



The Influence of Modified Hanging Ball Device on Volleyball Spike Performance in the Ngestiboga PWD Team

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ABSTRACT

This study aims to answer the following questions: (1) Does the hanging ball modification tool influence the results of volleyball smashes in the Ngestiboga PWD volleyball team? (2) To what extent does the hanging ball influence the results of volleyball smashes in the Ngestiboga PWD team? This research is a quantitative study using a one-group pretest-posttest design and quasi-experimental approach. Ten members of the Ngestiboga PWD volleyball team were used as the research sample. The sampling method employed was total sampling. The validity testing steps of the research instrument included testing the ability of volleyball smashes and using the Pearson product-moment correlation formula, which yielded an observed correlation coefficient (r) > the tabulated correlation coefficient (r -table) at 5%, namely $0.760 > 0.632$, and a two-tailed Sig. value of $0.0011 < 0.05$, indicating the accuracy of the data. The reliability test using Cronbach's alpha resulted in a high interpretation value of 0.805. Paired Sample T-test was used as the data analysis technique, along with homogeneity and homogeneity of variance tests as prerequisites for the Shapiro-Wilk normality test. The results of this study showed that the null hypothesis (H_0) was rejected, while the alternative hypothesis (H_a) was accepted (calculated t-value > tabulated t-value = $19.532 > 2.306$). To draw conclusions, it is important to note that: (1) The hanging ball modification tool influences the results of volleyball smashes in the Ngestiboga PWD team. (2) The R Square value of 0.116 according to the linear regression test. The percentage of the impact of the Ngestiboga PWD team's reaction to the hanging ball modification on volleyball smash results is 11.6%, and 88.4% is influenced by other factors.

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INTRODUCTION

Currently, one widely recognized truth on a global scale with significant implications for society is sports (Syahputra & IP, 2019). Sports and society are closely linked as distinct phenomena with significant social effects. Given its potential to foster

character development, sports can serve as a bridge for shaping character, national or regional identity, and patriotism. In general, sports achievements have a significant impact on a region (city, district, or nation) and serve as a source of pride for other areas in terms of political and economic recognition (Rohendi & Rustiawan, 2020). However, in the modern era, sports success won't advance on its own without supporting variables. One supportive aspect to be explored here is the body of knowledge in the sports industry known as sport science (Endriani, 2013).

Volleyball is a sport that needs to be developed. In Indonesia, volleyball is a very common sport. As a foundation for achieving excellence in sports, volleyball clubs should start teaching volleyball progressively, starting from beginners and progressing to seniors (Ismoko & Sukoco, 2013). According to Yusmar (2017), the objective of volleyball is to drop the ball into the opponent's court to win, achieved by bouncing the ball back and forth over the net. In volleyball matches, the team that wins is the one whose ball lands in the opponent's court after being bounced, as per Gazali (2016).

The hanging ball is one modification tool that can be used in training to enhance attacks or smashes for optimal results. Educators can construct developmentally appropriate and beneficial learning using modification techniques (Prayuda, 2022). Smash is a tactic often used in volleyball to attack, disrupt the opponent's mindset, and offer a way to score points (Maifa, 2021). Smash is the primary strike used to attack by forcefully slamming the ball into the opponent's court to score points for victory (Wahyu Cirana et al., 2021). Given its key role in volleyball attacks, the skill of smashing requires ample practice (Mahfud et al., 2023). The hanging ball is a modification tool that can be used in training to enhance attacks or smashes for optimal results. People are more interested in playing volleyball when it's modified. Athletes are motivated and assisted by this adjustment tool during their smash practice.

According to Soepijanto (2019), one tool used as an intermediary for smashes is the hanging ball. Hanging ball exercises can help improve hitting speed and accuracy. Mariadi et al. (2021) describe the hanging ball as a modified teaching illustration where a cold ball is suspended just out of a player's reach using rubber. The hanging ball is intended to facilitate players in performing proper movements before practicing on the field. The hanging ball is a ball suspended by a string within a student's reach, acting as a jar-like object aiding children in smash games (Purwaningsih & Wibowo, 2014). Ahmad Yanuar Syauki (2020) states that the hanging ball is a tool to convey information to the receiver, particularly about proper body alignment and palm-to-hand contact strength. By aiding teachers and students in their learning process, this medium is used to enhance student learning outcomes.

According to Zulhermandi et al. (2015), hanging ball modification is done to simplify the basic smash method and enhance volleyball strikes. The hanging mechanism has been added to the conventional volleyball to facilitate practicing basic

smash techniques and improve volleyball strikes, as an effort to simplify basic volleyball smash techniques for athletes. Sukendro et al. (2021) state that hanging ball modification can be used as a medium for conveying messages from sender to receiver, especially in training smash techniques in volleyball. Hanging ball modification is considered the most suitable medium for developing hitting skills since it teaches how to strike a target (Suharsono, 2020). Using modified tools as an alternative for physical and mental conditioning allows for faster mastery of smash techniques than conventional equipment. Using a modified volleyball at a reachable height, hanging from a string attached to a rotating pole, helps simplify the learning process.

Hence, the researcher is interested in discussing volleyball gameplay because it's widely popular and frequently practiced among people, from children and teenagers to adults. Volleyball tournaments are commonplace, ranging from village to international levels. An example is the volleyball tournament held by Jayaloka District, a competition between villages commemorating Indonesian Independence Day every year. The Ngestiboga PWD team also participates in these tournaments annually. However, the team has only won twice so far, due to inadequate mastery of volleyball techniques, especially in attacking or smashing.

The Ngestiboga PWD team is based in a remote village, Ngestiboga 2, in Jayaloka District, Musi Rawas Regency, South Sumatra Province. Established in 2018, the team primarily consists of teenagers. Despite being situated in a remote village, the team's spirit remains unwavering in nurturing their interests and talents. They actively participate in tournaments organized by villages and neighboring districts. However, they have yet to secure victories in these competitions. Mastering the fundamentals of volleyball, particularly smashing, is crucial for achieving volleyball success. Yet, various challenges persist during play.

Based on research observations, issues arise during Ngestiboga PWD team matches, notably during smashes. Problems encountered when team members perform smashes include: 1) inaccurate smashing, 2) many balls going off-course, 3) a lack of precision in smashing, 4) a lack of successful smashes. Team members practice smashing directly, resulting in insufficient skills. The lack of foundational technical smash knowledge, unfamiliarity with ball characteristics, and insufficient skill development hinder members from producing optimal results and scoring points. These issues need to be addressed.

To improve the performance of the Ngestiboga PWD volleyball team, enhancing their attacking strategies is essential. Transforming volleyball into a hanging ball can help enhance the game and court equipment. It's hoped that team members can refine their basic volleyball skills, with training sessions focusing more on the ball and encouraging fast smashes.

Hence, the researcher is interested in testing the impact of the hanging ball modification tool on the Ngestiboga PWD volleyball team's smashing results. Transforming the game of volleyball into a hanging ball can serve as a method for improving smashing techniques. Based on the above data, the researcher believes that addressing these issues is necessary to enhance volleyball skills. Given the challenges faced by the Ngestiboga PWD team, the researcher has chosen the title "The Impact of the Hanging Ball Modification Tool on Volleyball Smashing Results in the Ngestiboga PWD Team.

RESEARCH METHOD

This research employs quantitative measurement techniques and is characterized as quantitative in nature. Due to the difficulty in identifying a control group for this study, a quasi-experimental research design is used. As stated, this design is accurate (Sugiono, 2015). The aim of experimental studies is to determine how specific activities affect individuals. The research design used in this study is the One Group Pretest-Posttest Design. A pretest is conducted in this study. This approach enables a comparison between conditions before and after the therapy, allowing for a more accurate assessment of treatment outcomes (Sugiono, 2015). There is no control group in this research, and the subjects are not randomly selected. The One Group Pretest-Posttest Design allows for the measurement of impact.

The research will take place on the volleyball field in Ngestiboga 2 Village. The study will be conducted from April 15, 2023, to May 22, 2023. The initial phase of the research, involving the pretest, is scheduled for April 15, 2023, as agreed upon with the team. Subsequently, the treatment will be administered during 12 sessions on every Monday, Wednesday, and Saturday. The treatment sessions are spread out over one week with 3 meetings. After completing the 12 treatment sessions, the posttest will be conducted on May 22, 2023.

The population of this study comprises all volleyball players of the Ngestiboga PWD Team, totaling 10 members. The sampling technique employed is total sampling, resulting in a sample size of 10 individuals, all of whom are members of the Ngestiboga PWD volleyball team.

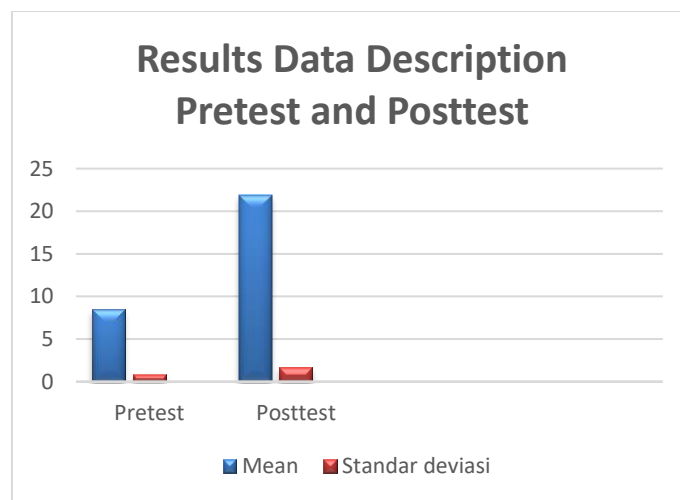
The instruments chosen and used by the researcher to carry out the study systematically are the research instruments. Data collection techniques are used as a means of data collection. The volleyball smash ability test from Nurhasan (2001) is utilized as the data collection tool and method. This test is designed to evaluate smashing abilities. In this study, tests and measurements are used as the data collection approach. According to Arikunto (2006), tests consist of various questions, activities, and other instruments used to measure an individual's or group's skills, intelligence, knowledge, abilities, or talents.

Using SPSS version 25, the data analysis method comprises descriptive analysis, data requirement tests, hypothesis testing, and linear regression analysis. Two measures of central tendency are used to describe the data: mean and standard deviation. Inferential statistics include tests for normality, paired-sample t-tests, and linear regression analysis.

RESULTS AND DISCUSSION

Result

This study was conducted on the volleyball field in Ngestiboga 2 Village, involving the Ngestiboga PWD team. The research was carried out from April 15, 2023, to May 22, 2023.



Picture 1.

Histogram Data Description Pretest and Posttest

The total pretest score was determined from the pretest and posttest data descriptions, with a pretest mean score of 8.50 and a standard deviation of 0.850. Data processing for the pretest resulted in a final score of 85. Meanwhile, data processing for the posttest yielded an average score of 21.90 and a standard deviation of 1.792. The total score after posttest data processing was 219 points. This indicates that there is a difference in the improvement of the Ngestiboga PWD team's training with the hanging ball modification tool in volleyball smash techniques.

Table 1.
Normalitas Test

| Tests of No Normality | | | | | | | |
|-----------------------|----------|-----------|----|--------------|-----------|----|-------|
| KolmogorovSmirnova | | | | Shapiro-Wilk | | | |
| | Group | Statistic | Df | Sig. | Statistic | Df | Sig. |
| Value | Pretest | 0,222 | 10 | 0,178 | 0,906 | 10 | 0,258 |
| | Posttest | 0,162 | 10 | .200* | 0,968 | 10 | 0,874 |

The results of the normality test conducted using the data generated by SPSS are presented in Table 1. The 2-tailed pretest value is 0.258, which is greater than 0.05, and the 2-tailed posttest value is 0.874, also greater than 0.05. It can be concluded that the data follow a normal distribution based on the Shapiro-Wilk normality test determinants. This means that the normality criterion is met.

Table 2.
T-Test Results

| Paired Samples Test | | | | | | | | |
|---------------------|------------------|---------|----------------|---|---------|---------|---|-----------------|
| Paired Differences | | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | Sig. (2-tailed) |
| Pair 1 | Pretest-Posttest | -13,400 | 2,171 | 0,686 | -14,953 | -11,847 | 9 | 0,000 |

Based on Table 2, the output from the "Paired Samples Test" indicates that Ha (alternative hypothesis) is accepted and Ho (null hypothesis) is rejected because the 2-tailed Sig. value is 0.000, which is less than 0.05. The mean difference between pretest and posttest scores after using the hanging ball modification tool is -13.400. This suggests that the tool has an impact on the volleyball smash results of the Ngestiboga PWD Team.

In conclusion, Ha is accepted and H0 is rejected based on the comparison of the calculated t-value and the tabulated t-value: $t_{\text{calculated}} > t_{\text{tabulated}} = 19.523 > 2.306$.

This indicates that the hanging ball modification tool has a significant impact on the volleyball smash results of the Ngestiboga PWD Team.

Table 2.
Linear Regression Test
Model Summary^b

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .340 ^a | 0,116 | 0,005 | 1,724 |

Calculation of the R Square value, also known as the coefficient of determination, can be used to understand the extent of the impact of the modification tool. The R Square value is calculated using the data from Table 3. Table 3 shows an R Square value of 11.6%, indicating that it can have an impact due to the hanging ball modification tool, while the remaining 88.4% might be influenced by other factors.

Discussion Mastering the skill of volleyball smashes is crucial as the smashing technique is the offensive move that generates points in volleyball. One way to enhance volleyball smashing ability is through adapted hanging ball training.

The modified hanging ball equipment was used in this study. Ha was accepted and Ho was rejected according to the research data collected using the T-test at a 5% significance level. This indicates that the use of the hanging ball modification tool impacts the volleyball smash results of the Ngestiboga PWD team. $T_{\text{calculated}} > t_{\text{tabulated}} = 19.523 > 2.306$ or $p\text{-value } 0.000 < 0.05$ provides evidence of this.

From Table 3, the correlation coefficient is denoted by the symbol R. The correlation score in the table is 0.340. The table also provides the R Square value, or coefficient of determination (KD), which indicates the effectiveness of the modification tool. For the hanging ball modification tool, the R Square value is 11.6%, and the remaining 88.4% is influenced by external factors such as irregular training, lack of commitment to training, insufficient mastery of fundamentals, techniques, materials, etc. This can positively enhance the smashing technique by introducing modifications like the hanging ball during training.

CONCLUSION

Based on the research findings and explanations provided, the relationship between the two variables is demonstrated by the calculated $t\text{-value} > t\text{-tabulated} = 19.523 > 2.306$, or a $p\text{-value} \text{ of } 0.000 < 0.05$. Therefore, Ha is accepted while Ho is rejected. This indicates that the use of the hanging ball modification tool impacts the volleyball smash results of the Ngestiboga PWD team.

The hanging ball modification has an influence of 11.6% on the volleyball smash results of the Ngestiboga PWD team, while other factors affect the remaining 88.4%. As

a result, the volleyball smash technique benefits from the hanging ball modification tool.

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