Evaluation of Problem of Athletic Potential Test of Secondary School Students in India

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ABSTRACT:

Sports in the present day have become extremely competitive, previous records are being broken whenever there is competition. It is not mere participation or few days practice that brings an individual victory, but the continuous hard work by training right from childhood. Competition is a fundamental feature of any sport and it is one type of human behaviour. Emphasis is needed on the development of personal traits and factors that influence performances in competition. The team winner is used in sport competition to mean an athlete or team whose attitude, determination and fortitude combined with physical ability will consistently contribute success. It is easy to recognize winners who have great performance ability. In this article, the problem of athletic potential test of secondary school students in India was evaluated.

Keywords: Athletic, Students, School, India, Potential

INTRODUCTION:

The preparation of an athlete today for achievement is a complex dynamic matter, characterized by a high level of physical and physiological efficiency and the degree of perfection of necessary ability and knowledge and proper teaching and tactics. An athlete arrives at the training center/institute only as a result of corresponding training sports activity

in this respect is an activity directed at steadily enhancing the preparation of an athlete and grooming him for a higher-level achievement [1-5].

The objective of the present investigation is to construct an athletic potential ability test and norms for school students in India.

RESEARCH METHODOLOGY AND DATA ANALYSIS:

Hypotheses:

It was hypothesized that,

- ➤ The newly constructed Athletic Potential Ability test battery may be reliable.
- ➤ The newly constructed Athletic Potential Ability test battery may be valid.
- ➤ The newly constructed Athletic Potential Ability test battery may be objective.

Evaluation:

Evaluation transcends mere measurement in that basically subjective Judgments which are based upon the data collected in the measurement process.

Selection of Subjects:

The purpose of the present study was to construct the athletic potential ability among school athletes. To achieve the purpose of the study, 300 school athletes were selected randomly from various schools in India who participated in the Inter school athletic meets. The age of the subjects ranged from 13 to 16 years.

The study was conducted only on male athletes. The athletes have been participating in competitions for a minimum period of 3-5 years in the school level tournaments. Only the players who represent the school teams and are actively involved in the inter-school, inter-district and open competitions were selected for the study.

Selection of Criterion Variables:

Success in sports, as measured by competitive performance, is dependent upon a number of significant mental and physical components. Somatotype, motor abilities, age, nutritional status, physiology, psychology, training level, genetic endowment, and injury risk are the major independent variables influencing performance.

Hence, the following variables were selected for this study:

- Weight

- Height

- Body Mass Index

- Standing Broad Jump

- Vertical Jump

- Five bounds jump for distance

- 60 M run from a standing start

- 30 M run from a moving start

- 30 M run from a Standing start

- Stride frequency during 30-M run from a moving start

- Stride length during 30-M run from a moving start

- Shot put backward throw

Criterion Measures

The following criterion measures were chosen for the administration of the test items. The selected tests items were presented in table I.

Table I

TESTS SELECTION

Criterion Measure	Tests	Unit of Measurements
Weight	Weighing Machine	In Kilograms
Height	Stadiometer	Centimetres

Body Mass Index	$BMI = Weight/Height^2$	Kilograms/cm^2
Horizontal Explosive Power	Standing Broad Jump	In Metres
Vertical Explosive Power	Vertical Jump	In Centimetres
Elastic Power	Five bounds jump for distance	In Metres
Speed	60 M run from a standing start	Seconds
Acceleration	30 M run from a moving start	Seconds
	30 M run from a Standing start	Seconds
Stride Frequency	Stride frequency during 30-M run from a moving start	Numbers
Stride Length	Stride length during 30-M run from a moving start	In Metres
Strength	Shot put backward throw	In Metres

Competency of the Tester

The investigator took all the measurements in this study with the assistance of coaches/Managers of concerned schools. To ensure that the investigator was well versed with the technique of conducting tests, they had a number of practice sessions in the correct testing procedure. The tester's reliability was established by test and re-test method.

Instrument's reliability

Weighing machine, Stadiometer, quality stopwatches and measuring tapes were used for the study. The $1/10^{th}$ second calibrated stop watches (Casio) were used for measuring the time, and standard calibrated synthetic tape (Freemans) was used for measuring the distance and marking the areas. The reliability of the instruments was found to be excellent for the purpose of the study.

Orientations to the Subjects

The investigator explained the purpose of the study to the subjects and their part in the study. For the collection of data, the investigator explained the procedure of testing on selected dependent variables and gave instructions about the procedure to be adopted by them for measuring. The subjects of all the groups were sufficiently motivated to perform their maximal level during testing periods.

Collection of Data

The tests were administered to 300 athletes from India who were the subjects for the study. Since the inter-school competitions start from the month of September, the data was collected during the month of August just before the interschool competitions. All the test items were administered at their schools on consecutive days on both the sessions. For getting better results the purpose of the study was clearly explained to the athletes. Each test item was demonstrated to the subjects one by one before the tests. Their doubts and apprehensions were cleared then and there. The subjects were asked to perform all the tests as per test's rules and regulations. The data collected from the 300 school athletes by administering the twelve test items were taken as the data for the study.

Establishment of Validity, Reliability and Objectivity of the Test Items

Validity

Face validity was established for the test items. All the 12 tests were selected on the basis of the recommendations of experts, coaches, and knowledge gained through available literature and their face values.

Reliability

Test and retest method was followed in order to establish the reliability of data by using ten subjects at random. The same personnel under similar conditions tested all the dependent variables selected in the present study twice for the subjects. The intra class co-efficient of correlation was used to find out the reliability of the data and the results are presented in Table II.

TABLE II : INTRA CLASS CO-EFFICIENT OF CORRELATION ON SELECTED DEPENDENT VARIABLES

S.No.	Variables	'R' Value
1	Weighing Machine	0.97
2	Stadiometer	0.96
3	BMI=Weight/Height^2	0.96
4	Standing Broad Jump	0.89
5	Vertical Jump	0.90
6	Five bounds jump for distance	0.91
7	60 M run from a standing start	0.90
8	30 M run from a moving start	0.89
9	30 M run from a Standing start	0.87
10	Stride frequency during 30-M run from a moving start	0.91
11	Stride length during 30-M run from a moving start	0.92
12	Shot put backward throw	0.93

Since the obtained 'R' values were much higher than the required value, the data were accepted as reliable in terms of instrument, tester and the subjects.

Objectivity

The objectivity of tests was established by correlating (using Product Moment Correlation formula) the two sets of test scores conducted by two testers, the research scholar and a coach on the same ten subjects and correlation obtained is presented in table III.

Table III : OBJECTIVITY CO-EFFICIENT OF CORRELATION OF ALL THE ABILITY TEST ITEMS

S.No.	Variables	'R' Value
1	Weighing Machine	0.95*
2	Stadiometer	0.96*
3	BMI=Weight/Height^2	0.97*
4	Standing Broad Jump	0.92*
5	Vertical Jump	0.91*
6	Five bounds jump for distance	0.93*
7	60 M run from a standing start	0.90*
8	30 M run from a moving start	0.88*
9	30 M run from a Standing start	0.92*
10	Stride frequency during 30-M run from a moving start	0.91*
11	Stride length during 30-M run from a moving start	0.93*
12	Shot put backward throw	0.95*

* Significant at 0.01 level

From table III, it is evident that the objectivity of all the test items was significantly high, thus establishing the competency of the scholar to administer the test.

Statistical Procedure

The first statistical analysis was Pearson's Product Movement Correlation which was used to find out the relationship among all the ability test items. Factor analysis was applied using the Principal Component Analysis (Un rotated Factor Loadings and Varimax Rotation). Final solution so obtained was used to identify the different factors. These factors were given an appropriate name depending upon the characteristics of variables contained in it. A test battery was constructed by picking up variables having higher loading from each factor. Finally, a norm was developed for the selected test items using Percentile Scale for interpretation of potential ability performance, and a 6-Sigma scale was developed for grading the overall performance.

Analysis and Interpretations of Data:

The statistical analysis of data was done to construct a battery of tests and to develop a norm for the selected test items to interpret the Athletic Potential Ability of the school athletes in the age group of 13-16. The data obtained from all the test items were first subjected to descriptive analysis in order to have an idea about the characteristics of all the test items.

Further, all the test items were analysed by Factor Analysis by using the Principal Component Analysis and Varimax Rotation Method as a final solution method to reduce the test items for developing a test battery for the school athletes in the age group of 13-16. Finally, a norm was developed for the selected test items using percentile for the interpretation of the playing ability.

FINDINGS, RESULTS AND DISCUSSION:

The statistical analysis of the data reveals that all the ability test items selected were highly correlated. The tests were constructed involving all the fundamental abilities of the athletics. The designing of the tests was carefully crafted keeping in mind the demand of the abilities in competition situation. The significant correlation is attributed to the reliability of the tests constructed.

Factor 1

The factor 1 of the factor analysis shows that only ten test items were loaded higher than 0.70. The other test items had a loading less than 0.70 and hence were not considered for the Battery. Shot put, Stride Length, Weight, 60 m run, Long Jump, Height, Vertical Jump, Five Bounds, Standing 30 m, Flying 30 m from this factor were taken for the Test Battery.

Bounding and Sprinting were an ability that is in high demand in athletics. Shot put, Stride Length, Weight, 60 m run, Long Jump, Height, Vertical Jump, Five Bounds, Standing 30 m, Flying 30 m are very important abilities in athletics so they have rightly emerged with high loadings and are taken for the Test Battery. Since these abilities are performed by athletes for various events, this factor was named as the 'Athletic Potential ability Test'.

Factor 2

The factor 2 of the factor analysis shows that one test item in this factor had a loading higher than 0.5. Stride frequency had a loading of 0.960. Since the other test items had a loading less than 0.70, only one test item, stride frequency was taken for the test Battery.

Discussion on Hypothesis

In the beginning of the study, it was hypothesized that the newly constructed Athletic Potential Ability test battery may be reliable. The findings of the study also produced similar results. Hence the first researcher hypothesis was accepted.

In second hypothesis it was hypothesized that the newly constructed Athletic Potential Ability test battery may be valid. The findings of the study also produced valid results. Hence the second researcher hypothesis was accepted.

In third hypothesis it was hypothesized that the newly constructed Athletic Potential Ability test battery may be objective. The findings of the study also produced valid results. Hence the third researcher hypothesis was accepted.

CONCLUSION:

Within the constraints and limitations of the present study, the following conclusions were drawn.

1. All the test items included in this study were highly correlated.

2. Test item factors with higher loadings were taken to constitute the Battery of Athletic Potential Ability tests for the school athletes in the age group of 13-16 years. The test items are

- Shot put,
- Stride Length
- Weight
- 60 m run
- Long Jump
- Height
- Vertical Jump
- Five Bounds
- Standing 30 m
- Flying 30 m and
- Stride Frequency

3. The Athletic Potential Ability of the athletes was interpreted by using a scale on the basis of a 6-Sigma scale as A, B, C, D, & E or Excellent, Good, Average, Satisfactory & Poor respectively according to their overall score based on the percentile scale which was developed for all the five test items.

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