

Relationship between Centre of Gravity and High Jump Performance among School Athletes

Dr.Deepak Bachewar: Vasantrao Naik college Nanded (M.S)

Dr.V.R.Parihar: N.S.B. College Nanded(M.S)

Abstract

Existing research techniques are being improved constantly and some of the specialists in training methods have taken sincere efforts to find out the relationship of different body segments and athlete performance. There is a close relationship of centre of gravity and high jump performance, since the high jump performance is directly related to the distance centre of gravity above the ground. The study of correlation of centre of gravity in relation to high jump performance was much explored.

In the investigation 50 boys students between the age group of 14 to 17 years from high school Nanded dist. Maharashtra were selected as subjects. The centre of gravity and high jump performance will be measured in centimetres.

The correlation between the centre of gravity and high jump performance was found to be 0.87. The reliability limits of the obtained 'r' at 0.01 levels.

Introduction

The strength of the muscles is the most important and necessary pre requisite for individual. Among various part of the physical strength, abdominal strength is one of the most important. Abdominal strength plays vital role in playing games, such as Volleyball, Basketball, and track and field events. There are relationship between abdominal and centre of gravity and relationship also there between centre of gravity and performance in jumping events especially high jump performance. (Hoffman K (1965))

The athlete who is high jumper or long jumper, he should have long legs otherwise he cannot perform better in his attempt. Men with short legs cannot his activity steadily and speedily the reason is that leg strength is conducted with centre of gravity and centre of gravity is associated with high jump performance. (Copper Yetal 1970)

The scientific aspects of teaching and coaching include balance motion, force, lever and so on. Among all balance is having his own role towards between achievements in sports performance. It is fact that balance is highly associated with centre of gravity. Centre of gravity plays significant role in all jumping events especially high jump performance. In this regards Bunns (1972) view is that the centre of the body is a major factor in determining the soundness of the stance, which is advocated is any technique in any sports in order to accomplished the desired objects most effectively. Therefore these factors must receive most careful attention.

Variorum, Multi- Disciplinary e-Research Journal
Vol.-01, Issue-IV, May 2011

Bucher (1968) explained the centre of gravity as “In the human body the centre of weight is now as the centre of gravity” the point from which the body can be suspended in perfect balance and point that constantly changes during movements and shifts in the direction of the movements or additional weight. When a human being stands erect with theory at the study of the relationship between centre of gravity and high jump performance, has become a major topic of interest to sports scientists in recent years.

Under normal circumstances for a male, the centre of gravity will be the navel region that is the rounded depression on the surface of the belly. But for the female it will be slightly below the navel (Broder M. R. 1967)

“The position of the centre of gravity according to the build and consequent distribution of the weight of the body”. Roughly speaking the centre of gravity will be found at about the front and back of an individual standing erect or lying in a prone or supine position.

Keeping in view of the paucity of information about centre of gravity in general and performance in particular an attempt has been made in this area to investigate the relationship between centre of gravity and high jump performance.

Hypothesis

It was hypothesized that there would be a significant positive relationship between centre of gravity and high jump performance.

Delimitations

The study was delimited in the following respects.

The study was restricted to select 50 boys of Z. P. School, Nanded during the academic year 2009 to 2010 within the age group of 12 to 14 years.

Objective of the study

1. To find out the relationship between centre of gravity and high performance among school athletes.
2. The physical education teacher and the coach adopted correct selection procedure to select better high jumpers by considering their centre of gravity.

Methodology

There is an attempt to analyse and find out the relationship between centre of gravity and high jump performance. To meet this purpose the investigator adopted a very careful and planned method for the selection of the subject to successful completion of the study.

Variorum, Multi- Disciplinary e-Research Journal
Vol.-01, Issue-IV, May 2011

Keeping in the view the nature of the problem under study the investigator includes 50 boys as subjects. The subjects were selecting to adopting systematic random sampling from Zila Parishad High School, Nanded M. H. Their age ranged was 14 to 17 years.

Prior to the administration of the test, investigator conducted test and established the test reliability for these purpose. The investigator selected 10 firms the subjects at random and high jump performance ware recorded. The investigator computed of coefficients of correlation and it found to be which as appreciably high and test reliability was established.

To assist the investigator to conduct the test and also to record the score there of her efficient and experienced class-mates came forward as testers they were given though idea about the research, test procedure, Method of data collection etc.

Since there is no standard specific test to measure the centre of gravity. The investigator considers the distance from floor to one inch below the navel when the subjects are standing erect. The measurements were taken in centimetres.

The uprights about two meters height the distance between the upright about 3.70 meters, triangular metal cross bar about the length of 4 meters, a 5 meters measuring still tape and jumping pit above 5 meters long and 4 meters wide with the run way about 15 meters length were used for conducting the test. First of all cross bar was placed at high of 0.95 meters. The cross bar was raised at a rate 1 centimetre. Each subject was allowed the benefits of 3 changes for each height the high cleared by 50 subjects were recorded separately.

Statistical Techniques

The following statistical procedure may be adopted to estimate relationship between centre of gravity and high jump performance.

The coefficient of correlation (r) was calculated by using the formula suggested by Clark known as persons = r .

To reach the result the data which collected from the subject were analyzed and statistically interpreted.

Results and Discussion

The mean (\pm S. D.) of the age of the athletes was 17.42 (3.99) years, high 161.33 (\pm 7.22) and weight 59.25 (4.33) Kg.

The statics of the results of relationship between centre of gravity and high jump performance among athletes are shown in Table 1.

Variorum, Multi- Disciplinary e-Research Journal
Vol.-01, Issue-IV, May 2011

Table 1

Mean, S. D. and coefficient correlation of centre of gravity and high jump performance.

Sr. No.	Variables	Means	S. Ds.	Coefficient of correlation
1	Centre of gravity	89.76	4.91	0.87*
2	High Jump	113.66	7.83	

*Significant at 0.5 level.

With regards to the relationship between centre of gravity and high jump performance among school athletes, mean values of centre of gravity and high jump were 89.76 and 113.66 respectively. The obtained $r = 0.87$ was significant at 0.05 level indicating that there was a significant relationship between centre of gravity and high jump performance. Thus the hypothesis of the study was accepted.

Recommendations

- 1) Relationship between gravity and vertical jumping ability could be studied.
- 2) Relationship between abdominal strength and high jump performance could be explained.
- 3) Relationship between abdominal strength and high jumping ability could be studied.
- 4) Relationship between upper extremity, lower extremity and centre of gravity could be studied.
- 5) The similar study could be done on collegiate and university and other athletes

BIBLIOGRAPHY

Backe Laverne W., Relationship of selected Anthropometrics and Physical Performance measures to performance in running and hop Step and jump, Research quarterly, 35:107-115, 1964.

Brorer Marion R., Efficiency of Human Movement, London: W.B. Saunders Co., 1967.

Bucher Charles, A., Foundations of Physical Education, St. Louis: The C.V.Mosby Co., 1968.

Bunn John, W., Scientific Principals of coaching, Englewood Cliffs, N. /J.: Prentice-Hall, Inc., 1972.

Copper John, M., James Lavery and William, Track and Field of Coach and Athletics, New Jersey: Prentice- Hall, Inc., 1970

Copper John, And Ruth R. Glasscow, Kinesiology, Saint Lewis: The C.V. Mosby Co., 1972

Cureton Thomas K., Mechanics of track running Scholastic Coach", Research Quarterly, 4 : 7, 1935.

Dysm Geoffrey, H.c and Joseph Edmundson, Athletics of School, London: University of London Press Ltd., 1964.

Gene Hooks, Application of weight training Athletics, Englewood Cliffs, N.J. : Prentice Hall, Inc.,1962.

Hay James, G., The Biomechanics of Sports Techniques, Englewood Cliffs, N.J. Prentice-Hall, Inc., 1973.

Hoffman Karol, The relationship between the length and frequency of studies, stature and leg length, Sports Belgium, 8: 401, 1965.

Jesee Fiering Williams, The relationship of Physical Education, London: W.B. Saunders Co., 1964.

Krakower Hyman, Skeletal Symmetry and high jumping, Research quarterly, 12:227-228, 1964.

Lookabough, G. The prediction of total potential strength of adult male from skeletal build, Research quarterly, 8 : 103-108, 1937.

Lawther John,D., Sports Psychology, Englewood Cliff, N.J. : Prentice-Hall Inc., 1972.

Schwri Evelyn,L., Movement Experience- Children : Curriculum and methods for elementary School physical education, New York : Meredith Publishing Co.,1967.