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Comparision of Body Composition and Anthropometric Variable of selected Plyometric Sports

[1]Dr Sunil Dhiman & [2]Dr. Sujay Bisht

[1]Assistant Professor, M.M.Degree College ,Khekra (U.P) (India)
[2]Assistant Professor, Lakshmibai National Institute of Physical Education, N.E.R.C, Guwahati (India)

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ABSTRACT

Purpose: The purpose of the study was to compare the body composition and anthropometric variables of basketball, volleyball and handball players. Methods: Total 30 male students who were enrolled in BPEd course at LNIPE, Guwahati selected for the study. They have been divided into three groups Ten basketball, Ten volleyball and Ten Handball players. The data collection of selected variable like Height, Weight ,BMI, Fat Mass, Muscles Mass, Fat Free Mass and Glycogen Mass were all administered at institute Exercise Physiology Laboratory. The data pertaining to different variable were examined by One Way Analysis of Variance (ANOVA) in order to determine the difference, if any. The level of significance was set at 0.05 levels for testing the hypothesis Result: The analysis exhibits that Fat mass and height were significant amongst the other variable. The calculated F ratio of fat mass and height were 8.51 and 16.09 respectively which were greater than the tabulated F ratio value 3.35 at 0.05 levels. Conclusion : On the basis of the analysis of data and the limitation of the study the conclusion were drawn that the Basketball player pertaining higher in height and more fat mass in comparison to others sports i.e handball and volleyball.

INTRODUCTION

The body composition and anthropometrics characteristic of an athlete or any sportsman has been reflect their performance in term achievement of team and individual too. The body composition and fluid monitoring is not just about body weight measurement of body composition is an important indicator of one's health status. To have basic knowledge of body composition and fluid distribution is essential in many field including medicine, nutrition, health exercise science, performance and other biological sciences. The assessment should be used to provide scientifically sound advice that is tailored to meet the need of the individual, interest and abilities. Our bodies are complex organism made up of much tissue that changes as our body develop, mature and ages. It is important to known how these body compositions may affect the skill as well as game performance. Body composition is an important aspect of fitness for various games as excess adipose tissue acts as dead weight in actives where body mass be lifted repeatedly against the gravity. Sports performance is highly dependent on the health and skill related component of fitness in addition to the athlete technique and level of competency in sports specific motor skill. All fitness components depend on body composition to some extent. An increase in lean body mass contributes to strength and body development. Strength and power are related to muscle size. Thus, an increase in lean body mass enables the athlete to generate more force in a specific period of time. The demand of sports requires that athlete maintain standard levels of body composition. Over the last 100 year the average human has changed in body size and shape, a changed generally attributed to improvement in health and nutrition. Test of anthropometry include measurement of body size, structure and composition. There is a wide range of idea body shape and composition, depending on the sport, the playing position and the fitness level.

SUBJECT AND METHODS

Total 30 male students were enrolled in B.P.Ed course at L.N.I.P.E , Guwahati as subject in the study. They have been divided into three groups. Ten basketball, Ten volleyball and Ten handball players. All the players are medically fit and had no history of any disease like asthma, infection and cardiovascular disease. All of them gave their written consent regard their health and fitness status. For the assessment of anthropometric measurement like height and weight were measurements in the institute exercise physiology laboratory following all the protocol of the test. Height was measured to the nearest 0.1 cm using a fixed stadiometer and weight was measured to nearest 0.1 kg with a standard weighing machines. For the assessment of body composition like B.M.I., Fat mass, muscles mass , glycogen mass and fat free mass, Maltron Bio- Scan 916 analyzer were used for the administration of selected body composition. The obtained data in the experiment were analyzed and processed by using 17.0 SPSS Statistical program. The Descriptive statistics were expresses as mean (m) and standard deviation (s.d).

RESULT:

Table-1
Descriptive statistic of height, weight, BMI, Fat Mass, Muscles Mass, Fat Free Mass, Glycogen Mass (n = 30). (Mean ± SD)

Variable	Group	Mean ($\bar{x}$)	Standard Deviation (σ)
Height	• Basketball	181.9	7.46
	• Volleyball	176.4	3.34
	• Handball	167.4	5.62
Weight	• Basketball	69.3	15.26
	• Volleyball	70.3	5.10
	• Handball	67.1	10.62
BMI	• Basketball	21.55	2.74
	• Volleyball	21.78	1.16
	• Handball	21.90	2.43
Fat Mass	• Basketball	7.04	2.94
	• Volleyball	3.95	.583
	• Handball	4.30	1.04
Muscles Mass	• Basketball	30.27	7.12
	• Volleyball	27.36	3.37
	• Handball	27.32	4.27
Fat Free Mass	• Basketball	62.26	12.57
	• Volleyball	64.70	6.70
	• Handball	62.79	10.01
Glycogen Mass	• Basketball	579.6	58.12
	• Volleyball	581.4	48.88
	• Handball	554.6	63.47

Figure 1
Mean comparison of height, weight, BMI, fat mass, muscles mass, fat free mass and Glycogen mass of Basketball, Volleyball and Handball.

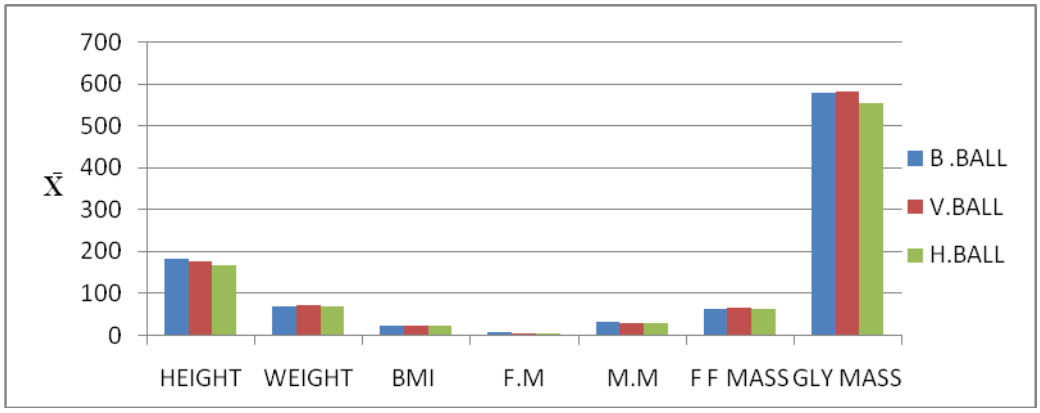

Table -2
One way Analysis of Variance of different Group

		Sum of Squares	df	Mean Square	F
Height	Between Groups	1056.06	2	528.03	
	Within Groups	885.8	27	32.80	16.09*
	Total	1941.86	29		
Weight	Between Groups	53.600	2	26.800	.216
	Within Groups	3347.100	27	123.967	
	Total	3400.700	29		
BMI	Between Groups	.633	2	.316	.064
	Within Groups	133.601	27	4.948	

	Total	134.234	29		
Fat_Mass	Between Groups	57.462	2	28.731	8.516*
	Within Groups	91.090	27	3.374	
	Total	148.552	29		
Muscle_Mass	Between Groups	57.340	2	28.670	1.069
	Within Groups	723.889	27	26.811	
	Total	781.229	29		
Fat_Free_Mass	Between Groups	33.012	2	16.506	.163
	Within Groups	2730.870	27	101.143	
	Total	2763.882	29		
Glycogen_Mass	Between Groups	23128.067	2	11564.033	1.074
	Within Groups	290755.800	27	10768.733	
	Total	313883.867	29		

***significant, $F_{0.05}$ (2,27)=3.35**

It is evident from table -2 that the calculated F-ratio of Height, Weight, BMI, Fat Mass, Muscles Mass, Fat Free Mass and Glycogen Mass were 16.09*, .216, .064, 8.51*, 1.06, .163 and 1.074 respectively. As the calculated value of height and Fat mass than the tabulated F-Value (3.35) at 0.05 level of significant. It shows that there was a significant difference between the mean of height and fat mass. The other selected variable were not significant as there calculated value was lower than the tabulated value (3.35) at 0.05 level of significant. To find out the paired mean difference the LSD Post Hoc test was used and finding pertaining to this been presented in table 3 & 4.

Table 3
L.S.D Post Hoc Test of the Mean of Fat Mass

Basketball	Volleyball	Handball	Mean Difference
7.04	3.95		3.09*
7.04	4.30		2.74*
3.95	4.30		0.35

*** Significant, $CD_{0.05}$ = 1.68**

Table 3 revealed that there was a significant difference between the paired mean of fat mass in Basketball and Volleyball, Basketball and Handball was 3.09* and 2.74* respectively. The highest significant paired mean difference was recorded between Basketball and Volleyball (3.09), on the other hand the lowest significant paired mean difference was recorded between basketball and handball (2.74). The above L.S.D post hoc finally revealed on the basis of above calculation that Basketball Players having higher mean Fat Mass in comparison of other two categories players.

Table 4
L.S.D Post Hoc Test of the Mean of Height

Basketball	Volleyball	Handball	Mean Difference
181.9	176.4	5.5*	
181.9	167.5	14.4*	
176.4	167.5	8.9*	

*** Significant, $CD_{0.05}$ = 5.24**

Table 4 revealed that there was significant difference between the paired mean of height in Basketball and Volleyball, Basketball and Handball and volleyball and handball was 5.5*, 14.4* and 8.9* respectively. The highest significant paired mean difference was recorded between Basketball and Handball (14.4) and the lowest significant paired mean difference was recorded between basketball and volleyball (5.5). On the basis of above result it was revealed that the basketball player pertaining higher mean height in comparison of other two categories of sports.

DISCUSSION AND CONCLUSION:

The purpose of the study was to find out the comparison of selected body composition and anthropometric variables of selected plyometric sports (Basketball, Volleyball and Handball). The analysis exhibit that fat mass and height were significant amongst the group. The calculated F ratio for fat mass and height were 8.51 and 16.09 respectively which were greater than the tabulated F value of 3.35 at 0.05 levels. Once the F ratio was higher than tabulated value L.S.D post hoc test were adopted to find out the critical difference and post hoc revealed that amongst these group Basketball players acquiring more Fat mass in comparison to others two group.

Same findings revealed in height that Basketball players were the taller than other two group. The others selected variables like weight , BMI, Muscle Mass , Fat Free Mass and glycogen Mass were not significant statistically because the calculated F ratio was less than tabulated value but there was some difference between but these are not statistically significant. Body height is the prime demand of these sports because they have to handling the ball some time above their head (cited in Gaurav, et, all, 2010) and their height help them to reach towards the basketball or the top of the net as well as defend the ball against the opponent. The taller players in basketball have an advantage because ball has to pass shorter distance to the basket , as well as they start out closer to the rebound and their ability to jump much higher than their opponent , give them a chance to block their shoots. The descriptive table indicate that the weight, fat free mass, glycogen mass, BMI were almost equal amongst the three group. Fat mass were higher than in basketball players amongst the group, this may be because of more height or their dietary habits. On the other hand this study revealed that the mean muscles mass of basketball players were greater as compared to volleyball and handball players. While this may be because of bone maturation and bone content. (Hadzic et. al.sep 2012).

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