Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

The Effect of Free Throw Shooting Training Using Modified Balls on Basketball Free Throw Performance among Male Students at SMP Dwijendra Mataram

I Wayan Riyan Pratama[1], Dadang Warta Chandra W. K.[2], Noor Akhmad[3]

*Corresponding Author: Dadang Warta Chandra W. K , e-mail: dadang@undikma.ac.id
[1]Physical Education and Health Study Program, Faculty of Sport, Health, and Community Sciences, Universitas Pendidikan Mandalika, Mataram, Indonesia

Abstract

Objectives: This study aimed to determine the effect of free throw shooting training using modified balls on basketball free throw performance among male students at SMP Dwijendra Mataram. Specifically, this study examined the effect of training using a size 3 basketball, the effect of training using a volleyball, and the comparison between both modified ball training methods.

Materials and Methods: This study used an experimental method with a pre-test and post-test group design using a matching subject design. The sample consisted of 16 male students who were divided into two groups. Group A received free throw shooting training using a size 3 basketball, while Group B received free throw shooting training using a volleyball. The research instrument was a free throw shooting skill test. Data were analyzed using normality tests, homogeneity tests, and paired sample t-tests with SPSS version 21.

Results: The results showed that free throw shooting training using a size 3 basketball improved students' free throw performance. The mean score increased from 3.25 in the pre-test to 5.62 in the post-test. The paired sample t-test showed a significant difference between pre-test and post-test scores. Free throw shooting training using a volleyball also improved students' free throw performance, with the mean score increasing from 2.75 in the pre-test to 5.12 in the post-test. However, based on the comparison of post-test mean scores, the size 3 basketball group showed a higher final mean score than the volleyball group.

Conclusions: Free throw shooting training using modified balls improved students' basketball free throw performance. Both size 3 basketball and volleyball training had a positive effect, but the use of a size 3 basketball produced better results than volleyball. Therefore, a size 3 basketball can be recommended as a more effective modified ball for improving free throw shooting performance among male junior high school students.

Keywords: free throw shooting; ball modification; size 3 basketball; volleyball; basketball training

Introduction

Basketball is one of the most popular sports among students at junior high school and higher education levels (Candra et al., 2024). Its popularity is closely related to the dynamic and competitive nature of the game, as well as its potential to develop students' physical, technical, cognitive, and social abilities. In physical education, basketball is not only used as a recreational activity, but also as a learning medium to improve motor skills, teamwork, decision-making, discipline, and confidence (Nisa et al., 2024; Suardika et al., 2024).

One of the most important basic techniques in basketball is shooting. Shooting is the main technique used to score points during a game. The success of a team is often determined by the players'

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

ability to shoot accurately and consistently. Among several types of shooting in basketball, the free throw is one of the most strategic skills because it provides an opportunity to score without direct defensive pressure from opponents (Scanlan & Dalbo, 2019).

Although free throw shooting seems simple, many students still find it difficult to perform the movement correctly and consistently. Free throw performance requires proper body position, hand placement, balance, coordination, focus, and shooting rhythm. Students who have limited strength, coordination, or technical understanding may struggle to direct the ball accurately toward the basket (Verhoeven & Newell, 2016).

Based on the learning conditions at SMP Dwijendra Mataram, students' free throw shooting ability still needed improvement. Several students were unable to perform the free throw technique effectively. This problem may have been caused by limited mastery of basic shooting technique, low movement coordination, lack of confidence, and monotonous training methods. Therefore, teachers and coaches need to apply more suitable and enjoyable training strategies.

One strategy that can be used to improve free throw shooting performance is ball modification (Hidayat et al., 2024). Ball modification is an instructional or training approach that adjusts equipment to students' physical ability, skill level, and learning needs. Modified balls can help reduce movement difficulty, increase students' confidence, and provide a more enjoyable learning experience. In basketball training, modified balls such as smaller basketballs or lighter balls may help students practice shooting mechanics more effectively (Verawati et al., 2021).

The use of modified equipment in physical education has been shown to support skill development. Modified learning tools can make sport techniques easier to understand and perform, especially for students who are still developing basic motor skills. Previous studies have reported that ball modification, modified rings, and training aids can improve basketball learning outcomes and shooting performance (Wahyu Juanna & Amirulah Rachman, 2018).

However, studies comparing the effectiveness of different modified balls in free throw training remain limited. Therefore, this study focused on comparing two modified ball training methods: free throw shooting training using a size 3 basketball and free throw shooting training using a volleyball. These two types of balls were selected because they may provide different learning experiences in terms of ball size, weight, handling, and shooting control. Based on this background, this study aimed to determine the effect of free throw shooting training using modified balls on basketball free throw performance among male students at SMP Dwijendra Mataram.

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

Materials and Methods

Study Design

This study used an experimental method with a quantitative approach. The research design was a pre-test and post-test group design using a matching subject design. This design was used to compare students' free throw shooting performance before and after receiving training with modified balls.

The study involved two treatment groups. Group A practiced free throw shooting using a size 3 basketball, while Group B practiced free throw shooting using a volleyball. Both groups were given a pre-test before treatment and a post-test after treatment.

Study Participants

The population of this study consisted of 16 male students at SMP Dwijendra Mataram. Since the number of students was limited, this study used total sampling, meaning that all members of the population were included as the research sample. The 16 students were divided into two groups using a matching subject design. This grouping was intended to balance the initial ability of participants before the treatment was given.

Study Organization

The research instrument used in this study was a free throw shooting skill test. The test was used to measure the students' ability to perform free throw shooting before and after the training intervention. The score was based on the number of successful free throw shots. The treatment was conducted using two types of modified balls. The first treatment was free throw shooting training using a size 3 basketball. This ball was selected because it is smaller and lighter than a standard basketball, making it easier for students to control and shoot during practice. The second treatment was free throw shooting training using a volleyball.

The volleyball was also used as a modified ball because it is lighter and may help students practice shooting movement with less physical burden. Both training methods were intended to help students improve their shooting technique, coordination, confidence, and accuracy. Data were collected in two stages: pre-test and post-test. The pre-test was conducted before the treatment to measure students' initial free throw shooting ability. After the training treatment was completed, the post-test was conducted to determine the improvement in shooting performance.

Statistical Analysis

The data were analyzed using SPSS version 21. Before hypothesis testing, normality and homogeneity tests were conducted. The normality test was used to determine whether the data were normally distributed, while the homogeneity test was used to determine whether the variances between groups were equal. After the prerequisite tests were completed, paired sample t-tests were used to

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

determine whether there were significant differences between pre-test and post-test scores in each group. The comparison of post-test mean scores was used to determine which modified ball training method produced better results.

Results

Descriptive Statistics of the Size 3 Basketball Group

The descriptive results of the group that received free throw shooting training using a size 3 basketball are presented below. The results show that the mean free throw shooting score increased from 3.25 in the pre-test to 5.62 in the post-test. The minimum score increased from 2 to 5, while the maximum score increased from 4 to 7. These results indicate an improvement in free throw shooting performance after training using a size 3 basketball.

Table 1. Descriptive Statistics of Free Throw Shooting Performance in the Size 3 Basketball Group

Test	Mean	Standard Deviation	Minimum Score	Maximum Score
Pre-test	3.25	0.707	2	4
Post-test	5.62	0.744	5	7

Descriptive Statistics of the Volleyball Group

The descriptive results of the group that received free throw shooting training using a volleyball are presented below. The results show that the mean free throw shooting score increased from 2.75 in the pre-test to 5.12 in the post-test. The minimum score increased from 0 to 4, while the maximum score increased from 4 to 6. These findings indicate that free throw shooting training using a volleyball also improved students' shooting performance.

Table 2. Athletes' Assessment of Video Appearance

Test	Mean	Standard Deviation	Minimum Score	Maximum Score
Pre-test	2.75	1.281	0	4
Post-test	5.12	0.834	4	6

Normality Test and Homogeneity Test

The normality test was conducted to determine whether the data were normally distributed. The original analysis used the Kolmogorov-Smirnov and Shapiro-Wilk procedures. Based on the reported significance values above 0.05, the data were interpreted as normally distributed. Therefore, parametric

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

testing using the paired sample t-test was considered appropriate.

The homogeneity test was conducted to determine whether the two groups had equal variance. The result showed a significance value of 0.862 for the post-test data. Since this value was higher than 0.05, the post-test data were considered homogeneous. This means that the two groups had similar variance and could be compared.

Paired Sample t-Test Results

The paired sample t-test was used to determine whether there was a significant difference between pre-test and post-test scores in each group. The results show that both groups experienced significant improvement. The size 3 basketball group improved from 3.25 to 5.62, while the volleyball group improved from 2.75 to 5.12. Since the significance value in both groups was lower than 0.05, both training methods had a significant effect on free throw shooting performance.

Table 3. Summary of Paired Sample t-Test Results

Group	Pre-test Mean	Post-test Mean	Sig.	Interpretation
Size 3 basketball	3.25	5.62	<0.05	Significant improvement
Volleyball	2.75	5.12	<0.05	Significant improvement

The comparison of post-test mean scores showed that the size 3 basketball group had a higher mean score than the volleyball group. Based on the post-test mean scores, training using a size 3 basketball produced better results than training using a volleyball. Therefore, the hypothesis stating that free throw shooting training using a size 3 basketball is more effective than training using a volleyball was accepted.

Discussion

The findings of this study show that free throw shooting training using modified balls improved students' basketball free throw performance. Both the size 3 basketball and volleyball groups showed significant improvement from pre-test to post-test. This indicates that modified balls can be used as effective training tools for junior high school students who are still developing basic basketball shooting skills.

The group that practiced using a size 3 basketball showed an increase in mean score from 3.25 to 5.62. This improvement suggests that the size 3 basketball helped students perform free throw shooting more effectively. Since the ball is smaller and lighter than a standard basketball, students may have found it easier to control the ball, maintain shooting rhythm, and direct the ball toward the basket. The reduced difficulty may also have increased students' confidence during practice.

Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 6, No. 2, April 2024, Pg. 324-331
DOI: 0.35724/mjpes.v6i2.7614

The volleyball group also showed improvement, with the mean score increasing from 2.75 to 5.12. This indicates that training with a volleyball also helped students improve their free throw shooting performance. Because a volleyball is lighter than a standard basketball, it may reduce physical burden and allow students to focus more on shooting motion, arm swing, and ball direction. However, because the shape, texture, and bounce characteristics of a volleyball differ from a basketball, the transfer to actual basketball shooting may not be as strong as training with a size 3 basketball.

The comparison between the two groups showed that the size 3 basketball group had a higher post-test mean score than the volleyball group. This finding suggests that the size 3 basketball was more effective as a modified training tool. The size 3 basketball is still a basketball, so its shape, grip, and shooting feel are more similar to the original sport equipment. Therefore, students could practice with a modified ball while still maintaining movement patterns that were closer to actual basketball shooting.

These findings are consistent with the idea that modified equipment can support students' learning in physical education. Modified equipment allows students to practice with tools that match their physical ability and skill level. This approach can reduce technical difficulty, increase learning motivation, and improve skill acquisition. In basketball learning, modified balls or modified rings can help students gradually develop shooting mechanics before using standard equipment.

The results also support previous findings by (Alexander, 2016) who reported that the use of training aids could improve free throw shooting performance. Similarly, (Risjanna et al., 2021) found that modifying basketball ring height could improve free throw shooting technique. (Praja et al., 2021) also emphasized that modified basketball shooting models can be useful for school-aged children because they provide a more suitable and enjoyable training experience.

The improvement in both groups can also be explained by repeated practice. Free throw shooting requires consistency, coordination, focus, and correct technique. Through repeated training, students become more familiar with the shooting movement pattern. They learn how to position their feet, align their body, use arm movement, release the ball, and follow through properly.

Although both modified balls improved performance, the size 3 basketball appears to be more appropriate for free throw shooting training. It provides a balance between reduced difficulty and similarity to real basketball equipment. Therefore, teachers and coaches may use a size 3 basketball as a progressive training tool before students move to a standard-size basketball. Overall, the findings suggest that ball modification is an effective strategy for improving free throw shooting performance among junior high school students. Physical education teachers can apply this method to make basketball learning more enjoyable, accessible, and developmentally appropriate.

Conclusions

Based on the results of the study, it can be concluded that free throw shooting training using a size 3 basketball significantly improved students' free throw shooting performance at SMP Dwijendra Mataram. Free throw shooting training using a volleyball also significantly improved students' free throw shooting performance. However, training using a size 3 basketball produced better results than training using a volleyball. Therefore, the size 3 basketball can be considered a more effective modified ball for improving free throw shooting performance among male junior high school students.

Referencess

Alexander, M. J. L. (2016). The Effectiveness of the Shotloc Training Tool on Basketball Free Throw Performance and Technique. *International Journal of Kinesiology and Sports Science*, *4*(2). https://doi.org/10.7575/aiac.ijkss.v.4n.2p.43

Candra, O., Rahmadani, A., Zulrafli, Z., Parulian, T., Zulham, Z., & Novrandani, S. (2024). BOLA BASKET SEBAGAI MEDIA PENDIDIKAN KARAKTER: MENGAJARKAN DISIPLIN, KERJASAMA, DAN SPORTIVITAS. *Community Development Journal : Jurnal Pengabdian Masyarakat*, *5*(3), 5497–5502. https://doi.org/10.31004/cdj.v5i3.30263

Hidayat, F., Royana, I. F., & Pradipta, G. D. (2024). Development of Physical Education Learning Media for Basketball Material Based on Android-BASUKA. *Musamus Journal of Physical Education and Sport (MJPES)*, *6*(3), Article 3. https://doi.org/10.35724/mjpes.v6i3.6244

Nisa, A., Fajriah, A. N., Ramadani, A. S., Putri, M. M., Fauziyah, N., & Mulyana, A. (2024). MANFAAT BOLA BASKET DALAM MENINGKATKAN KERJASAMA DAN DISIPLIN SEKOLAH DASAR. *Jayabama: Jurnal Peminat Olahraga*, *2*(2), Article 2. https://doi.org/10.6732/jayabama.v2i2.3581

Praja, Z., Pelana, R., & Widiastuti. (2021). BASKETBALL SHOOTING LEARNING MODEL FOR ELEMENTARY SCHOOL AGE 9-12 YEARS OLD. *Gladi : Jurnal Ilmu Keolahragaan*, *12*(01), 1–8. https://doi.org/10.21009/GJIK.121.01

Risjanna, M. R., Mulyana, D., & Kusumah, W. (2021). Improvement of Shooting Techniques on Free Throw Line in Basketball Game. *JUARA : Jurnal Olahraga*, *6*(2), 278–287. https://doi.org/10.33222/juara.v6i2.1310

Scanlan, A. T., & Dalbo, V. J. (2019). Improving Practice and Performance in Basketball. *Sports*, *7*(9), 197. https://doi.org/10.3390/sports7090197

Suardika, I. K., Kadir, S., Haryanto, A. I., & Mile, R. (2024). Integrasi Life Skills pada Program Latihan Bola Basket dalam Rangka Positif Youth Development. *Jurnal Pendidikan Kesehatan Rekreasi*, *10*(2), 250–259. https://doi.org/10.59672/jpkr.v10i2.3736

Verawati, I., Dewi, R., & Ritonga, D. A. (2021). Development of Modification of Big Ball Game with Play Approach in Order to Develop Basic Movement Skills in Elementary School Students. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *4*(2), Article 2. https://doi.org/10.33258/birci.v4i2.2051

Verhoeven, F. M., & Newell, K. M. (2016). Coordination and control of posture and ball release in basketball free-throw shooting. *Human Movement Science*, *49*, 216–224.

https://doi.org/10.1016/j.humov.2016.07.007

Wahyu Juanna, M., & Amirulah Rachman, H. (2018). Students' Participation in Physical Education Learning Through Modification of Equipment. *Proceedings of the 2nd Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS 2018) and 1st Conference on Interdisciplinary Approach in Sports (CoIS 2018)*. Proceedings of the 2nd Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS 2018) and 1st Conference on Interdisciplinary Approach in Sports (CoIS 2018), Yogyakarta, Indonesia. https://doi.org/10.2991/yishpess-cois-18.2018.23