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Enhancement of basic tennis technical skills: Game and drill training methods of male athletes reviewed by age group

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ABSTRACT

Background Problems: The lack of variety in exercises applied by coaches makes players feel bored, so they must be given training variations by looking at training methods that significantly improve basic tennis technique skills between game training methods and drills. **Research Objectives**: This study aims to determine differences in the effect of game and drill training methods on improving basic tennis technical skills based on the age groups of 10-12 years and 13-15 years. **Methods**: In this context, the method used was experimental research with a 2x2 factorial design. The sample consisted of 24 male athletes in Lampung who were separated into 4 groups. **Findings and Results**: (i) There are differences in the effect of game practice and drill methods on improving basic tennis technique skills. (ii) There is a difference in improving basic tennis technique skills between the age groups of 10-12 years and 13-15 years. (iii) There is an influence of interaction between training methods and age groups on improving basic tennis technique skills. **Conclusion**: The age group 10-12 years is more appropriate if given the game training method, and the age group 13-15 years is more appropriate if given the practice training method. The findings of this study provide an important contribution by highlighting the importance of both applied training methods for basic tennis technique. This training method is also adapted for age-based characteristics. Therefore, the recommendation to use game and drill training methods as part of tennis training can help athletes cope with intense playing conditions. Based on the analysis above, the novelty of the research developed by the researcher was two exercise methods compared, two age groups that were sampled, and research instruments using International Tennis Number (ITN) On Court Assessment. Researchers used game and drill training methods that could affect the sample after treatment. Different from previous research, the sample used was male athletes aged 10-15 years.

Keywords: Age groups; basic tennis technical skills; training methods

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INTRODUCTION

Tennis is a popular sport worldwide, played by millions of people from all walks of life and at many different levels (Tantri et al., 2018). To be able to play tennis, both for amateurs and especially for professional players, players are required to master the techniques of hitting the ball, steps, and appropriate body movements (Rolnick & Schoenfeld, 2020). As tennis is a reactive and dynamic sport, the athlete must respond to the opponent's shot. The athlete must be able to move in all directions in an environment that causes him or her to be off-balance and out of position (Wang et al., 2022). To play well and correctly and have high achievements, especially for beginner tennis players, the basic skills of playing tennis must be mastered. The development of tennis in Indonesia itself quickly spread to other areas, one of which is Lampung.

Many people are fond of this sport, and then many championships began to be held by Pelti, one of which was the junior championship. Meanwhile, many athlete parents choose to migrate their children to other provinces to get better guidance for athlete performance as well as to gain training experience from a coach. It is the job of a coach to provide the right training methods in accordance with the needs of athletes, especially those who want to improve their basic technical skills in tennis (Anderson, 2009). Before providing training methods to athletes, the coach needs to know the extent of the skill level possessed by each athlete and see the age of the athlete. The initial results of the athlete's skills can be used by the coach to provide the right training method, so that the athlete can carry out the exercise happily and not get bored because of the same training method (Teguh et al., 2023). Based on the opinion above, it can be concluded that each basic tennis technical skill has its own function when players compete. Tennis players must master all the basic techniques of tennis well, along with components and other supporting elements, because players who master the techniques well have a high chance of achieving. By paying attention to the training methods provided and seeing the age of the athletes, in the future it will help athletes and also coaches to achieve the desired goal, namely, to get as many achievements as possible, especially in Lampung.

Previous research demonstrates the efficacy of various training models in enhancing tennis skills among young athletes. For instance, Irawan et al. (2020) found that a game-based mini-tennis training model effectively improved forehand technique skills among tennis athletes aged 6–8 years in West Sumatra. Similarly, Siahaan and Mawardinur (2022) discovered a significant improvement in forehand groundstrokes through a training programme utilising the drill-fixed target method. Furthermore, Jannah et al. (2021) showed that a game-based tennis backhand learning model was effective and efficient in enhancing backhand techniques. Leveraging age-appropriate playing methods, such as those outlined by Ngatman et al. (2023), can optimise the training process for field tennis athletes.

In basic tennis techniques, there are various training methods. In this research, the method used was the game and drill training method. The game training method is an exercise carried out in a series that resembles an actual game, which can be done with a friend or coach according to the aim of getting a score to win. Game training methods have been recommended as a pedagogy for improvement in decision-making, skill implementation, and sports coaching (Maddox et al., 2022). Therefore, this method is recommended as an alternative way of learning with games and basic techniques, and it is important to put tactics before technique (Agustiyanta et al., 2022). Thus, game practice methods require interaction and simultaneous application with awareness or knowledge of tactics and the execution of skills.

Apart from that, this research used the drill training method. The drill training method is an exercise that is carried out repeatedly in the form of movements that regulate the ready position and hitting distance according to the direction the ball is coming from (Unierzyski & Crespo, 2017). This movement is carried out in the form of stepping or running towards the ball to adjust the hitting distance by moving (Costa et al., 2022). Therefore, these exercise methods will make you feel sweaty and tired. So it must be executed consistently in a pleasant manner (Kovacs et al., 2017). The drill training method aims to help players improve, correct weaknesses, learn new skills, and understand strategic game concepts for competition (Hoskins-Burney & Carrington, 2015). Repeated practice makes the shot perfect, allows the player to determine the flow of the shot, and improves overall field movement according to the athlete's physical condition (Payne, 2017).

So, these two methods will be tested to see which method is suitable and appropriate for the age groups of 10-12 years and 13-15 years. With this, the key to a player's success is training consistently using appropriate training methods (Parpa & Michaelides, 2022). The advantages and disadvantages of these two training methods are at least a way to improve basic tennis technical skills in athletes (Nurkadri, 2019). This research aims to provide interactions between training methods and age groups to improve basic tennis technical skills and gain insight into designing effective training programmes (Tsetseli et al., 2018). By combining the interaction of training methods with age groups, especially game and drill training methods, in adapted training methods, this research seeks to optimise the performance of field tennis athletes and address new training programmes for coaches to overcome the challenges of each training ocess.

It is hoped that this research can help athletes overcome the problem of implementing training methods that can later combine the two training methods, namely games and drills, to improve basic tennis technical skills by taking into account the athlete's age (Unierzyski & Crespo, 2017). In this study, researchers used two training methods to obtain optimal interaction in training with age groups. Thus, it should be noted that previous research by Daulay et al. (2021) has explained that a game-based mini-tennis training model is effective in improving forehand technical skills for West Sumatran tennis athletes aged 6-8 years. Resulting in the novelty of the research presented, namely the two training methods that were compared and the two age groups used as samples, namely 10-12 years and 13-15 years. In contrast to previous research, there have been many studies with samples that used only one age category and did not compare variables. Thus, the methodology and findings of this study are poised to make a major contribution to the field, providing insight into effective interventions for competitive athletes.

METHOD

The current study was carried out at Clubs Tennis in Lampung and involved twenty-four junior tennis players. These players are ages 10-15 and male. They must be active in training at the club for at least one year. Before the training programme commenced, the players were provided with detailed information about the procedures for the r the test. The training programme is carried out for 16x meetings outside of the 1x pretest and 1x posttest. Then the exercise method is divided into 2, namely game and drill, which are represented in Tables 1 and 2.

Table 1. Exercise Game Method Training

Day	Exercise	Duration	Repetitions	Sets
Monday	One Up One Back	1 minute	2x	5
	Live Ball	1 minute	2x	5
Wednesday	Crazy-8 Groundstroke	1 minute	2x	5
	Chip and Rip Backhand	1 minute	2x	5
Friday	Survivor	1 minute	2x	5
	Shot Tolerence	1 minute	2x	5
Sunday	Short Shot Challenge	1 minute	2x	5
	Four Hit Serve and Volley	1 minute	2x	5

Table 2. Exercise Drill Method Training

Day	Exercise	Duration	Repetitions	Sets
Monday	Nonstop Rally	1 minute	18x	5
	Alley Rally	1 minute	18x	5
Wednesday	Two On One Buster	1 minute	9x	5
	Approach Shot and Volley	1 minute	6x	5
Friday	Serve	1 minute	18x	5
	Inside Ins	1 minute	9x	5
Sunday	Hurricane	1 minute	4x	5
	Fast Grass	1 minute	9x	5

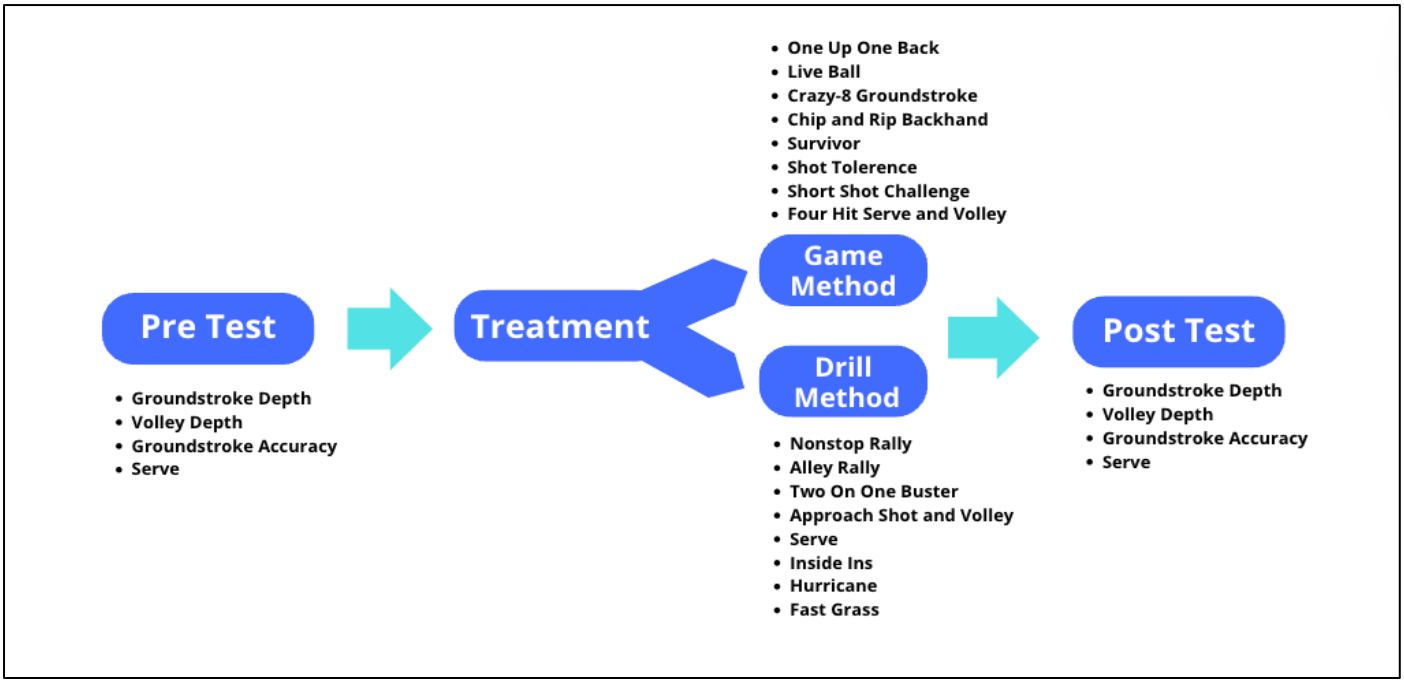

Figure 1. Schematic Diagram of Game and Drill Method Schedule

Procedure of Data Collection

This research instrument uses basic tennis skills obtained through the ITN On Court Assessment (ITF, 2004). ITN stands for International Tennis Numbers. ITN is an international tennis number that represents a player's general playing level to determine a player's playing level. In this assessment players will be classified starting from ITN 1-ITN 10.3 where the ITF expects every player to have an ITN. In this assessment, players was classified starting from ITN 1-ITN 10.3, where the ITF expects every player to have an ITN. This assessment could also be used to measure serve, forehand, backhand, and volleyball abilities, as well as mobility assessments. The tests assessed are ground stroke depth (forehand backhand), groundstroke accuracy (backhand forehand), serve, and volley depth (Olcucu & Vatansever, 2015).

Table 3. ITN Correlation Table

Score (F)	57-79	80-108	109-140	141-171	172-205	206-230	231-258	259-303	304-344	345-430
Score (M)	75-104	105-139	140-175	176-209	210-244	245-268	269-293	294-337	338-362	363-430
ITN	ITN 10	ITN 9	ITN 8	ITN 7	ITN 6	ITN 5	ITN 4	ITN 3	ITN 2	ITN 1

(Olcucu & Vatansever, 2015)

Data Analysis

Research data analysis techniques used SPSS 26 software. To find out the results of this research hypothesis, it was carried out in the initial stage, namely using a normality test and a homogeneity test with a sig. value > 0.05, and in the final stage, answering the hypothesis using a two-way ANOVA test with a significance < 0.05.

RESULTS AND DISCUSSION

Result

In this study, there were two independent variables and one dependent variable. The independent variables consisted of manipulative variables or treatment variables, namely the training method (A). This variable consisted of two, namely the game training method (A1) and the drill training method (A2). The attributive variable studied was (B). The age group consisted of two groups, namely 10-12 years (B1) and

13-15 years (B2). The dependent variable was the basic technical skills of tennis (Y). The data presented included a description of the data, a requirements analysis test, and hypothesis testing.

Table 4. Data Results of Descriptive Analysis

Treatment	Age Group	Statistics	Results Test Beginning	Results Test End	Enhancement
Training Method *Games*	10 – 12 years	ΣX	733	1162	429
		$\bar{x}$	122.2	193.7	71.5
		SD	7.8	7.1	2.4
	13 – 15 years	ΣX	1168	1548	380
		$\bar{x}$	194.7	258	63.3
		SD	10.3	6.8	4.6
Method Exercise *Drills*	10 – 12 years	ΣX	726	993	267
		$\bar{x}$	121	165.5	44.5
		SD	10.5	6.6	4.2
	13 – 15 years	ΣX	1137	1412	275
		$\bar{x}$	189.5	235.3	45.8
		SD	10.8	8.4	2.9

Information:
ΣX : Total value
$\bar{x}$: Average Value
SD : Standard Deviation

The basic tennis technique assessment table. The following is the presentation of the prerequisite test in Table 5.

Table 5. Normality Test Results

Group Treatment	N	M	SD	L count	L table 5%	Conclusion
A1B1	6	71.5	2.4	0.24	0.319	Distributing Normal
A1B2	6	63.3	4.6	0.27	0.319	Distributing Normal
A2B1	6	44.5	4.2	0.22	0.319	Distributing Normal
A2B2	6	45.8	2.9	0.18	0.319	Distributing Normal

Table 5 above shows the results of the first prerequisite test, namely normality. According to the table, the value of Lcount in all data for each treatment group is < L-table (0.319), indicating that the data is normally distributed (L-count = 0.248 for A1B1, L-count = 0.27 for A1B2, L-count = 0.22 for A2B1, L-count = 0.18 for A2B2). Table 6 presents the results of the homogeneity test in relation to the normality test results.

Table 6. Homogenity Test Results

F	df1	df2	Sig.
.679	3	20	,575

Based on the output above, it is known that the value of Sig. Levene's Test for Equality of Variances is 0.575. Because Fcount is 0.679 and the probability value of Sig. 0.575 is greater than 0.05, it can be concluded that all variables have the same or homogeneous variance.

Table 7. Result of ANOVA Hypothesis Test of Basic Tennis Technique Skills

Source	Df	F	Sig.
Corrected Model	3	78.65	.000
Intercepts	1	5650.77	.000
Method	1	220.70	.000
Group	1	5.20	.034
Method*Group	1	10.05	.005

The following explanation is based on the results of the analysis of variance of the two paths in the table above, which show that the game practice method and drill practice have different influences on improving basic tennis technical skills (F-count = 220.70 > F-table for degrees of freedom 1 and 20 and value 4.35) or F-count > F-table, with a value smaller than 0.000 level = 0.05 (0.000 = 0.05), then based on the F test (Ho), it can be concluded that there is a different influence between game practice methods and exercises to improve basic tennis technical skills. Meanwhile, the next result is that there is a difference between the age groups 10-12 years and 13-15 years in improving basic tennis technical skills (F-count = 5.20 > F-table for degrees of freedom 1 and 20 obtained a value of 4.35) or if there is a difference but the level is less than 0.05 (0.034 < 0.05), so based on the F Test then (Ho) is rejected and it can be concluded that there is a difference in skills between the age groups 10-12 years and 13-15 years towards increasing basic technical skills in tennis. Other variables show that there is an interaction effect between training method and age group on improving basic tennis technical skills (F-count = 10.059 > F-table for degrees of freedom 1 and 20 and a value of 4.35) or F-count > F-table, with a level of 0.011 or more smaller than = 0.05 (0.005 < α = 0.05), so that based on the F test, (Ho) is rejected and it can be concluded that there is an interaction effect between training methods and age groups on improving basic technical skills in tennis.

Practicing basic tennis technical skills using game practice methods can raise enthusiasm for practice. This is because this game training is an exercise that presents material according to the needs of each athlete and is certainly packaged with an interesting and fun programme (Harvey et al., 2015). With the game training method, athletes are indirectly aware of the weaknesses they have so that each athlete can train according to their respective weaknesses but can still train simultaneously, where technique is a means for carrying out tactics (Ruciack, 2020). Not only that, the training atmosphere that will be created after applying the game training method will be more enjoyable and will make athletes feel less bored because the score obtained can also be applied when practicing, making athletes more serious and sincere when doing training.

Tennis is often described as a game with a constant state of emergency because with each shot hit by an opponent, the ball can have a different speed and different types and degrees of spin placed in different parts of the court (Xiao et al., 2022). The habit of players not hitting with one style or in the same place makes them accustomed to receiving the ball from opponents. This is one of the advantages if coaches apply game-training methods.

The initial strategy principles should be the basis of an athlete's game, and over time, the athlete can feel and even see the abilities they have. This training method looks fun and easy to do, but it still requires continuous practice so that an athlete's tennis skills continue to improve (Irawadi & Yusuf, 2021). Thus, the aim of the game training method is to improve technical skills as well as overall game performance by combining tactical awareness and technical execution (Widiyanto et al., 2024). This is in line with research by Kolman et al. (2021), which shows that game training methods can improve basic technical tennis skills in athletes, but the results of this research are only for professional athletes, not amateurs. So, the application of game training methods at primary and middle class levels makes children think about organising and carrying out small game situations so that the faster children can organise themselves, the better the impact will be, especially during learning (Hegen et al., 2016).

The results of this research show that the interaction of game and drill training methods can be applied to both age groups (Gallwey, 2024). After being given treatment, it turned out that these two age groups made greater improvements with the game training method. Both training methods are equally good for athletes, but they can be adjusted to the athlete's age. The 10- to 12-year-old age group is included in late childhood, where at this age individuals express more and play, so the game training method is good to give to the 10- to 12-year age group. At this age, endurance also needs to be developed further when playing and rallying (Tsetseli et al., 2018). The main characteristic of this age group is that children will focus on improving control, combination, and analysis skills, as well as reaction speed and rhythm. Therefore, training will focus on its development (Filipcic et al., 2021). While ages 13-15 are included in the early adolescence phase, which at this age is one level higher than the previous phase, Therefore, there is an opportunity for further

research to uncover current limitations so that more comprehensive results can be obtained to increase knowledge about tennis training methods.

CONCLUSION

The results of the research show that (1) there are game and drill training methods for improving basic tennis technical skills. The game training method provides a greater improvement effect when compared to the drill training method. (2) There are differences in the improvement of basic tennis technique skills between the age groups of 10-12 years and 13-15 years. The 10-12-year-old group has a greater increasing effect when compared to the 13-15-year-old group. (3) There exists an effect of interaction between training methods and age groups on basic tennis technique skills. The logical consequence of this study is that there are differences in the effect of game and drill training methods, as well as the age groups of 10-12 years and 13-15 years, on the improvement of basic tennis technical skills, which can be significantly influenced. Thus, the age group of 10-12 years is more appropriate if given the game practice method, and the age group of 13-15 years is more appropriate if given the drill practice method.

The limitations of this research are that the results cannot present the basic technical skills of tennis in a sample of women and the use of a relatively small sample. So, further research needs to be done with a larger sample size, even though it has been supported statistically. Further research also needs to explore longer game and drill training methods in different age groups to gain a more comprehensive understanding. In addition, it is recommended to investigate the effects of game and drill training methods on pre-match, match, and post-match to determine the optimal time to apply these training methods.

The findings of this study provide an important contribution by highlighting the importance of both applied training methods for basic tennis technique. This training method is also adapted for age-based characteristics. Therefore, the recommendation to use game and drill training methods as part of tennis training can help athletes cope with intense playing conditions. In addition, the application of optimal training methods and training programmes can be the subject of future research to find out whether there are significant differences between the two training methods. Thus, this research provides a basis for coaches to consider using game and drill training methods as part of routine training to improve basic tennis techniques in athletes.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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