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Resistance Band Training To Increase The Arm Muscles Strength In Swimming Athletes

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Abstract

This study aims to determine the effect of resistance band training on arm muscle strength in freestyle swimming athletes at Palopo city swimmers. The method used in this study is an experimental one-group pretest-posttest design with a quantitative approach from the research that has been carried out on the effect of resistance band training on the arm muscle strength of swimming athletes in Palopo. Moreover, This research shows increased arm muscle power by applying resistance band training on Palopo swimming athletes. Thus, there is a significant relation between Resistance band training towards the arm muscle power of Palopo freestyle swimming athletes.

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INTRODUCTION

Sport is necessary for human life(Mahfud & Fahrizqi, 2020). Sport is one way to maintain the human body system to run well and improve a person's quality of life(Saputra & Aguss, 2021). Sport is an effective method for maintaining one's quality and conscious movement activities (Amicta & Maidarman, 2019). In doing swimming movements, especially in freestyle movements, strength aims to produce motion in the body(D, 2022).

Swimming is one of the best sports to maintain and improve physical health. To achieve swimming goals, it is important to identify the talents, do regular and scheduled exercises, and use a good and effective program.(Aditia et al., 2018). Swimming is a fun sport that is affordable and good for health. Swimming can be done by any group and can be done anywhere, including in lakes and rivers(Prastyo & Hananto, 2021). Swimming is also a very popular sport in demand among human beings because its

movements benefit health and involve human muscles. (Lahinda, 2020). Swimming is a complex motion activity; perform good swimming movements that require the ability to coordinate hand and leg movements and breathing.(Sembiring et al., 2021). Swimming is not only in demand by many people but also a sport that has been included in various recognized world championships(Julio, 2017). Freestyle swimming is done with the chest facing the water's surface. While the legs are alternately shuffled up and down, the hands are alternately pushed far forward in the rowing action. When the arms are raised from the water, and the body is tilted, it is time to breathe (Stagery & Syaranamual, 2020). Freestyle is the fastest swimming style compared to the other three styles; freestyle swimming has good movement coordination and the least resistance; it has the characteristics of rotating arm movements like airplane propellers and leg movements that go up and down crosswise.(Rizkiyansyah & Mulyana, 2019).

Strength is a key component in sports as it acts as a driving force to prevent injury. Strength also contributes significantly to physical skills such as strength, agility, and Speed. Therefore, strength is the key element to achieving peak performance (Nasution, 2022). Strength is a factor or one of the biomotor components that must be fulfilled. There are many factors in the match to get good results. Among them are mental readiness, tactics in competing to win matches, and skills that must be possessed. These factors are part of the physical. Maintaining fitness is important for an athlete(Elinopita & Setiana, 2021). Strength is the ability of the muscles to overcome a load as well as resistance carried out during exercise or carrying out activities or activities(Rohmah, 2018).

Arm strength and swimming ability are closely related to freestyle swimming. By using dynamic strength in freestyle swimming, swimmers try to move body position.(Sembiring et al., 2021). Speed can be increased by producing more or more force thanks to strong arm muscles. When the muscles are stimulated, the muscles will work. When the arm performs rowing movements, such as pulling and pushing, where this movement is the most significant forward body movement, arm muscle strength is very important. (Shanty et al., 2021).

A resistance band is an efficient fitness equipment that uses handrails to support it. Rubber resistance bands have various elasticities; in this study, resistance bands can be used for training to increase power in swimming(Azis, 2019). Resistance band exercise is a form of physical activity in developing muscle size by utilizing external(US Lestari et al., 2022). Exercises using resistance bands or resistance can be done with rubber to strengthen the body's muscles and ligaments and increase lung capacity(A. Lestari & Nasrulloh, 2018). To increase arm muscle strength, you can use resistance bands or rubber exercises(Elinopita & Setiana, 2021).

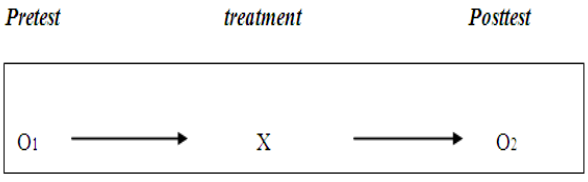
The problem in this research is. "Does resistance band training affect the arm muscle strength of freestyle swimming athletes?". This study aims to determine whether resistance band training affects arm muscle strength in freestyle swimming athletes.

The following is relevant research on the physical condition of the research conducted by Juvianti Br Sembiring and Muhammad Faisal Ansari Nasution (2022) in the journal "the effect of variations in resistance band training on arm muscle strength in male swimming athletes aged 12-13 years, sailfish swimming club, Medan in 2021". The study's results prove a significant effect of variations in resistance band training in arm muscle strength in male swimming athletes aged 12-13 years in sailfish swimming club Medan in 2021.

Based on previous research that the effect of variations in resistance band training on arm muscle strength in swimming athletes greatly affects the arm muscle strength of male swimming athletes aged 12-13 years, sailfish swimming club Medan in 2021, the researchers are interested in examining the effect of resistance band training in increasing muscle strength at Palopo city freestyle swimming athletes.

METHODS

The research uses quantitative research with pre-experimental methods. The design of this study uses a one-group pretest-posttest design (Ramadan & Juniarti, 2020). This study conducted a pre-test to determine initial ability, then be given treatment in the form of resistance band training. A post-test was conducted to measure the final ability. Using pre-test and post-test designs has the advantage that it can determine the effect of the results of the treatment given. According to Sugiyono (2017:107), experimental research is a research method carried out to determine the effect of treatment under controlled conditions. The population in this study were swimming athletes from Palopo, with a sample of 15. In this study, swimming Speed was used as an instrument or measuring instrument. The following is a one-group pre-test research design:



In this design, the test was carried out twice, before and after the experimental treatment. Tests that are carried out before getting treatment are called pre-tests. Pre-test was given to the experimental athlete (O1). After the pre-test, treatment was given as a resistance band (X) exercise, and in the final stage, a post-test (O2) was given.

Collecting data from this research is primary data collection because this research

has never been done before on the sample in this study. Tests and measurements are data collection techniques that will be used during the implementation of research; Pre-test strength is to determine the initial data strength of each research subject. Then given, a resistance band exercise treatment. Post-test to determine the final results of research subjects after doing a resistance band strength training model.

The following is a data analysis technique in this study using the following formula.

a. Description of data. The formula used in processing the data is as follows, the mean or the calculated average is the number obtained by dividing the number of values by the number of individuals. This mean is used to find the average of the test results data carried out by the Palopo freestyle swimming athletes,
b. The prerequisite and statistical tests in this study are included in parametric statistics. Parametric statistics are statistical tests that require certain conditions to be tested, while the test conditions in this study are as follows:
c. Normality test Nothing but testing the normality or not of data in the study that will be analyzed further. This test is carried out depending on the variables to be processed. Testing the normality of the data using Kolmogorov Smirnov with the help of SPSS 23
d. Hypothesis testing Hypothesis testing uses a t-test with the help of SPSS 23 by comparing the mean. If the t-count value is smaller than the t-table, then Ha is rejected; if the t-count is greater than the t-table, Ha is accepted. Test the hypothesis of this study using the help of SPSS 23.

FINDINGS AND DISCUSSION

Findings

The results of the pre-test and post-test data calculation of arm muscle strength from a sample of 15 athletes are described with descriptive statistics, which included: a) several samples, b) average (mean), c) median, d) Std. Deviation, e) range, f) minimum value, g) maximum value

Description of data

Statistics

		Pre-test	Post-test
N	Valid	15	15
	Missing	0	0
mean		32.7980	31.1027
median		32.6400	31,1600
Std. Deviation		2.34168	1.92646
Range		7.82	5.78
Minimum		28.11	27.61
Maximum		35.93	33.39
Sum		491.97	466.54

From the table above, it can be seen that the number of research subjects is 15 subjects. With an average (mean) pre-test of 32.7980 and a post-test value of 31.1027. Std deviation pre-test 2.34168 and post-test 1.92646. The minimum score for the pre-test was 28.11, and the post-test was 27.61. The maximum score for the pre-test is 35.93, and the post-test is 33.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pairs 1	Pretest - Posttest	1.69533	,73721	,19035	1.28708	2.10359	8,907	14	,000

Normality test

The normality test is carried out to determine whether the data to be tested is normally distributed or not.

The table above shows that the pre-test and post-test data have a value of (Sig.) > 0.05, so the variables are normally distributed. Because the data is normally distributed, it can be continued.

Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Pre-test	,123	15	,200*	,944	15	,442
Post-test	,135	15	,200*	,948	15	,490

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The calculation of the t-test in this study using the SPSS application aims to determine whether or not there is an influence on the results of resistance band exercises on the strength of the athlete's arm muscles that research subjects have carried out. The

intended t-test uses paired sample t-Test in statistical calculations, namely the paired different sample test.

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 Ho is rejected. Thus, resistance band training has a significant effect on arm muscle strength. The research, analysis, and data studies carried out previously show that the average value of the resistance band exercise is 32.7980 for the pre-test and 31.1027 for the post-test. Referring to these results, there is an increase from the pre-test to the post-test, and there is a significant effect on the arm muscle strength on the results of the paired sample t-test.

Discussion

The physical conditions of swimming must be met, namely, strength, Speed, flexibility, and endurance. Strength is one component of physical condition regarding the ability to use muscles to accept loads at work. Resistance exercise, which, in its implementation, can push, pull and lift a load(Persadanta, P., Sukendro, S., & Rasyono, 2020). resistance band tool is a tool in the form of handrails to facilitate movement. Athletes can perform movements according to their goals in training muscles(Nasution, 2022).

This study provides resistance band training in athletes intended to increase arm muscle strength in palopo city swimming athletes. The exercise provides new knowledge in training the Speed of freestyle swimming athletes. This can be seen from the results of swimming Speed, which shows an increase in the athlete's swimming speed; this is because one of the components supporting the athlete's Speed is strength. Because the strength of the swimmer's arm muscles is very influential in the athlete's Speed during the race. Arm muscle strength, thus good arm muscle strength, a swimmer will be able to swim faster. A swimmer can overcome water resistance well by having good arm muscle strength. In this study, researchers focused on strength training. The strength of the swimmer's arm is the ability of the swimmer's arm muscles to work while swimming. Arm muscle strength is a person's ability to bring out all the potential or existing strength in a short period of time. Thus a good arm muscle strength than a swimmer will be able to swim faster. With good arm muscle strength, a swimmer can handle water resistance well. Based on the description above, the researcher will provide a form of resistance band training where the resistance band is a method known to increase strength to increase arm muscle strength in Palopo swimming athletes.

According to Juvianti Br Sembiring and Muhammad Faisal Ansari Nasution (2022), in the journal The effect of resistance band training on arm muscle strength in male swimming athletes aged 12-13 years, sailfish swimming club, Medan 2021. The author uses an experimental method. The subject in this study is male swimming athletes aged 12-13 years, sailfish swimming club, Medan 2021. experiment. With a research design of one group pre-test – post-test design. The variables studied in this study were variations in

resistance band training as the independent variable and arm muscle strength as the dependent variable. The data obtained from the results of the arm muscle strength test were processed using statistical procedures: normality test, looking for the mean pre-test and post-test scores, looking for differences in the mean pre-test and post-test, looking for the standard deviation of the pre-test and post-test data, looking for the calculated value between the pre-test and post-test, it was found that resistance band training had a significant effect on increasing arm muscle strength in male swimming athletes aged 12-13 years old, sailfish swimming club 2021. In this study, researchers experienced several obstacles, namely when conducting research because of the coronavirus. Resulting in the swimming pool sometimes not opening. In addition, during the training process, sometimes some athletes arrive late, and some are absent. Also, the number of samples is very small, with only eight people. In this study, researchers experienced several obstacles, namely when conducting research because of the coronavirus. Resulting in the swimming pool sometimes not opening. In addition, during the training process, some athletes sometimes arrive late, and some are absent. Also, the number of samples is very small, with only eight people. In this study, researchers experienced several obstacles, namely when conducting research because of the coronavirus. Resulting in the swimming pool sometimes not opening. In addition, during the training process, sometimes some athletes arrive late, and some are absent. Also, the number of samples is very small, only 8 people.

According to Dwi Prastyo and Ramadhany Hananto Puriana (2021) in the journal The Effect of Rope Pushdown Training Using Resistance Bands And Up And Down Bench Against The 50 Meter Freestyle Swimming Speed For Men Sidoarjo U 15. The subject of the study was a 15-year-old "Diamond Aquatic Club" athlete totaling 20 people. This study uses a draft design control group pre-test and post-test design. Analysis of the data used to test the hypothesis is the "t" test formula. The design used in this experimental study used a "control group pre-test and post-test design," namely a design that was given a pre-test (before being treated) and a post-test (after being treated). The data collection method in this study used tests and measurements. From this study, it was obtained that the test results stated differences in the Pre-test and Post-test scores in the rope pushdown training group of the Men's Swimming athlete Diamond Aquatic Club Sidoarjo U 15. Then in the up-and-down exercise group, a statement was also obtained that there was a difference between the average value of the initial test score (pre-test) without treatment and the score (post-test) without any treatment for up-and-down exercises.

According to Ahmad Nasrulloh and Iswadi Sigit Wicaksono (2020) in the journal Bodyweight exercise with total-body resistance exercise (TRX) can increase muscle strength. This research is using experimental method. The research design uses a one-group

pretest-post-test design. Namely, the experiment is carried out in one group without a comparison group. The design can be explained that the experimental subject being given a pre-test by measuring muscle strength, including the legs, back, arms, and hands. The instruments used are a leg and back dynamometer to measure leg and back muscle strength, a hand grip dynamometer to measure arm muscle strength, and a pull and push dynamometer to measure hand muscle strength in pulling and pushing. The results showed that bodyweight training with total-body resistance exercise (TRX) could significantly increase muscle strength, including leg muscle strength, back muscle strength, hand muscle strength, arm muscle pulling strength, and arm muscle pushing strength.

According to Samrotul Jannah and Mochmad Purnomo (2011), overhead tricep extension resistance band exercises and overhead tricep extension dumbbell exercises affect arm power. This research is quantitative research using experimental methods. The approach in this study is the none equivalent (pre-test and post-test) control group design. Based on the results of an independent test sample t-test which aims to determine the difference in exercise between the overhead tricep extension resistance band and overhead tricep extension dumbbell on arm power by being treated for six weeks, the frequency is three times a week. The results showed a difference in exercise between the overhead tricep extension resistance band and overhead tricep extension dumbbell on arm power. This shows the overhead tricep extension resistance band exercise is better than the overhead tricep extension dumbbell.

According to Fandi Purwadinata and Dr. Wijono (2020), The effect of the punch resistance band and punch dumbbell exercises on increasing arm muscle explosive power. The method used is descriptive quantitative, using a research design in the form of two experimental designs that carry out exercise treatment for six weeks from the data tested with independent samples t-test. The test was used to determine the difference between the two groups. There is a significant effect on punch resistance band exercises to increase arm muscle explosive power. There is a significant effect on dumbbell punch exercises to increase arm muscle explosive power.

Hypothesis testing shows a significant effect of resistance band training on increasing arm muscle strength in swimming athletes in Palopo City. The results of this study were influenced by the training program given in doing the exercises and the high and low motivation of athletes during exercise. This shows that resistance band training can be one of the maximum achievements of athletes to improve their knowledge and skills of athletes to be achieved properly.

The recommendation given by the researcher is a tIn connection with the discussion and conclusions above, coaches and athletes can review this to increase the strength of the athlete's arm muscles. The results of this study can be used as a reference in further research. The advantages of this research are that this research is relevant to the current problem conditions, uses the latest references,

and the methods used in this research are comprehensive; this research has never been studied before in this research sample. The weakness of this research lies in the small number of samples, which is expected to further researchers to increase the number of samples to be studied.

CONCLUSION

Based on the results of data analysis that has been carried out, it is known that the number of research subjects is 15 subjects. With an average (mean) pre-test of 32.7980 and a post-test value of 31.1027. Std deviation pre-test 2.34168 and post-test 1.92646. The minimum score for the pre-test was 28.11, and the post-test was 27.61. the maximun value of pretest was 35.93 and posttest was 33.39. And the normality test that the pre-test and post-test data have a value of (Sig.) > 0.05, then the variables are normally distributed. Because the data is normally distributed, it can be continued. Then the t-test was carried out with the results obtained, namely sig, 0.000 <0.05. This can be seen from the sig value, 0.000 < 0.05, which means Ho is rejected. Thus, resistance band training has a significant effect on arm muscle strength.

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REFERENCES

Aditia, L., Badruzaman, B., Paramitha, ST, & Jajat, J. (2018). Comparison of Vo2max Test Results for Swimming Athletes Using the Williams Swimming Beep Test and Bleep Test. Journal of Applied Sports Science, 3(1), 53. https://doi.org/10.17509/jtikor.v3i1.8933

Amicta, BS, & Maidarman. (2019). Overview of Physical Conditions for Deeper Swimming FIK UNP Students. Journal of Education and Sport, 2(1), 203–208.

Azis, N. (2019). The effect of 8 weeks of exercise with resistance bands in a special period on the leg power of taekwondo athletes.

D, FD (2022). the effect of strength and power training on the muscles of the arms and legs on the Speed of freestyle swimming. 11(2), 141–146.

Elinopita, T., & Setiana, I. (2021). Can Resistance Band Exercise Increase Arm Strength of Volleyball Extracurricular Students at Aletheia Christian Middle School Malang. Journal of Equatorial Physical Education, 2(1), 9. https://doi.org/10.26418/jpjk.v2i1.47109

Julioe, R. (2017). CASE STUDY INTEREST OF MTS STUDENTS HADIL ISHLAH BILEBANTE IN SWIMMING _____. Ekp, 13(3), 1576–1580.

Lahinda, J. (2020). THE INFLUENCE OF BASIC ENGINEERING TRAINING ON FREESTYLE SWIMMING ABILITY ON STUDENTS OF HEALTH AND HEALTH CARE

STUDENTS, MASAMUS UNIVERSITY. Science of Sport and Healthy, 1(1), 85–90.

Lestari, A., & Nasrulloh, A. (2018). Effectiveness of Body Weight Training Training With and Without Using the Resistance Band Towards Weight Reduction and Percentage of Fat. Medikora, XVII(2), 91–101.

Lestari, US, Asnar, E., & Suhartati, S. (2022). Effect of Differences in Intensity of Resistance Elastic Band Exercises on Body Mass Index (BMI). Biomedical Journal:JBM.https://ejournal.unsrat.ac.id/index.php/biomedik/article/view/35337

Mahfud, I., & Fahrizqi, EB (2020). Development of Motor Skills Training Models Through Traditional Sports For Elementary School Students. Sport Science and Education Journal, 1(1), 31–37. https://doi.org/10.33365/.v1i1.622

Nasution, juvianti, muh faisal ansari as sembiring. (2022). effect of resistance band training on arm muscle strength in male swimming athletes aged 12-13 years sailfish swimming club Medan 2021. 21(1), 65–73.

Persadanta, P., Sukendro, S., & Rasyono, R. (2020). THE EFFECT OF RESISTANCE BAND EXERCISE ON MUAY THAI ATHLETE MUSCLE POWER. 1, 23–29.

Prastyo, D., & Hananto, R. (2021). The Effect of Rope Pushdown Training Using Resistance Bands and Up and Down Benches on the Speed of 50 Meter Freestyle Swimming Putra Sidoarjo U 15 The Effect of Rope Pushdown Training Using Resistance Bands and Up and Down Benches on the Speed of 5. 7(1), 48– 58.

Ramadan, Gilang & Juniarti, Y. (2020). Metode penelitian : pendekatan kuantitatif, kualitatif dan R & D. CV Sadari Press

Rizkiyansyah, A., & Mulyana, B. (2019). Effect of Skateboard Media and Pull Buoy Drill Method Pattern on Learning Outcomes of Freestyle Swimming Basic Techniques. Journal of Sports Coaching, 11(2), 112–123. https://doi.org/10.17509/jko-upi.v11i2.20311

Rohmah, MQ (2018). The Effect of Chest Press Resistance Band Exercises and Push Ups on the Strength of the Arm Muscles at the State University of Surabaya. Journal of Sports Achievement, 1(4), 1–16. https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/26211

Saputra, GY, & Aguss, RM (2021). Interest of Class VII and VIII Students in Participating in Physical Education Learning in Sports and Health at SMP Negeri 15 Mesuji. Journal Of Physical Education, 2(1), 17–25. https://doi.org/10.33365/joupe.v2i1.797

Sembiring, H., Wiyaka, I., Medan, UN, North, S., Sport, J., & Indonesia, K. (2021). CORRELATION OF ARM AND LIMB MUSCLE STRENGTH WITH SWIMMING ATHLETES SPEED. 1,

75–83.

Shanty, E., Ridwan, M., Argantos, A., & Setiawan, Y. (2021). Contribution of Arm Muscle Strength, Leg Muscle Strength and Back Muscle Strength to 50 Meter Freestyle Swimming Speed. Patriot's Journal, 3(2), 179–191. https://doi.org/10.24036/patriot.v3i2.703

Tahapary, JM, & Syaranamual, J. (2020). Basic Technique Exercises Can Improve Freestyle Swimming Results. JARGARIA SPRINT: Journal of the Science of Sport and Health, 1(1), 30–38. https://doi.org/10.30598/jargariasprintvol1issue1page30-38