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The Relationship Between Leg Muscle Strength, Arm Muscles and Confidence With 50 Meter Freestyle Swimming Speed

Johanna Matitaputty

Universitas Pattimura, Ambon, Indonesia

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Abstract

The purpose of this study was to find out the relationship between leg muscle strength and self-confidence, arm muscle strength and self-confidence, as well as leg muscle strength arm muscle strength and self-confidence with swimming speed 50 meters freestyle.The research sample consisted of 30 male students. In accordance with the formulation of the problem and the objectives to be achieved, the research method used in this study is a quantitative method with correlation and descriptive techniques, namely researchers will see the relationship between one variable and another. Based on the results of research data analysis and discussion, the results of the study can be concluded as follows (a) there is a relationship between leg muscle strength and swimming speed 50 meters freestyle of 3.61 (b) there is a relationship between arm muscle strength and swimming speed 50 meters freestyle of 3.47. (c) there is a relationship between self-confidence with a swimming speed of 50 meters freestyle of 4.95 with such a relationship between muscle strength of the limbs muscle strength of the arms and self-confidence with a swimming speed of 50 meters freestyle of 14.99.

Keywords: *Swimming 50 meters freestyle, leg muscle strength, arm muscle strength, self-confidence. Arm Muscle Strength, self-confidence*

(*) Corresponding Author: *jokematitaputty0@gmail.com*

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INTRODUCTION

Sport is one part of the Indonesian Human development sector as a whole. Sport has an important meaning in efforts to improve the quality of human resources. In Law number 3 of 2005 it is stated that sports are all systematic activities to encourage, foster, and develop physical, spiritual and social potential (Toho Cohlik 2010: 1).

Sport cannot be separated from human life, because human life consists of two aspects, namely: physical and spiritual aspects which cannot be separated. If these two aspects develop and grow in harmony, a harmonious life will arise in its growth. The harmony of physical and spiritual life in humans can be achieved by doing sports. One of those sports is swimming.

Swimming is one of the sports that is carried out in water with a supine or lying position or body position. This sport attracts the attention of both children and adults. Swimming is now known not only as a sport that requires a lot of energy, but also as a recreational activity. Swimming is one of the 5 aquatic sports clubs.

According to Thomas, David G swimming is an activity that can build your overall confidence, and is also a relaxing sport as well as for cultivating

the body (David.G 1996:v). Swimming is expected to be able to maintain physical fitness, fill free time (recreation), recuperate (rehabilitation) and is also one of the sports that are contested.

Swimming is a sport that must be supported by complex movements that are accompanied by adequate physical conditions. Having a good physical condition will make it easier to do difficult movements. Physical condition is one of the most important requirements in an effort to increase one's speed in swimming.

Swimming is usually done by swimmers, and is contested consisting of four styles which include: 1) freestyle or*Crawl stroke*, 2) breaststroke or*breast stroke*, 3) backstroke or*back stroke*, 4) butterfly style or*butterfly stroke*. Of the four styles mentioned, each has its own level of difficulty.

The foreign language of Freestyle is*Crawl*. the way people used to swim is no different from the method used by stylish swimmers*Crawl* or called freestyle swimming now. The reason for this is because the freestyle that is shown now resembles the swimming of an animal such as the dogstroke (*dog style*). Therefore it is also called style*Crawl* which means to crawl.

Freestyle (*free style*) is swimming with the chest position facing the water surface. The two hands are alternately moved to paddle, while the two legs are alternately whipped up and down up and down.

Freestyle swimming is required to have a high swimming speed in order to arrive at the finish line or touch the pool wall quickly, so for that speed is one of the most important parts of doing the 50 meter freestyle swimming. however, the 50 meter freestyle swimming speed also requires the support of several physical conditions such as leg muscle strength, arm muscle strength, apart from that a swimmer must have a strong mentality and is supported by other motor factors, besides that psychological factors are also much needed than swimmers. because if a swimmer already has good technical and physical abilities without the support of good psychological factors such as self-confidence, then the swimmer cannot swim well.

Swimming is a physical activity carried out in water. This sport has elements such as body shape, basic techniques, movement mechanisms, mentality and physical conditions as a unit that must be owned by someone to be able to float and move from one place to another.

As was the case with the students of Physical Education, Health and Recreation at the University of Pattimura for the 2020 academic year when they received swimming practice courses, especially freestyle swimming. In the process of implementing the basic swimming techniques course, almost all students were able to do the basic swimming techniques well, but the swimming speed they had was not in accordance with what was expected. 50 meters distance. But the reality is that there are some students who cannot reach the finish line or reach a distance of 50 meters. This is because the strength of their legs and arms is not too strong in carrying out swimming motions when the legs swing up and down alternately to be able to push their bodies forward and also the arms are not yet able to draw water pressure from front to back to help the legs carry out their respective tasks. each to bring the body to move forward so that when entering the finish line it is not according to the time determined by the lecturer. To be able to swing your legs,

strong muscles are needed, both leg muscles and arm muscles so that they can help swimmers to gain swimming speed and be able to enter the finish according to a predetermined time. . Swimming is relatively minimal risk of physical injury because when swimming all body weight is held by water or floats.

In water sports such as swimming and diving, of course, it requires strength to push. the pushing force produced from the strokes and kicks in improving swimming agility, the aim is to produce changes that increase the pushing force and reduce the strength that can hold the body. this can be solved by assuming a heavy body position and by kicking both legs sufficiently. The position of the body in the water has been affected by the resistance to forward motion. the up and down movement of the body creates waves that increase resistance. Hence the vertical motion of the body must be kept to a minimum in other words, the body must move smoothly in a straight line. Moisture forces can be a source of added resistance if a steady pace is not maintained.

Besides leg muscle strength, arm muscle strength, another factor that is no less important is psychological, one of which is self-confidence. Confidence or self-confidence is very important in a swimming competition which must be owned by swimmers who do freestyle swimming, because without confidence and high confidence to swim it will certainly be very difficult to be able to enter the finish/touch the pool wall. In this case the swimmer's confidence will have a very big role in the 50 meter freestyle swimming speed.

In every sport, speed is the core and an important factor needed to quickly be able to move the body or move the limbs from one position to another. Sajoto (1995:8) explains that speed is the ability to move the same activity over and over again in the shortest possible time (Sajoto 1995:8) Bouchard as quoted by Johansyah Lubis (2004:39) says that the factors that set speed (*speed)* are (1) the frequency of stimulation that depends on the will, determination, and nerve motivation, (2) the speed of muscle contraction, (3) the degree of automation of motion, (4) the condition of certain muscle qualities (explosive power). Speed is generally measured by getting how much time a person takes to cover a certain distance, with speed someone can be more successful than others.

1. Speed

Speed in swimming is useful to finish the race quickly. Speed in swimming is influenced by: technique, start, reversal, and finish, so swimmers must master all of these techniques because the average horizontal speed of swimmers during sliding depends on the horizontal speed of start, slide, and water resistance (James. G 1985: 342-343).

the forward speed of a swimmer is the product of two forces. According to Soejoko Hendro 1992: 8) One force tends to hold it, which is called resistance or resistance caused by water that must be pushed or under it and, there are three types of these obstacles: 1) obstacles from the front, 2) obstacles in the form of skin friction, obstacles which is the range of water behind the swimmer or tail drag. The force that pushes forward is called the force exerted by the arms and legs. A swimmer in order to swim fast must do one of the following things: 1) reduce or reduce resistance, 2) increase thrust, 3) do both.

2. Freestyle swimming

According to Haler (2008:23) Swimming consists of four styles, which include: 1) freestyle or*crawl stroke,* 2) breaststroke or*breast stroke* 3) butterfly style or*buttefly stroke* and, 4) backstroke or*back stroke*. The four styles each have their own level of difficulty. Style*crawl* by some people called freestyle. Actually, this term is wrong, because freestyle is the name of a swimming competition number, while style*crawl* is a swimming technique. The Foreign Language of Freestyle is "*Crawl*". David (2007: 13) reveals that freestyle is the fastest style and based on this style swimming prowess will be judged on how smooth and easy it is to swim freestyle.

The free style is to swim with the chest position facing the water surface. The two hands are alternately moved far forward with a paddling motion, while the two legs are alternately whipped up and down up and down. [1] When swimming freestyle, facial position facing the water surface. Breathing is done when the arms are moved out of the water, when the body becomes tilted and the head turns to the side. When taking a breath, swimmers can choose to turn left or right. Compared to other styles, freestyle is swimming which can make the body go faster in the water. This is because achievement is determined by achieving travel time, so swimmers try to make swimming motions as fast as possible by reducing a lot of resistance or resistance in penetrating the water. In a swimming competition, the assessment is based on swimming time, launch and finish. The same thing was stated by Ermat Suryatna and Adang Suherman (2001:67) that all the basic freestyle swimming techniques can be divided into: body position, arm movement, leg movement, breathing, and coordination movement.

3. Leg Muscle Strength

strength or (*strength)* is one element of the physical condition that must be owned by everyone, because it is a component of all human movement activities such as walking, running, jumping and throwing.

According to Tangkudung (2012: 68) strength is a very important component in improving a person's overall physical condition.

Bompa said Strength is: the ability of the nerves of the muscles to use force. Strength is muscle nerves to withstand loads from within and from outside the body.

In the human body there are several groups of muscle strength. The use of muscle strength groups must be in accordance with the type of activity being carried out. Besides that, muscle strength is also one of the determining factors for performance in various kinds of sports, because without adequate muscle strength in carrying out activities, the basic movements of skills performed by everyone must experience obstacles. Muscle strength is also one of the determinants of the appearance of players (athletes) in every sport, including swimmers. With adequate strength, it is possible for a swimmer to be able to perform basic swimming movements properly. Without having enough strength, a swimmer will experience difficulties in making swimming movements.

According to Pate, Rotela (1993:229) muscle strength is the power that can be exerted by a group of muscles in a single maximum effort. Muscle strength is also a description of the muscles to overcome loads by lifting, rejecting, pushing and holding.

Muscle strength in sports activities is a prerequisite factor for swimmers who want to excel, especially in sports that use strength and speed, because without good muscle strength an athlete cannot move quickly in a short time.

Legs are the main locomotor used to move the body. Movement can be done if mechanical energy is available. That is the energy obtained as a result of chemical metabolism that occurs in the body. The movement of the limbs is caused by the contraction of a muscle or group of muscles to overcome an obstacle or load.

In the sport of swimming, the legs function as an active means of movement to carry out and master swimming techniques, namely: starting movements, leg movements when swimming and turning movements. In addition, the legs also have a function as a support for the upper body and also function as a tool to catapult the body towards*vertical* nor*horizontal.*

Movement in humans is caused by muscle contractions that move bones. So motion is a collaboration between bones and muscles. Bones are called passive locomotors because they only follow muscle control, whereas muscles are called active locomotors because they are able to contract, so they can move bones. Muscles work by contracting and relaxing, which requires energy and involves chemicals. These three muscle groups are the parts that make up the leg muscles as a whole. as a tool of movement functions as a lever used to overcome resistance or increase speed and as the lowest limb of the human body is a simple mechanical device.

4. Arm Muscle Strength

To be able to do good activities, muscle strength is an important component that must be owned first. Strength means the ability to exert maximum power in one effort, the ability of strength means the occurrence of muscle contractions in humans,

Thomas R. Baechle and Barney R. G (2000:5) there are three types of contraction in human muscles, namely; static, concentric and eccentric. While speed is the ability to perform movements in the shortest possible time. This is based on the notion of strength as the quality that allows the development of muscle tension in muscle contraction. Then the arm as part of the upper limb, functions to pull, hold, and push an object. The arm is one of the upper limbs which is arranged based on the bony framework and the muscles or group of muscles that wrap it. There are 4 parts of the arm, namely: 1) Upper Arm, 2). Forearms, 3).Hands. Arm muscle strength is the ability of a group of arm and shoulder muscles in maximum contraction to overcome/against the burden of Frank S. Pyke (1980:30).

then Bruce McClenan's pate, the arm muscles are the muscles attached along the arm bones, namely: (1) pectoralis major, (2) deltoids, (3) tricep brachii, (4) bicep brachii, (5) oracobrachialis, (6)) brachialis, (7) brachioradialis, and (8) extensor carpi radialis langus Arm muscle strength is needed in performing movements such as: throwing, hitting, pushing, lifting, and pulling. These movements arise as a result of muscle contractions that extend, shorten, move away, approach parts of the body, and rotate in all directions within a 360 angle range. Anatomically these movements are: (1) flexion, (2) extension, (3) abduction, (4) posterior abduction, (5) horizontal abduction, (6) lateral rotation, and (7) medial rotation. Swimming movement is an arm swinging movement which is anatomically a combination of horizontal abduction-flexion-extension movements. When doing freestyle

swimming, the outer and inner muscle components contract, causing the fast and slow power of these muscles to contract.

Thus it can be concluded that: Arm muscle strength is the ability of a muscle or group of arm and shoulder muscles in maximum contraction to move the arm quickly.

5. Confidence

Confidence is a person's feeling that he believes in his ability to complete tasks, mentally and physically or emotionally. Someone who has adequate self-confidence will be able to adapt to environmental conditions and be able to overcome obstacles or difficulties that occur. Confidence will make swimmers feel able to do that. This feeling will make swimmers calm in action so that they can carry out a series of movements according to the technique.

Confidence basically consists of two parts, namely: inner self-confidence and outer self-confidence. Inner self-confidence is the feeling or assumption that we are in good shape and capable of doing a task, while the outward self-confidence is the appearance and behavior of a person who is shown to the outside world that he is confident in his abilities. (1997:3-10) Belief in the abilities possessed by swimmers can give birth to an attitude and motivation that greatly affect the increase in self-confidence to perform physical, mental and emotional tasks.

The feeling of being able to carry out tasks also means being able to anticipate all kinds of obstacles and challenges that come as the following opinion says: Confidence is a term that has been used for someone who has the ability to complete mental, physical and emotional tasks, besides that he also has the ability to anticipate all kinds of obstacles and challenges that are not in accordance with his wishes David L, Gallahue (1989:351).

The feeling of being able is also related to the ability to focus or concentrate when doing a task, control the movement process, and anticipate all kinds of disturbances that come.

To be able to do freestyle swimming properly and satisfactorily, a swimmer must be supported by self-confidence that ensures that he is able to do this task properly.*Sport confidence* is a more general sense of self-confidence in sports. Confident (*Self confidence*) consist of*Trait* self confidence (*SC Traits*) dan State Self Confidence (*SC State*). *Self confidence trait* is the confidence that a swimmer has in his ability to successfully perform a specific task in a sport.

RESEARCH METHOD

The method used in this study is a quantitative method with correlation and descriptive techniques. Where data is collected, arranged systematically, factually and carefully, then examined the relationship between these variables. The purpose of this research method is the extent to which variations in one variable are related to variations in other variables. the population in the study amounted to 67 students from three parallel classes and the sample in this study amounted to 30 male students who were taken randomly*Random sampling*. Data collection techniques

According to Sugiyono, data collection techniques are the most strategic steps in research, because the main objective of research is to obtain data.

Furthermore Nasir said that the data to be collected were in the form of numbers, written statements, oral information and various facts related to the focus

of the research that Nasir was researching, Moh (2003: 328). where to collect data researchers use test and measurement techniques, tests are measuring tools to obtain data or information. Measurement is a process to obtain information Nurhasan,. (2001:12). The data obtained in this study are leg muscle strength ( ), arm muscle strength ( ), self-confidence, and one dependent variable, namely: 50 meter freestyle swimming speed (Y).

RESULTS AND DISCUSSION

Table 1: Research Raw Data

No	Variable			
	Swimming speed 50 meter freestyle (Y)	**Leg Muscle Strength ( )**	**Arm Muscle Strength ( )**	**Confidence ( )**
Amount	**2958**	**882**	**5072**	**1115,05**
Rerata	**98,8**	**29,4**	**169,0667**	**37,16**
SD	**22,85**	**7,40**	**17,14**	**2,53**
Variance	**522,25**	**54,73**	**293,65**	**6,41**
Median	**95**	**28,5**	**166**	**37,03**
Modus	**89**	**20**	**154**	**0**

1. Swimming Speed 50 meters freestyle

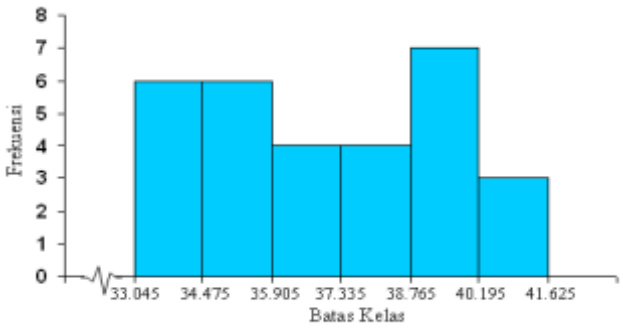
The results of the 50-meter freestyle (Y) swimming speed study on Physical Education and Recreation Students at the FKIP Pattimura University, Ambon, obtained the lowest score of 33.05 seconds, and the highest score of 41.59 seconds, so the range is 8.54 seconds. The average value is 37.16 seconds, the median is 37.03 seconds, the mode is 0 seconds, the standard deviation (*s)* of 2.53 and a variance of 6.41.

Table 2: Frequency distribution of the 50 meter freestyle swimming speed score Whore (Y)

Interval Class	Lower limit	Upper limit	Frec. Absolutely	freq. Relatively
33.05 - 34.47	33.045	34.475	6	20.0%
34.48 - 35.90	34.475	35.905	6	20.0%
35.91 - 37.33	35.905	37.335	4	13.3%
37.34 - 38.76	37.335	38.765	4	13.3%
38.77 - 40.19	38.765	40.195	7	23.3%
40.20 - 41.62	40.195	41.625	3	10.0%
Amount			30	100%

Based on data from 30 research samples of Putera Penjaskesrek FKIP University of Pattimura Ambon, the results of each respondent were compared with the average, it turns out that those who get the 50-meter freestyle swimming speed score above the group average of 12 people (40%) are below the average group of 14 people (46.7%) and 4 people (13.3%) are in the average group.

Figure 1: Histogram of 50 Meter Freestyle Swimming Speed



2. Leg Muscle Strength

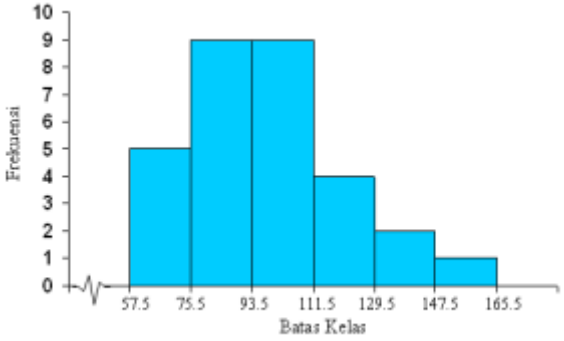
The results of research on Leg Muscle Strength ( ) FKIP Unpatti Ambon students obtained the lowest score of 58 kg, the highest score of 165 kg, so that the range is 107 kg. Average value ( ) was 98.6 kg, median was 95 kg, mode was 89 kg, standard deviation (s) was 22.85 kg and variance was 522.25.

Table 4: Frequency distribution of arm muscle strength scores ( )

Interval Class	Lower limit	Upper limit	Frec. Absolutely	freq. Relatively
58 - 75	57.5	75.5	5	16.7%
76 - 93	75.5	93.5	9	30.0%
94 - 111	93.5	111.5	9	30.0%
112 - 129	111.5	129.5	4	13.3%
130 - 147	129.5	147.5	2	6.7%
148 - 165	147.5	165.5	1	3.3%
Amount			30	100%

Based on data from 30 research samples of Putera Penjaskesrek FKIP Unpatti Ambon students, the results of each respondent were compared with the average. an average of 7 people (23.3%), and 9 people (30.0%) are in the average group.

Figure 2: Histogram of leg muscle strength ( ) Male Student of Penjaskesrek FKIP Unpatti Ambon



3. Arm Muscle Strength

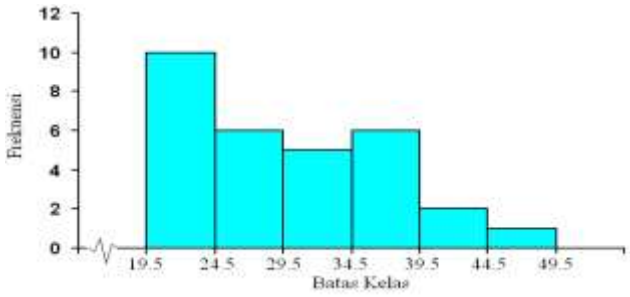
The results of research on Arm Muscle Strength ( ) of FKIP Unpatti Ambon students obtained the lowest score of 20 kg, the highest score of 47 kg, so that the span was 27 kg. Average value ( ) of 29.4 kg, median of 28.5 kg, mode of 20 kg, standard deviation (s) of 7.40 kg and variance of 54.73.

Table 5: Frequency Distribution of Arm Muscle Strength scores ( )

Interval Class	Lower limit	Upper limit	Frec. Absolutely	freq. Relatively
20 - 24	19.5	24.5	10	33.3%
25 - 29	24.5	29.5	6	20.0%
30 - 34	29.5	34.5	5	16.7%
35 - 39	34.5	39.5	6	20.0%
40 - 44	39.5	44.5	2	6.7%
45 - 49	44.5	49.5	1	3.3%
Amount			30	100%

Based on data from 30 research samples of Putera Penjaskesrek FKIP Unpatti Ambon students, the results of each respondent were compared with the average. an average of 14 people (46.7%), and 6 people (20.0%) are in the average group.

Figure 3: Arm Muscle Strength Histogram ( )



4. Confidence

Table 6: Frequency Distribution of Self-Confidence Scores

Interval Class	Lower limit	Upper limit	Frec. Absolutely	freq. Relatively
144 - 155	143.5	155.5	8	26.7%
156 - 167	155.5	167.5	8	26.7%
168 - 179	167.5	179.5	5	16.7%
180 - 191	179.5	191.5	5	16.7%
192 - 203	191.5	203.5	3	10.0%
204 - 215	203.5	215.5	1	3.3%
Amount			30	100%

Based on data from 30 research samples of Putera Penjaskesrek FKIP Unpatti Ambon students, the results of each respondent were compared with the average. an average of 9 people (30%), and 5 people (16.7%) are in the average group.

Figure 4: Histogram of Self-Confidence ( )

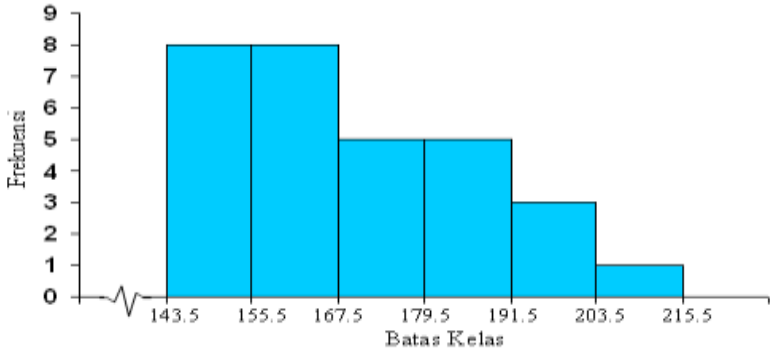


Table 7: Normality Test Results

Variable	L_{count}	L_{table} (0,05)	Results Testing
Leg Muscle Strength ( )	0,1047	0,161	Normal
Arm Muscle Strength	0,0935	0,161	Normal
Confidence)	0,1221	0,161	Normal
Y Swimming Speed	0,0915	0,161	Normal

1. Variance Homogeneity Test

To test the homogeneity used Barlett test. The homogeneity test in this study is to test the homogeneity of the combined population variance, namely $H_o : p_1^2 = p_2^2 = p_3^2 = p_4^2$.

Table 8: Calculation of homogeneity test with Barlett test

Sample	Db	1/db	s_i^2	log s_i^2	db log s_i^2	db s_i^2
AND	30	0,03333	97,96	1,991	59,732	2938,931
X_1	30	0,03333	100,44	2,002	60,057	3013,138
X_2	30	0,03333	100,48	2,002	60,062	3014,345
X_3	30	0,03333	99,24	1,997	59,901	2977,241
Total	120				239,752	11943,655

Test criteria: "Reject hypothesis H_0 if ≥ (1-α) (k-1), where (1-α)(k-1) is obtained from the chi-square distribution list with probability (1-α) and dk = (k-1),

Table 9. Calculation of the homogeneity test with the Barlett test

hypothesis	Dk		(α = 0.05)(3)	Conclusion
$H_O : p_1^2 = p_2^2 = p_3^2 = p_4^2$ **$H_i : p_1^2 = p_2^2 = p_3^2 = p_4^2$**	3	0.006	7.81	Homogeneous

Information :

H_0 = Null hypothesis (0)
H_i = Alternative hypothesis
p_1^2 = Variable variance of leg muscle strength
p_2^2 = Variable variance of arm muscle strength
p_3^2 = Variance of confidence variable
p_4^2 = Variable variance of swimming speed in 50 meter freestyle
dk = Degrees of freedom
= Chi-square calculation results
(α = 0.05)(2) = Chi-square table with a significant level of α = 0.05.

Table 10. Regression linearity test $\hat{Y} = 22.21 + 0.556\ X_1$

Source Variance	Dk	JK	RJK		
Tuna is suitable	20	1489,81	74,49	13,00	3,44
Error Error	8	450,25	56,28		

From the calculation results obtained F_{Count} = 13,00 and$_{(\alpha = 0.05;\ 1/28)}$ = 3.44. Thus it can be concluded that the regression equation model has a linear (significant) form of regression. The results of the calculation of the linearity regression test for swimming speed of the 50 meter freestyle (Y) on the strength of the arm muscles (X_2) can be briefly seen in the following table:

Table 11. Regression linearity test $\hat{Y} = 22.91 + 0.542\ X_2$

Sumber Varians	Dk	JK	RJK		
Tuna is suitable	14	705, 61	50,40	0,55	2,55
Error Error	14	1279,78	91,41		

From the calculation results obtained F_0 = 0.55 less than$_{(\alpha = 0.05;\ 1/28)}$= 2.55. Thus it can be concluded that the 50 meter swimming speed on arm muscle strength has a linear regression form.

Table 12. Regression linearity test $\hat{Y} = 16.02 + 0.679\ X_3$

Sumber Varians	Dk	Sum of Squares	Average Sum of Squares		
Tuna is suitable	18	881,48	48,97	0,77	2,82
Error error	10	632,83	63,28		

From the calculation results obtained $F_0 = 0.77$ less than$_{(\alpha = 0.05;\ 1/28)} = 2.82$ Thus it can be concluded that the regression form of the 50-meter freestyle swimming speed on self-confidence is linear.

Table 13. Simple Linear Regression Significance Test Results $\hat{Y} = 22.21 + 0.556\ X_1$

Sumber Varians	Dk	JK	RJK		
Total	30	77741,00			
Reg (a)	1	74900,03		13,00	4,20
Reg (b/a)	1	900,91	900,91		
Left over	28	1940,06	69,29		

From the calculation results obtained = 13.00 meanwhile$_{(\alpha = 0.05;\ 1/28)}$ = 4.20. It turns out that the price is greater than , so it can be concluded that the regression of the 50-meter freestyle swimming speed on leg muscle strength has a significant regression coefficient direction.

Table 14. Simple Linear Regression Significance Test Results = $22.91 + 0.542\ X_2$

Sumber Varians	Dk	JK	RJK		
Total	30	77741,00			
Reg (a)	1	74900,03		12,07	4,20
Reg (b/a)	1	855,57	855,57		
Left over	28	1985,39	70,91		

From the calculation results obtained = 12.07 while $F_{table(\alpha = 0.05;\ 1/28)} = 4.20$. It turns out that the price is greater than , so it can be concluded that the regression of 50-meter freestyle swimming speed over arm muscle strength has a significant regression coefficient.

Table 15. Simple Linear Regression Significance Test Results

$\hat{Y} = 16{,}02 + 0{,}679X_3$

Sumber Varians	Dk	JK	RJK		
Total	30	77741,00			
Reg (a)	1	74900,03			
Reg (b/a)	1	1326,66	1326,66	24,53	4,20
Left over	28	1514,31	54,08		

From the calculation results obtained = 24.53 while $F_{table\ (dk\ =1/28\ and\ \alpha\ =\ 0.05)}$= 4.20. It turns out the price is greater than , so it can be concluded that the regression coefficient of the direction of the regression coefficient is significant.

Test criteria: "If the calculated F from the formula exceeds the F table from the F distribution list with the chosen significance level, then it is concluded that the regression is significant.

Table 16. Regression Linearity Test $Y = -1096 + 0.280\ X_1 + 0{,}276X_2 + 0{,}466\ X_3$

Sumber Varians	db	JK	RJK		
Total	30	77741,000			
Regression (a)	1	74900,033			
Residue (b/a)	3	1800,274	600,091	14,992	2,89
Left over	26	1040,693	40,027		

From the calculation results obtained = 14.992 while $F_{table\ (dk\ =\ 26\ and\ \alpha\ =\ 0.05)}$= 2.89. It turned out to be greater than , so it can be concluded that the regression of leg muscle strength, arm muscle strength, self-confidence, together - the same - the speed of the 50 meter freestyle swimming speed of the regression direction is significant / significant.

Hypothesis test

Hypothesis testing was carried out with the aim of testing the correlation between the independent variables and the dependent variable. There are four hypotheses that have been formulated and will be tested empirically in this study, namely:

Table 17. Hypothesis Test Results for the Relationship between Leg Muscle Strength (X_1) With swimming speed 50 meters freestyle (Y)

hypothesis	F_{count}	$F_{table\ (dk = 28 \text{ and } \alpha = 0.05)}$	Conclusion
H_O : $ry._1$ 0	3,61	1,70	Reject
H_i : $ry._1$ 0			(There is a Relationship)

The results of the analysis above turned out to be $F_0 = 3,61 > F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ and means the null hypothesis ( ) rejected. Conclusion: there is a relationship between leg muscle strength (X_1) with a swimming speed of 50 meters freestyle (Y) at level $\alpha = 0.05$.

Table 18. Hypothesis Test Results for the Relationship between Arm Muscle Strength (X_2) With swimming speed 50 meters freestyle (Y)

hypothesis	F_{count}	$F_{table\ (dk = 28 \text{ and } \alpha = 0.05)}$	Conclusion
H_O : $ry._2$ 0	3,47	1,70	Reject
H_i : $ry._2$ 0			(There is a Relationship)

The results of the analysis above turned out to be = 3.47 > $F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ and means the null hypothesis ( ) rejected. Conclusion: there is a relationship between arm muscle strength (X_2) with a swimming speed of 50 meters freestyle (Y) at level $\alpha = 0.05$.

Table 19. Results of Hypothesis Testing The relationship between self-confidence (X_3) With swimming speed 50 meters freestyle (Y)

hypothesis	F_{count}	$F_{table\ (dk = 28 \text{ and } \alpha = 0.05)}$	Conclusion
H_O : $ry._3$ 0 **H_i : $ry._3$ 0**	4,95	1,70	Reject (There is a Relationship)

The results of the analysis above turned out to be = 4.95 > $F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ and means the null hypothesis ( ) rejected. Conclusion: there is a relationship between self-confidence (X_3) with a swimming speed of 50 meters freestyle (Y) at level $\alpha = 0.05$.

Table 20. Hypothesis Test Results for the Relationship between Leg Muscle Strength (X_1) arm muscle strength (X_2), self-confidence (X_3) With a swimming speed of 50 meters freestyle (Y)

hypothesis	F_{count}	$F_{table\ (dk = 28 \text{ and } \alpha = 0.05)}$	Conclusion
H_O : $ry._{123}$ 0 **H_i : $ry._{123}$ 0**	14,99	1,70	Reject (There is a Relationship)

The results of the analysis above turned out to be = 14.99 > $F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ and means the null hypothesis ( ) rejected. Conclusion:

there is a relationship between leg muscle strength (X_1) with a swimming speed of 50 meters freestyle (Y) at level $\alpha = 0.05$.

DISCUSSION

a. Based on the results of the analysis of leg muscle strength variables with swimming speed of 50 meters freestyle in Putera Penjaskesrek FKIP Unpatti Ambon students, the results obtained were $F_{count} = 3,61 > F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ at the level $\alpha = 0.05$ and means the null hypothesis (H_0) is rejected, so there is a relationship between leg muscle strength (X_1) with a swimming speed of 50 meters freestyle (Y).
b. Based on the results of the analysis of the variable arm muscle strength with swimming speed of 50 meters freestyle in Putera Penjaskesrek FKIP Unpatti Ambon students, the results obtained were $F_{count} = 3,47 > F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ at the level $\alpha = 0.05$ and means the null hypothesis (H_0) is rejected, so there is a relationship between arm muscle strength (X_2) with swimming speed of 50 meters freestyle (Y)
c. Based on the results of the analysis of the variable self-confidence with swimming speed of 50 meters freestyle in Putera Penjaskesrek FKIP Unpatti Ambon students, the results obtained were $F_{count} = 4,95 > F_{table\ (dk = 28 \text{ and } \alpha = 0.05)} = 1.70$ at the level $\alpha = 0.05$ and means the null hypothesis (H_0) is rejected, so there is a relationship between self-confidence (X_3) with a swimming speed of 50 meters freestyle (Y).
d. Based on the results of the analysis of the relationship variables between leg muscle strength, arm muscle strength, self-confidence with swimming speed of 50 meters freestyle in Putera FKIP Unpatti Ambon students, the results obtained were $F_{count} = 14,99 > F_{table\ (dk = 28 \text{ and} \alpha = 0.05)} = 1.70$ at the level $\alpha = 0.05$ and means the null hypothesis (H_0) is rejected, so there is a relationship between leg muscle strength (X_1), arm muscle strength (X_2), self-confidence (X_3) with a swimming speed of 50 meters freestyle (Y).

CONCLUSION

Conclusions from the results of hypothesis testing and discussion of research results, the following conclusions can be drawn:

1. There is a significant relationship between leg muscle strength and the speed of swimming in the 50-meter freestyle in Men's Students of Penjaskesrek FKIP Unpatti Ambon.
2. There is a significant relationship between arm muscle strength and 50-meter freestyle swimming speed in Men's Men's Students of Penjaskesrek FKIP Unpatti Ambon.
3. There is a significant relationship between self-confidence and the speed of swimming in the 50-meter freestyle for Men's Men's Students, Penjaskesrek, FKIP Unpatti Ambon.
4. There is a significant relationship between leg muscle strength, arm muscle strength, and self-confidence together with the 50-meter freestyle swimming speed in Men's Physical Education, Health and Recreation Students, FKIP Unpatti Ambon. Thus, the 50 meter freestyle swimming speed can be

increased through physical training of leg muscle strength, arm muscle strength, and self-confidence.

SUGGESTION

1. So that students can continue to practice according to their abilities and swimming skills, so that later when they graduate and become teachers they can train their students in addition to the learning process and for achievement by doing basic exercises, especially on leg muscles and arm muscles and also teach them to always be confident in carrying out every movement activity.
2. It is recommended for academics in the field of sports to conduct other research involving other variables from anthropometric aspects such as leg length, arm length and strength in performing freestyle swimming techniques.

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