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The Impact of Utilising a Wobble Board for Training on The Precision Archery Shots a 30-Meter Distance among Athletes

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A B S T R A C T

The purpose of the study. This study aims to find out the effect of the training using the wobble board method on the body balance and the accuracy of archery at a distance of 30 metres of archery athletes.

Materials and methods. The research used a quasi-experimental research type with the One Group Pretest-Posttest Design. The samples in this study were 12 athletes taken from the archery athletes of Selabora Panahan aged 13-17 years old. The instruments used were the Stork Test and a 30 metre archery. The data analysis technique used the Normality Test assisted by SPSS 16 software and the Homogeneity Test to determine whether the variance of samples taken from the same population was equal or not.

Results. Based on the research findings, it can be obtained: analysis of body balance of archery athletes of Selabora Panahan, obtained t value (6.199)>t_{table} (2.20), and p value (0.000)<0.05, based on data analysis for the accuracy of archery athletes of Selabora Panahan obtained the value of t_{count} (5.437)>t_{table} (2.20), and the value of p (0.000)<0.05.

Conclusions. it can be concluded that there is an effect of training using a wobble board on the body balance and accuracy of archery at a distance of 30 meters of the archery athletes.

A R T I C L E I N F O

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INTRODUCTION

Archery is a sport that has long been a part of Indonesian culture. It requires a unique combination of attributes, including a delicate touch, patience, tenacity, concentration, and a strong mental fortitude (Nugroho et al., 2022). These elements, such as proper posture, mastery of basic techniques, movement mechanics, mental preparedness, and physical conditioning, are essential for an archer to excel(Komarudin et al., 2021). Archery is a sport of precision, as the ultimate goal is to shoot the target

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surface as accurately as possible. One of the fundamental factors that contributes to success in archery is the archer's ability to maintain consistent technique throughout the training and competition process (Mohammadi et al., 2016). Consistency is crucial, as it allows the archer to achieve the desired results during competition(Kim et al., 2023). In addition to consistency, various other factors influence success in archery. Two key factors are excellent physical condition and well-developed movement skills (Kim et al., 2024). Archery is characterized by the release of arrows through a specific trajectory towards a target at a given distance (Humaid, 2014). When compared to sports that require static motion or other closed skills, such as shooting, the distinguishing factor lies in the type of propulsive force employed (Pekalski, 1990).

Achieving the desired level of performance in archery requires not only excellent physical condition but also a mastery of the basic archery techniques (Leroyer et al., 2007). An archer can get maximum results not only with the basic techniques of archery that must be done but the suitability of the tool is also very concerned about the weight of the bow and the level of stiffness of the arrows and the rate of arrows after release (Verma, 2020). Because it greatly affects the increase in scores by archers and accuracy and precision in releasing arrows. In addition to good basic techniques and good tool suitability, there are other factors that have a major influence on accuracy in archery, namely the provision of balance training (Kim et al., 2021). Giving balance training can help stabilise the archer in aiming at the target if the archer is unable to hit the target (Stuart & Atha, 1990). Encounter undesirable weather or terrain in a race, such as strong winds, heavy rain or uneven footing. Many archery coaches do not understand the benefits of providing balance training for archery athletes (Verawati et al., 2020). They think archery only requires muscle endurance from the arms and back alone to get good accuracy in archery. But in reality athletes who only have good muscle endurance are not enough to get maximum results in archery (Ariffin & Rambely, 2017). In this problem, many athletes from Selabora Archery do not know the importance of providing additional training in addition to core training in each training session to improve the quality of their shots or increase their archery accuracy(Saing et al., 2022). Most athletes only do exercises that they consider most important to support the

accuracy and quality of their shots such as bow training and archery practice according to their distance (Developing Strength and Endurance with Specific Physical Training, 2018). Of course, these exercises are very good for athletes, but often athletes put aside or have not done balance training (Paillard, 2023). This can have an impact on the less than optimal quality of athlete archery which results in not achieving the desired archery accuracy (USA Archery Athlete Development Model, 2022). Thus, the need for Archery Selabora athletes to do balance training. One of the methods of balance training is to use the Wobble Board (Dewi & Palgunadi, 2021).

Archery is a sport that requires precision, balance, and consistent technique. Skilled archers have been found to exhibit a high degree of postural consistency, which is crucial for achieving accurate and repeatable shots. (Stuart & Atha, 1990) Consistency in archery performance is often associated with the archer's ability to anticipate and make necessary postural adjustments before the string release. (Kuch et al., 2023) However, the impact of incorporating a wobble board during training on the precision of archery shots at a 30-meter distance has not been extensively explored. This study aims to investigate the effect of utilizing a wobble board during training on the precision of archery shots at a 30-meter distance among athletes.

Archery is a sport that requires a high degree of postural control and stability to achieve accurate shots (Sarro et al., 2020). Archers must maintain a still posture while drawing and aiming the bow, as any instability or movement can negatively impact the trajectory of the arrow (Yachsie et al., 2023). Postural stability is considered a critical factor in precision aiming sports, as it allows the archer to maintain a consistent body position throughout the shooting sequence (Sarro et al., 2020). Previous research has explored the relationships between different training modalities and archery performance. One study found that incorporating balance training, such as the use of a wobble board, (Dewi & Palgunadi, 2021) can improve postural stability and shooting accuracy in novice archers. Another study investigated the effects of Pilates-based core stability exercises on the balance abilities of archers, concluding that such training can enhance the control and stability required for accurate shooting (Sarro et al., 2020).

The effect of core stability training on the balance and accuracy of archery athletes has also been examined. This study found that circuit training using a BOSU ball (Prasetyo et al., 2023), a type of unstable surface, can improve balance and archery accuracy among young archery athletes. Additionally, a study on adolescent archers observed that a core stability training program was effective in reducing postural sway, which is a measure of balance and stability. These findings suggest that training on unstable surfaces, such as a wobble board, may have a positive impact on the precision of archery shots.

MATERIALS AND METHODS

Study participants

Study participants

The research used a quasi-experimental research type with the One Group Pretest-Posttest Design. The samples in this study were 12 athletes taken from the archery athletes of Selabora Panahan aged 13-17 years old.

Study Organization

The research method of this paper I took by using experimental research methods. Archery sport has long been known by the people in Indonesia, this sport requires a touch of a delicate soul, patience, tenacity, concentration and has a strong mentality and has a high level of anxiety. So that elements such as posture, basic techniques, movement mechanisms, mentality and physical condition are a unity that must be owned by an archer.

RESULTS

The purpose of this study is to determine whether there is an effect of balance training using the Wobble Board on body balance and accuracy in archery in Archery athletes. Description of the research results of pre-test and post-test data on balance and archery accuracy can be described as follows: 1) Body Balance Data of Archery athletes The results of research on body balance data of Archery athletes can be seen in the table below:

Table 1. Body Balance Data of Archery Athletes

Responden	Pretest	Posttest
1	3,02	4,38
2	3,57	5,05
3	2,36	3,48
4	3,13	3,36
5	2,37	3,20
6	3,88	4,36
7	4,04	6,52
8	3,25	3,67
9	4,50	6,08
10	4,06	5,54
11	2,45	3,48
12	2,50	3,34
Mean	**3,26**	**4,37**
Median	**3,19**	**4,01**
Mode	**2,36[a]**	**3,48**
Std. Deviation	**0,74**	**1,16**

2) Archery athlete Accuracy Data, The results of research on archery accuracy data for Archery athletes can be seen in the table below:

Table 2. Archery Accuracy Data of SELABORA Archery Athletes

Responden	Pretest	Posttest
1	296	320
2	325	333
3	254	278
4	296	306
5	287	302
6	306	321
7	274	320
8	229	276
9	230	258
10	238	254
11	217	265
12	289	296
Mean	**270,08**	**294,08**
Median	**280,50**	**299**
Mode	**296**	**320**
Std. Deviation	**35,30**	**27,18**

3) Data Analysis, Data analysis is used to answer the hypothesis that has been proposed in the previous chapter. The analysis tests used are normality test, homogeneity test and hypothesis test (t test). The results of the normality test, homogeneity test and t test can be seen as follows:

Normality Test

The homogeneity test is useful for testing the similarity of the sample, namely whether or not the sample variants taken from the population are uniform. The criteria for homogeneity are if p> 0.05 is declared homogeneous, if p < 0.05 the test is said to be inhomogeneous. The results of the homogeneity test of this study can be seen in the following table:

Table 3. Homogeneity Test Results

Variables	Df	Df 2	*Z*	*p*	Description

Body balance	Pretest	1	10	2,471	0,147	Homogeneous
	Posttest	1	10	1,961	0,192	Homogeneous
Archery accuracy	Pretest	1	10	0,347	0,569	Homogeneous
	Posttest	1	10	0,024	0,879	Homogeneous

Based on the results of the homogeneity test in the table above, the pre-test and post-test data on body balance and archery accuracy obtained a p value> 0.05, with these results it can be concluded that all variations are homogeneous

Statistical test with the T test

The t-test in this study is intended to answer the hypothesis that has been proposed. Hypothesis testing uses t-test (paired sample t test) at a significant level of 5%. The results of the hypothesis test (t-test) can be seen in the table below:

Table 4. Hypothesis Test Results

Pretest - posttest	**Df**	**T table**	**T count**	**P**	**Sig 5%**
Body balance	11	2,20	6,19	0,000	0,05
Archery accuracy	11	2,20	5,43	0,000	0,05

Based on data analysis of body balance of Archery SELABORA athletes obtained t_{value} 6.199>t_{table} 2.20, and p_{value} 0.000<0.05, these results indicate that the t_{value} is greater than the t_{table}. Thus, it can be interpreted that there is an effect of training using wobble board on Balance body balance Archery athletes. Based on data analysis of archery accuracy of Archery athletes obtained t_{value} 5.437>t_{table} 2.20 and p_{value} 0.000<from 0.05, these results indicate that the t_{value} is greater than t_{table}. Thus it can be interpreted that there is an effect of training using a wobble board on the archery accuracy of Archery athletes. Based on the results of the t test, it shows that the value of t_{count}> t_{table}, with the results listed above indicating that the hypothesis is accepted.

DISCUSSION

The findings of this study suggest that balance training utilizing a wobble board can have a favorable impact on both body balance and archery accuracy among athletes. This aligns with previous research indicating that training on unstable surfaces, such as the wobble board, can enhance balance and postural control (Suppiah et al., 2017) (Prasetyo et al., 2023). One potential explanation for this may be that the use of the wobble board requires the athlete to actively engage their core muscles and maintain a stable, balanced posture, which are crucial elements for achieving accurate

archery shots. Furthermore, the observed improvement in archery accuracy corroborates earlier research establishing the relationship between balance and precision in archery. By enhancing the athlete's ability to maintain a stable and well-balanced body position throughout the shooting sequence, the incorporation of the wobble board training may have directly contributed to their increased shooting accuracy at the 30-meter distance. It is important to note that the current study was focused on evaluating the immediate effects of wobble board training on balance and archery performance. Interestingly, a separate study that examined the long-term impact of core stability training on the balance of young archers also found similar positive results. (Suppiah et al., 2017) These findings suggest that incorporating balance training utilizing unstable surfaces like the wobble board could be a beneficial strategy for archery athletes, as it may lead to improvements in both balance and shooting precision over time.

CONCLUSION

The findings of this investigation suggest that incorporating a wobble board for balance training can significantly enhance both the body balance and archery accuracy of the participating athletes. The results indicate that engaging in balance training on unstable surfaces, such as a wobble board, may be a highly valuable strategy for archery athletes seeking to improve their overall performance. The observed improvements in body balance and shooting precision align with previous research, which has established a robust link between postural stability and accurate archery shot placement. By requiring the athlete to actively engage their core musculature and maintain a well-balanced, controlled posture throughout the shooting sequence, the wobble board training appears to have directly contributed to the participants' increased accuracy at the 30-meter distance. Furthermore, the positive effects observed in this study are consistent with the findings of prior long-term investigations, which have also demonstrated the benefits of core stability training for young archers. These collective results underscore the importance of incorporating balance-focused exercises, such as those utilizing the wobble board, as part of a comprehensive training regimen for archery athletes. By enhancing their balance and postural control, these

athletes may be able to unlock new levels of shooting precision and overall performance on the archery range.

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APPENDIX

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