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Dr. J Manohar Chendur Pandi
Director of Physical Education,
Department of Physical
Education, Arignar Anna
Government Arts College,
Villupuram, Tamil Nadu, India

Prediction of track and field performance of young talents: A review

Dr. J Manohar Chendur Pandi

Abstract

Performance has constantly been of significance to athletes, coaches and scientists. Since track and field events are the oldest ceremonial and competitive sports, the attention in a human being's ability and accomplishment in running, jumping and throwing has a long and diversified history. Talent identification in track and field events has been used with unpredictable degrees of success. Talent identification has generally reliable in predicting the future success of young talents, which differed from model used by the country or organization with respect to the anthropometrical factors. Successful programs have been for sports that do not have a large participation base, and have clear physical attributes for success that can be tested for. Physical educationist, mathematicians, statisticians, physiologists and applied researchers have developed several models to predict future performances and optimum performances in track and field events. There have been many publications regarding the prediction of track and field performances. This paper made attempt to focus on the track and field event predicted models used by the various countries.

Keywords: Talent identification, prediction, sprinting, jumping and throwing

1. Introduction

The track and field sports are undoubtedly oldest, which was the ceremonial and competitive event at the ancient Olympics in Greece. The data of track and field was very rich and accurate. The sprint, jumping and throwing ability are determined by the most popular tests. Investigator has found testing to be most effective for children between the ages of 11-14 years. More specific tests can be performed when athletes for a certain sport are being recruited. Additionally, a test that is of short duration and none fatiguing would be desirable. Scientists use track and field performance data to develop prediction models. Evaluating and predicting track and field performances have a long history and there have been numerous models developed to evaluate and predict future track and field performances.

2. Materials and Methods

The major advantage of collecting track and field performance data is that it can be obtained easily from different published sources. The International Association of Athletic Federation (IAAF, <http://www.iaaf.org>) is a governing authority for athletic programs, standardized technical equipment and world records. Track and field performances data can also be obtained from journals, conference proceedings, newspapers and magazines (e.g., Track and Field News), yearbooks and organization web-pages.

3. Results and Discussion

Table 1 examined the various studies related to the talent identification that have been made to develop guidelines for testing athletes so as to identify the predictive field tests. The following table represents the major contribution of field test to determine the track and field performance. The following table reveals that the contribution of field tests used to predict the track and field performance in view of various authors of different countries.

Correspondence

Dr. J Manohar Chendur Pandi
Director of Physical Education,
Department of Physical
Education, Arignar Anna
Government Arts College,
Villupuram, Tamil Nadu, India

Table 1: Various Predictor tests of Track and Field Performance

S. No	Author	Study Title	Predicting Events	Predictors
1	Atalin, Nischt, and Jeffries (1980)	Talent Identification in Track and Field	Track and Field Events	60m, 300m, Trunk Bend, Five Steps, Height and Weight.
2	Foreman (1981)	Talent Identification in Track and Field	Track and Field Events	Vertical jump, standing long jump, bounds, five double leg hops, body fat and 50 yard dash.
3	Recev (1985) ^[3]	Modern Athlete and Coach: Talent Identification in Sport.	Track and Field Events	Standing long jump, vertical jump, 60 m sprint, sit-ups and bent arm hang
4	Kruger and Pienaar (2009) ^[6]	Anthropometric, Physical and Motor Performance Determinants of Sprinting and Long jump in 10-15 Year old Boys from Disadvantaged Communities in South Africa	Sprinting Ability (100m sprint)	Anaerobic power output, acceleration, body mass, reaction time, iliopsoas flexibility, speed endurance, sitting height, age and push-ups.
5	Gerd Schroter and Gerald Voss. Modern Athlete and Coach. (1990)	Predicting Performances of Young Athletes	Sprint Ability	Complex sprint test, Crouch start test, speed, Explosive Strength
6	Tabatchink (1980)	Talent Identification in Track and Field	Sprint Ability	Muscular strength, standing long jump and standing triple jump.
7	Foreman (1989)	United States-commonly used field tests	Sprinting Ability	Standing long jump, the vertical jump and the 50 yard dash
8	Tan Kok Siang	Development of a talent identification model to determine the physical attributes of Athletes for the long jump event	Jumping Ability	30m Run, Sit-ups, Sargent Jump, Standing Long Jump And Sit and Reach (S&R).
9	Gerd Schroter and Gerald Voss- Modern Athlete and Coach. (1990)	Predicting Performances of Young Athletes	Jumping Ability	Jump test, Sprint test, Long jump, Frontal crouched high jump, Five-step bounding.
10	Kruger and Pienaar (2009) ^[6]	Anthropometric, Physical and Motor Performance Determinants of Sprinting and Long jump in 10-15 Year old Boys from Disadvantaged Communities in South Africa	Jumping Ability (Long Jump)	Horizontal jump, age, acceleration and ankle flexibility
11	Jarver (1983)	Talent Identification in Track and Field	Jumping Ability	30 an d60 m sprint, standing broad jump, standing triple jump, push-ups and pull-ups.
12	Jarver (1983)	Talent Identification in Track and Field	Throwing Ability	30 m Flying start, 60 m from the standing start, over head shot throw, push-ups and pull-ups.
13	Afanasiev (1982)	Ussr Model	Throwing Ability	Vertical jump, barbell squat, and strength of the leg.
14	Siris and Gaidarska (1986)	Soviet youth sports schools selection	Throwing Ability	Height, weight, arm span, 30 m flying start, 60 m standing start, standing long and triple jump, shot throw backwards over the head, pull-ups and push-ups.

Table 2

Recommended Field Test For Predicting The Track And Field Performances					
Sprinting Ability (7 Studies)	Influences of Field Test on Sprinting Ability	Jumping Ability (7 Studies)	Influences of Field Test on Jumping Ability	Throwing Ability (6 Studies)	Influences of Field Test on Throwing Ability
Sprint test	85.70% (6 studies)	Sprint test	85.70% (6 studies)	Sprint test	61.22% (5 studies)
SBJ	61.22% (5 studies)	SBJ	85.70% (6 studies)	SBJ	42.86% (3 Studies)
VJ	57.14% (4 Studies)	VJ	42.86% (3 Studies)	VJ	42.86% (3 Studies)
Others	28.57% (2 or Less Studies)	Others	28.57% (2 or Less Studies)	Others	28.57% (2 or Less Studies)

The table 2 exposed that the track and field event performances influenced by many field tests, especially sprint test, standing broad jump (SBJ), vertical jump (VJ) and other least significant items. In this study, 7 studies for predicting sprinting and jumping ability, and 6 studies for predicting throwing ability were taken to consideration with respect to selection of young talents.

The result shows that sprint test was used as the key test to predict the sprinting, jumping and throwing ability. From the collected sources 85.70% of studies includes sprint test as the most important test to predict the sprinting and jumping ability. For concern with the throwing ability 61.22% of

studies encompassed sprint test. Next to the sprint test standing broad jump was the key element to predict the sprinting (61.22% studies), jumping (85.70% studies) and throwing (42.86% studies) ability. Vertical jump test was also preferred by the half of the studies to select the young talents. The other tests were used in the prediction model in very few studies.

4. Conclusion

It may be concluded from the previous studies on talent identification and prediction of athletic ability, the sprinting test is most influential factor to determine the sprinting,

jumping and throwing events performances. Explosive standing broad jump and vertical jump test are also the determinant factor next to the sprint test.

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