



Investigating the effects of technical trainings applied 10-12 age male tennis players on their stroke performances

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Abstract

The aim of this study is to investigate the effects of technical trainings applied 10-12 age tennis players on their stroke performances. 16 male tennis players joined to the study who are in Isparta and match in tournaments as individuals regularly. These were detected from players that mean of age was $10,62 \pm 0,80$ years, mean of height was $144,06 \pm 8,28$ cm and mean of weight was $38,75 \pm 9,04$ kg. Trainings were applied to the players as technical 3 days a week and as condition 1 day a week. ITN test (International Tennis Number) were applied to test the stroke performances. Datas were compared by using "Paired t Test" at SPSS 18.0 statistic programme. Differences were found to be statistically significant at result of comparing stroke performances' pre-posttests ($p < 0,05$). This study shows the regular technical and conditional trainings' positive effects on performance and provides recommendations to trainers and sport scientists about planning, programming a training and defining performance criteria.

Keywords: Tennis, Training, Performance.

Introduction

Nowadays, tennis is a sport branch that has great potential worldwide as a performance sports attracting individuals from every category. In tennis and other sports branches, selection of talented athletes can be done by ensuring participation in sports at an early age. Ensuing the emergence of successful tennis players in the international arena can be achieved by only having children playing tennis at their early ages (Çalışkan, 2014). This much interest in tennis around the globe has brought different perspectives. On the one hand, it is a popular recreational activity done by people in the elite level; on the other hand, it has become a competitive sport for providing a significant amount of revenue. Regular trainings should be started at early ages in order to have a continuous development and keep the performance of the players at high levels in tennis game (Unierzyski, 1995).

Motor skills, which mean the use of force required to perform an athletic move, can be acquired by use, experience and training at early ages (Mengütay, 1999). Development of these sports skills can be achieved with the help of trainings (Kermen, 1992). In parallel, tennis stroke techniques are also developed with the help of training activities. The physical fitness of professional tennis players and tennis technical trainings are based on a solid foundation established at a young age. These players should devote a large part of their trainings to physical fitness and special technical work (Okudur, 2010).

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In light of these informations obtained from the literature, the aim of this study is investigating the impact of technical trainings performed by 10-12 year old male tennis players on their stroke performance.

Method

Participants: A total of 16 tennis players competing in tennis tournaments individually participated in the study. The mean age of the athletes is recorded as 10.62 ± 0.80 years, the average height is 144.06 ± 8.28 cm and the average body weight was recorded as 38.75 ± 9.04 kg, respectively.

"Informed Consent Form" was obtained from parents of the students participating in the study; they were informed about that personal information and findings obtained during the study will be kept confidential.

Procedures: Athletes were subjected to technical training 3 times a week and fitness training once a week. The start of preparation period and the end of 12 weeks-period were taken as basis of pre-test and post-test measurement times. Trainings were continued until the summer season. All trainings and tests of the study group were conducted in Tennis Center building of Süleyman Demirel University.

Training Model:

Table 1. Training model applied to the study group

	Monday	Tuesday	Thursday	Saturday
1st, 2nd and 3rd Weeks	-Warm-up for 20 min. -Technical developers drill workout for 60 min. - Recovery for 10 min. (low tempo running)	-Warm-up for 20 min. -Agility and Athletic workouts for 30 min. - Cat ladder (single foot right-left both feet, passing exterior to interior without stepping on the ladder) 3x2 sets, -5 min. rest between sets - Recovery for 10 min.	-Warm-up for 20 min. -Technical developers drill workout for 40 min. - Recovery for 5 min.	-Warm-up for 20 min. -Playing with football one to one and two to two on the mini court and Baseline for 60 min. - Recovery for 5 min.
4th, 5th and 6th Weeks	-Warm-up for 20 min. - Technical stroke drill trainings for 40 min. (Forehand- Backhand-Serve) - Rally workout for 20 min. on the Baseline - Recovery for 10 min.	-Warm-up for 20 min. -Agility and Athletic workouts for 30 min. - Moving out trainings 2 x 3 sets -5 min. rest between sets - Skipping rope 3x100 times -5 min. rest between sets - Recovery for 10 min.	-Warm-up for 20 min. -Technical stroke drill trainings for 40 min. (Forehand- Backhand-Serve) - Rally workout for 20 min. on the Baseline - Recovery for 10 min.	-Warm-up for 20 min. -Technical stroke drill trainings for 40 min. (Forehand- Backhand-Serve) - Rally workout for 20 min. on the Baseline - Recovery for 10 min.
7th, 8th and 9th Weeks	-Warm-up for 20 min. -Technical stroke drill trainings for 40 min. (Forehand- Backhand-Serve) - Rally workout for 20 min. on the Baseline - Recovery for 10 min.	-Warm-up for 20 min. -Agility and Athletic workouts for 30 min. - Stairs training (50 steps)3 x3 sets -6 min. rest between sets -Lactic stretching (forehand-backhand) 4x20 -5 min. rest between sets - Recovery for 10 min.	-Warm-up for 20 min. -Rally workout for 15 min. on the mini court -Football one to one and two by two for 50 min. -Cooling off for 10 min.	-Warm-up for 20 min. -Technical stroke trainings for 40 min. (Forehand-Backhand-Vole-Slam Dunk) - Rally workout for 20 min. on the Baseline - Recovery for 10 min.

<p>10th, 11th and 12th Weeks</p>	<p>-Warm-up for 20 min. - Rally workout for 15 min. on the mini court - Rally training one to one and two by two for 20 min. on the Baseline - 30 min. game -Cooling off for 10 min.</p>	<p>-Warm-up for 20 min. -Agility and Athletic workouts for 30 min. - Cat ladder (single foot right-left both feet, passing exterior to interior without stepping on the ladder) 2x20 times, -6 min. rest between sets -6 min. rest between sets - Recovery for 10 min.</p>	<p>-Warm-up for 15 min. - Playing football for 15 min. on the mini court - 50 min. game -Cooling off for 10 min.</p>	<p>-Warm-up for 20 min. - Rally workout for 15 min. on the mini court - Rally workout one to one and two by two for 50 min. on the Baseline -Cooling off for 10 min.</p>
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Technical Stroke Test:

ITN Test (International Tennis Number)

This is an important test developed and applied by International Tennis Federation (ITF) in order to identify initial and development level of athletes in tennis sports.

General Evaluation Rules

Players should be warmed and well prepared before the game. Each player is given 4 tries before each test section (forehand and backhand, volley, serve). The player has the right to refuse ball fed before the stroke. If there is a physical contact with the ball, then the stroke is taken into evaluation. High scores are considered when ball is dropped on the line. The authority of evaluator is valid during evaluations and the last decision is made by the evaluator. All scores are recorded after each stroke and at the end of each section. Test evaluation form is signed by the player and evaluator after evaluations. One copy of the form is given to the player.

Test Procedure

- Depth measurements including strength measurements for ground strokes (A total of 10 strokes including 1 forehand, 1 backhand, respectively)
- Accuracy measurements including strength measurements for ground strokes (A total of 6 strokes; 1 forehand parallel, 1 backhand parallel and 6 strokes; 1 forehand cross, 1 backhand cross, respectively)
- Depth measurements including strength measurements for volley strokes (A total of 8 strokes, including 1 forehand, 1 backhand, respectively)
- Serve including strength measurement (A total of 12 serves, 3 serves to each target area)
- Mobility (agility measurement) test

Ball Feeder Instructions

During testing period, it is necessary to make sure that the ball feeder and the test subject (player) should be in the right place. The ball feeder should provide simple and stable ball throws to all players. The ball feeder should wait until the player is ready to receive the ball. The player and ball feeder has the right to refuse the ball before the stroke. If there is a physical contact with the ball, then the stroke is taken into evaluation.

Maximum Scores

- Depth Tests on the Ground Strokes..... 90 Points
- Accuracy and Strength Test on the Ground Strokes..... 84 Points
- Depth Tests on the Volley Strokes..... 72 Points
- Test of Serve Strokes..... 108 Points
- Agility Test..... 76 Points

The highest score that can be achieved..... **430 Points**

Test Evaluation Scoring

- 0 point(s): If the first contact of the ball is outside of the line of singles
- 1 point(s): If the first contact of the ball is within somewhere in serve boxes
- 2 point(s): If the ball falls back to the first court in the divided area
- 3 point(s): If the ball falls back to the second court in the divided area
- 4 point(s): If the ball falls back to the last court in the divided area

Strength Scores

- Strength Area = 1 Bonus Point – If the second bouncing of the ball is anywhere between baseline and strength line after the first bouncing in anywhere in the singles court, then the player receives an additional 1 point.
- Strength Area = Double Points – If the second bouncing of the ball is anywhere behind strength line after the first bouncing in anywhere in the singles court, then the player receives double points received from the first bouncing (www.internationaltennisnumber.com).

Statistical Analysis: Statistical analysis of the data was performed on SPSS 18.0 (Statistical Package for Social Sciences) program. “Shapiro-Wilk Test” was used for normality and "Paired t test" was used for comparison of ITN values. Results were evaluated according to significance level of " $p < 0,05$ ".

Findings

Table 2. Result of Normality Test

(n=16)		\bar{X}	SS	p
ITN Test (points)	Pre Test	122,25	23,73	,081
	Post Test	143,68	24,82	,177

Considering the data given in Table 2, distribution of ITN pre and posttest values were found statistically normal.

Table 3. The Comparison of Pre and Post ITN Test Values

(n=16)		\bar{X}	SS	t	p
ITN Test (points)	Pre Test	122,25	23,73	-25,03	,000
	Post Test	143,68	24,82		

Considering the data given in Table 3, a significant difference was found between ITN score applied on athletes and average scores of the posttest ($p < 0,05$).

Discussion

In research, which was conducted to determine the effect of technical trainings on stroke performances of 10-12 years old male tennis players, technical trainings for 3 days and fitness trainings for 1 day were applied to the athletes. The beginning of preparation period and end of a 12 weeks period were determined to be the measurement dates of pretests and posttests.

As a result of 12-week training, the average ITN pre-test scores of the participants to study was found as $147,21 \pm 36,06$ points, whereas their post-test scores was found to be $160,51 \pm 37,38$ points. Accordingly, a significant improvement was observed in the tennis skills of the participants.

In the research of Suna (2013), which was aiming to determine the effect of aerobic, anaerobic, technical and combined trainings on the performance of tennis players, the average ITN pretest score was found as $124,3 \pm 22,6$ points; and the average post-test score was found as $193,5 \pm 20,5$ points. According to the result of the statistical comparisons applied on findings obtained by the researcher, there is a significant difference. Suna stated the results of performance increment that uniting the combine trainings which develop the motoric skills with technical trainings. The data obtained is consistent with our findings.

In the study of Özcan (2011), which was aiming to determine the effect of two different training methods on biomotoric and physiological characteristics in basic tennis technical education, the athletes were divided into two groups and tennis training was applied on one of the groups with inductive method and deductive method was applied on the other group. In the study, ITN test was used to determine improvements of tennis players as we did in our study. As a result of the study, significant difference was found between ITN pretest and posttest scores of tennis players received tennis training in both groups.

In a study conducted by Söyleyici (2011), which was aiming to determine the intensive 8-week strength and technical trainings on biomotoric and technical development of tennis players in the technical tennis trainings, the average ITN pre-test scores of players was found as $75 \pm 0,0$ points and their average post-test scores was found as $148,9 \pm 18,2$ points. At the end of the study, the increase in ITN scores of the athletes was found to be statically significant. These results are consistent with our findings. In addition, result of this study supports our research findings.

Çalışkan (2014) aimed to determine the effects of strength and technical trainings applied to children on tennis skill development and some motoric features. As a result of ITN Test values, he found significant difference. He stated in the study as the same as Suna that applying motoric and technical trainings contemporaneously will affect the tennis skills positively.

Oppositely Ölçücü et. all (2010) aimed to evaluate conditional of coordinative factor affecting the acquisition of tennis skills of the youngs who have done one of the sports before related to the balls and who haven't done. They did not find differences in ITN Test values. They stated lack of development reason that the trainings period was not enough to develop both motoric and tennis skills.

Conclusion

According to the data obtained, positive improvements were observed in the stroke performance of 10-12 years old tennis players. In addition, it has been concluded that technical trainings have also positive impacts on tennis skills of children.

We believe that our study will make positive contribution to sportive performance of players as well as providing reference values for coaches applying technical trainings in tennis. Furthermore, we think that our study is important in terms of creating plans and programs of trainings based on results of stroke performance analysis.

We think that it is necessary to apply well-planned and programmed trainings in terms of conditional and coordinative characteristics in order to support skill learning and performance

developments in tennis. In future studies, the effect of conditional and coordinative characteristics on the stroke performance can be analyzed.

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