

THE RELATIONSHIP BETWEEN ARM MUSCLE STRENGTH, FITNESS AND KINESTHETIC PERCEPTION AND VOLLEYBALL PASSING SKILLS IN EXTRACURRICULAR MEN'S STUDENTS OF SDN BUNDER 1 PATUK GUNUNG KIDUL IN 2020Dwi Gunadi^{1*}, Shodiq Hutomono², Slamet Santoso³¹Universitas Tunas Pembangunan Surakarta (UTP), Indonesia²Universitas Tunas Pembangunan Surakarta (UTP), Indonesia³Universitas Tunas Pembangunan Surakarta (UTP), Indonesia*e-mail: dwi.gunadi@lecture.utp.ac.id

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Abstract

In accordance with the objectives of this study, this study uses a descriptive method with a correlational study approach. This research was carried out in the field of Bunder 1 Patuk Gunung Kidul State Elementary School in male students extracurricular activities and this research was conducted in October 2020. In this study the independent variable is also called predictor and the dependent variable is also called as a criterion. Data collection techniques in this study were to use test and measurement techniques. The types of tests used are: (1) Push-up test to measure arm muscle strength), (2) The togok flexibility test, namely by touching the test, (3) Test Kinesthetic perception in the vertical plane to measure kinesthetic perception, (4) The upper passing test used in this study used the upper passing test. Instructions for the execution of each test are attached.

Based on data analysis and hypothesis testing that has been carried out, the conclusions that can be obtained are: (1) There is a significant relationship between arm muscle strength and upper passing, $r_{count} = 0.493 > r_{table} 5\% = 0.444$. (2) There is a significant relationship between Flexibility and Upper Passing, $r_{count} = 0.465 > r_{table} 5\% = 0.444$. (3) There is a significant relationship between kinesthetic perception and upper pass, $r_{count} = 0.497 > r_{table} 5\% = 0.444$. (4) There is a significant relationship between arm muscle strength, flexibility and kinesthetic perception with upper passing, $R^2_y (123) = 0.493 > r_{table} 5\%$ at the 5% significance level of 0.444 and F_0 of 4.3831 > f_{table} at the 5% significance level of 2.89.

Keywords: Arm Muscle Strength, Flexibility, Kinesthetic Perception, Volleyball, Passing Skill

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INTRODUCTION

The game of volleyball is very popular, especially in Indonesia. This is because the equipment is relatively easy and cheap and the game is also enjoyable to watch and practice together for the purpose of filling free time, entertainment, recreation, education, even for achievement purposes although it cannot be denied that the average Indonesian people still play it. This sport is for entertainment purposes only and to fill free time.

In almost every corner of the village to the city, there are many volleyball courts. However, unfortunately there is no proper coaching yet so the quality of playing volleyball is still not good or in other words people don't use the correct techniques when playing volleyball so the results are not optimal.

The game of volleyball was also taught to students at Bunder 1 Patuk Gunung Kidul State Elementary School in 2020 and on average the students also enjoyed playing volleyball. Male students have received volleyball training and they have even been given a top passing training program for 2 months in order to provide treatment for experimental research. So it can be said, the student is already adept at performing upper passing skills. This is what then makes researchers interested in conducting further research, namely correlational research. Researchers are interested in conducting research on the top passing technique that has been mastered by the 2020 Extracurricular Male Students of Bunder 1 Patuk Gunung Kidul State Elementary School, by connecting the elements of physical conditions that support the process of implementing the top passing movement skill technique.

According to Suharno H.P. (2003: 20), the elements of physical conditions that support technical abilities in volleyball skills are: strength, endurance, speed, power, flexibility, explosive power, coordination, accuracy and stamina. Meanwhile, according to Sugiyanto (2004: 4), citing the opinion of Anita J. Harrow, who divides 6 classifications of body movements, namely: reflex movements, basic human movements, perceptual abilities, physical abilities, movement skills, and non-discursive communication. In this case the researcher will focus research on the elements of physical condition, strength, as well as the classification of body movements, perceptual abilities, which are still divided into five types, namely: differentiation of sense of movement (kinesthetic), differentiation of sight (visual), differentiation of hearing (auditory), differentiation of touch (tactile), and coordination abilities. Researchers take perceptual abilities that differentiate the sense of kinesthetic movement by calling kinesthetic perception and eye-hand coordination.

Techniques for playing volleyball include: passing, set-up, serving, baiting and blocking (Soedarwo and Soeyati, 2001: 15). The overhead passing technique is a basic technique in the game of volleyball which plays a role in helping when the team is attacking. Without mastery of the top passing technique, the volleyball squad or team, in this case the feeder or tosser, will not

be able to carry out their duties effectively because there is no "good" ball that can be fed to the smasher.

Based on the explanation above, this research will focus on "The Relationship between Arm Muscle Strength, Flexibility, and Kinesthetic Perception with Upper Passing Skills in Extracurricular Male Students at Bunder 1 Patuk Gunung Kidul State Elementary School in 2020."

METHODS

The method used in this research is a descriptive method with a correlation study, where the aim of the research is to find out whether there is a relationship between the independent variables and the dependent variable. The independent variables in this study were arm muscle strength, flexibility, and kinesthetic perception, while the dependent variable was overhead passing skills.

The population of this study was extracurricular male students at Bunder 1 Patuk Gunung Kidul State Elementary School in 2020, totaling 47 students. The sample size used in this research was 20 students, obtained using purposive sampling technique. The reason for the pandemic is instructions from the Gunung Kidul District Education Office not to gather more than 20 students.

The data collection technique used is test and measurement techniques. The tests used are The Push-up Test to measure arm muscle strength (Ismaryati, 2006: 123), the Togok Flexibility Test with the touching test from Mulyono B (2002:23), the vertical plane Kinesthetic Perception Test to measure kinesthetic perception (Barry L Johnson and Jack K. Nelson, 2006: 189-190), and The Top Passing Test used in this research uses the top passing test from Suharno H.P. (2005: 71).

FINDINGS AND DISCUSSION

Findings

The data obtained from each variable is then grouped and analyzed statistically, as shown in the attachment. A summary of the overall data description will be presented as follows:

Table 1. Description of Test Results Data for Arm Muscle Strength, Flexibility and Kinesthetic Perception and Upper Passing

Variable	Test	N	Mean	SD	Highest Value	Lowest Value
Arm Muscle Strength	Test	20	27.63	7.00	41	15
	Re-test	20	20.07	6.90	43	18
Flexibility	Test	20	22.43	4.53	33	11
	Re-test	20	22.70	3.80	30	12
Kinesthetic Perception	Test	20	2.57	1.92	7	1
	Re-test	20	4.23	1.77	7	2
Top Passing	Test	20	6.10	2.26	9	2
	Re-test	20	7.53	1.66	9	4

The results of correlation analysis and regression analysis between test data for arm muscle strength (X1), flexibility (X2), kinesthetic perception (X3) and overhead passing (Y) in this study are:

1. Correlation Analysis of Each Predictor

The results of the correlation analysis of each predictor with the criteria of this research are as follows:

- a. Based on the correlation analysis between arm muscle strength (X1) and overhead passing (Y), a correlation coefficient of 0.493 was obtained. With N = 20, the r table value 5% = 0.444. It turns out that $r_{\text{calculated}} = 0.493 > r_{\text{table } 5\%} = 0.444$. This shows that there is a significant relationship between arm muscle strength (X1) and overhead passing (Y).
- b. Based on the correlation analysis between flexibility (X2) and overhead passing (Y), a correlation coefficient of 0.465 was obtained. With N = 20, the r table value 5% = 0.444. It turns out that $r_{\text{calculated}} = 0.465 > r_{\text{table } 5\%} = 0.444$. This shows that there is a significant relationship between flexibility (X2) and overhead passing (Y).
- c. Based on the correlation analysis between kinesthetic perception (X3) and overhead passing (Y), a correlation coefficient of 0.497 was obtained. With N = 20, the value of rtable 5% = 0.444. It turns out that $r_{\text{calculated}} = 0.497 > r_{\text{table } 5\%} = 0.444$. This shows that there is a significant relationship between kinesthetic perception (X3) and overhead passing (Y).

A summary of the results of the correlation analysis of each predictor with the criteria of this research is as follows:

Table 2. Summary of Correlation Analysis Results for Each Predictor with Criteria

Variable	r _{count}	r _{table}	Conclusion
X1Y	0.493	0,444	Significant correlation
X2Y	0.465	0,444	Significant correlation
X3Y	0.497	0,444	Significant correlation

2. Regression Analysis

The regression analysis carried out in this study used multiple regression analysis of three predictors. The results of the regression analysis between kinesthetic perception test data (X1), arm muscle strength (X2), flexibility (X3) and overhead passing (Y) in this study are as follows:

- a. The regression line equation is:

$$\hat{y} = 0.049 X1 + 1.097 X2 + 0.039 X3 + -41.096$$

- b. Correlation and determination coefficients between predictors and criteria:

$$Ry(1,2,3) = 0.632$$

$$R2y(1,2,3) = 0.493$$

- c. Test the significance of regression analysis.

The results of this research's regression significance test can be seen in the following table:

Table 3. Summary of Regression Analysis Results

Source Variation	db	JK	RK	F reg
Regression (reg)	3	44,4558	14,8186	4,3831
Residue (res)	16	54,0942	3,3809	-
Total	19	98,5500	-	-

From the results of the regression analysis it can be concluded, with db = m versus N - m - 1 = 3 versus 26, the F table 5% price is 2.89. Meanwhile, the F value obtained was 4.3831, which turned out to be greater than the limit for rejecting the null hypothesis. Thus the null hypothesis

is rejected, which means that there is a significant relationship between arm muscle strength (X1), flexibility (X2), kinesthetic perception (X3) and overhead passing (Y). The R2 value between arm muscle strength (X1), flexibility (X2), kinesthetic perception (X3) and overhead passing (Y) is 0.493.

DISCUSSION

Hypothesis Testing and Discussion

1. The Relationship between Arm Muscle Strength and Upper Passing

From the results of correlation analysis on arm muscle strength data with overhead passing, an r value of 0.493 was obtained, where this value is greater than the table r value at the 5% significance level, namely 0.444. Because the calculated r value $>$ r table, the correlation value is significant. This means that changes in overhead passing variance are influenced by the arm muscle strength variance component.

2. The Relationship between Flexibility and Overhead Passing

Based on the results of the analysis that has been carried out on the flexibility data for overhead passing, an r value of 0.465 is obtained, where this value is greater than the table r value at the 5% significance level, namely 0.444. Because the calculated r value $>$ r table, the correlation value is significant. This means that the variance of the flexibility element influences the increase in the variance of the overhead pass.

3. The Relationship between Kinesthetic Perception and Overhead Passing

Based on the results of the analysis carried out on kinesthetic perception data on overhead passing, an r value of 0.497 was obtained, where this value is greater than the table r value at the 5% significance level, namely 0.444. Because the calculated r value $<$ r table, the correlation value is significant. Thus it can be concluded that kinesthetic perception has a significant relationship to overhead passing.

4. Relationship between Arm Muscle Strength, Flexibility and Kinesthetic Perception with Overhead Passing

In the hypothesis it is stated that the relationship between arm muscle strength, flexibility and kinesthetic perception with overhead passing is known to be $R^2y(123) = 0.493$, while the r table at the significance level of 0.05 and $n = 20$ shows $r\text{ table} = 0.444$, with these results r is calculated $>$ r table 5% and $f\text{ count} = 4.3831$, while $f\text{ table } 5\%$ with $db\ 3:26 = 2.89$, this means $F_0 >$ $F\text{ table } 5\%$ so the hypothesis is accepted.

CONCLUSION

Based on the research results and the results of the regression analysis and product moment correlation that have been carried out, the following conclusions can be obtained:

1. There is a significant relationship between arm muscle strength and overhead passing, r count = 0.493 > r table 5% = 0.444.
2. There is a significant relationship between flexibility and overhead passing, r count = 0.465 > r table 5% = 0.444.
3. There is a significant relationship between kinesthetic perception and overhead passing, r count = 0.497 > r table 5% = 0.444.
4. There is a significant relationship between arm muscle strength, flexibility and kinesthetic perception with overhead passing, r^2 (123) of 0.493 > r table 5% at the 5% significance level of 0.444 and f_0 of 4.3831 > f table at the 5% significance level % of 2.89.

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