Somatotype of STC Inmates of SAI Centre, Patiala

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ABSTRACT

The present study was conducted on seventyfive male (N=76) and forty three female (N=43) of STC inmates training at SAI centre Patiala in 2016. For the purpose of this study, following anthropometric measurements were taken by using standard instruments and following standard techniques (Weiner and Lourie, 1969, Sodhi , 1991 & Kansal, 2008). Male fencers were found significantly older followed by Cycling, Boxing, Wushu & Hockey and in female, fencers are examined significantly older followed by Hockey and Wushu. Cycling males are found significantly taller followed byFencing, Boxing, Hockey & Wushu and in Female, Fencers are examined significantly taller followed by Hockey and Wushu. Cycling males are examined significantly heavier among all sports disciplines followed by Fencing, Boxing, Hockey &Wushu and in female, fencers are found significantly heavier followed by Hockey and Wushu. Hockey males are recorded significantly higher height weight followed by Fencing, Wushu, Boxing and Cycling. In female, Hockey players are found higher height weight ratio followed by Wushu and Fencing but non-significant differences. Boxing males are found significantly higher endomorphy among all sports disciplines followed by Fencing, Wushu, Cycling and Hockey. In female Fencing players are found maximum endomorphy followed by Wushu and Hockey but non-significant differences. Cycling males are examined maximum mesomorphy among all sports disciplines followed by Boxing, Wushu, Fencing, Wushu & Hockey and in female, fencers are found maximum mesomorphy followed by Wushu and Hockey but non-significant differences. Hockey males are recorded maximum ectomorphy among all sports disciplines followed by Fencing, Wushu, Boxing and Cycling and in female, Hockey players are found maximum ectomorphy followed by Wushu and Fencing but non-significant differences.

KEYWORDS:

Somatotype, height, body weight, height weight ratio, endomorphy, mesomorphy, ectomorphy

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INTRODUCTION

Anthropometry has been shown to play an important role in athlete selection and performance criteria in sports. It is obvious that determination of the somatotype is especially supportive in sports in which the body may impact on the biomechanics of movement and the resulting performance (Vucetic et al, 2008) and Massidda et al, 2013). Investigations of somatotypes in elite sportsmen play an important role in the study of the dynamics of development of a specific shape of the human body under the influence of various intensive purposeful training processes and competitive periods. It is well known that the anthropometric profile may indicate whether a player would be suitable to participate at the highest level in a specific sport (Bourgois et al 2000 &2001, Claessens et al 1999 and Reilly et al 2000).

One of the basic performance determine factors, in sports is the physique of the individual. To achieve optimum, performance in different sports disciplines, different kind of physique is required. Tanner (1964) has shown that who become best in the world in 1960 Olympics had definite body characteristics that were clearly specific for different events, in which they completed. Physique and body composition, to a large extent, sets the limits or predisposes individual to certain types of athletic ability.

Time has come to explore the possible body structures related to specific sports activity and develop them for particular level of performance. In this way, Kinanthropometry plays an important role in the selection and development of sportspersons. The present study has made a sincere effort in the direction and has tried to find out the somatotype of STC inmates of SAI centre, Patiala.

METHODOLOGY

The present anthropometric data have been taken on five male (N=76) and three female (N=43) STC sports disciplines inmates training at SAI centre, Patiala, as shown in Table1.

Table-1: Sample Size of STC Inmates of SAI Centre, Patiala

S. No.	Male STC Inmates	Sample Size (n)	Female STC Inmates	Sample Size (N)
1	Boxing	12	Boxing	--
2	Cycling	03	Cycling	--
3	Fencing	18	Fencing	14
4	Hockey	35	Hockey	18
5	Wushu	08	Wushu	11
	Total Sample Size	**76**		**43**
	Grand Sample Size		**119**	

For the purpose of this study, following anthropometric measurements were taken by using standard instruments and following standard techniques (Weiner and Lourie, 1969, Sodhi , 1991 & Kansal, 2008).

Anthropometric measurements: Decimal age (in years), body height (cm), body weight (kg), height weight ratio, somatotype components (endomorphy, mesomorphy and ectomorphy) etc.

Appropriate statistic (Mean, SD, and ANOVA f test) was used to analyze the data (Nelson and Johnson, 1970).

RESULTS & DISCUSSION

In this study anthropometric variables are studies on STC inmates of SAI Centre, Patiala, as follows:

Decimal age (in years):

Table 2 depicts decimal age of male and female inmates of various sports disciplines. Fencing males are found older among all sports disciplines followed by Cycling, Boxing, Wushu and Hockey. In female fencers are found older followed by Hockey and Wushu. It was observed that five male sports disciplines have shown non-significant results of ANOVA f value (1.721) which means all sports disciplines in male are of same age group, while three female sports disciplines have shown significant ANOVA f value (8.548*) at 1% level. On applying post hoc t test among female sports disciplines, it was examined that Wushu has shown significant differences with Fencing (3.39*) and Hockey (1.96) as shown in Table10.

Table -2: Decimal Age (in Years) of Male and Female STC Inmates of SAI Centre, Patiala

S. no		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1	Decimal Age (in Years)	BOXING	12	16.76	1.52	BOXING	--	--	--
2		CYCLING	3	16.98	2.40	CYCLING	--	--	--
3		FENCING	18	17.21	2.69	FENCING	14	16.78	2.13
4		HOCKEY	35	14.67	1.80	HOCKEY	18	15.35	2.15
5		WUSHU	8	14.93	2.76	WUSHU	11	13.39	1.51
		F value		**1.721**		**F Value**		**8.548***	

*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Body Height (cm)

Table 3 depicts body height of male and female inmates of various sports disciplines. Cycling males are found taller among all sports disciplines followed by fencing, boxing, hockey and wushu. In female, fencers are found taller followed by hockey and Wushu. It was observed that five male and three female sports disciplines have shown significant results of ANOVA f values (4.285 & 8.335 respectively) at 1% level. On applying post hoc t test for body height among male sports disciplines, it

was examined that Wushu has shown significant differences with fencing (3.98*) and cycling (6.34*) as shown in table-9. In female sports disciplines, body height has shown significant results between fencing versus hockey (5.85*) and fencing versus Wushu (11.86*) as depicts in table-10.

Table -3: Body Height (cm) of Male and Female STC Inmates of SAI Centre, Patiala

S. no		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1	Body Height (cm)	BOXING	12	168.63	8.39	BOXING	--	--	--
2		CYCLING	3	178.67	8.98	CYCLING	--	--	--
3		FENCING	18	173.26	6.09	FENCING	14	161.04	6.78
4		HOCKEY	35	166.50	10.63	HOCKEY	18	155.20	6.31
5		WUSHU	8	159.46	10.79	WUSHU	11	149.18	9.72
		F value		**4.285***		**F Value**		**8.335***	

(*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Body Weight (Kg)

Table 4 reveals body weight of male and female inmates of various sports disciplines. Cycling males are examined heavier among all sports disciplines followed by Fencing, Boxing, Hockey and Wushu. In female, fencers are found heavier followed by Hockey and Wushu. It was observed that five male and three female sports disciplines have shown significant results of ANOVA f values (5.702 & 8.010 respectively) at 1% level. On applying post hoc t test for body weight among male sports disciplines, it was examined that cyclist male has shown significant differences with Hockey (6.89*) and Wushu (7.75*) as shown in Table 9. In female sports disciplines, body weight has shown significant results between fencing versus Hockey (3.32*) and Fencing versus Wushu (4.87*) as seen in Table10.

Table - 4: Body Weight (kg) of Male and Female STC Inmates of SAI Centre, Patiala

S. No		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1	Body Weight (kg)	BOXING	12	61.17	11.53	BOXING	--	--	--
2		CYCLING	3	75.00	16.82	CYCLING	--	--	--
3		FENCING	18	65.15	13.65	FENCING	14	55.49	6.60
4		HOCKEY	35	53.62	9.94	HOCKEY	18	45.96	7.53
5		WUSHU	8	50.81	10.36	WUSHU	11	43.79	11.49
		F value		**5.702***		**F Value**		**8.010***	

*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Height Weight Ratio

Table 5 reveals height weight ratio of male and female inmates of various sports disciplines. Hockey males are recorded maximum height weight ratio among all sports disciplines followed by Fencing, Wushu, Boxing and Cycling. In female, Hockey players are found maximum height weight ratio followed by Wushu and Fencing. It was observed that five male sports disciplines have shown significant results of ANOVA f values (6.998) at 1% level and non significant results among female sports disciplines (2.531), respectively. On applying post hoc t test for height weight ratio among male sports disciplines, it was examined that Hockey male has shown significant differences with Boxing (0.72*), Cycling (1.29*) and Fencing (0.62*) at 5% level as shown in Table 9.

Table -5: Height Weight Ratio of Male and Female STC Inmates of SAI Centre, Patiala

S. No		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1		BOXING	12	43.03	1.29	BOXING	--	--	--
2		CYCLING	3	42.67	3.10	CYCLING	--	--	--
3	Height	FENCING	18	43.42	2.87	FENCING	14	42.32	1.94
4	Weight	HOCKEY	35	44.37	1.43	HOCKEY	18	43.50	1.48
5	Ratio	WUSHU	8	43.29	2.02	WUSHU	11	42.72	1.84
		F value		**6.998***		**F Value**		**2.531**	

(*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

SOMATOTYPE COMPONENTS OF STC INMATES

Endomorphy

Table 6 reveals endomorphy of male and female inmates of various sports disciplines. Boxing males are found maximum endomorphy among all sports disciplines followed by Fencing, Wushu, Cycling and Hockey. In female, Fencing players are found maximum endomorphy followed by Wushu and Hockey. It was observed that five male sports disciplines have shown significant results of ANOVA f values (2.743*) at 5% level and non significant results among female sports disciplines (2.179), respectively. On applying post hoc t test for endomorphy among male sports disciplines, it was examined that Hockey male has shown significant differences with Boxing (0.37*) at 5% level as shown in Table9.

Table -6: Endomorphy of Male and Female STC Inmates of SAI Centre, Patiala

S. No		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1		BOXING	12	3.15	1.22	BOXING	--	--	--
2		CYCLING	3	2.44	1.83	CYCLING	--	--	--
3		FENCING	18	2.74	1.31	FENCING	14	4.12	1.26
4		HOCKEY	35	2.06	0.93	HOCKEY	18	3.44	0.80
5	Endomorphy	WUSHU	8	2.75	0.81	WUSHU	11	3.77	1.12
		F value		**2.743***		**F Value**		**2.179NS**	

(*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Mesomorphy

Table 7 reveals mesomorphy of male and female inmates of various sports disciplines. Cycling males are examined maximum mesomorphy among all sports disciplines followed by Boxing, Wushu, Fencing, and Hockey. In female, Fencing, players are found maximum mesomorphy followed by Wushu and Hockey. It was observed that five male and three female sports disciplines have shown non-significant results of ANOVA f values (2.39 & 1.607), respectively.

Table -7: Mesomorphy of Male and Female STC Inmates of SAI Centre, Patiala

S. No		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1		BOXING	12	5.12	0.53	BOXING	--	--	--
2		CYCLING	3	5.18	1.32	CYCLING	--	--	--
3		FENCING	18	4.77	1.88	FENCING	14	3.86	1.12
4		HOCKEY	35	4.07	0.93	HOCKEY	18	3.32	1.11
5	Mesomorphy	WUSHU	8	4.72	1.42	WUSHU	11	3.85	0.94
		F value		**2.399**		**F Value**		**1.607**	

(*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Ectomorphy

Table 8 reveals ectomorphy of male and female inmates of various sports disciplines. Hockey males are examined maximum ectomorphy among all sports disciplines followed by Fencing, Wushu, Boxing and Cycling. In female, Hockey players are found maximum ectomorphy followed by Wushu and Fencing. It was observed that five male and three female sports disciplines have shown non-significant results of ANOVA f values (1.795 & 2.460), respectively.

Table -8: Ectomorphy of Male and Female STC Inmates of SAI Centre, Patiala

S. No		Male STC Inmates	N	Mean	SD	Female STC Inmates	N	Mean	SD
1		BOXING	12	2.92	0.95	BOXING	--	--	--
2		CYCLING	3	2.65	2.27	CYCLING	--	--	--
3		FENCING	18	3.29	1.92	FENCING	14	2.43	1.36
4		HOCKEY	35	3.90	1.05	HOCKEY	18	3.26	1.07
5	Ectomorphy	WUSHU	8	3.11	1.48	WUSHU	11	2.69	1.35
		F value		**1.795 NS**		**F Value**		**2.460NS**	

*Significant at 5% & 1% Level (2.49 & 3.56 for N=76 and 3.20 & 5.11 for N=43)

Table -9: Post hoc t test Values of All Somatotype Parameters of Male STC inmates of SAI Centre, Patiala

S No.	Anthropometric Parameters	SPORTS	Mean Differences	Significance at 0.05%
	Body Height (cm)			
1		Cycling Vs Wushu	6.34*	0.027
2		Fencing Vs Wushu	3.98*	0.008
	Body Weight (kg)			
1		Cycling Vs Hockey	6.89*	0.022
2		Cycling Vs Wushu	7.75*	0.021
3		Fencing Vs Hockey	3.32*	0.008
4		Fencing Vs Wushu	4.87*	0.034
	Height Weight Ratio			
1		Boxing Vs Hockey	0.72*	0.037
2		Cycling Vs Hockey	1.29*	0.011
3		Fencing Vs Hockey	0.62*	0.001
	Endomorphy			
1		Boxing Vs Hockey	0.37*	0.034

Table -10: Post hoc t test Values of All Somatotype Parameters of Female STC inmates of SAI Centre, Patiala

S No.	Anthropometric Parameters	SPORTS	Mean Differences	Significance at 0.05%
	Decimal Age (years)			
1		Fencing Vs Wushu	3.39*	0.000
2		Hockey Vs Wushu	1.96*	0.025
	Body Height (cm)			
1		Fencing Vs Hockey	5.85 *	0.044
2		Fencing Vs Wushu	11.86*	0.000
	Body Weight (kg)			
1		Fencing Vs Hockey	9.53*	0.003
2		Fencing Vs Wushu	11.70*	0.003

CONCLUSIONS

Following conclusions are drawn from this study:

Decimal age

Fencing males are found older among all sports disciplines followed by Cycling, Boxing, Wushu and Hockey. In female fencers are found older followed by Hockey and Wushu. It was observed that five male sports disciplines have shown non-significant results, which means all sports disciplines in male are of same age group, while in female sports disciplines significant results are observed. Post hoc t test has shown significant differences between Wushu &

Fencing (3.39*) and Wushu & Hockey (1.96*).

Body Height (cm)

Cycling males are found significantly taller among all sports disciplines followed by Fencing, Boxing, Hockey and Wushu. In female, Fencers are examined significantly taller followed by Hockey and Wushu. Post hoc t test for body height among male sports disciplines is recorded significant results between Wushu & Fencing (3.98*) and Wushu & Cycling (6.34*). In female sports disciplines, Fencing versus Hockey (5.85*) and Fencing versus Wushu (11.86*) has shown significant post hoc t test value.

Body Weight (Kg)

Cycling males are examined significantly heavier among all sports disciplines followed by Fencing, Boxing, Hockey and Wushu. In female, Fencers are found significantly heavier followed by Hockey and Wushu. Post hoc t test for body weight among male sports disciplines, Cyclist male has shown significant differences with Hockey (6.89*) and Wushu (7.75*). In female sports disciplines, body weight is examined significant results between Fencing versus Hockey (3.32*) and Fencing versus Wushu (4.87*).

Height Weight Ratio

Hockey males are recorded significantly higher height weight ratio among all sports disciplines followed by Fencing, Wushu, Boxing and Cycling. In female, Hockey players are found higher height weight ratio followed by Wushu and Fencing but non-significant differences. Post hoc t test for height Weight ratio among male sports disciplines Hockey male has shown significant differences with Boxing (0.72*), Cycling (1.29*) and Fencing (0.62*).

Endomorphy

Boxing males are found significantly higher endomorphy among all sports disciplines followed by Fencing, Wushu, Cycling and Hockey. In Female, Fencing players are found maximum endomorphy followed by Wushu and Hockey but non-significant differences. Post hoc t test for endomorphy among male sports disciplines, Hockey male has shown significant differences with boxing (0.37*) at 5%.

Mesomorphy

Cycling males are examined maximum mesomorphy among all sports disciplines followed by Boxing, Wushu, Fencing and Hockey and in female, fencers are found maximum mesomorphy followed by Wushu and Hockey but non-significant differences.

Ectomorphy

Hockey males are recorded maximum ectomorphy among all sports disciplines followed by Fencing, Wushu, Boxing and Cycling and in female, Hockey players are found maximum ectomorphy followed by Wushu and Fencing but non-significant differences.

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