Effect of Using Different Techniques for Developing Force Distinguished by Speed on the Digital Level of Youth Team Triple Jump

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Abstract: The study aimed at identifying the differences between the first experimental group, which used a high degree of force and a low degree of speed and the second experimental group, which used a high degree of speed and a low degree of force on the force distinguished by the speed development and digital level of youth team triple jump. The researcher used the experimental method using the two experimental groups by applying the two pre and post tests such as experimental design. The study was conducted on a purposeful sample (nonrandom) of 10 players from the youth triple jump team of South Valley University and clubs of Qena (under 20) years old. After following the presentation and discussion of results, the researcher concluded to the improvement of force ratio characterized by speed for the first experimental group which used a high degree of force and a low degree of speed from the second experimental group, which used a high degree of speed and a low degree of force which led to the improvement of the digital level of the first experimental group from the second experimental group. The researcher recommended using a high degree of force and a low degree of speed when force distinguished by the speed development of the youth team triple jump. The researcher also recommended the importance of knowing the quality of the mixture that is formed from the capacities of force and speed when force distinguished by the speed for other activities that are suitable with the type of activity practiced.

Key words: Triple jump - Force development distinguished by speed

INTRODUCTION

The development of qualities or physical abilities required for the different type of sports activity is considered the most important duties of athletic training in order to reach the highest levels in the individual sports. As Speed-Distinguished Force is characterized by speed and is considered one of the distinctive dynamic qualities which play positive and effective role in the practice of many sports activities as jumping. In order to achieve elements of force-distinguished by speed, the player is characterized by the following:

- A high level of muscular strength.
- A high level of speed.
- A high level of dynamic skill to integrate force muscle with speed [1, 2].

As both speed and force have common intertwined physical capabilities, so when the force ratio is greater than the speed, force-distinguished speed results in which is a mixture of muscle strength and speed. It does not mean that an individual who has the muscular strength and speed can achieve high standards on tests of force-distinguished by speed which depends on the ability the individual in the integration of these two components in one frame [3].

There is an inverse relationship between force and speed which one can not reach to both variables to the maximum at the same time. This is what required from the force-distinguished by speed so force characterized by speed can increase as variable depending on the force and speed by relying on one of the following three techniques:

- A strong force at low speeds.
- High speed and low force.
- Mean values for each of the force and speed [4].

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In the light of the researcher's work at the training track and field events, he observed low-level digital youth team triple jump. When doing some measurements, he found low level in the force characterized by speed component, although that training programs include training for the development of this component, but these programs may differ in regulation and the establishment of mass training. Through reading some Arab and foreign references, the researcher also found different points of views of for specialists for the way the size and intensity of strength training the force characterized by speed should be formed, which may be due to the different nature of the activity practiced [5].

Techniques: According to the procedures and the nature of this research and to achieve its objectives the researcher used the experimental method using two experimental groups by applying two of the pre and post-measurement as an experimental design where the research community is represented in the players of triple jump to the team of South Valley University and clubs of Qena under 20 years. The research community was selected deliberately (non-randomly) (22 players). So the number of the sample reached 20 players, classified to 10 players for the necessary sample and 10 players of the survey study.

Research Objectives: The research aims at identifying the effect of using different techniques to develop force distinguished by the speed at digital level for youth team triple jump through:

- Identifying the effect of using a high degree of force and a low degree of speed on the development force characterized by speed and the digit level.
- Identifying the effect of using a high degree of speed and a low degree of force on the development force distinguished by speed and digital level.
- Recognizing the differences between the two experimental groups in the force distinguished by speed and digital level of youth team triple jump.

Research Hypotheses:

- There are significant mean differences in the pre and post -testing in the force distinguished by speed and the digital level because of the use of a high degree of speed and a low degree of force in favor of post testing.
- There are significant mean differences in the post testing in favor of the two experimental groups in force distinguished by speed and the digital level of youth team triple jump.

MATERIALS AND METHODS

Due to the nature and procedures of the research and to achieve its objectives, the research followed the two group's experimental design through applying two of the pre and post-tests.

Research Community: The research community includes the players of triple jump to the team of South Valley University and clubs of Qena under 20 years. The research community was selected purposefully (non-randomly) (20 players). They were classified into 10 players for the necessary sample and 10 players of the survey study. The researcher created harmony between the two experimental groups of the research in the rates of growth (age - length - weight) and physical abilities (force distinguished by speed _ maximum Speed _ muscle strength _ flexibility _ fitness _ compatibility _ digital level ) where transactions convolution is limited between ± 3 which shows the moderation of distribution for the research sample and also humongous. The calculated (T) value is less than the indexed (T) value at the level of significance (0.05), which shows the equality of the two groups (experimental) in all the variables of the research.

Physical Tests Which Are Used in the Research: Significant statistical differences (t -test) were found between the distinguished group and non-distinguished group. It was found that there are a statistical significance between the two groups as the calculated (T) value in each of the test of wide jump from steadiness 2.03 cm and running 30 m from the flying start 9.36 s and test the muscle strength for the two legs 3.59 kg, which shows the validity of the tests and their ability to distinguish between the two groups. The indexed (T) value at 0.5 level is 1.86. The researcher applied such tests and measurements on the exploratory sample (10 players) and then re-applied for the second time on the same sample
Comparing the Effects of Force Distinguished by the Speed Development Through a High Degree of Force and a Low Degree of Speed (The First Experimental Group) and Using a High Degree of Speed and Low Force (The Second Experimental Group) on the Research Variables.

**DISCUSSION**

**Impact of the Development of Force-distinguished by Speed Through a High Degree of Force and a Low Degree of Speed on the Research Variables:** Table 2 indicates the following results:

- There are statistically significant mean differences in the pre and post tests of the variables of physical and digital level within the first experimental group favoring the post testing.
- It can be identified that the rate of improvement in the physical variables were organized (put in order) as follows:

The force-distinguished by speed 84.62 - fitness 13.62% - speed 13.12% - flexibility 13.01% - muscle strength 8.90% - compatibility 5.53%.

### RESULTS AND DISCUSSION

**The Impact of Force Distinguished by the Speed Development Through a High Degree of Force and a Low Degree of Speed on the Research Variables:** Impact of force-distinguished by the speed development through a high degree of speed and a low degree of force on the research variables.

### Table 1: Tests and scales which are used in the research

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test name</th>
<th>Scale unite</th>
<th>Test Objective</th>
<th>Tools &amp; materials used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Running test (30) meter from the starting point</td>
<td>S</td>
<td>Measuring the maximum speed</td>
<td>Stop watch</td>
</tr>
<tr>
<td></td>
<td>opening legs Tests</td>
<td>Cm</td>
<td>Measuring flexibility of hip</td>
<td>Measure strip</td>
</tr>
<tr>
<td></td>
<td>Test of falling down from standing for 15 s</td>
<td>S</td>
<td>Measuring Fitness</td>
<td>Stop watch</td>
</tr>
<tr>
<td></td>
<td>Digital circles tests</td>
<td>S</td>
<td>Measuring Compatibility of legs</td>
<td>Stop watch</td>
</tr>
<tr>
<td></td>
<td>Wide jump from steadiness</td>
<td>cm</td>
<td>Measuring muscle ability</td>
<td>Measure strip</td>
</tr>
<tr>
<td></td>
<td>muscle strength for legs</td>
<td>Kg</td>
<td>Measuring muscle strength for legs</td>
<td>Dynameter</td>
</tr>
<tr>
<td>Digital</td>
<td>Running 100m from low</td>
<td>S</td>
<td>Measuring the time of 100 m running</td>
<td>Stop watch</td>
</tr>
</tbody>
</table>

### Table 2: Significant differences in the variables of physical and digital level between the two pre and post-tests for the first experimental group (high degree of force and low degree of speed) N = 5

<table>
<thead>
<tr>
<th>Physical variables</th>
<th>Scale unit</th>
<th>The first experimental group</th>
<th>The second experimental group</th>
<th>T Value</th>
<th>Rate of improvement%</th>
<th>The difference between the two means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>S</td>
<td>3.43 0.13</td>
<td>2.98 0.09</td>
<td>8.49</td>
<td>13.12</td>
<td>0.45</td>
</tr>
<tr>
<td>The force characterized by speed</td>
<td>m</td>
<td>2.12 0.45</td>
<td>2.43 0.48</td>
<td>2.46</td>
<td>14.62</td>
<td>0.31</td>
</tr>
<tr>
<td>Muscle strength</td>
<td>kg</td>
<td>418.8 40.801</td>
<td>455.8 40.314</td>
<td>117.0</td>
<td>8.90</td>
<td>37.0</td>
</tr>
<tr>
<td>Digital level</td>
<td>m</td>
<td>11.75 0.24</td>
<td>13.34 0.36</td>
<td>5.83</td>
<td>13.53</td>
<td>1.59</td>
</tr>
</tbody>
</table>

Value of indexed (T) in the level of 0.05 = 2.13
Table 3: Significant differences in the variables of physical and digital level between the two pre and post tests for the second experimental group (high degree of speed and low degree of force) N = 5

<table>
<thead>
<tr>
<th>Physical variables</th>
<th>Scale unit</th>
<th>The first experimental group</th>
<th>The second experimental group</th>
<th>T Value</th>
<th>Rate of improvement%</th>
<th>The difference between the two means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>S</td>
<td>3.71 ± 0.15</td>
<td>3.02 ± 0.12</td>
<td>8.65</td>
<td>18.59</td>
<td>0.69</td>
</tr>
<tr>
<td>The force characterized by speed</td>
<td>m</td>
<td>2.10 ± 0.32</td>
<td>2.20 ± 0.027</td>
<td>7.42</td>
<td>4.76</td>
<td>0.1</td>
</tr>
<tr>
<td>Muscle strength</td>
<td>kg</td>
<td>391.0 ± 32.97</td>
<td>423.6 ± 32.898</td>
<td>101.19</td>
<td>8.21</td>
<td>32.6</td>
</tr>
<tr>
<td>Digital level</td>
<td>m</td>
<td>11.65 ± 0.23</td>
<td>12.45 ± 0.32</td>
<td>4.54</td>
<td>6.87</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Value of indexed (T) at the level 0.05 = 2.13

Table 4: Significant differences in the physical variables and digital level between the post test for the two experimental groups

<table>
<thead>
<tr>
<th>Physical variables</th>
<th>Scale unit</th>
<th>The first experimental group</th>
<th>The second experimental group</th>
<th>T Value</th>
<th>Rate of improvement%</th>
<th>The difference between the two means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>S</td>
<td>2.98 ± 0.09</td>
<td>3.02 ± 0.12</td>
<td>2.76</td>
<td>1.32</td>
<td>0.04</td>
</tr>
<tr>
<td>The force characterized by speed</td>
<td>m</td>
<td>2.43 ± 0.048</td>
<td>2.20 ± 0.027</td>
<td>17.42</td>
<td>10.45</td>
<td>0.23</td>
</tr>
<tr>
<td>Muscle strength</td>
<td>kg</td>
<td>455.8 ± 40.314</td>
<td>423.6 ± 32.898</td>
<td>12.18</td>
<td>7.60</td>
<td>32.2</td>
</tr>
<tr>
<td>Digital level</td>
<td>m</td>
<td>13.34 ± 0.36</td>
<td>12.45 ± 0.32</td>
<td>3.92</td>
<td>7.15</td>
<td>0.89</td>
</tr>
</tbody>
</table>

(T) value at the level 0.05 = 1.86

It is also clear that the proportion of improvement in the level digital 13.53%. With reference to the experimental group in Table 2, the research attributed the reason for this improvement to the increase in force-distinguished by speed and digital level and physical abilities (speed - muscle strength) to the effective and positive influence of the training program proposed as percentages of improvement ranged between 5.53% and 14.62% in favor of the post test.

Impact of Force-distinguished by Speed Development Through High Degree of Speed and a Low Degree of Force on the Research Variables: Table 3 indicates the following results:

There are statistically significant mean differences in the pre and post test in the variables of physical and digital level of the second experimental group in favor of the post testing.

- It can also be interpreted that the rate of improvement in the physical variables were organized (put in order) as follows:
  
  Speed 18.59% ÜÜÜÜ muscle strength 8.21% ÜÜÜÜ fitness 7.82% ÜÜÜÜ compatibility 5.51%, flexibility, 5.44%, the force characterized speed 4.76%. - It can also be seen that the rate of improvement in the digital level 6.87%.

- With reference to the experimental group in Table 3, the researcher attributed the reason for this improvement to the increase in force-distinguished by speed and digital level and physical abilities (speed - muscle strength) to the effective and positive influence for the training program proposed as percentages of improvement ranged between 4.76% and 18.59% in favor of the post test.

This is due to the suggested training program and its various exercises which are directed to the training objective for the program included in the parts of training unit.

Comparing the Effects of Force Distinguished by the Speed Development Through a High Degree of Force and a Low Degree of Speed (The First Experimental Group) and Using a High Degree of Speed and Low Force (The Second Experimental Group) on the Research Variables: Table 4 indicates the following results:

There are statistically significant differences between the first experimental group and the second experimental group in some physical variables in favor of the first experimental group in the digital level in some physical variables (flexibility, fitness, compatibility).
Regarding Table 4, the researcher thinks that the results of the first experimental group which used a high degree of force and low degree of speed are different from the second experimental which used a high degree of speed and low degree of force in spite of improvement in research variables for the two groups which are attributed to the difference of mixing the components of force characterized by speed in the same frame.

This was confirmed by previous study [6] that the level of force-distinguished by speed depends on the individual's ability to integrate these components and takes it out in one frame.

The researcher attributed the distinction of the first experimental group from the second experimental group to what Ahmad [7] referred that both the speed and force have physical capabilities can be mixed. When the ratio of force is greater than speed, force characterized by speed results in as an important element in the jumping competitions.

Abdel-Maksoud [8] referred that force-distinguished by speed is affected by the quality of mixing that is formed from capacities of force and suitable with the quality of the activating practiced.

The researcher finds that the improvement in the level of force-distinguished by speed helps to the growth and the development of the quality of speed and the muscle strength. This is confirmed by prior studies [2, 9] that the improvement in the level of force-distinguished by speed helps to the growth and the development of the quality of speed and the muscle strength finds that muscle strength is closely linked to a factor of force-distinguished by speed. The muscle strength gains the individual the ability to produce strong contractions that means an increase in the force-distinguished by speed and also the ability to repeat the muscle contractions in a shorter time which means acquiring the quality of speed. Therefore the researcher has verified and achieved its three hypotheses.

**CONCLUSION**

The development of force-distinguished by speed with a high degree of force and a low degree of speed, led to a better rate of improvement from the use of a high degree of speed and a low degree of force. Differences of improvement amounted to 10.45% for the force-distinguished by speed, where as the differences of improvement of 7.15% for the digital level. Therefore, the researcher recommended to use a high degree of force and a low degree of speed when devolving force characterized by speed for the youth triple jump. The researcher also recommended the importance of knowing the quality of mixing that is formed from abilities force and speed when devolving force distinguished by the speed to the other activates which are suitable with the quality of activates practiced.

**REFERENCES**