A comparative study of physiological profile of Soccer trainee of different ages

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ABSTRACT  
The purpose of the study was to compare the physical parameters viz. height, weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition).

A group of soccer players (training) comparing of 56 in number are being trained at a regular interval. 35 out of 56 players who voluntarily agreed to participate in this study have been included. They have been briefed about the study. Standard Statistical tools were used for generalized the fact. From the study it was revealed that the body height, weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition) are more compare to the value of a national and international players.

INTRODUCTION  
Top soccer players do not necessarily have an extraordinary capacity in any of the areas of physical performance. Soccer training is largely based on the game itself, and a common recruitment pattern from player to coach and manager reinforces this tradition. New developments in understanding adaptive capacity in any of the areas of physical performance. Soccer performance depends upon a myriad of factors such as technical/biomechanical, tactical, mental and physiological areas. One of the reasons that soccer is so popular worldwide is that players may not need to have an extraordinary profile as part of a holistic monitoring of talented young players.

Soccer is the most popular sport in the world and is performed by men and women, children and adults with different levels of expertise. Soccer performance depends upon a myriad of factors such as technical/biomechanical, tactical, mental and physiological areas. One of the reasons that soccer is so popular worldwide is that players may not need to have an extraordinary capacity within any of these performance areas, but possess a reasonable level within all areas. However, there are trends towards more systematic training and selection influencing the anthropometric profiles of players who compete at the highest level. As with other activities, soccer is not a science, but science may help improve performance. Efforts to improve soccer performance often focus on technique and tactics at the expense of physical fitness. During a 90-minute game, elite-level players run about 10 km at an average intensity close to the anaerobic threshold (80-90% of maximal heart rate). Within this endurance context, numerous explosive bursts of activity are required, including jumping, kicking, tackling, turning, sprinting, changing pace, and sustaining forceful contractions to maintain balance and control of the ball against defensive pressure.

The positional role of a player is related to his or her physiological capacity. Thus, midfield players and full-backs have the highest maximal oxygen intakes ( > 60 ml x kg(-1) x min(-1)) and perform best in intermittent exercise tests. On the other hand, midfield players tend to have the lowest muscle strength soccer players don’t cover a full marathon distance (42 kilometers) during a game, the alternating fast and slow running which they utilize can easily deplete their leg-muscle stores. For example, just six seconds of all-out sprinting can trim muscle glycogen by 15 per cent, and only 30 seconds of upscale running can reduce glycogen concentrations by 30 per cent! The high average intensity of soccer play (studies show that top-notch players spend over two-thirds of a typical match at 85 per cent of maximal heart rate) accelerates glycogen depletion. Plus, the time duration of a soccer match, 90 minutes, is more than enough to empty leg muscles of most of their glycogen. In fact, research has shown that soccer players sometimes deplete 90 per cent of their muscle glycogen during a match, more than enough to heighten fatigue and dramatically reduce running speeds.

OBJECTIVES OF THE STUDY:  
To study the physical parameters viz. height, weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition).

METHODOLOGY  
SELECTION OF SITES:  
After visiting 4 training club of soccer in different places of Kolkata, the author had selected and restricted the study nearer to Dankuni area in the district of Hooghly, West Bengal, India.

SELECTION OF SUBJECTS:  
A group of soccer players (training) comparing of 56 in number are being trained at a regular interval. 35 out of 56 players who voluntarily agreed to participate in this study have been included. They have been briefed about the study.

FIELD DATA COLLECTION:  
Following data have been collected in the relevant equipment.

1. Age: The age of the subject was calculated from their date of birth and then their age in decimal fraction was calculated. It was also recorded from their record book of club register. It is expressed in kg.
2. Height: Body height was measured using anthropometric rod adopting standard procedure. It is expressed in cm.
3. Resting Heart Rate: It is monitored by record the time taken for 30 beat. It is expressed in beats/min.
4. Maximum Heart Rate: It is computed as ...(220-age). It is expressed in beats/min.
5. Reserve Heart Rate: It is computed as ...( Maximum Heart Rate - Resting Heart Rate). It is expressed in beats/min.

6. Nutritional Survey:  
To perform the diet survey Oral questionnaire method for three days was done then one days average food consumption was...
calculated and from that the energy, carbohydrate, protein and fat content of the food is compared and calculated with the energy, carbohydrate, protein and fat requirement of the family. It is assumed that we get 70%, 10% and 20% energy from carbohydrate, protein and fat respectively.

**Statistical Analysis**

The parameter studied in the present investigation where subjected to statistical analysis under student t-test (two tail), mean, SD, etc.

**RESULT AND DISCUSSION**

Physical characteristics of the soccer players of three ages (17 year,18 year 19 year) having under study are summarize in table-1 A, B and C. It can be seen from the table the mean value of the body weight of all three ages were 59.46, 60.63, 61.49 respectively. The average heights of all three ages were 168.33, 168.68, and 169.6 respectively. Similarly the average body mass indexes (BMI) of all three ages were 21.30, 22.41, and 22.69 respectively. It is interesting to note as the age goes on increasing the value of all three parameters mention above were increasing. This may be due to the fact the subject under study are in the growth and developmental phase.

The value of BMI(Kg/M2) of all the ages vary from 21.30 to 22.69 (Kg/M2). This indicate the subject under study are neither under nourished or over nourished and this value according to WHO with a cut off mark of Asian it categorized as normal.

This table also shows that the average resting heart rate of the subject were 63.62,63.37,60.75 respectively along with the maximum heart rate and heart reserve of three ages are 203,202,201 and 139.3,138.65,140.2 respectively. The value of systolic and diastolic blood pressures of all ages that is 17,18,19 years are 119,117,23,118 and 74.45,76.84,78.44 respectively, indicating that none of the subject are hypertensive or hypotensive. So based on that value of the heart rate and blood pressure both cardiovascular status of the subject can be consider as normal.

<table>
<thead>
<tr>
<th>Variable</th>
<th>17 YEAR</th>
<th>±SD</th>
<th>Range</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height(cm)</td>
<td>168.33</td>
<td>3.45</td>
<td>173.4</td>
<td>163.4</td>
<td></td>
</tr>
<tr>
<td>Weight(Kg)</td>
<td>59.46</td>
<td>2.05</td>
<td>62</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>BMI(Kg/M2)</td>
<td>21.30</td>
<td>0.56</td>
<td>22.3</td>
<td>20.6</td>
<td></td>
</tr>
<tr>
<td>Resting HR(beats/min)</td>
<td>63.62</td>
<td>4.99</td>
<td>72</td>
<td>56.29</td>
<td></td>
</tr>
<tr>
<td>HR max(beats/min)</td>
<td>203</td>
<td>--</td>
<td>203</td>
<td>203</td>
<td></td>
</tr>
<tr>
<td>HR Reserve(beats/min)</td>
<td>139.37</td>
<td>4.99</td>
<td>146.7</td>
<td>131</td>
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</tr>
<tr>
<td>Systolic BP(mm Hg)</td>
<td>119</td>
<td>4.81</td>
<td>130</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Diastolic BP(mm Hg)</td>
<td>74.45</td>
<td>±5.203</td>
<td>82</td>
<td>65</td>
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</table>

**Table 1B**

<table>
<thead>
<tr>
<th>Variable</th>
<th>18 YEAR</th>
<th>±SD</th>
<th>Range</th>
<th>Upper</th>
<th>Lower</th>
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<tbody>
<tr>
<td>Height(cm)</td>
<td>168.33</td>
<td>3.45</td>
<td>173.4</td>
<td>163.4</td>
<td></td>
</tr>
<tr>
<td>Weight(Kg)</td>
<td>59.46</td>
<td>2.05</td>
<td>62</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>BMI(Kg/M2)</td>
<td>22.41</td>
<td>0.78</td>
<td>22.1</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Resting HR(beats/min)</td>
<td>63.37</td>
<td>5.27</td>
<td>72</td>
<td>58.26</td>
<td></td>
</tr>
<tr>
<td>HR max(beats/min)</td>
<td>202</td>
<td>--</td>
<td>202</td>
<td>202</td>
<td></td>
</tr>
<tr>
<td>HR Reserve(beats/min)</td>
<td>138.65</td>
<td>5.29</td>
<td>144.84</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Systolic BP(mm Hg)</td>
<td>117.23</td>
<td>4.095</td>
<td>122</td>
<td>115</td>
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<tr>
<td>Diastolic BP(mm Hg)</td>
<td>76.84</td>
<td>3.131</td>
<td>80</td>
<td>74</td>
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**Table 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>19 YEAR</th>
<th>Mean ±SD</th>
<th>Range</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height(cm)</td>
<td>169.6</td>
<td>±3.85</td>
<td>174.6</td>
<td>162.9</td>
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<tr>
<td>Weight(Kg)</td>
<td>61.49</td>
<td>±2.85</td>
<td>63</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>BMI(Kg/M2)</td>
<td>22.69</td>
<td>±0.61</td>
<td>22.4</td>
<td>21.1</td>
<td></td>
</tr>
<tr>
<td>Resting HR(beats/min)</td>
<td>60.75</td>
<td>±0.75</td>
<td>125</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>HRmax(beats/min)</td>
<td>201</td>
<td>±0</td>
<td>201</td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>HR Reserve(beats/min)</td>
<td>140.24</td>
<td>±5.55</td>
<td>149</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Systolic BP(mm Hg)</td>
<td>118</td>
<td>±4.34</td>
<td>125</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Diastolic BP(mm Hg)</td>
<td>78.44</td>
<td>±2.24</td>
<td>82</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Average value of energy intake :- Amount of carbohydrate, fat and protein and their% contributing to total energy intake in the habitual diet of the soccer training under study**

<table>
<thead>
<tr>
<th>Age</th>
<th>Energy Intake</th>
<th>Carbohydrate</th>
<th>Fat</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>3952</td>
<td>526</td>
<td>53.2</td>
<td>142</td>
</tr>
<tr>
<td>18</td>
<td>3680</td>
<td>501</td>
<td>52.3</td>
<td>132</td>
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<tr>
<td>19</td>
<td>3742</td>
<td>542</td>
<td>64.83</td>
<td>141</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The present study is under taken on a group of players (soccer trainee) having three different age group mainly 17, 18 and 19 years.

The physical profile of the subject under study can be categorized as though normal as per recommendation of WHO considering the value of BMI yet for athletes communities. The gross value of height, weight should have been proportionally more.

The body compositions of the subject in terms of percentage of fat and fat mass are more comparable to the value of national.
and international players. According to the ICMR chart, the value of Nutritional status indicates a lower value than the expected. The national statuses of the player are not at all desired level and needs to be improved.

### Reference