, for this reason as a prospective researcher tries to provide a solution to increase the speed of the Ap Chagi kick by giving lunges and rubber weights so that it is expected with this form of exercise the kick speed of the athletes is expected to increase. Therefore, researchers want to conduct research on the effect of lunges and rubber weights on the speed of Ap Chagi kicks, which will later be carried out on camel taekwondo club athletes.

Based on the background stated above, the formulation of the research problems:

1. Is there an effect of lunges training on Ap Chagi kick speed in UNTAD Taekwondo Club (UTC) Athletes?
2. Is there an effect of rubber weight on Ap Chagi kick speed in UNTAD Taekwondo Athletes Club (UTC)?

The aim of this research is:

1. To find out whether there is an effect of lunges and rubber weights on Ap Chagi kick speed in UNTAD Taekwondo Club Athletes.
2. To find out whether there is an effect of lunges and rubber weights on Ap Chagi kick speed in UNTAD Athletes Taekwondo Club.

Research Methods

The type of research used in this research is experimental research. Experimental research is research conducted to determine the causal relationship between variables (Alvin Kurnain & Andrijanto, 2019). This study aims to prove the effect. The research design used is an experimental design that is pre-experimental design (Nondesigned) with the type

of One-Group Pretest-Posttest Design (Sugiyono, 2019). The variables that were studied in this study were the independent variables (lunges and rubber weights) and the dependent variable (increased kick speed). This research will be conducted at Dojang Vatulemo, Jl. Moh. Yamin, South Palu District, Tanamodindi Village, Palu City, Central Sulawesi.

The population is the entire object of research and meets certain characteristics (Rosmala Dewi, 2021). In this study, the population used was UNTAD Taekwondo Club athletes, totaling 20 athletes. The sample is part of the number and characteristics possessed by the population (Jasmalinda, 2021), the sample used was 20 athletes. The sampling technique in this study was carried out using the total sampling method. The sample was divided into 2 groups, namely the Lunges training group consisting of 10 people and the Rubber Weights group consisting of 10 people.

The tests and measurements in this study were carried out to obtain data about the results of the Ap Chagi kick which were carried out twice, namely pre-test and post-test. Test results are recorded in centimeters. The procedure or work step in this study used was the Pre-test and Post-test Group.

This study used a research instrument to measure the speed of Ap Chagi kicks before and after giving lunges and rubber weights. This study was to collect data using the research instrument of the Ap Chagi kick speed test 5 times and the time was calculated. Instrument means research facilities in the form of a set of tests to collect data as processing material. The instrument used in this study was the Ap Chagi kick with the aim of knowing the speed of the Ap Chagi kick at the initial test and at the end of the final test. After the data from the pre-test and post-test have been collected, the next step is to process and analyze the data using the IBM SPSS Statistics 21 application.

Findings

The results of this study were obtained based on the results of pretest and posttest research data that had been carried out in the Vatulemo Field, which were first grouped into two groups as seen from the initial test results.

Table 1. Ap Chagi Kick Initial Test Results Data

No	Name	*Ap Chagi* Pre-test (Seconds)	*Ap Chagi* Post-test (Seconds)	Group
1	Astrid	0.35	0.32	A
2	Love	0.36	0.33	A
3	vibes	0.33	0.31	A
4	Baim	0.49	0.47	A
5	Kiran	0.39	0.37	A
6	Azka	0.55	0.50	A
7	Kenzi	0.44	0.42	A
8	Rehan	0.34	0.30	A
9	risk	0.35	0.31	A
10	Come on	0.25	0.19	A
11	David	0.37	0.33	B

12	Ray	0.34	0.32	B
13	mardi	0.36	0.33	B
14	Fig	0.43	0.40	B
15	God	0.44	0.40	B
16	Dede	0.33	0.32	B
17	Tirta	0.50	0.48	B
18	fatir	0.35	0.32	B
19	Ezi	0.44	0.40	B
20	Madika	0.24	0.20	B
Amount		7.65	7.02	
Means		0.3825	0.3510	
Percent		38.0%	35.1%	

Based on table 1 of the initial and final tests, Ap Chagi's kick speed on the UNTAD Taekwondo Club athletes consisted of 20 samples divided into two groups, the fastest time result was from group A 0.25 seconds, while the late one from group A was 0.55 seconds. With a percentage of 38.25%. Based on the final test table stating the speed of Ap Chagi's kick on UNTAD Taekwondo Club athletes which consisted of 20 samples divided into two groups, the fastest time result was from group A 0.19 seconds, while the late one from group A was 0.50 seconds. With a percentage of 35.1%.

Normality test

The data normality test is used to determine whether the data obtained is normally distributed or not. This test uses the Kolmogrov-Smirnov test formula with the criteria that the data is normally distributed if the significant value or KS probability value is > 0.05 and vice versa if the significant value is <0.05 it means that the data distribution is not normal. The results of the calculation of the normality test of the initial and final test data for Ap Chagi's kick speed are as follows:

Table 2. Normality Test Results

	Group	Kolmogorov-Smirnova			**Shapiro-Wilk**		
		Statistics	df	Sig.	**Statistics**	**df**	**Sig.**
Ap Chagi kick results	Pre-test Lunges	.213	10	.200*	**.935**	**10**	**.499**
	Post-test Lunges	.195	10	.200*	**.940**	**10**	**.555**
	Pre-test Rubber Load	.154	10	.200*	**.957**	**10**	**.753**
	Post-test Rubber Load	.244	10	093	**.908**	**10**	**.268**

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

Based on the table above which is a summary of the results of the data normality test on each research variable with Shapiro-Wilk because the sample is less than 100, it can be described as follows:

1. To see the speed of Ap Chagi's kick before being given the Lunges exercise (pretest), the Sig. probability level is obtained. of 0.499 is greater than α = 0.05 (0.499 > 0.05) and after being given the Lunges exercise (post-test) the normal value of the data is obtained

through Shapiro-Wilk with a probability level of Sig. of 0.555 is greater than α = 0.05 (0.555 > 0.05) which means this indicates that the data has followed a normal distribution or normal distribution.

2. To train Ap Chagi's kick speed before being given rubber weight training (pretest) the data normality value is obtained with a probability level of Sig. 0.753 is greater than α = 0.05 (0.753 > 0.05) and to increase after being given rubber weight training (posttest) the normal value of the data is obtained through Shapiro-Wilk with a probability level of Sig. of 0.268 is greater than α = 0.05 (0.268 > 0.05) which means this indicates that the data has followed a normal distribution or normal distribution

Homogeneity Test

If the significance value is > 0.05, then the data distribution is homogeneity, and if the significance value is <0.05, then the data distribution is not homogeneous.

Table 3. Homogeneity Test Results

		Levene Statistics	df1	df2	Sig.
Post-test	Based on Means	.422	1	18	.524
	Based on Median	.268	1	18	.611
	Based on Median and with adjusted df	.268	1	17,500	.611
	Based on trimmed mean	.422	1	18	.524

Based on the results of the homogeneity test calculations in the table above, it was found that the sig value was 0.524 or (0.524 > 0.05). It means that the sample variance is homogeneous, then the hypothesis which states the variance of the variables is the same or accepted. The results can be concluded that the data variance is homogeneous.

Hypothesis testing

H_o: There is no significant effect of lunges and rubber weights on kick speed

H_a: There is a significant effect of lunges and rubber weights on kick speed

hypothesis: There is an effect of Lunges training and rubber weights on Ap Chagi's kick speed in UNTAD Taekwondo Club Athletes.

a. Lunges Exercise Hypothesis Test

Table 4. Paired Samples Statistics Lunges T-test Results

		Paired Differences					t	df	Sig. (2-tailed)
		Means	std. Deviation	std. Error Means	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test Lunges – Post-test Lunges	.03300	.01418	.00448	.02286	.04314	7,359	9	.000

Based on the table above, it shows that the t count for Lunges training is more than 7,359 using a significant level of 5% of the t table value of 2,262, the hypothesis states that there is an effect of Lunges training on Ap Chagi's kick speed in UNTAD taekwondo Club Athletes.

b. Rubber Load Hypothesis Test

Table 5. Paired Samples Statistics Rubber Load t-test results

		Paired Differences					t	df	Sig. (2-tailed)
		Means	std. Deviation	std. Error Means	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test Rubber Load - Post-test Rubber Load	.03000	.01054	.00333	.02246	.03754	9,000	9	.000

Based on the table above, it shows that the t count for rubber weight training is more than 9,000 using a significant level of 5% from the t table value of 2.262, the hypothesis states that there is an effect of rubber weight training on Ap Chagi's kick speed in UNTAD Taekwondo Club Athletes.

c. Increase Percentage Difference

According to Pham and Jimenez (2012) analysis of the paired sample test to determine the increase in speed, as shown in the following table:

Table 6. Percentage of Increase in Ap Chagi Kicks in percent in group 1 and group 2

Group	N	Mean Pre-test	Mean Post-test	Mean Different	Percentage Increase
Lunges	10	3,850	3,520	330	3.4%
Rubber Loads	10	3,800	3,500	300	3.5%

The results from the table above show that there is an increase in the percentage of lunges training by 3.4% on the speed of Ap Chagi kicks. There is an increase in the percentage of rubber load by 3.5% on the Ap Chagi kick speed. In accordance with the results above, it can be concluded that rubber weight training is more efficient and can increase the speed of Ap Chagi kicks at the UNTAD Taekwondo Club.

Thus, there is a significant influence on Lunges and Rubber Load training on Ap Chagi's kick speed for UNTAD Taekwondo Club Athletes from a total of 20 athletes sampled, 10 athletes sampled for Lunges training, the total number of Ap Chagi kick speed final tests is 3,520. And for the 10 athletes who were sampled for the Rubber Weight training, the total number of the final test for Ap Chagi's kick speed was 3,500.

Discussion

Based on the results of testing the hypothesis, it proved that the average difference in the value of Ap Chagi's kick speed before being given the Lunges exercise was 3,850, while after being given the Lunges exercise, the value of Ap Chagi's kick speed was 3,520 so that there was an increase. Meanwhile, based on the results of the hypothesis testing, it proved that the average difference in the value of Ap Chagi's kick speed in athletes before being given rubber weight training was 3,800 while after being given training the rubber load value of Ap Chagi's kick speed is 3,500 so that there is an increase. T test calculation results, where t_{count} for Lunges 7,359 exercises using a significant level of 5%, the t value is obtained$_{table}$2,262 this means that the value of t_{count} bigger than t_{table} or 7.359 > 2.262. While the results of the calculation of the t

test, where t_{count} for 9,000 Rubber Load exercises using a significant level of 5% the value of t is obtained $_{table}$ of 2,262, this means that the value of t_{count} bigger than t_{table} or 9,000 > 2,262 Then the null hypothesis (Ho) which states there is no effect is rejected, so the alternative hypothesis (Ha) is accepted. To prove that there is an increase, it is evidenced by the average percentage increase, namely with lunges exercises of 3.4% and rubber loads of 3.5%. Thus, the hypothesis states that: 1). There is an effect of Lunges training on Ap Chagi's kick speed in UNTAD Taekwondo Club Athletes with an increase percentage of 3.4%. 2). There is a rubber load on Ap Chagi's kick speed for UNTAD Taekwondo Club athletes with an increase percentage of 3.5%. 3). There is a difference in the effect of Lunges and Rubber Load exercises on the speed of Ap Chagi kicks for UNTAD Taekwondo Club Athletes of 0.1%.

Partial test is done by comparing t count with t table at a significant level of α 5%, this test is done to find out the significant role partially between the independent variables on the dependent variable by assuming that the other independent variables are considered constant (Sugiyono, 2019). The t statistical test is also called the individual significant test. This test shows how far the influence of the independent variables partially on the dependent variable. In the end, a conclusion will be drawn that Ho is rejected or Ha is accepted from the hypothesis that has been formulated. The t statistical test is also called the individual significant test. This test shows how far the influence of the independent variables partially on the dependent variable.

In the end, a conclusion will be drawn that Ho is rejected or Ha is accepted from the hypothesis that has been formulated. One of the exercises that can improve leg muscle strength and balance is lunges, which aims to increase the development and strength of the lower body muscles (Permadi et al., 2021). Providing stabilization of the movement around the ankle joint will train the leg muscles better. Lunges exercise also to improve balance and coordination of the body (Suharjana, 2007). Weight training is a systematic exercise using weights as a tool to increase muscle strength in order to achieve goals such as improving the athlete's physical condition, preventing injury or for health purposes. This is in accordance with the opinion stating that kick speed can be increased using weight training, namely by spring force training the elastic properties of inner tube rubber (Imbang, 2014). Rubber resistance is a training aid that can be used to increase kick speed because resistance training can increase speed. Thus, the results of the study show that there is an influence between Lunges Exercise and Rubber Loads which can be used as an exercise to increase the speed of Ap Chagi kicks. And there is a difference between lunges and rubber weights for Ap Chagi kick speed, namely rubber weights is more efficient than lunges.

Conclusion

The conclusions in this study were 1) There was an effect of Lunges training on increasing the speed of Ap Chagi kicks in UNTAD Taekwondo Club athletes with an increase of 3.4%. 2) There is an effect of Rubber Load training on increasing Ap Chagi kick speed in UNTAD Taekwondo Club athletes with an increase of 3.5%. 3) There is a difference between Lunges and Rubber Load exercises on the increase in Ap Chagi speed in UNTAD taekwondo Club athletes by 0.1%.

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