



ISSN: 2456-0057

IJPNE 2016; 1(2): 22-24

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www.journalofsports.com

Received: 06-05-2016

Accepted: 07-06-2016

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Comparative Effect of Anthropometric Variables between High and Low Performance on Tribe Long Jumpers

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Abstract

The use of such measures helps to understand the impact of various anthropometric variables on performance of sportsman. The study was revealed to understand the correlation among anthropometric and sports performance. The purpose of this study was to find out anthropometric characteristics in high performer and low performer Long jumpers. 40 male Long jumpers of age 19 years were assessed for the present study. Out of which 20 were high performers and 20 were low performer, the data of athletes was collected at Athletics Summer Camp 2016 in Ranchi region. The Long jumpers having participation of at least two years were selected for the current study. All subjects were assessed for height, weight, girths, diameters, and skin fold thickness. The data was analyzed by Applying descriptive statistic i.e., mean, standard deviation & t-test to find out the significant differences of/in high & low Performer Long jumpers in tribal areas. The high performance Long jumpers had taller than low Performance Long jumpers for standing height, upper leg length, lower leg length. The low performer long jumpers possess significantly greater weight, skin fold measurements ($p < 0.05$). In Body Girths and Skeletal Diameters no significant differences were found ($p > 0.05$). It is concluded that in some of the parameters there were significant differences between high & low performer in Long jumpers and high performer athletes showed better in anthropometric measurement.

Keywords: Anthropometry, Bodyweight, Height, Circumference, Skin folds thickness

Introduction

Anthropometric measurements are the best applicable means for studying body size, shape and composition. It helps greatly in sports talent selection, sports counseling and measurement of obesity for health related physical fitness. Anthropometry is the application of body measurement to the study of human size, shape, proportion, composition, maturation and gross functions so as to help understand human movement in the context of growth, exercise, performance and nutrition. Anthropometry is widely used for sports talent Identification, human growth study, performance enhancement in sports etc. Anthropometry examines the link between anatomy (structure) and performance (function) (MacDougall *et al.*, 1982). Athletes often use extreme training methods to gain any edge they can over their competitors. sports training is a popular method of athletes utilize, especially endurance training consists of training several weeks in tribal area, preferably over 250 feet above sea level. Today it has been widely accepted by the experts that top performance in sports is achieved if an athlete possesses the basic anthropometric characteristics suitable for the event. Anthropometric factors may have different effects in different sports disciplines and over different body. Body composition also makes an important contribution to an individual's level of physical fitness for performance. Several studies on various body characteristics of different sports activities have been carried out by many researchers and they concluded that strong relationship exist between structure and performance (Gualdi Russo & Graziani, 1993; Rienzi, 2000; Tanner 1964, Carter 1984; Morrow *et al.*, 1982; Singh *et al.*, 1987; Guennadi, 1990; Bell & Rhodes, 1975; Torilola, 1987). Long jump which is an excellent track & field sports has been widely accepted as a highly competitive as well as recreational event all over the world. Anthropometric measurements have revealed correlation's between body structure, physical characteristics and sports capabilities. The knowledge of mathematical correlation permits sports physicians to evaluate and to predict performance – potentialities on the basis of physical characteristics and specific requirements of the game. Thus the aim of this work is

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Analyze body composition. Skeletal diameters, length measurement, circumference effect of the performance of Long jumpers.

Parameter for high and low long jump performance was seventh place performance in long jump event in last All India inter university athletic competition, performance above than that comes in high performance and performance below than that performance consider as low performance.

Methodology

The present study was conducted on 40 male Long jumpers (20 high performers and 20 low performers) of the age group of 19 years. The data of athletes was collected at Athletics

Summer Camp 2016 in Ranchi region. The Long jumpers having participation of at least two years were selected for the current study. Group-I with average height <1.70meters. In Long jumpers were considered as High performance athletes and Group-II with average height >1.54 meters. In Long jumpers were considered as Low performance athletes. Selection of subject, selection of variables, criterion measures, collection of data, administration of tests and statistical technique, for the analysis of data, have been described.

Sample

The samples consisted of randomly selected 40 Athletes of the age group of 19 years.

Sr. No.	Athletes Performance	Sample Size
1	High performance athletes	20
2	Low performance athletes	20

Variables

Tools used

1. Height was measured by Anthropometric rod set to the nearest 0.5cm.
2. Body weight was measured by weighing machine to the nearest 0.5kg.
3. Girth was measured by non-stretchable steel tape to the nearest 0.5 cm.
4. Skeletal Diameters was measured by sliding caliper.
5. Skin fold was measured by Harpendon skin fold caliper to the nearest 0.1mm.

The relationship of anthropometric variables to athletic ability was established by computing descriptive Statistics for each characteristic were calculated; Mean, Standard deviation, T-value. Data was analyzed using SPSS (statistical package for the social sciences, version 17.0).

Results

Mean, SD, & t-value of height, weight, leg length, upper leg length, lower leg length, thigh girth, calf girth, hip girth Knee Diameters, Ankle Diameters, thigh skin fold, calf skin fold, Abdomen skin fold, Table no:-1,2,3,4,5,respectively.

Statistical Analysis

Table 1: Physical characteristics of high performer and low performer Long Jumpers

Variables	Groups	N	Mean	SD	t-value
Height (cm)	High Performance	20	171.85	3.34	4.345*
	Low Performance	20	167.75	2.57	
Body Weight (kg)	High Performance	20	64.70	2.51	2.495*
	Low Performance	20	67.05	3.37	

*Significance at 0.05 level (df 38 = 2.02)

Table 2: Body Girths (cm) of high performer and low performer Long jumpers

Variables	Groups	N	Mean	SD	t-value
Thigh Girth	High Performance	20	42.01	1.85	7.393*
	Low Performance	20	45.57	1.09	
Calf Girth	High Performance	20	29.89	0.74	2.489*
	Low Performance	20	30.96	1.77	

*Significance at 0.05 level (df 38 = 2.02)

Table 3: Skeletal diameter (cm) of high performer and low performer Long jumpers

Variables	Groups	N	Mean	SD	t-value
Knee Diameter	High Performance	20	11.91	0.094	3.962*
	Low Performance	20	12.25	0.382	
Ankle Diameter	High Performance	20	9.30	0.348	2.495*
	Low Performance	20	9.53	0.202	

*Significance at 0.05 level (df 38 = 2.02)

Table 4: Length measurement (cm) of high performer and low performer Long jumpers

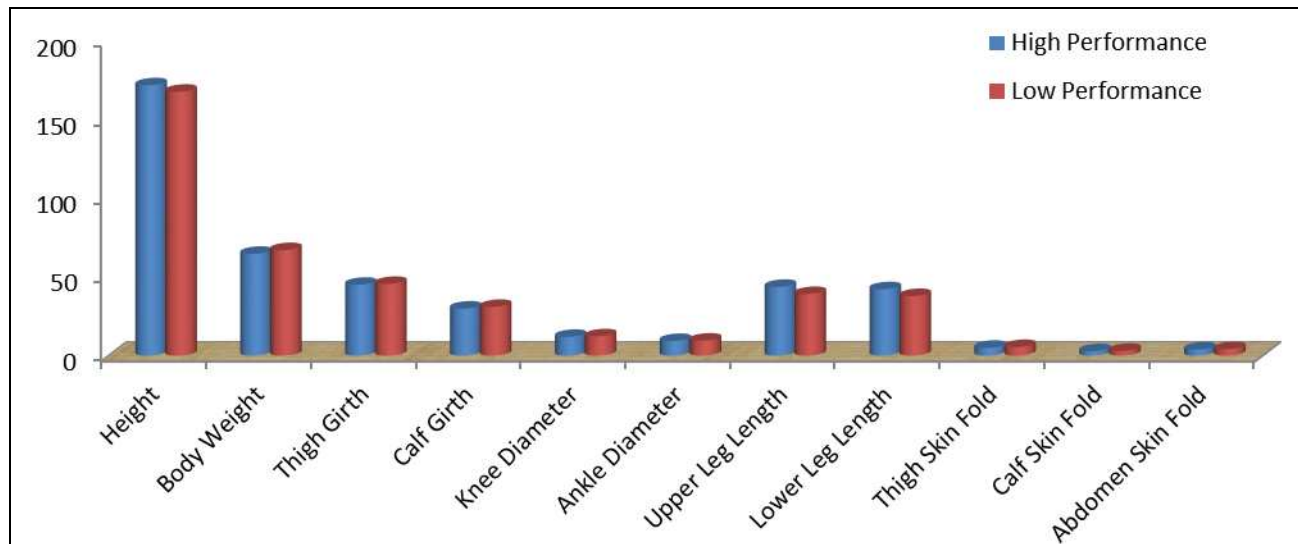
Variables	Groups	N	Mean	SD	t-value
Upper Leg Length	High Performance	20	43.67	1.19	8.932*
	Low Performance	20	39.15	1.92	
Lower Leg Length	High Performance	20	42.20	2.09	6.396*
	Low Performance	20	37.85	2.20	

*Significance at 0.05 level (df 38 = 2.02)

Table 5: Skin fold (mm) of high performer and low performer Long jumpers

Variables	Groups	N	Mean	SD	t-value
Thigh Skin Fold	High Performance	20	4.96	0.234	4.523*
	Low Performance	20	5.49	0.474	
Calf Skin Fold	High Performance	20	2.79	0.052	4.824*
	Low Performance	20	3.01	0.190	
Abdomen Skin Fold	High Performance	20	3.87	0.12	4.911*
	Low Performance	20	4.09	0.15	

*Significance at 0.05 level (df 38 = 2.02)



Discussion

The result of the present study shows that the Long jumpers differed in body anthropometric measurement with regard to their performance. Height can play a significant role in contributing to success in some sports by offering certain natural advantages. Physical characteristics of a sportsman have a tremendous influence on the performance level. However, there can also be significant disadvantages posed by size and resultant mass that could prove to be a hindrance to success. But in Track and Field athletics, most of the events required a good height for better performance.

Conclusion

The following conclusions were drawn within the limitation of the present study.

Variables High performer (N=20) Low performers (N=20) T-value

Mean SD Mean SD

Upper leg length 44.3 3.3 40.1 2.2 5.50*

Lower leg length 43.1 4.0 38.5 2.0 5.96*

The high performance Long jumpers had taller than low performance Long jumpers for standing height, upper leg length and lower leg length. The low performance of Long jumpers had bigger than high performance Long jumpers for body weight & skin folds measurements. Hence, it could be concluded that anthropometrical characteristics were one of the most influential factors in determining good athletic performances.

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