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The Effect Of Dumbbell Exercise Using Resistance Bands On Arm Muscle Strength In The Petanque Team Of Universitas Muhammadiyah Palopo

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Abstract

This study aims to determine the effect of dumbbell exercises using resistance bands on arm muscle strength in the petanque team at the University of Muhammadiyah Palopo. The method used in this research is a one-group pretest-posttest experimental design with a quantitative approach. From the results of a study that has been carried out on the effect of dumbbell training using resistance bands on arm muscle strength in the Petanque Team at the University of Muhammadiyah Palopo. Moreover, the results of data processing with statistical analysis show that this research has a sig value of $0.000 < 0.05$, which means that H_0 is rejected. Thus, dumbbell training using resistance bands significantly affects arm muscle strength in the Petanque Team at the University of Muhammadiyah Palopo.

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INTRODUCTION

Petanque is a sport originating from France; similar games are bocce and bowls; the original form of this game appeared in 1907 in Lactate, a province in the south of France, at the 2011 SEA Games sporting event in Indonesia; petanque at the SEA Games was included in the category of concentration sports, has specific requirements(Sari, 2021). Petanque sport entered Indonesia in 2011 during the Sea Games in Indonesia in Palembang under the auspices of the Indonesian petanque sports federation (FOPI)(Suwanto et al., 2018). Petanque sports entered South Sulawesi from 2016 to 2019.

Petanque sports in South Sulawesi still use the role of students and several urban districts in South Sulawesi(Awaluddin, 2021). Petanque is a form of boules game whose goal is to throw an iron ball as close as possible to a wooden ball or jack; the position of the feet must be in a small circle; all ages can play this petanque.

Several numbers are contested in this Petanque sports game, including shooting, double, triple, mix, and single; this can also be played on hard ground, grass, sand, or other ground surfaces(Laksana et al., 2017). In the game of petanque, two techniques need to be understood, namely pointing and shooting; in which pointing is throwing an iron ball to hit the target to a small ball commonly called a jack while shooting is one of the techniques in the game of petanque to throw the opponent's ball from the target ball jack means the throw made must be right on target on the wooden

ball to get the winning point (Sinaga et al., 2019). Based on the observations and results of the petanque coaching at the University of Muhammadiyah Palopo, the problems that exist in petanque when shooting both during training and during matches are the lack of concentration on athletes when throwing, athletes in a hurry when throwing iron balls, then it needs to be improved the physical component, especially in muscle strength, because the iron that will be thrown does not hit the target or the throw is inaccurate.

Regarding the development or progress of shooting practice, it is progressing or improving, but technical skills and unique techniques for regular physical training must support it. The discipline of the petanque athletes during training is that almost all athletes arrive late for various reasons, such as their busyness.

To improve discipline, there must be firmness from the coaching staff by giving sanctions to athletes who take disciplinary actions such as giving suspensions or other sanctions based on mutual agreement. Apart from that, to increase the interest in practicing petanque athletes, it is necessary to educate them about the goals to be achieved together, while other things that must be considered to increase the interest of athletes, namely the formation of an athlete's mindset so that they have an awareness of the importance of routine training carried out, to improve teamwork, maintaining athlete fitness, improving technique and building mentality or confidence in athletes.

In Petanque, athletes must have a good mentality to face competition or practice so they do not experience tension or worry, which can affect concentration breakdown. Motivating athletes is a need to boost their self-confidence.

The rules for the game in petanque are as follows, a) when in a circle, you cannot step on the circle when the athlete is playing; b) when you are in the circle, the athlete cannot be spoken to because you will get a violation, c) when the athlete is competing, the audience is not allowed to make noise because the athlete's concentration is disturbed, d) then the opponent may not be on the field line, They must be outside the match field if ones do not follow the rules then get a violation. e) game time for charging is 60 minutes or 120 seconds nonjack. If it has entered the final art, nonjack is allowed to play again

Training is improving sports skills (proficiencies) with various equipment according to the goals and needs of the chosen sport (Najmudin et al., 2021). By training an athlete to increase physical fitness, physiologically, the factors that are developed are the systems and functions of the organism to achieve optimal sports performance (Amansyah, 2019).

Dumbbell is a tool for lifting weights using training using one hand raised; the dumbbell is a short bar with plates at both ends of the exercise tool; if done regularly, it can strengthen and form arm muscles (Ungu et al., 2020). Dumbbell exercises are carried out in a standing position, so the weights that are lifted are hefty so that they can strengthen and form

a stronger back area; if done regularly, dumbbell exercises in the form of exercises in pointing and shooting techniques this petanque sport has a great effect on dumbbell exercises so that it strengthens the muscles. in the arms and other joints(Mibahunnur, 2017). This exercise is carried out regularly, systematically, and continuously; it will increase the physical element of arm strength and speed (Latuheru et al., 2021).

A resistance band is one of the sports fitness equipment made of rubber by using it in hand; the target for using this tool is the arm muscles; rubber resistance bands have various elasticities, one of which is medium-sized resistance bands that can be used for training to increase power in the petanque sport (Aziz, 2019). Resistance bands or rubber exercise is valuable for increasing muscle strength (Elinopita, 2021). Using simple training tools, we hope to help petanque athletes practice to get maximum results (Ali, 2020).

Shooting is the basic technique of throwing in petanque to expel the opponent's bosi from the target Boka; this technique is used when the opponent's bosi is close to the Boka; the level of difficulty of the shooting technique is affected by body position, foot position must be stable when delivering the ball to get perfect balance (Laksana et al., 2017). Shooting in petanque is a number competition with competing shooting agility or shooting at a distance of 6 meters, 7 meters, 8 meters, and 9 meters(Augustine, 2017). Several components can affect shooting in shooting, such as ball grip, body position towards the target, the static balance of the

legs, low body position and leaning forward, releasing the ball, and follow through. (Isyani, 2019). Game matches in the shooting are seen from the stages of the athlete's movements when shooting techniques constantly change, sometimes according to good technique. However, several occasions are different from the technique.(Ulpiana et al, 2021). The shooting method is very much needed in Petanque because it determines how many points you get or hinders your opponent from getting points in each game. One of the factors that make athletes less adept at shooting is the lack of specific training for developing shooting skills(Badaru et al., 2021)

Strength is an essential component of supporting physical activity and an essential role in protecting muscles; maximum muscle work can increase the workability of a person, which will ultimately increase individual achievement in sports (Martini, 2018). Strength, namely the ability of a person to receive a maximum load on physical abilities, can increase one's work ability (Kuncoro, 2021). Strength is a component of a person's physical condition to strengthen muscles in receiving loads during activities (Antony, 2019). The ability to strengthen is the power of muscle contraction to achieve maximum effort. A muscle or group makes the maximum effort of muscles to overcome resistance; besides that, strength plays a vital role in the components of physical ability such as power, agility, and speed (Rusdy et al., 2020)

Arm strength is the physical ability so it can overcome loads; In contrast, strength is vital in sports activity; strength is a driving

force that can avoid injury in carrying out activities; besides that, strength also plays a vital role in physical abilities such as speed and agility(Saptiani et al., 2019). The very dominant arm often does the activity and uses both arms; muscle strength is essential in doing the activity. Both arms have differences in muscle strength between the dominant and non-dominant arms (Castendo et al., 2020). Arm muscle strength helps to achieve the throw, to form arm muscle strength exercises that are used in order to build strength in the arms such as one with exercise, namely, physical exercise, be it pull-up exercises using rubber resistance bands and push-up exercises fast and slow or using dumbbell tool(Faridhatunnisa et al., 2019). When hitting, arm muscle strength is needed as a driving force (Ibrahim et al., 2022).

Relevant previous research results regarding the physical condition of the research conducted by(Ungu et al., 2020)said that "Sport-Mu Journal of Sports Education The Effect of Dumbbell Exercise on the Result of Throwing Sideways Discs in Extracurricular Students at MTs Nurul Hidayah Dalil."

Based on previous research on the effect of dumbbell variation exercises on arm strength in Petanque athletes at UM. palopo, dramatically influences the arm muscle strength of petanque athletes at UM Palopo. Hence, the authors are interested in examining the effect of dumbbell training using resistance bands on the arm strength of Um palopo's petanque team.

METHODS

This type of research is quantitative research using experimental methods. The research design used a one-group pretest-posttest design. In practice, the athlete performs an initial test (pre-test) before the athlete is given treatment. The sample will be given dumbbell exercises using a resistance band to measure the final ability (post-test). The pre-test and post-test designs have the advantage of determining the effect of the results of the treatment given. According to (Sugiyono, 2018), Experimental research is a research method conducted to determine the effect of treatment under controlled conditions. The population in this study was the Um. Palopo petanque team athletes who took part in this study totaled ten athletes; all were sampled. In this study, you must examine the strength ability of the Um Palopo petanque team athletes.

Collecting data from this study 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 to find out the initial data on the strength of each research subject—then given a dumbbell exercise treatment using a resistance band. Post-strength test to find out the final results of research subjects after doing dumbbell strength training models using resistance bands.

The population and sample-taking technique use *random sampling* (free), which is

a sampling technique based on chance; that is, anyone who happens to meet the research can be used as a sample if it is seen that the person met by chance is suitable as a data source, in the incidental sampling technique, sampling is not determined in advance, research This method directly collects data from the sampling unit that is encountered (Prof. Dr. Sugiyono, 2018).

The instrument used in this study was push-ups for 60 (seconds) to determine the level of endurance in arm strength; the opportunity given was three times the maximum opportunity.

The formula that will be used in processing the data is as follows. The mean or arithmetic average is obtained by dividing the value by the number of individuals. This mean is used to find the average of the test results data conducted by Petanque athletes.

The prerequisite test, the statistical test in this study referred to as parametric statistics. Parametric statistics are statistical tests that require specific conditional tests, while the conditional tests in this study are as follows.

none other than conducting tests on whether or not data in research is to be analyzed further. This test is carried out depending on the variable to be processed. The data normality tester uses Kolmogorov Smirnov with the help of SPSS 23.

The hypothesis test uses the t-test with the help of SPSS 23 by comparing the mean. If the value of the t count is smaller than the t table, then 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 arm muscle strength from a sample of 10 subjects are

described with descriptive statistics, which include: a) number of samples, b) average (mean), c) minimum, d) maximum, e) std deviation

Descriptive Statistics

	N	Range	Minimum	Maximum	sum	Means	std. Deviation
Pre-test	10	7	4	11	68	6.80	2,150
Posttest	10	7	7	14	99	9.90	2,234
Valid (listwise)	N 10						

From the table above, the number of research subjects was ten people. With an average (mean) pre-test value of 6.80 and the post-test value of 9.90. Std deviation value pre-test 2,150, as well as a post-test value of 2,234. Minimum pre-test of 7 and a post-test

score of 4. Maximum pre-test of 11 and a post-test score of 14

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

Tests of Normality

	Kolmogorov-Smirnov Statistic			Shapiro-Wilk		
	s	Df	Sig.	Statistics	Df	Sig.
Pre-test	.287	9	.031	.805	9	.023
Post-test	.193	9	.200*	.911	9	.326

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

a. Lilliefors Significance Correction

The table above shows that the pre-test and post-test data have a p (sig) value > 0.05, so they are typically 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 dumbbell training using

resistance bands on arm muscle strength in petanque athletes carried out by research subjects. The t-test in question uses the paired sample t-test in statistical calculations, namely the paired sample difference test.

Paired Samples Test

		Paired Differences		std. Error Means	95% Confidence Interval of the Difference		Q	Df	Sig. (2-tailed)
		Means	std. Deviation		Lower	Upper			
Pair 1	pre-test	-3,222	1,481	.494	-4,361	-2,084	-6,526	8	.000
	Post-test								

Based on the table above, it can be seen that the probability number of the sig is 0.000 <0.05. This means that Ho is rejected; thus, it can be concluded that dumbbell training significantly affects the petanque athlete's arm muscles. From the results of research, analysis, and data studies that have been done before, it can be seen that the average value of dumbbell exercises is 6.80 for the pre-test and 9.90 for the post-test. Referring to these results, there is an increase from the pre-test to the post-test; there is a significant effect on the strength of the arm muscles and the results of the paired sample t-test.

Discussion

Based on the results of research and analysis of data on dumbbell muscle endurance and resistance bands on increasing the ability of petanque arm muscle endurance. The results of an increase in arm muscle endurance (60-second push-ups) and an increase in accuracy that has been obtained from the results of the pre-test and post-test with treatment for five weeks with a frequency of 1 week three meetings with a 1-day break after treatment with an increase in the training program of 16 meetings.

The physical condition of the petanque athlete must be met, which aspects, namely, strength, speed, flexibility, and endurance, affect not only the improvement of technique but also the improvement of tactics. Improving tactics will only work if you have mastered the technique properly and are supported by good physical condition. The physical condition of the players in Petanque will also affect the mentality of the players. Conversely, the players' mentality will also affect their physical condition and their techniques and tactics. Mental and physical conditions are the most critical elements in creating a good game(Mahesar et al., 2018)

Dumbbell weight training, referred to in this study, is a form of physical exercise using weights from outside as dumbbells used as loads in training. This form of exercise also aims to train the strength and speed of the arm muscles, which are muscles that play an essential role in increasing the shooting speed in petanque sports; this dumbbell exercise (weight training) is very effective in increasing performance ability of the arm muscle endurance, the actual dumbbell exercise better at providing overall muscle gain in a sense not

just the primary muscle(Bergquist et al., 2018).

A resistance band is a sports tool made of rubber and is easy to carry anywhere. So according to researchers, the use of assistive devices such as resistance bands in methods such as shoulder stretch, overhead triceps, and back of the arm is very influential in helping to increase arm muscle strength in order to improve the results of shooting petanque sports; a resistance band tool is a tool in the form of rubber that is tied to a wall or pole using handrails, in facilitating movement. Athletes can perform movements according to their goals in training muscles (Febrianto, 2018)

According to Samrotul Jannah and Mochmad Purnomo (2011), the effect of overhead tricep extension resistance band exercises and dumbbell overhead tricep extension exercises on arm power. This research is quantitative research using experimental methods. The approach in this study was none equivalent (pre-test and post-test) control group design. Based on the results of an independent sample t-test which aims to find out the differences in exercise between overhead tricep extension resistance bands and overhead tricep extension dumbbells on arm power with treatment for six weeks, a frequency of 3 times a week. The results show differences in training between overhead tricep extension resistance bands and overhead tricep extension dumbbells to arm power. This shows that the resistance band overhead tricep extension exercise is better than the dumbbell overhead tricep extension exercise.

According to Fandi Purwadinata and Dr. Wijono (2020), The effect of the punch resistance band and punch dumbbell exercises on increasing the explosive power of the arm muscles. 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 of the punch resistance band exercise on increasing the explosive power of the arm muscles. There is a significant effect of the punch dumbbell exercise on increasing the explosive power of the arm muscles. There is no significant difference between the punch resistance band and punch dumbbell exercises in increasing the explosive power of the arm muscles.

Testing the hypothesis shows a significant effect of dumbbell training using resistance bands on increasing arm muscle strength in petanque sports athletes. The results of this study were influenced by the training program given in doing the exercises and the level of athlete motivation when practicing. This shows that dumbbell training using resistance bands can be one of the maximum achievements of athletes to improve their knowledge and skills of athletes can be adequately achieved.

The recommendations given by researchers are related to the discussion and conclusions above; this can be reviewed again by coaches and athletes to increase the athlete's arm muscle strength. The results of

this study can be used as a reference for further research. The advantages of this research are that this research is relevant to the current problem conditions, this research uses up-to-date references, and the methods used in this research are comprehensive; this research has also never been studied before on this research sample. The weakness of this study lies in the small number of samples expected for further researchers to increase the number of samples to be studied.

CONCLUSION

Based on the results of the data analysis that has been done, it is known that the number of research subjects is ten subjects. With an average (mean) pre-test value of 6.80 and a post-test value of 9.90. Std deviation pre-test 2.150 and post-test 2.234. The minimum pre-test value is 4, and the post-test is 7. The maximum pre-test value is 11, and the post-test is 14.

Moreover, the normality test shows that the pre-test and post-test data have a p (sig) value > 0.05 , so the variables are normally distributed. Because the data is normally distributed, it can be continued. Then a t-test was conducted results were obtained, namely sig, namely 0.05. This can be seen from the sig value, $0.000 < 0.05$, which means H_0 is rejected. Thus, dumbbell training has a significant effect on the strength of the petanque athlete's arm muscles.

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