

Morphological and body compositional study on Indian elite athletes

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ABSTRACT

The purpose of the study was to analyze the morphological and body compositional characteristics of Indian elite athletes. For accomplish the study a total 40 subjects were randomly selected from different regions of Indian i.e. North Zone, South Zone, East Zone and West Zone of India. 10 subjects were selected from each zone. This study was conducted on athletes of track & field. The age of subjects were ranged from 18 to 25 years. Height, weight and Body Mass Index were analyzed as dependent variables among athletes of different zone. One way analysis of variance (AVOVA) was used to compare the dependent variables. The level of significance was set at 0.05 respectively.

1. Introduction

To be successful at some sporting events, specific anthropological characteristics are required. It is also important to keep in mind that there are some differences in the structure of the body and the composition of sports in the individual structure and in team sports. In some programs, such as shooting or high jump, the work is quite specific and different from each other and, therefore, there are also successful physical objects. Through this process, the physical demands of a game are encouraged to select suitable body types for the game that is known as "morphological adaptation". Track and field events are marked by a single phenomenon, an extraordinary variety of energy demands and energy release speeds. The fact is that runners need to load their body weight, which means that they must overcome the force of gravity at different distances, in a phenomenon, a special (lean for more efficient and economic performance) Determines the structure of the body as precondition. Athletes who have acquired the optimum body for a particular event are more likely to succeed than those who lack common characteristics. Studies on somatotypes of athletes, elite athletes and Olympic athletes have generally shown that athletes dependent on strength and movement are basically mesomorphic, while distance-dependent athletes have more eomomorphic mesomorphic muscles with limited amounts. A somatotype is the description of the current morphological confirmation. It has been expressed in the qualification, which includes three successive numbers, which are always recorded in the same sequence. Each number represents the evaluation of one of the three basic components of the physicist, which describes the individual variation in the framework and human structure. Endomorphy, or the first component, refers to physical relative obesity and leanness; The mesomorphy, or the second component, refers to the elevated muscular-skeletal development; And the actomorphy, or third component, refers to the relative linearity of the individual body. In athletes, measurements of body structure are widely used to determine the desired body weight, to optimize competitive performance and to evaluate the effects of training. It is generally accepted that the majority of relative body fat is desirable for successful competition in most sports. The reason for this is that the additional body fat joins the body weight without contributing to

its production capacity or energy production, which means that there is a lack of relative strength. It is clear that the weight of fat gain will be detrimental in sporting activities in which the body is transferred against gravity (such as high jumps, pole vaulting, volleyball spike action) or runs horizontally (custom-made) running). To run at any sub-maximum speed, the need for oxygen increases with any increase in body weight, which is the increase in oxygen consumption due to the demand for more energy to start and maintain a large weight. This is there Previous research has shown that most running programs have less body fat compared to athletes. Morphological parameters are an integral part of the evaluation and selection of sports for different areas of the game, the standard data on these standards are still decreasing in the context of India in track and field athletic programs. The purpose of the present study was to evaluate the physical parameters, anthropological measurements, body structure and somatotype of Indian track and field athletes and compare the data with their foreign counterparts.

2. Material and Methods

Subjects: 40 track and field athletes comprised of sprinters, Jumpers, throwers and long distance runners were randomly selected from four regions of India for accomplish the study.

Procedure: 3 morphological measures were taken: Height, weight and Body Mass Index The height was measured by means of stadiometer to the nearest 0.5 cm and a bathroom scale was used to measure body mass to the nearest 0.1 kg. body mass index was computed from height and weight.

Considering the purpose of the study mean and standard deviation were computed for the statistical treatment of the data. The obtained data were treated with analysis of variance (ANOVA) for finding out the difference between groups. When the obtained F ratio found to be significant at 0.05 level, Sheffe's test was used as Post Hoc test to find out the mean differences.

3. Results

Table 1
Descriptive Statistics

	Sprinters	Jumpers	Throwers	Long distance runners
Height	171.75	172.80	176.45	169.03
Weight	61.82	63.20	79.20	57.28
BMI	21.51	21.20	25.38	20.09

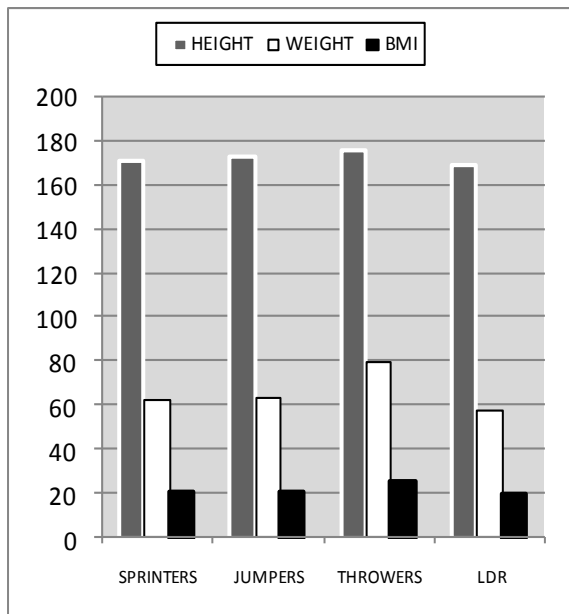


Table no. 1 shows the descriptive statistics of height, weight, and body mass index of selected track and field athletes and it was observed that the mean score of sprinter in relation to their height was 171.75, jumpers 172.80, throwers 176.45 and long distance runners 169.03 cm respectively. Average weight of sprinter was 61.82 kg, jumpers 63.20kg, throwers 79.20 kg and long distance

runners were 57.28kg. The body mass index of sprinter was 21.51, jumpers were 21.20, throwers were 25.38 and long distance runners were 20.09 respectively. It was also observed that the throwers has the highest mean score in their height and weight category and long distance runners have the lowest mean score in relation to their height, weight and body mass index.

Table 2
Zone Wise Descriptive Statistics Of Selected Subjects

		N	Mean	SD
S.H	NORTH ZONE	10	173.00	9.117
	SOUTH ZONE	10	175.00	4.243
	EAST ZONE	10	169.00	6.092
	WEST ZONE	10	170.00	10.154
	Total	40	171.75	7.844
J.H	NORTH ZONE	10	171.60	11.128
	SOUTH ZONE	10	174.60	7.058
	EAST ZONE	10	172.10	3.479
	WEST ZONE	10	172.90	4.630
	Total	40	172.80	7.010

T.H	NORTH ZONE	10	176.60	5.016
	SOUTH ZONE	10	176.30	5.334
	EAST ZONE	10	177.40	4.949
	WEST ZONE	10	175.50	3.440
	Total	40	176.45	4.607
L.D.R.H	NORTH ZONE	10	168.00	4.738
	SOUTH ZONE	10	171.70	10.350
	EAST ZONE	10	167.20	6.286
	WEST ZONE	10	169.20	8.842
	Total	40	169.03	7.748
S.W	NORTH ZONE	10	62.00	8.919
	SOUTH ZONE	10	64.10	3.665
	EAST ZONE	10	62.20	4.638
	WEST ZONE	10	59.00	5.617
	Total	40	61.83	6.093
J.W	NORTH ZONE	10	67.10	7.355
	SOUTH ZONE	10	63.20	7.084
	EAST ZONE	10	62.20	5.203
	WEST ZONE	10	60.30	6.093
	Total	40	63.20	6.722
T.W	NORTH ZONE	10	88.00	14.079
	SOUTH ZONE	10	86.20	12.839
	EAST ZONE	10	68.80	10.020
	WEST ZONE	10	73.80	12.145
	Total	40	79.20	14.444
L.D.R.W	NORTH ZONE	10	57.10	4.725
	SOUTH ZONE	10	59.00	7.888
	EAST ZONE	10	58.00	6.360
	WEST ZONE	10	55.00	4.269
	Total	40	57.28	5.940

Table no.2 shows the descriptive statistics of sprinter, jumpers, throwers and long distance runners in relation to their regions which were already divided earlier into four zones.

Table 3
Analysis of variance

Variables	F-ratio	Sig. (two tailed)
Sprinter Height	1.257	.304
Jumper height	.333	.801
Thrower height	.274	.844
Long Distance Runner height	.624	.604
Sprinter weight	1.217	.318
Jumper weight	1.949	.139
Thrower weight	5.756*	.003
Long distance runner weight	.811	.496
Sprinter BMI	.928	.437
Jumper BMI	2.813	.053
Thrower BMI	7.940*	.000
Long distance runner BMI	.923	.440

Table no. 3 revealed the F-value of selected groups in relation to their different zones. The level of significance was set at .05 which was formulated earlier. It was observed that F-value of throwers weight was 5.756 which was significant at 0.05 level of significance. It means the weight of throwers is significant differ in relation to different zone. The mean score of body mass index (BMI) was also significant with F-value (7.940) at 0.05 level of significance because the body mass index is calculated with the help of height and weight and weight was already significant.

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