



Comparative study of anthropometric characteristics between national and state-level Kabaddi players in Chhattisgarh

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Abstract

This study aimed to compare the anthropometric characteristics of national-level and state-level Kabaddi players from Chhattisgarh. A total of 40 male players were selected—20 national-level and 20 state-level—aged between 18 and 25 years. The anthropometric variables included height, weight, body mass index (BMI), arm length, leg length, and chest circumference. The data was statistically analysed using independent sample t-tests. Results revealed significant differences in height, weight, arm length, and chest circumference, with national-level players outperforming their state-level counterparts. These findings suggest that superior anthropometric attributes may contribute to higher performance in competitive Kabaddi.

Keywords: Kabaddi, Anthropometry, National Players, State Players

Introduction

Kabaddi is one of the most popular indigenous sports in India, combining elements of strength, agility, speed, endurance, and tactical intelligence. It is a combative team sport, requiring players to raid the opponent's half and return safely while tagging as many defenders as possible. The sport's physical nature demands optimal fitness and well-developed anthropometric profiles to perform at elite levels. Physical build, body proportions, and structural characteristics play a pivotal role in player selection and performance enhancement.

Anthropometry is the scientific study of body measurements and proportions. In the context of sports, anthropometric variables—such as height, weight, limb length, and body circumferences—are essential indicators of an athlete's potential for performance in specific roles and positions. In Kabaddi, different positions like raiders, defenders, and all-rounders may benefit from specific body types. For instance, a tall and muscular player may have an advantage in defence due to reach and strength, while a lean yet strong player might excel in raiding.

Understanding anthropometric differences between players of different performance levels (e.g., national vs. state) is essential for coaches, talent scouts, and physical educators. Such comparative studies help in identifying key physical traits that correlate with higher levels of success in the sport. They also assist in designing position-specific training regimes to enhance physical capacities suited to each role.

Chhattisgarh, being a growing hub for Kabaddi, has nurtured many players who have represented the state at national-level tournaments. However, limited research exists comparing the physical profiles of players competing at different levels within the region. Identifying how national-level Kabaddi players differ anthropometrically from their state-level counterparts can provide insights into the physical benchmarks required for elite performance.

Therefore, this study aims to conduct a comparative analysis of selected anthropometric characteristics between national and state-level Kabaddi players in Chhattisgarh. By doing

so, the research seeks to contribute to the growing body of sports science literature and aid in evidence-based talent identification and training planning in Kabaddi.

Methodology

Selection of Subjects

For this study researcher selected 40 kabaddi athlete National level (20) and state level (20) and age ranged between 18 to 30 years selected as randomly

Selection of variables

1. Height (cm)
2. Weight (kg)
3. Body Mass Index (BMI)
4. Arm Length (cm)
5. Leg Length (cm)
6. Chest Circumference (cm)

Criterion Measures

1. Stadiometer for height
2. Weighing scale for weight
3. Measuring tape for lengths and circumference
4. BMI was calculated using the formula

Test Procedures

1. Height Measurement

The subject stood erect against the stadiometer with feet together, heels touching the wall, and head in the Frankfort horizontal plane. Measurement was taken to the nearest 0.1 cm.

2. Weight Measurement

Participants stood still on the digital scale, evenly distributing their body weight. Reading was taken after stabilization to the nearest 0.1 kg.

3. BMI Calculation

BMI was calculated using the standard formula after recording weight and height.

4. Arm Length

Measured from the acromion process (tip of the shoulder) to the tip of the middle finger with the arm fully extended. Recorded in centimetres.

5. Leg Length

Measured from the anterior superior iliac spine (hip bone) to the medial malleolus (ankle bone). Subject stood upright during measurement.

6. Chest Circumference

Measured at the level of the nipples, with the subject standing upright and breathing normally. Measurement taken at the end of normal expiration.

Reliability and Validity

Each measurement was taken twice, and the average value was used for analysis to reduce error. Equipment was calibrated prior to testing. The same examiner recorded all measurements to ensure consistency and reduce inter-rater variability.

Statistical Analysis

The data collected was tabulated and subjected to statistical analysis. Descriptive analysis was done by computing means, standard deviations and independents ‘t’ test were applied to analyse the data.

Table 1: Mean and S.D. of Anthropometry between National and State Level Kabaddi players

Variable	National Mean ± SD	State Mean ± SD	t-value	p-value
Height (cm)	176.5 ± 4.2	172.8 ± 5.1	2.52	0.015*
Weight (kg)	72.3 ± 5.6	68.1 ± 6.2	2.29	0.026*
BMI (kg/m ²)	23.2 ± 1.8	22.8 ± 1.6	0.83	0.41
Arm Length (cm)	75.1 ± 3.2	71.9 ± 4.1	2.91	0.006*
Leg Length (cm)	101.3 ± 3.6	99.8 ± 4.2	1.24	0.22
Chest Circumference (cm)	96.2 ± 4.7	91.7 ± 5.3	2.92	0.006*

Results and Discussion

The results indicate that national-level players have significantly greater height, weight, arm length, and chest circumference than their state-level counterparts. These characteristics may offer advantages in reach, tackling ability, and overall physical dominance—essential components in Kabaddi performance.

Although BMI and leg length did not show significant differences, the trend suggests better physical build among national-level players.

These findings are consistent with previous research indicating that higher-level athletes often exhibit superior anthropometric profiles that align with the demands of their sport.

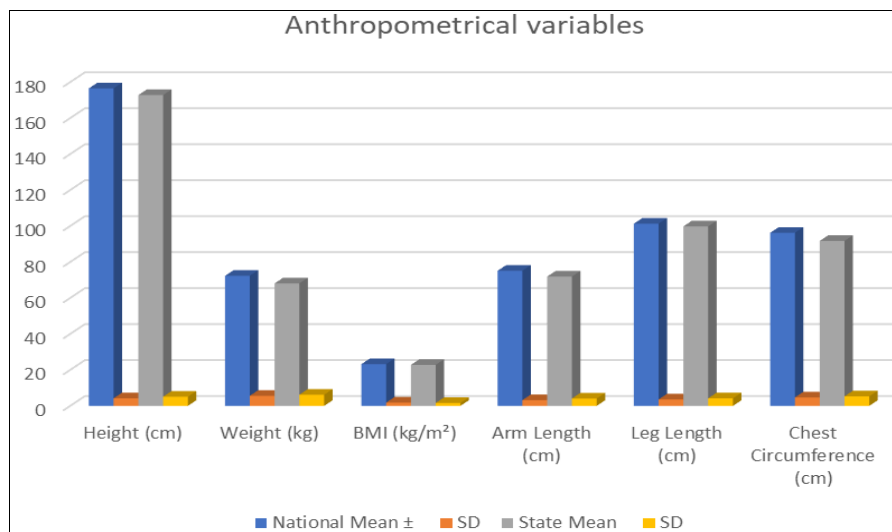


Fig 1: Graphical Representation of Anthropometrical Variables between Nation and State Level Kabaddi Players.

Conclusion

The results indicate that national-level players have significantly greater height, weight, arm length, and chest circumference than their state-level counterparts. These characteristics may offer advantages in reach, tackling ability, and overall physical dominance—essential components in Kabaddi performance. Although BMI and leg length did not show significant differences, the trend suggests better physical build among national-level players. These findings are consistent with previous research indicating that higher-level athletes often exhibit superior anthropometric profiles that align with the demands of their sport.

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