



## Morphological and physical fitness profile of kabaddi and non-kabaddi female players aged 14 to 17 years

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### Abstract

The present study has been conducted on one hundred thirty-six female kabaddi players and controls with the objectives to find out the difference in physique anthropometric status and body composition. Each subject has been measured anthropometrically by following the technique of Tanner *et al.* (1969). Somatotype was assessed by using the method of Heath and Carter (1967). The data was treated by applying “t” test

It was found that female kabaddi players of above 14 to 17 year of age group possessed significantly greater height, body weight, broad chest, lesser waist circumference, lower values of skin folds and greater biacromial breadth as compared to control group. They were more mesomorphic and lesser endomorphic than non kabaddi players.

The superior physique of female kabaddi players over the controls is undoubtedly clear from these results that female kabaddi players undergo intense sports training for a longer duration, develop physiological developments resulting finally in some morphological adaptation too.

**Keywords:** kabaddi players, physical fitness

### Introduction

Top performance in various sports and games is influenced by many factors such as level of physical abilities, techniques, physiological characteristics, psychological traits, and sociological factors. But there are some morphological characteristics which differentiate sportsperson from nonsports person. The system of modern coaching necessitates deep knowledge of all the sports sciences for imparting scientific coaching. The role of anthropometry as a sports science is very crucial. It is essential because, the physique and body composition are of fundamental importance in developing the criteria of talent selection and training in sports. Various researchers have found that different body size, shape and proportions are beneficial in different physical activities (Bramwell & Ellies 1931; Krakower 1935; Cureton 1933, 1941, 1951; Kroll 1954; Dupertius 1965; Hirata 1966, Malhotra *et al.* 1972; Sidhu and Sodhi 1970; Kansal *et al.* 1986; Sidhu *et al.* 1996; Singh 2001. Kanupriya *et al.* 2007 and Kaur, B. 2009) [1, 12, 13, 8, 14, 16, 9, 15, 17, 11]. They have come to conclusion that to excel in a physically competitive sport, the player must possess such dimensions of body characteristics which suit the most in his/her sport. So the present study is planned to find out difference between anthropometric characteristics, body composition and somatotype in female kabaddi players and controls. The analysis of result of this study will satisfy a unique two-fold need to identify accurately in a small population, the very best talent that exists for this indigenous sport on the basis of those determinants.

### Methodology

The present investigation was planned to determine anthropometric characteristics, body composition and

somatotype components of female kabaddi players and control. A total of one hundred thirty-six female kabaddi players and controls with age ranging between 14 to 17 years were selected as subjects from different training centres of Punjab. They were further divided in to two groups i.e. 68 female kabaddi players and rest 68 were control girls. Kabaddi players had participated at Distt. and state level of competitions in the last two year. Control group had not participated at any level of competition and were not participating in sports for the last two year.

All the measurements were taken on the subjects by following the standard anthropometric techniques worked out by Tanner *et al.* (1969) [18]. Somatotype was assessed by using the method of Heath and Carter (1967) [7]. The data have been tabulated in different tables. Each table of descriptive statistical constant enlist the mean value, standard deviation and ‘t’ value.

### Results and Discussion

Table 1 shows the distribution of mean values and standard deviations of different anthropometric measurements and body composition between female kabaddi players and controls aged 14 to 17 years. The results of mean body weight indicate kabaddi playing girls were significantly heavier and taller than non Kabaddi players. This may be because of the reason that, kabaddi girls are physically active than their counterparts.

There are many studies, which shows that regular training accelerates the growth process resulting increase in stature and weight (Godin 1920, Ekbohm 1969, Eriksson 1972). Sports girls have significantly broader shoulders wider femuri than non sports girls in all the age groups. The difference was

significant in three diameter. When comparisons were made between kabaddi and non-kabaddi players it was found that kabaddi girls possessed broader shoulders and femuri than non kabaddi players.

It has been observed that active kabaddi girls are significantly lighter, leaner having lesser waist and girth at all ages than inactive girls. The former also possess lower bim and waist to hip ratio values than latter. This may be the result of physical activity in former group as compared to later.

1. Non kabaddi girls possessed higher mean values of bicep, tricep, subscapular, suprailiac and calf skinfold measurements (5.70 mm, 7.86mm, 10.96mm, 11.57 mm and 12.68 mm respectively) than sports girls (5.63mm, 7.72mm, 10.22mm, 10.80mm and 12.03mm respectively), exhibiting significant differences in suprailiac skinfolds (t- value 2.44 and 2.05,  $P < 0.05$ ).
2. Kabaddi girls have lower values of skinfolds at all sites

than non sports girls in all the age groups. The difference was significant in some of the skinfolds.

3. Kabaddi girls have significantly lower percentage of body fat and consequently more percentage of lean body mass than control

It is interesting to observe that kabaddi girls on the average possessed low percentage of body fat (17.12) than non sports girls (18.34) the student "t" test further confirms the statistically significant difference (t-value = 2.00,  $P < 0.05$ ) between mean of two groups. Consequently kabaddi girls were leaner having greater lean body mass (82.88) than their counterparts (81.96%) and the difference is significant (t-value = 2.03,  $P < 0.05$ ). Our finding regarding the lower values of skinfold thickness in kabaddi girls agree with the results of Tanner (1964) who also stated the high performing level of athletes have lower values of skinfolds in their specific regions.

**Table 1:** Descriptive statistics of various anthropometric and body composition variables in kabaddi and non kabaddi player girls aged 14 to 17 years

Variables	Kabaddi Playing Girls (N=68)		Non Kabaddi Playing Girls (N=68)		t value
	Mean	SD	Mean	SD	
Weight (kg)	52.36	5.24	47.74	4.30	6.02**
Height (cm)	157.56	6.04	153.52	5.20	7.24**
Diameters (cm)					
Biacromial diameter	35.90	1.59	35.63	2.00	5.76**
Bicristal diameter	30.19	1.59	28.68	1.88	1.88
Humerus diameter	6.38	.23	6.13	.19	2.19*
Femur diameter	8.12	.44	7.80	.29	5.52**
Circumferences (cm)					
Waist circumference	62.57	2.2	66.36	2.65	8.05**
Bicep circumference	24.85	1.92	23.36	1.68	6.37**
Calf circumference	30.85	1.44	28.97	1.81	6.67**
Skinfolds (mm)					
Biceps skinfold	5.63	.47	5.70	.58	.39
Triceps skinfold	7.72	.91	7.86	1.61	.63
Subscapular skinfold	10.23	1.63	10.96	1.86	1.84*
Suprailiac skinfold	10.80	1.59	11.57	1.00	2.05*
Calf skinfold	12.03	.88	12.68	1.04	2.01
Body composition					
Body fat %	17.12	1.91	18.34	2.23	2.03*
Lean body mass %	82.88	1.91	81.66	2.23	2.03*

\* Significant at 0.05 level      \*\* Significant at 0.01 level

**Table 2:** Descriptive statistics of various somatotype components in kabaddi players and non kabaddi player girls aged 14 to 17 years

Components	Kabaddi Playing Girls (N=68)		Non Kabaddi Playing Girls (N=68)		t value
	Mean	SD	Mean	SD	
Endomorphy	3.11	.41	3.33	.34	2.20*
Mesomorphy	3.52	.98	3.27	.60	2.32*
Ectomorphy	2.18	1.56	2.21	1.26	.11

\* Significant at 0.01 level

Table 2 shows that the girls aged 14 to 17 years significantly differ on the different components of somatotyping. Kabaddi girls have 3.11-3.52-2.18 somatotype rating as compared to control girls 3.33-3.27-2.21. Kabaddi girls are Meso-Endo dominant somatotype (t = 2.32 and 2.20 and  $P < 0.05$ ). However no significant difference was observed in regards to ectomorphy components between these two groups.

### Conclusion

It is concluded that kabaddi playing girls have lower body fat, well developed shoulder and musculature body because of intense sports training for longer periods thus have high value of mesomorphy and lesser endomorphy. The long stature is of advantageous to the kabaddi players to give better range of movement during raid. Greater lean body mass contribute to

more power to make strong momentum against resistance while coming back to their own field. Her conduct was.

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