The Relationship Between Power of Arm Muscles and Shoulder to the Power of Leg Muscles and the Flexibility of Wrist With the Smash Result on The Pendor Volleyball Team University Of Riau

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Abstract: The purpose of this research was to knowWhether there is a relationship between the power of arm muscles and shoulder with accuracy of Smash onPendor volleyball team University of Riau,?Whether there is a relationship between the Power of leg muscles against accuracy of Smash on Pendor volleyball team University of Riau?, Whether there is a relationship between the flexibility of wrist against the accuracy of Smash on Pendor volleyball team University of Riau?, Whether there is a relationship between the power of arm muscles and shoulder, power of leg and flexibility of wrist against the accuracy of the Smash on Pendor volleyball team University of Riau?,The research was conducted using a correlation research that aims to find out how far the variables on a factor which is related to other factors. The population of research was the son athlete volleyball team Pendor University of riau as many as 16 people, Thevariable research includes free variable consists of an explosive power of leg muscles, arm muscles, flexibility of wrist and variables are bound is the result of smash accuracy.The results of analysing of data obtained calculation of explosive power of leg muscles, strength of arm muscles, flexibility of wrist with normal smash results known F count each of 18.02 (X 1), 34.56 (X 2), and (X 3) 21,88 > F table 4.60 so the hypothesis is accepted. This means that there is a relationship of explosive power of leg muscles, strength of arm muscles, and flexibility of wrist with the results normal smash onpendorVolleyball Team University of Riau.

1. Introduction

Sport is a physical activity that is performed to get the body healthy and strong, the activity itself tends to be fun and entertaining. the word of sport is derived from the native of Indonesia. Not same with *sport.* Sport means to cultivate or body or physical refining. Viewed from the purpose, sport is divided into three, they are sports education, sports recreation and sporting achievements. Sports education implemented in school, Sports achievements made at the club-club sports through the parent sports, while recreational sport done only to fill free time.

One of the goals of development and sports development in Indonesia is to improve coaching and sports skills, among them is the sport of volleyball. The game of volleyball is a very popular sport branch and According to the experts is currently listed as a sports volleyball ranks second in the world with famous players reach more than 140 million people. Until now, the parent

organization of this sport is *international volley ball federation* (IVBF), 180-member countries (nuril ahmadi, 2007:1). Similarly in indonesia, the sport of volleyball was one among the many branches of the popular sports in society,the game of volleyball is favored by people of various age levels, children, teens and adults both men and women. It is proved that the sport of volleyball played on many villages, in offices and schools.The game of volleyball can be used as a means to educate, because in volleyball sport can create personal sportsmanship, honesty, cooperation, responsibility. All of that is values education that can be embedded. Therefore volleyball sport match applied in the environmental community and the school environment.

According to the NurilAhmadi (2007:20), The game of volleyball is a complex that is not easily done by everyone, required knowledge of basic techniques and advanced to be able to play volleyball. The basic technique involves passing, serving, setting, digging and doing a smash and blocks. From some of the basic techniques in volleyball, Smash is one of the factors to obtain victory in volleyball match, This can be seen at the time of the match. In the games of volleyball which consists of 3 sets (Three Winning Sets) with rally point system. If a team won 3 setsin a games then the team is asserted win, and If an equation set is then followed by the last round. In the game, many of the factors that led to the smash skill of a player not effective of which many errors occur. This happens due to declining physical condition so that the skills as well as declining pressure from opponents and spectators.

Aside from that the physical condition is needed by a player of volleyball. The physical condition is a unified whole of components which cannot be separated for granted either an increase or maintenance. Among some of the physical condition: strength, endurance, power, speed, flexibility, agility, coordination, balance, accuracy and reaction, Sajoto (1995:8-9). From some of the components needed by a volleyball player, not only do passing, movement and block services alone, but required in performing the smash. Because in practice it is the technique that must be smash take precedence and Smash is a powerful weapon to win every rally and yield figures. But surely smash is to do with the good and perfect, strong, sharp and directional, Therefore the above components is needed. From the description it can be concluded that in the game of volleyball, must have a basic techniques and good physical condition. To be able to acquire or master the basic skills of volleyball one of them is smash, the athlete must practice correctly and continue against all factors that determine or influence the mastery of basic skills of volleyball.

Smash or spiking is the movement hit the ball with a powerful and loud as well as the course of the ball fast, sharp and swooped and difficult opponent received a ball when it is done quickly and precisely (Aip syarifuddin.1997:58).on the smash technique is the art volleyball game and this technique including deadly attack techniques to earn points. If the players wanted to win the game then inevitably have to master the technique of smash. as for who should be on the need to do a smash, the first must have agility, second must have the power or high explosive power, the third has the Felling to determine the accuracy or timing that right when the ball will be hit, the fourth must have the strength of blows to hit the perfect ball (Sukirno , 2012:18).

Power is a combination of components of maximum speed and maximum strength (Bompa,1994:317). A sportsman who had a huge power properly then it is certain he has the optimal physical ability. to generate both of components required an exercise with time long enough through the hard exercise, power will always be related with explosive (Sukirno,2012:148).According to (ismaryati,2008:101), flexibility is the ability of moving the body or part possible without going the tension joints and muscle injury, There are two kinds of flexibility, that is dynamic flexibility and static flexibility, dynamic flexibility is the ability to

use joints and muscles are continuously in motion space filled quickly, and without a obstruction movement. Static flexibility is the ability to conduct a joint motion in a large space. Flexibility is needed by many sports, but nevertheless there are differences flexibility needs for each appearance. This will very easily marked with a level of flexibility of the joints throughout the body, especially the muscles, and ligaments surrounding the joints and ligaments-. It can be concluded the higher the joints flexibility of the wrist then hand motion in the swing angle is also getting bigger, so generated power is also getting bigger.

After a study of observation and the observation that was done by the author's on the field, and also based on information from the coaches and the athletes, that the sport of pendor volleyball Team at the University of Riau. up to this point have not been able to show maximum achievement. One of the reasons is caused a smash, and of course it can affect the outcome of the game of pendor volleyball team at University of Riau. There are still a lot of players who have experienced failure at the time did spike a volleyball. Failure often occurs when smash such as: ball did not pass the net, the ball can be returned or blocked by the opponent, the ball is not right on target or a ball out of the field of play. The weakness of this smash suspected contributing factor because of a physical condition, have not been fullest among others: power arm and shoulder muscles, and flexibility of wrist so that hard for athletes steer his smash.

Based on the basis of several failures that occur when doing a smash on the game on bintangmuda volleyball team Sub Regency of GunungToarKuantanSingingi, suspected contributing factor is the physical condition of players like power of arm and shoulder muscles, wrist flexibility so that researcher would like to take the title of this research, The relationship of arm Power and shoulder Muscles and the wrist flexibility with Smash accuracy of Pendor Volleyball Team at the University of Riau.

2. Methodology

The research was conducted using a correlation research aims to find out how far the variables on a factor which is related to other factors. Correlation is a research designed to determine the level of the relationship of the different variables in a population and aims to find out the extent of the relationship between free and bound variables, (SuharsimiArikunto, 2006:131). Free variables in this research is: power of arm and shoulder muscles (X 1), Power of leg (X 2) Wrist flexibility (X 3), and variable bound that is smash accuracy volleyball (Y). This research place is in the Pendor volleyball field University of Riau Rumbai. The population in this research is a team of studentspendor volleyball University of Riau totally 16 people. The technique of sampling in this research is the technique of total sampling with sample research 16 people. The instrument used to measure the explosive arm and shoulder muscles using the test Two-Hand Medicine Ball Put. (Ismaryati, 2006:64 – 65).Test and measurement of wrist flexibility Ismaryati (2008:109).Instrument test *vertical power jump*. Spike/smash tests used the accuracy of smash (Nurhasan: 2001:168). Regression analysis used in this research was single regression analysis and regression.

3. Results and Discussion

Power of arm muscles and shoulder The measurement of the power of arm muscles and shoulder are performed with the Two-Hand Medicine Ball Put test against 16 samples with the

highest value and the minimum value is 3.40 5.40 average (mean) 4.46, (standard deviation) 0.57. For more details look at the distribution of frequencies below:

Table 1Frequency Distribution Of The Variable Power of arm and shoulder muscles(X_1)

Interval	Absolute frequency (af)	Relative frequency (rf)
3.4-3.7	1	6.25
3.8-4.1	2	12.5
4.2-4.5	7	43.75
4.6-4.9	3	18.75
5.0-5.3	3	18.75
	16	100

Based on the frequency distribution table at the top of the 16 samples, 1 person (6.25%) to have the results of muscle power arm muscles and shoulder with a value of 3.4-3.7, then 2 people (12.5%) to have the results of the power arm and shoulder muscles with a value of 3.8-4.1, 7 persons (43.75%) have the results of the power arm and shoulder muscles with a value of 4.2-4.5, then 3 people (18.75%) to have the results of muscle power arm and shoulder with a value of 4.6-4.9, 3 people (18.75%) to have the results of muscle power arm and shoulder with a value of 5.0-5.3, For more details can be seen in the image below:

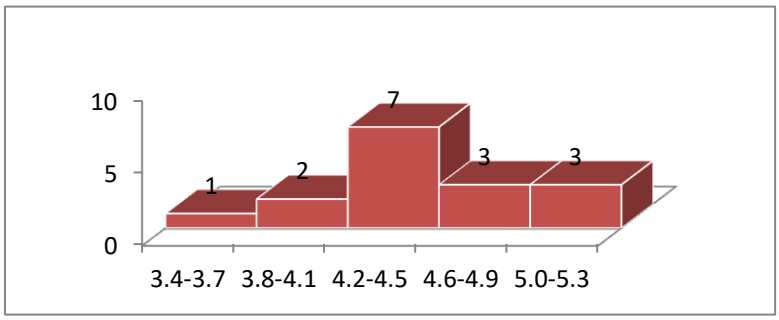

Figure 1 Histogram Power arm muscles and shoulder

Power of Leg Muscles

Measuring power of leg muscles performed with Vertical Jump test against 16 samples with the highest value and the minimum value of 63.00 42.00 average (mean) 54.75, (standard deviation) 5.71. For more details look at the distribution of frequencies below:

Table 2. Frequency Distribution Of The Variable Power of leg(X_2)

Interval	absolute frequency (AF)	Relative frequency (RF)
42-45	2	12.50
46-49	0	0
50-53	3	18.75
54-57	6	37.50
58-61	5	31.25
	16	100

Based on the frequency distribution table at the top of the 16 samples, 2 persons (12.50%) have results power of leg muscles with the value 42-45, then 3 people (18.75%) have results power of leg muscles with the value 50-53, then 6 people (37.50%) have results power of leg muscles with the value 54-57, then 5 people (31.25%) have results power of leg muscles with the value 58-61, For more details can be seen in the image below:

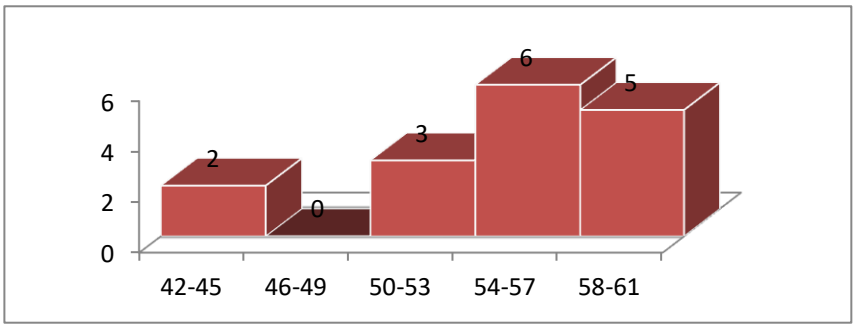

figure2. Histogram Power of leg muscles

The wrist flexibility

Measuring wrist flexibility is performed by wrist flexibility test against the 16 samples with the highest value is 80 and the minimum value is 50 average (mean) 65.19, (standard deviation) 9.32. For more details look at the distribution of frequencies below:

Table 2. Frequency Distribution Of The Variable wrist flexibility(X_3)

Interval	Absolute frequency (af)	Relative frequency (rf)
50-55	4	25
56-61	0	0
62-67	4	25
68-73	4	25
74-79	4	25
	16	100

Based on the frequency distribution table at the top of the 16 samples, 4 people (25%) have the results of wrist flexibility with a value 50-55 then 4 people (25%) have the results of wrist flexibility with a value of 62-67, the next 4 people (25%) have the results of wrist flexibility with a value of 68-73, then 4 people (25%) have the results of the wrist flexibility with a value of 74-79. For more details can beseen in the image below:

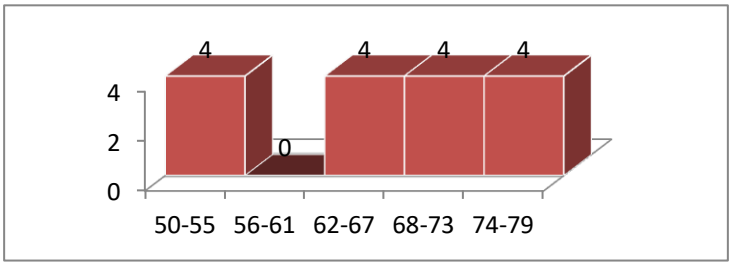

figure 3. Histogram wrist flexibility

The smash result

Measuring the normal smash results is performed with smash test from laveage against 16 samples, obtained the highest score is 75 and lowest score is 43, the average (mean) 59.63, (standard deviation) 8.16. For more details on the frequency distribution can be seen below:

Table 4. Frequency Distribution Of The Variable smash accuracy (Y)

interval	absolute frequency (AF)	Relative frequency (RF)
43-48	1	6.25
49-54	3	18.75
54-59	3	18.75
60-65	5	31.25
66-71	4	25
	16	100

Based on the frequency distribution table at the top of the 16 samples, 1 person (6.25%) have the smash result with 43-48 values, while the stretch of 3 people (18.75%) have the smash result with the stretch value 49-54, then 3 people (18.75%) have the smash result with the 54-59 value, the next stretch of 5 people (31.25%) have the smash result with the value 60-65, and 4 people (25%) have the smash results with the stretch value 66-71, For more details can be seen in the image below:

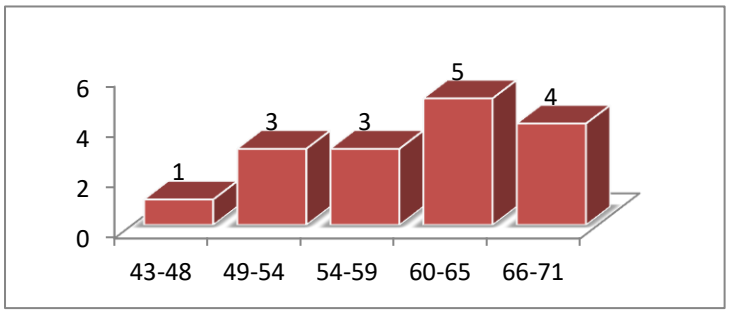

Figure 4. Histogram *smash result*

The relationship Power of arm muscles and shoulders with the Smash resultsexplosive power is a person's ability to apply maximum force deployed in a nutshell as short, in this matter it can be stated that the explosive was the result of the multiplication between the power with speed (Sajoto, 1995:8). So to get a good and perfect explosive , then the one has to perform various physical exercises related to explosive exercise.
Muscle is a connective tissue that its main task is to contract to move the parts of the body either realize or not. The movement caused by cooperation between muscles and bones. Bones are not able to function as a tool of the movement if it is not on the move by the muscles. Muscle is able to move bones because it has the ability to contract.

The calculation of correlation between shoulder and arm muscle power (X 1) and the smash accuracy (Y) using the formula of the product moment correlation. Testing criteria if r count > r table, then there is a significant relationship and contrarily (Sudjana 2002:369). From the results

of calculation of correlation between the power of the arm muscles and shoulders with smash accuracy retrieved F count 18.01 F table on the significant extent of α = 0.05 that is. 4.60. Means there is a connection between the power of arm muscles and shoulder with the smash result.

The relationship power of leg muscles with the Smash result.

Explosive power or power is often also referred to as explosive power or muscular power. Power is the product of strength and speed, according to Harsono (1988:200)that "Power is the ability of a muscle to drive maximum strength, in a very fast". Then according to Sajoto (1995:8) that explosive muscle (Muscular power) is a person's ability to perform maximum power, with the efforts deployed in the shortest time", While according to Bompa (1999:61),power is the ability of a muscle to remove the maximum power in a very short time.

The calculation of correlation between shoulder and arm muscle power (X 2) with the smash accuracy (Y) using the formula of the product moment correlation. Testing criteria if r count > r table, then there is a significant relationship and contrarily (Sudjana 2002:369). From the results of the calculation of correlation between the power of arm muscles and shoulders with smash accuracy retrieved F count 34.56 while F table at level significant α = 0.05. that is 4.60. Means there is a connection between the power of arm muscles and shoulder with the smash result.

The wrist flexibility with smash result

Flexibility is the body's ability to perform the exercises with the amplitude of the movement are big and spacious.In other words, flexibility is the ability to do wrist movements to all directions optimally.

According to Ismaryati (2008:101), flexibility is the ability of moving the body or parts of the widest possible without going the tension joints and muscle injury. According to m. Sajoto (1995:9), flexibility is the effectiveness of someone in the adjustments themselves for all activities with a wide body. This will be very easy in the mark with joint flexibility on the whole body.

From the explanation above, the authors are able to clarify that flexibility is the ability of a person to be able to move the body in a single movement with widest might be without injured joints and muscles. Wrist flexibility for that much needed and required in performing the smash.

The calculation of the correlation between the wrist flexibility (X 3) with accuracy of service top (Y) using the formula of the product moment correlation. Testing criteria if r count > r table Ho is rejected and Ha is accepted. then there is a significant relationship and contrarily (Sudjana 2002:369). From the results of calculation of the correlation between the wrist flexibility with the accuracy of service over retrieved F count 21.88 while F table at level significant α = 0.05 that is 4.60. Means in this case there is a relationship between the wrist flexibility with the Smash result.

The relationship between the power of arm muscles and shoulder , power of leg muscles and flexibility of the wrist with the smash result.

To know the relationship of two or more variables used the formulas of double regression analysis. From the results of the calculation obtained double regression analysis (F test)

acquired F count = 53.04 whereas F table acquired for 4.60, so F count > F table, This means that there is a relationship together between power of arm muscles and shoulder (XI), power of leg muscles (X 2) and the flexibility of the wrist (X 3) with the ability the smash result (Y).

Based on the above description it is clear that the third of these factors can affect the smash result that does by a person in the game of volleyball. contrarily there are still many other factors that can affect a player's skill of volleyball skills especially in the normal smash.

4. Conclusion

a. There is relationship an explosive power of leg muscles with the smash result on pendor Volleyball Team at the University of Riau with F count > F table 18.02 4.60 so hypothesis is accepted
b. There is a relationship strength of arm muscles with smash result on pendor Volleyball Team at University of Riau with F count > F table 34.56 4.60 so hypothesis is accepted
c. There is a relationship the wrist flexibility with normal smash result on pendor Volleyball Team at University of Riau with F count > F table 21.88 4.60 so hypothesis is accepted
d. There is a relationship explosive power of leg,strength of arm muscles, and the wrist flexibility with the normal smash result on pendor Volleyball Team at University of Riau with F count 53.04

References

Arikunto, Shuarsimi.2006. ProsedurPenelitianSuatauPendekatanPraktek. Jakarta: PT RinekaCipta.

Ismaryati.2008. *TesdanPengukuranOlahraga. Surakarta: LPP UNS dan UPT*

Muhajir.2006. PendidikanJasmaniOlahragadanKesehatan.Jakarta :Erlangga

Nurul Ahmadi.2007. PanduanOlahragaBolavoli. Surakarta :Pustakaumum

PBVSI.2004. *MetodologiPelatihanBolavoli.Jakarta: ekretariatUmum*PP.PBVSI

Nurhasan. 2001. *TesdanPengukuranDepdikbud.* Universitas Terbuka

Harsono. 2001. *LatihanKondisiFisik.* JurusanIlmuKeolahragaanFakultasIlmuPendidikanUniversitasNegeri Malang.

Sajoto.M. 1995.*PeningkatandanPembinaanKekuatanKondisiFisikdalanOlahraga.*Semarang :Dahar Prize

_____1998.*PembinaanKondisiFisikdalamOlahraga.*Jakarta. Dedpdikbud

Suharsono.H.P 1986.IlmuKepelatihanOlahraga. Yogyakarta: FPOK-IKIP Yogyakarta

_____1981. MetodikmelatihPermainan Bola Voli. Yogyakarta: IKIP

Sukadiyanto. 2002. TeoridanMetodologiMelatihFisikTenis. Yogyakarta FIK UNY

Syafruddin. 1992. PengantarIlmuMelatih. Padang : UNP Press

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