

The Relationship between Limb Muscle Power and Backstroke Swimming Ability

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Abstract

This study aims to determine the relationship between leg power and the ability to swim backstroke students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo. This research is correlational description research. The research subjects used were 24 students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo and then given tests and measurements on each sub-variables. The research instrument is leg power and backstroke swimming ability. The data analysis technique uses tests and measurements, namely correlation coefficient tests, prerequisite tests, normality tests, and linearity tests. The results showed a relationship between leg power and backstroke swimming ability with a r -hitung of 0.481 and a r -table of 0.404. Because r_{count} is greater than r_{table} ($0.481 > 0.404$), this means that there is a relationship between leg power and the ability to swim backstroke by students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo. Thus the alternative hypothesis is accepted.

Keyword: leg power, backstroke swimming

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INTRODUCTION

Aquatic is a form of water activity that is included in the lecture. In the implementation of aquatic classes, exceptional facilities and infrastructure are needed, such as swimming pools, buoys, rescue tools, etc. The lecture process can be carried out quickly in the room or the field. At the same time, the aquatic aspect requires water or a pond in the learning process. Aquatic learning includes: 1) water orientation, 2) water entry, 3) breath control, 4) buoyancy, 5) arm propulsion, 6) leg action, and 7) combined movement (Keshtidar, Ghandehari, and Harati 2017).

Swimming has been divided into several kinds of movements or styles. There are four types of swimming commonly used: crawl style, breaststroke, backstroke, and dolphin style (Nugroho and Fifukha Dwi Khory 2020). Swimming is a complete form of activity that combines various aquatic activities in the form of fashion. The

many styles in the sport of swimming also make it possible for someone to train them separately according to the characteristics of the type.

Backstroke is a swimming posture with the back facing the water (Ishak, Hasmarita, and Afandi Harja 2020). The movement of the legs and arms is similar to the freestyle, but the body is prone to the water. Hands move to the waist alternately with a pedaling motion. The basic backstroke swimming technique is divided into foot movements, hand movements, posture and body position, breathtaking, and coordination of backstroke swimming movements.

The results of observations made by researchers on the swimming ability of students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo stated that the percentage of students who had mastered the backstroke was smaller than students who had not got the backstroke. The student already has the correct technique in both limb movements, hands, breath, and body coordination. In addition, students who already can swim backstroke in a suitable category are also indicated to have the leg power to support the body forward speedwell, namely the better the leg power, the better the backstroke swimming ability, which is used to push the body when in the water in style swimming. Back. However, this ensures that these students have good skills in other sports practices. Many students who have good leg power also have good abilities in additional physical education lessons, including long jump, high jump, and so on, have achieved maximum results and are expected.

Previous research stated a relationship between leg power and the ability to swim breaststroke elementary school students (Bangkit Wahyudi 2013). This is the background of this study with the difference in the dependent variable, namely the backstroke swimming, which is different from breaststroke. This study also has a striking contrast, namely the use of a sample of sports students.

METHOD

This study uses the correlational method (Ramadan & Juniarti, 2020). The population in this study were 31 students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo who took the Swimming Practice Theory course. The research sample was taken using the purposive sampling method with the characteristics of the male gender, active students, and willingness to follow all

research provisions. The sample consisted of 24 students. The research instrument used a vertical jump test. Another instrument uses the backstroke swimming ability (Amin 2018).

The data obtained from the results of tests and measurements are then processed and analyzed. From the results of this data analysis and processing, conclusions can be drawn. Before conducting a thorough data analysis, a descriptive research description of leg muscle power and backstroke swimming is presented. At the same time, the previous hypothesis testing was carried out with normality and linearity tests.

RESULTS AND DISCUSSION

Results

The results of descriptive statistical analysis of leg muscle power in this study can be seen in the following table:

Table 1 Descriptive Statistical Analysis of Power of the Limb Muscles

Variable	Max	Min	Mean	Median	Mode	St. Dev
Leg muscle power	66.05	37.34	50.86	49.31	44.52	9.95

The following is a table of the frequency of leg muscle power as follows:

Table 2 Limb Muscle Power Frequency

No	Interval Class	Frequency	Percentage (%)
1	37.34 – 42.13	7	29.17
2	42.14 – 46.93	4	16.67
3	46.94 – 51.73	4	16.67
4	51.74 – 56.53	1	4.17
5	56.54 – 61.33	3	12.50
6	61.34 – 66.13	5	20.83
Total		24	100

The results of the descriptive statistical analysis of backstroke swimming in this study can be seen in the following table:

Table 3 Descriptive Statistical Analysis of Backstroke Swimming

Variable	Max	Min	Mean	Median	Mode	St. Dev
Backstroke swimming	60.67	26.15	50.01	52.73	26.15	0.14

The following is a table of the frequency of backstroke swimming as follows:

Table 4 Frequency of Backstroke Swimming			
No	Interval Class	Frequency	Percentage (%)
1	26.15 – 31.90	1	4.17
2	31.91 – 37.66	1	4.17
3	37.67 – 43.42	4	16.67
4	43.43 – 49.18	3	12.50
5	49.19 – 54.94	5	20.83
6	54.95 – 60.70	10	41.67
Total		24	100

The normality test was tested on each research data, namely leg muscle power and backstroke swimming ability. The normality test in this study used the Chi-Square formula. The rule used to determine whether a distribution is normal or not is if $p > 0.05$, the distribution is declared normal, and if $p < 0.05$, the distribution is said to be abnormal $\chi^2 \text{ count} < \chi^2 \text{ table}$. The results are as follows:

Table 5 Normality Test Results				
Data	$\chi^2 \text{ count}$	df	$\chi^2 \text{ table}$	Description
Leg muscle power	3.500	10	18.31	Normal
Backstroke Swimming	0.000	23	35.17	Normal

The calculated χ^2 price of all variables is less than the table χ^2 price, so the hypothesis that the sample comes from a normally distributed population is accepted. The conclusion is that the normality of the distribution is met.

Accept or reject the hypothesis by comparing the value of F_{ount} with F_{table} at a significance level of 0.05 and using or comparing the p-value with 0.05 at a significance level of 0.05. The F price is then consulted with the table price with a significant level of 0.05. The regression is said to be linear if $F_{\text{count}} < F_{\text{table}}$. On the other hand, it is said to be non-linear if $F_{\text{count}} > F_{\text{table}}$. The results of the linearity test can be seen in the following table:

Table 6 Linearity Test Results					
Data	Account	df1	df2	F_{table}	Description
Leg muscle power	1.559	8	13	2.77	Linear

The account is more minor than F_{table} or $p > 0.05$ at a significance level of 0.05, then the hypothesis stating the variance of the existing variables is the same is

accepted. Thus it can be concluded that the population variance of leg muscle power is linear.

Accepting and rejecting the hypothesis is to compare the results, r_{count} with r_{table} from each variable at a significance level of 0.05. If $r_{\text{count}} > r_{\text{table}}$ 0.05. Then there is a significant relationship between these variables. Meanwhile, if $r_{\text{count}} < r_{\text{table}}$, it indicates that there is no significant relationship between these variables.

The results of the analysis of multiple correlation coefficients. Regarding the relationship between leg muscle power and breaststroke swimming ability, it can be seen in the following table:

Table 7 Multiple Correlation Coefficient Results

Variable	N	Average	r_{count}	r_{table}
Leg muscle power	24	50.86	0.481	0.404
Backstroke Swimming		50.01		

Based on these results, it means that there is a relationship between leg muscle power and the effects of backstroke swimming in students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo.

Discussion

The importance of leg muscle power when performing movements in the backstroke swimming number is because at the beginning of backstroke swimming, to reach the distance as quickly as possible and accelerate the results achieved, leg muscle power can lead to more profound strength in swimming as soon as possible. Therefore, it can be concluded that leg muscle movements require strength when performing activities because leg muscle power is one of the physical components that have a very dominant role in every explosive action of the body. Leg muscle power is very influential on backstroke swimming because backstroke swimming uses leg movements to achieve results as quickly as possible.

The magnitude of the influence between leg muscle power on the ability to swim backstroke often occurs when mistakes are made in every backstroke swimming movement. The results are not as expected. Errors that often arise include: a) pedaling too wide, b) elbows going down too fast, c) pedaling too far backward, d) irregular breathing, e) body and head lifted, f) head into the water, g) the sole turns inward, pushing the water with the back of the foot.

CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that: There is a significant relationship between leg power and backstroke swimming ability of students of Pendidikan Kepelatihan Olahraga Universitas Negeri Gorontalo with a correlation coefficient of 0.481 with a r_{table} value of 0.404, ($r_{count} > r_{table}$). Thus the alternative hypothesis is accepted.

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