

Research Paper :

# Relationship of selected physical and physiological variables to the performance in long jump

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## ABSTRACT

Fifteen male students of Lakshmbai National Institute of Physical Education, Gwalior were selected as subjects. For the establishment of relationship of dependent and independent variables and number of tests were employed. The findings of the study revealed the significant relationship between the performance of subjects in long jump and selected variables *i.e.* standing broad jump (0.786) and no significant correlation was obtained with variables *i.e.* 50 m dash/(-0.839), maximum strength (0.418), vital capacity (0.076), positive breath holding capacity (0.062), negative breath holding capacity (0.304) and resting heart rate (0.240).

**Key words :** Long jump, Physical variable, Physiological variable

The performance of long jump is affected by different factors like physiological, psychological, motor traits and physical etc. Many studies had been done in respect of physiological and psychological factors on the performance level and so on. So, the efforts have been made to investigate the relationship of physical and physiological variables on the performance of long jump.

## Objective:

The purpose of the study was to compare the selected physical, physiological variables to the performance in long jump.

## Hypothesis:

On the basis of literature reviewed, research findings and the scholar's own experience in the field, it was hypothesized that there would be no relationship between selected physical variables and physiological variables to the performance in long jump.

## METHODOLOGY

### Selection of subjects:

Fifteen male long jumpers studying from B.P.E 1 to B.P.E. III of Lakshmbai National Institute of Physical Education, Gwalior were selected randomly as subjects for this study. According to college records, the average age of the subjects was in the range between 19 to 22 years.

### Selection of variables:

Based on the review of related literature, experts advices, the comparable study in the related field,

feasibility, delimitation of the present study as well as very purpose of the study, the following variables were selected for the purpose of the study:-

### Physical variable:

- Explosive leg strength
- Maximum leg strength
- Speed (50 meter dash run)

### Physiological variable:

- Vital capacity
- Maximum breath holding (positive and negative)
- Resting heart rate

## Statistical technique:

The relationship of selected physical and physiological variables to performance in long jump was calculated by using the method cited by Clerke and Clarke.

$$r_{xy} = \frac{N \bar{x}\bar{y} - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

## OBSERVATIONS AND DISCUSSION

To determine the relationship between the independent variables namely, selected physiological variables *i.e.* vital capacity, positive breath holding capacity, negative breath holding capacity and resting heart rate and selected physical variables *i.e.* standing broad jump, 50 meter dash, maximum strength and dependent variables namely, performance in long jump and the product moment correlation were applied. The frequency

of deviation for x and y variables were recorded and their products were obtained and analyzed. The product moment of all the sequences were conducted with due regards to plus and minus signs and on the basis of plus and minus signs and on the basis of entries, were also made carefully in “x” and “y” columns. All the products moment were circled to facilitate additional obtaining the correlation “r” between the independent and dependent variables. The recommended formula was used and the aspects results relating to the aspects are presented in Table 1.

**Table 1 : Coefficient of correlation between dependent and independent variable**

Variables	Coefficient of correlation
Performance in long jump and 50 meter dash	-0.839
Performance in long jump and maximum strength	0.418
Performance in long jump and SBJ	0.786*
Performance in long jump and vital capacity	0.076
Performance in long jump and positive breath holding	0.062
Performance in long jump and negative breath holding	0.304
Performance in long jump and resting heart rate	0.240

\* indicates significance of value at P=0.05

Tabulated value of “r” required to be significant at 0.05 level of confidence for degree of freedom 0.514.

Table 1 shows that the calculated value of “r” for standing long jump (0.786) was found to significant at

0.05 level of confidence. Further, it is evident from table that 50 meter dash, maximum strength, vital capacity, positive breath holding, negative breath holding capacity and resting heart rate were found to statistically insignificant to be the performance in long jump.

### Conclusion:

Within the limitations of the study, the following conclusions were drawn.

- There was significant correlation between standing broad jump and long jump performance.
- There was no significant correlation between 50 meter dash, maximum strength, vital capacity, positive breath holding capacity, negative breath holding capacity, resting heart rate in long jump performance.

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