



The effect of game and drill training methods on increasing basic technical skills in tennis in a review based on age groups at tennis clubs in Lampung

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Abstract

The objectives of this experimental study: (1) Differences in the effect of game and drill training methods on improving basic tennis technique skills, (2) Differences in basic tennis technique skills between the age groups 10-12 years and 13-15 years and (3) The effect of interaction between training methods and age group on the improvement of basic tennis technical skills. This research method uses experimental research with a 2x2 factorial design. The sample consisted of 24 male athletes in Lampung who were separated into 4 groups, each consisting of 6 people. Sampling was carried out by purposive random sampling, namely (1) boys aged 10-15 years (2) actively participating in club training for at least 1 year (3) the condition of the child is physically and mentally healthy (4) proper facilities and infrastructure. Tennis basic technique skills test using the ITN Assessment On Court. Two-way analysis of variance (ANOVA) was used to analyze data with a significance level of 0.05. SPSS software version 26 was used for the entire data analysis process. The results showed: (1) There are differences in the effect of game and drill training methods on improving basic tennis technical skills. The game training method provides a greater improvement effect when compared to the drill training method. This is evidenced by the acquisition of an average score for the game training method of 48.6 and the drill training method of 40.35. The 10-12 year old group has a greater increasing effect when compared to the 13-15 year old group. This is evidenced by the acquisition of an average score for the 10-12 year age group of 45.50 and the 13-15 year group of 43.45. (3) There is an interaction effect between training methods and age groups on basic tennis technical skills. This is evidenced by the average score of each cell for the game practice method with the 10-12 year old group (a1b1) of 48.8, the game practice method with the 13-15 year age group (a1b2) of 48.40, the game method drill training with the age group of 10-12 years (a2b1) of 42.4, and drill training methods with the age group of 13-15 years (a2b2) of 38.5. Thus the game training method has a greater influence when compared to the drill training method. Furthermore, the game training method has a greater effect on the age group 10-12 years compared to the age group 13-15 years. The results of this study can be concluded: (1) The game training method is better than the drill training method for improving basic tennis technical skills; (2) Athletes in the age group of 10-12 years have better improvement than athletes in the age group of 13-15 years to improve basic tennis technical skills and (3) there is an interaction effect between training methods and age group to improve basic tennis technical skills.

Keywords: Training methods, age groups, basic tennis technical skills

Introduction

Tennis is widely considered to be a skill-based sport, with shots performed at varying speeds on both sides of the body, above the head, and from a wide range of incoming ball trajectories (Lafont, 2007) [9]. In addition to the net, some tools and equipment are needed to play tennis such as balls, rackets and tennis shoes (Wada *et al.*, 2020) [16]. Tennis, like other sports, includes certain technical aspects (Krause *et al.*, 2018) [8]. 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) [13]. In order to play well and correctly and have high achievements, especially for beginner tennis players, the basic skills in playing tennis must be mastered. The world organization that oversees tennis is the International Tennis Federation (ITF) while in Indonesia, the national-level body that handles tennis is PB Pelti (Management Board of the Indonesian Tennis Lawn Association) (Robyanur, 2016) [12]. The development of tennis in Indonesia itself quickly spread to 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 while

looking for new seeds at that time. When all activities go according to the work program, the change of management from period to period turns out to be a determinant of the life of tennis in Lampung. After obtaining new seeds, competitions were routinely held in Lampung until 2014, many athletes have achieved quite encouraging achievements, especially for the province of Lampung, but it is very unfortunate that when the next change of management until 2019, many athletes are no longer training as usual because there were no short or long term programs made by the Pelti board at that time and there was no visible competition as a venue for selection and at the same time a means of evaluation. The importance of regular matches being held is to measure the ability of an athlete so that the coach can immediately evaluate the deficiencies in the athlete and improve his post-match training program (Brown, 2017) [3]. As a result of the rarity of matches being held in Lampung, the distribution of tennis athletes in Lampung is very minimal because they are too tired to practice which has an effect and also has an impact on the emergence of new seeds who should become the next generation or replace the existing senior athletes. The impact of the coaching situation described by the

researchers is of course that many athlete parents choose to move their children's coaching to other provinces.

After the inauguration of the new Pelti management, several work programs made by Pelti, one of which was the junior tennis circuit, was able to revive the enthusiasm of children who wanted to play tennis. This junior tennis circuit is routinely held every 3 months and is one of several forms of work programs that need to be appreciated because with this program Pelti has succeeded in making athletes who have not practiced for a long time become actively practicing as well as massing and even capturing new seeds for short and long term coaching. Then, after the researchers made observations of the training programs implemented by the trainers, it turned out that the trainers in Lampung were still using the drill training method for all age groups. The lack of variations in the exercises applied by the trainers will make the players feel bored and bored, especially after the researchers conducted interviews with several players. Even though the trainer can provide training programs or training methods that are more fun so that players can easily understand the techniques conveyed such as game-based training methods. Therefore, the coach must be able to develop other training methods besides drills such as game-based exercises so that tennis players in the 10-15 year age group can more easily understand the movements and basic techniques that will be learned when they practice, not only that the coach also creates an atmosphere fun exercise and does not make athletes feel bored. The age group of 10-15 years is divided into two age groups, namely older children aged 10-12 and early adolescents, namely 13-15 years. In this age group, it is the age with the highest number of athletes in Lampung because these athletes are the result of the previous management of Pelti.

other elements that must be mastered properly such as grip, footwork, stages of hitting, and types of strokes if they want to improve basic tennis technical skills (Krause *et al.*, 2018)^[8]. The basic strokes that must be mastered by players include forehand, backhand, service, volley. It's not just a matter of hitting but how players can master several other components when hitting the ball to be able to play tennis well, namely acceleration, accuracy, consistency and variety (Gescheit *et al.*, 2017)^[6]. This component must be trained by the coach so that players can master the basic technical skills of tennis properly. Each stroke that must be mastered by the player has its own use, such as the forehand stroke which is the most dominant shot in the game of tennis (Busuttill *et al.*, 2022)^[4]. A player can win a match if he can hit a forehand well so that it is difficult for the opponent to return the shot. Some players who have very good forehand skills will try to take the ball in the forehand position as often as possible, even though the direction of the ball places it in the backhand position. The backhand shot is very important to master because it makes it easier and puts the player in a safe position. When a player masters the backhand well, the player does not need to change his position. Players only need to adjust the direction of the ball and hit the ball from the backhand side. Backhand and forehand strokes can be used by players to carry out attacks or make passes by placing the ball on the opponent's court with the resulting strokes not being too hard. For service strokes, it is the opening stroke in the game. In modern tennis, service strokes are not only the initial stroke to start a

match, but service strokes are used as the first strike to gain points. Players who have a good service shot will try to get points from this shot. The points that are often obtained by players from service strokes will speed up the completion of a game. Players don't need to struggle to force a groundstroke rally which is quite tiring. While a volley is a shot made before the ball hits the floor. Volley shots can also be taken when the ball is higher than the waist. The volley is shot with the ball close to the net. This punch is used to carry out attacks. Players can do this by hitting the ball as hard as possible so that the ball cannot be reached by the opponent.

This is the job of a coach to provide the right training methods and in accordance with the needs of athletes, especially for those who want to improve their basic technical skills in tennis. 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. 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.

Methodology

The type of research used in this study was an experiment using a 2 x 2 factorial research design. This design involves several factors (active independent variables and attributes) which are worked on simultaneously (consisting of two factors). The two factors (independent variables) involved in this experiment are the training method and the age group (Sugiyono, 2018)^[14]. The researcher chose this design because, factorial design is an efficient way to study multiple relationships with a single data set.

The type of data obtained in this study is quantitative data. Quantitative data was obtained from basic tennis skills data obtained through the ITN On Court Assessment (Depth, 2004). ITN stands for International Tennis Number. ITN is an international tennis number that represents the general playing level of a player to determine the playing level of a player. In this assessment, players will be classified starting from ITN 1 – ITN 10.3 where the ITF expects every player to have an ITN. This assessment can also be used to measure serve, forehand, backhand and volley abilities as well as mobility assessment. The tests assessed are groundstroke depth (forehand backhand), groundstroke accuracy (forehand backhand), serve, and volley depth.

The validity of the instrument based on *the ITN (International Tennis Number) Assessment is shown in table 5 with the ITN rating scale norm* which determines the results of the hitting level and the correlation effect in measurement as well as determining the level of a player. The reliability of this instrument affects the level of seriousness in the tests carried out and the individual's motivation in carrying out the tests.

Table1: 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

(Depth, 2004)

This research data analysis technique presents data for each variable studied, performs calculations to answer the problem formulation, and performs calculations to test the hypotheses that have been proposed. After the basic tennis technique skill data has been collected, the next step is to process and analyze the data using SPSS 26 software. By using statistical descriptive analysis, normality test, homogeneity test, and hypothesis testing using a two-way factorial test (ANOVA) at a significance level $\alpha = 0,05$.

Results

In this study there were two independent variables and one dependent variable studied. The independent variables consist of manipulative variables or treatment variables, namely the training method (A). This variable consists 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). As the dependent variable is the basic technical skills of tennis (Y). The data presented includes a description of the data requirements analysis test and hypothesis testing

Table 2: Data Results of Descriptive Analysis

Treatment	Age Group	Statistics	Results Test Beginning	Results Test End	Enhancement
Training Method Games	10 – 12 years	\bar{x}	908	1201	293
		ΣX	151.3	200,1	48,8
		SD	13.93	12.31	1.83
	13 – 15 years	ΣX	196.6	245	48,4
SD		16.83	14.92	10,23	
MetoeExercise Drills	10 – 12 years	\bar{x}	709	963	254
		ΣX	118,1	160.5	42,4
		SD	20,39	10.30	7,28
	13 – 15 years	\bar{x}	1178	1409	231
ΣX		196.3	234.8	38.5	
SD		17,22	8,84	8.59	

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 3.

Table 3: Normality Test Results

Group Treatment	N	M	SD	L count	L table 5%	Conclusion
A ₁ B ₁	6	48,8	1.83	0.204	0.319	Distributing Normal
A ₁ B ₂	6	48,4	10,23	0.191	0.319	Distributing Normal
A ₂ B ₁	6	42,4	7,28	0.192	0.319	Distributing Normal
A ₂ B ₂	6	38.5	8.59	0.208	0.319	Distributing Normal

Table 3 above shows the results of the first prerequisite test, namely normality. Based on the table, it can be seen that the value of Lcount in all data for each treatment group is <Ltable (0.319), this means that the data is normally distributed (Lcount = 0.204 for A1B1, Lcount = 0.191 for A1B2, Lcount = 0.192 for A2B1, Lcount = 0.208 for A2B2).

Referring to the results of the normality test, the results of the homogeneity test are presented in table 4 as follows.

Table 4: Homogeneity Test Results

F	df1	df2	Sig.
,931	3	20	,444

Based on the output above, it is known that the value of Sig. Levene's Test for Equality of Variances 0.444, because Fcount is 0.931 with a probability value of Sig. 0.444 is greater than 0.05, it can be concluded that all of these variables have the same or homogeneous variance.

Table 5: Result of Anava Hypothesis Test of Basic Tennis Technique Skills

Source	D f	F	Sig.
Corrected Model	3	52,14	.000
Intercepts	1	6303, 12	.000
Method	1	22, 29	.000
Group	1	126, 30	.000
Method * Group	1	7, 85	011

The following explanation is based on the results of the analysis of variance of the two paths in the table above:

1. Game and drill training methods have different effects on improving basic tennis technique skills ($F\text{-count} = 22.297 > F\text{-table}$ for degrees of freedom 1 and 20 and a value of 4.35) or $F\text{-count} > F\text{-table}$, with less than 0.000 level of $\alpha = 0.05$ ($0.000 < 0.05$), so the F test can be used to determine whether the hypothesis is true. This training method can improve basic tennis technical skills through tabata.
2. There is a difference between the age groups 10-12 years and 13-15 years in improving basic tennis technical skills ($F\text{-count} = 126.300 > F\text{-table}$ 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 ($0.000 < 0.05$), then the hypothesis is accepted based on the F test. The basic technical skills of tennis increased in both age groups, namely 10-12 and 13-15 years.
3. There is an interaction effect between training methods and age groups on improving basic tennis technique skills ($F\text{-count} = 7.850 > F\text{-table}$ for degrees of freedom 1 and 20 and a value of 4.35) or $F\text{-count} > F\text{-table}$, with a level of 0.011 or more smaller than $\alpha = 0.05$ ($0.011 < \alpha = 0.05$), so based on the F test, it can be concluded that the hypothesis is accepted, or there is an interaction effect between training methods and age groups on improving basic tennis technique skills.

Based on the results of the data analysis above, the results of the study show that *the game* and *drill training methods* have a different increase in basic tennis technique skills. This is evidenced by the $F_{\text{calculated}} = 22,297 > F_{\text{table}} = 4.35$. Thus the null hypothesis (H_0) is rejected. Which means that *the game* and *drill training methods* have different improvements that can be accepted. From further analysis obtained that it turns out that training using the *game training method* has a better improvement than the training method using the *drill training method*, with an average increase of respectively 48.6 and 40.35.

The results of the study showed that male athletes in the age group of 10-12 and 13-15 years had a different increase in basic tennis technique skills. This is evidenced by the $F_{\text{count}} = 126,300 > F_{\text{table}} = 4.35$. Thus the null hypothesis (H_0) is rejected. Which means that male athletes in the age group of 10-12 years have an increase in basic tennis technique skills that are different from those in the age group of 13-15 years which can be accepted as true.

From further analysis, it was found that male athletes in the age group of 10-12 years had a better improvement in tennis skills than male athletes in the age group 13-15 years, with an average increase of 45.50 and 43 respectively.

The results of the research show that the interaction between training methods and age groups is very significant. Because $F_{\text{count}} = 7,850 > F_{\text{table}} = 4.35$. Thus the null hypothesis is rejected. There is a significant interaction between training methods and age groups.

Discussion

The influence of training methods and age groups on the improvement of basic tennis technique skills is discussed in the discussion of research findings. The discussion of research findings is divided into three parts according to the research objectives, namely: (1) differences in the effect of

game and drill training methods on improving military physical fitness; (2) the difference in the effect of the age group 10-12 years and 13-15 years and (3) the effect of the interaction between training methods and the age group on the improvement of basic tennis technique skills.

Practicing basic tennis technique skills using the *game training method* can generate enthusiasm in practicing. This is because this *game training* is an exercise that presents material according to the needs of each athlete and is certainly packed with an interesting and fun program. With the *game* training method, athletes are indirectly aware of their weaknesses so that each athlete can practice according to their respective weaknesses but can still practice simultaneously. Not only that, the training atmosphere that will be created after applying the game training method will be more fun and make the athletes feel less bored because the acquisition of scores that can also be applied when practicing makes athletes have sincerity and seriousness when doing training.

The situation created in the game training method has also provided simulations for athletes, namely during matches, so this situation provides an opportunity for athletes to develop the ability to think and act quickly and precisely in making each stroke. The application of training methods with games at the elementary and middle grade levels makes children think about organizing and carrying out small game situations so that the sooner children can manage themselves the better the impact will be, especially during learning (Woro, 2015) [17]. This requires the implementation of the correct technique. But in situations game mistakes in performing a technique are more difficult to detect and correct (Blumenstein & Orbach, 2020) [1].

When athletes are able to hit *forehand*, *backhand*, *volley* and *serve*, the coach should teach them how to play, even if beginners at least try to modify the points that the athlete feels capable of. Adjusting the rules or modifying strokes can be done and the coach must understand the correct tennis strategy to start or provide this training method to athletes. For example hitting the ball over the net, not crossing the infield line, and continuing to hit consistently, this is the easiest strategy to start but has a very good impact on the development of athletes (Firdaus, 2011) [5].

The principle of the initial strategy should be the basis of an athlete's game and over time athletes can feel and even see their abilities. This training method looks fun and is also easy to do, but it still has to be done continuously so that an athlete's tennis skills continue to improve (Trout & Christie, 2017) [15].

In male athletes, the age group of 10-12 years has higher potential than the age group of 13-15 years. The 10-12 year age group belongs to late childhood, which is the final stage of a child before entering the teenage stage. Meanwhile, children aged 13-15 years are included in early adolescence. At the age of 10-12 years, most children will begin to experience significant growth, but boys at this age tend to be slower than girls at this age. Puberty itself is usually seen at the age of 10, but it depends on each child because the growth of children is different, some may have to wait until they are 11, 12 or even past that when they are 13-15 years old.

At the age of 10-12 years the physical development that can be seen in a child is an increase in agility, speed, coordination and balance and even better small muscle coordination. The signs of puberty include oily skin,

increased sweating, and hair growth in the genital area and under the arms (Bompa & Carlo, 2019)^[2].

Meanwhile, in the emotional development of children aged 10-12 years, they usually have a better self-understanding, although it is important for parents to help learn how to properly deal with uncomfortable emotions such as anger, anxiety, sadness, even frustration, as well as when entering the age of 13 – 15 years old, feelings of shame, confusion, worry or excessive excitement begin to arise (Kraemer & Ratamess, 2017)^[7].

The game that is attached to the sport of tennis and how difficult it is to get points from each stroke makes children at this age look emotionally unstable. When on the field, it is often seen that children slam the rackets when they hit the net or even when they lose they cry, this indicates that the emotions at this age are not yet stable (Agustiyanta *et al.*, 2022)^[1]. Therefore, it is important to train children mentally and control their emotions to remain ready for all conditions, especially when on the field, especially during matches (Montero, 2020)^[11]

Mental can be trained one way with Mental Imagery, namely by creating or re-creating a situation in one's mind. Athletes can imagine when they are on the court starting from entering the field, then picking up the racket, serving with good technique, continuing to hit good forehand and backhand to get point after point in every game. One way to improve the game of athletes is mental imagery (Melo *et al.*, 2016)^[10].

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 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) exists the effect of interaction between training methods and age groups on basic tennis technique skills.

The logical consequence in this study is that there are differences in the effect of game and drill training methods as well as the age group 10-12 years and 13-15 years on the improvement of basic tennis technical skills which can be significantly influenced. When implementing training methods with respect to the age group in training, it significantly affects basic tennis technique skills in athletes, especially male athletes. This finding allows implications to be made, so that the basic technical skills of tennis athletes in the age group of 10-15 years in Lampung can be increased.

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