

Relationship among the Anthropometric Variable and Jumping Performance in Track and Field

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Abstract

Present investigation was carried out in order to "assess the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field. A total of 10 subjects (some of them were not specialized Long Jumpers) were randomly selected from Department of Physical Education and Sports Technology "Sri Guru Granth Sahib World University", Fatehgarh Sahib, because the subjects were not specialized Long Jumper, they underwent the Long Jump activity class, as scheduled during the morning and evening classes on the University's 400 meter standard Track. Through both the critical and allied literature pertaining to the problem under consideration the following anthropometric variables were selected- Standing Height, Waist Circumference, Thigh circumference, Calf Circumference. In order to find out the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field, Pearson's Product Moment Correlation was calculated at level of significance 0.001(2-tailed).). Results indicate that a significant relationship was found among anthropometric Variables with the Performance of Long Jumpers in Track and Field.

Introduction

Anthropometry is the branch of anthropology that is concerned with the measurement of human body. The definition has confined to the kind of measurements commonly used in associating physical performance with body build. Anthropometry involves the measurement of external part of the body, including body diameters, body circumferences somatotypes (Saha, 2012) 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). Physical characteristics and body composition have been known to be fundamental to excellence in athletic performance (Mathur & Salokun, 1985).

Methodology

Selection of Subjects

Present investigation was carried out in order to "assess the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field. A total of 10 subjects (some of them were not specialized Long Jumpers) were randomly

selected from Department of Physical Education and Sports Technology "Sri Guru Granth Sahib World University", Fatehgarh Sahib, because the subjects were not specialized Long Jumper, they underwent the Long Jump activity class, as scheduled during the morning and evening classes on the University's 400 meter standard Track.

Selection of Variables

Through both the critical and allied literature pertaining to the problem under consideration the following anthropometric variables were selected-

- a) Standing Height
- b) Waist Circumference
- c) Thigh circumference
- d) Calf Circumference

Criterion Measures

These Anthropometric variables were measured by using the criteria given below:-

Variable's Name	Equipment Used	Units
Standing Height	Anthropometric Rod	Centimeters
Waist Circumference	Steel tape and Skin Marking Pencil	Inches
Thigh circumference	Steel tape and Skin Marking Pencil	Inches
Calf Circumference	Steel tape and Skin Marking Pencil	Inches

Statistical Analysis

In order to find out the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field, Pearson's Product Moment Correlation was calculated at level of significance 0.001(2-tailed).

Table 1
Descriptive Statistics of Anthropometric Variables with the Performance of Long Jumpers in Track and Field

	N	Std.		Variance	Skewness	Kurtosis		
		Mean	Deviation			Std. Error	Std. Error	
Performance	10	5.68	0.21	0.04	-.167	.687	-.710	1.334
Standing Height	10	171.60	4.19	17.60	.126	.687	-.319	1.334
Waist Circumference	10	32.40	1.83	3.37	-.607	.687	-.017	1.334
Thigh Circumference	10	21.50	2.36	5.61	-.251	.687	-1.839	1.334

Calf Circumference	10	16.40	1.07	1.15	.322	.687	-.882	1.334
Valid N (listwise)	10							

The above table evident that the descriptive statistics of Long Jump performance with the anthropometric variable Standing Height, Waist Circumference, Thigh Circumference and Calf Circumference, as the mean \pm standard deviation of the anthropometric variables is 171.60 ± 4.19 , 32.40 ± 1.83 , 21.50 ± 2.36 and 16.40 ± 1.07 respectively.

Table 2
Coefficients of Correlation of Anthropometric Variables with the Performance of Long Jumpers in Track and Field

Variable	Coefficient's of Correlation	P-Value
Standing Height	.901**	0.000
Waist Circumference	-.875**	0.001
Thigh Circumference	.891**	0.001
Calf Circumference	-.940**	0.000

**Correlation is significant at the 0.01 level (2-tailed).

Table 2 reveals that a significant coefficient correlation (.901,-.875,.891,-.940) was found between the Long Jump performance and Anthropometric Variables (Standing Height, Waist Circumference, Thigh Circumference and Calf Circumference) as the obtained p-value (0.000,0.001,0.001,0.000) is less than 0.05. However the correlation is also found to be significant as the obtained p-value is even less than 0.01. Above statistical findings can be clearly interpreted as that the standing height increases, also leads to improve the performance in long jump due to the significant correlation coefficient (.901**), same as a positive correlation(.891**)was found between the long jump performance and Thigh circumferences as the size of the thigh increase leads to increase the performance in long jump whereas a negative (-.875**) correlation was found among long jump performance and waist circumference means decrease the circumference of the waist leads to increase the performance in long jump, same as a negative correlation was found among long jump performance and Calf circumference means decrease the circumference of the Calf leads to increase the performance in long jump

Discussion of findings

Present investigation was carried out in order to "assess the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field. In order to find out the relationship of anthropometric Variables with the Performance of Long Jumpers in Track and Field, Pearson's Product Moment Correlation was calculated at level of significance 0.001(2-tailed) and results indicate that a significant coefficient of correlation was found among the anthropometric variables and performance in Long Jump as the positive correlation was found among the Performance and standing height and thigh Circumference This significant difference may be occur due to the reason that, generally standing height is always an important factor in Track and Field, same as in

long jump, In the landing phase a jumper can improve a healthier landing distance by using their height whereas standing height also benefits to the jumper on the approach run, as he can covered it in minimum strides with less efficiency, also the circumference of the thigh helps the jumper to produce more force during the take-off because its basic principle of the sports training- "Bigger the muscle can produce the more force". But a negative correlation was found among the performance and waist and calf circumference This significant difference may be occur due to the reason that waist circumference helps the jumpers in the air, where a biomechanical law "Law of Ends and Middle" came into existence in the hang technique whereas calf circumference assist the jumpers to gain the sun-maximal momentum during the approach run and at the time of take off. Similar study was conducted by Saha, (2012), he attempted to compare the Anthropometric Measurements and Body Composition among Individual and Team Game, also Similar study was conducted by Meysam Gholamali (2012), he attempted to find out the Relationship between Anthropometric Factors and Ability of Standing Long-Jump Among Track and Field Cadet Athletes. the results of these study have a extent support to the present study.

Recommendation

- a) Similar study may also be conducted on the different anthropometric variables.
- b) Similar study may also be conducted on the national or Intervarsity level subjects.
- c) Similar study may also be conducted on female Long Jumpers

References:

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