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The Effect of Squat Training Using Resistance Bands on Leg Strength in Beginner Swimmer

Desi Ratnasari^{1*}, A. Heri Riswanto², Hikrawati³, Rachmat Hidayat⁴
1,2,3,4,5Universitas Muhammadiyah Palopo, Jl. Jend Sudirman No Km 03 Binturu, Palopo 91922, Indonesia
*e-mail: desiratnasari@sudent.umpalopo.ac.id

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Abstract

This study aims to determine the effect of Squat Exercises using resistance bands on leg strength in swimming athletes at the Garuda Laut Palopo Club. The method used in this study is a one-group pretest-posttest experiment design with a quantitative approach. Based on the results of the data analysis that has been done, The number of research subjects is 12. With an average (mean) pre-test value of 66.25 and a post-test value of 81.08. Std deviation pre-test 2,864 and post-test 3,232. The minimum value of the pre-test is 60, and the post-test is 75. Moreover, the normality test shows that the pre-test and post-test data have a value of ρ (Sig.) > 0.05 , so the variables are normally distributed. Because the data is normally distributed, it can be continued. Then a t-test was conducted with the results obtained, namely sig, $0.000 < 0.05$. This can be seen from the sig value, $0.000 < 0.05$, which means H_0 is rejected. Thus, it can be concluded that squat training using resistance bands significantly affects leg strength in beginner swimming.

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✉ Correspondence address: Jl. Jend Sudirman No Km 03 Binturu
E-mail : desiratnasari@student.umpalopo.ac.id

INTRODUCTION

One of many popular sports in the community is swimming; swimming is a sport that can be taught to children, adolescents, and adults; even babies aged a few months can begin to be taught swimming.(Haking & Soepriyanto, 2019). Swimming is a sport that involves the legs moving in the water, such as the arms, legs, and head(Fitriady et al., 2020). Swimming is a physical activity that can help

optimize body development through movements based on muscle movement.(Yasa & Artanayasa, 2020).

Swimming breaststroke is the slowest of the four styles and the most unique; in swimming, the forward thrust to gain speed in this sport is dominant in techniques related to arm and leg movements. Swimmer's feet are caused by the pressure created by the arms and legs when pushing the water backward.(Midona & Oktavia, 2022).

Strength is a muscle group's ability to overcome resistance or burden in carrying out activities (Samsudin, 2022). Leg muscle strength functions as a balancing stabilizer in the water, helping to encourage gliding, helping swimmers to float, and avoiding body rotation during swings. biggest boost and determinant in swimming speed (Asri et al., 2020). The leg movements of the breaststroke swimming technique consist of several phases or stages of movement, which are carried out sequentially by carrying out each phase of the movement properly and correctly; the movement of the legs can produce a force that can encourage the body to slide. (Ryzki et al., 2021). Calf raises, jump rope, and butt kick exercises are variations of the exercises studied to increase swimming athletes' speed and leg muscle strength (Hakim et al., 2020). Resistance bands are an efficient and easy-to-carry fitness tool made of rubber (rizki Ottaviani, 2020). Resistance bands strengthen the human body's muscles, strengthen joint stability, strengthen ligaments and the stability of muscle groups, and increase lung capacity (A. Lestari & Nasrulloh, 2018). Resistance training can provide benefits that cannot be found in other types of exercise (US Lestari et al., 2022). Medium-sized resistance bands can be used to improve the physical condition in swimming; good training is not enough to only provide technical material, but improving the quality of physical condition is also very important. (rizki oktaviani, 2020).

Training is the process of preparing athletes for higher performance improvement. Through training, an athlete is prepared to

achieve clear goals. The training process targets the development of several aspects that correlate with the tasks or exercises undertaken. These aspects include multilateral physical development, sports physical development, technical skills, tactical abilities and strategies, psychological factors, health care, injury resistance, and theoretical knowledge (Amansyah, 2019). One form of exercise in developing muscle strength and speed is plyometric training which consists of repeated jumping or jumping movements. (Hakim et al., 2020). Physical exercise or exercise refers more to physical activities that are planned, structured, and repetitive movements to improve or maintain body fitness (Anuar et al., 2021). The forms of exercise that can determine the athlete's achievement are leg press, leg extension, leg curl, jump to box, double leg speed hop, single, e.g., speed hop, squat jump, knee tuck jump, squat thrust, and so on. All these forms of exercise can be used to increase leg muscle strength. Squat jump is a form of exercise that is thought to be used to increase leg muscle strength, leading to an increase in athlete's ability (Arwandi et al., 2020). One form of exercise that can be used to train the physical condition of athletes in breaststroke swimming speed is the squat thrust. The squat thrust is a physical exercise that can be done quickly and does not require training facilities that are too difficult and expensive so that squat thrust training can be done correctly and adequately as well as providing benefits to the body; the exercise must be carried out correctly and adequately by its implementation.

The problem in this research is. "Lack of leg muscle strength in beginner swimming when doing breaststroke swimming." This study aims to determine whether squat exercises using resistance bands affect leg strength in beginner swimmers.

The following is relevant research regarding physical conditions, research conducted by Fardi and Risman (2019) The Effect of Interval Squat Thrust Exercises And Circuit Training Against Swimming Speed 50 Meters Breaststroke; from the data analysis, the results were obtained: there was a significant effect of interval squat thrust training on the swimming speed of 50 meters breaststroke (year 12.94 > tb 1.86) from a mean of 62.32 to 58.99 seconds. Circuit training significantly affects the swimming speed of 50 meters breaststroke (yr 11.03 > tb 1.86) from a mean of 63.96 to 59.61 seconds. There was no significant difference between squat thrust training at intervals and circuit training for swimming speed of 50 meters breaststroke (year 0.1206 < tb 1.86). The following is relevant research regarding physical conditions, conducted by A. Nahdia T Walinga (2021) in the journal "The Effect of Half Squat Jump Training on the Ability to Swim in the Chest Style of the Makassar Garuda Laut Club. The research results prove that there is an effect of half squat jump training on the breaststroke swimming ability of PR Garuda Laut Athletes Makassar City 18.5200 > 15.3770 (2) There is an effect without half squat jump training on the breaststroke swimming ability of PR Garuda Laut Athletes Makassar City 18.6070 > 17.9650, (3) There is a difference in the effect

of half squat training and without half squat jump training on the breaststroke swimming ability of PR Garuda Laut Athletes Makassar City 15.3770 < 17.9650.

Based on the relevant research above, it can be concluded that physical exercise dramatically influences leg muscle strength in beginner swimmers, specifically swimming breaststroke. From observations made by researchers on swimmers of the Palopo Laut Garuda Club, there are still many who have not been able to maximize their physical abilities in leg muscle strength in pushing or kicking movements in breaststroke swimming, so researchers are interested in training novice swimmers using resistance bands to find out whether by using a resistance band tool is effective when doing squat exercises to train leg muscle strength in breaststroke swimming.

Based on this, the researcher is interested in researching the influence of squat exercises using resistance bands on leg strength in beginner swimmers. Researchers are interested in using breaststroke swimming as a research object.

METHOD

The research method used in this study is quantitative with experimental methods. Treatment is given in data collection techniques using tests and measurements. Before the athletes are given treatment, they are first given an initial test (pre-test), then the sample will be given physical exercise using a resistance band (Rusli et al., 2022). According to (Sugiyono, 2017), Experimental research is a

method to determine the effect of treatment under controlled conditions. The population is the number of subjects or respondents selected by researchers, as many as 12 people. Sampling in this study used a saturated sample (census), a sampling technique in which all populations are sampled. The sample in this study was 12 people.

Retrieval of data from this study, using primary data where the data was obtained directly. I am doing a pre-test to determine each athlete's strength before being given resistance band training. Then given resistance band exercises, the next stage is the post-test stage to determine the final results after doing physical exercises using resistance band training tools.

After listening to the starter's whistle, the test takers lined up at the pool's edge to get ready to start. As soon as they were given a warning signal, the test participants took a starting position, and after the whistle sounded, the test participants immediately swam the breaststroke as fast as possible at a distance of 50 meters; at that moment, the stopwatch was turned on. The stopwatch was immediately turned off after the test participant touched the pool wall. Assessment: a record of the test taker's time in one trial.

Taking time records in one trial, namely the sample doing a 50-meter breaststroke swimming speed test. The following are data analysis techniques in this study using the following formula: 1) Data description. The formula that will be used in processing the data is as follows. The mean or arithmetic average is the number obtained by dividing the total values by the number of individuals. This mean

is used to find the average of the test results data carried out by breaststroke swimming athletes in the beginner swimming team Garuda Laut Palopo; 2) This study's prerequisite test, the statistical test, is included in parametric statistics. Parametric statistics are statistical tests that require specific conditional tests; 3) Normality test, Testing the normality of data in research was analyzed further. This test is carried out depending on the variables to be processed. Data normality test using Kolmogorov Smirnov with the help of SPSS 23; 4) Hypothesis testing, Hypothesis testing uses the t-test with the help of SPSS 23 by comparing the mean. If the calculated t value is less than the t table, H_0 is rejected; if the t count is greater than the t table, H_0 is accepted. Test the research hypothesis using SPSS 23.

FINDINGS AND DISCUSSION

Findings

The results of the calculation of the pre-test and post-test data on leg muscle strength from a sample of 12 athletes are described with descriptive statistics, which include: a) several samples, b) average (mean), c) median, d) Std. Deviation, e) range, f) minimum value, g) maximum value. From the table above, it can be seen that the number of research subjects totaled 12 subjects. With an average (mean) pre-test value of 66.25 and a post-test value of 81.08. Std deviation pre-test 2,864 and post-test 3,232. The minimum pre-test score is 60, and the post-test is 75. The maximum pre-test value is 70, and the post-test is 85.

The table above shows that the pre-test and post-test data have a value of p (Sig.) > 0.05 , so the variables are normally distributed. Because the data is normally distributed, it can be continued. The t-test calculation in this study uses the SPSS application, which aims to

determine whether or not there is an effect on the results of resistance band training on the athlete's arm muscle strength that research subjects have carried out. The t-test is meant to use the paired sample t-test in statistical calculations, namely the paired sample difference test.

Paired Samples Test

Paired Differences		std.Deviation	std. Error Means	95% Confidence Interval of the Difference		Tt	df	Sig. (2-tailed)
				Lower	Upper			
air 1	pre-test - pre-test	1,267	.366	15,639	14,028	40,546	1	.000

Based on the data in the table above, it can be seen that the probability number of sig is $0.000 < 0.05$. Which means that H_0 is rejected. Thus, there is a significant effect of resistance band training on leg muscle strength. From the results of research, analysis, and data studies that have been done before, it can be seen that the average value of resistance band exercises is 66.25 for the pre-test and 81.08 for the post-test. Referring to these results, there is an increase from the pre-test to the post-test results. There is a significant effect on leg

muscle strength from the paired sample t-test results.

Discussion

Swimming physical conditions that must be met have aspects, namely, strength, speed, flexibility, and endurance. Strength is a component of the physical condition regarding using muscles to receive workloads. In developing strength, the correct exercises to use are resistance training which, in practice, can push, pull, and lift a load.(Persadanta, Sukendro, 2020). Resistance bands are sports equipment that is easy to carry around and

made of rubber with handles as the support. Rubber resistance bands have varying elasticity; medium-sized resistance bands can be used for training to improve physical conditions in swimming. (rizki oktaviani, 2020).

The effect of squat training on leg strength at 50-meter swimming speed is because squat training can have an effect or influence on several elements of physical condition where the elements of the physical condition are the physical conditions needed in swimming the 50-meter breaststroke (Fardi & Risman, 2019).

According to Fardi and Risman (2019) Effect of Interval Squat Thrust Training and Circuit Training on Swimming Speed 50MetersChest Style. The type of research used is a quasi-experiment (Quasy Experimental). Data collection by conducting initial and final tests of 50-meter breaststroke swimming speed. The data analysis technique uses the mean difference test (t-test) formula. From the data analysis, the results were obtained: interval squat thrust training had a significant effect on the swimming speed of 50 meters breaststroke. Circuit training significantly affects the swimming speed of 50 meters breaststroke. There is no significant difference between squat thrust training at intervals with circuit training exercises for a swimming speed of 50 meters breaststroke.

According to A. Nahdia T Walinga (2021), in the journal "Effect of Half Squat Jump Exercise on Club Chest Style Swimming Ability GarudaSeaMacassar." This study used two different training methods: squat thrust

exercises at intervals and circuit training exercises. Based on the results of data analysis, this study concluded that (1) there is an effect of half squat jump training on the breaststroke swimming ability of PR Garuda Laut Athletes in Makassar City. There is a difference in the effect of half squat training and without half squat jump training on the breaststroke swimming ability of PR Garuda Laut Athletes Makassar City; the conclusion is that the experimental group of half squat training is more influential than the control group without haf squat jump training on breaststroke swimming ability. Garuda Laut PR athlete, Makassar City.

CONCLUSION

Based on the results of the data analysis that has been done, it is known that the number of subjects studied totaled 12 subjects. With an average (mean) pre-test value of 66.25 and a post-test value of 81.08. Std deviation pre-test 2,864 and post-test 3,232. The minimum value of the pre-test is 60, and the post-test is 75. The maximum pretest is 70 and the posttest is 85. Moreover, the normality test shows that the pre-test and post-test data have a value of ρ (Sig.) > 0.05 , so the variables are normally distributed. Because the data is normally distributed, it can be continued. Then a t-test was conducted with the results obtained, namely sig, $0.000 < 0.05$. This can be seen from the sig value, $0.000 < 0.05$, which means that H_0 is rejected. Thus it can be concluded that there is a significant effect on squat training using resistance bands against strong legs in beginner swimming. This

resistance band exercise aims to increase leg strength in beginner swimming.

The physical conditions of swimming must be fulfilled: strength, speed, flexibility, and endurance. Strength is a component of the physical condition regarding using muscles to receive workloads. In developing strength, exercises that are suitable for use are resistance exercises which in practice can push, pull, and lift a load (Persadanta, P., Sukendro, S., & Rasyono, 2020). a resistance band tool is a tool in the form of rubber tied to a wall or pole using handrails to facilitate movement. Athletes can move according to their goals in training muscles (Nasution, 2022).

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