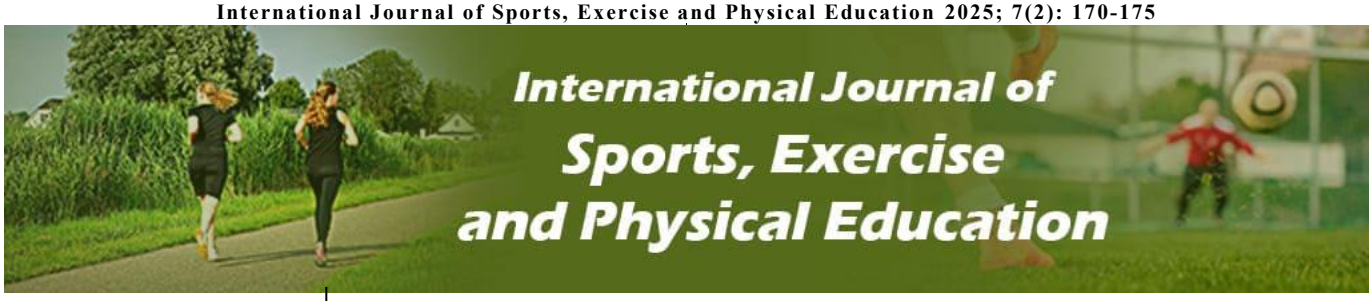

ISSN Print: 2664-7281
ISSN Online: 2664-729X
Impact Factor: RJIF 8.15
IJSEPE 2025; 7(2): 170-175
https://www.sportsjournals.net
Received: xx-05-2025
Accepted: xx-06-2025

Susmita Howladar
Sports Instructor, University of Engineering and Management Kolkata, West Bengal, India

Dr. Manas Banerjee
Sports Officer University of Engineering and Management Kolkata, West Bengal, India

Tanmay Ghosh
Sports Instructor, University of Engineering and Management Kolkata, West Bengal, India

Corresponding Author:
Susmita Howladar
Sports Instructor, University of Engineering and Management Kolkata, West Bengal, India

Relationship of selected anthropometric variables with performance of long jumpers

Susmita Howladar, Manas Banerjee and Tanmay Ghosh

DOI: https://www.doi.org/10.33545/26647281.2025.v7.i2c.221

Abstract
The present study aimed to examine the relationship between selected anthropometric variables and the performance of male long jumpers. Fifty district-level long jumpers aged 12–16 years from Jalpaiguri and Darjeeling districts served as the subjects. Key anthropometric variables including height, weight, total leg length, thigh circumference, calf circumference, foot length, and foot girth were measured using standard techniques. Performance was assessed through the standing broad jump test. Pearson's correlation coefficient was used to determine the relationship between each variable and performance at a 0.05 level of significance.
The findings revealed a significant positive correlation between performance and the following anthropometric variables: height (r=0.593), weight (r=0.613), leg length (r=0.491), thigh circumference (r=0.281), and calf circumference (r=0.414). However, no significant correlation was found between performance and foot length (r=0.043) or foot girth (r=0.090). The results suggest that certain anthropometric factors-especially those related to limb length and muscle mass-play an important role in long jump performance, while others like foot dimensions may not significantly influence outcomes. These findings can assist coaches and physical educators in talent identification and sport-specific training.

Keywords: Anthropometry, long jump, performance, height, leg length, sports science

Introduction
Sports in the present day has 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's victory, but the continuous hard work of training right from childhood strong genetic makeup and various anthropometric variables may influence success in sports. Today's sports person faces some unique challenges. The standards are higher, the competition is tougher, and the stakes are greater attention in these days. Coaches, physical educationists and sports scientists have always expressed a great need to know more about those anthropometry variables, which are helpful in improving the motor skill of the players. Today's world is a world of competition, the rivalry to reach top and excel each other is so much, that every aspect that contributes for the excellence is carefully looked in it. One of such aspects is the selection of the right person for the right event in sport and games to give best performance and bring laurels to the country.
Previous studies indicated that various factors have contributed to athletic performance such as age, sex, psychological skill, physical growth, and biomechanical factors. In fact, these factors vary on types of sports. Other studies stated that genetics, muscle type, altitude, nutrition, lifestyle, physical,
anthropometric, psychological, sociological, physiological are the major contributors. kinanthropometric variables are playing highly role in contributing to achieve in several sports by giving positive natural advantages.
Anthropometric is not just only body measurement, but identifying more related athletes' physique parts and predicts their performance. Many scholars have defined anthropometric in different ways, but almost in the same context.
Long jump is a track and field sports consist as a horizontal jump for a distance. The long jump is a very simple event where a athlete runs fast to the takeoff board and jump. The long jump divided into 5 phases.

The anthropometric difference might help players in performance where some players after hard training could not overcome many obstacles. Coaches and physical education teacher may guide an athlete in selection of correct sports in respect of their anthropometric differences and also encouraged them for better performance. Anthropometric variables which might not change through training and mainly depends on genetic factors so according to athletes anthropometric differences they may choose correct sports where they may achieve highest performance.

Methodology

The purpose of the study was to find out the relationship between anthropometrical variables with the performance of long jumpers. For this study 50 district level male long jumpers from Jalpaiguri and Darjeeling district were considered as subjects. Subjects were selected purposively and the age range of the subjects was 12 to 16 years. Correlation of co-efficient was employed to calculate the collected data at 0.05 level of confidence.

Criterion Measures: The following variables were selected to fulfill the objective of the present study and the tests were conducted to measure the parameters were.

Variables	Measuring tools	Unit of measurement
Height	Measuring tape	centimeter
Weight	Digital weight machine	kilogram
Total leg length	Measuring tape	centimeter
Thigh circumference	Measuring tape	centimeter
Calf circumference	Measuring tape	centimeter
Foot length	Sliding caliper	centimeter
Foot girth	Sliding caliper	centimeter
Broad jump	Standing broad jump	feet

Statistical Procedure

Collected data were converted to numerical value and also to standard score for statistical calculation interpretation and analysis discursion and drawing final conclusion for this co-relation of coefficient was used.

Findings

Table 1: The mean score and standard deviation of height and performance of long jumper

Variables	Mean	Sd	'r' value
Performance	4.783	0.589	0.593*
Height	159.8	9.568	

0.05 level of significant, df(48)=.276 (*=Significant)

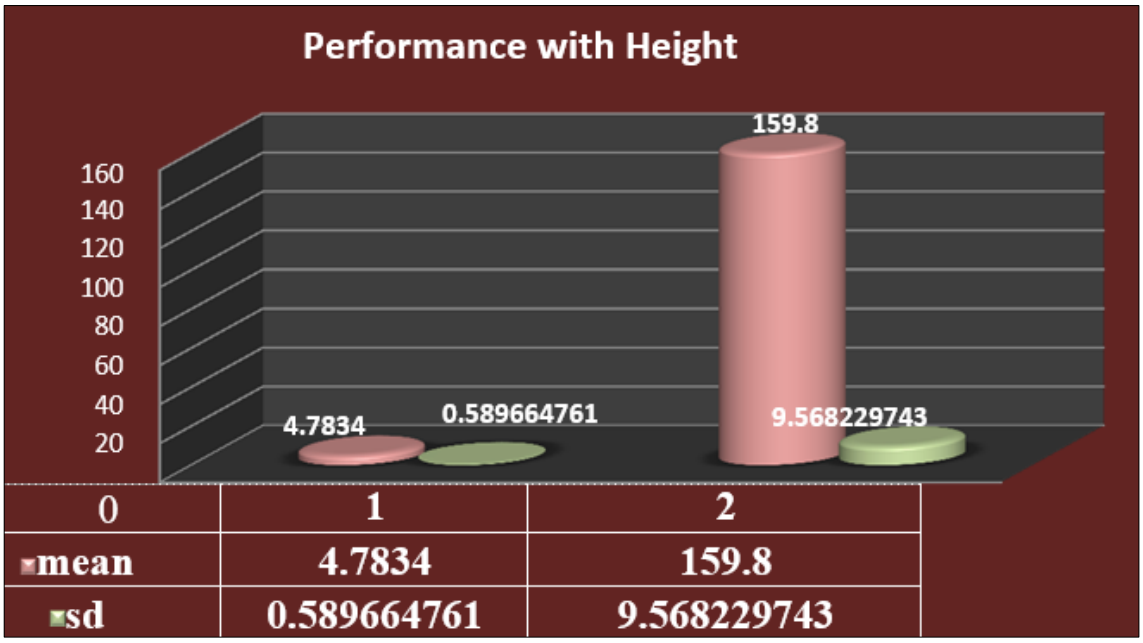

Fig 1: Relationship of Performance with Height

From the above Table -1 and Figure – 1 it was evident that the Mean scores of Performance (4.783), Height (159.8**)** and SD of Performance (0.589), Height (9.568)as well as the coefficient of correlation were 0.593. It indicates that there was significant relationship between performance and Height of the Male long jumpers. Since it was significant (calculated 'r' 0.593 >Table value, .276). The Mean and SD scores on Performance and Height have been presented graphically (Fig-1).

Table 2: The mean score and standard deviation of weight and performance of long jumper

Variables	Mean	SD	'R' value
Performance	4.783	0.589	0.613*
Weight(kg)	50.34	8.178	

0.05 level of significant, df(48)=.276(*=Significant)

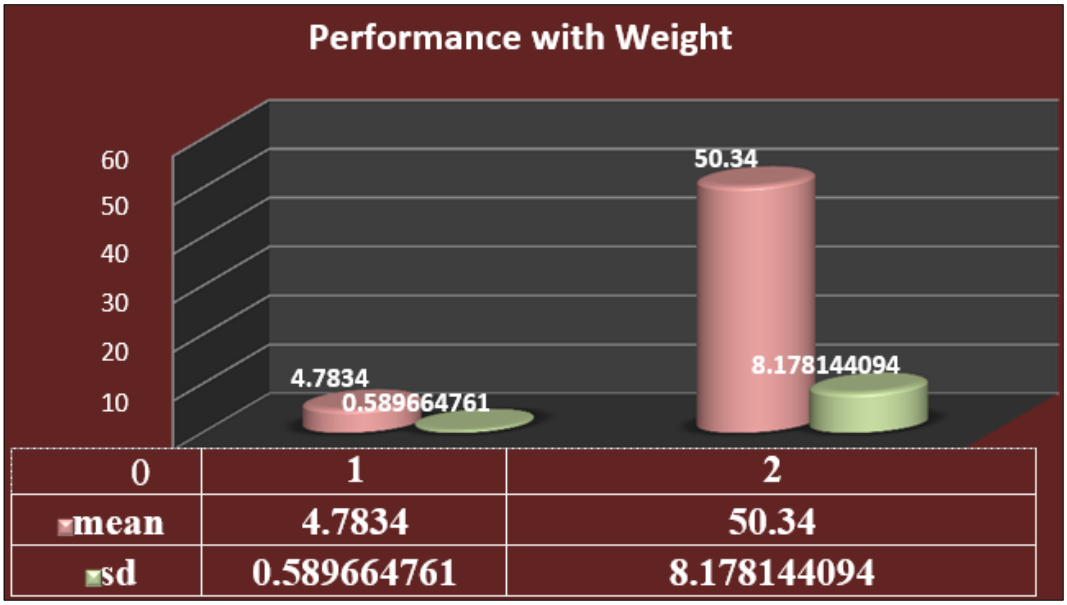

Fig 2: Relationship of Performance with Weight

From the above Table -2 and Figure–2 it was evident that the Meanscores of Performance (4.783), Weight (50.34) and SD of Performance (0.589), Weight(8.178)as well as the coefficient of correlation were 0.593. It indicates that there was significant relationship between performance and Weight of the Male long jumpers. Since it was significant (calculated 'r' 0.613>Table value, .276). The Mean and SD scores on Performance and Weight have been presented graphically (Fig-2).

Table 3: The mean score and standard deviation of leg length and performance of long jumper

Variables	Mean	SD	'r' Value
Performance	4.7834	0.589664761	0.491*
Leg length (inch)	33.462	1.781639923	

0.05 level of significant, df(48)=.276(*=Significant)

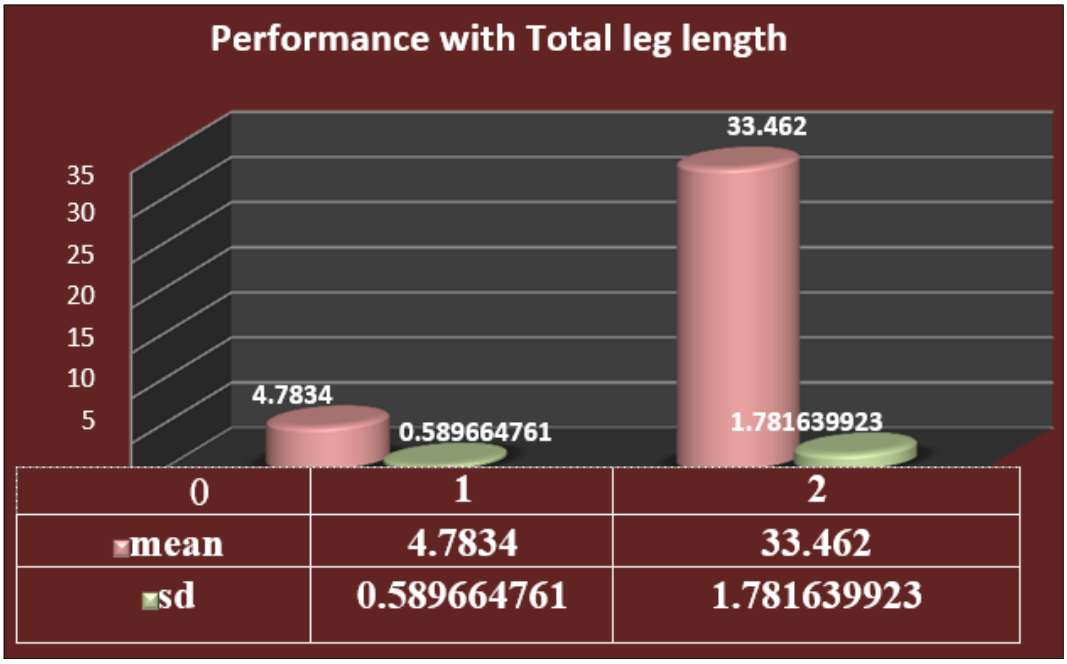

Fig 3: Relationship of Performance with Leglength (inch)

From the above Table -3 and Figure–3 it was evident that the Mean scores of Performance(4.783), Leg length (inch) (33.462)and SD of Performance (0.589), Leg length (inch) (1.781) as well as the coefficient of correlation were 0.491. It indicates that there was significant relationship between performance and Leg length of the Male long jumpers. Since it was significant (calculated'r'0.491>Table value, .276). The Mean and SD scores on Performance and Weight have been presented graphically (Fig-3).

Table 4: The mean score and standard deviation of thigh girth and performance of long jumper

Variables	Mean	SD	'r' Value
Performance	4.783	0.589	0.281*
Thigh circumference	18.474	2.766	

0.05 level of significant, df(48)=.276(*=Significant)

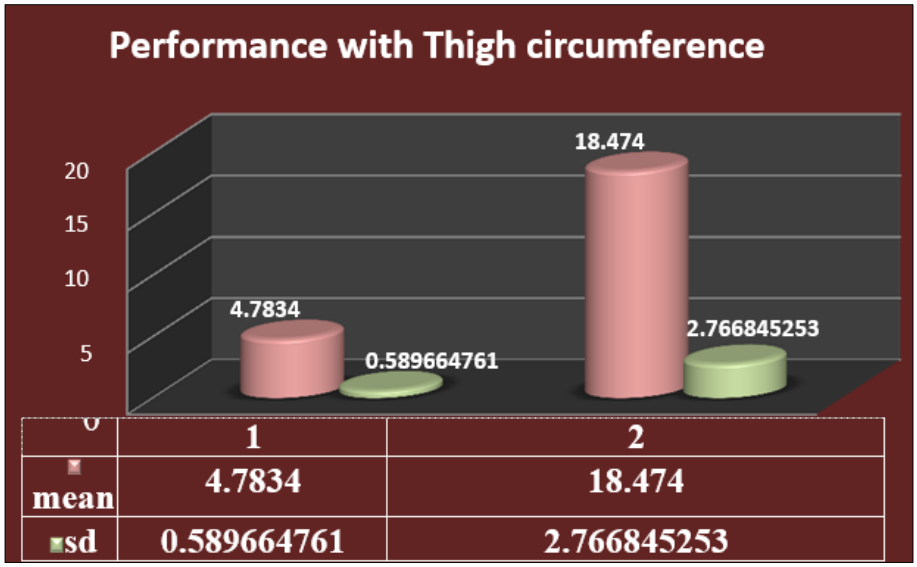

Fig 4: Relationship of Performance with Thigh Circumference (inch)

From the above Table -4 and Figure – 4 it was evident that the Mean scores of Performance(4.783), Thigh circumference (inch) (18.474**)** and SD of Performance (0.589**),** Thigh circumference (inch) (2.766)as well as the coefficient of correlation were 0.261. It indicates that there was significant relationship between performance and Thigh circumference of the Male long jumpers. Since it was significant (calculated 'r' 0.281>Table value, .276). The Mean and SD scores on Performance and Thigh circumference have been presented graphically (Fig-4)

Table 5: The mean score and standard deviation of calf girth and performance of long jumper

Variables	Mean	SD	'r' Value
Performance	4.783	0.589	0.414*
Calf circumference	12.528	1.113	

0.05 level of significant, df(48)=.276(*=Significant)

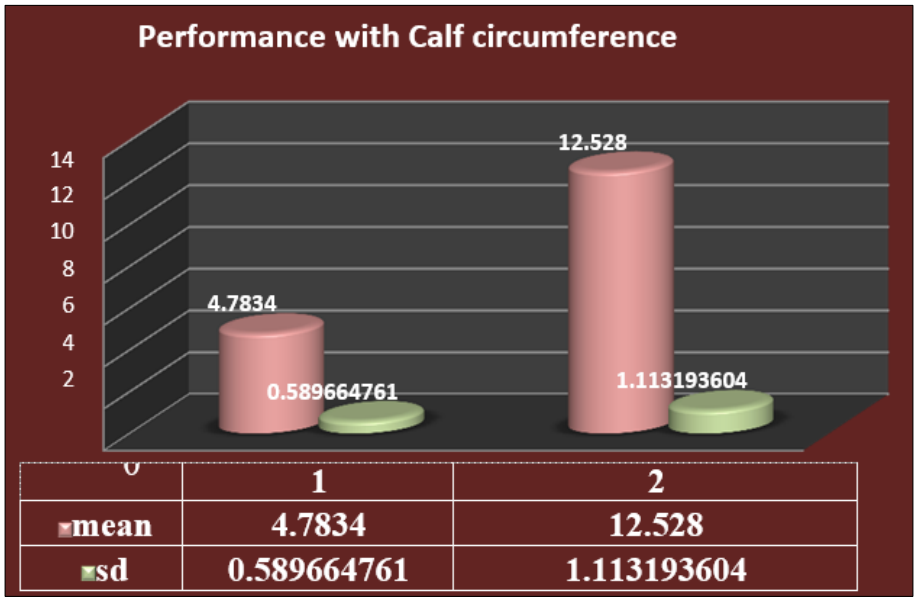

Fig 5: Relationship of Performance with Calf Circumference (inch)

From the above Table -5 and Figure–5 it was evident that the Mean scores of Performance(4.783), Calf circumference (inch) (12.528**)** and SD of Performance (0.589**),** Calf circumference (inch) (1.113) as well as the coefficient of correlation were 0.414. It indicates that there was significant relationship between performance and Calf circumference of the Male long jumpers. Since it was significant (calculated 'r' 0.414>Table value, .276). The Mean and SD scores on Performance and Calf circumference have been presented graphically (Fig-5).

Table 6: The mean score, standard deviation and of foot length and performance of long jumper

Variables	Mean	SD	'R' value
Performance	4.783	0.589	0.0438
Footlength (inch)	25.200	113.399	

0.05 level of significant, df(48)=.276(*=Significant)

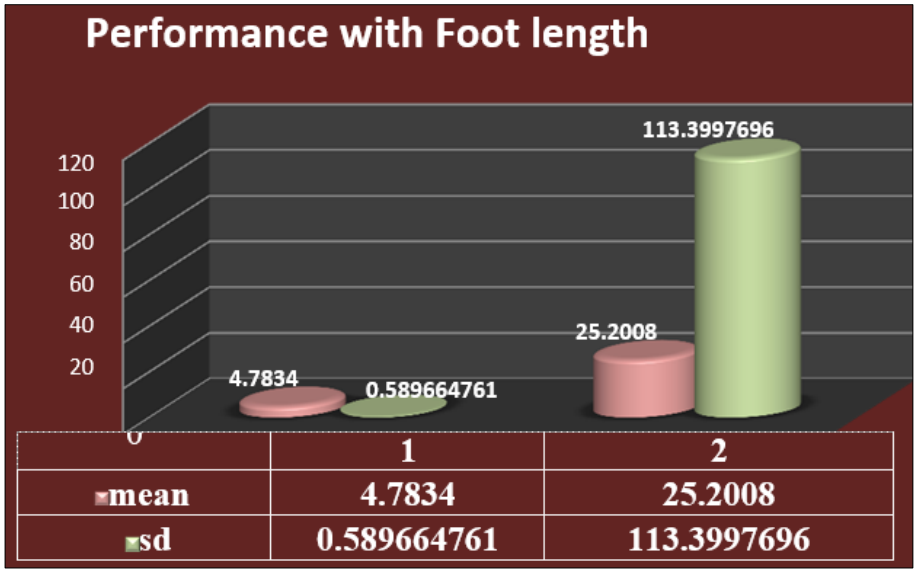

Fig 6: Relationship of Performance with Foot length (inch)

From the above Table -6 and Figure–6 it was evident that the Mean scores of Performance(4.783), Foot length(inch) (25.200) and SD of Performance (0.589), Foot length (inch) (113.399) as well as the coefficient of correlation were 0.414. It indicates that there was no significant relationship between performance and Foot length of the Male long jumpers. Since it was significant (calculated 'r' 0.043>Table value, .276). The Mean and SD scores on Performance and Foot length have been presented graphically (Fig-6).

Table 7: The mean score and standard deviation of foot girth and performance of long jumper

Variables	Mean	SD	'r' Value
Performance	4.783	0.589	0.090
Foot girth (inch)	3.567	0.416	

0.05 level of significant, df(48)=.276(*=Significant)

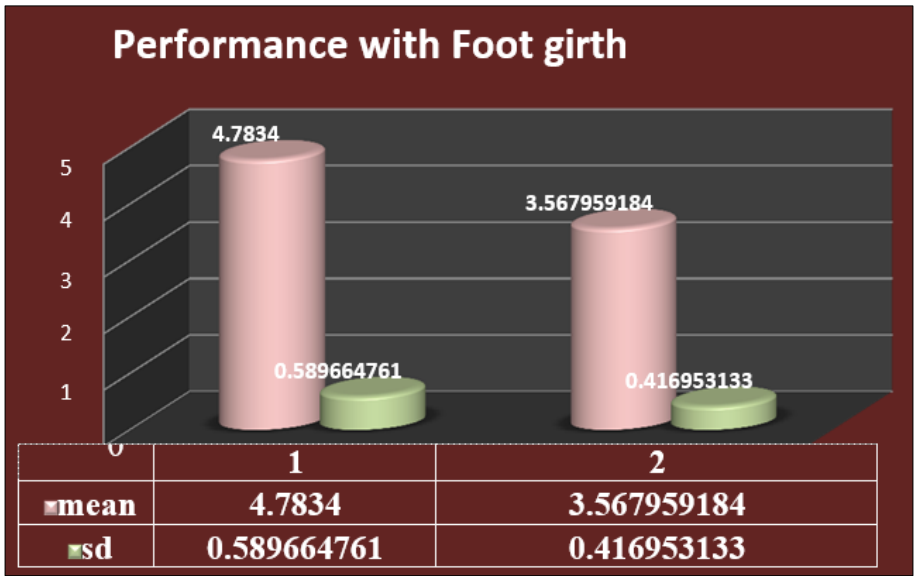

Fig 7: Relationship of Performance with Foot girth (inch)

From the above Table -7 and Figure–7 it was evident that the Mean scores of Performance(4.783), Foot girth(inch) (3.567) and SD of Performance (0.589), Foot girth (inch) (0.416) as well as the coefficient of correlation were 0.090 It indicates that there was no significant relationship between performance and Foot girth of the Male long jumpers. Since it was significant (calculated 'r'0.090<Table value, .276). The Mean and SD scores on Performance and Foot length have been presented graphically (Fig-7).

Discussion of findings: The aim of the present study was to determine the relationship of selected anthropometric variables with the performance of the long jumpers.

From the above table -1, 2, 3, 4, 5, these were clearly revel that significant relationship was found of performance with in relation to selected anthropometric variables i.e. Height, weight, Total leg length. Thigh circumference, calf circumference. Height of the body provides the force for the covering the maximum distance during jumping event. Morphological structure of the muscles is one of the prime factors and it is related to the performance of long jumpers.

This result of the present study was in consonance with the result of Dessalew *et al*. (2019) [13], P. Kaur (2019) [14], Dr. S.Kr. Yadav (2015) [8].

From the table- 6 & 7 these were clearly revealed that no significant relationship was found of performance in relation

to selected anthropometric variables i.e. foot length, & foot girth.

This result was further supported by Sundip Hemant Chamode *et al* where he got non-significant relationship in foot length.

Conclusion

Based on the finding and within the limitation of the present study, the following conclusions were drawn:-

- Significant relationship is found in respect of performance with Height.
- Significant relationship is found in respect of performance with Weight.
- Significant relationship is found in respect of performance with Total leg length.
- Significant relationship is found in respect of performance with Thigh circumference.
- Significant relationship is found in respect of performance with calf circumference.
- No Significant relationship is found in respect of performance with foot length and foot girth.

References

1. Clarke DH, Clarke HH. Research Process in Physical Education. Prentice-Hall; 1970.
2. International Society for the Advancement of Kinanthropometry. International Standards for Anthropometric Assessment.
3. Uppal AK. Principles of Sports Training. Delhi: Friends Publication.
4. Singh H. Science of Sports Training. DVS Publication.
5. Marfel JM, Olds T, Stewart A, Cater L. International standards for anthropometric assessment. Australia: ISAK; 2006.
6. Verma JP. A Text Book on Sports Statistics. Sports Publication; 1986.
7. Singh S, Singh J, Singh H. Comparison of Physical Fitness between senior and Junior Group of Hockey Girls. J Sports Sports Sci. 2003;26(1).
8. Yadav SK. Relationship of selected anthropometric & physical fitness variables with the volleyball playing performance. Indian J Appl Res. 2015;5(3). doi:10.36108/ijar.
9. Kumar A. A study of selected biomechanical characteristics of jumping in athletes. Punjabi University Department of Sports Science; 2015.
10. Gill A, Singh A. Performance Assessment of Inter University Handball Females Players in Relation To Their Anthropometric and Physical Fitness Variables. 2014.
11. Singh K, Singh R. Relationship of selected physical fitness variables with the performance of male long jumpers. Int J Phys Educ Sports. 2016;1(1):23-27.
12. Mohammed A. Analysis of psychological and anthropometric variables as factors to predict athletic performance in jumping and throwing events of Ethiopian senior athletes [dissertation]. Addis Ababa University; 2018.
13. Dessalew GW, *et al*. The relationship between anthropometric variables and race performance. Open Access J Sports Med. 2019;10:191-197. doi:10.2147/OAJSM.S234067.
14. Kaur P. Relationship of Anthropometric Variables with the Performance Score of Women Athletes of Universities of Punjab [dissertation]. Patiala: Department of Physical Education; 2019.