The effects of the wobble board on archery accuracy at 30 meters for archers

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Abstract

This research aims to determine whether wobble board training methods affect shooting accuracy in archers at a distance of 30 meters. This research uses a quasi-experimental method with a One Group Pretest-Posttest Design. The research sample consisted of 12 archers aged 15–18 years, selected from the SELABORA Archery of FIK UNY. The instrument used was archery at a 30 meters distance. The data analysis technique employed Normality Test using SPSS 25 software, followed by a Homogeneity Test to determine whether sample variances derived from the same population were equal. Based on the research findings and discussion: Based on the analysis of the archery accuracy data of SELABORA Archery FIK UNY, the calculated t value (5,437) > t table (2,20), and the p value (0,000) < of 0.05. Therefore, it can be concluded that wobble board training significantly affects archery accuracy at 30 meters among SELABORA Archery FIK UNY.

Keywords: wobble board, balance, archery accurac

INTRODUCTION

Archery is a target accuracy sport (Hirota et al., 2023; Susanto et al., 2021), because the ultimate goal of archery is to shoot at the target face as precisely as possible (Kim et al., 2023; Turna et al., 2021), so one of the basic factors that must be possessed in archery sports movements is consistency (Nasoulas et al., 2024). This must be done continuously and do not change techniques during training to get the desired results during the competition (Hardi et al., 2022). In addition to persistence, many factors affect success in archery, two of which are excellent physical condition (Mukholid et al., 2025) and qualified movement skills (Destriani et al., 2024).

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 (Arkin & Budak, 2021; Yacshie et al., 2022). Provision of balance training can help stabilize archers in aiming at targets when they get unwanted weather or terrain in a competition, such as strong winds, heavy rain, or maybe uneven footing (Kesilmiş et al., 2024).

In this case, many archery athletes 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. Most athletes only do exercises that they consider most important to support the accuracy and quality of their shots such as *plank training* (Yachsie et al., 2023), *push ups* (Baifa et al., 2023), *bow training* (Pratama, 2024) and *balance training*. Of course, these exercises are very good for athletes but, often athletes put aside balance training, many and often they do this exercise jokingly.

This can have an impact on the less than optimal quality of archery athletes which results in not achieving the desired archery accuracy (Archer, 2021). Thus, the need for archery athletes to start taking balance training seriously (Prasetyo et al., 2023). One of the methods of balance training is to use the *Wobble Board* (ALJawaee et al., 2021).

Based on these problems, researchers consider it important to be raised as research and as an additional source of information. Based on this, researchers will conduct research on the Effect of Balance Training Using the *Wobble Board* on Archery Accuracy of 30 Meter Distance Archery Athletes.

METHODE

The population used in this study were of SELABORA Archery FIKK UNY athletes. Then the determination of the sample continued with *purposive sampling* with the criteria of male and female gender, registered as a student for at least 3 months, aged 15-18 years, willing to follow the treatment. Thus, the sample used totalled 12 athletes.

This research is in the form of an experiment, with a One Groups Pretest-Post test Design with 21 times of treatment. The accuracy test treatment was carried out in 6 increments of 2 sessions, where one increment shot 6 arrows. The first thing in conducting an experiment using this single sample design is to give a test to a sample that has not been given treatment called a *pretest* (O1), *the pretest* carried out includes a 30-meter distance score. After obtaining the total score and record time to hold the balance of the body, then the treatment (X) begins with balance training using the *wobble board* tool. After the treatment is given to the athlete, another test is given to measure the total score after being subjected to the experimental variable (X) called *the post test* (02), in *the post test* will get the results of data from the experiment where archery accuracy and the athlete's balance level increase or not after the treatment. Compare O1 and O2 to determine how much difference arises, if any as a result of giving experimental variables.

According to research from AS Dinesha and Arun Prasad B (2011: 28-29) there are 3 kinds of balance training programs with the *Wobble Board* method, namely: 1) Stand with your feet parallel to the board, shake the board back and forth. 2) Stand with your feet parallel to the board, shake the board from the right side to the left side, 3) Stand wide on the board, shake the front of the board from side to side in a circulating motion.

Image 1.   Movement 1

This exercise requires the athlete to stand with a straight upright body position and a straight and shoulder-width apart leg position on the *Wobble Board*, besides that the athlete must also shake the *Wobble Board* forwards and backwards.

Image 2.   Movement 2

This exercise requires the athlete to stand with a straight upright body position and a straight and shoulder-width apart leg position on the *Wobble Board*, besides that the athlete must also shake the *Wobble Board* right side to left side or vice versa.

Image 3. Movement 3

This exercise requires the athlete to stand in a straight upright body position and the position of the legs is straight and opened as wide as the board on the *Wobble Board,* besides that the athlete must also shake the *Wobble Board* on all sides.

The following is a balance training treatment using the *Wobble Board* tool performed by SELABORA Archery FIKK UNY athletes to improve archery accuracy.

Table 1. Treatment of balance training with the wobble board

Week	Day	Type of Exercise	Duration	*Recovery*	Volume
I	Wednesday Thursday Saturday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		
		3. Movement III	30 Seconds		
II	Wednesday Thursday Saturday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		
		3. Movement III	30 Seconds		
III	Wednesday Thursday Saturday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		
		3. Movement III	30 Seconds		
IV	Wednesday Thursday Saturday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		
		3. Movement III	30 Seconds		
V	Wednesday Thursday Saturday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		
		3. Movement III	30 Seconds		
VI	Wednesday Thursday	1. Movement I	30 Seconds	10 Seconds	3 set
		2. Movement II	30 Seconds		

	Saturday	3. Movement III	30 Seconds		
VII	Wednesday	1. Movement I	30 Seconds	10 Seconds	3 set
	Thursday	2. Movement II	30 Seconds		
	Saturday	3. Movement III	30 Seconds		

Data analysis in this research was conducted using paired t-test and one-way ANOVA statistical tests to evaluate differences in pretest and post test results between groups with significance ($p<0.05$). Before the main analysis, normality test and homogeneity test were conducted to ensure that statistical assumptions were met with significance ($p>0.05$). The data analysis process was assisted by SPSS version 27 software, which facilitates efficient and accurate data processing (George & Mallery, 2021).

RESULTS AND DISCUSSION

Research results are presented in graphical, table, or descriptive form. Analysis and interpretation of these results are required before they are discussed. Tables are written in the middle or at the end of each text description of research results/objectives. If the width of the table is not enough to be written in half a page, it can be written on a full page. The title of the table is written from the left centered, all words are capitalized, except conjunctions. If more than one line is written in single space. For example, see Table 1.

The following are the results of data collection through the pretest -post test of 30-meter archery accuracy ability of SELABORA Archery FIKK UNY athletes aged 15-18 years. The first analysis is the normality test with the *Kolmogrov-Smirnov* test. The rule used to determine whether a distribution is normal or not is p> 0.05 the distribution is declared normal, and if *p < 0.05* the distribution is said to be abnormal.

Table 1. Normality Test

Variable		Z	p	Description
Archery Accuracy	Pretest	0,184	0,200	Normal
	Post test	0,163	0,200	Normal

From the table above, it shows that the significance value (p) of all variables is greater than 0.05, so the data is normally distributed. Because all data are normally distributed, the analysis can proceed with parametric statistical analysis.

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.

Tabel 2. Homogeneity Test

Variable		Df 1	Df 2	Z	p	Description
Archery Accuracy	Pretest	1	10	0,347	0,569	Homogeneous
	Post test	1	10	0,024	0,879	Homogeneous

Based on the homogeneity test results in the table above, the *pretest* and *post test* data on archery accuracy obtained a *p> 0.05*, with these results it can be concluded that the entire variation is homogeneous.

The t-test in this research is intended to answer the hypothesis that has been proposed. Hypothesis testing using the t-test *(paired sample t test)* at a significant level of 5%.

Table 3. Hypothesis Test Results (t Test)

Pretest – post test	Df	T-table	T-count	P	Sig 5 %
Archery Accuracy	11	2,20	5,43	0,000	0,05

Based on data analysis of archery accuracy of SELABORA Archery FIK UNY athletes obtained t_{count} (5.437) > t_{table} (2.20), and p value (0.000) < from 0.05, these results indicate that the t_{count} is greater than t_{table}. Thus, it can be interpreted that there is an effect of balance training using a *wobble board* on the archery accuracy of SELABORA Archery FIK UNY athletes.

Based on the results of the t test, it shows that the value of t_{count} > t_{tabel} table, with the results listed above indicating that the hypothesis is accepted, so that it has a hypothesis that reads "there is an effect of training using a *wobble board* on the accuracy of 30-meter archery distance athletes SELABORA Archery FIK UNY".

Balance training in this study uses a *wobble board* tool with 3 kinds of training programs, namely: 1) Stand with your feet parallel to the board, shake the board back and forth, 2) Stand with your feet parallel to the board, shake the board from the right side to the left side, 3) Stand wide on the board, shake the front of the board from side to side in a circulating motion. This study has a design, namely *"One Groups Pretest-Post test Design"* with a sample of SELABORA Archery FIK UNY athletes who have been actively training for the last 3 months and are aged 13-17 years, the length of treatment using this wobble board is 3 times a week for 8 weeks.

Before *the treatment* is carried out, athletes run a *pretest* consisting of an assessment of body balance and archery accuracy. *Pretest* results of the experimental group totalling 12 children obtained data, namely: 1) Maximum result 325. 2) Minimum result 217. 3) Mean 270.08. 4) Median 280.50. 5) Mode 296.

After the athletes do the next *treatment*, a post test is carried out which consists of an assessment of body balance and archery accuracy. The post test results of the experimental group totalling 12 children obtained data, namely: 1) Result 333. 2) Minimum result 254. 3) Average 294.08. 4) Median 299. 5) Mode 320.

The discussion focuses on linking the data and the results of its analysis with the problem or research objectives and the broader theoretical context. It can also be an answer to the question of why facts are found as in the data. The discussion is written attached to the data discussed. The discussion should not be separated from the data discussed.

CONCLUSION

According to the results of previous research and discussion, it can be obtained: data analysis of archery accuracy of SELABORA Archery FIK UNY athletes obtained the value of t_{count} (5.437) > t_{table} (2.20), thus it can be concluded that there is an effect of training using the *Wobble Board* on the archery accuracy of SELABORA Archery FIK UNY athletes.

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