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Application of special exercises to develop the fixation time and the skills of forehand and backhand groundstrokes in tennis players

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ABSTRACT

The present study was conducted on the Misan tennis clubs advanced players, in the premises of the tennis court of the Technical Institute in Misan. The study was conducted within the timeframe of August 2020 to December 2020. In the current study, the research community was represented by the players of the Misan Governorate team. A total of 8 players were selected as the participants for the study. All the participants were randomly allocated into two groups with n=4 in each group. The researcher formulated a set of exercises. These exercises were performed by the participants of the experimental group during their preparation phase and in the main training phase. The control group participants received training by exercises developed by the training coaches. The total number of training exercises was 8. In each training dose 4 exercises were included. In the present study the researchers concluded that there was a positive effect of the special exercises in developing the fixation time during the performance of the forehand and backhand groundstrokes.

KEYWORDS

Forehand; backhand; tennis.

1. INTRODUCTION

Tennis is a skill sport that is based primarily on learning to handle the racket in order to direct the tennis ball. Grips are the foundation of tennis strokes. In the game of tennis, there are a variety of types of shots (ways of hitting the ball) which can be categorized in various ways. The skills of the forehand and backhand groundstrokes are among the most important skills in the game of tennis. These two skills are characterized by movement on both sides of the court most of the time of its performance. It requires a tennis player to possess physical and kinetic requirements at a higher level. For any tennis

shot, prior to hitting the stroke, there is a state of bounce. The bounce comes as a result of the two legs resting completely on the ground for establishing the stability. This state of stability depends on the good performance of the skill to a very large extent. The state of stability is preceded by the player running towards the ball coming from the opponent in various places inside the field, especially on both sides of the field, i.e. when executing the front and back strikes, where the player's movement is relatively fast towards the ball. Knowing that these two skills are the most performed by a tennis player during play and therefore this fixation time is of great importance in achieving good performance.

The game of tennis is characterized by the kinetic skills that greatly depend on the strength and speed of the player. A coherent technical performance is characterized by high compatibility and accuracy. Hence, the training coaches must focus in developing physical abilities in order to get the best motor output. In the game of tennis, a tennis player must attain stability prior to the stage of hitting the shot. Hence, the researchers identified the problem and focused on developing the fixation time for tennis players through the application of some special exercises and thus reflecting their impact on the state of stability as well as the level of performance of the skill of the front and back strike of tennis players.

The primary objective of the study was to prepare special exercises to develop the time of fixation and its impact on the effectiveness of the performance of the forehand and backhand groundstrokes for the tennis players and to recognize the effect of special exercises in developing the fixation time during the performance of the forehand and backhand groundstroke. In the present study, the researchers hypothesized that there would be a positive effect of special exercises in developing the fixation time during the performance of the forehand and backhand groundstrokes.

2. METHODS

2.1. Design and participants

The present study had a pre-post experimental design. The research community was determined by the comprehensive inventory method, which "is chosen freely on the basis that it achieves the purposes of the study carried out by the researcher" (Obeidat et. al., 1988). In the current study, the research community was represented by the tennis players of the Misan Governorate team. A total of 8 advanced tennis players were selected as the participants for the study. All the participants were randomly allocated into two groups with n=4 in each group. The present study was conducted in the premises of the tennis court of the Technical Institute in Misan, from August 2020 to December 2020.

2.2. Instruments

Many tools and devices were used for the purpose of data collection with the aim to achieve the objectives of the research. The tools used in the present study included a measuring tape, tennis rackets and balls, ball shooter with different speeds, high-speed cameras, ladders of ropes and straps.

The research variables and their tests were determined followed by extensive discussion with a team of specialists in the field of sports training and tennis

Stabilization time (the time that the player takes from the moment of pivoting with both feet following the movement of the player in the direction of the ball coming from the opponent to the moment of hitting the ball) was measured directly through video imaging by the biomechanical method.

Forehand and backstrokes skills test (Hashem and Kazar, 2013) was intended to measure the accuracy and power of the forehand and backstrokes. At the beginning of the test, it was ensured that the participants have completed their warm-up and are ready to take the test. A total of 6 balls were given to the players from both the sides; one in the front and the other in the back. The player was directed to hit the ball inside the individual court in a straight line. Followed by this, six more balls are awarded to the player from both sides, one in the front and the other in the back. The player was instructed to hit the ball diagonally inside the individual court. Evaluation points were calculated in light of the place where the ball falls in the first rebound for accuracy and the second rebound for the force of the strike.

Ground accuracy points were scored. One point was given when the ball falls in any area of the center outside the planned target areas. Two points were given when the ball falls into the accuracy target area before the service line and three points when the ball falls inside the accuracy target area in the accuracy back target area and on the tennis single court as indicated in the drawing.

Strength points of the hit were scored. One point was given in the second bounce behind the baseline and before the second strength zone line. The points were doubled in the second rebound of the ball when it falls in the far ball area, and an example of the first case, four points were given in case the ball falls in the area (3) on the field and rebounds again outside the field and in an area behind the baseline and an example of the second case. If it falls The ball is in a zone (3) on the court and rebounds again in the zone of strength, the number of points is doubled and becomes (6). Also, the player gets a (zero) when the ball falls in the first rebound outside the singles tennis court. The player was awarded with an extra point for each correct hit without any mistake. All the points were collected and the

highest possible score a player can reach in this test was 84 points for accuracy and strength (36 for accuracy + 48 for strength) point.

2.3. Procedures

The exploratory experiment is defined as a preliminary experimental study, which is carried out by the researcher on a small group of sample before conducting the primary experiment. The exploratory experiment is conducted with the aim of testing the research methods and tools (Arabic Language Academy. 1984). The exploratory experiment is conducted to verify the validity of the tools used in terms of positive assistance, to verify the fitness of the tests for the tester members and the ease of their application, to know the time required to conduct the tests, to verify the understanding and efficiency of the assistant work team in conducting measurements and tests and recording the results, to know the difficulties that the researcher may encounter during the course of the study and providing appropriate solutions to them.

The pre-tests were applied to the research participants of the experimental group and the control group in the stadium of the Technical Institute Hall in Misan Governorate in the month of November 2020.

The primary experiment was initiated in the month of September 2020, where the 16 training units were distributed over eight weeks, two doses per week. The experiment was successfully completed in the month of November 2020. During the main experiment, the special exercises were prepared in a scientific manner subject to the foundations of sports training. These exercises were applied, in which the focus was placed on developing the fixation time for players through skill exercises, compatibility, agility and kinetic speed for the performance of the tennis players. These exercises were performed by the participants of the experimental group during their preparation phase and in the main training phase. The control group participants received training by exercises developed by the training coaches. The total number of training exercises was 8. In each training dose 4 exercises were included. Exercises of each dose varied in order to apply the principle of change and diversification within the training curriculum prepared by the trainer in line with its training objectives in the small training department.

After completion of the exercise protocol, the posts-tests for study variables were conducted by the researchers under environmental conditions similar to the pre-tests. The results of the tests were statistically processed by the researcher to identify the nature of the differences between the two groups because of the experimental group's application of exercises during the main experiment period.

2.4. Statistical analyses

In the present study, the statistical analysis was done using the Statistical Package for the Social Sciences (SPSS). We computed arithmetic means and standard deviations for the different variables. Also, we conducted t-tests.

3. RESULTS AND DISCUSSION

As shown in the table 1, there were significant differences between the pre and post-tests of the control group in all the research variables, in favor of the post-tests at $p<0.05$. The researcher attributed this difference to the set of exercises developed by the training coach for the participants of the control group. The exercises were developed based on the general principles that inevitably have an effect on the members of that group if they apply them because it is known that any regulated physical load works for the athlete's adaptations.

Table 1. Differences between the pre and post-tests of the control group in the research variables.

Variables	Measuring unit	Pre-test		Post-test		T value	Level Sig	Type Sig
		Mean	SD	Mean	SD			
Accuracy and power of two strikes: Forehand and Backhand	Degree	50.60	6.04	54.00	6.16	6.66	0.00	Sig
Forehand fixation time	Second	0.5960	0.450	0.6520	0.618	6.03	0.00	Sig
Backhand fixation time	Second	0.4700	0.583	0.5280	0.286	3.32	0.02	Sig

Significant when the significance value ≤ 0.05 under degree of freedom of 3

As shown in the table 2, there were significant differences between the pre and post-tests of the experimental group in all the research variables, in favor of the post-tests at $p<0.05$. Hence, the research hypothesis was accepted. The researcher attributed this difference to the set of special exercises developed by the researcher which were all in the favor of developing the fixation time and the effectiveness of performing the front and rear strikes, which took into account the physical loads that serve the variables and work to bring about great adaptations as well as the proper rationing of those exercises.

Table 2. Differences between the pre and post-tests of the experimental group in the research variables.

Variables	Measuring unit	Pre-test		Post-test		T value	Level Sig	Type Sig
		Mean	SD	Mean	SD			
Accuracy and power of two strikes: Forehand and Backhand	Degree	52.00	8	59.00	6.24	5.53	0.00	Sig
Forehand fixation time	Second	0.6440	0.492	0.7760	0.820	6.91	0.00	Sig
Backhand fixation time	Second	0.5040	0.606	0.6420	0.535	11.92	0.00	Sig

Significant when the significance value ≤ 0.05 under degree of freedom of 3

As shown in the table 3, there were significant differences between the two post-tests of the control and experimental groups in all the research variables, in favor of the experimental group with $p<0.05$. The researcher attributed the significant difference to the special exercises developed by the researcher for development of the skills of the backhand and the forehand in the tennis players along with the appropriate guidance provided to them using special and modern vocabulary similar to competitions and the installation time to help the players perform these skills well during the matches and with the least possible interruption. Hence, the special exercises treated most of the training variables that negatively affect performance.

Table 3. Differences between the two post-tests of the control and experimental groups in the research variables.

Variables	Measuring unit	Control group		Experimental group		T value	Level Sig	Type Sig
		Mean	SD	Mean	SD			
Accuracy and power of two strikes: Forehand and Backhand	Degree	54.00	6.16	59.00	6.24	2.46	0.03	Sig
Forehand fixation time	Second	0.6520	0.618	0.7760	0.820	2.69	0.02	Sig
Backhand fixation time	Second	0.5280	0.286	0.6420	0.535	4.19	0.00	Sig

Significant when the significance value ≤ 0.05 under degree of freedom of 6

However, there are multiple factors that may have negative impact and decrease the level of performance of the players. Sometimes training creates physical fatigue that leads to reduced performance compared to the resting state. Similarly, the lack of interest of the player or lack of

encouragement from the training coach may cause loss of focus and poor performance of the players (Mahjoub, 2000).

The researchers also attribute this difference to the experimental group to the high level of other special motor fitness elements like kinetic speed, agility, compatibility, and fluidity. Also, it contributed in developing the level of performance of the players. Yassin and Al-Hajar (1986) indicated that accuracy in any performance is positively affected the evolution of other components of physical fitness. These results of the present study were consistent with the previous literature in which it has been stated by several authors that the speed of motor skills performance is at the expense of accuracy. Also, the movement time increases when accuracy is the primary goal of the player (Sazabo, 1982).

4. CONCLUSIONS

In the present study the researchers concluded that there was a positive effect of the special exercises in developing the fixation time during the performance of the forehand and backhand groundstrokes. Based on the findings of the study, the authors recommended that there is necessity to emphasize the kinetic aspect during the development of training programs in tennis training. They also suggested that there is a strong need of bringing tennis players to a state of kinetic fluidity during the performance of various skills by including exercises that work in order to achieve this. Finally, the authors recommend to develop a state of stability before hitting the ball for the tennis player, through creativity in formulating special exercises that serve this aspect.

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AUTHOR CONTRIBUTIONS

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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