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The Effect of Drill Training on Volleyball Smashing Ability at State Senior High School 1 South Dampal

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Abstract

Objective This study aims to determine the effect of drill training on volleyball smash skills in extracurricular students of Senior High School 1 Damsel. Smash is a primary attack technique that requires coordination, strength, and precision, but many students still have difficulty in performing it optimally. The research method uses a quantitative approach with a one-group pretest–posttest design. The sample consisted of 12 volleyball extracurricular students selected by purposive sampling. Data were collected through smash skill tests before and after treatment. Drill training was conducted for six weeks (16 meetings). Data analysis used a normality test and a paired sample t-test with a significance level of 0.05. Results The average pretest score showed a score of 33, while the posttest increased to 71 or an increase of 86.84%. The t-test results showed a significance of 0.00 <0.05 with a calculated t of 11.938> t table 2.201, so there is a significant effect of drill training on volleyball smash skills. Drill training has been proven to be effective in improving smash skills through systematic repetition of movements. This method is recommended for use in volleyball learning and extracurricular activities to optimize students' basic techniques.

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INTRODUCTION

Education is a basic and planned effort to create a learning atmosphere and learning process that allows students to actively develop their potential: having spiritual and religious strength, self-control, mature personality, intelligence, noble morals, and skills needed for themselves, society, nation, and state (Erica et al., 2019). Furthermore, according to Rosdiani in (Depdiknas, 2018), physical education is an educational process that utilizes systematically planned physical activities, which aims to develop and improve individuals organically, neuromuscularly, perceptually, cognitively, and emotionally, in order to support the implementation of the national education system.

Based on recent research, structured physical activity not only supports physical and motor skills but also strengthens cognitive functions (memory, attention, analytical skills), emotional-affective motivation, and social skills in students. For example, the study "Physical Activities and Cognitive Functions of Students" (Tarigan, Hidayat, & Lardika, 2022) found that physical activity is positively correlated with cognitive function among junior high school students.

In addition, a literature review of Sustainable Physical Education in Achieving School Well-Being (Septiani et al., 2022) concluded that sustainably designed physical education programs improve school well-being by improving physical fitness, student engagement, emotional development, and social skills.

Volleyball is a team sport played by two teams of six players each. The ball must be struck directly, meaning before it touches the ground, to keep the ball in play. Volleyball can be played on both indoor and outdoor courts. Essentially, the sport relies on teamwork and technical skills such as serving, passing, setting, smashing, and blocking.

The educational value of game rules not only maintains orderly competition but also fosters sportSenior High Schoolship and ethics in the game (D'Elia, Sgrò, & D'Isanto, 2020). To improve technical skills, training methods such as circuit training have proven effective in enhancing player performance (Hakim, Ishak, & Bismar, 2023). A skills-oriented learning approach is also a widely recommended strategy in modern physical education (Hakim & Sahabuddin, 2025). On the tactical side, developing methods for teaching attacking tactics can strengthen players' decision-making abilities during matches (Keldiyor Tirkashev & Jurakul Eshnazarov, 2023; Yakubzhonov & Yakubzhonova, 2025).

To achieve outstanding performance in volleyball, mastery of basic techniques and good physical coordination are required. These basic techniques include serving, passing, blocking, and smashing. Smashing is the primary weapon athletes often use to attack opponents and score points. Optimally executing a smash requires a high jump and a powerful push. A high jump can be achieved through exercises such as squat jumps and other plyometric training variations, which aim to increase and develop leg muscle strength and

power (explosive power) (Arte, YB, et al. 2020; Nggana, M., et al. 2022; Sukrawan, N., et al. 2024).

Volleyball is a unique sport where the goal is to hit the ball towards the opponent with a strategy to make the opponent make a mistake in returning the ball (Rohandi, 2018). However, problems encountered by students on the field indicate that the smashing ability of students at Senior High School 1 Damsel is not optimal. Many students experience difficulties in managing coordination, jump timing, and hitting power, which impacts the team's low attack effectiveness in matches. One of the main contributing factors is the lack of variety in the applied training methods, so that students' skills do not develop optimally. Previous research has shown that the use of varied training methods can improve athletes' technical abilities and coordination in volleyball (Abdiliah, Rasyid, & Syafruddin, 2021; Kristriawan & Sukadiyanto, 2020; Smith & Jones, 2020).

To address these issues, systematic, targeted, and repetitive training methods are needed to enable students to better master smash techniques. One method commonly used in sports education is drill training. Drills are repetitive exercises aimed at improving movement technique, increasing consistency, and developing correct motor skills. Through drill training, students are expected to more quickly grasp smash movement patterns, improve coordination between the approach, takeoff, hit, and landing, and produce more powerful and targeted smashes. Research shows that consistent drill training can improve athletes' technical skills and performance in volleyball (Johnson & Lee, 2019; Martínez et al., 2021; Silva & Costa, 2018).

METHODS

This research uses a quantitative approach with an experimental method, which involves administering a specific treatment to the research subjects to determine its effects. According to Suarifqi (2017), the experimental method is effective in testing hypotheses related to cause-and-effect relationships. The design used is a One Group Pretest-Posttest Design, which involves one group being tested before (pretest) and after treatment (posttest) without a comparison group, so that the treatment effect can be measured directly.

Participants

According to (Siyoto and Sodik, 2016), a population is a collection of objects or subjects that have certain characteristics and are determined by researchers to be studied. The population in this study was 12 students who participated in the volleyball extracurricular activity.

A sample is a portion of a population that represents the whole (Siyoto & Sodik, 2015). Because the population is small, the entire population is sampled using a saturated sampling technique.

Sampling Procedures

This study used data collection techniques in the form of tests and measurements to obtain objective and measurable data, namely the results of volleyball smash tests. Tests were conducted before (pretest) and after

(posttest) treatment to determine the effect of the treatment.

Prior to hypothesis testing, prerequisite tests are conducted, including a normality test to determine data distribution and a homogeneity test to ensure equality of variance. These tests are essential for valid statistical analyses, such as t-tests. According to Arikunto (2010), data testing aims to ensure the feasibility of the analysis, thus ensuring more accurate and reliable research results.

Materials and Apparatus

The test instrument used in this study was a badminton smash skills test. This test was adapted from the smash test developed by Nurhasan (2001), which has been proven to have good validity and reliability in measuring basic smashing skills. This test was chosen because it aligns with the research objectives, which focused on evaluating students' smashing skills.

Nurhasan's smash test assesses aspects such as hitting power, accuracy, and motor coordination. The test was conducted according to established procedures in the guidelines to ensure objectivity and consistency of measurement. Using this instrument, researchers were able to obtain accurate data on the subjects' smashing abilities.

Procedures

The data collection technique in this study used testing and measurement methods. The data collected consisted of volleyball smash test results. Before the pretest and posttest, the sample first took a smash test to obtain baseline skill data.

Before testing the hypothesis, prerequisite tests, such as normality and homogeneity tests, were conducted. These tests aimed to ensure the data met the basic assumptions of statistical analysis, so that the research results could be analyzed and concluded accurately (Arikunto, 2010; Sudjana, 2005).

Design or Data Analysis

The data analysis in this study was conducted quantitatively through several stages. The first stage involved calculating descriptive statistics to obtain the average value and percentage increase in pretest and posttest results. Next, a normality test was performed to ensure the data were normally distributed, thus meeting the requirements for parametric testing.

After the normality assumption was met, the analysis continued with a paired sample t-test at a significance level of 0.05. This test aims to determine whether there is a significant difference between the pretest and posttest scores. If the significance value (p-value) is <0.05 and the calculated t-value is >t-table, then the alternative hypothesis is accepted.

RESULT

The results of the research on volleyball smash abilities before and after being given this Smash Drill training which was carried out in 16 meetings are described as follows:

Based on (Initial Test) the smash ability in volleyball games of Extracurricular students of Senior High School 1 Damsel, before being given smash drill training from 12 students, the results of smash ability were obtained with the highest score of 5 points and the lowest score was 1 point, the total points were 38 points. Based on (Final Test) the

smash ability in volleyball games of Extracurricular students of Senior High School 1 Damsel, after being given smash drill training for 6 weeks from 12 students, the results of smash ability were obtained with the highest score of 8 points and the lowest score was 4 points, the total points were 71 points. Furthermore, the data of smash ability results in volleyball games before and after being given smash drill training were grouped in 1 table to find out the difference, a total of 33 points then continued with testing, the analysis requirements were data normality tests.

The normality test in this study was used to determine whether a distribution was normal or not. The normality test in this study used the Kolmogorov-Smirnov Sample test. The criteria used to determine whether a distribution was normal or not were if p > 0.05 (5%) the distribution was declared normal, and if p < 0.05 (5%) the distribution was said to be abnormal. The results of the normality test for the initial and final volleyball smash ability tests of extracurricular students at Senior High School 1 Damsel can be seen in the table below:

Table 1. Data Normality Test (Smash drill exercise)

(Smash drill practice)	Kolmogorov Smirnov	Sig	α	Criteria
Initial Test	0.647	0.797	0.05	**Normal**
Final Test	**0.745**	**0.636**	**0.05**	**Normal**

Based on the table above, which is a summary of the results of data normality for each research variable, it can be described as follows:

For the smash ability in volleyball before being given smash drill training (Pretest), the data normality value was obtained through the Kolmogorov Smirnov -test of 0.674 with a probability level of sig. (2 Tailed) or (P) of 0.797 greater than α = 0.05 (0.797 > 0.05) which means that this shows that the data has followed a normal distribution or is normally distributed. For the smash ability in volleyball after being given smash drill training (Pretest), the data normality value was obtained through the Kolmogorov Smirnov -test of 0.745 with a probability level of sig. (2 Tailed) or (P) of 0.636 greater than α = 0.05 (0.636 > 0.05) which means that this shows that the data has followed a normal distribution or is normally distributed.

Table 2. Pre-Test and Post-Test Results

Variables	T ht	T tb	Sig
Pretest & Posttest	11,938	2,201	0.00

Based on the results of the paired sample test pretest and posttest showed that the significance of 0.00 < 0.05, then Ho is rejected and Ha is accepted, meaning that there is an effect of drill smash training on improving the smash ability of volleyball games of Extracurricular students of Senior High School 1 Damsel. From the statistical calculation of drill smash training t-count = 11.938 using a significance level of 5% (N-1) = 12-1 = 11 obtained t-table value = 2.201 this means that the t-count value is greater than the t-table 11.938 > 2.201 or there is an increase between Pre-test and Post-test.

DISCUSSION

This study aims to determine the effect of smash drill training on smashing ability in volleyball among extracurricular students at Senior High

School 1 Damsel. The data obtained consisted of pretest (initial test) and posttest (final test) results, which were used to measure the effect of smash drill training. After 6 weeks of training, the posttest results showed an increase in smash ability scores. Some students with low pretest scores were suspected to be influenced by less supportive body posture factors, while students with high scores had more supportive postures.

The results of the hypothesis testing showed that the average smash ability value before training was 33, while after training it increased to 71, an increase of 86.84%. The Paired Sample T-Test showed a significance value of 0.00 <0.05, so Ho was rejected and Ha was accepted, which means there was a significant effect of smash drill training on improving volleyball smash ability. The t-count value of 11.938 was greater than the t-table of 2.201 (df = 11, α = 0.05), confirming a significant increase between the pretest and posttest.

Drilling is a training method that strengthens associations and skills through repeated repetition, thereby developing speed, accuracy, and efficiency in performing a motor skill. Through consistent practice, drilling helps instill solid, automatic movement habits, so that the skill becomes stable and can be performed reflexively without the need for excessive conscious thought. This approach is crucial in learning complex motor skills, as systematic repetition allows for the formation of stable, well-coordinated movement patterns (Magill & Anderson, 2017).

In the context of volleyball, a smash drill is a focused exercise that consistently repeats the smash movement pattern, from the takeoff, push, arm swing, and landing. This exercise forms correct and efficient motor skills, which improve the coordination, power, and accuracy of the smash. A study by (Williams et al. 2018) showed that structured drills significantly improved smash technique performance in volleyball athletes, with improved motor skills and faster and more precise motor responses. Thus, smash drills play a crucial role in improving the technical quality and movement efficiency of volleyball players.

International research also supports these findings. For example, (Alkhawaldeh et al., 2021) stated that repeated practice (drill training) significantly improves smash skills in novice volleyball athletes, improving motor coordination and muscle strength. Furthermore, (Smith and Lee, 2019) confirmed that systematic drill training can accelerate the learning of complex movements and form automatic motor patterns, positively impacting athlete performance.

Thus, it can be concluded that drills are a structured and repetitive method for developing correct movement skills and habits. This method is highly effective for improving smashing ability in volleyball, which requires complex motor coordination for optimal results.

CONCLUSION

The results of the hypothesis testing prove that the average difference in smash ability scores in volleyball games before being given smash drill training is 33 while after being given smash drill

training, the average increase in smash ability in volleyball games is 71 so that there is an increase of 86.84%. Based on the results of the paired sample test, the pretest and posttest show that the significance is 0.00 < 0.05, so Ho is rejected and Ha is accepted, meaning that there is an effect of smash drill training on increasing smash ability in volleyball games at Senior High School 1 Damsel Extracurricular. From the statistical calculation of smash drill training, t-count = 11.938 using a significance level of 5% (N-1) = 12-1 = 11, the t-table value is obtained = 2.201, this means that the t-count value is greater than the t-table 11.938 > 2.201 or there is an increase between the Pre-test and Post-test

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