The Effect of Sensory Kinetic Exercises in the Development of Some of the Functional Abilities and the Accuracy and Strength of Serving Skill in Tennis

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Abstract

The problem lies in the apparent decrease in the accuracy and strength of the serving performance of the Anbar University team in tennis and the lack of focus on the mental abilities and linking them to the physical and skillful aspects, which necessitated the researchers to go into this problem through the development of sensory - kinetic exercises to address this decline. The research aims at identifying the effect of sensory-kinetic exercises in the development of the functional abilities, and the accuracy and strength of serving in tennis. The researchers hypothesized that the impact of exercises has a statistical significance on the functional abilities and the accuracy and strength of the skill of serving in tennis. They used the experimental approach to design the two equal groups and on a sample of (12) players. The field procedures of the research were by conducting the pretests on Wednesday, 4/10/2017 at 11am on the outdoor tennis court and the closed hall at the college. The sensory-kinetic exercises were carried out over 6 weeks at three units per week. On Sunday, 12/11/2017 at 11 am the post-tests were conducted in the same court and conditions similar to the conducting of the pretests. The researchers concluded that the controlling and experimental groups developed but the experimental group that used sensory-kinetic exercises was more advanced in the post-tests. They recommend the emphasis on using the sensory-kinetic exercises to develop the skill of serving, other tennis skills, and other individual and team sports.

Keywords: Sensory, Kinetic exercises, Functional abilities, Accuracy and Serving skill.

Introduction

The sports in general are in a great and remarkable development. This did not come from a vacuum, but came from following the scientific foundations of the scientific research. The developed countries in the sport field did not leave any means to upgrade in the sport level, and to reach the highest levels and achievement. To reach the high levels is the most important objectives of the planned sports training according to the scientific foundations.

The level of performance in the sports activities in their different aspects depends on the careful planning of the training process, which should include, on its part, the measurement and evaluation processes because of their special important in the essence of the training process starting from the process of selection to the planning for training, and directing all its processes as well as identifying the points of strength to develop them, and identifying the points of weaknesses to improve them in addition to determine the current level of the player or team and compare it to what must be and the predict what will be in the future.

Tennis is an individual sport with a popular base of the first place. It is preferred and loved by all ages and is suitable for both genders, therefore it is called (sport of life) and this stems from the fact that the personal effort in play can vary easily. If the individual wants to reach a high level in sports competition of tennis matches, he has to pay attention to the development of important aspects such as kinetic skill, and physical and kinetic abilities, and the player must work to acquire them if he wants athletic excellence.¹) As the achievement of the level of the championship is a goal...
pursued by all the specialized sports sectors, by taking care of all aspects of the preparation so the researchers' attention has been directed to study the variables that in turn may affect the process of preparing the players in all aspects of the training process in a deeper manner, especially by giving attention to the high mental processes and their relationship to the development of performance. Therefore, the sensory-motor cognition is one of the higher mental processes, which are subject to research because of their positive role in the practice of tennis, which is one of the most important psycho-kinetic functions, which contribute to the realization and acquisition of the motor skills in many sports activities that necessarily require the accuracy of the development of spatial, temporal, and motor relations.

The skill of serving is one of the important and basic skills, if not the most important one in tennis. It is considered the direct offensive weapon of the points of set and is often decisive for the whole game. Through the field experience of the researchers as they are instructors at the College of Physical Education and Sports Sciences-University of Anbar, and they are coaches of the university teams each according to his specialty noted that the level of the players of the university in the sport of tennis was under ambition, especially in the skill of serving that requires that the player should have the strength, speed, as well as the accuracy.

This can be attributed to the lack of emphasis on the mental abilities and linking them to the physical aspect because of their positive and effective role in the development of the skill. Thus, the problem emerged, and the researchers tried to make sensory-kinetic exercises to develop these abilities which can help in raising the level of the skillful performance of the players and achieve the best results and achievement in the sport of tennis.

The tennis player has to be precise in the skill of serving, which is one of the most important skills of tennis as accuracy plays an important role in the performance of the tennis players because the skill of serving depends heavily and fundamentally on the accuracy, and the main goal to implement serving is to drop the ball in the right area in the court of the opponent as well as dropping the ball in certain areas in which it is difficult for the received player to return the ball.\(^2\)

**Research Methodology**

The researchers used the experimental approach to design two equal groups that suit to the nature and problem of the research.

**Community and Sample Research**

The research community was chosen by the intentional way, which represented by Anbar University tennis team numbered (12) players, they symbolize the original research community (100%). The research samples included all the members of the original community with the same proportion and were divided into two equal groups, they were randomly distributed (using lottery). One of it is a control sample and the other is experimental.

**Tests Used of Research**

**Dry Spirometer device\(^3\)**

**The Purpose of Test**

To measure the vital capacity of the lungs

**Tools**

- Pre-performance training is preferred.
- Exhaled air is not allowed to breathe out while blowing in a rubber tube.

**Calculation of Grades**

The machine shall be read in cubic inches.

**Test of Tensile to Top\(^4\)**

**The Purpose of Test**

Measurement of muscular endurance of the regions of the arms and shoulders

**Tools**

A horizontal bar with ability to change its height so the experimenter's foot doesn't touch the ground in the Pull-ups mode, and the Pull-Ups base should be made from steel or wood and have a diameter of about 4 cm to be suitable for hand grip.

**Performance Description**

The experimenter stands below the "Pull-Ups" bar and at the start signal, he will rise himself and catch Pull-ups bar and starting tensile his two arms until his chin reach above the "Pull-Ups" bar, then goes down until his arms are fully stretched out as the
first time and repeats the earlier performance with the highest number of non-stop until fatigue.

**Test Instructions**

Do not kick the feet, or bend the knees during the performance, do not swing the body, the experimenter has ten minutes to rest at least between this test and any test applied after, the experimenter has only one try.

**Test Administration**

The referee that calls the experimenters and observes their performance, and recording results in the case of using one device "Pull-Ups"

**Calculation of the Grades**

Every correct and complete tensile is calculated in which the experimenter with its chin rise above the bar, it does not calculate the parts of tensile, it does not calculate the correct tensile in the following cases when the weighted body or when kicking feet or when bending the knees or when failure to reach his chin above the bar. The degree of the experimenter is the number of correct tensile times.

**White Test (5)**

**The Purpose of Test**

Measuring the strength and accuracy of the transmission blow

**Procedures**

The tennis court is planned as shown in Figure (1). The rectangles [3,4,5,6] are measured by [1.5 x 3 feet], while the rectangle [2] is measured by [6 x 10.5] And the rest of the area of the rectangle [1], all of which give accuracy, and installs a rope on the two pillars of the network length (7 feet) and the height of the net (4 feet) then, the zones of the strike force shall be for zone (1) of the pitch between the transmission area and the end line followed by the two (3) zones, ten feet behind and finally the area (4) of the wall.

**Performance Description and Method of Registration**

(10) minutes to warm up and then the experimenter stands behind the base line at the area allocated for transmission, he has ten attempts to transmit the ball and to pass between the rope and the network, he is throwing to himself the ball, the mark is calculated in the score area of the ball’s fall (1-6) (1-4) of the transmitting power, but if the ball falls outside these places or outside the area allocated between the cord and the network is given zero for that attempt, knowing that the highest achievement of the experimenter for the ten attempts are (60) degree of accuracy of transmission,(40) Degree to its strength and (100) degrees to its effectiveness of .

**Pilot Study**

The researchers carried out the pilot study, which was a practical training for researchers to identify the negatives encountered during the tests, on Monday, 2/10/2017 at 10:00 am on three students from the fourth division, who studied tennis item in the last year and those Who have the privilege in it, And the intended was to identify the time and avoid errors If any, and their suitability to the sample members and understanding the auxiliary team.

**Field Research Procedures**

**Pretests**

The Pretests of the abilities, the strength and accuracy of the transmitter skill were carried out on Wednesday 4/10/2017 at 11 am in the closed hall and the outdoor tennis courts in the collage of physical Education and sport science- Anbar University. All the requirements for the tests and the auxiliary team were prepared. The results of each test, the number of attempts, the flow of work, the calculation of scores, and their registration were presented and explained in the evaluation form.

**Field Procedures**

The researchers applied sensory-motor-extension exercises (1) to develop some of the functional and skill capabilities of the experimental group of Anbar University athletes to raise the level of the transmitter skill in terms of strength and accuracy to reach the optimum performance and achievement, which was implemented over a period of 6 weeks by three units per week, that’s mean eighteen units for the curriculum as a whole and within time 60 minutes for the unit. The first week started on Sunday 8/10/2017 and ended in the sixth week which is final week of the curriculum on Wednesday 9/11 / 2017 the sample was trained by the trainer and the auxiliary team.
Post-tests

Post-tests were carried out after the completion of the training modules by the auxiliary team on Sunday, 12/11/2017 at 11 am in the same stadium under similar conditions to the two groups and the preparation of all special requirements as in the Pre-tests.

Results

Presentation and Analysis of the Results of Functional and Technical Tests

Table 2: Shows the computational and standard deviations of the control and experimental groups in the pre- and post-tests in the tests under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>The experimental group</th>
<th>control sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>STD. EV.</td>
</tr>
<tr>
<td>Endurance</td>
<td>45.16</td>
<td>3.93</td>
</tr>
<tr>
<td>Vital Capacity</td>
<td>36.46</td>
<td>455.0</td>
</tr>
<tr>
<td>Transmitter Skill</td>
<td>18.16</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Table 3: This table described arithmetic mean, the standard error of the differences, the calculated t values, and the significance of the differences between the results of the pre- and post-test tests of the control and experimental groups of the tests within investigation

<table>
<thead>
<tr>
<th></th>
<th>Groups</th>
<th>F</th>
<th>FH</th>
<th>calculate T values</th>
<th>mistakes percentage</th>
<th>Significance of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endurance</td>
<td>experimental</td>
<td>66.50</td>
<td>2.44</td>
<td>6.74</td>
<td>0.001</td>
<td>significance</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>5.50</td>
<td>0.71</td>
<td>7.65</td>
<td>0.002</td>
<td>significance</td>
</tr>
<tr>
<td>Vital Capacity</td>
<td>experimental</td>
<td>424.66</td>
<td>65.81</td>
<td>6.51</td>
<td>0.001</td>
<td>significance</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>36.66</td>
<td>77.58</td>
<td>0.47</td>
<td>0.656</td>
<td>Non significance</td>
</tr>
<tr>
<td>Transmitter Skill</td>
<td>experimental</td>
<td>13.33</td>
<td>1.96</td>
<td>6.80</td>
<td>0.002</td>
<td>significance</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>7.83</td>
<td>1.19</td>
<td>6.55</td>
<td>0.001</td>
<td>significance</td>
</tr>
</tbody>
</table>

* The value of t-table (2.78) at the level of significance (0.05) and the degree of freedom (4)

Table (3) shows the results of the tests for the sample of the research between the Pre and Post-tests. The results of the experimental and control groups showed a significant difference in favor of the remote tests. The error rate was less than 0.05 in front of the freedom degree (4) that showed the difference between the pre and posttest of the two groups, while the control group did not obtain the significance in the bio-capacity test because the error rate is greater than (0.05).

Table 4: Shows the computational and standard deviations and the calculated t value of the experimental and control groups in the post-test of the tests in question

<table>
<thead>
<tr>
<th>Tests</th>
<th>The experimental group</th>
<th>control sample</th>
<th>t values</th>
<th>mistakes percentage</th>
<th>Significance of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>STD. EV.</td>
<td>Mean</td>
<td>STD. EV.</td>
<td></td>
</tr>
<tr>
<td>Endurance</td>
<td>62.16</td>
<td>5.34</td>
<td>50.66</td>
<td>2.06</td>
<td>4.91</td>
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<tr>
<td>Vital Capacity</td>
<td>4070.6</td>
<td>470.19</td>
<td>3592.33</td>
<td>220.23</td>
<td>2.25</td>
</tr>
<tr>
<td>Transmitter Skill</td>
<td>31.50</td>
<td>1.97</td>
<td>27.33</td>
<td>2.80</td>
<td>2.97</td>
</tr>
</tbody>
</table>

** Significant value (T) at the level of significance (0.05) and in front of the degree of freedom (5)

Table 4 shows the significance of the differences for all post-test tests between the experimental and control groups. The results go for the control group where the error rate was less than the significance level (0.05). This indicates a significant difference between the two groups and for the experimental group in all tests indicated in the table above.

Discussion

Table (2-3) show significant differences for all tests in the pre and post-tests for each groups. The post-test for the two groups achieved significance that goes to the experimental group. The researchers attribute the reasons behind this state of affairs to several issues pertaining to the stipulated programmer and the selected exercise according to sound scientific basis in addition to their variation and grading to suit the player's abilities.
In the endurance test, the results have indicated that the experimental group outdid the control group in the post – test. Scholars attributed this to the significance of this foundation ability to tennis players, in addition their affordability to the exerciser, additionally in enduring those exercises, which enhanced their progress. Elin state that muscle endurance plays a fatal role in maintaining constant rates during the tennis match.

Also, it helps the players to achieve skillful, physical and planned performance without allowing this rate to fall down throughout the match. (6) Table (2) displays an acceptable level of the biological capacity for the two groups in the post – test. This capacity is within normal limits (4070.6-3629, 0). A number of studies mention that the normal rate of the biological capacity ranges between (3500-4500) Mlt. It can normally be (4600) Mlt. and increases in Athlete above this level. Also, its increase depends on the type of experienced activity. For instance, in football players, it might reach (5600) Mlt. Moreover, it might reach (7000-8000) Mlt. in tall endurance Athlete. As for the percentage of the biological activity, studies indicate that it doesn't exceed 90% in non- Athlete, where it might reach 100% or more in Athlete. In addition, Table (2) and (3) indicate that the experimental group exceed in these tests, while the control group didn't achieve the progress in the pre/post-test. Scholars attribute this to the lack of focus on exercises that participate in increases the biological capacity of the players.

In this regard, Periodic respiratory endurance is one of the most important components for the exercise of most motor activities and some activities that require continuous work for long periods of time . Achieving significance in the test on the shot skill transmission, the researchers attribute the rush of the research sample to the application of exercises in the curriculum, and that the character that characterizes the educational and training unit is the exercise Accordingly, it builds the amount of learning and development of performance and proficiency, In order for the exercise to be Effective and influential, it must be subject to basic conditions and considerations (7).

References


Appendix

Drills

- Using the curtain on the network from seating position the two players must sit on the baseline on both sides of the stadium and then send the ball to specific areas of the stadium.

- Each player stands in front of the wall and he is prohibited from looking then directing the tennis ball by hand to specific areas (colored squares) drawn on the wall.

- Each player stands in front of the wall and sends the ball alternately by looking and prohibited looking at the colored squares using the bat and selecting the color before the performance.

- Each player stands in front of the other along the network and performs the transmitter directing the balls in the transmitter area constantly and using the curtain on the network.

- The player sends the ball blindfolded to the designated area and to both sides.

- Set the starting line and a line away from him (210 cm) and the player sits on the starting line is blindfolded and throw the tennis ball using the racquet to fall on the second line.