Comparison of Body Composition and Physique of Judokas and Wrestlers

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ABSTRACT

The present investigation has been conducted with an aim to find out difference in body composition and physique of judokas (n=50) and wrestlers (n=50). The data for the present study were collected during the inter-college competitions of Himachal Pradesh University, in the academic session 2008-2009.

Each athlete was tested for various anthropometric measurements necessary for estimation of bone mass, muscle mass, body fat percentage and somatotype. The muscle and bone masse of each athlete was estimated using Matiegka's (1921) method; body density was estimated by using Durnin & Womersley's (1974) Equation; body fat percentage was estimated by using formula devised by Brozek et al (1963). Heath and Carter (1990) Somatotype Method was used to get the three components of somatotype. To compare the body composition and physique between judokas and wrestlers, the 't' test was applied.

The results indicated that judokas were older, taller, and heavier than wrestlers. It has been also found that judokas were more developed in bone mass, muscle mass and possess more body fat percentage, more endomorphic and mesomorphic, and less ectomorphic than wrestlers. The results also revealed that there was significant difference in age, fat percentage and endomorphy component between judokas and wrestlers.

INTRODUCTION

By nature human being are competitive and ambitious for the excellence in all athletic performances. Not only every man but also every nation wants to show his supremacy by challenging the other nation. This can only be possible through scientific, systematic and planned sports participation, as well as, by finding out their potentialities. The success and failure of an individual athlete depends upon the

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blending of physical ability, conditioning, training, body types, body composition, mental preparation and the ability to perform well under pressure.

Parnell (1954) and Hebbelink (1985) suggested that good results, in sports, cannot be achieved if the biological features, particularly the somatic ones, are unsatisfactory. Body fat percentage of Indian trained children, elite group sportsperson, and children of different countries, have been reported by Majumdar (1989). Peak performance age, in different sports disciplines, is associated with the time to start sport training, in a particular sport discipline, and time required to develop the necessary conditional, tactical, technical and sports performance. With regards to weight, height, body size and body composition, certain dimension is necessary, for success in selected events and sports. Age, height, body weight, body size and body composition of the Olympics, international and national athletes have been a subject of great interest for many research workers (Tanner, 1964; Claessens & Lefevra, 1998; Guladi & Zaccagani, 2001; Kawashima, Kat & Miyazaki, 2003). Researchers have reported anthropometric data on Olympic athletes and revealed that suitable physique plays a predominant role for success in sports. Debnath & Bawa, 1990; Kaur et al., 2002; Bajpai & Uppal, 2003; and Chauhan, 2004; have reported data on national athletes.

The physical structure, worked out, can be used as a tool of talent hunt for a particular game or sport. Training of some sports has to begin at an early age so as to have any hope of reaching to the top. Training every individual as to be a future champion may be futile exercise. While selecting player for any event, physical structure of top most achievers or the profiles of high level performers of that event could be considered as a model. In the light of such a situation future champions can be selected and trained. Keeping all this in view, the present scientific study; focused on the study of body composition and physique among judokas and wrestlers of Himachal Pradesh University.

METHODOLOGY

Purposive random sampling procedure was adopted by the investigator for the collection of data. The sample of the present study comprised of judokas (n=50) and wrestlers (n=50), who had participated in inter-college level competition of Himachal Pradesh University, during the session 2008-2009. Their Age group ranged from 18-25 years. Each athlete was tested for various anthropometric measurements necessary for estimations of bone mass, muscle mass, body fat per centage and somatotype. A set of anthropometric measurements, which included height, body weight, bicondylar widths of humerus, femur, wrist and ankle, the circumference of upper arm, forearm, thigh and calf and the skin folds at biceps, triceps, forearm, thigh, calf (medial), supra-iliac and subscapular sites, were taken on each subject, by following standard technique of Heath and Carter (1967). The muscle and bone masses of each athlete was estimated using Matiegka's (1921) Method. The

body density was estimated by using Durnin and Womersley's (1974) Equation; body fat was estimated by using formula devised by Brozek et al 1963; and Heath and Carter (1990) Somatotype Method was used to get the three components of somatotype. To test the significance of mean difference among the judokas and wrestlers, the 't' test was applied.

RESULT & DISCUSSION

Table-1 : Comparison of age, height and weight between judokas and wrestlers.

Variables	Judokas (N=50)			Wrestlers (N=50)			t ratio
	Mean	S.D	S.E.M	Mean	S.D	S.E.M	
Age (Yrs.)	20.5	1.68	0.24	19.58	1.18	0.17	3.16**
Height (Cm.)	170.04	7.51	1.06	169.26	6.10	0.85	0.57
Weight (Kg.)	68.66	13.33	1.88	64.06	10.81	1.52	1.89

** Significant at .05 level;* *** Significant at .01 level*

Table 1 depicts the mean, standard deviation and S.E.M value of age, height and weight of judokas and wrestlers. It was observed that judokas were older, taller and heavier than the wrestlers. It was also revealed, that there was significant difference between judokas' and wrestlers' mean scores on age because the obtained (t) ratio value (t=3.16) was found to be more than the required 't' value (2.63), to be significant at .01 level of confidence. However, in height and weight they showed non-significant difference between each other because the obtained (t) ratio value (for height, t=.57 and for weight, t=1.89) was found to be less than their required 't' value (1.98), to be significant at .05 level of confidence. This indicates that judokas were older than wrestlers but almost same in height and weight.

Table-2 : Comparison of body composition between judokas and wrestlers.

Variables	Judokas (N=50)			Wrestlers (N=50)			t ratio Mean
	Mean	S.D	S.E.M	Mean	S.D	S.E.M	
Bone Mass (Kg.)	10.24	1.39	0.19	10.19	1.88	0.27	0.17
Muscle Mass (Kg.)	31.19	5.13	0.73	29.89	4.93	0.70	1.29
Fat Percentage(%)	14.15	5.65	0.80	11.16	4.05	0.57	2.53*

** Significant at .05 level;* *** Significant at .01 level*

Table 2 depicts the mean, S.D. and SEM value of bone mass, muscle mass and fat per centage of judokas and wrestlers. It was observed that judokas were heavier in bone mass and muscle mass, and fattier than wrestlers. It was also revealed that there was no significant difference between judokas' and wrestlers' mean scores on bone mass and muscle mass because the obtained (t) ratio value (for bone mass, t=.17 and muscle mass, t=1.29) was found to be much smaller than their required 't' value (1.98), to be significant at .05 level of confidence. However, in fat percentage, they showed significant difference between each other because the obtained (t) ratio value (t=2.53) was found to be more than their required 't' value (1.98), to be significant at .05 level of confidence. This indicates that judokas and wrestlers were more or less same in bone mass and muscle mass but judokas possessed more fat percentage.

Table-3 : Comparison of somatotype between judokas and wrestlers

Variables	Judokas (N=50)			Wrestlers (N=50)			t ratio
	Mean	S.D	S.E.M	Mean	S.D	S.E.M	
Endomorphy	2.36	1.27	0.18	1.80	0.74	0.10	2.76**
Mesomorphy	4.59	1.38	0.20	4.43	1.10	0.16	0.66
Ectomorphy	2.00	1.75	0.25	2.52	1.24	0.18	1.72

** Significant at .05 level:* *** Significant at .01 level*

Table 3 depicts the mean, S.D. and SEM value of somatotype of judokas and wrestlers. It was observed that judokas were more endomorphic and mesomorphic, and less ectomorphic than wrestlers. It also revealed that there was significant difference between judokas' and wrestlers' mean scores on endomorphy because the obtained (t) ratio value (t=2.76) was found to be more than the required 't' value (2.63), to be significant at .01 level of confidence. However, in mesomorphy and ectomorphy, they show non-significant difference between each other because the obtained (t) ratio value (for mesomorphy, t=0.66 and ectomorphy, t=1.72) was found to be less than their required 't' value (1.98), to be significant at .05 level of confidence. This indicated that the judokas were heavier and better developed than wrestlers but wrestlers were comparatively leaner in physique than the judokas.

It has been found that judokas were older, taller and heavier than wrestlers. There was significant difference established between the judokas and wrestlers in age. However, there was no significant difference in height and weight between them. This indicated that judokas were older than wrestlers but almost same in height and weight.

Judokas had more bone development, muscle development and possessed greater fat percentage than wrestlers. There was significant difference established between the judokas and wrestlers in body fat per centage. However, there was no significant difference in bone mass and muscle mass between them. This indicated that types of activity or exercise do not affect the bone mass and muscle mass but increase and decrease the body fat percentage.

The mean somatotype of judokas were 2.37-4.59-2.0, they were balanced mesomorph. The result of Mathur et al (1985) does not correspond with the results of present study. They reported that judokas were endomesomorphs and had the mean somatotype 3.6-5.1-2.6. The mean somatotype of wrestlers were 1.80-4.43-2.52. They were ectomorphic-mesomorph. The results of present study are in line with the results of Kroll's (1954) and Kaur (2000). They reported that wrestlers were ectomorphic mesomorph, and had the mean somatotype of 2.7-5.0-3.8 and 1.85-4.57-2.61, respectively. There was significant difference established between the judokas and wrestlers in endomorph component. However, there was no significant difference in mesomorphic and ectomorphic component between them. This indicates that judokas were heavier and better developed than wrestlers but wrestlers have comparatively leaner physique than judokas.

CONCLUSION

Based on the finding of the study, the following conclusions have been drawn.

1. Judokas were older in age, taller in height and heavier in weight than the wrestlers and the difference was found significant only in age.
2. Judokas possessed significantly greater amount of subcutaneous fat than wrestlers. However, they did not differ significantly in bone mass and muscle mass, when compared with each other.
3. The mean somatotypes of judokas were 2.37-4.59-2.0. They were balanced mesomorph. The average somatotypes of wrestlers were 1.80-4.43-2.52. They were ectomorphic-mesomorph. The judokas were dominant on endomorph and mesomorph component than wrestlers and difference was found significant in endomorph. Wrestlers were more ectomorphic than judokas.

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