Original Article Research

The Relationship of Arm Muscle Strength and Upper Service Skills in The Undana B Men's Volleyball Team

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Abstract

Among the general public, volleyball is a tremendously popular sport. From kids to adults, this sport is highly popular with individuals of all ages. Players from the Undana B men's volleyball team used the top serve technique in this study, but it wasn't the best because the ball was frequently caught in the net and, even when it went over the net, would still leave the playing surface. The purpose of this study is to ascertain how Undana B men's volleyball team players' arm muscle strength and upper serve abilities relate to one another. Twelve players from the Undana B men's volleyball team serve as the study samples for this thesis, which employs a quantitative descriptive methodology. Research that seeks to determine the relationship between two variables—specifically, variable X arm muscle strength and variable Y top service skills—is categorized as correlational research. Descriptive statistics, normality, linearity, and correlation tests using the SPSS 22 software are among the analyses needed to meet these standards. The linearity test results indicate a linear connection, and the residual values are normally distributed, according to data analysis from the normality test findings, which indicate that the significant values are 0.818 & 0.634 > 0.05. The high Sig value indicates this. The players' scores indicate a deviation from linearity of 0.221. Given that the analysis's significance level is higher than 0.05, it may be concluded that Ha is accepted and that the Undana B men's volleyball team's service talents and arm muscular strength are significantly correlated. This is evident from the Sig value, which is 0.000 in this study and less than the alpha value, which is 0, 05. The way that variables are interpreted.

Keywords: *Arm Muscle Strength, Upper Service, Volley Ball*

How to cite:

1. INTRODUCTION

Volleyball is a sport that is very popular among the public. This sport is very popular with people of various age categories, from children to adults. We can see this in various places such as schools, offices and also villages. Volleyball games can be used as a means of education because volleyball can form individuals who are sporty, honest, cooperative and responsible, all of which are educational values that can be instilled. Therefore, the sport of volleyball is given in the environment or as a school sport (Septiana, 2021). As a sport that is very popular with the public and therefore becomes entertainment, Nusa Cendana University, as one of the universities in East Nusa Tenggara, has formed a men's volleyball team to help enliven and entertain the public who enjoy watching this sport. There are two men's teams that have been formed by Nusa Cendana University, of the two teams that have been formed, namely the Undana A men's volleyball team and the Undana B men's volleyball team, both teams are well known among students, especially the Undana A Men's Volleyball team which has succeeded in winning several titles. champion in an inter-campus match in NTT. One of the latest achievements they achieved was that the Undana A Men's Volleyball team won 1st place in the men's tournament at the 2023 TLM Cup in Kupang City, while the Undana men's volleyball team B has not been able to achieve his best performance.

In volleyball, the serve technique is the first shot to start and continue the match. Serving can even be used as an attacking technique if done correctly and appropriately. One service technique that can be used as an attacking technique is the basic top serve technique. Regarding technique in the game of volleyball, it is very important, because to achieve good performance, players must master advanced techniques, such as sharp, efficient and accurate ball shots so that those who see them are also amazed. Serving is an important thing in the game of volleyball, serving must also be done by all volleyball players, because serving is a technique which is also the initial attack carried out by each individual in a volleyball game without the help of a team. Serves are divided into several types, one of which is the top serve, namely serving with a style of hitting the ball like you want to smash but done without jumping. This service technique is an attempt to earn points. A good top serve is a strong, fast and accurate serve in the intended direction. To obtain a good serve, apart from being supported by good technical skills, it is also very necessary to have physical condition components in the form of muscle explosive power, flexibility, strength, speed, coordination and arm muscle strength which have a dominant contribution in performing the serve. A player must have all the components above because the top serve has a very important role in determining victory. Therefore, volleyball coaches always try to create forms of service techniques that can make it difficult for opponents to get points in order to win in a game or match. The top serve is a basic technique in the game of volleyball that requires good physical condition. To produce a fast and hard top serve technique, of course it cannot be separated from several factors, namely, explosive power of the arm muscles, speed of hand movements, hand eye coordination and body position. In practice, the upper hand serve is difficult to do but is very good to implement because it has a greater chance of getting points than the lower hand serve. The ball from the top serve will travel flat and fast towards the opponent's court, making it difficult for the opponent to control the ball. Good and correct serving technique requires cooperation between the strength of the working muscles, especially the strength of the arm muscles to hit the ball correctly. Strength is an important thing that an athlete needs in his sports activities, not only strength but good physical condition is also needed, physical condition is an integral part that cannot be ignored in achieving maximum ability, strength is one element

of physical condition that is very important in activities exercising. Strength can help improve components such as speed, agility, and accuracy. Thus, strength is an inseparable part of improving sports performance. Arm muscles are muscles that are located in a person's hands and are capable of producing maximum energy in carrying out daily activities. In everyday life, the explosive power of arm muscles can be seen in throwing, pushing or hitting movements. Arm muscle strength is the ability of the muscles and nerves around the arm area to produce power when the arm is working or under load (Lobo, 2022).

Strength is the basis of all components of physical condition. So even though many sporting activities require more agility, speed, coordination, balance and so on, these factors are still combined with strength factors to obtain good results according to (Nasution, 2015) Strength is power and force, while in English strength is Strength, which means the ability of muscles to contract optimally. In this case, power is divided into two parts, namely, absolute power and relative power. Absolute power means the strength to overcome a maximum external load, while relative power means the strength used to overcome a load in the form of one's own body weight. The Undana B men's volleyball team is one of the teams formed to help students who have talent in volleyball to develop their abilities and be able to achieve achievements. This team was trained by one of the lecturers at the Physical Education Study Program, FKIP Undana. namely Mr. Salmon Runesi, S. Pd, M. Fis. From the results of observations I made in several matches participated in by the Undana B men's volleyball team, there were players who used the top serve technique, however, it was not optimal because the ball being served often got caught in the net and even when it passed over the net it would go out of the match court. Of the two men's teams that have been formed by Nusa Cendana University, namely the Undana A Men's Volleyball Team and the Undana B Men's Volleyball Team. Both volleyball teams often take part in various championships, but of the number of championships they participate in, the Undana A Men's Volleyball Team often achieves quite good achievements. while the Undana B Men's Volleyball team has not been able to achieve its best performance, for this reason researchers are very interested in conducting research on the relationship between arm muscle strength and top serve accuracy in Undana B men's volleyball players.

2. METHOD

This approach makes use of quantitative research techniques, which are studies conducted when statistical findings are crucial for obtaining knowledge or insights that may be put to use. When making critical judgments, numbers can offer a far better perspective. Researchers can determine a relationship between two closely related variables by using correlational research, a non-experimental research technique. Two distinct groups are needed for this kind of research. Finding the association between two variables is done without making any assumptions; statistical analysis methods determine the relationship between the variables. The correlation coefficient, which has a value between -1 and +1, establishes the relationship between two variables. A positive connection between the variables is shown by a correlation coefficient of +1, whereas a negative correlation is indicated by a correlation coefficient of -1.

2.1 Participants

The population in this study were all 12 Undana B men's volleyball players. Therefore, researchers will take the total population. Because the population is very small, it requires the research to take the entire population as a sample of 12 people. So in this study the sample was

all the Undana B men's volleyball team players. Because the population was less than 100, all of them were taken. Thus, if the entire population is used as a sample, this research will be called a saturated sampling technique.

2.2 Research Design

The purpose of this design is to gather responses to the formulated research questions. This type of research, which searches for a relationship between two variables—specifically, variable X arm muscle strength and variable Y top service skills—is categorized as Pearson correlational research in terms of the data collection process and the types of data that will be acquired. A measure of the degree of linear association between two variables with a normal data distribution is Pearson correlation analysis, commonly referred to as Product Moment correlation (Duwi Priyatno, 2014). The graphic below illustrates the research design that was employed in this study.

2.3 Instruments

The arm muscle strength test and the service skill exam were the instruments utilized in this study to collect data regarding the link between arm muscle strength and upper serve skills. The two primary variables in this study are information about the relationship between arm muscle strength (variable X) and upper serve skills (variable Y). Research findings regarding the Undana B men's volleyball team's varying association between arm muscle strength and top service skills.

2.4 Procedures

The research procedure regarding "The Relationship between Arm Muscle Strength and Upper Serve Skills in the UNDANA B Men's Volleyball Team" can be described in several systematic steps to ensure that the data obtained is valid and reliable. With this structured procedure, the research can provide clear insight into the importance of arm muscle strength in improving upper serve skills, as well as contribute to a better training program in the UNDANA B Men's Volleyball Team.

2.5 Data Analysis

To carry out data analysis regarding the relationship between arm muscle strength and upper serve skills in the UNDANA B Men's Volleyball Team, the following steps can be applied: Data Description, Data Tabulation, Descriptive Statistical Analysis, Normality Test, Correlation Test, Significance Test, Conclusion and Interpretation Results.

3. RESULTS

The Undana Men's and Women's Volleyball Student Activity Unit (UKM) with a Decree (SK) from the Chancellor of Nusa Cendana University having Number: 52/KM/2023 is one of the activities formed by one of the Undana FKIP Physical Education and Sports lecturers named Salmon Runesi S. Pd, M. Fis. He is one of the Penjaskesrek FKIP Undana lecturers who has excellent abilities in coaching volleyball and is supported by extraordinary enthusiasm in developing the talents of Undana students who have the ability to play volleyball so that it can be proven by the achievements that have been obtained by the men's volleyball team and Undana's daughter took part in several inter-campus tournaments in East Nusa Tenggara. One of the teams being trained is the Undana B men's volleyball team, which is one of the teams that is the population and sample in this research. This team was formed with 12 members who are Nusa

Cendana University students who have good abilities in playing volleyball and for the place. The training currently being used is the Undana Physical Education and Physical Education Study Program field with balls and nets owned by the coach and team.

3.1 Tables

Based on the results of research conducted on the Undana B men's volleyball team players, data on the results of arm muscle strength tests was obtained as described in the following table.

Table 1

Arm Muscle Strength Test Results

No	Name	Arm muscle score
1	CH	27
2	KB	24
3	FP	26
4	SS	24
5	AT	32
6	JL	26
7	PS	20
8	AN	17
9	MO	22
10	AB	32
11	FP	29
12	RM	20

Source: Primary Data

Table 2

Based on the results of research conducted on the players of the Undana B men's volleyball team, data was obtained on the results of the upper serve skill test as described in the following table

The Results of Experimental and Control Group from Teaching Model

No	Name	Service test results
1	CH	34
2	KB	27
3	FP	32

4	SS	28
5	AT	40
6	JL	30
7	PS	24
8	AN	21
9	MO	27
10	AB	39
11	FP	37
12	RM	24

Source: Primary Data

4. DISCUSSIONS

Data analysis techniques are methods used to process data into usable information. Data analysis is also an important step in research, namely the process of processing data into information. The purpose of this data analysis is to know the characteristics of the data so that it can be understood and can be processed into information that suits the research objectives.

4.1 Descriptive Statistics.

Tabel 3

Statistic Deskriptif

Descriptive Statistics					
	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
skor otot lengan	12	17.00	32.00	24.9167	4.71860
skor servis	12	21.00	40.00	30.2500	6.21033
Valid N (listwise)	12				

Descriptive statistics are methods related to collecting and presenting a group of data so as to assess the quality of data in the form of variable types, summary statistics (minimum, maximum, mean, standard deviation). From the data above there were 12 respondents. Descriptive statistics of arm muscle strength, namely, minimum 17.00, maximum 32, mean 24.9167 standard deviation 4. 71860 Descriptive statistics of the upper serve, namely, minimum 21.00, maximum value 40.00, mean 30.2500, and standard deviation 6.21033.

4.2 Normality Test

The normality test in this research uses the basic Kolmogorov Smirnov concept which is

analyzed using the SPSS 22 program. The results of the normality test based on the data obtained are as follows:

Tabel 4

Normality Test

Tests of Normality						
	Kolmogorov-Smirnov^a			*Shapiro-Wilk*		
	Statistic	*Df*	*Sig.*	*Statistic*	*Df*	*Sig.*
skor otot lengan	.101	12	.200*	.962	12	.818
skor servis	.141	12	.200*	.950	12	.634
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Normality Test is a method for testing whether data is normally distributed. Based on the results of the analysis using the basic concept of Kolmogorof Smirnov through the SPSS 22 program, it is normal if the significance value is greater than 0.05. Based on the results of the normality test, it is known that the significance value is 0.818 & 0.634 > 0.05, so it can be concluded that the value is normally distributed.

4.3 Linearity Test

The regression linearity test is used to test the experiment's or experimental tool's error and, in addition, to test the linear model of the collected data. In other words, the linearity test is used to ascertain the relationship between the independent and dependent variables; regression is considered linear if the calculated F result (observation) is less than the F table. The SPSS 22 program aids in the analysis of this study; the linearity of the data is visible through the SPSS 22 program based on the magnitude of the F value in the sig line; deviation from linearity, if the value is greater than 0.05, the data is linearly regressed. Based on the data collected, the SPSS 22 program analysis's findings are as follows:

Tabel 5

Linearity Test

ANOVA Table							
			Sum of Squares	*Df*	*Mean Square*	*F*	*Sig.*
skor servis * skor otot lengan	*Between Groups*	*(Combined)*	421.250	7	60.179	80.238	.000
		Linearity	410.946	1	410.946	547.928	.000
		Deviation from Linearity	10.304	6	1.717	2.290	.221
	Within Groups		3.000	4	.750		
	Total		424.250	11			

The Undana B men's volleyball team's upper serve skills and arm muscular strength are independent variables whose relationships are analyzed linearly. The high Sig value indicates this. The players' scores indicate a deviation from linearity of 0.221. Given that this analysis's value is greater than 0.05, it can be concluded that there is a linear relationship between the Undana B men's volleyball team's top serving talents and their independent variable arm muscular strength.

4.4.4 Hypothesis Testing

To ascertain the link between two or more variables, data analysis methods are used to analyze experimental data using the product moment correlation test. Following the completion of the prerequisite tests, the correlation test is conducted. Normality and linearity tests are among the required tests for this investigation. Correlation test analysis was performed using the SPSS 22 software to facilitate researchers' analysis, and the following outcomes were attained:

Tabel 6

Correlation Test

Correlations		skor otot lengan	skor servis
skor otot lengan	*Pearson Correlation*	1	.984**
	Sig. (2-tailed)		.000
	N	12	12
skor servis	*Pearson Correlation*	.984**	1
	Sig. (2-tailed)	.000	
	N	12	12

**. Correlation is significant at the 0.01 level (2-tailed).

By determining the coefficient between the independent and dependent variables, the correlation test is used to evaluate the study hypothesis. Arm muscle strength is the independent variable in this study, and upper serve skill is the dependent variable. The findings, which were examined using the SPSS 22 software, demonstrated a substantial correlation between the Undana B men's volleyball team's serving ability and arm muscular strength. This is evident from the Sig value, which is 0.05, which is less than the alpha value. Given that the study's 2-tailed significance level is 0.000, it can be said that the Undana B men's volleyball team's serving skills and arm muscular strength are significantly correlated. As the value of rxy, or aggressiveness, in this study is 0.984, it can be concluded that there is a very strong and very high correlation between variables X and Y. If the magnitude of rxy is 0, 81-1.00, then the correlation between variables X and Y is very strong and very high.

5. CONCLUSIONS

According to the findings of the data analysis conducted for the study on the relationship

between volleyball upper serve skills and arm muscle strength in the Undana B Men's Volleyball Team, training to build arm muscle strength can enhance upper serve abilities. With the title "The Relationship between Arm Muscle Strength and the Success of Volleyball Lower Serves in Extracurricular Female Students at SMP Negeri 5 Jujuhan Regency," Windy Septiana's (2021) pertinent research supports this. Bungo found a 1.03 link between arm muscular strength and a volleyball bottom serve's success. The t-test results, which show that t count > t table is 2.47 > 1.72, support the conclusion that hypothesis Ha is accepted and hypothesis Ho is rejected.

There is a significant correlation between arm muscle strength and volleyball top service results at the PKDP Pekanbaru Volleyball Club, according to research by M. Nusri Rachman (2018) titled "The Relationship between Arm Muscle Strength and Volleyball Upper Serve Results in Men's Volleyball Athletes from the Padang Pariaman Pekanbaru Family Association." The calculated t value is greater than the t table (2.942>2.14), and the relationship percentage is 38.31%. Then, to strengthen the muscles in your arms, In 2019, Saparuddin, S. Under the heading "The Effect of Push-Up and Pull-Up Training on Arm Muscle Strength in Archery Athletes in Perpani, Banjar Regency" The following conclusions can be drawn from the data analysis test results and the discussion of the research findings: 1) Push-up training significantly improves arm muscle strength in Perpani resistance athletes in Banjar Regency. 2. Pull-up training significantly improves arm muscular strength in Banjar Regency's perpani resistance athletes. 3) The impact of push-up and pull-up training on arm muscle strength varies significantly among athletes in Banjar Regency who hold perpani. Because of this, volleyball players can incorporate push-up and pull-up exercises into their training regimen to strengthen their arm muscles. In the meantime, every volleyball player needs to be proficient in the fundamental top serve technique since, as Arifin asserts, it is one of the tools a player can utilize to score points in a match if executed properly. According to Ningsih et al. (2020), "The upper hand serve is frequently employed to score points because it delivers a heavier blow that swoops downward towards the opponent. Thus, one of the primary motivations for researchers to consider top serve technique a crucial area of study is because of this. so that every study method has been used in accordance with the research procedure.

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