Research Article

The Relatioship between Leg Muscle Strength Arm Muscles and Self-Confidence with 50 Metres Swimming Speed Free Style

Johanna Matitaputty*

Department of Physical Education, Health and Recreation, Faculty of Teacher Training and Education, Pattimura University, Jalan Ir. M. Putuhena, Unpatti Campus, Poka, Ambon, Indonesia

ORCID
Johanna Matitaputty: https://orcid.org/0009-0007-9892-8956

Abstract.
The purpose of this study was to determine the relationship between leg muscle strength and self-confidence, arm muscle strength and self-confidence, and leg muscle strength, arm muscle strength and self-confidence with 50-meter freestyle swimming speed. The sample of this study was 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 the researcher will see the relationship between one variable and another. Based on the results of the analysis of research data and discussion, it can be concluded that the following research results (a) there is a relationship between leg muscle strength and 50-meter freestyle swimming speed of 3.61 (b) there is a relationship between arm muscle strength and 50-meter freestyle swimming speed of 3.47. (c) there is a relationship between self-confidence and 50-meter freestyle swimming speed of 4.95 which then the relationship between leg muscle strength and arm muscle strength and self-confidence with 50-meter freestyle swimming speed of 14.99. Thus, the stronger the leg and arm muscles, as well as good self-confidence, the better the 50-meter freestyle swimming speed of male students of the Health and Sports Study Program, FKIP Unpatti Ambon.

Keywords: Swimming 50 meters freestyle, leg muscle strength, arm muscle, self-confidence

Corresponding Author: Johanna Matitaputty; email: jokematitaputty0@gmail.com

1. Introduction

Sport is one part of the Indonesian Human development sector as a whole. Sport has an important meaning in an effort 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 [1]. Sports cannot be separated from human life, because human life consists of two aspects, namely: physical and spiritual aspects that cannot be separated. If these two aspects develop and grow in harmony, there will be

a harmonious life in their growth. 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 in a supine or enclosed position or body position. This sport is very attractive to 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 club aquatic sports. is an activity that can build your overall confidence, and is also a relaxing sport as well as for processing the [2]. Swimming sport is expected to maintain physical fitness, fill leisure time (recreation), healing (rehabilitation) and is also one of the contested sports.

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

Swimming that is usually done by swimmers, and contested consists of four styles which include: 1) free style or Crawl stroke, 2) breast style or breast stroke, 3) back style or back stroke, 4) butterfly style or butterfly stroke. Each of the four styles has its own level of difficulty. The way people used to swim is no different from the way used by Crawl style swimmers or called freestyle swimming today. This reason is because the freestyle shown today resembles the way an animal swims like a dog style (dog style). Therefore, it is also called Crawl style which means crawling. Freestyle (free style) is swimming with the chest position facing the surface of the water. Both hands are alternately moved to pedal, while both legs are alternately whipped up and down up and down. Freestyle swimming is required to have a high swimming speed in order to reach the finish line or touch the pool wall quickly, so for that speed is one of the most important parts of swimming 50 metres freestyle. However, 50 metres freestyle swimming speed also requires support from several physical conditions such as leg muscle strength, arm muscle strength, besides that a swimmer must have a strong mentality and be supported by other motor factors, besides that psychological factors are also very necessary from the swimmer, because if a swimmer has good technical and physical abilities without being supported by good psychological factors such as self-confidence, then the swimmer cannot do swimming 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 condition as a unit that must be owned by someone to be able to float and move from one place to another. As is the case with Pattimura University Penjaskesrek students in the 2020 academic year when getting swimming practice courses, especially freestyle swimming.

In the process of implementing basic swimming techniques lectures, almost all students are able to perform basic swimming techniques well, but the swimming speed they have is not in accordance with what is expected, this can be seen during the final exam of the semester They were given the opportunity to do a freestyle swimming race with a distance of 50 metres. But the reality is that there are some students who cannot reach the finish line or reach a distance of 50 metres. This is because the strength of their legs and arms is not too strong in performing swimming movements when the legs swing up and down alternately to be able to push their bodies forward and also the arms have not been able to draw water pressure from the front to the back to assist the legs in carrying out their respective tasks to bring the body forward so that when entering the finish line it is not in accordance with the time determined by the lecturer. To be able to swing the legs, strong muscles are needed, both leg muscles and arm muscles so that they can help swimmers to gain swimming speed and can enter the finish line in accordance with the predetermined time.apat Because to be able to enter the finish line quickly, good speed is needed in swimming. Swimming has a minimal risk of physical injury because when swimming the entire body weight is held by water or floats. In water sports such as swimming and diving, of course, it requires strength to push. pushing power is generated from strokes and kicks in improving swimming agility, the goal is to produce changes that increase pushing power and reduce the strength that can hold the body. this can be accomplished by assuming a heavy body position and by kicking both legs enough. The position of the body in the water is already affected by the resistance of the forward motion. The up and down motion of the body increases the waves which increase the resistance. Hence the vertical motion of the body should be kept to a minimum in other words, the body should move smoothly in a straight line. Moisture strength can be a source of added resistance if a steady stride is not maintained.

Besides leg muscle strength, arm muscle strength, another important factor is psychological, one of which is self-confidence. Self-confidence or self-confidence is very important in swimming competitions that must be possessed 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 wall of the pool. In this case the swimmer's confidence will have a very large role in the 50 metre freestyle swimming speed. In every sport, speed is the core and important factor needed to be able to immediately move the body or move the limbs from one position to another. [3]. Explains that speed is the ability to move the same activity over and over again in the shortest possible time says that the factors that determine speed are (1) the frequency

of stimuli that depend on will, determination, and nerve motivation, (2) the speed of muscle contraction, (3) the level of motion automation, (4) the state 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 a person can be more successful than others.

1.1. Speed

Speed in swimming is useful for finishing the race quickly. Speed in swimming is influenced by: technique, start, reversal, and finish, so swimmers must master all these techniques because the average horizontal speed of the swimmer during gliding depends on the horizontal speed of the start, glide, and water resistance (James. G 1985: 342-343). The forward speed of a swimmer is the result of two forces. According. [4]. One force tends to hold it back, which is called resistance or resistance caused by water that must be urged or under it and, this resistance is of three types: 1) obstacles from the front, 2) hembatan in the form of skin friction, obstacles in the form of water range behind the swimmer or tail resistance. The force that pushes forward is called the force generated by the arms and legs. A swimmer in order to swim quickly, must do one of the following: 1) reduce or minimise resistance, 2) increase thrust, 3) do both.

1.2. Freestyle Swimming

Swimming consists of four styles, which include: 1) free style or crawl stroke, 2) breast style or breast stroke 3) butterfly style or buttefly stroke and, 4) back style or back stroke. The four styles each have their own level of difficulty. Crawl style by some people is called freestyle. Actually this term is wrong, because freestyle is the name of a swimming race number, while the crawl style is one of the swimming techniques [5]. The foreign language of freestyle is 'Crawl'.

   Reveals that freestyle is the fastest style and based on this style, swimming prowess will be judged on how smooth and easy freestyle swimming. Freestyle is swimming with the chest facing the surface of the water [6]. Both hands are alternately moved far forward in a pedalling motion, while both legs are alternately whipped up and down. When swimming freestyle, the face is facing the surface of the water. Breathing is done when the arms are deployed out of the water, when the body becomes tilted and the head is turned to the side. When taking a breath, swimmers can choose to turn their head to the left or to the right. Compared to other styles freestyle is swimming that can

make the body go faster in the water. This is because achievement is determined by the achievement of travel time, so swimmers strive to perform swimming movements as quickly as possible by reducing a lot of resistance or resistance in penetrating the water. In swimming competitions the way of assessment is based on swimming time, launch, and finish. The same thing was stated [7]. That all basic freestyle swimming techniques can be divided into: body position, arm movements, leg movements, breathing, and coordination movements.

1.3. Limb Muscle Strength

Strength is one of the elements of physical condition that everyone must have, because it is a component of all human movement activities such as walking, running, jumping and throwing. According to[8]. Strength is a very important component to improve one's overall physical condition. Bompa says Strength is: the ability of muscle nerves to use energy. Strength is the nerves of the muscles to withstand loads from inside and outside the body. In the human body there are several muscle strength groups. The use of muscle strength groups must be in accordance with the type of activity performed. In addition, muscle strength is also one of the determining factors for appearance in various 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 perform basic swimming movements well. Without having enough strength, a swimmer will have difficulty in performing swimming movements.

Muscle strength is the power that a group of muscles can exert at a maximum single effort. muscle strength is also a description of the muscles to overcome the load by lifting, resisting, 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 it allows an athlete not to move quickly in a short time [9].

Limbs are the main means of movement used to move the body. Motion can be done if mechanical energy is available. That is energy obtained as a result of chemical metabolism that occurs in the body. The occurrence of limb movement is due to the contraction of a muscle or group of muscles to overcome obstacles or loads. In swimming, the limbs function as an active means of movement to perform and master swimming techniques, namely: starting movements, leg movements while swimming

and reversal movements. In addition, the limbs also have a function as a support for the upper body and also function as a tool to catapult the body towards vertical and horizontal. Motion in humans is caused by muscle contractions that move bones. So motion is a collaboration between bones and muscles. Bones are called passive means of motion because they only follow muscle control, while muscles are called active means of motion because they are able to contract, so they can move bones. Muscles work by contracting and relaxing, which requires energy and involves chemicals. The three muscle groups are the parts that make up the leg muscles as a whole. as a means of motion functions as a lever used to overcome resistance or increase speed and as the lowest human limb is a simple mechanical device.

1.4. Arm Muscle Strength

To be able to do good activities, muscle strength is one of the important components that must be owned first. Strength means the ability to expend maximum energy in one effort, the ability of strength means the occurrence of muscle contractions in humans,[10]. Human muscle contraction there are three types of contractions namely; static, coscentric and eccentric. While speed is the ability to perform movements in the shortest possible time. This is based on the notion of strength as a quality that allows the development of muscle tension in muscle contraction. Then the arm as part of the upper body, serves to perform the movement of pulling, holding, and pushing an object. The arm is one of the upper limbs arranged based on a skeleton of bones and muscles or a group of muscles that wrap it. There are 4 parts of the arm, namely: 1) Upper Arm, 2) Forearm, 3) Hand. Arm muscle strength is the ability of a group of arm and shoulder muscles in maximum contraction to overcome / resist loads. [11]. Furthermore, Bruce McClenan pate, arm muscles are muscles that are attached to along the arm bone, namely: (1) pactoralis 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 due to muscle contractions extending, shortening, moving away, approaching body parts, and rotating movements 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. The swimming movement is a swinging arm movement which is anatomically a combination of horizontal abduction-flexion-extension movements. When doing freestyle swimming, the outer and inner muscle

components contract, causing energy that is fast and slow in contracting the muscles. 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.

1.5. Self-Confidence

Self-confidence is a person's feeling that he believes in his ability to complete tasks, mentally and physically or emotionally. A person who has adequate self-confidence will be able to adjust to environmental conditions and can overcome obstacles or difficulties that occur. Self-confidence will make swimmers feel capable of doing that. This feeling will make swimmers calm in acting so that they can perform a series of movements in accordance with their technique. Self-confidence basically consists of two parts, namely: Inner self-confidence is the feeling or assumption that we are in good condition, and are able to do a task, while outward self-confidence is a person's appearance and behaviour that is shown to the outside world that he is confident in his abilities [12]. Belief in the abilities possessed by swimmers can give birth to a great attitude and motivation that affects the increase in confidence to perform physical, mental and emotional tasks.

The feeling of being able to carry out the task means also being able and anticipating all forms of obstacles and challenges that come as said by the following opinion [13]. Self-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 forms of obstacles and challenges that are not in accordance with his wishes. The feeling of ability is also related to the ability to focus the mind or concentration on performing tasks, controlling the movement process, and anticipating all forms of disturbances that come. To be able to perform freestyle swimming well and satisfactorily, a swimmer must be supported by self-confidence that convinces him that he is able to perform the task well. Sport confidence is a more generalised sense of confidence in sport. Self confidence consists of Trait Self Confidence (SC Traits) and State Self Confidence (SC State). Trait self-confidence is the confidence that a swimmer has in their ability to successfully perform a particular task in sport.

2. Methods

The method used in this research is 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 variation in one variable is related to variation in other variables. the population in the study amounted to 67 students from three paraler classes and the sample in this study amounted to 30 men who were taken by random sampling. Data collection technique

According to Sugiyono, data collection techniques are the most strategic step in research, because the main purpose of research is to get data. Furthermore, Nasir said that the data to be collected are in the form of numbers, written information, oral information and various facts related to the focus of the research studied [14]. where to collect data researchers use test and measurement techniques, tests are measuring instruments to obtain data or information. Measurement is a process for obtaining information [15]. The data obtained in this research are leg muscle strength (X1), arm muscle strength (X2), self-confidence (X3), and one dependent variable namely: swimming speed 50 metres freestyle (Y).

3. Results and Discussion

TABLE 1: Raw Research Data.

No	Variabel			
	50 metres freestyle swimming speed (Y)	Limb Muscle Strength (X_1)	Arm Muscle Strength (X_2)	Self-Confidence (X_3)
Total	2958	882	5072	1115,05
Mean	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
Mode	89	20	154	0

3.1. Swimming Speed 50 Metres Freestyle

The results of the research on swimming speed of 50 metres of freestyle for men (Y) in penjaskesrek FKIP students at Pattimura University Ambon obtained the lowest score of 33.05 seconds, and the highest score of 41.59 seconds so that the range was 8.54 seconds. The average value (Y ̄) is 37.16 seconds, the median is 37.03 seconds, the mode is 0 seconds, the standard deviation (s) is 2.53 and the variance is 6.41.

TABLE 2: Frequency Distribution of 50 Metres Freestyle Swimming Speed Scores (Y).

Interval Class			Lower Limith	Upper Limit	Frek. Absolut	Frek. Relatif
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%
Total					30	100%

Based on data from 30 research samples of FKIP Pattimura University Ambon students, the results of each respondent are compared with the average, it turns out that those who get a 50 Meter Freestyle Swimming Speed score above the average group are 12 people (40%) are below the average group as many as 14 people (46.7%) and 4 people (13.3%) are in the average group.
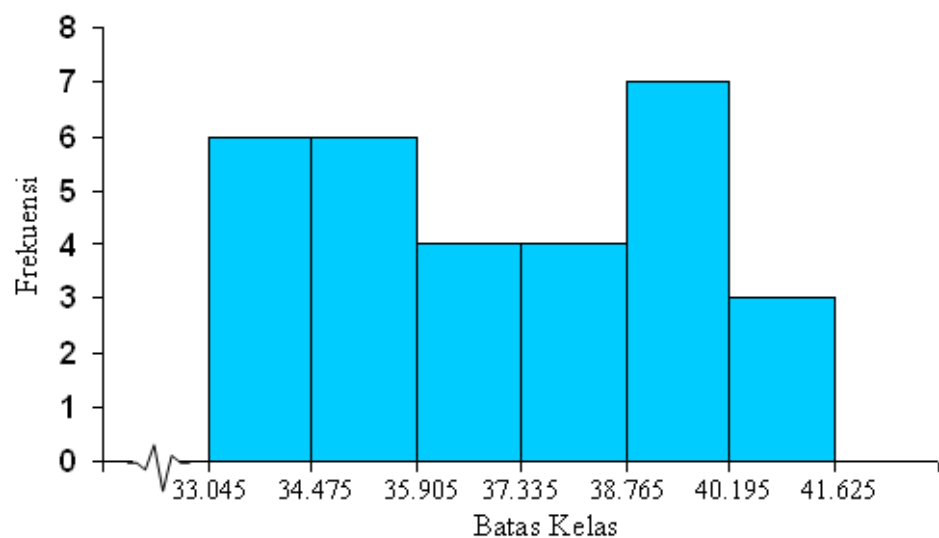

Figure 1:

3.2. Limb Muscle Strength

The results of research on Limb Muscle Strength (X_1) of FKIP Unpatti Ambon students obtained the lowest score of 58 kg, the highest score was 165 kg, so the range was 107 kg. The average value (X̄) is 98.6 kg, the median is 95 kg, the mode is 89 kg, the standard deviation (s) is 22.85 kg and the variance is 522.25.

TABLE 3: Frequency Distribution of Arm Muscle Strength Scores (X_1).

Interval Class			Lower Limith	Upper Limit	Frek. Absolut	Frek. Relatif
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%
Jumlah					30	100%

Based on data from 30 research samples of FKIP Unpatti Ambon students, the results of each respondent compared to the average, it turns out that those who get leg muscle strength scores above the average group are 14 people (46.7%), are below the average group as many as 7 people (23.3%), and 9 people (30.0%) are in the average group.
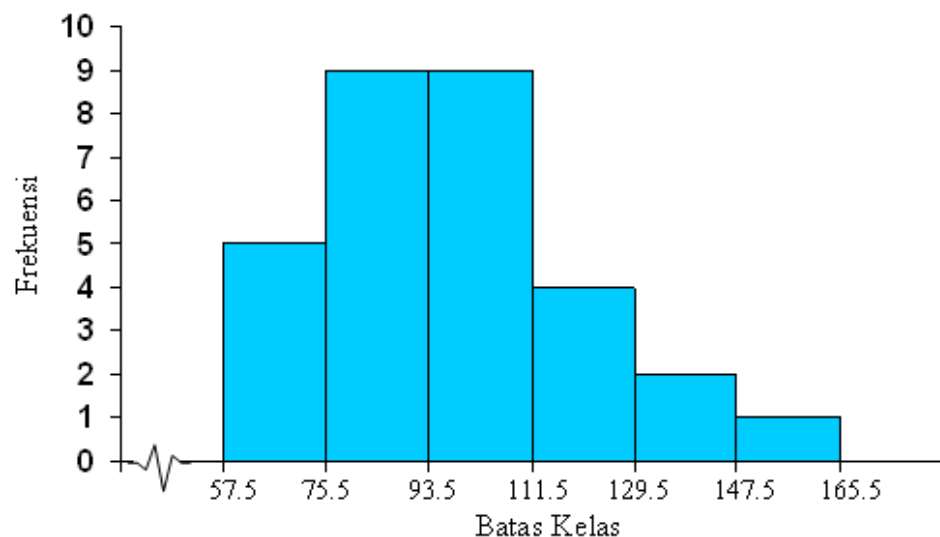

Figure 2: Histogram of Leg Muscle Strength (X_1) of Male Students of Penjaskesrek FKIP Unpatti Ambon.
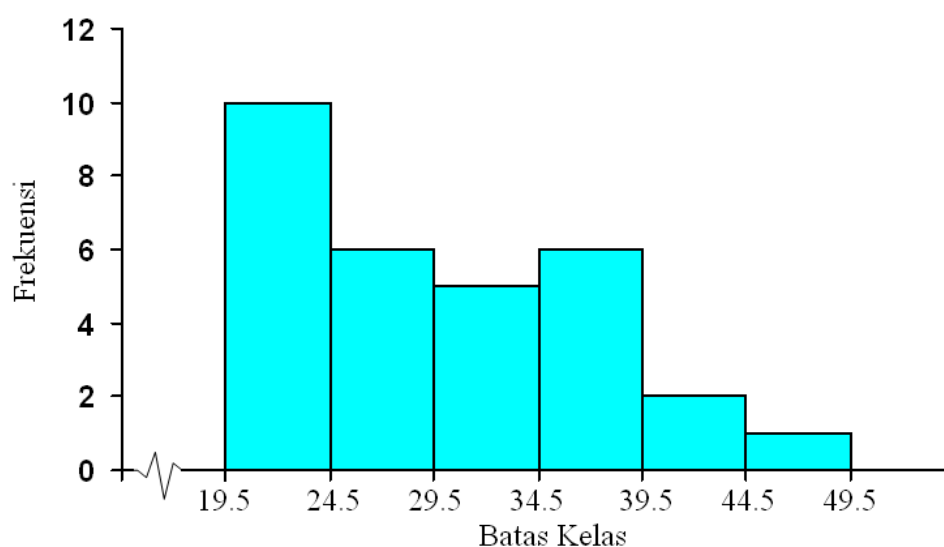
3.3. Arm Muscle Strength

The results of research on Arm Muscle Strength (X_2) of FKIP Unpatti Ambon students obtained the lowest score of 20 kg, the highest score of 47 kg, so the range was 27 kg. The average value (X)is 29.4 kg, the median is 28.5 kg, the mode is 20 kg, the standard deviation (s) is 7.40 kg and the variance is 54, 73.

TABLE 4: Frequency Distribution of Arm Muscle Strength Scores (X_2)

Interval Class	Lower Limith	Upper Limmit	Frek. Absolut	Frek. Relatif
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%
Total			30	100%

Based on data from 30 research samples of FKIP Unpatti Ambon students, the results of each respondent compared to the average, it turns out that those who get the Arm muscle strength score above the average group are 10 people (33.3%), are below the average group as many as 14 people (46.7%), and 6 people (20.0%) are in the average group.

Figure 3: Histogram of Arm Muscle Strength (X_2).

3.4. Self-confidence

Based on the data from 30 samples of research students of Putera Penjaskesrek FKIP Unpatti Ambon, the results of each respondent compared to the average, it turns out that those who get a self-confidence score above the average group are 16 people (53.4%), are below the average group as many as 9 people (30%), and 5 people (16.7%) are in the average group.

TABLE 5: Frequency Distribution of Self-Confidence Score.

Interval Class	Lower Limith	Upper Limmit	Frek. Absolut	Frek. Relatif
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%
Total			30	100%
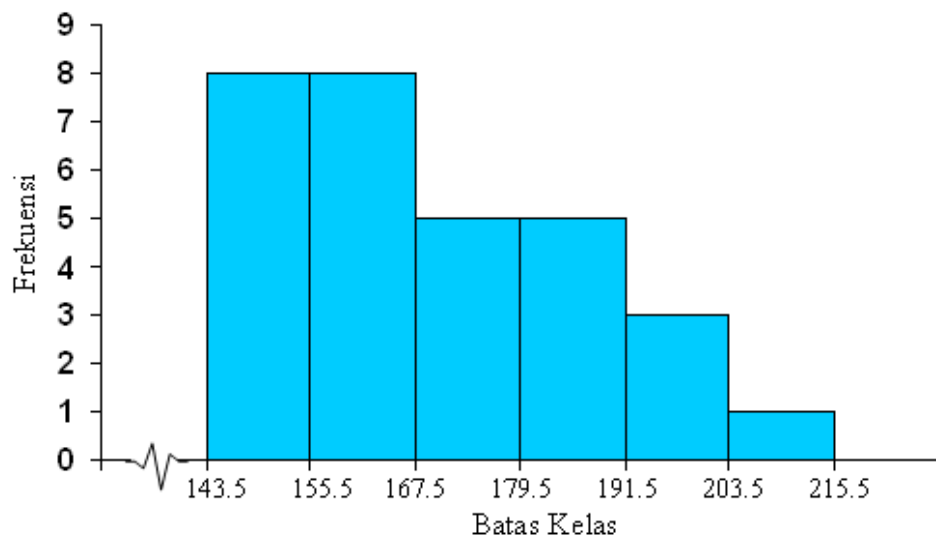
Figure 4: Histogram of Self-Confidence.

TABLE 6: Normality Test Results.

Variabel	L_{hitung}	L_{tabel} ($\alpha = 0,05$)	Result Testing
Limb Muscle Strength (X_1)			Normal
Arm Muscle Strength (X_2)	0,1047 0,0935	0,161 0,161	Normal
Self-confidence (X_3) Swimming	0,1221 0,0915	0,161 0,161	Normal
Speed Y			Normal

3.5. Variance Homogeneity Test

To test homogeneity, Barlett's test was used. The homogeneity test in this study is to test the homogeneity of the combined population variance, namely $H_O : \sigma_1^2 = \sigma_2^2 = \sigma_3^2 = \sigma_4^2$.

Testing criteria: ' Reject the hypothesis H_0 if $\geq \chi^2$ (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 7: Calculation Of Homogeneity Test with Barlett's Test.

Sample	Db	1/db	s_i^2	log s_i^2	db log s_i^2	db s_i^2
Y	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

TABLE 8: Calculation of Homogeneity Test with Barlett Test.

hypothesis	Dk	X_0^2	X_0^2 (α = 0,05)(3)	conclusion
$H_O : \sigma_1^2 = \sigma_2^2 = \sigma_3^2 = \sigma_4^2$ $H_i : \sigma_1^2 = \sigma_2^2 = \sigma_3^2 = \sigma_4^2$	3	0.006	7.81	Homogeneous

Description:

H0 = Null hypothesis (0)

Hi = Alternative hypothesis Keterangan :

σ_1^2 = Variance of leg muscle strength variables

σ_2^2 = Variance of arm muscle strength variable

σ_3^2 = V ariance of self-confidence variable

σ_4^2 = Variance of 50 metres freestyle swimming speed variable

dk = Degree of freedom

χ_0^2 = Chi-squared calculation result

$\chi^2(\alpha = 0,05)$ (2) = Chi-squared table with a significant level of α = 0.05.

TABLE 9: Regression Linearity Test $\hat{Y}$ = 22,21 + 0,556 X_1.

Source Variance	Dk	JK	RJK	F_{Hitung}	F_{tabel}
Misfit	20	1489,81	74,49	13,00	3,44
Error	8	450,25	56,28		

From the calculation results obtained F_{count} = 13.00 and F_{Table} (α = 0.05; 1/28) = 3.44. Thus it can be concluded that the regression equation model is linear (significant). The results of the calculation of the regression linearity test of 50 metres freestyle swimming speed (Y) on arm muscle strength (X_2) can be seen in the following table:

From the calculation results obtained F_0 = 0.55 is smaller than F_{table} (α = 0.05; 1/28) = 2.55. Thus it can be concluded that 50 metres swimming speed on arm muscle strength is linear.

TABLE 10: Regression linearity test $\hat{Y}$ = 22,91 + 0,542 X_2.

Source Variance	Dk	JK	RJK	F_0	F_t
Misfit	14	705, 61	50,40	0,55	2,55
Error	14	1279,78	91,41		

TABLE 11: Regression Linearity Test $\hat{Y}$ = 16,02 + 0.679 X_3.

Source Variance	Dk	Sum of Squares	Average Sum of Squares	F_0	F_t
Misfit	18	881,48	48,97	0,77	2,82
Error	10	632,83	63,28		

From the calculation results obtained F_0= 0.77 is smaller than F_{table} (α = 0.05; 1/28) = 2.82 Thus it can be concluded that the regression of 50 metres freestyle swimming speed on self-confidence is linear.

TABLE 12: Simple Linear Regression Significance Test $\hat{Y}$ = 22,21 + 0.556 X_1.

Source Variance	Dk	JK	RJK	F_0	F_t
Total	30	77741,00			
Reg (a)	1	74900,03		13,00	4,20
Reg (b/a)	1	900,91	900,91		
Sisa	28	1940,06	69,29		

The result of the calculation obtained F_0 = 13.00 while F_{Tabel} (α = 0.05; 1/28) = 4.20. It turns out that the price of F_0 is greater than Ft, so it can be concluded that the regression of 50 metres freestyle swimming speed on leg muscle strength the direction of the regression coefficient means.

TABLE 13: Simple Linear Regression Significance Test Results Y = 22,91 + 0,542 X_2.

Source Variance	Dk	JK	RJK	F_0	F_t
Total	30	77741,00			
Reg (a)	1	74900,03		12,07	4,20
Reg (b/a)	1	855,57	855,57		
Sisa	28	1985,39	70,91		

From the calculation results obtained F_0 = 12.07 while Ftable (α = 0.05; 1/28) = 4.20. It turns out that the price of F_0 is greater than F$_t$, so it can be concluded that the regression of 50 metres freestyle swimming speed on arm muscle strength in the direction of the regression coefficient means.

TABLE 14: Simple Linear Regression Significance Test Results $\hat{Y}$ = 16,02 + 0,679X$_3$.

Sumber Varians	Dk	JK	RJK	F_0	F_t
Total	30	77741,00			
Reg (a)	1	74900,03		24,53	4,20
Reg (b/a)	1	1326,66	1326,66		
Sisa	28	1514,31	54,08		

From the calculation results obtained F0 = 24.53 while Ftabel (dk = 1/28 and α = 0.05) = 4.20. It turns out that the price of F0 is greater than (F)_t, so it can be concluded that the regression of 50 metres freestyle swimming speed on self-confidence in the direction of the regression coefficient means.

Test criteria: 'If F calculated from the formula exceeds F table from the F distribution list with the selected real level, it is concluded that the regression means.

TABLE 15: Linearity Test of Regression Y = -1096 + 0.280 X1 + 0.276X2 + 0.466 X3.

Sumber Varians	db	JK	RJK	F_0	F_t
Total	30	77741,000			
Regresi (a)	1	74900,033		14,992	2,89
Residu (b/a) Sisa	3 26	1800,274 1040,693	600,091 40,027		

From the calculation results obtained F_0 = 14,992 while F$_{tabel\ (dk\ =\ 26\ dan\ \alpha\ =\ 0,05)}$ = 2,89. It turns out that F_0 is greater than F_t, so it can be concluded that the regression of leg muscle strength, arm muscle strength, self-confidence, together 50 metres freestyle swimming speed the direction of the regression means

The results of the above analysis showed that F0 = 3.61 > Ftable (dk = 28 and α = 0.05) = 1.70 and means that the null hypothesis (H_0) is rejected. Conclusion: there is a relationship between leg muscle strength (X1) and swimming speed 50 metres freestyle (Y) at the level of α = 0.05.

4. DISCUSSION

a. Based on the results of the analysis of the variable leg muscle strength with swimming speed of 50 metres freestyle in students of Penjaskesrek FKIP Unpatti Ambon, the results obtained Fhitung = 3.61> Ftabel (dk = 28 and α = 0.05) = 1.70 at the level of α = 0.05 and means that the null hypothesis (H0) is rejected, so there is a relationship between leg muscle strength (X1) with swimming speed 50 metres freestyle (Y).

b. Based on the results of the analysis of the arm muscle strength variable with a swimming speed of 50 metres freestyle in students of Penjaskesrek FKIP Unpatti Ambon, the results obtained Fhitung = 3.47 > Ftabel (dk = 28 and α = 0.05) = 1.70 at the level of α = 0.05 and means that the null hypothesis (H0) is rejected, so there is a relationship between arm muscle strength (X2) with swimming speed 50 metres freestyle (Y).

c. Based on the results of the analysis of the variable self-confidence with swimming speed of 50 metres freestyle in students of Penjaskesrek FKIP Unpatti Ambon, the results obtained Fhitung = 4.95> Ftabel (dk = 28 and α = 0.05) = 1.70 at the level of α = 0.05 and means the null hypothesis (H0) is rejected, so there is a relationship between self-confidence (X3) with swimming speed 50 metres freestyle (Y).

d. Based on the results of the analysis of the variable relationship between leg muscle strength, arm muscle strength, self-confidence with 50 metres freestyle swimming speed in FKIP Unpatti Ambon students, the results obtained Fhitung = 14.99> Ftabel (dk = 28 and α = 0.05) = 1.70 at the level of α = 0.05 and means the null hypothesis (H0) is rejected, so there is a relationship between leg muscle strength (X1), arm muscle strength (X2), self-confidence (X3) with 50 metres freestyle swimming speed (Y).

References

[1] Toho cholik mutohir, Muhamad Muhyi dan Albert Fenanlampir berkarakter dengan berolaraga,berolaraga dengan berkarakter Sport Media (PT java pustaka group 2010), p. 1

[2] Thomas, David G, Renang Tingkat Pemula (Jakarta: Raja Garfindo Persada, 1996: v)

[3] Sajoto 1995: 8) Bouchard as quoted by Johansyah Lubis (2004: 39)

[4] David Haller, Belajara Berenang (Bandung: PT Pionir Jaya, 2008), p. 23

[5] Soejoko Hendro Martono, Olahraga Pilihan Renang (Jakarta: Depdikbud Direktorat Jenderal Pendidikan tinggi Proyek Pembinaan Tenaga Kependidikan, 1992), p. 8

[6] David G. Thomas, Renang Tingkat Mahir(Jakarta: PT Raja Grafindo Persada, 2007), p.13

[7] Ermat Suryatna dan Adang Suherman, Renang Kompetitif untuk SLTP (Jakarta: Depdiknas, Dikdasmen, 2001), p.67

[8] Tangkudung James, Kepelatihan Olahraga (Jakarta: Penerbit: Cerdas Jaya, 2012) p. 68

[9] Pate, Rotella dan McCleanaghan, dasar-dasar Ilmiah kepelatihan terjemahan Kasiyo Dwijowinoto(Semarang: IKIP Semarang Press.,1993), p. 299

[10] Thomas R. Baechle and Barney R. G. Strength and conditioning specialist, terj R. Siregar (Jakarta: Raja Grafindo. 2000), p. 5

[11] Frank S. Pyke, Toward Better Coaching (Canberra: Australian Government Publishing Service, 1980), p. 30

[12] Lindenfied,Goacl, mendidik anak agar percaya diri, Alih Bahasa oleh Editi Kamil (Jakarta: Arcan, 1997), pp. 3-10

[13] David L, Gallahue, Understanding Motor Development, Infant, Children, Adolescents (Indiana: benchmark Press, Inc, 1989), p. 351

[14] Nasir, Moh, Metode Penelitian (Jakarta: Ghalia, 2003), p. 328

[15] Nurhasan, Tes dan pengukuran dalam pendidikan jasmani: Prinsip-prinsip dan penerapannya (Jakarta: Depdiknas, 2001), p. 12

[16] Hardianto Wibowo, Anatomi Ostologi dan alat gerak (Jakarta: IKIP Jakarta, 1994 : 11),

[17] Nenggala,A. K. 2006 (Pendidikan Jasmani,Olahraga, dan Kesehatan, Bandung: PT. Grafindo. Media Pratama.

[18] Russel R Pate, Bruce Mc Clenahan, dan robert rotella, op.cit., p. 151

[19] Http://www.crayonpedia.org/mw/Kategori: Sistem_Gerak_Pada_Manusia_11.1" Diakses pada tanggal 25 januari 2013.