RELATIONSHIP OF FEMALE SELECTED ANTHROPOMETRIC VARIABLES TO JUMPING ABILITY

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ABSTRACT

The purpose of the study was to find out the relationship between selected anthropometrical measurement variables to the performance of jumpers. Fifty female sports women(except athletes) of University and National level Participation from Rajasthan were selected for this study. The age groups of the subjects were ranged from 18years to 25 years. Total Seventeen variables i.e. twelve anthropometric and five Physical variables were selected. Anthropometric measurements included Standing Height, Weight, Shoulder width, Hip Girth, Thigh Girth, Thigh Length Leg length, Foreleg Length, Calf Girth, Foot Length, Ponderal Index and Crural Index. Weight was measured by weighing machine in kilograms. Leg length, fore leg length, thigh length was measured with the help of flexible steel tape in centimeters. Foot length and shoulder width was measured with the help of spreading caliper in centimeters. Thigh girth, calf girth, hip girth was measured with the help of flexible steel tape in centimeters. Ponderal index and Crural Index was calculated. The level of significance to check the relationship obtained by Pearson's Product Moment Correlation was set at 0.05 level of significance. In using the Product Moment correlation, a value of 0.273 was needed for significance for forty eight (48) degree of freedom for each group.

Key Words: Anthropometry, Fitness and Jumping Ability.

INTRODUCTION:

General athletic ability is considered simultaneously with general motor ability. It includes several items such as strength, power, agility, speed reaction time and flexibility. An abundance of these traits enables a person to perform well in such basic activities as running, jumping, climbing, throwing and dodging. If a performer has a large amount of general athletic ability, he is said to be natural athlete. A person with a high level of general athletic ability possesses the basic physical components necessary to achieve excellence in a number of activities. But in spite of this general ability he well still unable to perform well in a particular sport until, through long hours of practice,

he develops the skills specific to that sports.It has been proved that there are some motor qualities such as social psychological, physical and physiological to be needed for all athletes to achieve better performance in different games and sports. But in spite of there, physique and personal characteristics of an individual also affect performance. As people came to know the importance of games and sports, participation has increased year by year and the sports scientists become motor abilities, physical, physiological and psychological aspects and the potentialities of individuals.

The quality of physical performance is related to various basic of body and girls such as their maturation, body size and physique type. Many of these traits are acquired through heredity and are affected by environmental influences. Children differ significantly in these basic traits, while participation in physical activity will not appreciably, if at all in some instances, change their maturity, body size or physique type, these individual differences will greatly influence their physical performances. These factors, therefore, should be considered in judging students potentialities for participation in physical activities for example Children with a high degree of mesomorphy generally perform better in many sports; the endomorphs on the other hand are definitely handicapped by their body type. Mature and larger boys have greater advantages over small boys.Running jumping and throwing are inborn characteristics of child. Height and weight are the main features which effects the growth and performance of a child. Anthropometric measurements of an individual, his level of motor abilities and cardio-vascular fitness are the main features which are playing a significant role in sports performance.

SELECTION OF SUBJECTS:

Fifty female sports women (except athletes) of Rajasthan studying in various under graduate and post graduate courses in Physical Education were selected as subjects for this study.

SELECTION OF VARIABLES AND CRITERION MEASURES:

The research scholar made sincere efforts to review the related literature in the area of study and held series of discussions with experts and scholar's own understanding of the problem, the following variables were selected for the purpose of this study.

ANTHROPOMETRIC MEASUREMENTS:

Standing Height: Measured by using a wall with marked scale.

Weight: Measured by using weighing machine.

Shoulder Width: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Hip Girth: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Thigh Girth: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Thigh Length: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Fore Leg Length : It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Leg Length: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Calf Girth: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape.

Foot Length: It was recorded correct to the nearest half centimeter, with the help of flexible steel tape

Ponderal Index: It was obtained by using the formula: standing Height divided by the cube root of weight.

FINDINGS:

The data obtained on each of the independent variables was correlated with the dependent variables in order to find out the relationship between the dependent and independent variables. The analysis of data pertaining to this is presented in following table 1 & 2

Table-1

Relationship of anthropometric variables to long jump ability

Variables Correlated	Coefficient of Correlation (r)
tanding Height	0.166417
Veight	0.54781*
houlder width	0.25029
ip Girth	0.38763*
high Girth	0.27204
high Length	0.094196
eg length	0.213715
oreleg Length	0.222619
alf Girth	0.04403
oot Length	0.2097
onderal Index	0.609882*
rural Index	0.164458

*Significant at .05 level of confidence N=50 r 0.5 (48) = 0.273

Table-3

Relationship of anthropometric variables to high jump ability

Variables Correlated	Coefficient of Correlation (r)
Standing Height	0.31018*
Weight	0.43052*
Shoulder width	0.14437
Hip Girth	0.1897
Thigh Girth	0.23047
Thigh Length	0.301699*
Leg length	0.405117*
Foreleg Length	0.340233*
Calf Girth	0.01215

Foot Length	0.08206
Ponderal Index	0.598742*
Crural Index	0.048228

*Significant at .05 level of confidence N=50 r 0.5 (48) = 0.273

The analysis of data in table-3 reveals that High jump ability is significantly related to height (0.31018), weight (r=0.43052), leg length (0.405117), thigh length (0.301699), Foreleg length (0.340233) and ponderal index (0.598742). It is therefore, evident that High jump ability is influenced by height, weight, leg length, thigh length, fore leg length, thigh girth and ponderal index.

Foot length (0.08206), hip girth (0.1897), shoulder width (0.14437), calf girth (0.01215), thigh girth (0.23047) and crural index (0.048228) are not found to be significantly related to High Jumper's ability. Therefore, height, weight, leg length, thigh length, fore leg length and ponderal index may predict the quality of High Jumper's ability. It will be advantageous to take into consideration these six variables when spotting talented High jumpers.

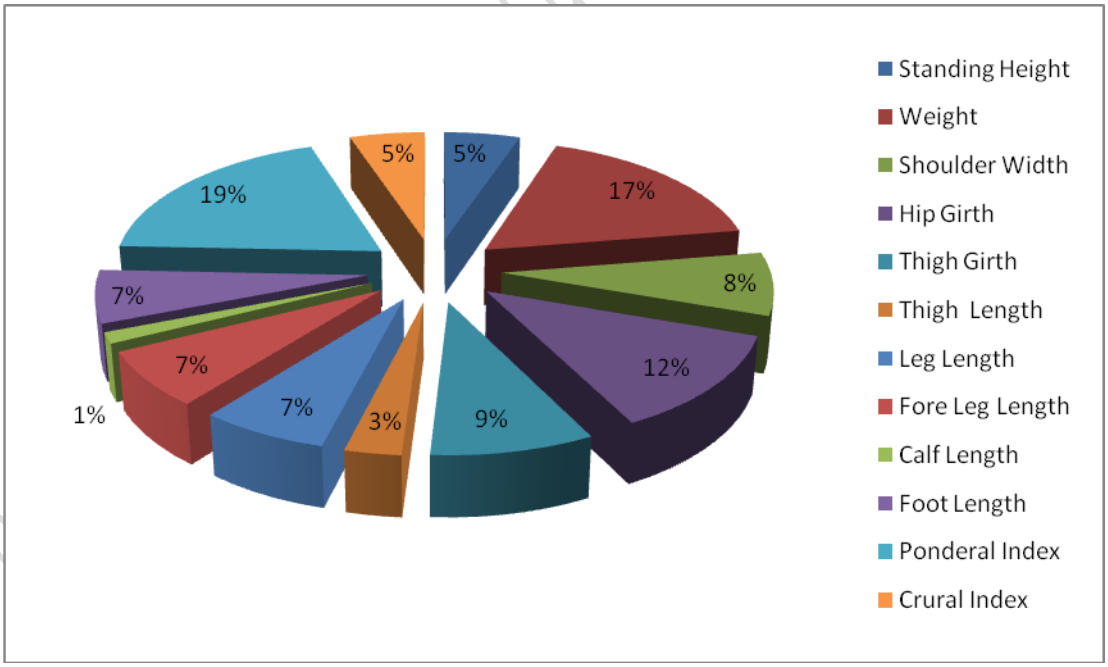

Figure 1-A

Correlation Coefficient of selected Anthropometric Variables to Long Jump Ability

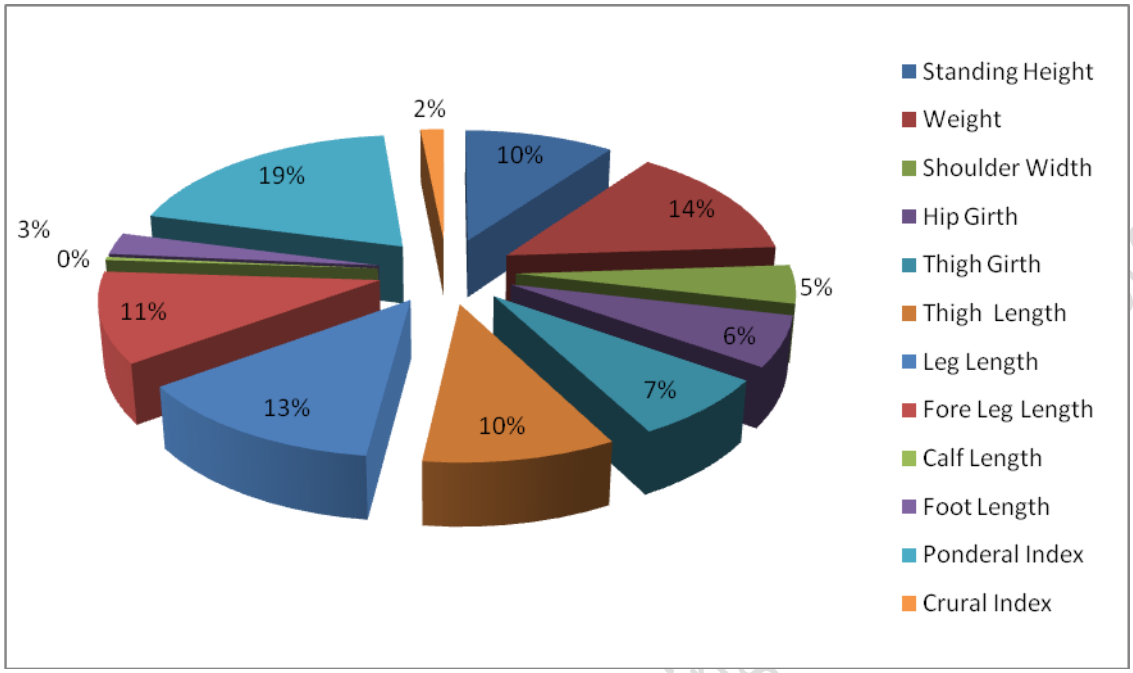

Figure 1-B

Correlation Coefficient of selected Anthropometric Variables to High Jump Ability

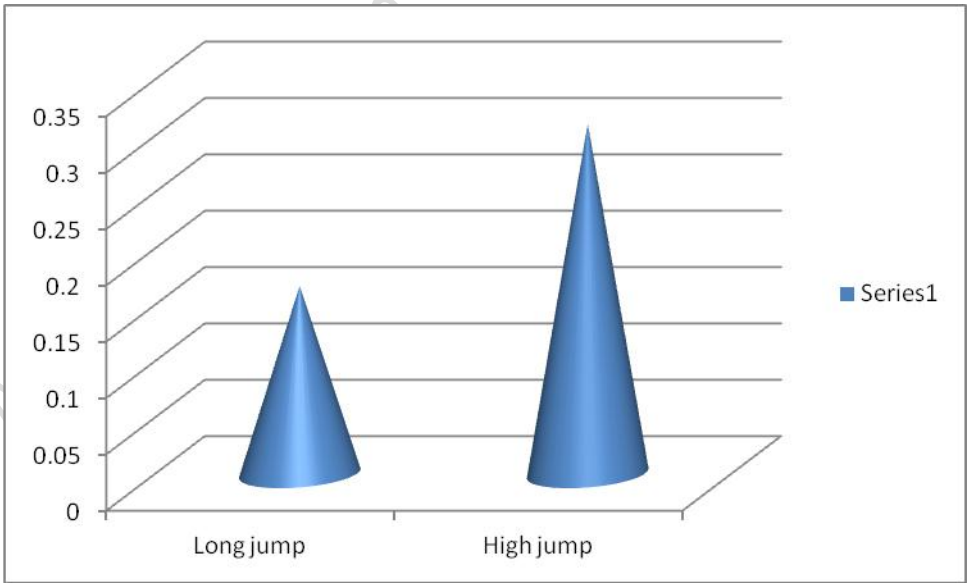

Figure- 1.1

Relationship between Standing Height and Jumping Ability

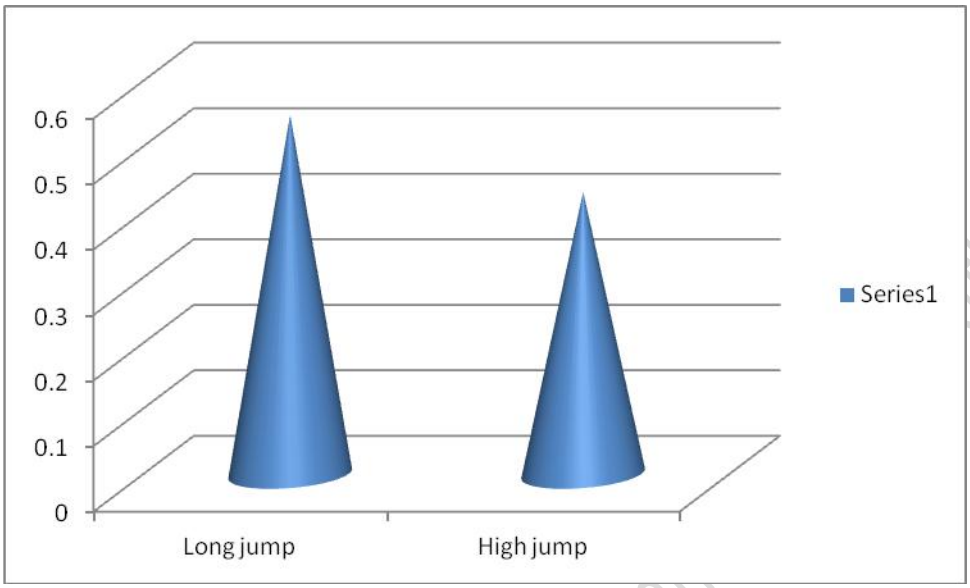

Figure 1.2

Relationship between Weight and Jumping Ability

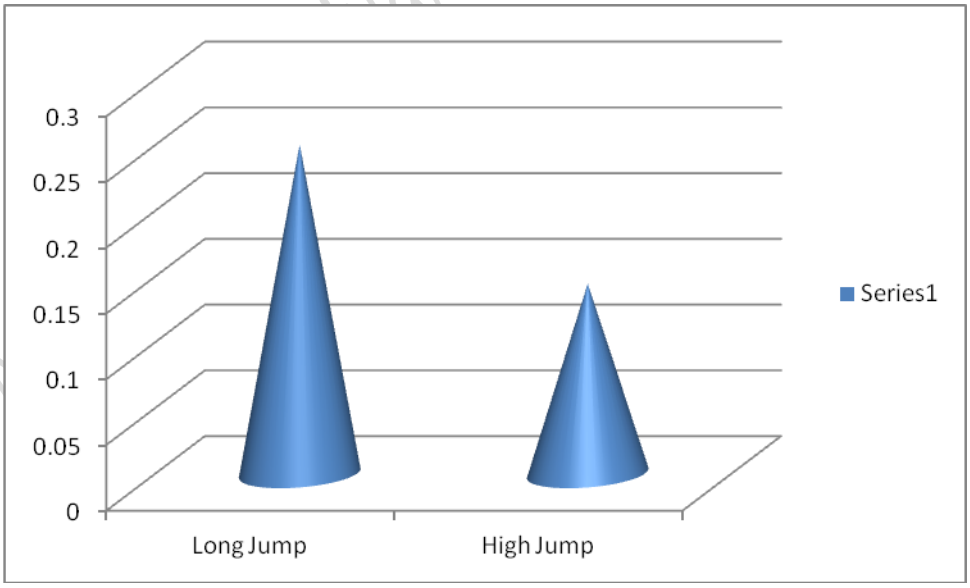

Figure-1.3

Relationship between shoulder Width and Jumping Ability

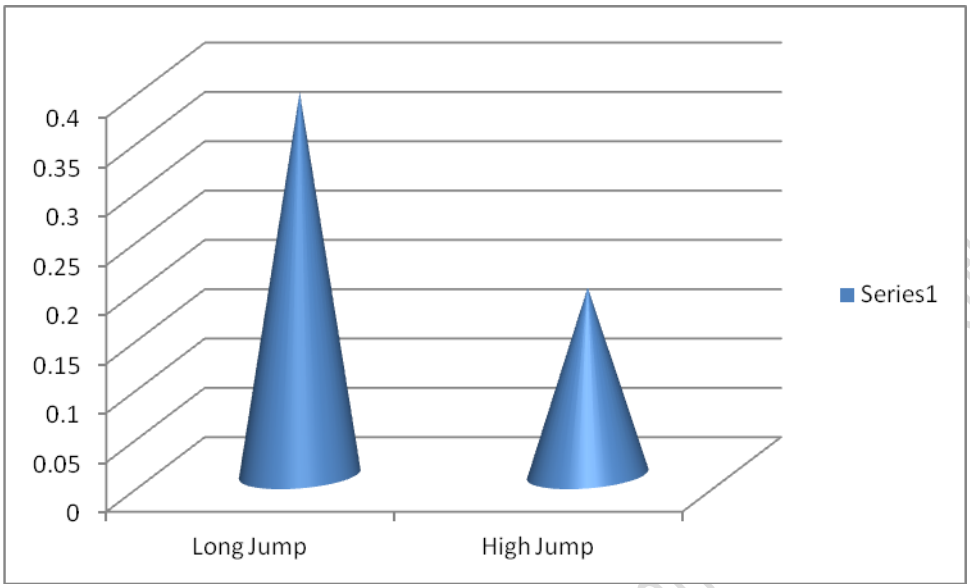

Figure 1.4

Relationship between Hip Girth and Jumping Ability

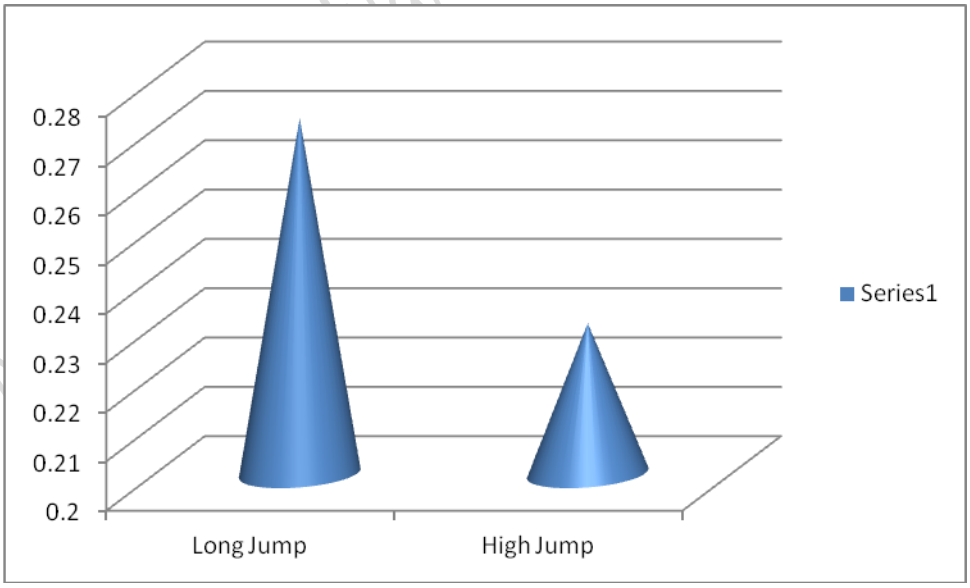

Figure-1.5

Relationship between Thigh Girth and Jumping Ability

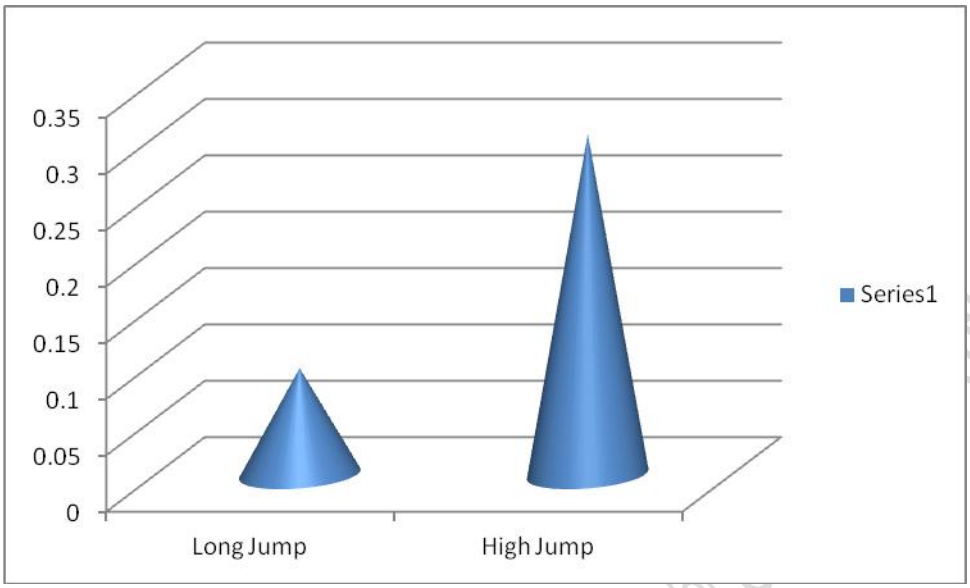

Figure-1.6

Relationship between Thigh Length and Jumping Ability

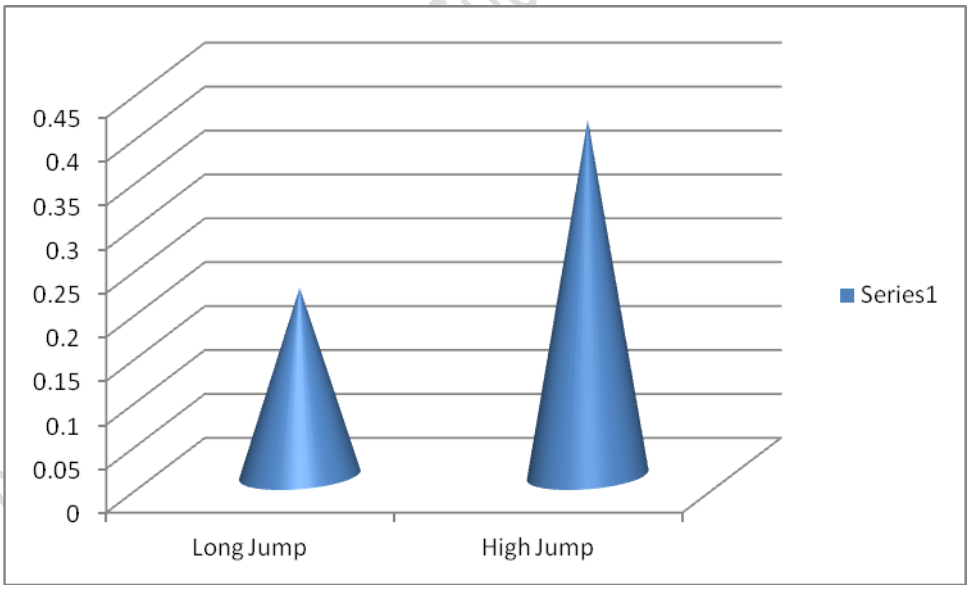

Figure-1.7

Relationship between Leg Length and Jumping Ability.

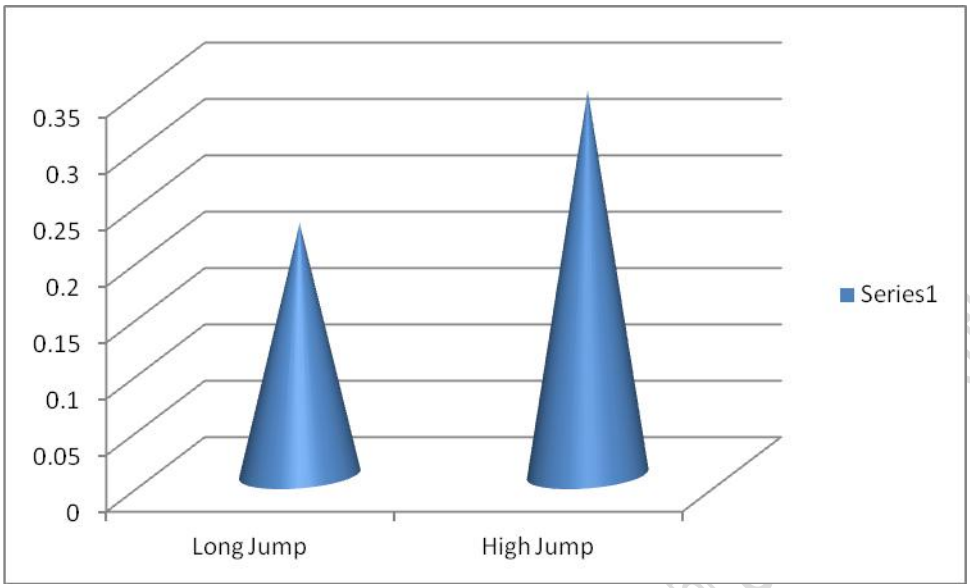

Figure-1.8

Relationship between Fore Leg Length and Jumping Ability

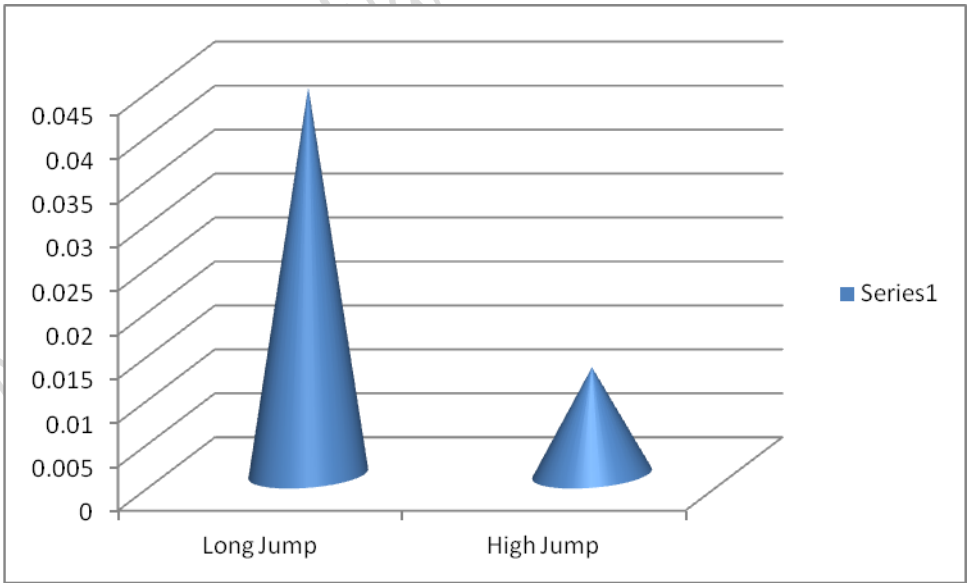

Figure-1.9

Relationship between Calf Girth and Jumping Ability

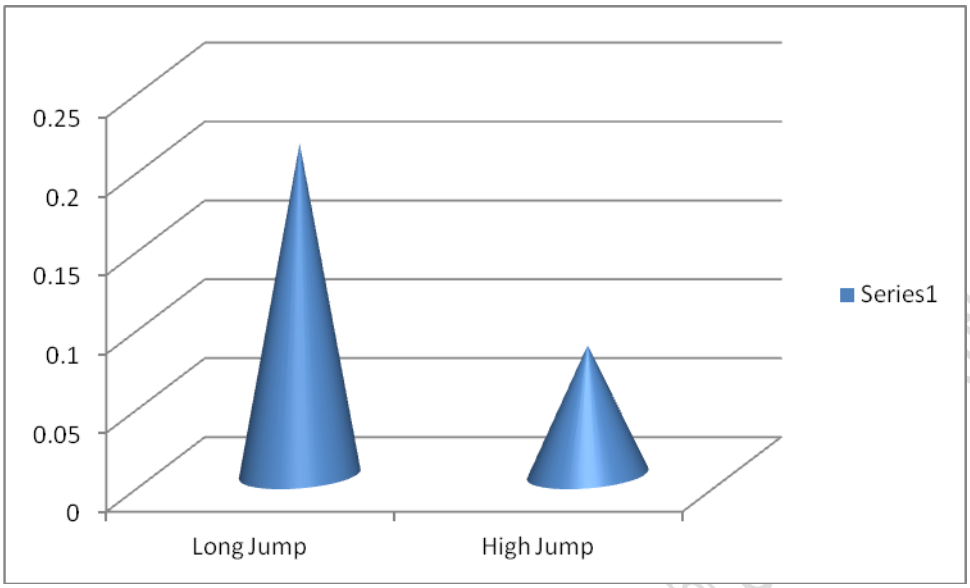

Figure-1.10

Relationship between Foot Length and Jumping Ability

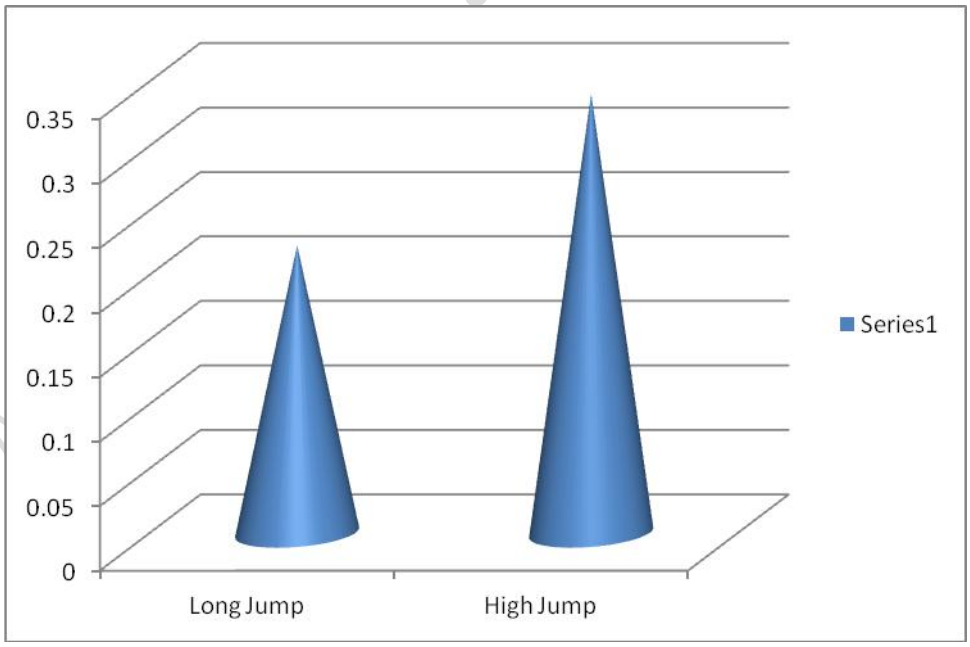

Figure-1.11

Relationship between Ponderal Index and Jumping Ability

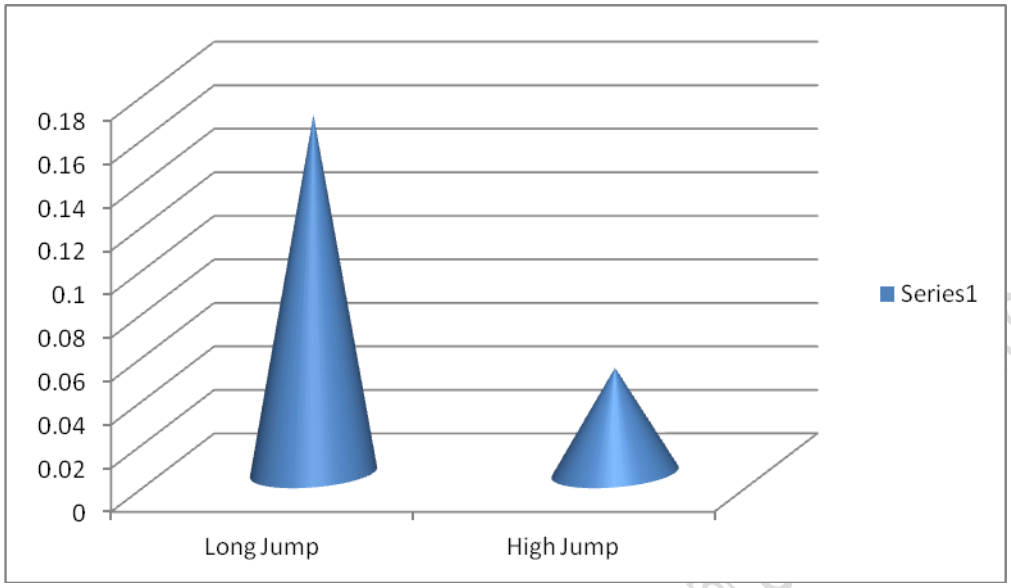

Figure-1.12

Relationship between Crural Index and Jumping Ability

DISCUSSION OF FINDINGS:

Jumping (vertical & horizontal) ability it was assessed with anthropometrical variables. From the findings it was indicated that weight and hip girth have significant relationship to long jump. Standing height, weight, leg length, fore leg length, thigh length and ponderal index were also significant to the high jump ability.

Therefore it may be logically accepted that those who are tall and heavy athletes as well as having longer lower extremities have performed better on jumping ability. Moreover, many athletes have also shown that tall athletes have advantageous position over the shorter athletes. Longer strides depend upon the leg length of the individual; therefore those with long limbs could have advantage in running event. Significant relationship between jumping ability and lower limb length in high jump may be attributed to this reason.

Besides height, leg length, foot length and hip girth, weight and fat variables also contributes to the athletic ability. Better hip girth may be constructed to have greater muscle

mass and in turn greater strength therefore performance in jumping events was probably better.

The physical size and shape has direct relationship to the nature of the movement produced for in a skill. The body size and limb segment length related to differences in body and limb mass which is unique for each individual and therefore each performance pattern of movement for specific skill is unique[1].

The significant relationship of height, weight, leg length, fore leg length, thigh length and hip girth to the performance in long jump and high jump may be the fact that it provides better position at the time of takeoff and landing, improve take off time and balance landing which help in improving the distances. The C.G of the tall athlete remains higher and need not be displaced more vertically than a shorter athlete. The result of the study concluded by Helderth which was reported by Sodhi favours the results of the present study.

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