A study of physique and body fat of National women wrestlers of different weight groups.

ABSTRACT

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The present cross-sectional anthropometric study has been conducted on 18 elite Indian National women wrestlers ranging in age from 20 to 31 years. Wrestlers were divided into different weight groups by considering body weight between two weight categories e.g. 51.5 to 55.4 as 51-55 weight group, 55.5 to 59.4 as 55-59 kg group, respectively. Data were collected during training camp in January, 2013. Majority of women wrestlers differ in body weight than their weight category because of training camp (Not in competition). So, weight categories were not followed, only body weight above weight category and below next weight category were clubbed a group i.e. 51 category above weights and 55 category below weights were grouped as 51-55 group. Somatotype components were computed through equations of Carter (1980). Body density was assessed through equations of Durnin & Womersley (1974). Body fat was assessed by formulae of Brozek et al. (1963). Women wrestlers of Weight group 51-55 were about 2cm shorter than 55-59 kg group whereas 59 to 72 kg groups resembles in height. F test indicates that women wrestlers do not differ significantly in height, endomorphic component of somatotype and percent body fat. The trend of increase in height with increasing body weight from 59 to 72 kg body weight is lacking.

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INTRODUCTION

Height, body weight, somatotype and percent body fat studies in different sports (Carter 1984; 1985; 2003; Carter et al., 1990; 2005; Eiben, 1985; de Garray et al. 1974; Tanner 1964) are well documented by Sodhi & Sidhu (1984) in a book on Physique and Selection of sportsmen. Most studies indicate that high performers are more mesomorpic and lesser endomorphic than low performers and heavy weight players to be taller than lower weight players. Morphological studies on women wrestlers are lacking. Keeping, this in view the present study was carried out on elite female Indian national wrestlers.

MATERIALS AND METHODS

The present cross-sectional anthropometric study has been conducted on 18 elite Indian female wrestlers with 20-30 year age range. The data were collected in January 2013. Most of the wrestlers possess more body weight than their weight category during training camp (Normally weight categories are finalized at the time of competition or at the time of selection for tournament). Therefore, weights between two categories were clubbed so that groups do not represent over weight. For example, 51-55kg weight group of wrestlers consists of overweight for 51 weight category but below 55 weight category. Thus, one category above body weight and next category below has been considered as a weight group. Anthropometric measurements were taken on right side of body by following standard techniques of Ross et al. (1978) using standard instruments. Somatotype components were computed according to equations of Carter (1980). Body density was calculated by equations of Durnin and Womersley (1974). Percent body fat was assessed through formulae of Brozek et al. (1963).

Mean and standard deviation were computed in Microsoft excel. Analysis of variance and post-hoc tests were used for interpretation of findings.

RESULTS AND DISCUSSION

Table 1 shows the mean, standard deviations of height, body weight, somatotype components and percent body fat. It is found that body height increases about 2 cm from 51-55 kg group to 55-59 kg group. Other weight groups almost resembles in body height. The F ratio has been found non-significant (2.044, Table 2). The increasing trend of body height is lacking in women wrestlers of 59-72 kg weights. Studies in women wrestlers are lacking to establish height trend from lower weight categories to upper weight categories. However, in male wrestlers the

increase in body height from lighter to heavier weight categories was reported by Sodhi & Sidhu (1984). The results of body weight show statistically significant differences (F= 58.585, Table 2). Wrestler of 51-55 kg weight group has been found significantly lighter than 67-72 kg group as indicated by post-hoc test (Table 3). Other weight groups show non-significant differences.

Endomorphy increases from lower weight categories to upper weight categories (Table 1). But the differences were non-significant statistically among women wrestlers (F= 2.438, Table 2). Therefore women wrestlers have similarity in endomorphic component (degree of fatness). Mesomorphy increases from lower weights to higher weights. F ratio indicate significant differences (F= 5.078*, Table 2). However, significant differences occur between 51-55 and 67-72 kg weight groups (Table-3). This trend is in line with somatotye studies of athletes (de garray

Table-1 Height, body weight, somatotype and percent body fat in National women wrestlers of different weight groups.

Weight group (kg)	Statistics	51-55 kg (N=3)	55-59 kg (N=3)	59-63 kg (N=3)	63-67 kg (N=4)	67-72kg (N=5)
Height (cm)	Mean	156.5	158.67	161.63	161.7	161.36
	SD	2.4	0.72	2.41	2.94	3.92
Body weight (kg)	Mean	53.63	58.03	61.0	66.52	69.9
	SD	1.55	1.05	1.73	1.02	2.19
Endomorphy	Mean	3.54	3.63	3.87	4.73	4.40
	SD	0.32	0.69	0.83	0.78	0.42
Mesomorphy	Mean	5.29	5.79	5.41	6.33	6.56
	SD	0.13	0.15	0.58	0.72	0.42
Ectomorphy	Mean	1.80	1.42	1.48	0.64	0.39
	SD	0.58	0.10	0.67	0.68	0.48
Body fat (%)	Mean	23.07	21.17	23.97	27.98	26.21
	SD	1.19	5.72	4.35	2.73	3.16

et al., 1974, Carter & Heath 1990). Ectomorphy decreases with increase in weight group. Maximum ectomophy has been found in weight group 51-55 kg whereas minimum in 67-72kg (Table 1). F ratio indicates significant differences among wresters in ectomorphy (F=4.558, Table 2). Ectomorphy represents height

Table-2 : Analysis of Variance among different classes of women wrestlers

Parameter	Source of Variance	SS	Df	MS	F	P
Height	Between Sample	70.184	4	17.546	2.044	0.147
	Within Sample	111.57	13	8.582		
	Total	181.754	17			
Weight	Between Sample	636.979	4	159.245	58.585*	0.0
	Within Sample	35.336	13	2.718		
	Total	672.315	17			
Endomorphy	Between Sample	3.795	4	0.949	2.438	0.100
	Within Sample	5.059	13	0.389		
	Total	8.854	17			
Mesomorphy	Between Sample	4.669	4	1.167	5.078*	0.011
	Within Sample	2.988	13	0.230		
	Total	7.657	17			
Ectomorphy	Between Sample	5.466	4	1.366	4.558*	0.016
	Within Sample	3.897	13	0.300		
	Total	9.363	17			
% Fat	Between Sample	100.734	4	25.184	1.944	0.163
	Within Sample	168.415	13	12.955		
	Total	269.150	17			

Significant f value at 5% = 2.96

and body weight. The significant differences are due to lesser change in body height as compared to body weight from lower weight groups to higher weight groups.

Body fat has been found maximum in wrestlers of 63-67 kg group (27.98%), whereas minimum in 55-59 kg group (21.17%). F ratio shows statistically non-significant differences among wrestlers (F= 1.944, Table 2). Thus, wrestlers resembles in body fat.

Table-3 : Post-hoc test among different weight groups of women wrestlers.

Weight group (kg)	Body Weight	Mesomorphy	Ectomorphy
51-55 vs 55-59	1.05	1.35	0.955
51-55 vs 59-63	1.65	0.272	0.81
51-55 vs 63-67	2.70	2.56	2.63
51-55 vs 67-72	4.46*	3.34*	3.39*
55-59 vs 59-63	0.575	0.86	0.12
55-59 vs 63-67	1.78	1.33	1.77
55-59 vs 67-72	2.66	1.99	2.47
59-63 vs 63-67	1.16	2.26	1.92
59-63 vs 67-72	1.99	2.99	2.62
63-67 vs 67-72	0.80	0.61	0.61

CONCLUSIONS

It is concluded that women wrestler resembles in height, endomorphic component of somatotype and percent body fat statistically. However, statistical differences have been observed in body weight, mesomorphic and ectomorphic components of somatotype.

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