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Comparisons of body composition between sprinters and throwers

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Abstract

The purpose of the study was to compare the body composition between sprinters and throwers. Specific anthropometric characteristics are needed to be successful in certain sporting events. It is also important to note that there are some differences in body structure and composition of sports persons involved in individual and team sports. Physical performance declines when body weight and percentage of body fat is at extreme level, but depending on the sport, a higher or lower body fat level may be beneficial. Because of this, body composition trends in different sports can help identify potential participants. A total of 30 male (sprinters $n = 15$ and throwers $n = 15$) subjects were selected from different colleges affiliated to: Rani Chennamma University, Belgavi state: Karnataka. The ages of athletes were between 20 to 25 years. The body composition of the subjects was assessed through Skinfold measurement of four sites i.e., biceps, triceps, suprailiac and sub-scapular were measured with the help of Skinfold caliper. To the assessment of percentage fat estimated from the sum of skin folds was calculated using equations of Siri (1956) and Durnin and Womersley (1974) was used. For the data analysis, t - test was employed. Results showed that there was a significant difference between sprinters and throwers.

Keywords: Percentage of fat body density, lean body mass throwers, sprinters body, composition, sprinters, throwers, physical education

Introduction

Specific anthropometric characteristics are needed to be successful in certain sporting events. It is also important to note that there are some differences in body structure and composition of sports persons involved in individual and team sports. The tasks in some events, such as shot put or high jump, are quite specific and different from each other and so are the successful physiques. This process whereby the physical demands of a sport lead to selection of body types best suited to that sport is known as "morphological optimization" (Bloomfield *et al.*, 1995). Track and field events are marked by an exceptional variety of duration of a single event, energetic demands and the tempo of energy release. The fact that runners need to carry their body weight, which means they need to overcome the force of gravity on different distances, stipulates a specific (lean) body composition as a prerequisite for more efficient and economic performance in a single event.

Athletes who have (or) acquired the optimal physique for a particular event are more likely to succeed than those who lack the general characteristics (Carter, 1984) [2]. In athletes, body composition measures are widely used to prescribe desirable body weights, to optimize competitive performance, and to assess the effects of training (Sinning, 1996) [9]. It is generally accepted that a lower relative body fat is desirable for successful competition in most of the sports. This is because additional body fat adds to the weight of the body without contributing to its force production or energy producing capabilities, which means a decrease in relative strength. It is obvious that an increased fat weight will be detrimental in sporting activities where the body is moved against gravity (e.g. high jump, pole vault, volleyball spiking action) or propelled horizontally (e.g. running). Hence, the purpose of the study was to compare fat percentage between sprinters and throwers in Track & Field.

Methods Selection of Subjects

For the purpose of the study was to compare the fat percentage between sprinters and throwers. A total of 30 male (sprinters N = 15 and throwers N = 15) subjects were selected from of different colleges affiliated to Affiliate to: Rani Chennamma University, Belgavi: Karnataka, The ages of athletes were between 20 to 25 years

Administration of Test and Collection of Data

The weight of subjects was measured by using Digital Weighing machine to the nearest 0.5kg. Skinfold measurement by means of Lange skinfold caliper with proper anatomical mark sites of Biceps, Triceps, and Supra iliac, Sub scapular. Percentage body fat as estimated from the sum of skin folds was calculated using equations of Siri (1956) and Durnin and Womersley (1974) [4]. The regression equations for the prediction of body density from the log of the sum of skin fold thickness at four sites in mm are as follows:

> For 20 to 29 years age group: Body Density (gm/cc) = 1.1631-0.0632 (X) (Durnin and Womersley, 1974) [4]

Whereas

1. $X = \log (\text{Biceps} + \text{Triceps} + \text{Subscapular} + \text{Suprailliac})$.
2. % Body Fat = $[4.95 / \text{Body density} - 4.5] \times 100$ (Siri, 1956)
3. Total Body Fat (kg) = (% Body fat/100) x Body mass (kg)
4. Lean Body Mass (kg) = Body mass (kg) – Total body fat (kg)

Statistical Analysis

Values are presented as mean values and SD. Independent samples t tests were used to test if population means estimated by two independent samples differed significantly. Data was analysed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SSPS Inc, and Chicago, IL, USA).

Table 1: Components of Body composition of Sprinters and Throwers

Variables	Sprinters		Throwers		T-Value
	Mean	SD	Mean	SD	
Body Density	1.05	0.002	1.06	0.0015	2.31*
% body Fat	12.76	1.04	14.55	0.77	2.31*
Total Body Fat (kg)	9.72	1.00	8.56	0.89	0.027
Lean Body Mass (kg)	53.60	3.008	58.44	3.71	4.15**

(* indicates $p < 0.05$ ** indicates $p < 0.01$)

Table 1 presents the various components of body composition of the Sprinters and Throwers. The Throwers were found to have significantly higher body density and percentage of body fat ($p < 0.05$) than the Sprinters, whereas Sprinters had significantly higher lean body mass ($p < 0.01$) as compared to Throwers. In total body mass there was no significant difference between sprinters and throwers.

Discussion and Conclusion

The purpose of the present study was to compare the throwers. The result of the study indicated that there is a significant difference in the mean values of two group in body composition ($p < 0.05$) this significant difference may be attributed to the nature of training programme generally followed by the sprinters and throwers. While the source of energy for sprinters & throwers remain same that is anaerobic system but sprinters indulge in a greater proportion of

endurance related activity also as require speed endurance. For throwing event weight of equipment influence the performance, but sprinters generally have less weight as compare to throwers therefore throwers also have a higher proportion study after analysing Proportion of fat mass the value of different sports on fat percentage. Within the limitation of the Study after analyzing the result it might be concluded that throwers have greater proportion of Body composition than sprinters.

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