THE EFFECT OF THE COMBINED PLYOMETRIC AND BALANCE TRAINING METHOD ON LAY-UP SHOOT PERFORMANCE

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Abstract

This research discusses the effect of the combined plyometric and balance training method on lay-up shoot performance. The purpose of this research is to determine the effect of the combined plyometric and balance training method on lay-up shoot performance. This research method used the experimental method with two group pre-test post-test control group design. The population used in this research is male UPI basketball athletes. The sample that the researcher used is a total sampling technique i.e 22 male UPI basketball athletes. The instrument used is the Lay Up Test. The data is processed using the SPSS program version 25. The result of this research showed that is a significant impact of the combined plyometric and balance training method on lay-up shoot performance of male UPI basketball athletes.

Keyword:
Training methods, Plyometric, Balance, Lay-up shoot performance.

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Introduction

Basketball was created by Prof. Dr. James A. Naismith, a physical education teacher at Young Men's Christian Association (YMCA) Springfield, Massachusetts, the United States in 1891. According to FIBA (2018, p. 4), the basketball game is played by 2 teams of 5 each player. The goal of each team is to score into the opponent's basket and try to prevent the opposing team from scoring.In basketball game, there are several basic techniques that must be mastered, passing, dribbling, and shooting. According to Lubay (2017, p. 17) Basketball players need to do physical movements namely running fast, stopping suddenly, throwing, catching,

jumping, and landing in good body balance, endurance, strength, and coordination of body movements.

In basketball games, shooting has a very important role. Shooting consists of various techniques, including set shoot, jump shoot, hook shoot, lay-up shoot, and all kinds of moves by trying to get the ball into the ring. Compared to the other shot types, lay-up shoot has a bigger percentage than the others. According to Jon Oliver (2007, p. 13) the highest percentage of shots are deep shots such as lay-ups, which are made by an attacking player who is within about 1 meter of the basketball hoop. Positions close to the basketball hoop usually have the highest shot accuracy (percentage of balls in), 55 to 60 percent of all their shooting attempts. The lay-up shot is taken close to the hoop after catching the ball or dribbling (Wissel, 2000). Lay-up shoot is an effective type of shot because it is carried out at the closest distance to the basketball hoop (Sadikun, 1992).

The lay-up shoot is also called a floating shot, because before making a shot, the players must take one long step, then take one short step in preparation to jump and shoot as close as possible to the basketball hoop. This series of movements from the lay-up shoot seems to float, so the lay-up shoot is said to be a floating shot. The lay-up shoot has a high level of difficulty and complexity because it includes several elements: sight, strength, balance, hand position, elbow alignment, shooting rhythm, and follow-through (Wissel, 2000). UPI men's basketball athletes have poor lay-up shoot skills, this was obtained from the results of an interview with Dally Nur Arif, the coach of the UPI men's basketball team. Poor lay-up shoot skills could happen because in doing lay-up shoots there are many mistakes such as the initial step is not strong enough, the first step is not long enough, the repulsion is not strong enough, less than optimal in jumping, and unbalanced in landing. This error could have been caused by weak leg muscle strength and also a lack of balance.

Increasing the strength of the leg muscles can be done by doing plyometric exercises while improving balance can be done with balance exercises. Plyometrics are exercises that aim to link speed and strength movements to produce explosive movements. The term is often used to relate repetitive jumping or stretching reflex exercises to produce an explosive reaction. Radcliffe (1999) stated that plyometric training is an exercise that has the following special characteristics i.e very strong muscle contractions in response to dynamic loading or rapid stretching of the muscles involved. Plyometrics is also known as stretch reflexes or myotatic reflexes or muscle twisting reflexes. Balance training is a physical activity that is carried out to increase body stability by increasing the muscle strength of the lower limbs. (Nyman, 2007). The purpose of this study was to find out about the combined plyometric training method with balance on the lay-up shoot performance of male basketball athletes at UPI Bandung.

Methods

This research used an experimental method with a two group pre-test post-test control group design. The population in this study were UPI Bandung male basketball athletes, the sample was determined by the total sampling method, then the sample used was all UPI Bandung male basketball athletes which consisted of 22 people, were then divided into experimental groups and control group. The experimental group will receive a combined plyometric and balance training method

and control group will receive conventional training. In equating or balancing the two groups, it is done by subject matching ordinal pairing, namely subjects whose results are the same or almost the same as the pre-test and then paired with the ABBA formula, then automatically two groups will be formed, namely experimental group and control group.

Instrument

In this study, the researcher used the Lehsten test, namely the lay-up shoot test (basketball per minute) which aims to measure shooting skills into a basketball basket with validity and reliability values of 0.94 and 0.89.

Procedure

This research was conducted at the UPI basketball court for 4 (four) weeks, meaning that 12 training sessions were given 3 times in one week (Tite, 2012). The first step in this study was to determine the population and sample, 22 UPI Bandung men's basketball athletes have participated in this study. The samples were divided into two balanced groups using ordinal pairing based on the results of the pre-test. Random assignment is used. The first group was randomly given a combined plyometric and balance training method and the second group was randomly given control group.

Data Analysis

The data obtained from the research results are quantitative data. Statistical analyses were carried out using the SPSS 25 program for Windows. The normality of all variables was tested using the Kolmogorov-Smirnov procedure. Means and SDs were calculated, using standard statistical methods.

Result

The data of the research results after the treatment was carried out, the results obtained. See the Table 1 below.

Table 1. Descriptive statistic of Plyometric Group and Combined Plyometric and Balance Group

	Combined Plyometric and Balance Group	**Control Group**
Pre-test	7.18 ± 1.17	7.18 ± 1.08
Post-test	10.00 ± 0.77	8.18 ± 1.08

Table 1. Show the results of descriptive statistics for the pre-test lay-up test for the combined plyometric and balance group, which obtained a mean score of 7.18 and a standard deviation score of 1.17, while for the post-test of the combined plyometric and balance group mean score of 10.00 and a standard deviation of 0.77. The results of descriptive statistics for the pre-test lay-up test for the control group, obtained a mean score of 7.18 and a standard deviation of 1.08, while for the post-test of the control group mean score of 8.18 and a standard deviation of 1.08.

Furthermore, to find out the results of the pre-test and post-test of the combined plyometric and balance group score obtained, see the Chart 1 below

Chart 1. Pre-test and Post-test Result of The Combined Plyometric and Balance Group

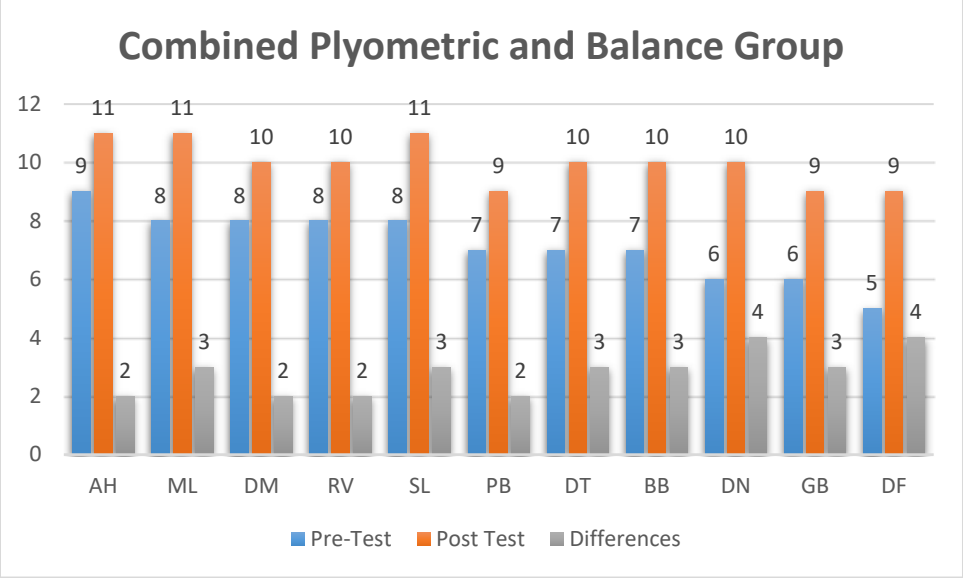

Chart 1. illustrates that there is a change in the results of the pre-test and post-test after being given treatment, the results for the combined plyometric and balance group, obtained a minimum score of 5 and maximum score of 9, while for the post-test of the combined plyometric and balance group, the minimum score 9 and maximum score 11. Furthermore, to find out the results of the pre-test and post-test score control group obtained, see the Chart 2 below

Chart 2. Pre-test and Post-test of The Control Group

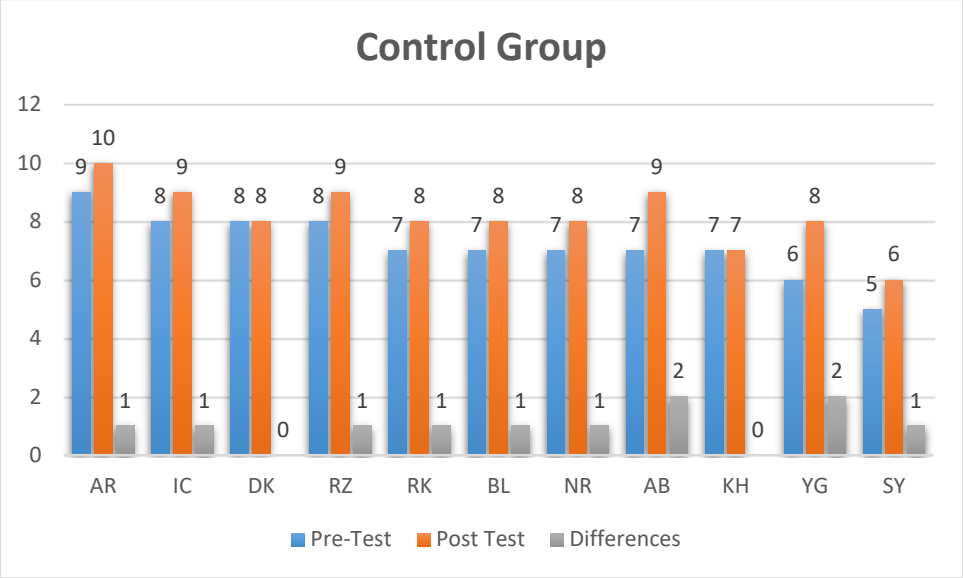

Chart 2. illustrates that there is a change in the results of the pre-test and post-test after being given conventional exercise, the results for the pre-test lay-up test for the control group, obtained a minimum score of 5 and maximum score of 9, while for the post-test of the control group, the minimum score 6 and maximum score 10. Furthermore, to find out which group differences are more effective, the gain value is obtained in Table 2.

Table 2. The Combined Plyometric and Balance Group and Control Group Gain Score

Group	*N- Gain*
Combined Plyometric and Balance	0.58
Control	0.21

The gain score shows that combined plyometric and balance training is more effective with a value of 0.58 compared to control group with a value of 0.21. Table 3. show normalized gain criteria according to Hake (2002), from the gain score, the plyometric and balance training is moderate, and the control group is low

Table 3. Normalized Gain Criteria

N-Gain Score	Criteria
$0{,}00 < N - Gain < 0{,}30$	Low
$0{,}30 \leq N - Gain \leq 0{,}7$	Moderate
$N - Gain > 0{,}70$	High

Source: Hake (2002)

Discussion

After processing and analyzing the data, the findings that the researchers found that leg muscle strength and balance are physical conditions that must be possessed by basketball players. According to Lubay (2017, p. 17) Basketball players need to do physical movements namely running fast, stopping suddenly, throwing, catching, jumping, and landing in good body balance, endurance, strength, and coordination of body movements.

To increase leg muscle strength, plyometric training methods can be used. Plyometric training provides a double advantage (Chu, 2013) that plyometric utilizes the force and speed achieved by accelerating body weight against gravity, this causes the force and speed of weight training to be available, besides plyometrics stimulates various sports activities such as jumping, running and throwing more often than weight training. Prayoga (2016) proves that the plyometric exercise method has a significant effect on increasing leg muscle strength. To improve balance, you can use balance exercises. Bosu ball is one of the media that can be used for balance training. Iskandar (2019) proves that balance exercises using the Bosu ball media provide a significant effect on improving balance. Bouteraa, et al (2018) proves that the combined method of plyometric training with balance can have a significant effect on increasing leg muscle strength and balance.

Conclusion

The results of this study that the combined plyometric and balance training can increase leg power and balance to improve shoot lay-up performance. The combined plyometric and balance training method is better compared to the conventional training. With this, the researchers suggest to coaches and basketball athletes to apply the combined plyometric training method with a balance to improve the lay-up shoot performance.

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