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## Measurement of Explosive Leg Strength in Relation To Different Axes

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### Abstract

Strength namely explosive leg strength is most important among the different conditional abilities. During participation in various types of big muscle activities, it is applied in various ways. Here, different axes refer to linear axis and vertical axis. In sprints and broad jumps, this ability is used mostly in horizontal direction but during high jump, volleyball and basketball playing, this ability is used mostly in the vertical direction. The extent of explosive leg strength applied in generally measured by either standing broad jump or vertical jump irrespective of the events participated. The question is whether it is right to measure the explosive leg strength of athletes who usually convert strength in the vertical direction by using standing broad jump or the athletes who mainly convert explosive leg strength in the horizontal direction by using vertical jump. For this purpose, sprinters and long jumpers were clubbed in one group and high jumper & volleyball players were clubbed in another group. They were tested both on standing broad jump and vertical jump. For analysis, correlation method was used for measuring the relationship among the variables.

**Keywords:** Explosive Leg Strength, Standing Broad Jump, Vertical Jump, Correlation, Linear Axis, Vertical Axis etc.

### Introduction

For achieving higher performances, sports person require optimum level of conditional abilities, technical and tactical ability and also intellectual efficiency. A person also requires sports specific physique for excellent performance. Among the conditional abilities, strength is considered as the most important ability. This important ability is being applied in different ways according to structure and nature of sports movement. In some events, like sprints and long jumps, this ability is mainly used in the linear direction and in other sports like high jump, volleyball, basketball etc., this ability is being used mainly in the vertical direction.

In case of measuring explosive leg strength, generally, we use the two tests – either Serjent Vertical jump or the Standing Broad Jump irrespective of the events participated. Now a question crops up in our mind as to whether it is right to measure the explosive leg strength of sprinter or long jumper by using the Serjent vertical jump or to measure explosive leg strength of volley ball, basketball player or high jumper by using standing broad jump. The present study is to find out whether the present practice is suitable or not in relation to measuring the explosive leg strength.

### Statement of the Problem

The study was to measure the explosive leg strength in relation to linear axis and vertical axis.

### Hypothesis

It was hypothesized that there will be insignificant difference of explosive leg strength in respect to linear axis and vertical axis.

### Delimitations

- ❖ The study was delimited to the different college level players in West Bengal.
- ❖ The study was conducted on the student forming two groups – one consisted of high jumpers and volleyball players and the other group consisted of sprinters and long jumpers.

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**Limitations**

- The subjects were motivated to give their best performance but due to individual difference the effect on the subjects might be different.
  - Level of fitness might affect the performance differently.
  - The training experience also might affect the performance differently.
- These were beyond the control of the investigator.

**Significance of the Study**

- ❖ The result might lead to confirmation of the present practice of measuring explosive leg strength.
- ❖ It might provide a new idea in measuring explosive leg strength of sports persons participating in different event.
- ❖ Sports scientists, administrators and physical educators might become interested in inventing sports-specific methods of measuring different conditional abilities.

**Procedure**

The students were selected and clustered in two groups of 30 students each, one group consisted of high jumpers and volley ball players and other group consisted of sprinters and long jumpers. They were tested on both standing broad jump for distance and Serjent Vertical Jump test for height.

**Serjent Vertical jump test**

The performer was standing with one side towards a wall heels together and hold a 1 inch piece of chalk in the hand nearest to the wall. Keeping the hills on the floor he should reach upward as high as possible and made a mark on the wall. The performer then jumped as high as possible and made another mark at the highest of his jump. Best of three trials were recorded as the score.

**Standing Broad Jump test**

The performer was standing with the feet parallel to each other and behind the standing mark. The performer bended the knees and swing the arms and jumped as for forward as possible. Best of three trials were recorded as the score. The subjects were advised to have sufficient warm-up before going through the tests.

**Statistical Analysis**

**Table 1:** Mean and Standard Deviation of Different Groups in Standing Broad Jump and Vertical Jump Test

Groups	Standing Broad Jump test	Vertical Jump Test
Sprinters & Long Jumpers	Mean – 253.02 S.D – 12.18	Mean – 57.10 S.D – 12.02
High Jumpers & Volley ball players	Mean – 250.17 S.D – 28.05	Mean – 57.06 S.D – 8.03

**Table 2:** Correlation among Sprinters, Long Jumpers and High Jumpers, Volleyball players

	Sprinters and Long Jumpers	High Jumpers and Volleyball players
Standing Broad Jump and Vertical Jump	r = .51	r = .38

From table – 2 it was founded that the performance of the groups with low to moderate correlation.

**Discussion of the Findings**

It was founded that sprinters and long jumpers performed good in both types of tests and that resulted in moderate correlation. The subjects considered for the tests had good years of training

experience and were very strongly built, their leg muscles were will developed. Thus they were found capable of doing well in both directions. Volley ball players and high jumpers performed almost at par with sprinters and long jumpers in vertical direction but their performance in the horizontals direction was inferior. High jumpers and volley balers are generally taller and lighter then sprinters and long jumpers. The result obtained of the present study might be due to that reason.

The result of the present study provokes us to rethink about the usual practice of measuring the explosive leg strength through either standing long jump or vertical jump irrespective of the event participated.

**Conclusions**

- ❖ Both groups, consisting of sprinters and long jumpers in one and high jumpers and volley ball players in the other, performed almost at par with each other in case of vertical jumps.
- ❖ Sprinters and long jumpers performed better than the other group in standing broad jump.
- ❖ Correlation coefficient of sprinters and long jumpers was found to be moderate.
- ❖ In case of High jumpers and Volleyball players the correlation coefficient of performances was found low.

**Reference**

1. Johnson Barry L, Nelson Jack K. Practical Measurements for Evaluation in Physical Education (3rd Edition), Delhi: Surjeet Publication, 1982, 202-210.
2. Harold Barrow M. Rosemary Mc. Gee. A Practical Approach to Measurement in Physical Education, (3rd Edition), Lea and Febiger: Philadelphia, 1997, 324-332.
3. Moria MP. A Systematic Approach to Skill Analysis, Periodicals Research and Technology in Sports, 1990, 11:1.
4. Singh H. Science of Sports Training, New Delhi: D.V.S. Publication, 1980, 85-90.
5. Clark Harison H. Application of Measurement to Health and Physical Education (5th Edition), New Jersey: Prentice Hall Inc, 1976, 145-156.
6. Verma Prakash J. A Text Book on Sports Statistics, Gwalior: Venus Publication, 2000, 138-150.
7. Bucher CA, Wuest DA. Foundation of Physical Education, Exercise Science and Sports (6th Edition), New Delhi: Tata McGraw Hill, 490-492.