



P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (RJIF): 5.38  
IJPESH 2024; 11(3): 329-330  
© 2024 IJPESH  
<https://www.kheljournal.com>  
Received: 15-04-2024  
Accepted: 17-05-2024

**Faustine Dwi Putri Wulandari**  
Faculty of Sport Science,  
Yogyakarta State University,  
Yogyakarta, Indonesia

**Tomoliyus**  
Faculty of Sport Science,  
Yogyakarta State University,  
Yogyakarta, Indonesia

**Endang Sukamti**  
Faculty of Sport Science,  
Yogyakarta State University,  
Yogyakarta, Indonesia

**Bacilius Sukadana**  
Faculty of Sport Science,  
Manado State University,  
Indonesia

**Corresponding Author:**  
**Faustine Dwi Putri Wulandari**  
Faculty of Sport Science,  
Yogyakarta State University,  
Yogyakarta, Indonesia

## The effect of limb power exercises on smash ability in volleyball games in Karitas Tomohon catholic high school students

**Faustine Dwi Putri Wulandari, Tomoliyus, Endang Sukamti and Bacilius Sukadana**

DOI: <https://doi.org/10.22271/kheljournal.2024.v11.i3e.3362>

### Abstract

The formulation of the problem in this study is: The effect of the leg power on smash ability in volleyball games Karitas Tomohon? Catholic High School students. The aims of the study were: There is an influence of the leg power in smash ability in volleyball games for Karitas Tomohon Catholic High School students. The research method used is the experimental method. The population of this study was all students of class Data collection instrument: Smash Test in Volleyball Game. The research design uses: Randomized control groups pre-test and post-test design. Hypothesis testing uses statistical techniques with t test. The results of calculation analysis using t-test statistics obtained an observation t value of  $t_{ob} = 3.470$ . meanwhile, from the table of critical values t with a real level of  $\alpha = 0.05$ ;  $n_1 + n_2 - 2$  obtained a t table value of  $t_{tab} = 2.101$ . This fact shows that the value  $t_{ob} = 3.470 > t_{tab} = 2.101$ , thus the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted.

**Keywords:** Leg power, students, smash volleyball game

### 1. Introduction

Volleyball is a large ball game played by two opposing teams where each team has six players. Volleyball is a game played by hitting and dropping the ball into the opponent's field which is limited by a net and has predetermined rules. One of the techniques used when playing volleyball is the smash technique.

The smash technique is the action of hitting the ball sharply and diving so that the opponent cannot block it with the aim of getting points for the team. To get maximum smashes, players must have leg strength that can support them so they can make high jumps. In school learning, there are still many students who have not mastered the basic smash techniques due to a lack of understanding, face to face intensity and inadequate infrastructure. From the results of observations made by the author, Karitas Tomohon Catholic High School has adequate facilities and infrastructure to improve academic and non-academic quality and so that it can improve performance in volleyball games by mastering basic smash techniques also requires practice that can support every volleyball player including excellent physical abilities. One of the things that needs to be considered in carrying out the basic smash technique is leg power, this has not been fully implemented at Karitas Tomohon Catholic High School, so the author is interested in researching the effect of leg power training on smash ability in volleyball games in Karitas Tomohon Catholic High School students.

### 2. Materials and Methods

The method used in this study is an experimental method, the population of this study is all grade XI students of Karitas Tomohon Catholic High School and the sample of 20 students is taken randomly and then divided into 2 groups, namely group A as an experimental group of 10 students and group B as a control group of 10 students. The research design used in this study refers to the experimental design using "Randomized control group pre-test and past test design".

### 3. Results & Discussion

This research is experimental research involving two main variables, namely the independent variable in the form of the leg training and the dependent variable namely volleyball smash ability. To find out that the research results are a results of variables manipulated (treated) by the researcher, this research uses a control group as a controller.

And the measurement results on the variable smash ability of the experimental group's volleyball game which was applied to Karitas Tomohon Catholic High School female students can be seen in the following table.

**Table 1:** Experimental Group Smash Ability Test Results

No.	Pre-test (Y1)	Post-test (Y2)	Difference
1.	12	15	3
2.	10	15	5
3.	9	15	6
4.	8	14	6
5.	11	15	4
6.	14	15	1
7.	10	15	5
8.	7	13	6
9.	13	14	1
10.	11	14	3

From table 1, statistical quantities are obtained which include, among other things, the number of pre-test results or initial observations (Y1) and post-test or active observations (Y2) of the experimental group, and with the help of the casio fx 3600p calculator the results are as follows.

$$\text{Pre-test (Y1)} = 105 \quad \bar{X} = 10.5 \quad \text{SD} = 2,173$$

$$\sum \text{Post-test (Y2)} = 145 \quad \bar{X} = 14.5 \quad \text{SD} = 0.707$$

Furthermore, the results of measuring volleyball smash ability in the control group (comparison group) are as follows:

**Table 2:** Control Group Smash Ability Test Results

No.	Pre-test (O1)	Post-test (O2)	Difference
1.	11	13	2
2.	14	15	1
3.	10	12	2
4.	14	15	1
5.	12	15	3
6.	7	10	3
7.	9	12	3
8.	10	12	2
9.	11	13	2
10.	8	11	4

From table 2, the quantities include, among other things, the number of pre-test results or initial observations (Y1) and post-test or final observations (Y2) in the group.

From table 2, the results of the difference between the pre-test and post-test of the experimental group and the control group, statistical quantities will be obtained and with the help of the casio fx 3600p calculator the results can be seen in the following table.

Experimental Group (X1)	Control Group (X2)
n <sub>1</sub> = 10	n <sub>2</sub> = 10
$\sum X_1 = 40$	$\sum X_2 = 22$
$\bar{X}_1 = 4$	$\bar{X}_2 = 2.2$
SD <sub>1</sub> = 1.943	SD <sub>2</sub> = 0.788
SD <sub>12</sub> = 3.777	SD <sub>22</sub> = 0.622

### 4. Discussion of Research Results

This study showed that limb power training for eight weeks, improved volleyball smash ability in Karitas Tomohon Catholic High School Students. The normality and homogeneity test ensures that the sample is normally distributed and homogeneous. The pre-test results of the two groups did not differ significantly, but the post-test showed a significant improvement in the experimental group. The t-test ( $t_{ob} = 3.470 > t_{tab} = 2.101$ ) supports the conclusion that limb power training has a positive effect on volleyball smash ability.

### 5. Conclusion

From research that has been proven by conducting training and testing data analysis based on the variables measured, a conclusion can be drawn that there is an influence of the leg power training on the smash ability in volleyball among female students at Karitas Tomohon Catholic High School.

### 6. References

- Donald A, Cheser Jacobs L, Razavieh A. Introduction to Research in Education. Translated by Furchan A. Surabaya: National Enterprise; c1982.
- Harsono. Coaching and Psychological Aspects in Coaching Science. Jakarta: Director General of Higher Education P2LPTK; c1998. p. 200.
- Nala IGN. Principles of Physical Sports Training. Bali: Udayana University Press; c2011.
- Irsyada M. Volleyball. Jakarta: Ministry of National Education, Director General of Basic Education; c2010.
- Sajoto M. Development and Improvement of Physical Conditions in Sports. Jakarta: Director General of Higher Education P2LPTK; c1995.
- Yunus M. Sport of Choice Volleyball. Jakarta: Ministry of Education and Culture, Director General of Higher Education, Education Personnel Development Project; c2002.
- Nurhasan. Test and Measurements in Physical Education: Principles of Application. Jakarta: Ministry of National Education, Directorate General of Basic Education; 2001.
- Ahmandi N. Volleyball Sports Guide. Solo: Era Pustaka Utama; c2002.
- Lutan R. Learning Motor Skills, Introduction to Theory and Methods. Jakarta: Depdikbud Director General of Higher Education PPLPTK; c1988.
- Subroto, Yudina. Volleyball Game Module. Bandung: Indonesian Education University; c2010.
- Sudjana. Statistical Methods. Bandung: Tarsito; c1986.
- Pramono S. Volleyball Game Techniques. Jakarta: PT Gramedia; c2009.