

## The Effect of Multiball Training and Hand Reaction Speed on the Accuracy of Forehand Drive Strokes in Table Tennis Games in West Sulawesi Polman Jaya Club Athletes

Nurnamira Nurnamira✉, Bambang Budi Raharjo, Andry Akhiruyanto

Universitas Negeri Semarang, Indonesia

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### Abstract

This study aims to analyze how the difference in the effect of constant pass multiball training and variable pass multiball training on the accuracy of forehand drive in table tennis games in West Sulawesi Polman Jaya club athletes, analyze how the difference in the effect of high hand reaction speed and low hand reaction speed on the accuracy of forehand drive in table tennis games in West Sulawesi Polman Jaya club athletes and analyze how is the interaction between the multiball training method and the speed of hand reaction to the accuracy of forehand drive strokes in table tennis games in athletes of the West Sulawesi Polman Jaya club. This type of research is an experiment with a 2 x 2 factorial design. The population of this study was 40 novice athletes from the active Polman Jaya club. The study sample was 28 athletes taken by purposive sampling technique. The data analysis technique used was a two-track Analysis of Variance (ANOVA) followed by the Tukey test with a significant level of  $\alpha = 0.05$ . The results of the study are as follows. (1) There is a difference in the effect of constant pass multiball training method and variable pass multiball training method on the accuracy of forehand drive in table tennis games in novice athletes of Polman Jaya club, where the variable pass multiball training method is better than the constant pass multiball method, as evidenced by the value of  $p = 0.000 < 0.05$ . (2) There is a difference in the accuracy of forehand drive strokes in table tennis games in athletes who have high and low hand reaction speeds in beginner athletes of Polman Jaya club, where athletes who have high hand reaction speeds are better than athletes who have low hand reaction speeds, as evidenced by  $p = 0.000 < 0.05$  values.

✉ Correspondence address:  
Campus UNNES Kelud Utara III Semarang  
E-mail: [nurnamira@students.unnes.ac.id](mailto:nurnamira@students.unnes.ac.id)

## INTRODUCTION

Table tennis or better known as "ping pong" is a unique and creative sport (Fandi Sutari & Sayuti Syahara, 2014). Table tennis is a racquet sport that belongs to the most popular physical activity (Duluard et al., 2022). Table tennis is a simple game (Irmawati, 2020). This is because this one sport is not too complicated to follow because table tennis games do not require expensive facilities and infrastructure, with even a small room the game can be played (Winata et al., 2021).

Table tennis is a sport that knows no age restrictions (Chairul Rizal Assiddiq, Indra Safari, 2020). Table tennis is a sport that can be enjoyed by all people (Rachmat Rusmana, 2020). In Indonesia, this branch of table tennis has been very popular both in schools, villages, agencies, companies, and so on (R. Imaniar, 2017). Table tennis is one of the sports of small ball games (Saputri, 2013). In table tennis, players use bats to hit the ball back and forth (Lan et al., 2015). Table tennis can be played by two people or four people (singles/doubles) who use the table as a court bounded by a net and use ping pong balls (Sudrajat & Irawan, 2019).

The development of table tennis in West Sulawesi, especially in Polewali Mandar, is actively conducting coaching and training to prepare for every match, both regionally and nationally, as proof that the Polman Regency government strongly supports the government's movement to advance the world of sports in this country. This table tennis sport has quite a lot of enthusiasts, and the opportunity to get achievements is very large (Agus Pujiyanto, 2015). One of the sports that is a priority to produce outstanding athletes is table tennis which is a member of the Polman Jaya club. Polman Jaya Club is also the best club in table tennis coaching in West Sulawesi.

However, the problem is that the athlete's ability is uneven, only one or two people have good ability to play, so these achievements tend to be born from one or two people only. This can be seen from the movement of athletes in hitting the

ball during training, especially in athletes who are just beginning or beginners playing table tennis.

In table tennis, the basic technique that must be mastered by novice athletes is one of forehand drive strokes. Drive is the basis of all types of punches and attacks (Nur Moh Kusuma Atmaja, 2015). The forehand drive hit is the most powerful blow, besides that the power used is usually more maximum than the backhand punch (Ika Rudi Mahendra, Prpto Nugroho, 2012). (Prabowo et al., 2021). This is because, the body does not get in the way when doing a backswing (backswing) and the muscles used are usually strong (AGUS KURNIADI, 2020). Forehand drive punches can be played as attacking punches or can also be controlled as desired. Therefore forehand drive strokes need to be trained with effective exercise methods. The reality on the field based on observation is that some coaches use the multiball method with constant passes and changing passes to improve the accuracy of forehand drive strokes, because coaches think these two methods can improve the ability to target forehand drive (Simpson, 2004). The practice method is a lesson for developing practice (Nila Fadlatul Islamy, 2017).

The multiball training method is a practice method where one player practices while the other player passes the ball (Ira Purnama Siregar & Rosmaini Hasibuan, 2012). According to (Sugiyono, 2012) states that in the multiball training method, the athlete performs movements according to what the coach instructs and performs repeatedly. The repetition of this movement is intended to automate the movement. Multiball training is a method of training with the help of an auto robot device or by an effective trainer (Diki Syafwan Subagja, 2019). This method is a proper way to learn punches, but the disadvantage is that only one person can practice at that time (Nurdianti et al., 2018). One of the goals of multiball training is to improve forehand drive skills in athletes (Satria Budi & John Arwandi, 2020). Using multiball practice methods can help improve the technical and tactical abilities of the players (Zhang et al., 2014). Based on the opinion above, using a multiball training method that has a lot of repetition of movements

can increase the accuracy of forehand drive strokes.

In addition to the exercise method, one of the factors that affect forehand drive strokes is hand reaction speed and accuracy. Table tennis is a game that is played in a very fast and short time (Kamijima et al., 2010). According to (Sukadiyanto & Muluk, 2011) The speed of hand reaction is a critical success factor in almost all sports. Table tennis is widely rated as one of the fastest sports, and can be described as quite a difficult movement (Faber et al., 2014). The ability to react quickly to various cues is a key factor in achieving an athlete's success (Castellar et al., 2019). The reaction is the time between the administration of an excitatory (stimulus) and the first motion (Agus Arief Rahmat & Aang Rohyana, 2020). Most sports require strong reaction speed skills to hit the ball, as well as excellent reaction time (Mori et al., 2002). The sport is very fast and its performance depends on the integration of technical and tactical factors, as well as physiological, physical, and psychological aspects (Kondrič et al., 2013).

The game of table tennis also requires a good reaction speed which is associated with the speed of welcoming the ball that comes as an excitatory and the hit or return of the ball as an action or response that must be carried out. The speed of the reaction will affect the timing of the hitting. Because the pace of the ball in a table tennis game is very fast, the right timing is needed. A split second late then the ball will be missed or fail to hit. Timing is related to the direction and placement of the ball so it also relates to the accuracy of a hit. Therefore, the speed of the reaction is also related to the accuracy of the blow.

Table tennis requires a precise hit to the target because the factor of accuracy in the game of table tennis is very important. This is useful for placing difficult balls in directions that are difficult to hit by opponents during matches. The success of every athlete in the game is always determined by his success in putting the ball in the corner of the court so that it presses the opponent so that it is difficult to return the ball and easily get points (Rizki Ridha Kusuma, 2019). The function of the accuracy of the punch is to make the opponent run

Reaching the ball that is out of reach (open the side court), is also used to complete a game (rally) or called a winning point. Based on the description above, it is necessary to test whether the two multiball training methods can increase the accuracy of forehand drive strokes in table tennis games in West Sulawesi Polman Jaya club athletes.

## METHOD

This study is a type of experimental research with a 2 x 2 factorial design with the population used being novice athletes from the West Sulawesi Polman Jaya club. The population in this study was novice athletes of Polman Jaya Club with a total of 40 people. Samples were obtained by purposive sampling techniques based on characteristics or characteristics set by researchers totaling 28 people. The sample tests the speed of hand reaction by catching the bar dropped by the officer. The sample was divided into two groups, namely group A and group B, consisting of 14 athletes who had a high hand reaction speed level and 14 athletes who had a low hand reaction speed level. Then the treatment was given to each group.

Samples in groups A and B were each given the same exercise method, namely the constant pass multiball exercise method and the variable bait multiball exercise method. The exercises provided apply the principles of exercise and the systematics of exercises. The frequency of exercise is 3 times a week for 5 weeks. After completion of treatment, each group conducted a post-test.

## RESULT AND DISCUSSION

### Result

Description of the results of pre-test and post-test data analysis of forehand drive accuracy in table tennis in athletes of the West Sulawesi Polman Jaya club who have high hand reaction speed and low hand reaction speed. The results of the data description of the group of constant feed multiball training methods and variable feed multiball in athletes who have high hand reaction speed and low hand reaction speed are presented in the table as follows.

**Hypothesis Testing I**

The first hypothesis reads there is a difference in the effect of constant pass multiball training methods and variable multiball bait on the

accuracy of forehand drive in table tennis games in Polman Jaya club athletes. The following are the results of the calculation of the analysis of variance using SPSS 22.

**Table 1.** Univariate Test Dependent Variable: Multiball Training Method

Source	Sum Of Squares	Df	Mean Square	F	Sig.
Multiball Training Method	231504.143	1	231504.143	2794.417	.000

From the results of the analysis using Anova, an F value was obtained;  $P < 0.05$  a significant level of 0.05. F count of 2794,417 with a significance level of 0.000 thus the hypothesis that there is a difference in the effect of multiball practice methods of constant passes and variable passes on the accuracy of forehand drive strokes in table tennis, is accepted. This means that there is a difference in the effect of multiball training methods, constant passes, and variable passes on

the accuracy of forehand drive strokes in table tennis games in Polman Jaya club athletes.

**Hypothesis Testing II**

The second hypothesis is that there is a difference in the accuracy of forehand drive strokes in table tennis games in athletes who have high and low hand reaction speeds in Polman Jaya club athletes. The following are the results of the analysis calculation using SPSS 22. More details can be found in the following table.

**Table 2.** Univariate Test Dependent Variable: Hand Reaction Speed

Source	Sum Of Squares	Df	Mean Square	F	Sig.
Hand Reaction Speed	2358.893	1	2358.893	2871.696	.000

The results showed that athletes who had a high hand reaction speed had an increase in forehand drive accuracy results that were more different from athletes who had a low hand reaction speed. This is evidenced by the results of the analysis using Anova obtained an F value;  $P < 0.05$  a significant level of 0.05. F count of 2871,696 with a significance level of 0.000 thus the hypothesis that there is a difference in the accuracy of forehand drive strokes in table tennis games in athletes who have high and low hand reaction speeds in Polman Jaya club athletes, is accepted.

This means that there is a difference in the accuracy of forehand drive strokes in table tennis games in athletes who have high and low hand reaction speeds in Polman Jaya club athletes.

**Hypothesis Testing III**

The third hypothesis is that there is an influence of interaction between multiball training methods and hand reaction speed on Polman Jaya club athletes. The following are the results of the calculation of the analysis of variance using SPSS 22. For more details see the following table.

**Table 3.** Test Of Between-Subjects Effects Dependent Variable: Drive

Source	Sum Of Squares	Df	Mean Square	F	Sig.
Interaction of multiball training methods and hand reaction speed	140300.161	1	140300.161	73.275	.000

From the results of this study, the group of exercise methods that have the ability of high hand reaction speed and the group of exercise methods that have low hand reaction speed both show interaction or crossing on the estimated marginal

means of drive line. Based on the facts found, it can be stated that there is an interaction or relationship between the training method and the speed of hand reaction to the accuracy of forehand drive strokes in table tennis. Because there is

interaction so that further analysis tests can be carried out.

### **Discussion**

Table tennis is a game that demands a fast rhythm in an effort to welcome and return the ball, so ideally a table tennis player should have the ability to fast hand reactions. Athletes who have the ability of high hand reaction speed will quickly adapt to the characteristics of the game. In other words, for athletes with high hand reaction speed ability, it means having the ability to welcome and return the ball well when performing forehand drive techniques in table tennis. From the description above, it can be concluded that the speed of hand reaction affects the accuracy of forehand drive strokes in table tennis.

The effect of the interaction between the practice method of the constant multiball pass and multiball pass fluctuates with high and low hand reaction speed on the accuracy of forehand drive strokes in table tennis. Based on data analysis, the results of testing the hypothesis that there is an influence of interaction between constant multiball pass training methods and variable multiball bait with high and low hand reaction speed on the accuracy of forehand drive strokes in table tennis games. Concluded that there was a significant interaction between the group of constant pass multiball exercise methods and variable multiball bait with the speed of hand reaction to the precision of forehand drive strokes in table tennis games. This means that there is the interaction between each group of exercise methods consisting of a constant multiball bait group and a multiball bait that changes with the reaction speed of the hands.

Based on this explanation, subjects who have the ability of high hand reaction speed are more suitable for the multiball bait method of changing. This is because the multiball training method changes in its implementation more towards the atmosphere or state in competition, so for athletes who have high hand reaction speed, it will be easy to do it when compared to athletes who have low reaction speed. If the reaction speed of the athlete's hand is low then the failed forehand drive technique will occur more.

While athletes who have a low hand reaction speed are more suitable to be trained with the constant pass multiball training method. This is because athletes who have a low hand reaction speed will be easier. After all, the feed given is constant and in the same place is not difficult for athletes.

From the results of this study, the group of exercise methods that have the ability of high hand reaction speed and the group of exercise methods that have low hand reaction speed both show interaction or crossing on the estimated marginal means of drive line. Based on the facts found, it can be stated that there is an interaction or relationship between the training method and the speed of hand reaction to the accuracy of forehand drive strokes in table tennis. Because there is interaction further analysis tests can be carried out.

### **CONCLUSION**

Based on the data obtained, the results of hypothesis testing and discussion of research results can be concluded as follows :

There is a difference in the effect of the constant pass multiball training method and the variable multiball pass method on the accuracy of forehand drive strokes in table tennis games in Polman Jaya club athletes. Overall, the results of forehand drive accuracy in table tennis games of Polman Jaya club athletes trained with multiball pass training methods fluctuated, forehand drive accuracy was higher than those trained with constant multiball pass training methods.

There is a difference in the accuracy of forehand drive in table tennis in athletes who have high and low hand reaction speeds in Polman Jaya club athletes. Overall, the results of forehand drive accuracy in table tennis games in Polman Jaya club athletes who have high hand reaction speed, forehand drive accuracy is higher than those with low hand reaction speed.

There is an interaction between the multiball training method and the speed of hand reaction to the accuracy of forehand drive strokes in table tennis games in Polman Jaya club athletes; (a) The constant feed multiball training method is suitable for athletes who have a low hand reaction

speed; (b) The variable multiball bait training method is suitable for athletes who have high hand reaction speeds.

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