



## THE EFFECT OF DRILL AND ELEMENTARY TRAINING TO FOREHAND ABILITY OF TENNIS ATHLETES

Lazuardy Akbar Fauzan<sup>1</sup>

<sup>1</sup>Physical Education, Sports Education and Health Department, Faculty of Teacher Training and Education, Universitas Lambung Mangkurat, Banjarmasin, Indonesia

### Article Info

#### Article History :

Received : February 2022

Revised : March 2022

Accepted : March 2022

#### Keywords:

Tennis, Forehand, Training

### Abstract

Tennis athletes really need to master the forehand stroke well. A quality forehand technique will give athletes high confidence to be able to play tennis well. This study aims to determine the effect of drill and elementary exercises in improving the forehand hitting ability of JPOK tennis athletes. The research method used is experimental. The study was conducted as many as 16 times the exercise. The subjects in this study were JPOK student tennis athletes, totaling 16 people. The sampling technique used is total sampling. The research instrument used was the Hewitt tennis achievement test to determine the forehand ability. Analysis of research data using t-score analysis to test the difference in the pre-test and post-test scores. The level of validation value is 0.63 and the level of reliability value is 0.75. The results of this study show that both drill and elementary training methods can improve the forehand hitting ability of JPOK tennis athletes. The results of data analysis, drill exercises obtained t-count is greater than t-table  $17.60 > 2.365$ . Forehand only effect, t-count is greater than t-table  $8.05 > 2.365$ . Drill and elementary training methods can be used as exercises to improve tennis athletes' forehand skills. Drill training is known to have more effect on tennis forehand ability.

Corresponding address : Taruna praja street banjarbaru South

Kalimantan, Indonesia

\*Corresponding email : lazuardy.fauzan@ulm.ac.id

ISSN 2685-6514 (Online)

ISSN 2477-331X (Print)

## INTRODUCTION

Tennis is an individual sport. This game requires good basic technical skills as an indicator of mastery of the game. The basic techniques in tennis include: Forehand groundstroke, backhand groundstroke, Forehand volley, backhand volley and service (Brown, 2016). Basically, to become an athlete who is proficient in playing tennis, athletes are required to master all the basic techniques. However, in tennis, the forehand technique is the first technique that must be mastered before developing other techniques.

Forehand is one of the basic techniques in the game of tennis (Sianipar, 2019), (Ngatman & Sulistyatna, 2017), (Maulidin et al., 2020), (Fauzan & Sarmidi, 2020). The forehand can be the main stroke in the game. Forehand is a stroke that is often used by tennis athletes as the main stroke to defend and attack. This is because the results of the forehand stroke make the ball have a harder spin than the backhand shot (Evita, Yuniar; Subagio, 2016), (Alexandru et al., 2014). Many athletes use forehand strokes in the game. It can be observed that in tennis, forehand strokes are very common in tennis (Dewi Angraini, 2020) and half of all strokes in court tennis are forehand (Brown, 2016). The forehand is also the most effective shot to attack in tennis. A player uses forehand strokes to attack on the forehand and backhand sides. We can observe that there are players who always use forehand strokes even though the position of the ball that comes is on the backhand side.

In modern tennis, the forehand technique is the initial foundation that must be mastered by players (Sinulingga, Andrew Rinaldi & Nova, 2020), because if this punch is developed it will produce the most powerful blow. The power used

to make a forehand shot and generated from this stroke is usually more maximal than a backhand shot. The result of the forehand hit makes the ball spin topspin aggressively, so this hit is very important because, namely: this punch is needed to attack with the forehand and backhand sides, this hit can be the main hit to make an attack, and is the most frequently used hit to do a smash. The key to success or sequence in order to be able to perform the forehand drive technique can be divided into three stages, namely: the preparation stage, the implementation stage (backswing and forward swing), and last stage (Mahendra, 2012).

Technical training in sports requires approaches and methods that are more effective and efficient. Technical training is a special exercise intended to form and develop motor habits or develop neuromuscular skills from each sport. Perfection in mastering the basic techniques of each movement is very important because it will determine the overall movement. Method of technical training according to Rothig & Grossing in (Syafuruddin, 2012) can be distinguished based on two points of view, namely: (a) the view from the point of view of the person who trains or the athlete and (b) from the point of view of the coach or the person who coaches. If viewed from the point of view of people who practice or athletes, then the method of technical training can be divided into active training, observation training, and mental training.

One of the methods of active training is drill and elementary exercises. Drill drill is an exercise that is done repeatedly in earnest with the aim of strengthening an association or perfecting a skill so that it becomes permanent (Dwijaya et al., 2020). The advantage of the drill method exercise is that the athlete will have more time before hitting because the ball fed by the coach bounces

more slowly (Gunarto & Adnyana, 2020). Having time to anticipate the arrival of the ball makes it easier for athletes to adjust their position before making a forehand shot. With drill exercises, athletes are given the opportunity to be able to make more strokes so that athletes have the opportunity to master the forehand strokes well. Elementary training is technical training in sports that is carried out part by part or the exercises carried out are separated into each part in technical training. Each movement-element must be mastered before proceeding to the next movement (Palmizal. A, 2020). Elementary practice results in mastery of good movement coordination (Ilham & Marheni, 2018). Coordination is the ability to combine several movements without tension, in the correct order, and to perform complex movements smoothly without excessive energy expenditure. Good coordination of movements can combine very complex biomotor abilities. Athletes can also integrate different types of movement into one or more specific movement patterns. The forehand has a systematic movement pattern. The movement pattern must be carried out in accordance with the sequence of movements. Athletes must be able to master the pattern of forehand movements from start to finish. If the movement phase pattern is missed, then the forehand stroke results are less than optimal. Therefore, the trainer is expected to be able to provide exercises for mastering each phase pattern of the forehand movement.

Based on the results of field observations, it was found that the ability of student athletes in performing the forehand technique was still unsatisfactory. This can be observed from the results of forehand strokes in returning the ball that sometimes fail. In addition, the results of forehand strikes are often weak and fall in areas that are

easily reached by the opponent. When observed from the process of implementing the forehand stroke, there are student athletes who perform a series or movement phase that is still less than perfect. The less perfect movement phase occurs when you don't exactly do footwork when you're about to hit. This affects the anticipation of the direction of the ball coming. In addition to these problems, the quality of the racket swing (from backswing to follow through), there are mistakes that are often made. Improper swing of the racket causes the quality of the forehand stroke to be weak. Athletes who have these deficiencies make the results of their strokes less hard and tend to play safe by returning the ball that came in. To produce a quality shot, the athlete must get the right timing and timing when making a shot (King et al., 2012). This problem is a concern for the coach and must be anticipated immediately, because, if left alone, the quality of the JPOK student athlete's game will not be good. Athletes who can play tennis well can master the performance of cognitive and motor skills and can be an indicator of skill level (Amico & Schaefer, 2022).

To do movement exercises and get good motor skills requires good effort (Schaefer, Sabine & Scornaienchi, 2020), (Schaefer, Sabine; Jagenow, 2015). Efforts made by the author to improve the forehand tennis skills of JPOK student athletes are by providing drill and elementary exercises. The exercise is based on the author's assumption that it is very suitable to be applied. Athletes who are given drill training have the opportunity to be able to make more strokes. This opportunity can be used by athletes to be able to create movement habits and get motion automation. Good exercise can form cognitive abilities in learning motion so that athletes can get

motion automation (Furley, P., & Wood, 2016).

Elementary exercises are very suitable to be applied. Athletes who are given elementary training are given the opportunity to be able to carry out the movement part by part or the exercises carried out are separated into each part of the technical training. This exercise provides an opportunity for students to be able to improve every phase of movement in tennis forehand strokes. By being given the opportunity to do exercises in each phase, it allows athletes to be able to carry out each phase of the movement well and is expected to produce better quality forehand strokes. Based on the background above, the hypothesis is taken in this study, namely 1) drill exercises have a significant effect on the forehand ability of JPOK student athletes, 2) Elementary training has a significant effect on the forehand ability of JPOK student athletes.

## **METHODS**

The research method used in this study is a quantitative research method with a descriptive approach, namely the data generated in the form of words or narratives. This research uses experimental research. Experimental research is research to determine the effect of the independent variables on the dependent variable (Sugiyono, 2016). Variables are the subject matter that is appointed as the title of a study (Fathoni Hidayat, 2019). There are 2 variables in this study, namely the independent variable and the dependent variable. The independent variables in this study are drill exercises and elementary exercises. The dependent variable is forehand ability. The research method used is an experiment with a one-group pretest-posttest design. Determination of the design refers to the opinion (Sudjana,

2014) the experimental units grouped in a group in such a way that the experimental units in the group are relatively homogeneous and the number of experimental units in the group is the same as the number of treatments being studied. The treatment in the study was carried out with the first meeting carrying out the initial test, the treatment at the 2nd meeting until the 15th meeting by passing the treatment, and at the 16th meeting the final test was carried out. By using this research method, it aims to determine the effect of exercise on a variable on the experimental group by basing on the results of the pre test and post test. The pre-test and post-test data were collected using the Hewitt Tennis Achievement Test test instrument which was modified according to the needs of forehand stroke data collection. The test instrument was written by James S. Bosco and William F. Gustafson (in (Mulya & Agustriyani, 2020). The test to measure the forehand has a validity level of 0.63 and a reliability level of 0.75.

## **Participants**

Population is a generalization area consisting of objects/subjects that have certain quantities and characteristics determined by the author to be studied and then conclusions are obtained (Sugiyono, 2016). The population of this study was the JPOK Club tennis players, totaling 16 people. After determining the research population, the next step is to determine the research sample. Sample based on opinion (Susanti, 2019) a part that is selected in a certain way to represent the entire population group. The similarity of the characteristics of the sample with the parent population causes the sample to be a representative of the population. The sample in this study was the JPOK Club tennis players, totaling 16 people. The characteristics of this research sample consisted of several

levels of force and their status was still an active JPOK student who was still actively practicing tennis at the JPOK Club.

### **Sampling Procedures**

Sampling using total sampling technique. Total sampling is a sampling technique where the number of samples is the same as the population (Sugiyono, 2016). The reason for taking the total sampling was because the total population was less than 100. The number of samples in this study were 16 athletes. The location used in this study is in the field of the JPOK FKIP ULM Banjarbaru campus, which is located at Jalan Taruna Praja Raya, North Loktabat, Banjarbaru City, South Kalimantan. The field where this research is located has good conditions so that it can be used for athlete training.

### **Materials and Apparatus**

This research requires equipment used for testing and for giving treatment. This equipment is a tool in collecting research data so that it can determine the quality of the data collected (Hamni Fadlilah Nasution, 2016). The equipment needed is a) Tennis court for single game, b) Racket, c) Tennis ball, d) Rope, e) Meter, f) Score list, g) Duct tape, h) Camera, i) Documentation book.

### **Procedures**

This research is experimental research. This research pattern uses the M-S pattern or Match Subject Design. This means that matching is done by subject and subject. Grouping the group by making two groups, namely the experimental group and the control group. The pairing used is ordinal pairing. To balance the two groups, this is done by means of subject matching ordinal pairing, namely subjects whose results are the same or almost the same in the

initial test, ranking is carried out and then paired with the AB-BA formula. This Method, two groups are formed that have a balanced level of ability. This aims to provide equal opportunities for both groups to be the experimental group and the control group, so that the subjectivity of the researcher is not included in it. The experimental group did drill exercises and the control group did elementary exercises.

The steps taken in group formation are:

- 1) Carry out a pre test to determine the ability of forehand strokes. The results of this initial test serve as the basis for group division. The test model used is: Hewitt Tennis Achievement Test. This initial test was carried out with a sample procedure of 10 forehand strokes, previously given the opportunity to each perform 3 forehand strokes as an experiment. Samples are called one by one according to the list of numbers that have been compiled. After the score taker and target supervisor were ready, the sample tested forehand strokes 10 times. The ball from the forehand must enter above the net and under the rope stretched over the net at a height of 2.13 m from the floor. The result recorded is the number of balls that enter the score. If the ball passes over the rope, then the score is divided by 2.
- 2) Divide the group into two, namely the experimental group and the control group. The treatment in this study was the experimental group doing drill exercises and the control group doing elementary exercises. Exercise is done 4 times a week and lasts for 4 weeks. The frequency of this exercise is in accordance with the considerations

(Fox, T.L.E.L., Bowers, R.W., dan Foss, 2013), (Kizilay et al., 2016).

- 3) After the experiment was completed, post-test data was collected using the same test instrument as the pre-test. The post test is carried out with the aim of knowing the results of the exercise achieved by the testee from each group after carrying out the training program (Wanli, 2011).

**Design or Data Analysis**

Experiments and tests have been completed, the next step is to tabulate the data to calculate descriptive statistics. Hypothesis testing is done by testing the requirements of the data normality test and homogeneity test using Kolmogorov Smirnov and chi-square. The next step is to perform a paired t-test. The analysis of the experimental results is based on subject matching (M-S) using a t-test on a related sample (Sutrisno Hadi, 2015) (Sutrisno Hadi, 2015). Testing the research hypothesis is carried out with the provisions of the pre-test if the t-count value is equal to or greater than the t-table then this hypothesis is rejected. If the t-count value is smaller than the t-table value, the null hypothesis is accepted. If the results of the pre-test at the time of the post-test, the t-count value is greater than the t-table, then the null hypothesis is accepted. If the value of t-count is smaller than t-table, then the null hypothesis is rejected. This data processing uses a computerized system with Statistical Product and Service Solutions (SPSS).

**RESULT**

Data analysis was carried out to obtain an answer to the formulated problem and the research hypothesis. Data processing is carried out using statistical formulas so that it can be seen

which form of forehand exercise affects the athlete's tennis stroke.

Based on the statistical data processing procedure, after ranking the sample scores from the highest score to the lowest score. The next step is to group it with the AB-BA procedure. After grouping, group A and group B were obtained. Group A or the experimental group did drill exercises and group B or control group did elementary exercises. The next step is to find the average score and standard deviation. These values are used to test for normality, homogeneity, improvement, and hypothesis testing. The average value and standard deviation of the initial test, post-test and improvement of the two groups can be seen in Table 1.

**Table 1.** The Results Of The Average Value, Standard Deviation, Pre Test And Post Test And The Improvement Of The Forehand Test

Group	Tes	X	Sd
Group A (drill exercise)	Pre test	15,88	7,18
	Post test	19,50	7,36
	Enhancemen t	3,62	
Group B (elementer exercise)	Pre test	15,69	6,34
	Post test	17,38	6,35
	Enhancemen t	1,69	

Based on the table above, it can be seen that the results of group A in the pretest were 15.88. Post-test was 19.50, an increase of 3.62, the results of group B. in the pretest was 15.69. Post-test was 17.38, an increase of 1 ,69.

**Normality Test Results of Pre-Test and Post-Test Data**

The next step of data analysis is to test the normality of the data using the Lilliefors statistical test. The results of testing the normality of the initial and final test data for both groups can be seen in Table 2.

**Table 2.** Normality Test Results of Initial Test and Final Test of Forehand Ability

Group	Test	L Count	L Table	Interpretation
Group A (drill exercise)	Pre test	0,112	0,285	Normal
	Post test	0,107	0,285	Normal
Group B (elementer exercise)	Pre test	0,135	0,285	Normal
	Post test	0,127	0,285	Normal

Based on Table 2 above, it is known that the calculated L value (L<sub>0</sub>) for the initial test and post-test for both groups is smaller than the L table at a significance level of 0.01 with a number of samples (N) 8. This means that the data is normally distributed. This refers to the Lilliefors normality test criteria that if L count (L<sub>0</sub>) < L table, then the data is normally distributed. Meanwhile, if L count (L<sub>0</sub>) > L table, then the data is not normally distributed.

#### Results of Homogeneity Test of Pre-Test and Post-Test Data

The next step of data analysis is to test the homogeneity of the initial test data and test the homogeneity of the final test data for each group. The results of the data homogeneity test from each test can be seen in Table 3.

**Table 3.** Results of Homogeneity Testing of Pre-Test and Post-Forehand Test Data

Test Periode	F count	F table	Interpretation
Group A (drill exercise)	1,01	4,99	Homogeneous
Group B (elementer exercise)	1,34	4,99	Homogeneous

The criteria for testing the homogeneity of the hypothesis H<sub>0</sub> can be accepted if  $F(1-\alpha)(n-1) < F_{\frac{1}{2}\alpha}(n_1-1, n_2-1)$ , and reject H<sub>0</sub> if  $F(1-\alpha)(n-1) > F_{\frac{1}{2}\alpha}(n_1-1, n_2-1)$ . On the basis of testing the two variance similarities in Table 3 above, the F count for the initial test group A of 1,01 smaller than F<sub>table</sub> (0,025,7/7) is 4,99. The interpretation of the test results is homogeneous. While the results of the final test of group B are 1,34 smaller than F<sub>table</sub> (0,025,7/7) is 4,99. The interpretation of the test results is homogeneous.

#### Hypothesis testing

The hypotheses in this research are (1) Drill exercise has a significant effect on the forehand skills of JPOK tennis athletes. (2) Lamerter training has a significant effect on the forehand skills of JPOK tennis athletes. Hypothesis testing on the results of group A and group B is presented in Table 5.

**Table 4.** Hypothesis Testing of Exercise Results Groups A and B

Group	X	Sd	t count	t table	Interpretation
A	19,50	7,36	17,60	2,36	Not Significant
B	17,38	6,35	8,04	2,36	

Based on the results of the t-test calculation, it shows that there is no difference in the two test groups, at a significance level of 0.01. This shows that drill and elementary exercises have the same effect on forehand ability. Thus the null hypothesis is accepted, and the alternative hypothesis is rejected.

#### DISCUSSION

Based on the results of data analysis, it was found that drill exercise had an effect on the forehand ability of JPOK tennis athletes, the t-count was

greater than t-table  $17.60 > 2.36$ . Elementary exercise has an effect on the forehand ability of JPOK tennis athletes, obtained t-count is greater than t-table  $8.04 > 2.36$ . Drill and elementary drills are tennis forehand skills that can contribute to improving the achievement of training goals. This is in accordance with the results of research conducted by (Yusuf et al., 2019) that drill training has an effect on increasing tennis groundstroke ability. Drill exercise is a form of exercise that is carried out by providing a planned and systematically arranged program that is carried out repeatedly or continuously. Drill training is a trainer-oriented training method and is very suitable if the learning goal is for athletes to master certain movement skills (Wahyu Cirana et al., 2021). Drill exercises have an element of repetition training. Drill exercises are exercises that focus on one material and focus on repetition (Akwila Febri Pradana, 2016). Repeated exercises that are carried out continuously can form motion memory in athletes so that athletes can get movement automation. If the automation of motion has been obtained, the athlete can easily master every movement that has been trained. The increasing results of forehand strokes from pre test and post test through drill exercises can be concluded that athletes can do good exercises with repetition exercises that are carried out to obtain quality automation movement of forehand strokes.

Elementary exercises are exercises that are carried out step by step, or provide training material based on the phases of the movement (Palmizal. A, 2020), (Muji Rahayu, 2020). From this exercise the athlete is able to analyze each phase of the movement in doing the forehand stroke. An indicator of the success of tennis athletes in hitting forehands well is by performing each

phase of the movement perfectly. So in every exercise the athlete must really master every phase of the movement. If in the forehand movement phase there is a wrong movement phase then the forehand stroke will not be perfect. Phases of movement that must be mastered by athletes in doing forehand according to (Brown, 2016) are the stages of preparation, implementation, and further movement. The preparation stage for the implementation sequence is (1) grip, (2) swing the racket back first, (3) turn sideways to the net and step towards the target. The implementation stage, the order of implementation is (1) move the body weight forward, (2) swing the racket parallel to the field, (3) wrist lock, (4) focus on the ball, hit the ball on the racket's sweet spot and hit it as soon as possible. . The advanced movement stage in the sequence of execution is, (1) continue swinging after hitting, (2) swing the racket across and up, and direct the racket towards the target. To get a good quality forehand, the athlete must master every phase of the forehand movement. The exercise process that is carried out carefully and repeatedly will improve biomotor abilities (Evita, Yuniar; Subagio, 2016). This can cause athletes to be more skilled, strong and efficient in carrying out movements and result in increased forehand skills.

## CONCLUSION

Based on the results of data analysis in this study, it can be concluded that 1) There is an effect of drill and elementary exercises on the forehand abilities of the JPOK Club tennis athletes, 2) The drill training method has a better effect than elementary training on the forehand abilities of the JPOK Club tennis athletes. The coach can apply drill and elementary exercises to improve the athlete's forehand hitting ability.



## ACKNOWLEDGEMENT

Thank you to Lambung Mangkurat University and all partners involved in this research process.

## REFERENCES

- Akwila Febri Pradana. (2016). Pengaruh Latihan Drilling Dropshot Dan Strokes Dropshot Terhadap Peningkatan Dropshot Pada Atlet Bulutangkis Putra Usia 10-11 Tahun Pb. Natura Prambanan Yogyakarta. In *Science of Surveying and Mapping* (Vol. 41). Universitas Negeri Yogyakarta.
- Alexandru, M. A., Ruxandra, R., & Carmen, G. G. (2014). Predictors of Tennis Performance of Junior Players. *Procedia - Social and Behavioral Sciences*, 116(Ester 2003), 5169–5174. <https://doi.org/10.1016/j.sbspro.2014.01.1094>
- Amico, G., & Schaefer, S. (2022). Tennis expertise reduces costs in cognition but not in motor skills in a cognitive-motor dual-task condition. *Acta Psychologica*, 223(January), 103503. <https://doi.org/10.1016/j.actpsy.2022.103503>
- Brown, J. (2016). *Tenis Tingkat Pemula*. Rajagrafindo Persada.
- Dewi Angraini, A. F. (2020). Pengaruh Latihan Highest Rally Forehand Dan Latihan Feeding Forehand Terhadap Kemampuan Forehand Drive Tennis Lapangan Atlet Kota Pariaman Tennis Club. *Jurnal Patriot Volume 2 Nomor 2, Tahun 2020*, 2(2), 434–445. <https://doi.org/https://doi.org/10.24036/patriot.v2i1>
- Dwijaya, R. I., Pradipta, G. D., & Setiyawan, S. (2020). Pengaruh Metode Latihan Drill Terhadap Ketepatan Pukulan Backhand Clear Pada Siswa Ekstrakurikuler Bulutangkis SMK Negeri 3 Jepara. *Journal of Physical Activity and Sports (JPAS)*, 1(1), 101–109. <https://doi.org/10.53869/jpas.v1i1.21>
- Evita, Yuniar; Subagio, I. (2016). ANALISIS GERAK FOREHAND TENIS LAPANGAN PADA RAFAEL NADAL. *Jurnal Prestasi Olahraga*, 3, 139–145. <https://ejournal.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/35826>
- Fathoni Hidayat. (2019). Pengaruh Latihan Precision With Tempo Terhadap Akurasi Pukulan Groundstroke Pada Ukm Tennis Lapangan UNY. In *Pendidikan Kepelatihan Olahraga Universitas Negeri Yogyakarta* (Vol. 8, Issue 5). Universitas Negeri Yogyakarta.
- Fauzan, L. A., & Sarmidi, H. (2020). The Difference of Backhand Drive Ability Using Internal Drive Method and Drive Crosscourt Method for Tennis Players. *407(Sbicsse 2019)*, 91–92. <https://doi.org/10.2991/assehr.k.200219.024>
- Fox, T.L.E.L., Bowers, R.W., dan Foss, M. . (2013). *The Physiological Basis for exercise and Sport*. Scientific Research Publishing, 5(1).
- Furley, P., & Wood, G. (2016). Working memory, attentional control, and expertise in sports: A review of current literature and directions for future research. *Journal of Applied Research in Memory and Cognition*, 5(4), 415–425. <https://doi.org/https://doi.org/10.1016/j.jarmac.2016.05.001>
- Gunarto, P., & Adnyana, I. K. S. (2020). Pengaruh Metode Latihan Drill dan Alley Rally Terhadap Akurasi Groundstroke Topspin Tennis Lapangan. *Jurnal Penjakora*, 7(2), 143. <https://doi.org/10.23887/penjakora.v7i2.27908>
- Hamni Fadlilah Nasution. (2016). Instrumen Penelitian Dan Urgensinya Dalam Penelitian Kuantitatif. *Jurnal Ilmu Ekonomi Dan Keislaman*, 4(1), 59–75. <https://doi.org/https://doi.org/10.24952/masharif.v4i1.721>
- Ilham, M., & Marheni, E. (2018). Pengaruh Metode Latihan Elementer dan Konvensional Terhadap Kemampuan Groundstroke Forehand Tennis Lapangan. *Jurnal JPDO*, 1(1), 130–134. <http://jpdo.ppj.unp.ac.id/index.php/jpdo/article/view/169>
- King, M. A., Kentel, B. B., & Mitchell, S. R.

- (2012). The effects of ball impact location and grip tightness on the arm, racquet and ball for one-handed tennis backhand groundstrokes. *Journal of Biomechanics*, 45(6), 1048–1052. <https://doi.org/10.1016/j.jbiomech.2011.12.028>
- Kizilay, F., Arslan, C., Kerkez, F. İ., Beykumul, A., & Kizilay, E. (2016). The Effects of Aerobic Exercise Training on Basal Metabolism and Physical Fitness in Sedentary Women. *Health*, 08(02), 173–180. <https://doi.org/10.4236/health.2016.82020>
- Mahendra, I. R. P. N. S. J. (2012). Kelentukan Pergelangan Tangan Dan Koordinasi Mata Tangan Dalam Pukulan Forehand Tennis Meja. *JSSF (Journal of Sport Science and Fitness)*, 1(1). <https://doi.org/10.15294/JSSF.V1I1.214>
- Maulidin, M., Syah, H., & Primayanti, I. (2020). Pengaruh Gaya Mengajar dan Koordinasi Mata-Tangan terhadap Keterampilan Dasar Forehand Tennis. *Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika*, 4(2), 126. <https://doi.org/10.36312/e-saintika.v4i2.199>
- Muji Rahayu, dkk. (2020). Efektifitas Latihan Elementer Dalam Mengembangkan Kemampuan Dribbling Sepakbola. *Jurnal Visipena*, 11(2), 99–115.
- Mulya, G., & Agustriyani, R. (2020). Pengaruh Latihan Stroke ke Dinding dan Latihan Stroke Berpasangan terhadap Keterampilan Forehand Groundstroke pada Peserta UKM Tennis Lapangan UNSIL Kota Tasikmalaya. *JOSSAE (Journal of Sport Science and Education)*, 4(2), 55–62.
- Ngatman, N., & Sulistyatna, E. (2017). Tingkat Kemampuan Forehand Groundstroke Dan Backhand Groundstroke Siswa Sekolah Tennis Menoreh Tennis Club, Handayani Tennis Club Dan Bantul Tennis Camp. *Jorpres (Jurnal Olahraga Prestasi)*, 13(1), 1–9. <https://doi.org/10.21831/jorpres.v13i1.12880>
- Palmizal, A. (2020). Pengaruh Metode Latihan Elementer Terhadap Akurasi Groundstroke Forehand Dalam Permainan Tennis. *Jurnal Ilmiah PENJAS*, ISSN : 2442-3874 Vol 3. No.2 Oktober 2017, 3(2), 10–19. <http://jurnal.globalhealthsciencegroup.com/index.php/JPPP/article/download/83/65%0Ahttp://www.embase.com/search/results?subaction=viewrecord&from=export&id=L603546864%5Cnhttp://dx.doi.org/10.1155/2015/420723%0Ahttp://link.springer.com/10.1007/978-3-319-7676>
- Schaeffel, Sabine; Jagenow, D. J. V. (2015). The influence of cognitive load and walking speed on gait regularity in children and young adults. *Gait & Posture*, 41, 258–262. <https://doi.org/https://doi.org/10.1016/j.gaitpost.2014.10.013>
- Schaefer, Sabine & Scornaienchi, D. (2020). Table Tennis Experts Outperform Novices in a Demanding Cognitive-Motor Dual-Task Situation. *Journal of Motor Behavior*, 52, 204–213. <https://doi.org/https://doi.org/10.1080/00222895.2019.1602506>
- Sianipar, M. A. (2019). Perbedaan Pengaruh Latihan Forehand Drive Menggunakan Feeding Dengan Latihan Forehand Drive Groundstroke Ke Dinding Terhadap Hasil Forehand Drive. *Jurnal Prestasi*, 2(4), 38. <https://doi.org/10.24114/jp.v2i4.11914>
- Sinulingga, Andrew Rinaldi & Nova, A. (2020). Pengaruh Latihan Footwork Terhadap Akurasi Pukulan Forehand Groundstroke Tennis Lapangan. *Jurnal Ilmiah STOK Bina Guna Medan*, 1, 1–6. <https://doi.org/https://doi.org/10.55081/jsbg.v9i1.256>
- Sudjana. (2014). *Metode Statistika (6th ed.)*. Tarsito.
- Sugiyono. (2016). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.
- Susanti, R. (2019). Sampling Dalam Penelitian Pendidikan. *Jurnal Teknodik*, 16, 187–208. <https://doi.org/10.32550/teknodik.v0i0.543>
- Sutrisno Hadi. (2015). *Methodology Research (2nd ed.)*. Yayasan Penerbitan Fakultas Psikologi UGM.

- Syafruddin. (2012). *Dasar-Dasar Kepeleatihan Olahraga* (1st ed.). UNP Press.
- Wahyu Cirana, Arif Rohman Hakim, & Untung Nugroho. (2021). Pengaruh Latihan Drill Smash Dan Umpan Smash Terhadap Keterampilan Smash Bola Voli Pada Atlet Putra Usia 13-15 Tahun Club Bola Voli Vita Solo Tahun 2020. *JURNAL ILMIAH PENJAS (Penelitian, Pendidikan Dan Pengajaran)*, 7(1), 1–11. <https://doi.org/10.36728/jip.v7i1.1381>
- Wanli, E. (2011). *Melakukan Forehand Drive Pada Petenis Pemula Klub Tenis Yuniior Blora Tahun 2010*.
- Yusuf, M. J., Program, H. I., Pendidikan, S., Olahraga, K., & Keolahragaan, I. (2019). Metode Latihan Drill Berpengaruh Terhadap Kemampuan Groundstroke Tenis Lapangan. *Jurnal Patriot*, 1(2), 831–839. <http://patriot.ppj.unp.ac.id/index.php/patriot/article/view/388>