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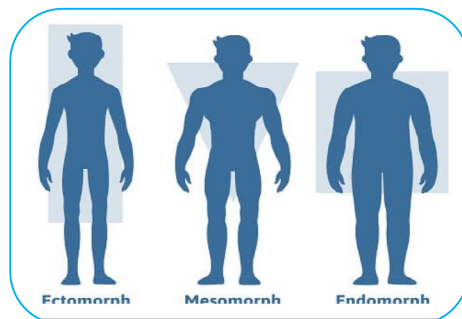
## THE COMPARATIVE STUDY OF BODY COMPOSITION AND BODY TYPES OF INTERCOLLEGIATE PLAYERS

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### ABSTRACT

The purpose of the study was to compare the Body Types and body composition between Inter collegiate players and control groups. 50 young male subjects (Basketball & Volleyball players: N= 25 & control groups: N= 25) of age group 18-25 years were randomly selected from the different colleges affiliated to Dr. B.R.A. University Agra. All the participants were assessed for height, weight, breadths, girths and skinfold thickness. The independent samples t-test revealed that Inter collegiate players had significantly higher height ( $p<0.05$ ), as compared to control groups. Basketball & Volleyball players were also found to have significantly greater lean body mass ( $p<0.01$ ) and ectomorphic component ( $p<0.05$ ) as compared to control groups. Control groups had significantly greater percent body fat and total body fat ( $p<0.05$ ) as compared to Basketball & Volleyball players. Further investigations are needed on above studied variables along with fitness and physiological variables to assess relationship among them and with performance in Basketball & Volleyball. The findings of the present study might be useful in future investigation on player selection, talent identification in the game of Basketball & Volleyball and its training programme development.



**KEYWORDS:** Body Types, Body Composition, Body Fat .

### INTRODUCTION

It was established that Basketball and Volleyball players compared to most other athletes have distinctive anthropomorphological characteristics. Basketball and Volleyball are fast playing game. These sports involving short and intensive physical efforts during training and competition . Basketball & Volleyball players fitness relies on their force, power output and jumping ability. To evaluate these physical characteristics, the anthropometric measurements, parameters of the body composition such as the percent body fat (% fat) and lean body mass (LBM) and somatotype components are often used. Sports performance is based in a complex and intricate diversity of variables which include physical, physiological, psychological and morphological and body type (somatic traits & body composition) factors. Basketball & Volleyball players must have great physical conditions especially related to somatic traits and body composition. Studies on the physical characteristics of the human body to-date indicate that the morphological characteristics of athletes play vital role in success in a specific sport. Body height, being the most characteristic trait of Basketball & Volleyball players is significantly conditioned genetically. External factors including training and starting loads do not influence this variable. Higher body mass however, is a hurdle for players in achieving good jumping height. Somatic

conditions are necessary to attain top sports level have to be brought about in a long and timeconsuming process of selection whereas the harmony of somatic traits and other elements specific for Basketball & volleyball is developed during many years of training . It requires being tall and having a high jumping ability. Examinations showed that body fat affects the jumping ability. Various researchers suggested that different body size, shape and proportions are beneficial in different physical activities. The present study, therefore, has been conducted on Inter collegiate players and controls to evaluate their Body type and body composition.

### METHODS AND EQUIPMENT

**Sample:** The present study was conducted on 50 young male subjects (Basketball & Volleyball players: N=25 & controls: N=25) of 18-25 years age. The subjects were randomly selected from the different colleges affiliated to Dr. B.R.A. Uni. Agra Uttar Pradesh, India. A written consent was obtained from the subjects. The study was approved by the local ethical committee.

**Anthropometric measurements:** The age of each subject was calculated from the date of birth as recorded in his institute. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. Skinfold thickness measurements of the subjects were measured by Slim guide skinfold caliper to the nearest 0.1 mm. Girths were taken with the steel tape to the nearest 0.5 cm. Widths of body parts were measured by using digital caliper.

### Statistical Analysis

Values are presented as mean values and SD. Independent samples t tests were used to test if population means estimated by two independent samples differed significantly.

### Results

Table 1 shows mean and standard deviation of Body Types between Inter collegiate players and control groups. In case of body weight difference between Basketball & Volleyball players and control group are found to be non significant. Basketball & Volleyball players significantly possess greater stature ( $p<0.01$ ) than controls. The result revealed that volleyball players were found to possess significantly low endomorphic ( $p<0.01$ ) rating but high rating of mesomorphic ( $p<0.01$ ) and ectomorphic ( $p<0.01$ ) components. It is evident from Table 2 that Basketball & Volleyball players have significantly greater values in percentage of lean body mass than the control group. The lean body mass contribute relatively more to body weight than body fat in Basketball & Volleyball players. Their training has resulted in muscular development in the Basketball & Volleyball which is supported by the fact that sufficiently the Basketball & Volleyball players have significantly lesser % body fat ( $p<0.01$ ) and BMI ( $p<0.01$ ) than the controls.

**Table 1**  
**MEAN VALUE & STANDARD DEVIATIONS OF BODY TYPES OF INTERCOLLEGIATE PLAYERS AND CONTROL GROUPS**

Variables	Volleyball players		Control Group		't' value
	Mean	SD	Mean	SD	
Height	182.70	6.35	172.10	4.50	6.61
BodyWeight	70.37	5.21	70.60	6.20	0.46
Endomorphy	2.40	0.86	3.65	1.06	4.33
Mesomorphy	4.3	1.10	3.23	0.98	3.38
Ectomorphy	3.70	1.36	1.98	0.95	4.97

Significant at 0.05 level of significance

**Table 2**  
**MEAN VALUES & STANDARD DEVIATIONS OF BODY COMPOSITION OF INTERCOLLEGIATE PLAYERS & CONTROL GROUPS**

Variables	Volleyball players		Control Group		't' value
	Mean	SD	Mean	SD	
<b>Total Body Fat</b>	9.01	2.90	11.57	3.01	2.97
<b>Lean Body Mass</b>	62.35	3.89	59.05	4.82	2.61
<b>% Body Fat</b>	12.50	3.35	16.26	3.35	3.81
<b>Body Mass Index</b>	21.46	2.13	23.85	2.05	3.95

Significant at 0.05 level of significance

**Somatotype was determined from the following equations:**

1. Endomorphy =  $-0.7182 + 0.1451(X) - 0.00068(X)^2 + 0.0000014(X)^3$
2. Mesomorphy =  $(0.858 \times \text{humerus width}) + (0.601 \times \text{femur width}) + (0.188 \times \text{corrected arm girth}) + (0.161 \times \text{corrected calf girth}) - (\text{body height} \times 0.131) + 4.5$ .
3. Ectomorphy =  $(\text{HWR} \times 0.732) - 28.58$  (Where HWR =  $(\text{body height in cm}) / (\text{weight in kg})^{1/3}$ ).

**The regression equations for the prediction of body density from the log of the sum of skinfold thickness at four sites in mm are as follows:**

For 17 to 19 years age group:  $\text{Body Density (gm/cc)} = 1.1620 - 0.0630(X)$  (Durnin & Womersley, 1974).

For 20 to 29 years age group:  $\text{Body Density (gm/cc)} = 1.1631 - 0.0632(X)$  (Durnin & Womersley, 1974)

Where  $X = \log(\text{biceps} + \text{triceps} + \text{subcapular} + \text{suprailliac})$ .  
 $\% \text{ body fat} = (4.95 / \text{body density} - 4.5) \times 100$   
 $\text{Total body fat (kg)} = (\% \text{ body fat} / 100) \times \text{body mass (kg)}$   
 $\text{Lean body mass (kg)} = \text{body mass (kg)} - \text{total body fat (kg)}$   
 $\text{BMI (Kg/m}^2) = (\text{body mass in Kg}) / (\text{Stature in meters})^2$

**DISCUSSION**

In the present study the Body Types and body composition of the Inter collegiate players and control groups have been evaluated and compared with each other. This study indicates the existence of differences among the Inter collegiate players and control groups. The overall results show that Basketball & Volleyball players were taller as compared to the control groups. Therefore, the presence of tall players is an indispensable factor in the success of Both games. The Basketball & Volleyball players in the present study have greater height and percentage of lean body mass than the controls. It is important to highlight that there were no significant differences in body weight between Basketball & Volleyball players and control groups. The Basketball & Volleyball players also reported to have greater values in lean body mass than the control group. This parameter, including all body tissues except for fat deposits, is considered a major precondition for a good performance in Basketball & Volleyball. The Basketball & Volleyball players in the present study have greater height and percentage of lean body mass. The somatotyping scores of volleyball players in the present study are 2.4- 4.2-3.6 and they are reported as mesomorph-ectomorph. The observations in the present investigation reflected higher fatness among non-sportspersons than sportspersons, In addition, according to body mass index (BMI) results strongly suggest that the controls had greater amount of body fat mass compared to Basketball & Volleyball players. Based on the results of the present study, we highlight somatic traits and body composition characteristics of volleyball players as compare to control groups. In Basketball & Volleyball game, anthropometric characteristics, somatic traits, body composition together with physiological, technical, and psychological variables account for performance or selection of players.

## CONCLUSION

There were significant differences in somatic traits and body composition between the Basketball & Volleyball players and control groups. The Basketball & Volleyball players were significantly taller and had less amount of subcutaneous tissue with more ectomorphic component than the control groups. The Basketball & Volleyball players also had higher lean body mass than the controls. The percent body fat and total body fat were also lesser in Basketball & Volleyball players. More data would be helpful on the above studied variables along with fitness and physiological variables to assess relationship among them and with performance in Basketball & Volleyball. Practical applications The data presented here will serve as reference for the somatic traits and body composition for university level Basketball & Volleyball players. The present study will help coaches to understand the somatic traits and body composition characteristics for selecting Basketball & Volleyball players.

## REFERENCES:

- Marques MC and Marinho DA (2009) Physical parameters and performance values in starters and nonstarters volleyball players: A brief research note. *Motricidade*. 5(3), 7-11.
- Kansal DK, Gupta N and Gupta AK (1986) A study of intrasport differences in physique of Indian University football players. In: James APD (ed.) *Perspectives in kinanthropometry, human kinetics publishers, champaign*.
- Driss T, Vandewalle H and Monod H (1998) Maximal power and force velocity relationships during cycling and cranking exercises in volleyball players. Correlation with the vertical jump test. *J. Sports Med. Phys. Fitness*. 38(4), 286–293.
- Gabbett TJ (2008) Do skill-based conditioning games offer a specific training stimulus for junior elite volleyball players? *J. Strength Conditioning*. 22(2), 509-517.
- Kansal DK, Gupta N and Gupta AK (1986) A study of intrasport differences in physique of Indian University football players. In: James APD (ed.) *Perspectives in kinanthropometry, human kinetics publishers, champaign*.