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Effectiveness of Ball Standing Throw Training on Heading Ability in Football Games

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Abstract

This study aims to determine the effectiveness of ball standing throw training on heading ability in soccer games. The method used in this study is an experimental research method with a pre-test-post-test design. The population in this study were all students who participated in extracurricular activities at State Senior High School 5 Kendari students totaling 25 people. The sampling technique used the total sampling technique, namely the entire population used as a sample of 25 people. The instrument used to measure soccer heading ability was the heading test. The training method used was ball standing throw training with a modified ball load. The sampling technique used the total sampling technique, namely the entire population used as a sample of 25 people. Based on the data analysis, it can be seen that the t-test value is 15.455 with a significance of 0.000 <0.05, meaning that between the implementation of the pretest and posttest of heading ability in soccer games there was an increase in the implementation of the posttest using ball standing throw training. Based on the average pretest value of 7.02 and the average posttest value of 8.13.

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INTRODUCTION

Physical education refers to the balance of movement, attitude, character, emotion and intellect that must be developed in each teaching (Giese & Ruin, 2018; Rodji et al., 2022). Physical education in its implementation can improve the quality of the young generation of Indonesia, so that they have good health and fitness, starting from an early age which is carried out in sports in the school environment and in the community (Maryuni & Nasrulloh, 2022). Physical education is carried out through a process of physical activity that aims to achieve comprehensive results covering physical, intellectual and social aspects carried out through sports activities (Dong et al., 2023; Breslin et al., 2023).

Sports are one of the human activities that are the main capital for health and can improve performance prestasi (Caillaud et al., 2022; Cojocaru et al., 2022). To be able to improve performance requires programmed and continuous training (Vaara et al., 2022). Heavy training requires an energy source that comes from carbohydrates (Von Ah Morano et al., 2020). Exercise can cause fatigue so that carbohydrate storage can be depleted, so before exercise you can consume carbohydrates to improve performance (Kaviani et al., 2020). To support training so that it can improve the ability to exercise, one of them is through soccer (Sulistiyono et al., 2022).

Football requires teamwork in the match (Hammerschmidt et al., 2021). Football is also a sport that has complex movement elements (Fransen et al., 2022). This complexity is indicated by the involvement of several elements of skill mastery including mastery of technical skills, tactical skills, physical skills, and mental skills. In football, to improve the quality of the game, it is necessary to have good mastery of basic techniques (Ihsan et al., 2022). Athletes or players who master basic techniques well and are supported by adequate physical abilities will be able to display football games skillfully (Arif, 2022). In football, there are quite a lot of basic techniques that players need to master in order to become reliable players, including dribbling, shooting, passing, heading, throw-in techniques (Jud & Sariul, 2022). One of the basic techniques in football is heading.

Football heading can put a lot of pressure when the player is jumping forward and dropping or directing the ball to a teammate (Coito et al., 2023). Heading the ball is a powerful weapon when attacking (Sarmento et al., 2020). Factors that influence the implementation of heading are changes in ball pressure accompanied by the size and weight of the ball (Peek, McKay, et al., 2021)**.** The ability of football players to execute headers to apply accurate strategies so that headers are not repeated (Peek et al., 2020; Reina et al., 2019).

Improving heading ability in soccer can be done by using ball standing throw exercises *throw* (Peek, Vella, et al., 2021). This exercise is a plyometric exercise whose function is based on anatomy which has special movements,

namely involving muscle contractions that can provide stimulation and loading (Bisciotti et al., 2020). Ball standing throw exercises are divided into two parts, namely plyometric and Isotonic (Arianda et al., 2021). Plyometric ball standing throw exercises are a form of ball throwing exercises in a standing position where when making a throwing movement before the shortening contact occurs, a lengthening contraction will occur or the movement is very fast, while isotonic ball standing throw exercises are a form of ball throwing exercises in a standing position where when making a throwing movement before the shortening occurs there is a time gap before the lengthening occurs or the movement is very slow (Marta et al., 2022).

Ball standing throw training is one form of plyometric training which is one of the methods currently being developed by coaches to improve strength, speed, power, muscle endurance, agility and accuracy. However, in terms of achieving achievements, there are always obstacles, barriers, and challenges that we face. This is evident from the achievements State Senior High School 5 Kendari football which have been achieved which still do not provide satisfactory results. This can be seen at the city level that has been implemented where athletes often fail to achieve achievements. In fact, supporting factors to achieve better have been attempted as much as possible, such as the provision of adequate facilities, and quality equipment, coaches, sufficient training and an atmosphere of encouragement from parents and teachers.

Ball standing throw training has not been studied specifically to improve heading ability. If this method is combined with other techniques, such as biomechanical analysis of movement or integration of balance training, it could also be of new value. Heading ability is often trained directly with game situations or crosses. However, this study explores a situational simulation approach with a standing ball throw, which can create new insights into the effectiveness of training without a full game. If this study is conducted on a specific group, namely children, adolescents, amateur athletes, or professional players, the novelty lies in proving the effectiveness of the method on a specific subject. The use of simple exercises such as the ball standing throw has the potential to be an innovative solution for coaches in communities or schools with limited facilities. This can open up opportunities for the application of the method in situations that have not been widely explored.

Some problems that arise related to the ability of soccer heading exercises in students are that students do not understand or are unable to carry out the correct heading technique. This can be caused by a lack of knowledge about the correct body position, the correct head angle, or how to aim the ball properly. Some students experience fear or anxiety related to heading, especially if they have had a head injury or feel uncomfortable

heading before. This can hinder their ability to carry out the heading technique with confidence. The ability to head is also related to physical strength, especially the muscles of the neck and upper body. Students who have muscle weakness or lack of physical strength have difficulty in carrying out headings strongly and accurately, so the purpose of this study was to determine the effectiveness of ball standing throw exercises on heading abilities in soccer games.

METHODS

Participants

This study was attended by students who participated in extracurricular soccer activities with male gender, on average aged 15 to 18 years, totaling 25 people at SMA Negeri 5 Kendari.

Sampling Procedures

This study carried out a procedure in sampling using total sampling, where all students who participated in extracurricular activities totaled 25 students.

Materials and Apparatus

The materials and equipment used in this study, namely for the heading test instrument, required a ball, cone, meter, and a flat floor used in the implementation of the pretest and posttest, as well as for the standing ball throw training method using a medicine ball designed by the researcher with varying weights according to the provisions of the training program with a weight of 5 kg.

Procedures

For the procedure of implementing the test using heading in the game of soccer in the implementation of the pretest and posttest, by preparing in a predetermined place, the ball is thrown upwards and then heading the ball as far as possible. The best results from three tests (Rohman, 2019). For the procedure of implementing the ball standing throw exercise, a warm-up is carried out first for 15 minutes, followed by core exercises with a total of 2 to 4 sets, a load of 5 kg, 8 repetitions, and a rest period of 2 minutes. Carried out for 18 meetings, in one week consisting of three times.

Design or Data Analysis

The research includes quantitative research with experiments using pretest posttest design, where the sample is given an initial test, then practice and finally given a posttest (Sugiyono, 2017). Data analysis using descriptive statistics, prerequisite analysis tests with data normality and homogeneity, and hypothesis testing using the t-test with the help of SPSS version 20.

RESULT

Descriptive results of the pretest and posttest data analysis of heading ability in soccer games can be seen in Table 1.

Table 1. Description of Pretest and Posttest Data Analysis Football Heading Ability

Variable	N	*Min*	*Max*	*Mean*	*Std. Deviation*
Pretest	25	5.83	8.70	7.02	0.81
Posttest	25	6.50	11.00	8.13	1.18

Based on table 1, the data analysis on heading ability in soccer game is obtained by using a sample of 25 people in the pretest implementation with a

minimum value of 5.83, a maximum value of 8.70, a mean or average of 7.02, and a standard deviation value of 0.81. While the implementation of the posttest, the minimum value was 6.50, the maximum value was 11.00, the mean or average was 8.13, and the standard deviation value was 1.18. From the results of the data analysis, it can be concluded that there was an increase of 1.11 in the implementation of the posttest.

Table 2. Football Heading Ability in Interval Class in Pretest Implementation

Class Interval	Frequency	Percentage
5,83 - 6,34	6	24%
6,35 - 6,86	5	20%
6,87 - 7,38	6	24%
7,39 - 7,90	3	12%
7,91 - 8,42	4	16%
8,43 - 8,94	1	4%
Total	25	100%

The data obtained percentage of 24% with interval 5.83 - 6.34, as many as 6 people who obtained the ability to head football in the implementation of the pretest. As many as 20% with interval 6.35 - 6.86, with a total of 5 people who obtained the ability to head football in the implementation of the pretest. As many as 24% with interval 6.87 - 7.38, with a total of 6 people who obtained the ability to head football in the implementation of the pretest. As many as 12% with interval 7.39 - 7.90, with a total of 3 people who obtained the ability to head football in the implementation of the pretest. As many as 16% with interval 7.91 - 8.42, with a total of 4 people who obtained the ability to head football in the implementation of the pretest. As many as 4% with interval 8.43 - 8.94, with a total of 1 person who obtained the ability to head football in the implementation of the pretest. The results of the analysis can be described in the form of histogram 1.

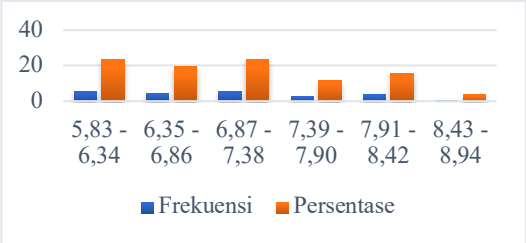

Figure 1. Pretest of Football Heading Ability through Histogram

Table 3. Football Heading Ability in Interval Class in Posttest Implementation

Class Interval	Frequency	Percentage
6,50 - 7,30	6	24%
7,31 - 8,11	10	40%
8,12 - 8,92	5	20%
8,93 - 9,73	2	8%
9,74 - 10,54	0	0%
10,55 - 11,35	2	8%
Total	25	100%

The data obtained percentage of 24% with interval 6.50 - 7.30, as many as 6 people who obtained the ability to head football in the implementation of the posttest. As many as 40% with interval 7.31 - 8.11, with a total of 10 people who obtained the ability to head football in the implementation of the posttest. As many as 20% with interval 8.12 - 8.92, with a total of 5 people who obtained the ability to head football in the implementation of the posttest. As many as 8% with interval 8.93 - 9.73, with a total of 2 people who obtained the ability to head football in the implementation of the posttest. As many as 0% with interval 9.74 - 10.54, with a total of 0 people who obtained the ability to

head football in the implementation of the posttest. As many as 8% with interval 10.55 - 11.35, with a total of 2 people who obtained the ability to head football in the implementation of the posttest. The results of the analysis can be described in the form of histogram 2.

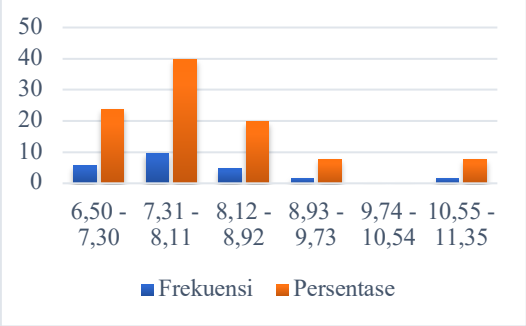

Figure 2. Posttest of Football Heading Ability through Histogram

Table 4. Pretest and Posttest with Data Normality Test

Variable	Statistic	Significance
Pretest Normality	0.125	0.200
Posttest Normality	0.149	0.156

Table 5. Homogeneity Test

Variable	df1	df2	*Levene Statistic*	Sig.
Pretest-Posttest	1	48	1.934	0.171

From the results of tables 4 and 5, all data have a value (Sig.) > 0.05, so the variables are normally distributed. The pretest significance value is 0.585 > 0.05, so H0 is accepted (homogeneous data).

Table 6. Results of the Research t-Test

Variable	t	df	Value
Implementation of pretest and posttest	15.455	29	0,000

Based on the data analysis, it can be seen that the t-test value is 15.455 with a significance of 0.000 <0.05, meaning that between the implementation of the pretest and posttest of heading ability in soccer games there is an increase in the implementation of the posttest using ball standing throw training. Based on the average pretest value of 7.02 and the average posttest value of 8.13.

DISCUSSION

The results of the study showed that ball standing throw training had a positive impact on heading ability. This exercise hones coordination skills between the hands, eyes, and head. This process is important because it requires precise timing. The movement of throwing the ball in a standing position involves the same muscles used when heading, thus strengthening the relevant body areas. This exercise resembles a heading situation on the field, giving students. The results of this study are in line with the theory that motor skills can be improved by practicing the same movements consistently. Ball standing throw provides an opportunity to repeat the heading movement under controlled conditions. This exercise shows a positive transfer from ball throwing skills to heading, where the movement patterns and muscles used are largely the same.

Heading is one of the fundamental techniques in football, especially for aerial duels, scoring goals, or blocking opponent attacks. Improving skills through effective training methods can support students' learning of basic football skills (Peek et al., 2024). This training not only improves physical strength but also improves hand-

eye coordination, body balance, and movement control, all of which are important for performance. This study supports the development of more effective teaching methods in physical education, especially in training football sports skills at the school level. According to Jones et al., (2014), improving heading skills through targeted training can increase students' confidence in playing football, which has a positive impact on their participation in sports.

Supporting research by Barlian, (2020), that this exercise focuses on improving strength, coordination, and heading techniques through specific movements. The study also highlights the importance of basic skill-based training before integrating with game situations. The difference in this study lies in the exercises used. But it has similarities, namely that it can improve heading skills in football games. Research conducted by Parsanejad et al., (2024), that good heading allows players to take advantage of opportunities in the air, especially when receiving crosses or corner kicks. Effectively used to block the ball from the defense area, reducing threats from opponents. Players can use heading to provide accurate passes to teammates in offensive or defensive situations. Proper training improves accuracy, strength, and control, all of which are important in the game.

The ball standing throw is performed in a static position, which does not fully replicate the dynamic situation on the field. Heading in a match usually involves running, jumping, or pressure from an opponent. This drill does not involve tactical elements such as aerial duels or interaction with a moving ball, which often occur in a match. In a match, players must react quickly to balls moving from various directions and speeds. The ball standing throw does not train these aspects optimally. This drill focuses on the mechanical aspects of heading, but does not involve decision-making such as choosing a heading direction or anticipating the opponent's movement. Common mistakes that occur if not properly supervised, students can use incorrect technique, such as inappropriate contact with the ball with the front of the head, which can increase the risk of injury.

The effectiveness of this drill is highly dependent on the ability of the coach or partner to throw the ball with the appropriate precision and power. Players with higher heading skills do not gain significant benefits from this drill because it does not mimic the complexity of heading in a real match. Therefore, to overcome this, namely by improving direction and speed, adding jumping elements to train leg strength and contact time with the ball. Incorporating game elements, such as aerial duels or pressure from opponents, to increase realism.

CONCLUSION

Ball standing throw training has been proven effective in improving students' heading ability. This training method significantly helps improve strength, coordination, and heading accuracy in soccer games. This training also provides benefits in improving basic heading techniques, especially in terms of body posture, neck muscle use, and body propulsion when in contact with the ball. Through a structured training program and

appropriate intensity, students show improved heading performance in terms of jump distance, accuracy, and movement efficiency.

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