Physical and Anthropometric Characteristics of Kabaddi Players

Kabaddi a Folk Game
Kabaddi is one of the most popular folk games in the world, mainly in India. Kabaddi is attacking and defending game played between two teams having seven players each. Kabaddi attained National status in the year 1918. The Amateur Kabaddi Federation of India (AKFI) was founded in 1973. The Governing body of Kabaddi in Asia is Asian Amateur Kabaddi Federation (AAKF) headed by Mr. Janardan Singh Gehlot. Parent body to regulate the game at international level is International Kabaddi Federation (IKF). Kabaddi was introduced and popularized in Japan in 1979. Federation Cup Kabaddi matches also commenced in the year 1981.

Importance of Research
As the game is gaining popularity in the world population, systematic studies are needed to select the player, to train up them, to manage their stress and to augment their individual and group performances.

Method
The present study was carried out through descriptive cross-sectional survey method within ex-post-facto research design. The details regarding the method of research design, sample, research instruments and tools, procedure of data collection and statistical technique are reported herewith.

Physical and Anthropometric
As physical and anthropometric characteristics – (i) height, (ii) weight, (iii) leg length, (iv) arm length, (v) mid thigh girth, (vi) calf girth, (vii) body composition (i.e. body fat %, fat mass and lean body mass) and (viii) body mass index were considered in the present study.

Sample
Kabaddi players of different university teams participated in the East Zone Inter-University Kabaddi (Men) Tournament, held during October, 12-14, 2006 which was organized by the University of Kalyani, Kalyani, Nadia. Total 24 teams participated to the tournament and total number of players were (24 × 12 =) 288. Due to scarcity of fund and research personnel, the present researcher could not include all of the 24 teams in his research. So, out of the total 24 teams 8 were selected randomly for the study. A list of 24 university Kabaddi teams was uploaded onto a computer, and then the computer was instructed to generate randomly a list of 8

versities out of 24. Then total number of players were (8 × 12 =) 96. These 96 players were the subjects of the study. Total 96 players were approached with the instruments and tools of the research. But, as all of the 12 players of a team were not selected to play a game so individual performance of 12 players of a team could not be assessed. The total number of players from where full set of data were possible to collect was 71.

Research Instruments
The following research tools were used in the present study for data collection. The tools were selected by applying yardsticks of relevance, appropriateness, reliability, validity and suitability. Brief descriptions of the tools are given herewith.

Instruments to Measure Physical Variables
A series of physical and anthropometrical measurement was carried out with the help of the instruments such as – (i) Height - Standing height measured by Stadiometre; (ii) Weight - Body weight measured by weighing machine; (iii) Length Measurements – Arm Length and Leg Length was measured by Steel Tape; (iv) Girth Measurements – Right Upper arm, Abdomen, Right Forearm, Mid Thigh, Calf was measured by Steel Tape; (v) Body Composition – Body Fat% was estimated with the help of girth measurements in the procedure as described by McArdle, Katch and Katch (2006) [1]. Fat Mass was calculated with the help of the following equation: Fat Mass = (Body Weight × Body Fat %) / 100, Lean Body Mass was estimated by the equation: Lean Body Mass = Body Weight - Fat Mass, the following equation was used for the estimation of Body Mass Index (BMI): BMI = Weight in kg / (Height in mt.)²

Result
Descriptive statistics of physical or anthropometric variables (viz., Thigh Girth in cm, Calf Girth in cm, Arm Length in cm, Leg Length in cm, Height in cm, Body Fat Percentage, Body Weight in kg, Fat Mass in kg, Lean Body Mass in kg and Body Mass Index in kg/m²) are presented hereunder.

Table-1 shows the descriptive statistics of physical or anthropometric variables of the university level Kabaddi players. In case of thigh girth the minimum of the scores was 38.00 cm, and maximum of those was 61.00 cm. the mean and standard deviation of the said distribution were 52.20 cm. and 4.26
cm. respectively. In case of calf girth minimum of the scores was 30.00 cm. and maximum of scores was 49.00 cm. The mean and standard deviation of the said distribution were 34.64 cm. and 2.88 cm. respectively. Here the minimum of arm length scores was 51.00 and maximum of those was 63.00. The mean and standard deviation of the said distribution were 56.69 and 2.76 respectively. In case of the leg length minimum of the scores was 73.00 and maximum was 96.00. The mean and standard deviation of the said distribution were 84.10 and 4.88 respectively. It is observed that the minimum and maximum scores of height were 155.00 and 182.00 respectively. The mean and standard deviation of the said distribution were 169.45 and 6.39 respectively. In case of body fat percentage the minimum of scores was 6.90 and the maximum of those was 25.10. The mean and standard deviation of those were 14.28 and 3.88 respectively. In case of body weight minimum of scores was 55.00 and the maximum of scores was 94.00. The mean and standard deviation of those were 73.00 and 8.31 respectively. In case of fat mass minimum of the scores was 3.8 and maximum of those was 21.84. The mean and standard deviation of the said distribution were 9.86 and 3.76 respectively. In case of lean body mass the minimum of the scores was 48.39 and the maximum of those was 72.85. The mean and standard deviation of the said distribution were 57.60 and 5.40 respectively. In case of body mass index the minimum of the scores was 19.38 and maximum was 28.53. The mean and standard deviation of the said distribution were 25.45 and 2.13 respectively.

### Table – 1: Descriptive Statistics of Physical or Anthropometric Variables of the University Level Kabaddi Players

<table>
<thead>
<tr>
<th>Physical Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thigh Girth (cm)</td>
<td>71</td>
<td>38.00</td>
<td>61.00</td>
<td>52.20</td>
<td>4.26</td>
</tr>
<tr>
<td>Calf Girth (cm)</td>
<td>71</td>
<td>30.00</td>
<td>49.00</td>
<td>34.64</td>
<td>2.88</td>
</tr>
<tr>
<td>Arm Length (cm)</td>
<td>71</td>
<td>51.00</td>
<td>63.00</td>
<td>56.69</td>
<td>2.76</td>
</tr>
<tr>
<td>Leg Length (cm)</td>
<td>71</td>
<td>73.00</td>
<td>96.00</td>
<td>84.10</td>
<td>4.88</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>71</td>
<td>155.00</td>
<td>182.00</td>
<td>169.45</td>
<td>6.39</td>
</tr>
<tr>
<td>Body Fat Percentage</td>
<td>71</td>
<td>6.90</td>
<td>25.10</td>
<td>14.28</td>
<td>3.88</td>
</tr>
<tr>
<td>Body Weight (kg)</td>
<td>71</td>
<td>55.00</td>
<td>94.00</td>
<td>67.46</td>
<td>8.31</td>
</tr>
<tr>
<td>Fat Mass (kg)</td>
<td>71</td>
<td>3.80</td>
<td>21.84</td>
<td>9.86</td>
<td>3.76</td>
</tr>
<tr>
<td>Lean Body Mass (kg)</td>
<td>71</td>
<td>48.39</td>
<td>72.85</td>
<td>57.60</td>
<td>5.40</td>
</tr>
<tr>
<td>Body Mass Index (kg/m²)</td>
<td>71</td>
<td>19.38</td>
<td>28.53</td>
<td>23.45</td>
<td>2.13</td>
</tr>
</tbody>
</table>

### Discussion

Dey, Khanna and Batra (1993) [2] conducted a study on 25 national Kabaddi players (of mean age 27.91 years), who attended a national camp at the Sports Authority of India, Bengaluru before the Beijing Asian Games in 1990. They have reported the mean body fat % as 17.56, which was found to be higher than normal sedentary people. Their physique tended a national camp at the Sports Authority of India, Ban
galore before the Beijing Asian Games in 1990. They have reported the mean body fat % as 17.56, which was found to be higher than normal sedentary people. Their physique was found to be endomorphic – mesomorph (3.8-5.2-1.7).

Khanna, et. al. (1996) [3] conducted a study to determine the physical and physiological profile of Kabaddi players and the physiological demands of playing a kabaddi match. Kabaddi players had the somatotype of 2.68-4.71-1.83, with absolute back strength of 175.0 kg. VO₂max and O₂ debt were 3.59 (0.36) litre min-¹ [47.82 (3.68) ml kg⁻¹ min⁻¹] and 5.3 (1.85) litres (70 ml kg⁻¹) respectively. They concluded that the Kabaddi is an intermittent sport. The rest pause during the game is sufficient for recovery. During raiding the main source of energy is anaerobic.

Kumar, Singh, Gore and Dhotre (2011) [4] conducted a study. The main purpose and objective of the study was to compare the Kabaddi and Kho-Kho players on the selected physical and mental abilities. The findings were – (i) the Kabaddi players group had more BMI showing greater body mass than the Kho-Kho players group; (ii) in the speed ability (40m sprint test) the Kho-Kho players group had better speed in comparison to the Kabaddi players group; (iii) the Kabaddi players group had high explosive strength, showing greater jumping ability than the Kho-Kho players group; (iv) in the Sit and Reach test the Kho-Kho players group had better hips and legs flexibility in comparison to the Kabaddi players group; (v) in one minute Sit-Ups test of muscular strength endurance the Kabaddi players group had better muscular strength endurance of abdomen muscles group, showing greater muscular endurance ability than the Kho-Kho players group; (vi) in the 12 minutes Run/Walk test of cardiovascular endurance the Kho-Kho players group had better cardiovascular endurance, showing greater heart and lungs capacity than the Kabaddi players group; and (vii) in the psychomotor ability the Kho-Kho players group had better psychomotor ability or eye hand coordination, proving better mental and physical coordination ability than the Kabaddi players group.

Kabaddi is a game which combines the actions of wrestling, judo, rugby and gymnastics. The important body movements in this game involve catching, holding, locking and jumping, thus the possession of desirable anthropometric and physiological characteristics will have a greater advantage in executing a better performance in competition.

As per report of Sodhi and Sidhu (1984) [5] Kabaddi players was almost similar to judo players but heavier than footballers, hockey players and boxers. They also reported that the total body fat percentage of the Kabaddi players was higher than judokas, boxers, weightlifters, wrestlers (except the heavyweight category) and footballers. The researchers also found that the mean height and weight of the Kabaddi players were higher than those of the average Indian population.

The result of the present study was in corroborated with the findings of previous studies.

### Conclusion

In selecting players for a Kabaddi team physical and anthropometrical characteristics as extracted in the study may be considered.

### Reference