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Estimation of Decathlon Performance on the Basis of Selected Anthropometric Characteristics

Rajeev Choudhary^{1*}, Vijay Gurjar² and Harish Bahadur²

^{1*}Corresponding author, Department of Physical Education, BHU, Varanasi, U.P. (India) Email-
choudharyrajee@yahoo.co.in

²SSPCPE, Vallabh Vidyanagar, Anand, Gujarat (India)

Abstract

The study was conducted on 30 subjects, those who participated in National athletic championship and Inter-university athletic championship with a purpose to find out correlation between independent variables (selected anthropometric characteristics) and dependent variable (decathlon performance), to study the joint contribution of independent variable in estimating dependent variable and to establish regression equation for predicting dependent variable on the basis of independent variables. Selected anthropometric characteristics were standing height, body weight, arm length, shoulder width, trunk length, leg length, thigh length, thigh girth and calf girth (independent variables). Decathlon performance was considered as dependant variable. To find out correlation between independent variables and dependent variable, product moment method of correlation was used. To study the joint contribution of independent variable in estimating dependent variable, multiple correlation method was used. Regression equation was established for predicting dependent variable on the basis of independent variables. There exists a significant relationship between decathlon performance and body weight, shoulder width, thigh girth, calf girth as the correlation coefficient values were found higher than the tabulated value at 0.05 level of significance. On the other hand, there exists a insignificant relationship between decathlon performance and standing height, arm length, trunk length, leg length, thigh length, as the correlation coefficient values were found lower than the tabulated value at 0.05 level of significance. Regression equation was found fructiferous in estimating decathlon performance on the basis of selected anthropometric characteristics.

Key words ; Standing height, body weight, arm length, shoulder width, trunk length, leg length, thigh length, thigh girth, calf girth.

Introduction

The decathlon is an athletic event consisting of ten track and field events. The word decathlon is of Greek origin (from deka [ten] and athlos [contest]). Events are held over two consecutive days and the winners are determined by the combined performance in all. Performance is judged on a

points system in each event, not by the position achieved. The decathlon is contested mainly by male athletes, while female athletes contest the heptathlon.

The objectives of the study were-

1. To find out correlation between independent variables (selected anthropometric characteristics) and

dependent variable (decathlon performance)

- To study the joint contribution of independent variable in estimating dependent variable.
- To establish regression equation for predicting dependent variable on the basis of independent variables.

Experimental

Subjects

For the purpose of the study 30 male subjects those who participated in National Athletic Championship and Inter-varsity Athletic Championship were selected as the subjects for the study. The subjects were from different states and Universities of the country. The age of the subjects was ranging from 18 – 30 Years.

Variables

Independent variables- Height, Body weight, Arm length, Shoulder width, Trunk length, Leg length, Thigh length, Thigh girth, Calf girth

Dependent variables- Decathlon performance

Measures

- Height was measured by stadiometer and recorded in centimeters.
- Body-Weight was measured by calibrated weighing machine and recorded in Kilograms.
- Measurements of Upper extremity and lower extremity parts of the body were measured by anthropometric kit and recorded in centimeters.

Statistical Analysis

- To find out correlation between independent variables and dependent variable, Product Moment Method of correlation was used.
- To study the joint contribution of independent variable in estimating dependent variable, Multiple correlation method was used.
- Regression equation was established for predicting dependent variable on the basis of independent variables

Results and Discussion

Table 1. Correlation between dependent variable and independent variables

Independent Variables	Correlation coefficient
Standing Height	0.328376
Body Weight	0.560556*
Arm Length	0.30572
Shoulder Width	0.479387*
Trunk Length	0.311428
Leg Length	0.307061
Thigh Length	0.288797
Thigh Girth	0.577758*
Calf Girth	0.426259*

* Significant at 0.05 level; $r_{0.05(28)} = 0.361$

Table 1. clearly indicates that there exists a significant relationship between decathlon performance and body weight, shoulder width, thigh girth, calf girth as the correlation coefficient values were found higher than the tabulated value at 0.05 level of significance.

On the other hand, there exists a insignificant relationship between decathlon performance and standing height, arm length, trunk length, leg length, thigh length, as the correlation coefficient values were found lower than the tabulated value at 0.05 level of significance.

Table- 2 indicates that significant relationship was found between criterion variables and independent variables as coefficient of multiple correlations was found 0.7209 which is higher than the tabulated value.

Table 2. Joint contribution of independent variables in predicting dependent variable

Criterion variables	Independent variables	r
Decathlon performance	Body weight Shoulder width Thigh girth Calf girth	0.7209*

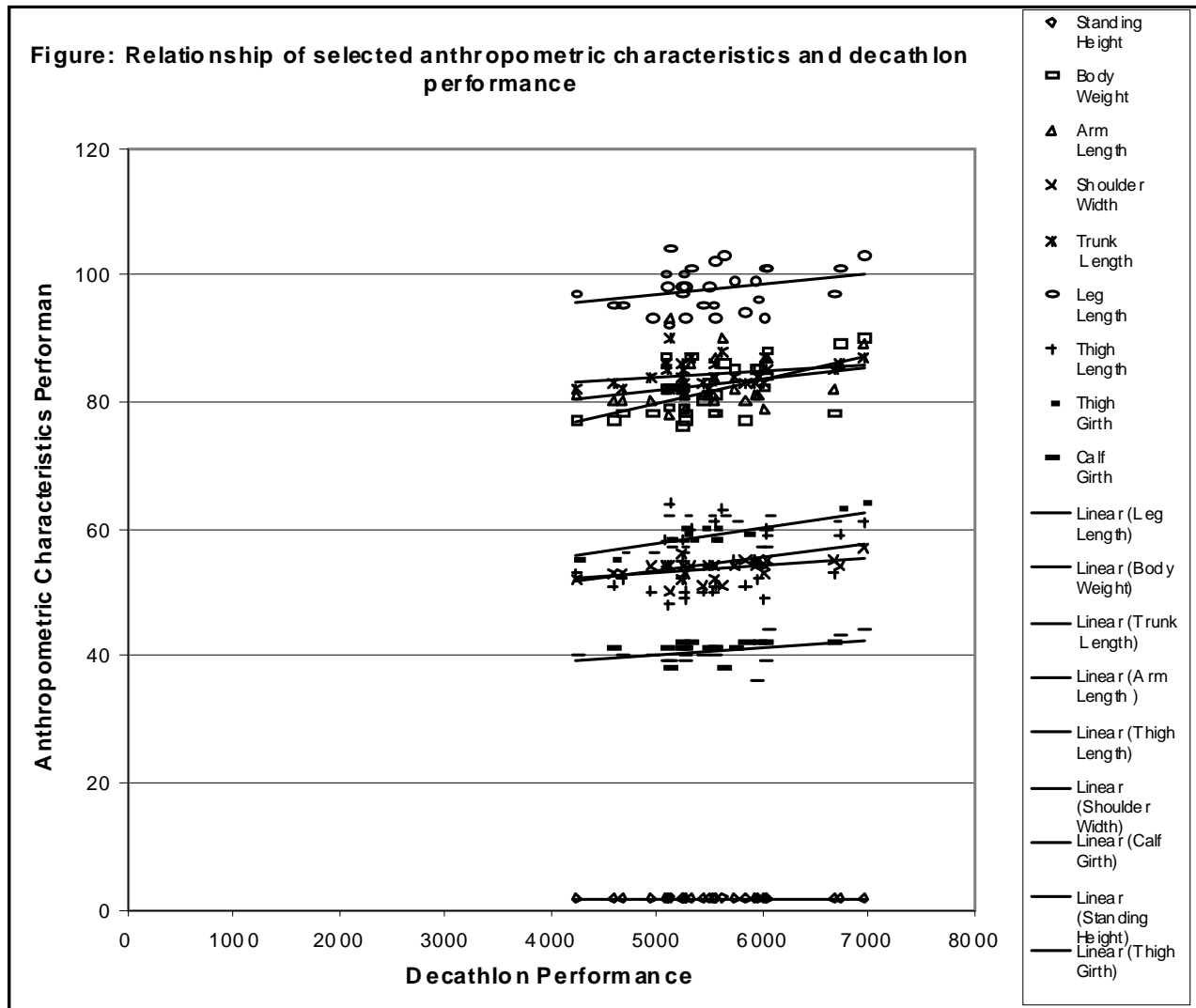
* Significant at 0.05 level; $r_{0.05(25)} = 0.381$

Multiple Regression Analysis

$$Y = -9912.76 + 37.70703X_1 + 141.2136X_2 + 94.15594X_3 - 18.5554X_4$$

Where,

Y = Estimation of Decathlon Performance
 X_1 = Body Weight



X_2 = Shoulder Width
 X_3 = Thigh Girth
 X_4 = Calf Girth

Significant Relation was found between decathlon performance and body weight; decathlon performance and shoulder width; decathlon performance and thigh girth; decathlon performance and calf girth; criterion variables and independent variables. Regression equation was found fructiferous in estimating Decathlon performance on the basis of selected Anthropometric Characteristics (Figure 1). Previous studies also reported significant relationship between criterion variables and independent variables and the regression equation was also found fructiferous in estimating dependent variable on the basis of selected independent variables¹⁻³.

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