El efecto del entrenamiento de ejercicios y de agilidad en las habilidades técnicas de derecha y revés de los tenistas aficionados

The Effect of Drill Training and Agility Training on the Forehand and Backhand Technique Skills of Amateur Tennis Athletes

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Abstract

Introduction: it seeks to help a novice court tennis athlete to hone his or her forehand and backhand skills.
Objective: This study aims to analyze the effect of drill and agility training methods on the forehand and backhand skills of beginner tennis players.
Methodology: This experimental research was conducted on the tennis court of Magelang Moncer Serius. The sample used was 30 people from the group of Magelang tennis players. This study was divided into two groups, namely the drill training group and the agility training group. The research instrument used a Dyer Tennis.
Results: This study showed a significant effect of the drill training method on the forehand and backhand technique skills with the values of tcount (14.511) > ttable (1.761) and a significance value of 0.000<0.05. Furthermore, there was also an effect of agility training methods on the forehand and backhand technique skills with the values of tcount (11.758) > ttable (1.761) and a significance value of 0.000<0.05. From the two methods, there was a difference in the effect between drill training and agility training, from the average skill value, in the drill training group showed a value of 21.27 while in the agility training group was 20.53 with a value of sig.
Conclusions: The mean difference value of 0.733 showed the difference between the average value of the drill training group and the agility training group. In conclusion, the drill training method has a more significant effect on improving the forehand and backhand skills of beginner tennis players.

Keywords

Word 1; Agility Training. 2; Backhand. 3; Drill Training. 4; Forehand. 5; Tennis

Resumen

Introducción: pretende ayudar a un deportista de tenis de pista principiante a perfeccionar sus habilidades de derecha y revés.
Objetivo: Este estudio tiene como objetivo analizar el efecto de los métodos de entrenamiento de ejercicios y agilidad en las habilidades de derecha y revés de los jugadores de tenis principiantes.
Metodología: Esta investigación experimental se llevó a cabo en la cancha de tenis de Magelang Moncer Serius. La muestra utilizada fue de 30 personas del grupo de jugadores de tenis de Magelang. Este estudio se dividió en dos grupos, a saber, el grupo de entrenamiento de ejercicios y el grupo de entrenamiento de agilidad. El instrumento de investigación utilizó un Dyer Tennis.
Resultados: Este estudio mostró un efecto significativo del método de entrenamiento de ejercicios en las habilidades técnicas de derecha y revés con los valores de tcount (14.511) > ttable (1.761) y un valor de significancia de 0.000 <0.05. Además, también hubo un efecto de los métodos de entrenamiento de agilidad en las habilidades técnicas de derecha y revés con los valores de tcount (11.758) > ttable (1.761) y un valor de significancia de 0.000 <0.05. De los dos métodos, hubo una diferencia en el efecto entre el entrenamiento de ejercicios y el entrenamiento de agilidad, desde el valor de habilidad promedio, en el grupo de entrenamiento de ejercicios mostró un valor de 21.27 mientras que en el grupo de entrenamiento de agilidad fue 20.53 con un valor de sig.
Conclusiones: El valor de la diferencia media de 0.733 mostró la diferencia entre el valor promedio del grupo de entrenamiento de ejercicios y el grupo de entrenamiento de agilidad. En conclusión, el método de entrenamiento de ejercicios tiene un efecto más significativo en la mejora de las habilidades de derecha y revés de los jugadores de tenis principiantes.
Debe redactarse en tercera persona, en tiempo pretérito exceptuando la frase concluyente, ser claro, descriptivo y no sobrepasar las 250 palabras como máximo. Sin abreviaturas, remisiones al texto principal, notas al pie de página o referencias bibliográficas.

Palabras clave

Palabra 1; entrenamiento de agilidad. 2; revés. 3; entrenamiento de ejercicios. 4; derecha. 5; tenis

Introduction

Basic tennis techniques include some essential skills that players must master to play effectively. One of the main techniques is forehand and backhand (Irawan et al., 2023; Yin & Gou, 2024). Mastering the forehand and backhand in tennis requires consistent practice and a deep understanding of correct technique. For the forehand punch, the player must start with the body facing sideways towards the net, with the dominant foot behind (Estrada-Esponda et al., 2024). Meanwhile, for the backhand punch, the player can use one or two hands. In a one-handed backhand, the player should point the shoulders and feet toward the ball, holding the racket with a Continental or Eastern Backhand grip (Baxter et al., 2023). Forehand and backhand skills are fundamental elements in tennis, especially for beginners who are building the basics of the game (Alfonso-Asencio et al., 2022). Beginners often face challenges in mastering this punch technique consistently and effectively. It is due to a lack of experience, body coordination that has not been optimal, and an in-depth understanding of the correct technique (Kumar & Das, 2024). Therefore, athletes need to be serious in carrying out and implementing the training program that has been set. However, a previous study stated that effective training to support forehand and backhand techniques based on testing analysis in tennis match situations is recommended by providing drill and agility training (Ngatman et al., 2024).

Drill training involves systematic and structured repetition of specific movements or tasks to improve and strengthen the mechanics of those movements. The main purpose of drill training is to build muscle memory so that the correct movements can be done automatically and efficiently without the need to overthink when in a match situation (Baxter et al., 2023). The intense repetition process in the drill training requires high concentration and good physical endurance (Perri et al., 2023). Athletes are also required to repeat the same movements and sequences or hit continuously until the body moves it reflexively, and then an easy and effective form of drill training in tennis is to repeat the movement of the basic technique of tennis punching (Gomes et al., 2016; Fauzan, 2022; Jatra et al., 2023). The players must be able to maintain their focus throughout the training session and continue to make the correct movements despite feeling tired. It not only helps improve technical skills but also builds the mental resilience needed to deal with pressure in matches. Through drill training, players learn to stay calm and focused despite challenging conditions (C. Wang et al., 2024).

Agility is one of the main supporting factors in the performance of tennis and various specific sports because players are required to move and move quickly in anticipation of the ball from the opponent (Mulyadi et al., 2024). Agility refers to the ability to move quickly and efficiently, changing direction without losing balance or speed. Agility training include a variety of activities designed to improve a player's speed, balance, coordination, and reflexes (Estrada-Esponda et al., 2024). Agility training not only improves physical abilities but also helps in mental development, such as improving situational awareness and reactions to visual stimuli. Based on the results of previous literature, the ability to move quickly and efficiently on the field allows the player to reach the optimal position for each hit, increasing the player's chances of effectively returning the ball. (Selmi et al., 2024). With regular and structured agility training, players can reduce their risk of injury as their bodies are better equipped to handle sudden, high-intensity movements in matches. Some agility training such as variations using cone drills with increasing turning paths and closer cone distances (Manurung et al., 2022; Pratama et al., 2023).

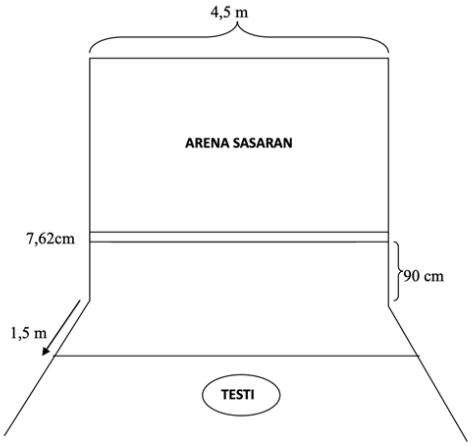
This study aims to examine the effect of drill and agility training on the forehand and backhand technique skills of amateur athletes. Understanding how these two types of training impact technical skills is expected to provide useful insights for coaches and athletes in designing more effective training programs. In addition, this research is also expected to contribute to the development of science in the field of sports, especially in the field of tennis. Through this study, it is expected that a significant relationship can be found between the type of exercise applied and the improvement of forehand and backhand technique skills to provide appropriate recommendations for improving the performance of amateur tennis athletes.

Method

Study Organization

An experiment design with two groups of pretest-posttest was employed in this research, and it was conducted on September 1, 2024 – October 13, 2024. The research location was carried out on the tennis court of Moncer Serius in Magelang Regency. It was conducted 18 times; a pretest was conducted at the

first meeting, and a posttest was done at the eighteenth meeting to see the final results. This research has received an official research permit letter from the university with the following number B/1567/UN34.16/PT.01.04/2024. Then, it was approved by the tennis organization and the research sample. Data collection techniques in the pretest and posttest used tests and measurements. This research instrument is a test of forehand and backhand skills, namely the Dyer Test which has been tested for its validity level based on the results of previous studies, namely r=0.975 (Alim & Nurfadhila, 2021). The Dyer Test was chosen because it is easy to carry out anywhere and has a good level of reliability to measure the skills of forehand and backhand techniques.



Participants

The population in this study was tennis players in Magelang Regency, Indonesia. Sample selection used purposive sampling with several sample criteria involved in this study to be by the objectives of this study. Samples must have at least two years of tennis training experience and have never participated in tennis championships or competitions at various levels. Thus, the sample collected was 30 amateur tennis players, consisting of 15 male and 15 female players. The characteristics of the players (mean±SD) were as follows: aged 15 – 19 (17.6±7.8) years, height 156 – 167 (162.5±5.7) centimeters, weight 50 – 70 kg (57.2±8.8) kilograms. After the sample has been successfully collected and identified, the sample must be willing to undergo a medical test before the pretest and be given treatment.

Procedure

The training program for the drill training group refers to the results of the study conducted by Syahriadi et al (2024). Several types of drill training were 1) Forehand Turn Core, 2) Forehand Turn Cone Back Cone, 3) Forehand Forward-Direction, 4) Forehand Hurdle Jump, 5) Forehand Sideways, 6) Forehand Turn Cone Center Service to Baseline, and 7) Forehand One-way service center to baseline. Then, the types of training for the agility training group were 1) shuttle run, 2) three-cone run, 3) zig-zag run, 4) W run, and 5) T run. Each type of training from the two groups was 3 – 5 sets, 60% - 85% intensity, and recovery between 2 – 3 minutes. This training program was conducted during 16 meetings in the afternoon, on Mondays, Wednesdays, and Fridays, at 4 – 5.30 p.m.

Data analysis

The data analysis of this study had three stages. The first stage was descriptive testing, the purpose of which was to examine the results before and after treatment. The second stage was assumption testing, and the third stage was hypothesis testing. The assumption test was with a normality test and homogeneity test, while the hypothesis test was a t-test and independent t-test. T-test was used to see the effect of the group before and after treatment, while independent t-test was used to analyze differences in results in the drill training and agility training groups. The significance level used in the hypothesis test was ($p<0.05$), and the data analysis of this study used the help of SPSS 26.

Results

After the pretest and posttest data had been given treatment, the data was analyzed, starting from the first stage, namely descriptive analysis. Data analysis in the form of descriptive is shown in the following Table 1.

Table 1. Descriptive Data Results

Descriptive Statistics	Drill Training Group		Agility Training Group	
	Pretest	Posttest	Pretest	Posttest
N	15	15	15	15
Mean	9.13	21.27	9.80	20.53
Median	10	21	9	20
Modus	11	21	9	19
Std. Deviation	2.669	3.058	2.426	2.386
Minimum	4	16	6	15
Maximum	12	26	15	24

Based on the results of Table 1, in the drill training group, the minimum value in the pretest was 4 times, and the maximum value was 12 times without losing the ball. Then, after being given the treatment, the minimum value on the posttest was 16 times, and the maximum value was 26 times without losing the ball. In the agility training group, the minimum value on the pretest was 6 times, and the maximum value was 15 times without losing the ball. Then, after being given the treatment, the minimum value on the posttest was 16 times, and the maximum value was 26 times without losing the ball.

In the second stage of testing, the assumption testing was carried out before the hypothesis testing. A normality test was carried out to determine whether a dataset or data distribution follows the normal distribution. The normality test used the Shapiro-Wilk method. The results of the normality test are shown in Table 2 below.

Table 2. Normality Test Results

No	Variable	Asym.Sig	Conclusion
1	Pretest of the Drill Training Group	0.329	Normal
2	Pretest of the Agility Training Group	0.786	Normal
3	Posttest of the Drill Training Group	0.398	Normal
4	Posttest of the Agility Training Group	0.621	Normal

Based on the results of the table above, it is known that if all significance values are more than 0.05, then the data is declared normal, and the data can be analyzed using a statistical parametric approach.

After the normality test was done, the homogeneity test was carried out. A homogeneity test is a statistical method used to determine whether several data groups have the same variance or homogeneity. The method used to test the homogeneity of this variance was the Levene test. The homogeneity test is said to be homogeneous if the significance level value is more than 0.05. The result of the homogeneity test is in Table 3.

Table 3. Homogeneity Test Result

Levene Statistic	df1	df2	Sigificance	Description
0.595	3	57	0.621	Homogeneous

The results of the table above show a significance value of 0.621>0.05, meaning that the variant is homogeneous or the sample of amateur tennis players comes from the same population.

After the data was known to be normally distributed and came from the same population through homogeneity testing, the third stage was carried out. The test in the third stage used a t-test to analyze the differences before and after treatment. Table 4 below is a t-test of the pretest-posttest in the drill training group on Forehand and Backhand skills.

Table 4. The First Hypothesis Test Result

Treatment	t_{count}	df	t_{table}	Sig. (2-tailed)
Drill Training Group	14.511	14	1.761	0.000

The results of the first hypothesis test from Table 4 above show that the t_{count} is greater than t_{table} (14.511>1.761), and the value of sig. (2-tailed) 0.000<0.05. Then, the first hypothesis shows that drill training affects the forehand and backhand technique skills of amateur tennis players.
Then, the t-test analysis was the group in the agility training on forehand and backhand technique skills in beginner tennis players in Table 5.

Table 5. The Second Hypothesis Test Result

Treatment	t_{count}	df	t_{table}	Sig. (2-tailled)
Agility Training Group	11.758	14	1.761	0.000

The results of the second hypothesis test from the table above show that the t_{count} value is greater than the t_{table} value (11.758 > 1.761), and the value of sig. (2-tailed) is 0.000<0.05. Then, the second hypothesis shows that agility training affects the forehand and backhand technique skills of amateur tennis players.
The third hypothesis test used an independent t-test to analyze the difference between the influence of the drill training group and the agility training group on forehand and backhand technique skills based on the posttest results in Table 6.

Table 6. The Third Hypothesis Test Result

Treatment	Mean	t_{count}	t_{table}	df	Sig. (2-tailed)	Mean Difference
Drill Training Group	21.27	13.732	1.901	28	0.037	0.733
Agility Training Group	20.53					

The data in Table 6 above shows the average value of the forehand and backhand tennis skill test results in the drill training group of 21.27 and the agility training group of 20.53. Descriptive-statistically, the two training methods have different results for forehand and backhand tennis skill tests. These results prove that there is a sig. (2-tailed) value of 0.037< 0.05, so it can be concluded that there is a significant difference. The mean difference value is 0.733, showing the difference between the average value of the drill training group and the agility training group, and the difference is -1.318 to 2.785.

Discussion

Drill training methods and agility training methods have a significant effect on improving forehand and backhand technique skills in beginner tennis players. The skill in playing tennis is not only determined by natural talent but also greatly influenced by the quality and method of training applied. Drill training and agility training are two approaches that can help novice players improve their technique skills efficiently and effectively (Yulianto et al., 2024). Drill training methods focus on the repetition and consistency of certain movements that are often performed in tennis. These exercises are designed to improve muscle memory and ensure that basic movements, such as the forehand and backhand, are performed correctly and consistently. By repeating the same moves many times, beginners can develop efficient movement patterns and reduce technical errors. Drill training often involves the use of aids such as tennis balls thrown by machines or coaches, allowing players to focus on technique without worrying about ball placement. Previous research conducted by Irjaba, (2022) shows that drill training can affect forehand punch enhancement, with an average pretest value of 24.00 and posttest value of 28.15. Then, the research results from a study by Gunarto et al., (2020) say that drill training not only helps in improving the accuracy and strength of forehand punches but also helps players build confidence in the technique. It is evidenced in the results of the study that the drill training method provided a significant increase from the pretest result of 37.08 and the posttest value of 69.16.

Agility training methods focus on improving player speed, coordination, and balance (Estrada-Esponda et al., 2024; Susiono et al., 2024). Agility training also has the added benefit of increasing stamina and muscle strength, which is especially important in tennis matches that can last a long time. By increasing agility, novice players not only become faster at reaching the ball but are also better able to survive intense play (Ruiz-Malagón et al., 2022). The ability to move quickly and efficiently on the field allows players to position themselves well to hit forehands and backhands with the correct technique. This skill improvement can be explained through several mechanisms. The first analysis, agility training improves the ability of athletes to react quickly to changing situations on the field. It is due to the number of turns

or acceleration when running (Pratama et al., 2023), allowing them to hit with better timing. The second analysis, improved coordination and balance obtained from agility training helps athletes regulate their body position when doing punches (P. Wang et al., 2024 & Santoso et al., 2024), resulting in better and more effective techniques. However, in this second analysis, dynamic balance becomes indispensable because the player must maintain his body weight when moving at high speed (Wedi et al., 2024).

Drill training methods have a more significant effect than agility training on improving forehand and backhand technique skills in beginner tennis players (C. Wang et al., 2024). Drill training in this study focused on repeating specific movements and was designed to improve muscle memory and ensure that basic techniques, such as forehand and backhand, are performed correctly and consistently (Syahriadi et al., 2024). By repeating the same moves many times, beginners can develop efficient movement patterns and reduce technical errors.

The relationship between drill and agility training methods and forehand techniques is also very significant. The forehand is one of the basic strokes in tennis that is often used by players to attack. Through drill training, players can repeat forehand movements many times in controlled situations (Perri et al., 2023). With intensive and repetitive training, players can improve the power and accuracy of their forehand punches, making them an effective weapon in matches. Agility training is also very important for the forehand technique. In the game of tennis, players often have to move quickly in various directions to reach the ball and hit the forehand (Manurung et al., 2022). Agility training helps players develop the speed, balance, and coordination needed to move quickly and efficiently on the field. With good agility, players can position themselves appropriately and perform forehand blows with the correct technique, even when under pressure or in difficult positions (Kumar & Das, 2024).

The combination of drill and agility training methods provides a holistic approach to tennis skill development. While drill training ensures that a player's basic techniques are improved and standardized (Baxter et al., 2023), agility training ensures that the player has the physical ability to apply those techniques in real-game situations (Mulyadi et al., 2024). These two methods complement each other and together help in improving overall player performance. While drills and agility training offer a variety of benefits, both methods also have limitations that need to be considered. Drills can support the development of muscle memory and consistency, but they also risk a lack of adaptability in dynamic and unpredictable match situations (Fauzan, 2022 & Jatra et al., 2023). Thus, over-reliance on learned patterns can hinder a player's ability to respond spontaneously to unexpected events on the court. Agility training, on the other hand, does improve speed and coordination, but can be less effective if not integrated with specific technique training, and players may lack precision in their shots (Pratama et al., 2023 & Selmi et al., 2024).

Therefore, for coaches and amateur tennis players who want to improve tennis performance, the integration of these two methods in training routines is a very effective strategy. The limitation of this study is that amateur players show a lack of seriousness in training because they assume that they play tennis for sports and fitness. Further research is expected to combine training programs on athlete performance with intermediate variables such as motivation or mental toughness.

Conclusions

Drill training methods have a more significant effect on improving forehand and backhand technique skills in beginners compared to agility training methods. Drill training focuses on repeating the same movements in controlled situations, allowing players to consistently improve their posture, leg position, and racket swing movements. It helps build strong muscle memory and quickly correct technical errors. While agility training is important for improving speed, coordination, and balance. Its effect on punch technique is not as great as drill training. The combination of the two training methods remains ideal, but a focus on drill training is essential to achieve optimal improvement in technique skills.

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