Relationship Between Some Morphological Variables and Level of Achievement for Players at Higher Levels in Tennis

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Abstract: The study aimed to identify the extent of correlation between variables morphological selected and the level of achievement for the players at higher levels in tennis. The researcher used the descriptive (survey) approach. Sample (n=10) was purposefully chosen from men tennis players who have centers of the first to tenth in the order of last general of the men in January 2011 according to the classification of the Egyptian tennis federation. The researcher conducted 26 morphological measurement including weight, lengths, breadth, circumference, thickness of skin folds and the level of achievement for players at high levels. The researcher used correlation coefficient between morphological variables selected and the level of players’ achievement. The researcher recommended that the morphological variables are important for the selection of the squad, particularly the national team. Also, conducting similar studies in the aspects (skills, physiological, psychological) associated with the level of achievement for high levels players in tennis, performing comparative studies for men tennis players in Egypt and other countries with higher levels in tennis using anthropometric variables.

Key words: Morphological variables %Level of achievement %Higher levels %Tennis

INTRODUCTION

See science is a remarkable development in various fields of life, where she was most of the phenomena of scientific research and I have enjoyed sports a large share of the study and contained a variety of studies, between studies of the mechanistic foundations of skills, sports and studies focused on studying the foundations of biological and bio-physical, the other focused on studying aspects of psychological and mental and knowledge, all in order to study the relationship or knowledge of the factors affecting the level of sporting achievement and then can gain access to scientific results is guided by the organizers of the processes of education and sports training in directing the course of the level of achievement.

We are now in the most difficult situations need to evaluations physiological and morphological under many waves severe emergency in the sports field, whether at the local level or international level. At the local level, we still need to pause to get to know our capabilities in terms of physical physiological and morphological and whether this potential can be either inherited or acquired to achieve access to high levels [1].

The identification of requirements of physical activity practices are the main focus of a standard or ruler of the test and selection correct scientifically and should start from the top to the bottom of the sense of identifying the potential and capacity of heroes people with digit level (as a model ) and put Requirements of physical activity practice, which should begin on the basis of recognition the capacity and potential physical, physical, motor and psychological individual seeks to achieve to reach the ranks of the tournament in that activity [2].

For each sporting activity requirements of physical special needs fulfilled by those who aimed to make the medals and trophies in this activity and that the size, shape, construction and configuration of the body of the person sporting a crucial factor for achievement and sporting excellence and trained professionals know the facts very well, so the first what excites them is the search and prospecting for raw materials Sports fruitful and
promising success and sporting excellence and their tools in this process are the specifications suitable for the type of physical activity [3]. That the individual’s fitness for the various sports activities is determined by the appropriateness of the installation body of performance required of them [4]. The correlation measurements of many physical basis of motor skills to excel in various sports activities and building physical and body weight, height and body lifts are the most important factors that determine the skill sports and is based upon access to higher levels of Sports [5].

That the goal of completion is determined that either compete with the standard, or a certain level of excellence, or compete with others, or compete with the individual with his past and try to seek and strive towards the achievement of unique and perseverance on the long-term effort to Mastery, control and the ability to do what is characterized as difficult [4, 6-9].

To follow the achievement of great importance in the process of orientation training in the choice of determining the level of achievement of the current basis for planning training and furthermore it will provide us with information on the effectiveness of the training performed as well as having an important role in self-monitoring of the athlete [10]. That the term is also synonymous with achievement of the performance, but it reflects the measured performance of any form of quantitative performance as expressed also The adequacy of performance [11]. That the mathematical skills require the idea of achievement, Faalanjaz a cornerstone and a point of rotation of sport and achievement in the field of sports training refers to the maximum performance is appreciated distance or points or time or weight, which is why the term achievement as a synonym for success [12].

That the level of achievement in the sports field can be measured through four basic criteria resulted in the views of gentlemen experts, the number was reached 26, a level measure as follows: body weight-length(total height, upper limb, arm, upper arm, forearm, palm, lower limb, thigh, leg)-Breadth(shoulder, chest)-circumference(upper arm, forearm, chest, abdomen, thigh, leg) - thickness of skin folds at each of the(muscle with three heads of the brachial, axillary line East, chest, bottom of the blade bone, abdomen, iliac higher, mid-thigh, above the line medial leg).

It also that the physical characteristics of the tennis player is one of the most important qualities on which the process of sports training to get to the tournament and the achievement of sporting achievement [7]. And there is a relationship between the achievement levels of sports, body composition, physical abilities and characteristics anthropometric is one of the salient factors that affect the learning of motor skills, as they indicated that measurements of anthropometric have an effect on the response of the body player to various circumstances surrounding it and also the efficiency of the physical, they provide the trainers in all types of physical activity and the significance of body measurements and symmetry properties depending on their age and level sports [17].

**Aim:** The current research aims to identify the extent of correlation between morphological variables selected and the level of achievement for the players at higher levels in tennis.

**Research Questions:** The current research poses the following question: Is there a relationship with a statistically significant correlation between the morphological variables under consideration and the level of achievement for the players at higher levels in tennis?

**MATERIALS AND METHODS**

The researcher used the descriptive (survey) approach. Sample (n=10) was purposefully chosen from players who have centers of the first to tenth in the order last year for men January 2011, according to the classification of Management Domestic leagues Union of the Egyptian Tennis. Other 5 men players (from the same research community and outside the main sample) were chosen for the pilot study.

**Data Collection Tools and Forms**

**Anthropometric Measurements:** Through literature review for previous studies related to anthropometric measurements [1, 4, 5, 7, 8, 15-22, 24,25] And to explore the views of gentlemen experts, the number was reached 26, a measure as follows: body weight-length(total height, upper limb, arm, upper arm, forearm, palm, lower limb, thigh, leg)-Breadth(shoulder, chest)-circumference(upper arm, forearm, chest, abdomen, thigh, leg) - thickness of skin folds at each of the(muscle with three heads of the brachial, axillary line East, chest, bottom of the blade bone, abdomen, iliac higher, mid-thigh, above the line medial leg).

**Forms:** The researcher used the Experts opinion form to identify anthropometric measurements that can be used as indicators for tennis players’ selection.

**Tools:** A medical balance - a restameter - a measuring tape - pluviometer- Alcaliber.
**Pilot Study:** Pilot study was done on 5 players (from the same research community and outside the main sample) from 7-5-2011 to 21-5-2011 to identify any difficulties that may hinder the main application.

**Main Study:** The researcher performed the anthropometric measurements from 1-6-2011 to 6-7-2011 under the suitable protocols for each measurement. Data were collected and recorded for statistical treatment.

**Statistical Treatment:** The researcher used SPSS software to calculate the following: mean - standard deviation - median - skewness - Person's correlation coefficient.

**RESULTS AND DISCUSSION**

Table 1 shows that skewness values for the research variables ranged between 0.124 and 1.546. This indicates that sample was homogenous in the chosen variables.

Table 2 shows correlation coefficient between the variables morphological and level of achievement for the players of the highest levels in tennis, the research sample, where the results indicated the table to the presence of correlation positive correlation was statistically significant at the level of 0.05 between body weight and level of achievement for the players the higher levels in tennis and attributed this result to the researcher that the weight of the body, if exceeded the allowable limit hinders the performance of the player who in turn affect the level achieved during the tournaments.

The results of this study agree with other studies, which have stated that if the availability of ideal body weight for tennis players can reach high levels and body weight of the factors affecting the effectiveness of the performance of tennis players [7, 21, 22].

There is a connection between the physical configuration of the player in terms of weight and access to high levels of sports often requires of all sporting activity of certain physical characteristics must be observed when the appropriate choice of the individual[2].

The results in Table 2 the existence of correlation positive correlation was statistically significant at the level of 0.05 between the length each of the (total height, upper limb, arm, upper arm, forearm, palm, leg) and the level of achievement for the players at higher levels in tennis, While no correlation is statistically significant at the level of 0.05 between the length of each of the (lower limb, thigh) and the level of achievement for the players at higher levels in tennis and attributed the researcher of this result to the importance of the total length and the length of some limbs in that it earns the player an advantage morphology of being able to revealed more space for half Pitch the other hand and then directing the payment of various strikes better accurate and positive influence in earn points and then to win and reach the level of achievement of a high during the tournaments, in addition to the total length and the length of some limbs contribute to the possibility of control of the player on the balls away with him.

The consistent results of this study with the results of a previous study where it indicated a positive relationship between the degree of accuracy performance and the total length of the body and the length of the arm and the length of the trunk and along the palm and the length of the leg, while there is an inverse relationship between the degree of accuracy performance and the length of the lower end and the length of the thigh [22].

The importance of anthropometric measurements of the upper side in the sport of tennis and the extent of their contributions to raising the standard of achievement among the players, due to the nature of the performance of a game of tennis in terms of the length of the striking arm and the length of the upper limb[19].

The results in Table 2 the existence of correlation positive correlation was statistically significant at the level of 0.05 between the breadth each of the (shoulder, chest) and the level of achievement for the players at higher levels in tennis and attributed the researcher of this result to the breadth of each of the shoulders and chest contribute player in the balance during the performance also contribute to increasing the length of arm strength and clear that you rotate the upper half of the body on the longitudinal axis of the processing to the player hit the ball.

The results of this study agree with results of previous studies, which indicated that the breadth of shoulders, chest and breadth of the morphological variables contribute to the level of the performance skills of tennis players [7, 16, 21, 25].

The results in Table 2 the existence of correlation positive correlation was statistically significant at the level of 0.05 between the Circumference each of the (upper arm, forearm, chest, leg) and the level of achievement for the players at higher levels in tennis, while no correlation is statistically significant at the level 0.05 between the Circumference each of the (abdomen, thigh) and the level of achievement for the players at higher levels in tennis, attributed the researcher of this result to the Circumference each of the (upper arm, forearm, chest, leg) is an indicator of the strength and ability to the muscle of the arm, chest and legs in general and that is the
### Table 1: Mean, standard deviation, median and skewness for anthropometric variables and the level of achievement (n=10)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>UM</th>
<th>Mean</th>
<th>SD±</th>
<th>Media</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Weight Kg</td>
<td>66.20</td>
<td>9.98</td>
<td>65.50</td>
<td>0.265</td>
<td></td>
</tr>
<tr>
<td>2- Height Cm</td>
<td>171.10</td>
<td>8.22</td>
<td>171.00</td>
<td>0.124</td>
<td></td>
</tr>
<tr>
<td>3- Upper limb length Cm</td>
<td>75.70</td>
<td>5.90</td>
<td>77.00</td>
<td>0.402</td>
<td></td>
</tr>
<tr>
<td>4- Arm length Cm</td>
<td>84.20</td>
<td>6.59</td>
<td>83.00</td>
<td>1.086</td>
<td></td>
</tr>
<tr>
<td>5- Upper arm length Cm</td>
<td>34.80</td>
<td>3.457</td>
<td>35.00</td>
<td>0.171</td>
<td></td>
</tr>
<tr>
<td>6- Forearm length Cm</td>
<td>30.20</td>
<td>3.22</td>
<td>30.00</td>
<td>1.092</td>
<td></td>
</tr>
<tr>
<td>7- Palm length Cm</td>
<td>19.20</td>
<td>0.918</td>
<td>19.00</td>
<td>1.546</td>
<td></td>
</tr>
<tr>
<td>8- Lower limp length Cm</td>
<td>96.90</td>
<td>4.067</td>
<td>97.00</td>
<td>0.412</td>
<td></td>
</tr>
<tr>
<td>9- Thigh length Cm</td>
<td>48.80</td>
<td>4.022</td>
<td>47.50</td>
<td>0.759</td>
<td></td>
</tr>
<tr>
<td>10- Leg length Cm</td>
<td>43.90</td>
<td>2.55</td>
<td>44.00</td>
<td>0.636</td>
<td></td>
</tr>
<tr>
<td>11- Breadth shoulders Cm</td>
<td>42.80</td>
<td>3.489</td>
<td>43.00</td>
<td>0.340</td>
<td></td>
</tr>
<tr>
<td>12- Breadth chest Cm</td>
<td>42.50</td>
<td>5.797</td>
<td>41.50</td>
<td>0.599</td>
<td></td>
</tr>
<tr>
<td>13- Upper arm circumference Cm</td>
<td>27.20</td>
<td>5.473</td>
<td>28.00</td>
<td>0.471</td>
<td></td>
</tr>
<tr>
<td>14- Forearm circumference Cm</td>
<td>28.00</td>
<td>7.947</td>
<td>38.00</td>
<td>1.337</td>
<td></td>
</tr>
<tr>
<td>15- Thigh circumference Cm</td>
<td>57.70</td>
<td>5.697</td>
<td>59.50</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td>16- Abdomen circumference Cm</td>
<td>35.30</td>
<td>6.481</td>
<td>38.00</td>
<td>1.473</td>
<td></td>
</tr>
<tr>
<td>17- At the brachial muscle Mm</td>
<td>13.681</td>
<td>5.473</td>
<td>15.591</td>
<td>0.622</td>
<td></td>
</tr>
<tr>
<td>18- Forearm circumference Cm</td>
<td>15.415</td>
<td>4.112</td>
<td>15.335</td>
<td>0.249</td>
<td></td>
</tr>
<tr>
<td>19- Bottom of the blade bone Mm</td>
<td>18.460</td>
<td>4.655</td>
<td>19.16</td>
<td>0.386</td>
<td></td>
</tr>
<tr>
<td>20- When the abdomen Mm</td>
<td>18.66</td>
<td>5.161</td>
<td>17.165</td>
<td>1.292</td>
<td></td>
</tr>
<tr>
<td>21- At mid-thigh Mm</td>
<td>14.167</td>
<td>2.994</td>
<td>12.835</td>
<td>1.050</td>
<td></td>
</tr>
<tr>
<td>22- At medial line of the leg Mm</td>
<td>6388.70</td>
<td>3424.4</td>
<td>5328.0</td>
<td>0.903</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Correlation between morphological variables and the level of achievement (n=10)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>UM</th>
<th>CC</th>
<th>LS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Weight Kg</td>
<td>66.20</td>
<td>0.606 *</td>
<td>SS</td>
</tr>
<tr>
<td>2- Height Cm</td>
<td>171.10</td>
<td>0.629 *</td>
<td>SS</td>
</tr>
<tr>
<td>3- Upper limb length Cm</td>
<td>75.70</td>
<td>0.637 *</td>
<td>SS</td>
</tr>
<tr>
<td>4- Arm length Cm</td>
<td>84.20</td>
<td>0.643 *</td>
<td>SS</td>
</tr>
<tr>
<td>5- Upper arm length Cm</td>
<td>34.80</td>
<td>0.609 *</td>
<td>SS</td>
</tr>
<tr>
<td>6- Forearm length Cm</td>
<td>30.20</td>
<td>0.653 *</td>
<td>SS</td>
</tr>
<tr>
<td>7- Palm length Cm</td>
<td>19.20</td>
<td>0.693 *</td>
<td>SS</td>
</tr>
<tr>
<td>8- Lower limp length Cm</td>
<td>96.90</td>
<td>0.131</td>
<td>NS</td>
</tr>
<tr>
<td>9- Thigh length Cm</td>
<td>48.80</td>
<td>0.147</td>
<td>NS</td>
</tr>
<tr>
<td>10- Leg length Cm</td>
<td>43.90</td>
<td>0.622 *</td>
<td>SS</td>
</tr>
<tr>
<td>11- Breadth shoulders Cm</td>
<td>42.80</td>
<td>0.634 *</td>
<td>SS</td>
</tr>
<tr>
<td>12- Breadth chest Cm</td>
<td>42.50</td>
<td>0.644 *</td>
<td>SS</td>
</tr>
<tr>
<td>13- Upper arm circumference Cm</td>
<td>27.20</td>
<td>0.634 *</td>
<td>SS</td>
</tr>
<tr>
<td>14- Forearm circumference Cm</td>
<td>27.20</td>
<td>0.699 *</td>
<td>SS</td>
</tr>
<tr>
<td>15- Thigh circumference Cm</td>
<td>27.20</td>
<td>0.622 *</td>
<td>SS</td>
</tr>
<tr>
<td>16- Abdomen circumference Cm</td>
<td>27.20</td>
<td>0.432</td>
<td>NS</td>
</tr>
<tr>
<td>17- At the brachial muscle Mm</td>
<td>13.681</td>
<td>0.493</td>
<td>NS</td>
</tr>
<tr>
<td>18- Forearm circumference Cm</td>
<td>13.415</td>
<td>0.620 *</td>
<td>SS</td>
</tr>
<tr>
<td>19- At the brachial muscle Mm</td>
<td>13.415</td>
<td>-0.105</td>
<td>NS</td>
</tr>
<tr>
<td>20- Axillary line at the East Mm</td>
<td>13.415</td>
<td>-0.274</td>
<td>NS</td>
</tr>
<tr>
<td>21- Skin at the chest Mm</td>
<td>13.415</td>
<td>-0.185</td>
<td>NS</td>
</tr>
<tr>
<td>22- Bottom of the blade bone Mm</td>
<td>13.415</td>
<td>-0.031</td>
<td>NS</td>
</tr>
<tr>
<td>23- When the abdomen Mm</td>
<td>13.415</td>
<td>-0.191</td>
<td>NS</td>
</tr>
<tr>
<td>24- Top iliac Mm</td>
<td>13.415</td>
<td>-0.266</td>
<td>NS</td>
</tr>
<tr>
<td>25- At mid-thigh Mm</td>
<td>13.415</td>
<td>-0.024</td>
<td>NS</td>
</tr>
<tr>
<td>26- At medial line of the leg Mm</td>
<td>13.415</td>
<td>-0.183</td>
<td>NS</td>
</tr>
</tbody>
</table>

* R table value on p<0.05 = 0.602 ** R table value on p<0.01 = 0.735

Note: CC=The correlation coefficient; LS=The level of significance; SS=Statistically significant; NS=No statistically significant
cornerstone upon which the player in the performance of
strikes and movements of the feet required by the sport of
tennis, the Circumference of the chest is an indication of
the efficiency of the respiratory system, which in turn
leads to late-onset fatigue and then the ability to maintain
the level of performance during the games which may
impact positively on the level of achievement of the player
during the tournament.

The variables morphological following the
circumference each of the (chest, leg) of the variables
contributing to the level of the performance skills of
tennis and the circumference of the leg is an important
indicator of the strength of the muscles of the legs and
that is the cornerstone of the movements of the tennis
player in the performance strikes the long side as it is an
important variable for maintaining the balance during the
performance, and the circumference of the chest is an
indication of the skin periodic breathing as an increase in
the circumference of the chest mean breadth of the rib
cage and the large size of the lungs, allowing the player to
increase the size and efficiency of breathing and maximum
oxygen consumption and thus a player can repeat the
performance strikes the same efficiency and effectiveness
throughout the game [16].

The results in Table 2 to a correlation inverse is
statistically significant at the level of 0.05 between the
thickness of skin folds each of the (muscle with three
heads of the brachial, axillary line East, chest, bottom
of the blade bone, abdomen, iliac higher, mid-thigh, above
the line medial leg) and the level of achievement for the
players at higher levels in tennis, attributed the researcher
of this result is that the nature of performance in the sport
of tennis is characterized by speed, strength, agility,
flexibility and the use of movements of the arms and torso
intensively all this performance requires the player to be
on the degree of High consistency of the physical and
does not contain the body of the player high or higher
than the limit of fat.

The consistent results of this study with the
indication by the results of multiple studies demonstrated
an inverse relationship significant between the amount of
fat and performance in sports activity the higher the
percentage of fat in the body's lack of performance of the
individual sports and this is because all the activities
required to move the body either vertically or horizontally
during play[1]. There are inverse association between the
percentage of body fat and physical fitness, it means
there is fat in an effort that the individual may say, what
to eat and the proportion of foods has become more than
the amount of the activity[15]. She also noted the results
of a previous study to the existence of an inverse
relationship between the percentage of fat and the level of
performance in tennis, where the weight of fat if exceeded
the allowable limit of 12-16% in the body obstructs the
progress of the performance level of the player, that when
available the proportion of fat suitable for players Tennis
can reach high levels[21].

CONCLUSION

The Researcher Concludes the Following:

C A correlation positive correlation was statistically
significant between body weight and the length each
of the (total height, upper limb, arm, upper arm,
forearm, palm, leg) and breadth each of the
(shoulders, chest) and the circumference each of the
(upper arm, forearm, chest, leg) and the level of
achievement for the players at higher levels in tennis.

C A correlation inverse is not statistically significant
between the thickness of skin folds each of the
(muscle with three heads of the brachial, axillary line
East, chest, the bottom blade bone, abdomen, higher
iliac, mid-thigh, above the line medial leg) and the level of achievement for the players at higher levels
in of tennis.

Recommendation

The Researcher Recommends the Following:

C Anthropometric variables should be among the bases
of selecting Men tennis players, especially for the
national team.

C Similar studies in other aspects (skills - physiological
- psychological) associated with the level of
achievement of higher levels players in tennis.

C Performing similar studies using inclined circulation
to validate these results.

C The need to customize the card for the morphological
measurements (anthropometric) for tennis players,
taking into account what may happen upon through
periodic follow-up.

C Performing comparative studies for men tennis
players in Egypt and other countries with higher
levels in tennis using anthropometric variables.

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