Anthropometric Profile of Female and Male Players Engaged in Different Sports Disciplines

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Abstract

Objective: To assess anthropometric profile of players. Methodology: A total of 13 female & 46 male trained players engaged in different sports disciplines were selected. Anthropometric indices were measured using standard procedures and compared with their respective standards. Results: Irrespective of sex & sport disciplines, all players were found to be shorter than their respective standard heights. Less than 50% groups of male players were found meeting the desirable body weight standards. Positive correlations were derived between height & weight for majority of sport groups of female & male players. Body weight was found to be directly proportional to shoulder width with positive correlation. Body mass index revealed stronger correlation with weight than height. Conclusion: Even though players were not meeting the standard norms of height & weight, they were successfully competing either at state or University level which could be attributed to mental strength, motivation & physical adaptations of players.

INTRODUCTION

There is a wealth of scientific & empirical evidence to support the claim that there are body size differences among athletes in different sports & games & among events within the same sport. The age, height & body size of national & international players are of interest from several points of view. Chronological age of top class athletes indicates the time at which peak performance might be expected. It is lower in case of swimming & higher in case of track & field & still higher in case of team game’s athletes. Peak performance age in different sports disciplines is associated with the time to start sport training in a particular sport & time needed to develop the necessary physique & level of performance. With regards to height & weight, certain body dimensions are necessary for success in selected sports. In some games, lighter body weight & comparatively smaller body size is required whereas in others, heavier weight & huge body size is needed to achieve optimum performance. Athletics, game or contest, played individually or in team, involves physical strength, skill & endurance. It needs long & stronger legs / calf & thighs to run & cover the distance in minimum time period. Badminton, a game for two or four players, using light weight rackets along with a shuttlecock back & forth over a net, trying to keep it from hitting the ground, requires light but strong bodies. Basketball players need long upper & lower extremities make them suitable to catch the ball with jumps, provide them with a wider reach during the passes & make it easier for them while throwing the ball into the basket. Volleyball requires tall players to play the game by hitting an inflated ball back & forth over a high net. It needs strong shoulders & wrists to withhold the pressure of the ball. A well developed physique with maximum force is needed for weightlifters (Parizkova, 1991; Maffulli, 1992; Lusting & Strauss, 2003).

Anthropometry comprises techniques that readily contribute to a more in-depth understanding of body composition & nutritional status, allowing the quantification of observations & the observation of changes with time. Championship performances no longer occur at random or as a result of chance alone. International sports performance in various sports & games are influenced by many factors such as level of physical, physiological & psychological abilities. Body measurements help talk about nutritional status & highlight the changes due to sports activities. (Debnath, 1994).

MATERIALS & METHODS

Study was conducted to assess the physical status of male &
female players involved in different sports disciplines through anthropometry.

**SELECTION & GROUPING OF SAMPLE**

Players [both males & females] engaged in regular practice & participating in professional sport tournaments were taken as subjects for the present study. These were young players [aged 18 – 22 years] engaged in different sports disciplines such as athletics, volleyball, cricket, judo, gymnastics, weight lifting, hurdle racing, half marathon, badminton, cross country etc. The subjects were chosen from a well known Physical Education Institution from Vidarbha, Maharashtra, India. Athletes who were participating in regular practice schedules & in many sports events from the past few years [players were in the field from last 3 – 7 years] were mainly of choice. Subjects were classified game wise, the data of which is shown in Table 1.

**Figure 1**

Table 1: Game-Wise Classification of Subjects

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sports Disciplines</th>
<th>No. of Subjects</th>
<th>Mean Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEMALES [N = 13]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Half Marathon</td>
<td>3</td>
<td>19.89 ± 0.95</td>
</tr>
<tr>
<td>2</td>
<td>Hurdle Racing</td>
<td>2</td>
<td>20.13 ± 1.62</td>
</tr>
<tr>
<td>3</td>
<td>Athletics</td>
<td>4</td>
<td>19.27 ± 1.0</td>
</tr>
<tr>
<td>4</td>
<td>Badminton</td>
<td>4</td>
<td>20.45 ± 1.0</td>
</tr>
<tr>
<td><strong>MALES [N = 46]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Athletics</td>
<td>7</td>
<td>20.52 ± 1.3</td>
</tr>
<tr>
<td>2</td>
<td>Badminton</td>
<td>6</td>
<td>21.87 ± 0.5</td>
</tr>
<tr>
<td>3</td>
<td>Cricket</td>
<td>6</td>
<td>20.98 ± 1.4</td>
</tr>
<tr>
<td>4</td>
<td>Judo</td>
<td>5</td>
<td>21.02 ± 1.7</td>
</tr>
<tr>
<td>5</td>
<td>Judo / Gymnastics</td>
<td>6</td>
<td>21 ± 1.2</td>
</tr>
<tr>
<td>6</td>
<td>Volleyball</td>
<td>14</td>
<td>20.39 ± 1.5</td>
</tr>
<tr>
<td>7</td>
<td>Weight Lifting</td>
<td>4</td>
<td>21.08 ± 0.5</td>
</tr>
</tbody>
</table>

Anthropometric measurements:

- Following measurements were taken:-
- Body weight
- Standing height
- Mid upper arm circumference (MUAC)

Body mass index (BMI) was calculated using the formula – weight (kg) / (height in meters)² (Bamji et al., 2005).

Measurements were taken using standard procedures (Sodi & Sidhu, 1991; Debnath, 1994; Bamji et al., 2005) & equipments & compared with NCHS/ICMR standards.

**STATISTICAL APPRAISAL OF DATA**

Means, standard deviations, & range were computed to draw conclusions. BMI categories of the players were derived & represented in percentages. Pearson’s Product Moment method was used to derive coefficient of correlations. A level of probability at both 0.05 & 0.01 levels was assumed to draw significance.

**RESULTS & DISCUSSION**

**HEIGHT, WEIGHT & BMI**

The height of an individual is influenced both by genetic (hereditary) and environmental factors. During periods of severe deprivation, linear growth rate slows down and leads to stunting as a consequence of chronic food deficiency (Bamji et al., 2005).
Figure 2
Table 2 shows data on mean height, weight & BMI for female & male players classified game wise

Table 2: Mean Height, Weight & Body Mass Index [BMI] Values of Players Classified Game-Wise

Among females, half marathon group showed the highest & athletics group showed the lowest mean values for height (162.56 & 152.4 cm respectively). Irrespective of sports, all groups of female players were found to be shorter than their respective standards. With the exception of athletics group, rest of the groups of female players showed mean values of weight lower than their respective standards.

Among male players volleyball group were found to be tallest & judo & gymnastics groups were found to be shortest (170.18 & 165.1 cm respectively). Irrespective of sports, all groups of male players were found to be shorter than their respective standards. Computed mean values for height were found to be similar for athletics, badminton & cricket groups. Mean body weights for athletics, badminton & judo groups were found to be higher than their respective standards. Rest of the groups showed mean weights less than the standards.

Figure 1 shows coefficient of correlation between height & weight for female & male players classified game wise. Correlation was found to be highly positive & significant for female half marathon players (r = 0.99, 0.010.05). Data on height of female Montreal Olympic players aged between 22 – 35 years showed that the average basketballers & high jumpers were tallest (177 cm) than all other categories. The players of the gold medalist team of basketball had an average height of 182.4 cm (http://www.gssiweb.com).

From Figure 1, it is clear that male badminton & judo players had a negative insignificant correlations between height & weight (r = - 0.97, highly negative & r = - 0.53, medium negative, respectively, p>0.05). Rest of the groups of male players showed positive correlations (r = 0.13 – 0.76, p<0.05).

Figure 3
BMI was calculated based on height & weight of players (Table 2). It can be seen that with the exception of half marathon among females & badminton among males, all other groups showed mean BMI values above 20 kg / m2 which is considered as normal. It is said that BMI is easy to calculate and correlates better with body fat than desirable body weight. The BMI or Quetelete’s index is the most commonly used weight / height ratio in adult populations (Bamji et al., 2005).

An attempt had been made to derive BMI categories for female & male players classified game wise. Results are shown in Figures 2 & 3. It can be seen that among females, 50 % hurdle racers, 25 % each from athletics & badminton & judo groups were found to be in the category of chronic energy deficient (CED) grade I (BMI – between 17.0 – 18.5 kg / m2). 25 % of female players from athletics & badminton groups were found to be grade II CED (BMI – between 16.0 – 17.0 kg / m2). Among males, majority of players were found under normal category of BMI, however, sports disciplines athletics, cricket & judo & gymnastics showed few players with CED grade II. Players need to gain weight in relationship with height to maintain normal BMI.
Figures 4 & 5 depict coefficient of correlations of BMI against height & weight for female & male players respectively. For female half marathon & badminton players, relationship of BMI with body weight was found to be highly positive ($r = 1.00, p<0.01$ & $r = 0.73, p>0.0$, respectively). Group of female athletics players reflected a medium positive relationship between BMI & height ($r = 0.61, p>0.05$).

With the exception of volleyball players, male players involved in other sports disciplines showed positive correlations between BMI & body weight ($r = 0.5$ to $0.96$, correlation was significant for weight lifters ($0.01$