

## THE EFFECT OF PUSH UP TRAINING ON ARM MUSCLE STRENGTH IN BEGINNER RICH ROWING ATHLETES

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### ABSTRACT

This study aims to determine the effect of Push Up exercises on Arm Muscle Strength in Beginner Kayak Rowing Athletes in South Sumatra. The type of research used is a quasi experiment with a pretest – posttest one group design. The independent variable is the push up exercise, the dependent variable is the arm muscle strength. The population of this study were beginner rowing athletes in South Sumatra. The sample of this research is 30 people. The instrument used is the flaxed – arm hang test. The treatment in this study was in the form of push up exercises, after being given treatment for 6 weeks with a frequency of exercise 3 times a week. Based on the results of research and data analysis, from the results of the initial test (pretest) and the final test (posttest) there is an average increase of 0.18. And after testing the hypothesis with the t test statistic, with a significance level of 0.05, tcount 55.27 while ttable 1.70, then tcount > ttable, so it can be concluded that the push exercise with a time of 6 weeks with a frequency of exercise 3 times a week can increase strength. South Sumatra beginner rowing athlete. The implication of this study is that push up exercises can be used as a type of exercise to increase arm muscle strength.

**Kata Kunci:** *Push Up, Arm Muscle Strength*

### Introduction

Rowing has been around for a long time, because basically a boat is rowed with oars, it's just that rowing competitions haven't been held like where they are now. According to Egyptian records in 1430 BC, the warriors of Amenhotep or Amenopsis II were famous for rowing. In the islands of Aenes, the girls perform one of the funeral services arranged by King Aenes in honor of their father. Then in the 13th century, the Venetians held the Regata festival in which there was a boat rowing race between one another. Rowing is also a type of aerobic sport. Water is the main means, and boats and oars are the medium. This sport can be done individually or in groups, in fact this sport can be said to be a sport that tends to provide elements of movement and elements of art, because it involves a combination of body movements and the tools used for rowing that rowing movements are carried out rhythmically, continuously and tones. a good ratio between the working phase and the resting phase. The factors that influence achievement are physical, technical, tactical, and mental strength. These four factors are interrelated with one another. Rowing requires these four factors. Rowing is known and developed in Indonesia, actually a combination of three sports namely, canoeing, rowing and traditional bot race. At the regional and international level, the three branches are affiliated with separate organizations, namely ICF (International Canoe Federation) for canoeing, FISA (Federation International Des Societes De Aviron or International Rowing Federation) for rowing, and IDF (International Dragon Boat Federation) for traditional boat

racers. In Indonesia, these three branches belong to an organization, viz PODSI (All Indonesian Rowing Sports Association). While Canoeing is divided into two numbers, namely, canoeing and kayaking. The difference between the two numbers is that in the canoe number the rower usually uses a paddle with one paddle on one side, and for the kayak number there are two paddles on both sides. The following is for kayaking number competitions which are often held at national and international events, consisting of single kayaking for men and women, 200 meters distance, double kayaking for men and women, distance of 200 meters, single kayaking for women, distance of 500 meters, double kayaking for women, distance of 500 meters, k4 women, distance of 500 meters, men's single kayak, distance of 1000 meters, men's double kayak, 1000 meters distance, and men's kayak, distance of 1000 meters.

The development of rowing in Indonesia is increasing and is developing as seen by increasing public knowledge of the sport and also increasing the frequency of championships that are participated in at the provincial, national and international levels (Izzuddin et al., 2022). It is realized that the effort to achieve achievement in sports is a complex thing, because it involves many factors, including external and internal factors. External factors include: trainers, facilities and infrastructure and so on. Increasing achievement in the field of sports besides requiring adequate facilities and infrastructure also requires achievement development, especially from an early age (Lengkana et al., 2019). Rowing requires a physical condition to be able to maintain balance and paddle on a boat, especially rowing in the kayak category. Basic physical condition components such as speed, strength and endurance must be met by athletes. Good physical condition will support good technique. Strength is a very important factor in improving good physical condition which will support good technique. Strength is the ability of the muscles to contract causing tension. Strength is a very important factor in improving overall physical condition. Physical fitness is the driving force behind all physical activity and physical fitness plays an important role in protecting athletes from injury.

Based on the results of observations at the South Sumatra Podsi on Lake Jakabaring, arm muscle strength in rowing athletes like South Sumatra is still low, so there is no strength during rowing practice and lack of arm muscle endurance, and there is still a lack of physical exercise, especially in the upper body parts such as the arms, and back because in kayaking athletes much needed upper body strength. Strength is the most important component of basic physical condition. The foundation to be able to carry out fast movements and endurance must be supported by the ability to have muscle strength. This is the basis for the importance of muscle strength in carrying out kayaking rowing skills. The kayak category focuses on the skill of coordinating the movement of the paddling arms, which is very important in improving the physical condition of rowing. Strength is a very important factor in improving overall physical condition, because strength is the driving force behind all physical activity and strength also plays a very important role in rowing. At present physical training is a very important need for athletes in rowing, because rowing is an endurance sport that requires excellent physical condition in the process of competition (Izzuddin et al., 2021). One of the exercises to strengthen the arm muscles is push ups, a strength sport that functions to strengthen the biceps and triceps (Koloway et al., 2021).

Push Up is an exercise of moving up and down from a prone position with a straight back and head in a straight line parallel to the vertebrae of the two arms shoulder-width apart, pressing the floor and straightening it, so that the weight is lifted with the body and legs in a straight line. The supporting muscles for the push-up exercise are the arm muscles. Meanwhile according to Mustaqim (2018) Push ups are a form of exercise with your own body weight and

aim to strengthen your arm muscles. Menurut Sari et al., (2018) Push up aims to determine the strength and endurance of the hand muscles. Based on the description above and the results of observations for rowing sports, especially kayaking in South Sumatra, after observing as an assistant coach, researchers saw a lack of arm muscle strength in kayaking athletes in South Sumatra. So the authors are interested in conducting research with the title: The Effect of Push Up Exercise on Arm Muscle Strength in Beginner Kayak Rowing Athletes.

## Method

This study uses a type of research that is experimental and uses a pretest and posttest one group research design. The purpose of this study is to determine whether there is an influence of the independent variables on the related variables (Sugiyono, 2019). The variables in this study consisted of the independent variable, namely push-up exercises and the dependent variable, which was the result of arm muscle strength in rowing athletes like beginners. The population in this study was 30 athletes and the sample used for this study was 30 athletes or using the total population sampling technique. The instrument for collecting this data is to measure the strength of the arm muscles from both the pretest and posttest. The analysis technique used in this study is the T test using the data normality test, homogeneity test and hypothesis testing using the SPSS 26 computer program.

## Discussion

Data obtained from measured t-test calculations gave 7,432 results which were obtained from the t dispersion table with  $dk = 30$  and a certainty level of 95% ( $= 0.05$ ), recorded in the table and t table was 1.70. Standard speculation test admits  $H_1$  if  $t_{count} > t_{table}$  (1-), and rejects  $H_0$  if  $t_{count} < t_{table}$  (1-), because  $t_{count}$  ( $7.432 > t_{table}$  (1.70) if the significance value of the paired T-test is less than 0.05 there is an influence and vice versa if the significance value is greater then there is no effect, then there is a large difference between the post-test and pre-test, test, in this way the  $H_0$  theory is rejected and the  $H_1$  speculation is acknowledged, the  $H_1$  articulation is "There is an effect of push-up training on arm muscle strength in South Sumatra beginner rowing athletes.

Tabel 1. Uji Paired T-Test

Variabel	t-hitung	Sig.	Level of Significant
<i>Pre-test &amp; Post-Test</i>	7.432	0	0,05

**N: 30**

**Sumber: SPSS 22**

Based on the research criteria, a discussion is needed to follow the results of the research which will discuss the results of the pretest and posttest data and the results of the data. The effect of push-up training on arm muscle strength in the flaxed-arm hang test in beginner rowing athletes in South Sumatra with the following criteria: week with a frequency of exercise 3 times a week based on Saputra & Syamsuramel (2021) namely technical efficiency after 6 weeks of training aimed at physiological-psychological regeneration of the central nervous system (CNS) before the start of the training season in the following year. Push up exercises aim to strengthen the arm and shoulder muscles in order to lift heavy loads. Scheduled push-up exercises can increase arm muscle strength. That push-ups are one of the exercises that increase the strength of pulling and pushing the arm muscles to the maximum. Therefore the ability to maximize the

strength of the arm muscles in rowing athletes is needed. According to Juwita (2019) Arm muscle strength is a very important component needed by the body because: 1) strength is the driving force of every physical activity, 2) strength plays a very important role in protecting athletes from possible injuries, 3) and athlete strength will be able to help strengthen joint stability. Based on the results of the initial test (pretest) it showed that the results of the flaxed-arm hang test obtained that the fastest time to survive the test was 9 and the longest time to do the test was 35, with an average of 17.7. After being given treatment in the form of push-up exercises for 6 weeks with a frequency of exercise 3 times a week, it turned out that there was an increase in speed in the flaxed-arm hang test for beginner rowing athletes in South Sumatra, which was an average of 10.5 from the difference between the initial test (pretest) to the final test (posttest). ). The final test result score obtained in (posttest) is 15 for the fastest time in doing the test and the longest time in doing the test is 40, with an average of 27.9. After testing the pretest and posttest data with normal distribution, the hypothesis testing was carried out using the "t test". The criteria for testing the hypothesis are reject  $H_0$  if  $t_{count} < t_{table} (\alpha - 1)$ , and accept  $H_1$  if  $t_{count} > t_{table} (1 - \alpha)$ , where  $t_{1 - \alpha}$  is contained in the t distribution table with  $dk = n - 1$  and probability  $(1 - \alpha)$ . If  $t_{count}$  is 7,432 with  $dk = 30 - 1 = 29$  and a confidence level of 0.95 ( $\alpha = 0.05$ ) then the  $t_{table}$  value can be calculated, because  $dk = 29$  and the value in the table is 1.70. The data obtained from the measured calculation of the t-test gives a result of 5,350 which is obtained from the t dispersion table with  $dk = 30$  and a certainty level of 95% ( $= 0.05$ ) while the significance value obtained is 0.00, recorded in the table and  $t_{table}$  is 1.70. The standard speculation test admits  $H_1$  if  $t_{count} > t_{table} (1-)$ , and rejects  $H_0$  if  $t_{count} < t_{table} (1-)$ , because  $t_{count} (7.432 > t_{table} (1.70))$  if the significance value of the paired T-test is less than 0.05 there is an effect and vice versa if the significance value is greater then there is no effect, then there is a large difference between the post-test and pre-test, test, in this way the  $H_0$  theory is rejected and the  $H_1$  speculation is acknowledged, the  $H_1$  articulation is "There is an effect of push up training on arm muscle strength in beginner rowing athletes in South Sumatra." Similar research on the effect of push-up exercises on arm muscle strength was also conducted by Dixon (2020) entitled The Effect of Push-Up Exercise on Increasing Arm Muscle Strength in Volleyball Extracurricular Students at SMPK Nurobo By obtaining data with the following results, namely the average initial test of arm muscle strength is 11.5, the final test average is 12.4 and  $t_{count} = 8.99$ . The results of subsequent calculations are compared with  $df: N-1 (10-1)$ , in t table at a significant level of 5%, it is obtained  $t_{count} 8.99 > t_{table} 1.833 (5\%)$ .

Thus the Alternative Hypothesis ( $H_a$ ) which states "Push-up exercise on arm muscle strength in volleyball extracurricular students at SMPK Nurobo" is accepted while the Hypothesis ( $H_0$ ) is rejected. Based on the research conducted and the results of the data analysis obtained, it can be concluded that push-up exercises can increase arm muscle strength in volleyball extracurricular students at SMPK Nurobo by 29%. Based on the results of this study, we can conclude that the push-up exercise is very effective in increasing the strength of the arm muscles in beginner rowing athletes in South Sumatra in carrying out the flexed arm hang test in order to strengthen the athlete's swing when rowing. These exercises and tests can become one of the routine activities so that the athletes have a maximum level of performance both during practice and during rowing competitions.

## Conclusion

Based on the research results and data analysis that has been obtained, it can be concluded that only push-up exercises can affect the increase in arm muscle strength in beginner rowing

athletes. The results of this study showed that only push up exercises can be used as a training method to increase arm muscle strength.

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