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A Comparative Study of Body Builders and Weight Lifters on Somatotypes

Mohd. Imran
Corresponding Author
Department of Physical Health and Sports Education,
Aligarh Muslim University, Aligarh, 202002, (U.P.), India.
E-mail: imranphe09@yahoo.com.in

Ikram Hussain
Department of Physical Health and Sports Education,
Aligarh Muslim University, Aligarh, 202002, (U.P.), India.
E-mail: ikram.husain@gmail.com

S. Tariq Murtaza
Department of Physical Health and Sports Education,
Aligarh Muslim University, Aligarh, 202002, (U.P.), India.
E-mail: abunaraashans@yahoo.co.in

Farkhunda Jabin
Department of Hifzane Sehat Wa, Samaji Tibb, Faculty of Unani Medicine,
Aligarh Muslim University, Aligarh, 202002, (U.P.), India.
E-mail: far.khun.da@hotmail.com

Mohd. Arshad Bari
Department of Physical Health and Sports Education,
Aligarh Muslim University, Aligarh, 202002, (U.P.), India.
E-mail: sbiomech90@gmail.com

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Abstract:

The purpose of the present study was to compare the somatotypes of Body Builders and Weight Lifters. The total fifty (25 body builders and 25 weight lifters) male All-India intervarsity players were selected for this study. The age of the subjects were ranged between 18 to 25 years. The data on somatotypes of the subjects were obtained by using the Carter and Heath method, developed by Carter and Heath (1990). The t test was used to determine the difference between the mean score of the body builders and weight lifters. Results revealed that there was a significant difference between body builders and weight lifters at 0.05 level of significance with 48 degree of freedom. The result of the study showed that there was a significant difference between body builders and weight lifters of their endomorph. Weightlifters are tend to have more fat percentage as compared to bodybuilders. There was not much difference found in the mesomorphy status of the bodybuilders and weightlifters but the bodybuilders showed slightly more musculature than the weightlifters and in the ectomorphy status bodybuilders tend to be more ectomorph than weightlifters.

Keyword: somatotypes, endomorph, mesomorph, ectomorph, body builders and weight lifters.

1.Introduction:

Now a days there are many methods for studying the somatotypes of an individuals. The interest in body type or physique of individuals and populations has a long history going back to the ancient Greeks, Rome and India. Many systems for classifying physique have been proposed over the centuries, leading to the system called somatotypes as proposed by Sheldon (1940), and subsequently modified by others, notably Parnell (1958) and Heath and Carter (1967). The somatotype is defined as the quantification of the present shape and composition of the human body. Sheldon believed that somatotype was a fixed or genetic characteristics, but the present view is that the somatotype is phenotypical and thus amenable to change under the influence of growth, aging, exercise and nutrition (Carter and Heath 1990). Among these, Heath and Carter somatotype method is one of the comprehensive evaluation methods. Using this method 10 items of anthropometric indicators are selected and three factors which could be to represent relative content of body fat, growth degree of skeletal muscle and relative height and thinness of body (relative line degree), respectively are calculated. Due to the advantages of being easy and accurate, this method has been widely used for assessing the somatotype. It is expressed in a three-number rating representing endomorphy, mesomorphy and ectomorphy components respectively, always in the same order. Endomorphy is the relative fatness, mesomorphy is the relative musculo-skeletal robustness, and ectomorphy is the relative linearity or slenderness of a physique. For example, a 3-5-2 rating is recorded in this manner and is read as three, five, and two. These numbers give the magnitude of each of the three components. Ratings on each component of ½ to 2½ are considered low, 3 to 5 are moderate, 5½ to 7 are high, and 7½ and above are very high (Carter & Heath, 1990).

2. Methodology

2.1Subjects:

A total of fifty (25 Body Builders and 25 Weight Lifters) male All-India intervarsity level players were randomly selected for this study. The age of the selected subjects were ranged between 19 to 25 years.

2.2Procedure:

By using Heath Carter Somatotypes method, ten anthropometric measurements were taken which were as follows:

i) Standing Height, ii) Body Weight, iii) Biepicondylar Humerus Diameter, iv) Biepicondylar Femur Diameter, v) Biceps Muscle Girth, vi) Calf Muscle Girth, vii) Triceps Skin Fold, viii) Sub Scapular Skin Fold, ix) Supraspinale Skin Fold, x) Medial Calf Skin Fold.

Each indicator was measured twice and the average was taken.

2.3Somatotype in Gradings

All the three components of somatotypes were calculated with the following formulae:

(a) Endomorphy:

Endomorphy= $-0.7182 + 0.1451 * \Sigma SF - 0.00068 * \Sigma SF^2 + 0.0000014 * \Sigma SF^3$

[Where ΣSF = (sum of triceps, sub scapular and supraspinale skin folds) multiplied by (170.18/height in centimeter).This is called height-corrected endomorphy and is the preferred method for calculating endomorphy.

(b) Mesomorphy:

The equation used to calculate mesomorphy is Mesomorphy =0.858 * humerus breadth + 0.601 * femur breadth + 0.188 * corrected arm girth + 0.161 * corrected calf girth – height * 0.131 + 4.5

(Subtract the triceps skin fold and calf skin fold from the arm girth and calf girth, respectively).

(c) Ectomorphy:

Ectomorphy was determined by comparing the HWR ratio with following underlined values.

$$\text{HWR} = \frac{Heigth\ in\ cm}{\sqrt[3]{Weight\ in\ Kg}}$$

- If HWR is greater than or equal to 40.75 than ectomorphy
  = 0.732 * HWR – 28.58
- If HWR is less than 40.75 and greater than 38.25 then ectomorphy = 0.463 * HWR – 17.63
- If HWR is equal to or less than 38.25 than ectomorphy = 0.1

2.4 Statistical Analysis

The t test was used to determine the differences between the means of Body Builders and Weight Lifters score. Further the level of significance was set at 0.05 levels with 48 degree of freedom.

3. Results:

Table 1: Descriptive statistics of the somatotypes of body builders and weight lifters

	Body Builders		**Weight Lifters**	
Somatotypes	Mean	SD	Mean	SD
Endomorph	2.90	0.49	3.23	0.72
Mesomorph	5.95	0.92	5.47	0.97
Ectomorph	1.56	1.19	1.38	1.12

Figure 1: Graphical representation of comparison of means of the somatotype between bodybuilders and weight lifters.

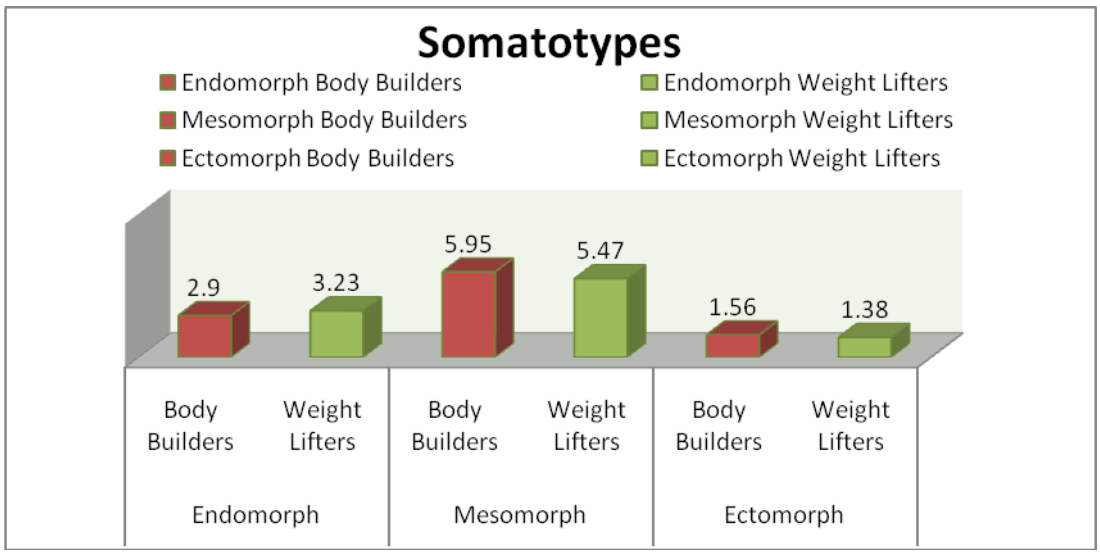


Table 2: Indicating mean difference of Endomorph between body builders and weight lifters.

	Mean	SD	Cal t
Body Builders	2.90	0.49	5.53*
Weight Lifters	3.23	0.72	

*Significant at 0.05 level of significance Tab t = 2.021

Table-2 indicated that there was a significant difference between body builders and weight lifters of their Endomorph at 0.05 level of significant with 48 degree of freedom.

Figure 2: Graphical representation of comparison of mean of the Endomorph between body builders and weight lifters.

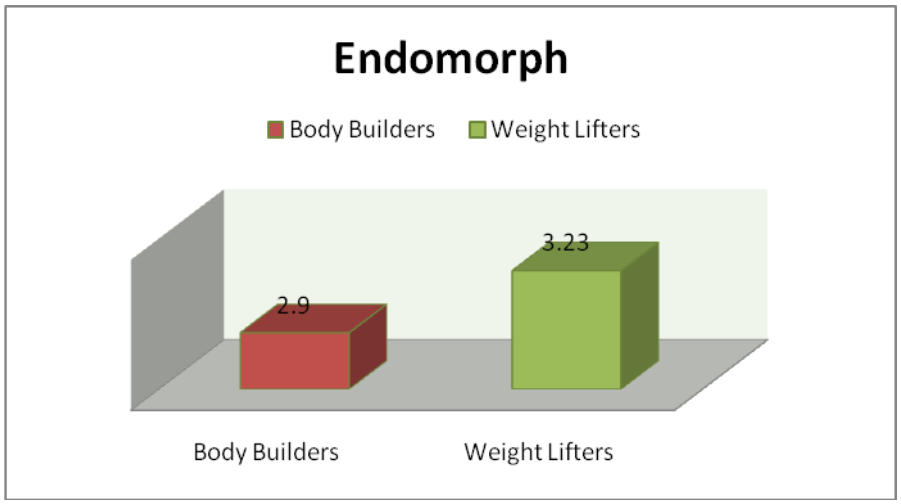


Table 3: Indicating mean difference of Mesomorph between body builders and weight lifters

	Mean	SD	Cal t
Body Builders	5.95	0.92	1.656
Weight Lifters	5.47	0.97	

*Significant at 0.05 level of significance Tab t = 2.021

An insignificant difference was documented between body builders and weight lifters of their mesomorph at 0.05 level of significant with 48 degree of freedom.

Figure 3: Graphical representation of comparison of mean of the Mesomorph between body builders and weight lifters.

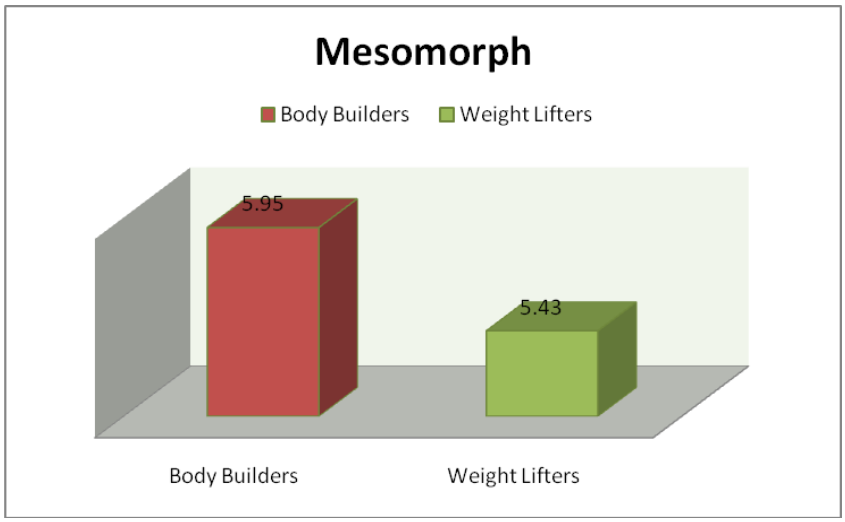


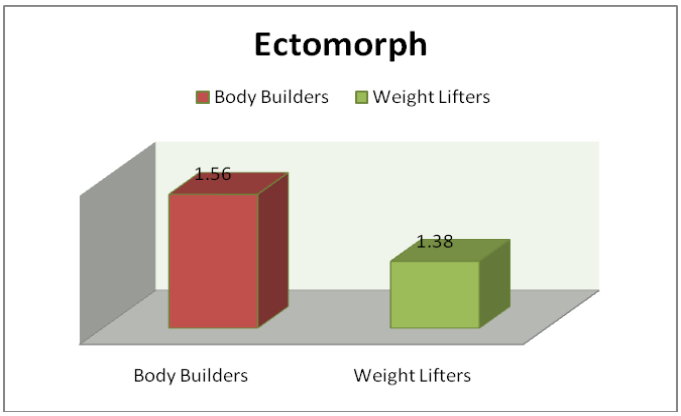
Table 4: Indicating mean difference of Ectomorph between body builders and weight lifters

	Mean	SD	Cal t
Body Builders	1.56	1.19	3.42*
Weight Lifters	1.38	1.12	

*Significant at 0.05 level of significance Tab t = 2.02

It is evidenced from the Table 4 that significant difference was found between body builders and weight lifters of their ectomorph at 0.05 level of significant with 48 degree of freedom.

Figure 4: Graphical representation of comparison of mean of the ectomorph between body builders and weight lifters.



4. Discussion:

The result of the study showed that there was a significant endomorphic difference between body builders and weight lifters. Weightlifters tend to have more fat percentage than body builders because of the two facts pertaining to their sport: 1) Weightlifters need extra mass to counteract the weight lifted during the competition, which primarily comes from fat depots, and 2) the main purpose of the weightlifter is to lift the maximum weight during the event, i.e. winning of competitions for the weightlifters do not come from their body prettiness and pleasant appearance but brute strength is required.

The result of the study showed that insignificant mean difference was documented between body builders and weight lifters in terms of their mesomorph. There was not much difference in the mesomorphy status of the bodybuilders and weightlifters but the body builders showed more musculature than weightlifters. Because both athletes need more musculature in order to compete satisfactorily (Christopher, Deborah & Allen, 2002), but bodybuilders tend to have more musculature as their whole performance is dependent on it.

The result of the study revealed that significant mean difference was found between body builders and weight lifters in terms of their ectomorph. This finding is also in concordance with all the preceding findings (Christopher, Deborah & Allen, 2002) as body builders tend to be more ectomorph than weightlifters due to the requirement of their sport.

5. Conclusion

On the basis of obtained results it is concluded that there was a statistical significant difference between body builders and weight lifters in their Endomorph and Ectomorph. Insignificant difference found in Ectomorph of Body Builders and Weight Lifters.

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