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Fix Target and Moving Target Training: Which is Better for Accuracy of Groundstrokes?

Rafidhiya Mohammad[1], Abdul Alim[2], Afeb Chesa Arianto[3], Ujang Nurdin[4]
[1,2,3,4]Department of Sport Science, Yogyakarta State University, Yogyakarta Indonesia
Email address: rafidhiyamohammad.2021@student.uny.ac.id, abdulalim@uny.ac.id, afebchesa.2018@student.uny.ac.id, ujangnurdin.2018@student.uny.ac.id

Abstract**—***The purpose of the study was to prove fix target and moving target training: which one is better for groundstrokes accuracy? The population in this study were Rafisa Tennis Club junior tennis players totaling 20 athletes of male gender and age range 12-16 years**.** This type of research is experimental, with a two group pretest-posttest design. Instruments to measure the ability of groundstrokes forehand drive and backhand drive using the Hewitt Tennis Acheivesment test. The results of the study can be concluded that there is a significant difference in influence between fix target and moving target training on the accuracy of groundstrokes of Rafisa Tennis Club junior tennis players, with a p-value <0.05. The moving target training group is better than the fix target training group by 6.7. For researchers who want to conduct further research so that they can make this research as information material and can examine with a larger and different population and sample.*

Keywords**—** *Fix target, moving target, groundstrokes accuracy*.

I. INTRODUCTION

Tennis is a sport that uses rackets and balls. The method of play is that the racket is hit to the ball, and welcomed by a pair of players who face each other on the field, limited by a net that is deliberately installed in a rectangular field (1). Basic tennis techniques include hitting the ball, ground stroke, types of strokes, footwork, timing, forehand drive, backhand drive, serving and hitting the ball back (2,3). One of the basic techniques of tennis is the technique of hitting consists of four kinds, namely: service, forehand groundstroke, backhand groundstroke, and volley (4,5). With good basic techniques, a tennis player will play well.

For players, one type of shot that must be mastered is groundstrokes. This is because, groundstrokes are very important that must be mastered by players, because in playing a game or match groundstrokes are the most done. Furthermore, it is said that the average player performs groundstrokes in the game 35-45% of the overall stroke during the game or match. That is, because of the number of these shots made in the match, therefore it is very necessary for players to master these groundstrokes (6).

Groundstrokes can be done with the forehand or often also called the forehand drive and can also be done with the backhand or often called the backhand drive, depending on where and where the ball is hit. The usefulness of groundstrokes is the beginning to start a game, to develop coordination between the racket and the eye and is a powerful weapon to drain the opponent's energy. In addition, the usefulness of groundstrokes is a saving weapon that can be used to kill the ball.

Forehand and backhand groundstroke are both important in the game of field tennis, because forehand and backhand groundstroke can defend the ball from the opponent and can kill the ball from the opponent. When playing field tennis the dominant groundstroke technique is used to defend and attack the opponent. Thus groundstroke really needs to be learned and developed by players who are beginners and who are already reliable at playing tennis. Because groundstroke is the dominant stroke technique used when playing field tennis.

Players in order to be able to perform groundstrokes well, there are several kinds of training methods, but along with the development of the game of tennis the coach has the ability to create a variety of exercises. The fixed target forehand groundstrokes and moving target forehand groundstrokes training methods are methods that can be used because they can increase accuracy and foot movement properly and of course will be very useful for groundstrokes ability.

The fixed target training method is a process of hitting that directs the ball to a certain target in a stage, namely hitting the ball that has been determined until it runs out, so the ball is given at three points but the direction of the ball is fixed. The moving target training method is a process of hitting the ball at several targets in a stage, namely hitting the ball that has been determined until it runs out, so the ball is given at one point and the direction of the ball moves (7).

Based on the results of observations at Rafisa Tennis Club, during the training process and matches there are several players who appear to lack accuracy, especially in groundstroke techniques. Errors made by tennis players can be in the form of the results of hitting the ball on the net, out of the playing field area, or the application of improper tactics, so that it is profitable for the opponent. The forehand groundstrokes swing technique performed by athletes is still not correct, the coordination of movements is not harmonious, so that the level of accuracy of the shot is not well directed. To reduce the risk in a tennis game, one of which is a blow out of the playing area, a level of accuracy is needed in playing tennis.

Based on the background that has been stated above, the researcher is interested in proving fix target and moving target training: which is better for groundstrokes accuracy?

II. METHOD

Study Participants

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The population in this study were Rafisa Tennis Club junior tennis players totaling 20 athletes of male gender and age range 12-16 years. The sample was paired with the A-B-B-A pattern in two groups with 10 athletes each. The sample distribution technique used in this study is by using ordinal pairing. Ordinal pairing is the division of groups into two with the aim that both have similarities or evenly distributed abilities.

Study Organization

This type of research is experimental, with a two group pretest-posttest design. The instrument to measure the ability of groundstrokes forehand drive and backhand drive using the Hewitt Tennis Acheivesment test with a validity coefficient of 0.67 and a reliability coefficient of 0.75. The Hewitt tennis achievement test is a test that emphasizes shot placement. Each testi performed 10 backhand groundstrokes and 10 forehand groundstrokes. Each ball return will be scored 0-5 points depending on where the ball falls.

Statistical Analysis

Data analysis techniques used in this study using SPSS 20, namely by using paired sample tests and independent sample tests at a significance level of 0.05. Previously, prerequisite tests of normality and homogeneity were carried out.

III. RESULT

The results of the pretest and posttest of groundstrokes accuracy are presented in Table 1.

TABLE 1. Descriptive statistic

Statistic	Minimum	Maximum	Mean	Std. Deviation
Pretest Fix Target	38.00	50.00	43.70	4.50
Posttest Fix Target	40.00	54.00	46.50	4.43
Pretest Moving Target	37.00	49.00	44.00	4.81
Posttest Moving Target	46.00	62.00	53.20	7.18

Based on Table 1 descriptive statistics above, if presented in diagram form can be seen in the following figure:

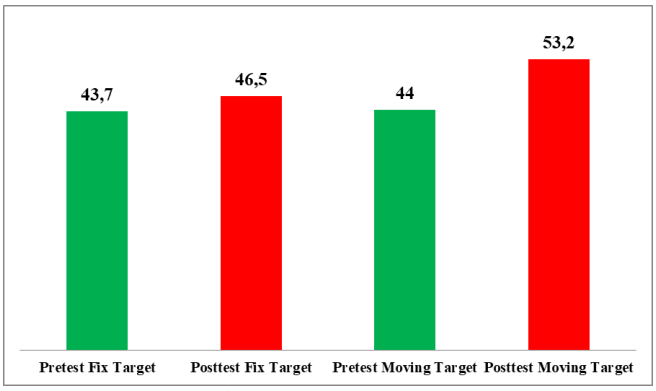

Figure 1. Diagram of pretest and posttest groundstrokes accuracy

Normality Test

The normality test uses the Shapiro-Wilk Test, namely by looking at the significance value of the residual variable if the value is above 0.05, it can be said that the data is normally distributed. The results are presented in Table 2.

TABLE 2. Normality test result

Group	Shapiro-Wilk		
	Statistic	df	Sig0.
Pretest Fix Target	0.921	10	0.368
Posttest Fix Target	0.959	10	0.779
Pretest Moving Target	0.838	10	0.142
Posttest Moving Target	0.798	10	0.014

Based on table 2 above, it can be seen that the pretest-posttest data for groundstrokes accuracy has a p-value > 0.05. then the variables are normally distributed..

Homogeneity Test

The homogeneity test is useful for testing the similarity of the sample, namely uniform or non-variant samples taken from the population. Homogeneity test using Levene Test. The homogeneity rule if sig. > 0.05, then the test is declared homogeneous. The results of the homogeneity test are presented in Table 3.

TABLE 3. Homogeneity test result

Test of Homogeneity of Variances				
Group	Levene Statistic	df1	df2	Sig.
Pretest-Posttest Fix Target	.507	1	18	.486
Pretest-Posttest Moving Target	11.197	1	18	.104

Based on table 3 above, it can be seen that the pretest-posttest data for groundstrokes accuracy obtained p-value > 0.05, so the data is homogeneous.

Hypothesis Test Result

The hypotheses in this study were tested using t-test analysis, namely paired sample t-test (df = n-1) for the analysis of hypotheses 1 and 2, while the independent sample test for hypothesis analysis 3 (df = n-2) using the SPSS version 21 software. The results of hypothesis testing are explained as follows:

TABLE 4. Test hypothesis 1 and 2

Paired Samples Test			
Group	t	Sig. (2- tailed)	Difference
Pretest-Posttest Fix Target	8.573	0.000	2.8
Pretest-Posttest Moving Target	9.546	0.000	9.2

Based on the analysis results in table 4 above, it can be seen that:

Pretest-posttest fix target p-value 0.000 < 0.05, then this result shows there is a significant difference. This means that the accuracy of Rafisa Tennis Club junior tennis players' groundstrokes increased after being given fix target training.

Pretest-posttest moving target p-value 0.000 < 0.05, then this result shows there is a significant difference. This means that the accuracy of Rafisa Tennis Club junior tennis players'

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groundstrokes increased after being given moving target training.

TABLE 5. Hypothesis test 3

Independent Samples Test			
Group	t-test for Equality of Means		
	t	Sig. (2- tailed)	Difference
Fix Target - Moving Target	2.512	0.022	6.7

Based on the analysis results in table 5 above, it can be seen that the p-value is 0.022 < 0.05, so this result shows that there is a significant difference. The posttest difference in groundstrokes accuracy after being given fix target and moving target training exercises is 6.7. The moving target training group is better than the fix target training group.

IV. DISCUSSION

Based on hypothesis testing, it is known that there is a significant influence between fix target and moving target training on the accuracy of groundstrokes of Rafisa Tennis Club junior tennis players. The fixed target training method is a process of hitting that directs the ball to a certain target in a stage, namely hitting the ball that has been determined until it runs out, so the ball is given at three points but the direction of the ball is fixed. The ball is fed by the feeder from the edge of the field as many times as specified towards the position of the rightmost hitter then the center and leftmost then right again and so on. The batter hits the ball in the same direction (8). The fix target method is a closed skill. Closed skill is when the supporting surface, objek, other poeple involve in the performance of a skill are stationary (9).

A fixed target is a place that is marked and does not move. Fixed targets can improve player accuracy when doing fixed target training gradually. The advantage of a fixed target is that it can increase the accuracy of an athlete who is carrying out fixed target training and the athlete will be able to memorize the location of the angle trained in the fixed target, the disadvantage of a fixed target is that the monotonous target does not vary.

The moving target training group is better than the fix target training group. The results of this study are reinforced in research showing that training with moving or moving targets has better results than training with fixed or stationary targets (10–12).

Marpaung in his study aimed to determine the difference in the effect of static and dynamic target training on accuracy. The results showed that dynamic target practice is more than static target practice on accuracy (13). This study is based on the adaptation process that described target practice as a useful practice variation to measure the ability of practice changes in motor learning. From this point of view, variable practice conditions were reviewed to be a stimulus of sufficient magnitude and direction to bring athletes to a higher level of performance and hence optimize motor learning (14).

Moving target training is a hitting process that directs the ball to several targets in one stage, namely hitting a predetermined ball until it runs out, so that the ball is hit at one point and the direction of the ball moves. The ball is fed by the feeder from the center of the field as many times as specified towards the batter's position in the center. The ball hitter always aims at the target which moves first from the right then to the center and left edge. In moving target training players are given the freedom to direct the ball to the target area, but the direction of the target must always change, the player is required to coordinate to aim at the target must be more careful than with a fixed target because it uses various target directions and emphasizes accuracy in directing the ball to more than one target.

Movement skills are the ability to perform movements efficiently and effectively, this is in the process of motion formation which does not occur automatically, but is an accumulation of the process of learning and practicing, namely by understanding the movement and repeating the movement accompanied by awareness of the movements performed. The benefit of target practice is that it requires athletes to develop tactical awareness and decision-making skills. The values that are expected to emerge are situational independence, learning independence, personality formation, personality formation. Often, a given property in a target game will be configured.

V. CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that there is a significant difference in influence between fix target and moving target training on the accuracy of groundstrokes of Rafisa Tennis Club junior tennis players, with a p-value < 0.05. The moving target training group is better than the fix target training group by 6.7. For researchers who want to conduct further research, they can make this research as information material and can examine with a larger and different population and sample size.

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