

Contribution of The Muscle Strength and the Strength of the Arm Muscle on the Ability of the 50 Meter Chest Style

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Abstract— This research is a kind of quantitative research using correlational analysis techniques followed by the aim of calculating the contribution of leg muscle strength and arm muscle strength to breaststroke swimming abilities of 50 m FIK UNP students. This research involved 30 male students. Data collection was carried out by measuring: (1) Swimming Test of 50 Meter Chest Style, (2) Leg Muscle Strength Used Half Squad Jump Test, and (3) Strength of Arm Muscles Measured with Stopwatch Through Pull-Ups Test for 30 seconds. The results showed a determinant coefficient with a significance level of $\alpha = 0.05$.

Keywords— *Leg Muscle strength, arm muscle strength, 50-meter chest style*

I. INTRODUCTION

Basically, human beings consist of body and spirit or body and soul which unite in a strong and intact. To achieve this balance can be fostered and developed through sports activities that are directed to the formation of healthy physical and mental high quality. All of these things can be learned through sports education, as explained in the Act.

"Sport national aims maintain and improve health and fitness, achievement, quality human being, instilling the value of morals, and morals noble, sportsmanship, discipline, cultivate and foster unity and the unity of the nation, strengthen the resilience of national, as well as lifting the dignity, maintain and honor of the nation" [1].

"Swimming is one branch of aquatic sports which is now popular in the middle - the middle. The development of swimming in sports communities Indonesia is increasingly accepted and loved by the community, even at school - school. This swimming branch has become there are subjects which must be taught by Physical Education teachers" [2].

Swimmers who have the muscles of the body that can be contracted in a row in the maximum and can maintain the technique pool with well be effective and efficient, it is said to be a swimmer that has the ability to pool style chest 50 meters of the well. In sports swimming style chest 50 meters, power the muscles can support the power buoyancy students when swimming. By reason that, factor conditions of physical and engineering to determine the ability of the ability of swimming style chest 50 meters.

But the reality on the ground, according to observations as a student researcher Nikken UNP see a lot of students who are less able to swim to quickly cover a distance of 50 meters. Most students look difficulty and less capable of doing 50-meter breaststroke swimming with quickly. At the time of the students swim with the distance traveled 30 meters, the students were able to swim with quickly. But at the time of taking a distance of 40 meters, the ability of swimming style chest 50 meters of the students began to slow and feel exhausted. Limbs foot as a means of driving from the back had started to slow to be moved and the arm as a means of driving forward of the front no longer strong draw water. Often occur errors in technique pool were performed, such as the position of the body no longer aligned with the surface of the water, breathing no longer regularly, the movement of legs and arms no longer effective in the use of force that occurred fatigue in almost all the muscles that contract in the movement of swimming and time journey which takes into not efficient. It's led to students overwhelmed in taking swimming style chest 50 meters.

Based on the above problems, researchers suspect that many problems have caused the low ability of 50 meter breaststroke swimming in students of the Faculty of Sport Science, Padang State University. Among other things, it is suspected that students lack training in swimming techniques because in general they only swim during lectures. Then, it is suspected that students do not yet have the main components of good physical condition that are specifically related to swimming in the breaststroke, such as leg muscle strength to perform kicking movements from the back and arm strength to maintain pedal strength. Even though they have passed a physical condition test while taking a graduation test to become a candidate for FIK UNP students. This was justified by Mr. Qalbi as a lecturer in FIK UNP who teaches swimming courses, that students only expect technical training during lecture hours and do not do physical condition exercises outside of lecture hours, so that when testing the ability to swim 50 meters quickly they often feel difficulty managing energy. Therefore, the

mentality of students in general is not ready to face the swimming test, especially for the ability to swim 50 meters breaststroke

Leg muscle strength and arm muscle strength are the physical conditions that are thought to be more dominant in determining the ability of 50m breaststroke swimming students, because for swimming 50m breaststroke strength of leg muscle strength and the frequency of arm movement is very much needed. Examining the need to support the success of 50 meter breaststroke swimming, then every student who takes a basic swimming course must have a physical condition that determines the level of success of one's 50 meter breaststroke swimming ability . By thus , researchers suspect factors condition physically that dominant role important and participate affect the ability of swimming style chest 50 meters is the strength of muscles limbs and power muscle arm

II. METHOD

The research belongs to the type of quantitative research using correlational analysis techniques followed by calculating the amount of contribution of independent variables to the dependent variable. The variables associated in this research is the strength of muscles limbs (X_1) and the strength of the muscle arm (X_2), while the dependent variable is the ability of swimming style chest 50 meters (Y). "Data collected from pre-test results and post-test will be processed by using procedure technique analyst statistics for prove whether the hypothesis is put forward can be accepted or rejected. Before the analysis of the t test used even more so first done test data normality, because t test can only be used to test the difference in mean, from sample data taken from populations that are normal"[3].

III. DISCUSSION

"breaststroke swimming is the style that is first learned by most people when they start learning to swim and is classified as the most effective style for long distances"[4]. In the swimming style of chest movement of the feet and hands can be driven in turns so that more economical to move in a range that far .

From the results of the analysis of statistical inferential obtained a picture that of the three hypotheses study that tested it empirically, the third hypothesis turned out to reject H_0 and receive H_a . This means that the three hypotheses that have contributed to the variable bound . Contributed leg muscle strength is significantly to the ability of 50-meter breaststroke swimming amounted to 29.68% and the remaining 70.32% is given by other variables, such as flexibility waist.

The research proves that leg muscle strength contributes to the 50 meter breaststroke swimming ability of FIK UNP students . That is, the variable leg muscle strength may contribute to students Nikken UNP in an effort capability swimming style chest 50 meters .

exercises to increase leg muscle strength elements should be given to students Nikken UNP in order to obtain the ability of swimming style chest 50 MINISTER were much better . The strength of arm muscles contribute as significantly to the ability of 50-meter breaststroke swimming amounted to 25.46% and the remaining 74.54% is given by other variables, such as spasticity.

Arm muscle strength is the ability of contraction of the muscles of the leg sleeves are involved in strong to seek the ability of swimming breaststroke 50 meters maximum . In order for the arm movements to produce strong thrust to move the body's speed quickly in order to strive for maximum 50 meter breaststroke swimming abilities , it requires arm muscle strength.

The results prove that arm muscle strength contributes to the ability to swim breaststroke 50 meters . That is, the variable arm muscle strength can contribute to the ability of the 50m breaststroke swimming . To achieve maximum performance in swimming, skeletal muscles are required to produce good muscle strength. Muscle strength is an important determinant of appearance in many sports activities. Therefore , the muscles as a producer of power through contraction, is very important in supporting the ability of swimming style chest 50 meters in maximum .

A student Nikken UNP was able to swim with the ability to pool style chest 50 meters require the arm muscle strength overall. If swimmers do not have the strength muscular arms are good , a student Nikken UNP not be able to maintain the speed of swimming up into the line *finish* [5] .

So, if the swimmer's arm has muscle strength, it will be able to avoid the rapid onset of fatigue in the use of strength in a relatively long time when swimming breaststroke 50 meters. This means a decrease in physical achievement can be avoided. High arm muscle strength needs to be sought by providing exercises that can improve the ability to swim breaststroke 50 meters . Therefore, exercises to improve muscle strength arm element must be given to the students Nikken UNP in order to obtain the ability of swimming style chest 50 MINISTER were much better , such as *pull-ups* , *push-ups* and exercise load . Leg muscle strength and arm muscle strength together contribute as significantly to the ability of 50-meter breaststroke swimming amounted to 44.5% and the remaining 55.5% is given by other variables, such as waist flexibility and pliability.

In accordance with the results of testing hypothesis one and two looks that power muscle limbs and power muscular arms give contribution to the ability of swimming breaststroke 50 meters. High levels of leg muscle strength and arm muscle strength will be able to streamline the movement, streamline the time and energy of FIK UNP students in the ability to swim breaststroke 50 meters .

The results prove that the strength of the leg muscles and the strength of the arm muscles together contribute to the ability to swim breaststroke 50 meters . That is, variable leg muscle strength and arm muscle strength can contribute to the ability of swimming 50 meters breaststroke .

In addition to the need for the strength of muscles limbs and power muscle arm , the stability of the techniques are also required . Stabilization of the correct technique can only be obtained through exercises with the use of appropriate training methods and load training. The end of the gradual training process will produce a stable and steady technical skill and can be applied in a variety of situations and conditions.

More further , a collaboration between the leg muscle strength and arm muscle strength that can be produced from the activities of the exercise in order to create the ability of 50-meter breaststroke swimming to the fullest . Through training activities it is likely that FIK UNP students who have special physical ability abilities and are trained and are quick to master the skills being taught.

From the explanation above, it means that training is one of the absolute requirements that must be followed by students in accordance with the training program provided by the trainer to be able to carry out movements efficiently, both with respect to the use of time, space, energy and everything that affects the achievement of optimal results in the 50 meter breaststroke swimming ability. Motion in sports must be trained, even must be done in the right number of repetitions with various methods and forms of exercise to get quality movement and can be realized properly if supported by the ability of good physical conditions as well.

In accordance with the theories that have been put forward , leg muscle strength and arm muscle strength are factors that influence the ability of swimming 50 meters breaststroke . By reason that , at the coach swimming can improve the elements of strength muscular limbs and the strength of the muscle sleeves are together -Same to improve the ability of swimming breaststroke 50 meters.

IV. CONCLUSIONS

Based on the results of the study conclusions can be put as follows:

The strength of muscles limbs associated with the ability of swimming style chest 50 meters. This can be seen if the strength of the leg muscles of students is high, then the ability to swim breaststroke 50 meter FIK UNP students tends to increase.

High arm muscle strength of students, the ability to swim 50m breaststroke UNP FIK students tends to increase.

Leg muscle strength and arm muscle strength together contribute as significantly to the ability of 50-meter breaststroke swimming student UNP Nikken by 45.95%.

Based on the conclusion above, the writer can provide suggestions that can help overcome the problems encountered in getting the ability to swim 50 meters breaststroke , namely:

For trainers to train the elements of leg muscle strength and arm muscle strength by warming up before starting the exercise and training the dominant muscles

For athletes to be able to improve their ability to swim breaststroke 50 meters by doing exercises systematically and continuously.

For researchers who want to continue this research in order to make this research as information material and examine with a larger population or sample and in different areas.

REFERENCES

- [1] Undang-undang Republik Indonesia Nomor 3 Tahun 2005, tentang Sistem Keolahragaan Nasional, Jakarta: Diperbanyak oleh Biro Humas dan Hukum Kementerian pemuda dan olahraga Republik Indonesia. 2009, pp. 23.
- [2] D. A. Putra and W. Witarsyah, "Pengaruh Latihan Dayatahan Kekuatan Otot Lengan dan Otot Tungkai Terhadap Kecepatan Renang Gaya Dada 50 Meter", *jpdo*, vol. 2, no. 1, pp. 51-56, Dec. 2019.
- [3] A. Fardi, & A. A. Yudi, "Silabus Matakuliah Statistik Lanjutan 2". Padang: Fakultas Ilmu Keolahragaan. 2010, pp. 25.
- [4] D. Haller. "Belajar Renang". Bandung: Pionir Jaya. 1982, pp. 45.
- [5] C. Marzuki. "Sains Dalam Kepelatihan Renang, Terjemahan". Padang: Dibiayai oleh Dana SP4 Jurusan Pendidikan Olahraga FIK UNP. 2004, pp. 59.