



A STUDY ON RELATIONSHIP BETWEEN ANTHROPOMETRIC VARIABLES AND SHOT PUT PERFORMANCE

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ABSTRACT

The present study finds the relationship between selected Anthropometric variables and performance of state level shot put players. For the purpose of the study sixteen (N=16) shot put players were selected as subjects with the age range between 14 to 22 years from Bhim stadium Bhiwani. The following anthropometric variables i.e. Height, weight, upper arm girth, lower arm girth, thigh girth, calf girth and lean body weight were selected for the testing of the hypothesis. The selected anthropometric measurements were taken with the help of Stadiometer, measuring tape and Digital skinfold Caliper. Shot put throw performance of the subjects was taken by measuring the range covered by subjects by throwing the shot put. Pearson's product moment (zero order) for correlation between dependent variable (Shot put throw performance) and independent variables (Physical) was applied for analysis of data. The anthropometric variables height, upper arm girth, lower arm girth and lean body weight have been found to possess positive and significant correlation with the shot put performance at 0.05. Weight, thigh girth and calf girth have been found to statistically insignificant correlation with the shot put performance. It can be concluded from the findings of the present study that height, upper arm girth, lower arm girth and lean body weight contribute significantly in shot put performance.

KEY WORDS- Anthropometry, variables, height, weight, upper arm girth, lower arm girth, thigh girth, calf girth, lean body weight, performance and shot put.

INTRODUCTION

Sports play a very prominent role in the modern society. It is important to individuals, a group, a nation and indeed the world. Throughout the world, sports have a popular appeal among people of all ages and both sexes. (Uppal, 1992)^[7].

Sports according to Australian Sports Commission, "a human activity capable of achieving a result requiring physical exertion and/ or physical skill, which, by its nature and organization, is competitive and is generally accepted as being a sports." ([http:// www.topensports.com/sports/what-is-a-sport.htm](http://www.topensports.com/sports/what-is-a-sport.htm). (2017-04-07)^[8].



The throws are field events in athletics. They are measure for explosive strength in a human being from ancient time to modern time. The throwers of shot put differed greatly in physique from the other athletes. The better development of the lean body mass will help them to provide the great strength required in the throwing events.

Shot put event was included in first Modern Olympic Games (1896) in Athens. The Shot is put from a circle 2.135 meter (7 feet) in diameter. A curved stop board is fixed in the middle of the circumference of the front half of the circle. The shot has to be put from the shoulder with one hand. When the athlete had taken a stance in the ring for starting his put, the shot has to be in the proximity of the chin. One of the earliest forms of shot putting was an event in which a huge erode stone was used as the implement. The stone was "put" as a test of strength among the warriors of peacetime armed forces of the previous century. This form of Shot putting is said to have originated in Scotland. (Dayal, 2007)^[2].

Many Variables, namely such personal qualities as personality, physical characteristic, motivation and motor abilities as well as environment conditions are regarded as having an interacting influence on an individual's selection of and achievement in various physical activities.(Yigletu, 1985)^[10].

Anthropometric measurements were central concern of the scientific era of measurement, which began in 1860's. Current interest in anthropometric measurements focuses on three areas growth measures, body type and body composition. The use of such measures include classification, prediction of growth pattern and prediction of success in motor activities as well as assessment of obesity.(Kishore, 1992)^[4].

Anthropometry as a study is a technique of expressing quantitatively the different forms of the human body. In other words, anthropometry means the measurements of human beings.(Barreto and Mathog, 1999)^[1].

Anthropometric measurements are widely used to assess and predict performance in various sports. Anthropometric measurements and morphological characteristics play an important role in determining the success of a sports person (Wilmore & Costill, 1999; Keogh, 1999) [22, 13]^[9].

An athlete's anthropometric and physical characteristic may represent important prerequisites for successful participation in any given sport. Indeed, it can be assumed that an athlete's anthropometric characteristics can in some way influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport (Singh, 2016)^[6].

Explosive strength is a combination of strength and speed abilities. It plays important role in throwing event. It can be defined as the ability to overcome resistance with high speed. Depending on the nature of combination of strength and speed the explosive strength can be further sub-divided into start strength, strength speed and speed strength. Start strength, is the ability to develop maximal muscle force during the starting phase of movement and strength speed is the ability to overcome heavy resistance with high speed. In throwing event strength speed play a vital role. The explosive strength is of different nature in cyclic and acyclic movements. (Singh, Hardayal, 1991)^[5].

1.1 Statement of the problem

A study on relationship between anthropometric variables and shot put performance.

1.2 Purpose of the study

The purpose of the study was to find out the relationship of anthropometric measurements of shot put throwers.

1.3 Significance of the study

The study will investigate the degree of relationship between the selected anthropometric variable and shot put performance.

The study would develop new concepts in improving shot put performance.

1.4 Hypothesis

There would be significant relationship between selected anthropometric variables with respect to shot put performance.

2 .METHODOLOGY

2.1 Selection of Subjects

16 state level male shot put players of Bhim Stadium Bhiwani were selected as subjects. The age of the subjects ranged between 14 to 22 years.

2.2 Criterion Measures

The criterion measures of selected anthropometric variables adopted in this study are as below:

- Height:** To measure height, stadiometer was used and the measurement was taken in centimeter.
- Weight:** Weighing machine was used and the score was recorded in kilogram.
- Upper Arm Girth:** Measurement tape was used and score was recorded in centimeter.
- Lower Arm Girth:** Measurement tape was used and score was recorded in centimeter.
- Thigh Girth:** Measurement tape was used and score was recorded in centimeter.
- Calf Girth:** Measurement tape was used and score was recorded in centimeter.
- Lean Body Weight:** The weight of the fat were deducted from each subjects total body weight and recorded. Digital skinfold caliper was used to assess the body fat.

2.3 Collection of data

The necessary data on the selected anthropometric variables of shot put throwers were collected during evening session at Bhim Stadium Bhiwani.

2.4 Statistical Analysis

To determine the relationships, Pearson Product Moment Method for correlation was applied.

2.5 Level of Significance

The level of significance was set at 0.05.

3 .FINDINGS

The results of the study are given in the following table-

Table3.1 Descriptive Statistics of Anthropometric variables of Shot Put Throwers.

SR. No	Variables	Mean	Maximum Score	Minimum Score	Range
1	Height(cm)	179.6	187.4	172	15.4
2	Weight(kg)	101.12	128	90	38
3	Upper Arm Girth(cm)	38.06	46	33	13
4	Lower Arm Girth(cm)	31.37	35	30	5
5	Thigh Girth(cm)	67.12	76	62	14
6	Calf Girth(cm)	41.62	47	37	10
7	Lean Body weight(cm)	79.99	91.27	69.62	21.65

N=16 (Shot Put Throwers)

Table3.2 Relationship of Anthropometric Variables to Shot put Performance

Variables Correlated	Obtained 'r' value	Required 'r' value
Height and Shot Put Performance	0.505*	0.49
Weight and Shot Put Performance	0.407	0.49
Upper Arm Girth and Shot Put Performance	0.543*	0.49
Lower Arm Girth and Shot Put Performance	0.517*	0.49
Thigh Girth and Shot Put Performance	0.111	0.49
Calf Girth and Shot Put Performance	0.111	0.49
Lean Body Weight and Shot Put Performance	0.526*	0.49

*Significant at 0 .05 level of confidence.

N=16; r .05 (14) = 0.497

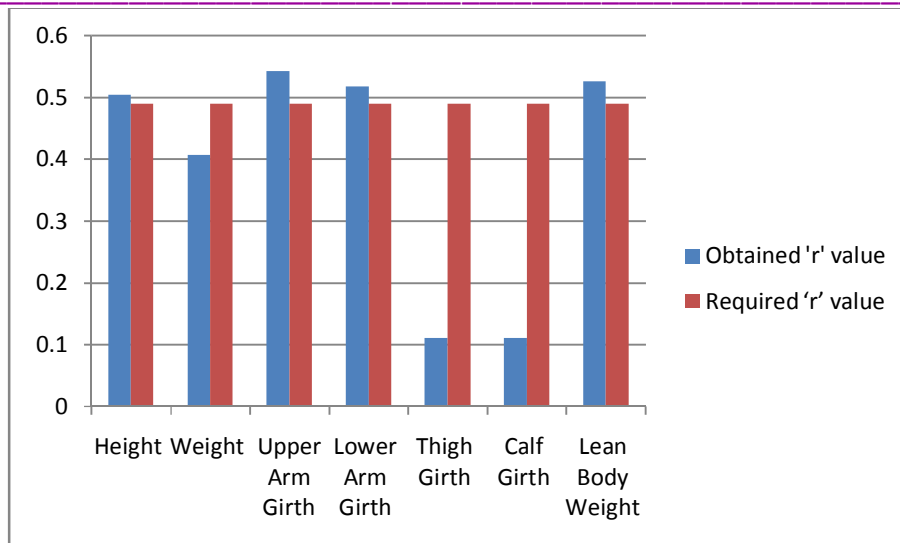


Fig 1: Graphical representation of the coefficient of correlation values between shot put performance and selected anthropometric variables

Tables 3.2 show the correlation between the shot put performance and various physical parameters. The above table point out that the shot put performance of throwers has been found to possess positive and significant correlations as the value obtained with height ($r=0.505$), upper arm girth ($r=0.543$), lower arm girth ($r=0.517$) and lean body weight ($r=0.526$) were much higher than the tabulated value (0.497) required, to be significant at 0.05 level with 14 degree of freedom.

Table 3.2 reveals that the weight ($r=0.407$), thigh girth ($r=0.111$) and calf girth ($r=0.111$) have positive but statistically insignificant correlation with shot put performance of throwers.

4 .DISCUSSION ON HYPOTHESIS

It was hypothesized that there will be significant correlation between selected anthropometric variables and shot put performance. The result reveals that there was significant correlation between shot put performance and the selected anthropometric variables such as height, upper arm girth, lower arm girth and lean body weight, so the hypothesis was accepted in these four variables.

But in weight, thigh girth and calf girth, there was no significant correlation, so the hypothesis was rejected.

5 .CONCLUSION AND RECOMMENDATIONS

- Through the review of the results of the study it can be concluded that upper arm girth contributes significantly in the improvement of shot put performance.
- The statistical finding showed that there was significant relationship of anthropometric variables i.e. height, upper arm girth, lower arm girth and lean body weight with the shot put performance.
- The statistical finding showed that there was no significant relationship of anthropometric variable i.e. weight, thigh girth and calf girth with the shot put performance.
- While preparing training programme in shot put, physical education teacher and coaches should give more attention to develop those variables, which have significant correlation with shot put performance like as lean body weight, upper arm girth and lower arm girth.
- The result of this study can help the physical education teacher, trainer and coach in screening and selection of potential shot putters.

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