ORIGINAL ARTICLE

PHYSICAL, PHYSIOLOGICAL, PSYCHOLOGICAL AND ANTHROPOMETRIC VARIABLES AS PREDICTORS FOR SPEED OF SUB-JUNIOR ATHLETES

Vivek Kumar Singh[1] and Richa Singh[2]

[1] Assistant Professor, Department of Physical Education, LPU, Phagwara.
[2] Research Scholar, Department of Physical Education, BHU, Varanasi.

Abstract:

Purpose of present study was to develop the suitable equation to predict the speed of sub junior athletes. To keeping this purpose in mind long range of variables from different categories was selected i.e. Physical, physiological, psychological and anthropometric, while the variables were leg strength, back strength, abdominal strength, flexibility, height, weight, leg length, arm length, calf girth, thigh girth, motivation, aggression, self confidence, resting heart rate and vital capacity. Subjects for this study were selected by stratified random sampling method from KVBamrauli, Allahabad. Data for this study was collected during sports camp by application of suitable criterion measures. Product moment correlation and multiple correlation was used to find out the correlation between criterion and predictor variables, while backward linear regression method was used to develop the prediction equation at 0.05 level of significance. According to findings leg strength, back strength, flexibility, height, motivation and vital capacity is found correlated with speed and equation develop on basis of these variables is significant for prediction. Some of variables like leg length, calf girth is not found correlated with speed may due to nature of different sport. May suitable prediction can be done if subjects are selected form on particular sports in large number.

KEY WORDS:

Regression, Speed and Self confidence.

INTRODUCTION

From the earliest times running has been a natural part of man's existence, whether he was catching animals for food or escaping from predators. However, he also began to run for pleasure and then competitively, leading to a desire to improve on his speed or ability to run farther. Running is the most natural of athletics movements. Children run, as part of their play and practically every game requires reserves of stamina and the ability to run fast. Every track event has running as its essence, sometimes alone, sometimes with a team and sometimes between obstacles. Every training and conditioning program contains an element of running, and tests of fitness or physical ability always include running for speed.

Today, in the modern competitive age every sportsman is in a race to excel others and competition has become a fundamental mode of human expression as it is one of the very important functions by which National and International reorganization and prestige is gained. From its very simple form, sports have emerged into highly organized activity of human society and it has become a complex social and cultural phenomenon. The modern world appears to be much more concerned with the world of sports. The hold of sports has grown very strong on the mind of individuals in the society at large. Sportsmen and spectators are very clear about the value and significance of sports.

In this respect lots of research is going through to enhance the level of performance. In this respect

it has been well observed, the training and coaching will be effective if it will applied on a well deserving or suitable athletes. For this regard it is important that on have scientific and well developed criteria to choose the best one. Present study has been taken to this regard. It has been tried to develop a suitable criteria for selection and nurture of a tailent.

Selection of Subjects: Present study was undertaken on forty athletes of sub-junior level who has participated in different games at U-16 level for there school or district. All the subjects of this study were selected randomly from KV Bamrauli, Allahabad. For selection of subjects stratified random sampling method was applied because subjects were from different games and to make equal proportion of each game.

Selection of Variables and Criterion Measures:

Table - I

Variables	Nature	Tools/Questionnaire	Measuring Unit
Speed	Dependent	50-yard dash	Sec
Leg Strength	Independent	Leg Dynamometer	Kg.
Back Strength	Independent	Back Dynamometer	Kg.
Abdominal Strength	Independent	Sit-ups	Count
Flexibility	Independent	Sit and reach test	Cm.
Height	Independent	Stadiometer	Mts.
Weight	Independent	Weighing Machine	Kg.
Leg Length	Independent	Measuring Tape	Cm.
Arm Length	Independent	Measuring Tape	Cm.
Calf Girth	Independent	Measuring Tape	Cm.
Thigh Girth	Independent	Measuring Tape	Cm.
Motivation	Independent	Sports achievement motivation test by Dr. M.L. Kamlesh	Count
Aggression	Independent	Sports aggression inventory by A. Kumar and P. Shukla	Count
Self Confidence	Independent	Self Confidence Inventory by Dr. RekhaAgnihotry	Count
Resting Heart Rate	Independent	Manual Palpation Method	Count
Vital Capacity	Independent	Spirometer	liter

Data Collection and Statistical Technique: Data was taken during sports camp at KV Bamrauli from subjects belonging to different sports by application of suitable criterion measures.

Pearson product moment correlation and multiple correlationwas used to find out the relationship between criterion and predictor variables, while liner regression was used to develop equation for prediction of speed. For present study level of significance was chosen as 0.05.

Table – II
Descriptive Statistics of Subjects in Relation to Criterion and Predictor Variables

Variables	Mean	Median	Mode	SD	Min.	Max.	Skew.	Kurt.
Speed	7.528	7.500	7.90	.379	7.00	8.50	.540	-.236
Leg Strength	144.00	145.00	140.00	21.599	85.00	185.00	-.807	.843
Back Strength	147.10	153.00	170.00	22.705	100.0	185.00	-.552	-.546
Abdominal Strength	39.84	40.00	40.00	3.803	28.00	46.00	-.998	.833
Flexibility	58.00	58.00	62.00	7.162	45.00	76.00	-.050	.138
Height	164.56	164.50	165.00	5.522	155.00	179.00	.531	.034
Weight	55.66	55.00	55.00	2.395	50.00	60.00	-.044	-.248
Leg Length	96.30	97.00	98.00	2.957	91.00	102.00	-.237	-.972
Arm Length	72.38	72.00	71.00	2.671	69.00	78.00	.423	-.861
Calf Girth	31.02	31.00	31.00	2.254	24.00	36.00	-.438	.567
Thigh Girth	46.98	46.00	46.00	4.340	39.00	55.00	.279	-.743
Motivation	30.04	28.00	28.00	4.772	24.00	40.00	.886	-.337
Aggression	20.74	21.00	19.00	2.229	12.00	24.00	.186	8249
Self Confidence	17.20	19.00	21.00	4.602	8.00	24.00	-.394	-1.026
Resting Heart Rate	69.460	70.00	72.00	2.635	64.00	73.00	-.517	-.816
Vital Capacity	3.68	3.80	4.20	.549	2.80	4.50	-.214	-.467

Table-II clearly revealed that data of all the variables is normally distributed excepted kurtosis value of self confidence. While values of skewness and kurtosis of rest variables is within the acceptable range along with Standard deviation value of all variables including self confidence.

Table – III
Correlation Table for Criterion Variables and Predictor Variables

Predictor Variables	Criterion Variables	Correlation	Sig.
Leg Strength		-.558	.000
Back Strength		-.639	.000
Abdominal Strength		-.208	.148
Flexibility		-.421	.002
Height		-.404	.047
Weight		-.262	.260
Leg Length		-.055	.705
Arm Length	Speed	-.005	.974
Calf Girth		-.180	.212
Thigh Girth		.061	.673
Motivation		-.395	.044
Aggression		.163	.257
Self Confidence		.116	.422
Resting Heart Rate		-.036	.806
Vital Capacity		-.375	.05

As table revealed that fifteen predictor variables from different categories has been selected on basis of earlier studies and experts opinion, while correlation table is revealed that only leg strength, back strength, flexibility, height, motivation and vital capacity is found correlated with speed of athletes. Where rest of nine variables i.e. abdominal strength, weight, leg length, arm length, calf girth, thigh girth, aggression, self confidence and resting heart rate is found insignificantly correlated with speed of athletes at 0.05 level of significance.

Table - IV
Model summary and Coefficient Table

Model Variables	R	Adjusted R Square	Unstandardized Coefficients	Beta	t	F
Leg Strength			-.010	-.549	-3.744*	
Back Strength			-.006	-.338	-2.611*	
Flexibility			-.048	-.303	-2.441*	
Height	.805	.579	.015	.224	1.759	9.426*
Motivation			-.020	-.257	-2.414*	
Aggression			.045	.264	2.633*	
Vital Capacity			.162	.235	2.346*	

Speed= 7.652-Leg Strength(.01)-Back Strength(.006) – Flexibility(.048)+Height(.015)-Motivation(.020)+Aggression(.045)+Vital Capacity(.162)

Table-IV revealed that Leg length, back length, flexibility, height, motivation, aggression and vital capacity has significant effect on speed, where multiple correlation of these predictor variables with speed is .805, while these variables are responsible for 57.9% variance in speed according to finding of this study. Table also revealed about individual effect of each variable on speed. According to table leg strength is causing highest variance in standard deviation of speed while height is causing lowest and it is also clear from table where 't' value of height is found insignificant. Table is also showing the 'f' value of model, which is also significant at 0.05 level which means equation develop for prediction of speed is significant.
Conclusion:Present study was conducted in thrust to find suitable predictors for junior level athletes who can be used as a tool for suitable selection of athlete and also can be used to adjust or develop the training plan accordingly. In this process it is find that leg strength, back strength, flexibility, height, motivation level and vital capacity are significantly contributing to speed.

DISCUSSION OF FINDINGS:

As findings of the study revealed that leg and back strength is significantly correlated with speed of junior level athletes. Findings are well supported by Haga (2008) conducted a study to find out the

relationship between physical fitness and motor competence in children, in findings of this study he revealed strong and significant correlation between motor competence and physical fitness within the sample.Haga also concluded that motor fitness components i.e. leg strength, flexibility have sufficient effect on speed.Young and et al (2005) has also concluded in there study of relationship between strength qualities and sprinting performance is strength qualities were related to sprinting performance and these relationships differed for starting and maximum speed sprinting. While study was conducted on twenty junior track and field athletes.Robert (1972) conducted a study to find out the effect of achievement motivation on risk taking choice of male and female athletes. Findings of study revealed that male and female athletes who was motivated to exhale had taken intermediate risk and become succeed in there events in compare to those who had not taken risk. According to Jones (1973) appropriate anxiety and high level of motivation is required for success of high school athletes.Mishra (2003) findings is supporting to finding of this study i.e. flexibility and vital capacity is also significant for speed. Mishra's finding revealed that relationship between speed and selected physical and physiological variables i.e. arm strength, flexibility, vital capacity and body surface was highly correlated, while 67% variance in speed is caused by concern variables.

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Vivek Kumar Singh
Assistant Professor, Department of Physical Education, LPU, Phagwara.

Richa Singh
Research Scholar, Department of Physical Education, BHU, Varanasi.