



Analysis of Somatotype Among Inter-University Athletes of Team Sports

KEYWORDS

Endomorphy, Mesomorphy, Ectomorphy, Athletes

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ABSTRACT The present investigation has been conducted on 240 subjects with an aim to find out differences in somatotype among the athletes of inter-university in games namely basketball, handball, hockey and volleyball. The data for the present study were collected during the various inter universities competition held in the session 2013-2014. Each athlete was tested for various anthropometric measurements necessary for somatotype. Somatotype ratings were calculated by the equations developed by Heath and Carter (1990). Analysis of variance (ANOVA) was used to find out significant difference among the athletes of four sports. In case of any significance of mean difference, Scheffee's post hoc't test was applied for further analysis. From the findings, it has been observed that volleyballers were found to be tallest and heaviest, and hockey players were shortest and lightest among inter-university athletes of team sports. The highest mesomorphic development have been found in volleyballers and surprisingly endomorphically also, and handballers were less developed mesomorphically and endomorphically, respectively among the inter-university athletes of team sports. In ectomorphy component basketballers show higher rating and handballers possess least rating. The results also revealed that there was significant difference in height, weight, endomorphy and mesomorphy components among inter-university athletes of team sports.

INTRODUCTION

International sports performance in physically competitive sports and games is influenced by the technical, tactical and physical abilities of the players. However, the top level performance is not ensured, if the anthropometric body dimensions of sportsmen do not correspond to the mechanical aspects of the game concerned. Studies have shown that champions in different sports differ in their anthropometric and physiological characteristics that correspond to some extent, with particular requirements of their respective events (Tanner, 1964; de Garay et al., 1974; Hirata, 1979; Carter et al., 1982; Sidhu et al., 1990; Sharma and Shukla, 1990). Therefore, it has been observed that apart from other factors the performance of a sportsman in any sport and game is influenced by various specific characteristics of physique, body composition, psychological traits and physiological functions which help him to attain better performance (Astrand, 1956; Cureton, 1951; Tanner, 1964; Bhatnagar, 1980; Bouchard and Lortie, 1984; and Stepnicka, 1986).

The physical structure worked out can be used as a tool of talent hunt for a particular game jhyoqrghwoor 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 comparative study of somatotype among athletes of team sports.

METHODOLOGY

To achieve the purpose of this study 240 athletes of inter-university in team sports i.e. basketball (n=60), handball (n=60), hockey (n=60) and volleyball (n=60), who participated in the various inter universities competition held in the session 2013-2014 were randomly selected and used as subjects in this study. Age group ranged from 18-25 years. The selected anthropometric variables namely, height, weight, humerus bicondylar diameter, femur bicondylar diameter, upper arm circumference, calf circumference, triceps skinfold, sub scapular skinfold, supra spinal skinfold and calf skinfold were taken on each subject by following standard technique of Heath and Carter (1967). Heath and Carter (1990) somatotype method was used to get the three components of somatotype. To test the significance of mean difference among the athletes of team sports namely basketball, handball, hocky and volleyball, analysis of variance (ANOVA) was used. In case of any significance of mean difference on the criterion measure to find out which pair of group was better among the other, the Scheffees post-hoc test was applied.

RESULT & DISCUSSION

The data collected by adopting above procedure were statistically analyzed. The results were presented in the following ways.

Table I: Mean, standard deviation and F values of height, weight and somatotype among inter-university athletes

Parameters	Basketball (n=60)	Handball (n=60)	Hockey (n=60)	Volleyball (n=60)	F value
	Mean± S.D	Mean± S.D	Mean± S.D	Mean± S.D	
Height	165.67 ± 4.61	163.61 ± 3.26	163.38 ± 3.76	166.22 ± 3.73	8.23**
Weight	58.14 ± 3.76	57.07 ± 2.92	56.03 ± 3.17	59.16 ± 4.01	8.92**
Endomorphy	2.44 ± .24	2.34 ± .11	2.43 ± .10	2.46 ± .16	6.50**
Mesomorphy	3.02 ± .67	3.0 ± .42	3.15 ± .43	3.26 ± .49	3.14*
Ectomorphy	2.74 ± .64	2.53 ± .47	2.68± .49	2.66 ± .44	1.68

*Significant at .05 level;

** Significant at .01 level

Table I represents the comparison of mean, standard deviation and level of significance of height, weight, Endomorphy, mesomorphy and ectomorphy components among inter-university athletes. Volleyballers were tallest among all athletes with average height (166.22 cm) and the hockey players were the shortest athletes with (163.38 cm). The difference was found to statistically significant, at the level of $P < .01$. Volleyballers were heaviest among all athletes with average weight (59.16 kg) and the hockey players were the lightest athletes with (56.03 kg), and difference was found to be statistically significant, at the level of $P < .01$. Endomorphy component was found to be more

in volleyballers (2.46) and less in handballers (2.34) among inter- university athletes of team sports. The difference was found to be statistically significant, at the level of $P < .01$. Mesomorphy component was found to be more in volleyballers (3.26) and less in handballers (3.0) among the inter- university athletes of team sports. The difference was found to be statistically significant, at the level of $P < .05$. Ectomorphy component was found to be more in basketballers (2.74) and less in handballers (2.53) among the inter-university athletes of team sports. The difference was found to be statistically insignificant, at the level of $P < .05$.

Table 2: Post-hoc t values of height, weight and somatotype components among among inter-university athletes

Parameters	T-Value					
	B.B Vs H.B	B.B Vs Hock	B.B Vs V.B	H.B Vs Hock	H.B Vs V.B	Hock Vs V.B
Height	2.92**	3.24**	.76	.32	3.68**	4.0**
Weight	1.66	3.30**	1.59	1.63	3.26**	4.89**
Endomorphy	3.46**	.37	.53	3.13**	4.0**	.87
Mesomorphy	2.45*	1.26	.26	1.52	2.72**	1.19

B.B- Basketball, H.B- Handball, Hock-Hockey, V.B- Volleyball
* Significant at .05 level; ** Significant at .01 level

From table II, it was observed that there was a significant mean difference between the volleyballers and hockey players ($t=4.0$; $p < .01$), having the maximum value followed by handballers and volleyballers ($t=3.68$; $p < .01$), basketballers and hockey players ($t=3.24$; $p < .01$), and then the basketballers and handballers ($t=2.92$; $p < .01$), in height, but insignificant mean difference was observed between basketballers and volleyballers, followed by handballers and hockey players. In body weight, it was clearly noticed that there was significant mean difference between volleyballers and hockey players ($t=4.89$; $p < .01$), having the maximum value followed by basketballers and hockey players ($t=3.24$; $p < .01$), and then the volleyballers and handballers ($t=3.26$; $p < .01$), but insignificant mean difference was observed between basketballers and handballers, followed by handballers and hockey players, and then basketballers and volleyballers. In endomorphy component, there was significant mean difference between the volleyballers and handballers ($t=4.0$; $p < .01$), having the maximum value followed by basketballers and hockey players ($t=3.46$; $p < .01$), and then handballers and hockey players ($t= 3.13$; $p < .01$), but insignificant mean difference was observed between volleyballers and hockey players, followed by basketballers and volleyballers, and then basketballers and hockey players. In mesomorphy component, there was significant mean difference between the handballers and volleyballers ($t=2.72$; $p < .01$), having the maximum value followed by basketballers and handballers ($t=2.45$; $p < .05$), but insignificant mean difference was observed between basketballers and hockey players, followed by volleyballers and hockey players, and then basketballers and volleyballers.

DISCUSSION

It has been found that volleyballers were tallest and kockey players were shortest among the inter-university athletes of team sports. The results of the present study were coincided with the results of Hirata (1966). He found that volleyballers and basketballers were taller than rest of group. There was significant difference among the inter-university athletes of team sports in height. Further, on applying post hoc t test, it was found that volleyballers and basketballers were significantly taller than handballers and footballers, respectively. The volleyballers were heaviest and hockey players were lightest among the inter-university athletes of team sports. However there was significant difference

among the inter-university athletes in body weight. Further, on applying post hoc t test, it was found that volleyballers were significantly heavier than handballers and hockey players, respectively. Similarly, basketballers were found significantly heavier than handballers.

The mean somatotype of basketballers and handballers were 2.44-3.02-2.74 and 2.14-3.28-3.33, respectively, they were balanced mesomorph. The study done by Kaur (2000) revealed that the somatotypes of basketballers were. The results of present study were in not line with above finding. The mean somatotype of hockey players were 2.43-3.15-2.68. The results of present study were not in accordance with the study conducted by Lal, M (2015). He reported that hockey players of inter college level were balanced-endomorph, had mean value of 2.72-3.33-3.19. The mean somatotype of volleyballers were 2.46-3.26-2.66, they were also balanced-mesomorph. Gaudli- Rusoo and Zaccagni (2000) do not support the above fact that volleyballers were ectomorphic mesomorph with the mean 2.2-4.2-3.2.

Analysis of results revealed that volleyballers were the most endomorphic and mesomorphic, and handballers were the least endomorphic and mesomrphic among the inter-university athletes. Whereas basketbblers were the most ectomorphic and the handballers were the least ectomorphic group. It has been also found the there was significant difference established among athletes of inter-university athletes in relation to endomorphy and mesomorphy components. Further, on applying post hoc t test for endomorphy component, it was found that handballers were significantly less endomorphic than basketballers, hockey players and volleyballers, respectively. For mesomorph component, it was found that handballers were significantly less mesomorphic than basketbaalers and volleyballers.

CONCLUSION

The volleyballers were found to be tallest and heaviest, and hockey players were shortest and lightest among inter-university athletes of team sports. In somatotype, the volleyballers were the most endomorphic and mesomorphic, and handballers were the least endomorphic and mesomrphic. Whereas basketballers were the most ectomorphic and the handbalers were the least ectomorphic group. Statistically, it has been observed that inter-university athletes of team sports differ significantly from each other in height, weight, endomorphy and mesomorphy component.

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