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Relationship Between Reaction Speed and Arm Muscle Explosion With Rowing Ability Of Junior Athletes Kutai Kartanegara

Risky Putra Cahyadi[1]
[1]Physical Education Study Program, Mulawarman University
Jupri [2]
[2]*Physical Education Study Program, Mulawarman University*
Nurjamal[3]
[3]Physical Education Study Program, Mulawarman University
Didik Cahyono[4]
[4]Physical Education Study Program, Mulawarman University

riskyputracahyadi716@gmail.com didikcahyono86@gmail.com

Abstract

This researcher aims to find out whether there is a relationship between reaction speed and arm muscle explosive power with the 50-meter rowing ability of Junior PODSI athletes in Kutai Kartanegara Regency 2022. The type of research used is correlation research with two independent variables, namely reaction speed and arm muscle explosive power, and with one the dependent variable is the ability to paddle 50 meters. The population of this study was junior athletes from Podsi Kutai Kartanegara Regency with a total of 15 people. The sampling technique used is Total Sampling. The data collection technique used a reaction speed test with a ruler drop test, an arm muscle explosive power test with a tow-hand medicine ball put/chest pass test. Data analysis techniques were processed using the SPSS Version 21 program.

Based on the results of data analysis, the following results were obtained: (1) There is a relationship between reaction speed and the ability to paddle 50 meters with a value of Recount = 0.682 > Rtable with a significance of 5% = 0.0514. (2) There is a relationship between the explosive power of the arm muscles and the ability to paddle 50 meters with a value of Recount = 0.711 > Rtable with a significant 5% = 0.514. (3) There is a relationship between reaction speed and arm muscle explosive power with the ability to paddle 50 meters with a value of Fount

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15.405 > Ftable at a significant level of 5% and degrees of freedom 2:12 which is 3.885 and Recount ($x_1.x_2$) = 0.848 > R table (0.05)(15) = 0.514.

Then the hypothesis states "There is a relationship between reaction speed and explosive power of the arm muscles with the 50-meter rowing ability of junior pods athletes in Kutai Kartanegara district.

Keywords: ***Reaction speed, arm muscle explosive power, 50-meter rowing, PODS***

INTRODUCTION

Sport is a physical training activity, namely physical activity to enrich and improve basic movement abilities and skills as well as movement skills (sports branches). This activity is a form of approach to aspects of physical well-being or physical health, which also means dynamic health, namely health accompanied by the ability to move which fulfills all the demands of movement in daily life. This opinion is supported by RI Law No. 3 of 2005 concerning the National Sports System, which states in Article 1 point 4, that: what is meant by sport is all systematic activities to encourage, foster, and develop physical, spiritual, and social potential. Physical, spiritual, and social are inseparable unity. To improve the development of good and correct achievements, coaching must begin at a young age who have potential abilities or talents so that optimal quality of potential and achievement can be created in all sports.

The background of the title that the researcher took was a problem that was observed from the results of observations when the researchers carried out rowing exercises. From the results of observations, the problems that often occur in junior pods athletes in Kutai Kartanegara district are reaction speed and explosive power of the arm muscles with poor rowing ability because they are still juniors. as well as a lack of exercise.

Speed of reaction and explosive power of arm muscles or power are also physical components that are very necessary for rowing and one of the physical components plays a very important role among several other physical components. According to Suharno HP (KONI Pusat, 1993, p. 33) that the factors Specific determinants of reaction speed are: depending on the nervous system, the orientation of the situation faced by the athlete, the sharpness of the senses in receiving stimuli, the speed of movement and the explosiveness of the muscles. So it can be concluded that reaction speed is the individual's ability to make movements from the start of the stimulus to the end of the response in the shortest possible time.

Arm muscle explosive power in rowing also has a very important role to gain forward

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movement in rowing. Therefore, in a simple understanding, balance and arm power contribute to kayak 1 rowing speed for a distance of 50 meters. Speed is the shortest time it takes to cover a certain distance. To judge the speed, the distance traveled must be far enough, so that there is no mistake in the assessment. Speed is influenced by: flexibility, body type, age, physical activity, gender, and temperature (Depkes 1996). The definition of explosive power (power) according to Hamidsyah Noer (Department of Education, 1993, p. 140) is the ability of a muscle or group of muscles to resist loads/resistance at high speed in one movement. Based on the description above, it can be concluded that explosive power is the ability of the muscles to resist loads/resistance at high speed in one movement, so to be able to perform optimal explosive power a combination of strength and speed is needed.

LITERARY REVIEW

In general, rowing itself cannot be determined by which nation first discovered the sport. This is because the history of rowing has existed from ancient times to modern times, where in ancient times humans were not familiar with writing, so it is very difficult to determine with certainty which country this rowing sport originated from. This rowing may have been known since ancient times because before using a motor to propel a boat, people used paddles as a tool to move or run a boat, it's just that in ancient times there were no competitions like there are now.

The history of the kayak goes back to Siberians building boats out of exposed wooden frames tied together with rope or plant rope and covered with seal skins sewn together. An embryo like this is called "umiak". They use the umiak as a means of sea transportation for transporting goods and people, as well as hunting whales. Over time, the Inuit modified the umiak to become smaller and lighter. The tribes at the North Pole initially made kayaks from objects that were easy to find around them, such as wood, animal skins, and bones.

This type of rowing sport was first introduced to Indonesia by the Dutch before World War II. At that time this type of sport was only known in big cities such as Jakarta, Semarang, and Surabaya. The existing clubs were still privately owned by the Dutch, but gradually Indonesians were allowed to become members. The famous rowing club at that time was "RoliVereniging Brantas" in Surabaya, which later spawned the PORAS Rowing Club, Surabaya. The canoe branch in Indonesia grew out of traditional rowing competitions. In Indonesia, several types of traditional boat races are known, such as bidar in South Sumatra, jukung in Central Kalimantan and South

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Kalimantan, lepa-lepa in South Sulawesi, then Kole-Kole in Maluku. The technique of rowing a traditional Indonesian boat bears a lot of resemblance to that of the British.

Rowing is one of the branches of water sports that is developing in Indonesia, especially in Kutai Kartanegara (Kukar) Regency, East Kalimantan provincial administrators have facilitated this sport by providing rowing training whose training center is in Podsi Kukar and starting to have young, talented athletes. Rowing sports development has now become an important part of improving achievement. sport, physical, technical, tactical, and mental abilities are needed

Training is a systematic effort to improve physical quality and the goal is to improve sports performance. In Indonesia, training camps are divided into each region or province that holds regional training camps. Rowing is certainly no stranger to the community because this activity is generally carried out over the sea or river. However, this sport can be done in a team or alone. Rowing is a branch of sport using paddles and boats that take place on rivers, lakes, or seas so that it also has various strokes to do this sport. The concept of rowing is also there, such as going forward or backward to turn the boat to the right and the left, of course, this can take a lot of energy to reach the goal of the finish line.

Reaction

Speed Speed is a very important component of physical condition. Speed is the ability to fight different resistance of motion with the highest possible speed (Marani, 2016).
Therefore it is very necessary to have training methods that condition athletes in real match situations where athletes are required to make the fastest possible movements in a short time (Marani, 2016). It can be concluded that reaction speed is where the concentration is to receive several types of stimuli that come. For example, how is an athlete, concentrated and ready to act while waiting for a ball whose direction cannot be ascertained? Thus, the athlete's reaction speed is required to be able to choose and make a decision quickly (Nasriani & Mardela, 2019).

Reaction speed is also one of the fine motor movements and the visual component in the concept of visual-motor coordination is described as an ability that includes finger dexterity, motion sequencing, and fine motor speed and accuracy (Tanto & Sufyana, 2020). This means that fine motor is part of sensorimotor activities. which involves the ability to coordinate eye-hand in performing sequential, precise, fast, imitative, and tracing-like movements. (Tanto & Sufyana, 2020). It can be concluded that reaction speed is where the concentration is to receive several types of stimuli that come. For example, how does an athlete concentrate and be ready for action

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when rowing to start and control balance to reach the finish line? Thus, the athlete's reaction speed is required to be able to choose and make a decision quickly.

Arm Muscle Explosive Power Muscle

Explosive power is the ability of a muscle or group of muscles to work explosively, influenced by the strength and speed of muscle contraction. Explosive power is a person's ability to use maximum power deployed in the shortest possible time, in this case, it is stated that power is equal to strength times speed (Dimyati, 2016).

The explosive power of the arm muscles is also one of the gross motor movements. Gross motor skills are a person's ability to use large muscles by using their whole body or part of their body correctly, taking into account the stages of motor learning, so that a person can carry out the desired movement, such as eye and foot coordination and eye and hand coordination (Alawiyah, 2014).). So what is meant by the explosive power of the arm muscles in this study is the ability of a person to use a group of arm muscles to produce maximum strength when doing rowing strokes in rowing sports, so that they can go fast so that it is difficult to be chased by opponents.

Frame of Mind

In rowing, where good physical quality is required in the movement, the physical components involved in rowing are the speed of reaction and explosive power of the arm muscles. Based on the discussion above, a frame of mind can be formulated as follows:

Arm muscle explosive power is very important and necessary in rowing, arm muscle explosive power is also included in one of the physical components of rowing, namely power, strength, and endurance to do strokes, pull, and push, and as a determining factor for the speed of a boat with a distance of 50 meters to reach the finish line as quickly as possible.

In rowing, there are physical components that are interconnected and cannot be separated from the 50-meter rowing ability, namely reaction speed and arm muscle explosive power. Because in a reaction speed, there must be explosive power to produce a push and pull stroke which plays a very important role in rowing to reach a finish line as quickly as possible.

So it can be concluded that the relationship between reaction speed and arm muscle explosive power on the ability to paddle 50 meters is very large and is also a physical component that plays an important role in rowing and is interconnected and cannot be separated.

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RESEARCH METHODS

This type of research is correlational research. Correlation research is a study that aims to clarify the relationship between variables, correlation research is a study that involves at least two variables. The goal is to find out how big the relationship is if there is, or whether there is a relationship. According to Suryabrata (1994:24) is to detect the extent to which variations in a factor are related to variations in one or more other factors based on the correlation coefficient.

Data Collection Techniques The

method of data collection in research is an important factor because it is directly related to the data that will be used in the research. The data collection method used in this study is to use a pre-test. The steps for collecting data in this study were as follows: all test participants took a reaction speed measurement test using the *ruler drop test* and an arm muscle explosive power measurement test using the *tow hand medicine ball put/chest pass test*, then carried out a 50-rowing ability test. meters using a *stopwatch.*

Data Analysis Techniques

After the data was collected, to prove the truth in this study order to be able to find out the relationship between the two variables, the entire series of data analyses used by this researcher used the SPSS statistical data processing program.

1. Descriptive
   the analysis aims to obtain an overview of the researcher's data based on variable data. obtained during the research.
2. Prerequisite Test Analysis
   a. of Normality
      Test Normality test is used to determine whether or not the distribution of data is normal in a group of data or variables. The examiner uses the Kolmogorov-Smirnov test. Criteria in a data normality test demand Tri Cahyono if the value of Sig. (P) or the probability value is greater than α (0.05) it can be concluded that the distribution is normal. (Tri Cahyono, 2015: 38)
   b. Linearity
      Test Linearity test was carried out aiming to find out whether the relationship between independent and dependent variables is linear or not. Linear

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means a relationship like a straight line. The criteria for deciding on the linearity test by comparing the sig. deviation from linearity. If the sig. deviation from linearity is more than 0.05, so there is a linear relationship between the two variables. (Wayan Widiana & Putu Lia Muliani, 2020: 53)

3. Hypothesis Test

To find out the coefficient of each predictor against the criterion and calculate the multiple relationships between the predictor and criterion with the following steps:

a. Calculating the correlation coefficient of each predictor

In calculating the correlation coefficient of each -each predictor of the criterium uses a personal correlation test. Decision making according to Singgih Santoso if the probability <0.05 then the relationship is significant (Singgih Santoso, 2001: 152). And when compared with Rtable, if Recount> R_{table}, the relationship is significant (Setyo Budiwanto, 2017: 70).

b. Calculating multiple relationships

In calculating the coefficient of multiple relationships using multiple regression analysis. The F test decision-making criteria, if Fount> Ftable or sig. <0.05, then the independent variable and the dependent variable have a significant relationship, and vice versa if Fcount <Ftable or sig. > 0.05, the relationship between the independent variable and the dependent variable is not significant (Imam Ghozali, 2016:96). To find Ftable using the formula (k: NK) where "k" is the number of independent variables and n is the number of respondents.

RESULTS AND DISCUSSION

Descriptive

Analysis This descriptive analysis aims to get an overview of the research data. The analysis was carried out to analyze reaction speed data, arm muscle explosive power, and 50-meter rowing ability data.

Table 1. Summary of Descriptive Data Results

Statistical Value	N	Mean	SD	Range	Min.	Max.
Reaction Speed	15	2.93	1.163	4	1	5
Arm Muscle	15	33.60	5.369	20	22	42

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Rowing Ability 50 M	15	281.47	51.792	128	206	334

From the table above, the data for each variable can be explained as follows:

a. Reaction speed data , obtained an average value of 2.93, a standard deviation of 1.163, a minimum value of 1, a maximum value of 5, and a range of 4.
b. Data on the explosive power of the arm muscles, an average value of 33.60, a standard deviation of 5.369, a minimum value of 22,
c. a maximum value of 42 orange 20.
d. Data on rowing ability of 50 meters, obtained an average value of 281.47, a standard deviation of 51.792, a minimum value of 206, a maximum value of 334, and a range of 128

Descriptive Results Categorizing Reaction Speed and Arm Muscle Explosive Power With 50 Meter Rowing Ability Each Variable.

The categorization of each variable aims to describe the level of achievement of each research variable. To know the categorization of each variable, it can be seen in the frequency distribution table below:

1. Categorization of reaction speed for Junior PODSI rowing athletes, Kutai Kartanegaa Regency

Table 2. Category of reaction speed

No.	Reaction Speed	Category	F
1.	< 7.5 cm	Very good	0
2.	7.5 - 15.9 cm	Good	0
3.	15.9 - 20.4 cm	Moderate	2
4.	20.4 - 28 cm	Poor	13
5.	> 28 cm	Very	0
Total			15

Source: (Abdul Narlan & Dicky Tri Juniar, 2020:138)

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When displayed in graphical form the results of categorizing the reaction speed of PODSI Junior rowing athletes in Kutai Kartanegara Regency. Can be presented below. Source: (Processed From Research Results Using Microsoft Excel 2010)

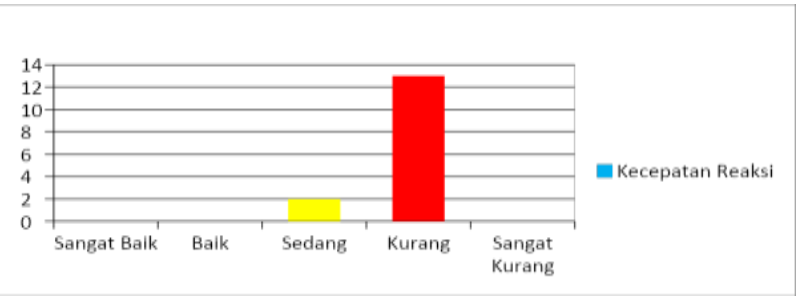


Figure 1. Graph of Reaction Speed

Based on Figure 8. Graph of Reaction Speed Categorization Results of PODSI Junior rowing athletes in Kutai Kaertanegara Regency with data totaling 15 samples. Each categorization data includes 0 very good athletes, 0 good athletes, 2 moderate athletes, 13 poor athletes, and 0 very poor athletes.

2. Categorization of Arm Muscle Explosive Power of Junior Rowing Athletes PODSI Kutai Kartanegara Regency

Table. 3. Arm Muscle Explosive Power Category

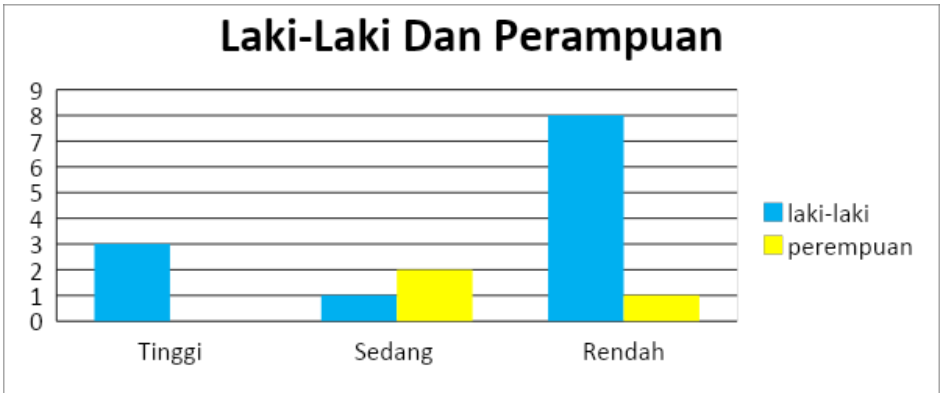
No	Value of Arm Muscle Explosive Power	Category	F
Male			
1.	> 440 meters	High	3
2.	370 - 440 meters	Medium	1
3.	< 370 meters	Low	8
Female			
1.	> 300 meters	High	0
2.	250 -300 meters	Medium	2
3.	> 250 meters	Low	1
Total			15

Source: (Abdul Narlan & Dicky Tri Juniar, 2020:114)

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When displayed in graphical form the results of the categorization of arm muscle explosive power for PODSI Junior rowing athletes, Kutai Kartanegara Regency. presented



Each data category of male athletes with categories as many as 3 high athletes, 1 medium athlete, and 8 low athletes. Each data categorizes female athletes with a category of 0 high athletes, 2 moderate athletes, and 1 low athlete.

3. Categorizing the ability to paddle 50 meters for PODSI Junior athletes in Kutai Kartanegara Regency

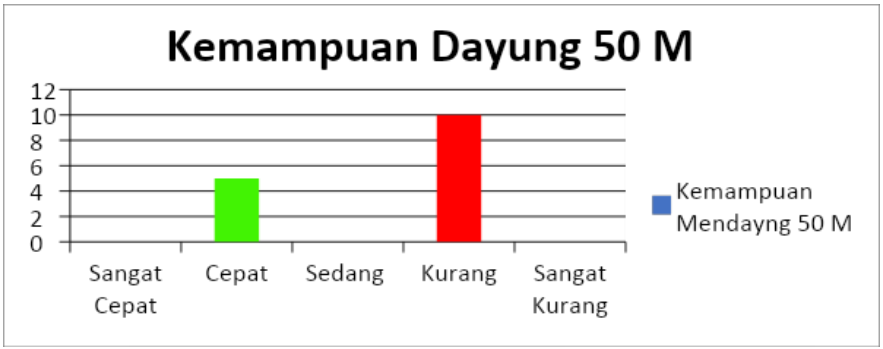
Table 4. Category 50-meter rowing ability

No	Value 50 m rowing ability	Category	F
1.	< 20.05 seconds	Very fast	0
2.	20.06 - 24.60 seconds	Fast	5
3.	24.60 - 29.15 seconds	Moderate	0
4.	29.15 - 33, 70 seconds	Less	10
5.	> 33.70 seconds	Very less	0
Total			15

Source: (Processed from research results)

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When displayed in graphical form the results of the 50-meter rowing ability categorization of PODSI Junior athletes in Kutai Kartanegara Regency. Can be presented below.



Source: (Processed From Research Results Using Microsoft Excel 2010)

Figure 3. Graph of Results for Categorizing
50-Meter Rowing Ability

Based on Figure 10. Graph of Results for Categorizing 50 Meter Rowing Ability for PODSI Junior rowing athletes in Kutai Kaertanegara Regency with data totaling 15 samples. Each categorization data with a category of 0 athletes who are very fast, 5 fast athletes, 0 moderate athletes, 10 athletes who are less, and 0 very lacking athletes.

Normality

Test Normality test is a prerequisite analysis test or classical test used in parametric statistical data analysis. To find out whether the data in this study were normally distributed, therefore a test was carried out using the Kolmogorov-Smirnov test.

Table 5. Summary of Normality Test

Variable	KS-Z	Probability	Description
Reaction Speed	1.073	0.199	Normal
Arm Muscle	0.450	0.987	Normal
Ability to Row 50 Meters	1.242	0.091	Normal

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Reaction Speed

Based on the results above, the Kolmogorov Smirnov results calculate 1.073 with a probability of 0.199. Because the probability is 0.199 > 0.05, it is normally distributed.

Arm Muscle Explosive Power

Based on the results above, the Kolmogorov-Smirnov results were obtained by calculating 0.450 with a probability of 0.987. Because the probability is 0.987 > 0.05, it means that it is normally distributed.

The ability to paddle 50 meters

Based on the above results, the Kolmogorov Smirnov count is 1.242 with a probability of 0.091. Because the probability is 0.091 > 0.05, it is normally distributed.

Linearity Test Linearity

the test is to find out the form of the relationship between the independent variable and the dependent variable, if the sig. deviation from linearity > 0.05, then there is a linear relationship between the independent variable and the dependent variable if the sig. deviation from linearity < 0.05, so there is no linear relationship between the independent variables and the dependent variable.

Table 6. Linearity Test of the

Variable	Sig	Alpha	Ket
X_1 Y	0.881	0.05	Linear
X_2 Y	0.878	0.05	Linear

a. X_1 Y

Based on the results of the linearity test above, it is known that the sig. of 0.881 > 0.05, it can be concluded that there is a linear relationship between the speed of action and the ability to row 50 meters.

b. X_2 Y

Based on the results of the linearity test above, it is known that the sig. of 0.878 > 0.05, it can be concluded that there is a linear relationship between the explosive power of the arm muscles and the ability to row 50 meters

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the correlation coefficient of each predictor

Table 7. Summary of Simple

No.	Analysis	Hypothesis	Results	.	Testing
Calculating	correlation	0.628	0.514	0.005	Significant
2.	X2 Y	0.514	0.003	Significant	Simple

1) correlation between reaction speed and rowing

.0.711 ability0.005 <0.05 and when compared with R_{table} Recount 0.628 > R_{table} 0.514 which means there is a significant relationship between reaction speed and the ability to paddle 50 meters PODSI Junior Kutai Kartanegara district. Thus the hypothesis "There is a relationship between the speed of reaction and the rowing ability of the junior Podsi in Kutai Kartanegara Regency. Be accepted.

2) Kartangara Regency

, Kutai. 0.003 <0.05 and if you compare it with R_{table} Recount 0.711 > R_{table} 0.514 which means there is a significant relationship between the explosive power of the arm muscles and the ability to paddle 50 meters in the Junior Podsi, Kutai Kartanegara Regency. Thus the hypothesis "There is a relationship between the explosive power of the arm muscles with the ability to paddle 50 meters for the Junior Podsi in Kutai Kartanegara Regency," is accepted.

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Multiple regression analysis

Table 8. Results of Multiple Regression Analysis Model Summary

Variable	R	Sig	Description
X_1, X_2, Y	0.848	> 0.05	Strong

Based on the table above, a multiple correlation values of Recount 0.848 and > 0.05 singgih Santoso states that if R above > 0.05 then the relationship can be said to be strong (Singgih Santoso, 2001: 171).

Table 9. Results of Multiple Regression Analysis

Model	SOS	Df	MS	F	Sig
Regression	27,339	2	13,670	15,405	0,000
Residue	26,394	12	77,200		
Total	53,733	14			

Note: SOS: Sum of Squares
Df: Degrees of Freedom
Mean Square: average squared
F = regression value.

From the coefficient results above, it can be concluded that the value of Fount is 15,405 and the significance level is 5%, the value of Fable is 3,806. So Fount (15,405) > Fable (3,806) and sig 0.000 < 0.05. So it can be concluded that the results are significant. Thus the hypothesis "There is a joint relationship between the speed of reaction, the explosive power of the relaxed muscles, and the ability to paddle 50 meters Podsi junior Kutai Kartanegara district. "Be accepted. The results of the relationship analysis that has been stated above, will be studied further in the discussion chapter. The following is the explanation:

1. **The relationship between reaction speed and 50-meter rowing ability**

   Based on the results of the analysis in the framework of hypothesis testing, results were obtained showing that there was a positive relationship between

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reaction speed and 50-meter rowing ability in Junior PODSI athletes in Kutai Kartanegara Regency with a Recount of 0.682 > from Table 0.514 so that Ho is rejected which states that there is no relationship between the two variables, meaning that if the reaction speed is increased it will potentially increase rowing speed.

2. **The relationship between the explosive power of the arm muscles and the ability to paddle 50 meters**

   Based on the results of the analysis in the context of testing the hypothesis, results were obtained showing that there was a positive relationship between the explosive power of the arm muscles and the ability to paddle 50 meters in Junior PODSI athletes in Kutai Kartanegara Regency with a Recount of 0.711 > from Table 0.514 so that Ho is rejected which states that there is no relationship between the two variables, meaning that if the explosive power of the arm muscles is increased, it has the potential to increase rowing speed.

3. **The joint relationship between reaction speed and arm muscle explosive power with 50-meter rowing ability.**

   Based on the results of the analysis in the framework of testing the hypothesis, results are obtained which show that there is a positive relationship between reaction speed and rural arm muscle explosive power together with rowing ability. 50 meters in PODSI Junior athletes in Kutai Kartanegara Regency with a Fount of 15,405 > from the Fable at a significant level of 5%, namely 3,806 and Recount of 0,848 > 0.05 so that Ho is rejected which states that there is no relationship between the two variables, meaning that if the reaction speed and the explosive power of the arm muscles are increased together, so it has the potential to increase rowing speed.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the descriptive analysis, the authors conclude this study, namely: There is a significant relationship between reaction speed and the 50-meter rowing ability of junior athletes in PODSI Kutai Kartanegara Regency 2022. There is a significant relationship between the explosive power of the arm muscles and the rowing able city 50-meter junior athlete PODSI Kutai Kartanegara Regency 2022. There is a jointly significant relationship between

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reaction speed and arm muscle explosive power with the 50-meter rowing ability of junior athlete PODSI Kutai Kartanegara Regency 2022

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