MAXIMUM STRENGTH PARAMETERS OF INDIAN MALE HAMMER THROWERS OF DIFFERENT PERFORMANCE LEVELS

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ABSTRACT

The present study have been conducted on male hammer throwers (n=60) of India, categorized under five different performance level Groups. Five physical fitness tests of maximum strength were taken with standard techniques. Results reveals that higher maximum strength in bench press and front squat of male hammer throwers were reported in Group V (Bench press: 106± 25.5 & Front squat: 158.2± 24) and lower Bench press in Group I (76.54±28.1) and Front squat (106.4± 34.1) respectively. On applying Anova, the f ratio value was found significant difference in bench press, front squat among all five groups. Mean dead lift (kg) of present study Hammer throwers was ranging from 203.3 to 124.6 kg and shown significant F-ratio (13.78) at 1% level. Snatch and Clean was recorded maximum Group-V (96.5±13.3) & Clean (132.1±22.5) and minimum Snatch in Group-I (54±14.3) and Clean (82.3±20.4) respectively, these two tests of five hammer throwing groups have shown significant F-ratio among each other at 1% level. From this study, it was concluded that high performer groups have shown higher Maximum strength and lower with respect to low performance groups.*

Key Words: *Bench Press, Front Squat, Dead Lift, Snatch and Clean.*

INTRODUCTION:

Many Scientist has conducted Somatotype studies on various sports populations of National and International level (Tanner 1964; Sodhi and Sidhu,(1984), de Garry et.al.(1974),Carter et.al., (1984) & (1990). As Carter (1970) considered that the morphological characteristics of athletes were of interest of the human biologist, for competitive sport demand the utmost from the body and it is therefore, responsible to expect to find in athletes a demonstration of the relationship of structure and function. The correct game and event chosen is very important for highest performance which is decided by the positive and negative points of the body for particular sport. Parnell (1951) in an anthropometrical study of athletes concluded that an individual's choice of athletic events might largely be due to characteristics, probably inborn. The main aim of present

study will be to help for selecting female hammer Throwers at early ages and for making guideline and counseling about the body Morphology.

MATERIAL & METHODS:

The present Anthropometric data have been taken on Indian female hammer throwers (N=30) from 15th September 2007 to 30th December 2007 during the course of various coaching camps; they were attending in connection with the national and international competitions. Ten anthropometric measurements like height, body weight, two bony diameters, two girths and four skinfolds were taken with standard instruments and standard techniques (*Ross et. al, 1980)*. Somatotypes were computed by using equations of Carter, 1980. Appropriate statistic is used to analyze the data. The performance in hammer throws of the subjects ranged between 30m and 55m for female. The subjects were divided into five groups based on throwing performance as given below in table-1.

Table 1

Sample Size of Indian Female hammer throwers of different performance levels

S. No	Performance based Groups	Sample Size
1	Group-1 (30-35mts)	6
2	Group-2 (35-40mts)	6
3	Group-3 (40-45mts)	5
4	Group-4 (45-50mts)	5
5	Group-5 (50-55mts)	8
	Total	30

RESULT AND DISCUSSION:

Mean age (years) was recorded minimum in Group-1 (18.33yrs) followed by Group-II, Group-III, Group-IV and maximum in Group-V (21.75yrs).

Table 2

Anthropometric Parameters of Indian Female Hammer Throwers.

S. No	Anthropometric Variables	Category	Group-I	Group-II	Group-III	Group-IV	Group-V	ANOVA (f-value)
1.		N	6	6	5	5	8	
2.	Age (Years)	Mean	18.33	19.67	21.00	21.40	21.75	3.21*
3.		SD	0.52	2.25	1.23	1.52	2.92	

4.	Height (cm)	Mean	164.78	164.33	165.0	164.72	163.7	NS
5.		SD	3.02	1.66	1.87	2.26	4.52	
6.	Weight (Kg)	Mean	58.38	71.67	74.0	67.8	71.19	NS
7.		SD	12.6	10.63	6.11	12.5	6.99	
8.	Ht. Wt. ratio	Mean	42.83	39.73	10.97	40.65	40.14	NS
9.		SD	2.83	1.94	1.01	2.51	2.20	

*Significant at 5% level (2.53), ** Significant at 1% level (3.65)

On applying Anova, F-value was found significant (3.21*) at 5% level as shown in Table-2. The Post hoc t-values for age of female were observed significant at 1% level between Group I and Group IV & Group I and group V and at 5% level between group I and III as shown in table-3.

Table 3

Post Hoc 't' Test For Women Hammer Throwers Age (Years).

	Group I	Group II	Group III	Group IV	Group V
Group I	0	1.17	2.23*	2.56**	3.20**
Group II		0	1.12	1.45	1.95
Group III			0	0.32	0.67
Group IV				0	0.31
Group V					0

* Significant at 5% level (1.96), **Significant at 1% level (2.33)

Mean body Height of Group-V (163.7 cm) was found shortest among all groups followed by Group-II, IV, I and Group-III (tallest 165.0 cm). For body height, no significant f-value was observed among all five groups of female hammer throwers as shown in Table-2.

Maximum weight was examined in group III (74 Kg) followed by group-II, Group-V, Group-IV and minimum in Group-I (58.38Kg). On applying Anova, F-value was found non significant among all five groups.

Maximum Height weight ratio was found in Group I (42.83) followed by group-III, Group IV, Group V and lower in Group-II (39.73). There was found non significant value among all five groups of female hammer throwers as shown in Table-2.

Table 4

Somatotype of Indian female Hammer Throwers.

S.No	Somatotype		Group-1	Group-2	Group-3	Group-4	Group-5	ANOVA (f-value)
1.		N	6	6	5	5	8	
2.	Endomorphy	Mean	4.17	5.77	4.88	4.35	3.69	3.96**

3.		SD	1.48	1.09	0.74	1.10	0.80	
4.	Mesomorphy	Mean	2.51	4.37	3.14	2.77	3.19	NS
5.		SD	2.21	2.31	1.28	2.12	1.89	
6.	Ectomorphy	Mean	2.20	0.77	1.34	1.19	0.95	NS
7.		SD	1.31	0.90	0.47	1.16	1.02	

*Significant at 5% level (2.53), ** Significant at 1% level (3.65)

Maximum Endomorphic (more fat) was found in group II (5.77) followed by group-III, Group IV, Group-I and minimum in Group-V (3.69). On applying ANOVA, F- ratio among five Groups, Endomorphic was found significant at 1% level. The Post hoc, t-values for Endomorphic was observed significant at 1% level between Group I and Group II, Group II and Group V and significant at 5% level between Group II and Group IV, Group III and Group V as shown in table-5.

Table-5
Post hoc't' test values For Women's Endomorphic Value.

Women	Group I	Group II	Group III	Group IV	Group V
Group I	0	2.70**	1.13	0.28	0.91
Group II		0	1.44	2.29*	3.79**
Group III			0	0.81	2.06*
Group IV				0	1.60
Group V					0

*Significant at 5% level (1.96), **Significant at 1% level (2.33),

Higher Mesomorphic value was found in group II (4.37) followed by group-V, Group III, Group IV and lower in Group-I (2.51). Higher Ectomorphic value was found in group I (2.20) followed by group-IV, Group III, Group V and lower in Group-II (0.77). on applying Anova, the f- values were found non-significant for mesomoprhy and ectomorphy among all five female hammer groups as shown in table-4.

CONCLUSION:

a. Age (years) was found increases from low performer group (I) to high performer group (V) and had shown significant differences among all five groups,
b. Maximum body heights and body weights was reported in group-III throwers and minimum in group-V & group-I throwers respectively.

c. Top performer throwers (Group-V) were found less endomorphic (less fatty), more mesomorphic (good muscular-skletal development) as compared with low performer thowers (group-I)

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