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A relationship between leg physique status and leg explosive strength of male and female

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Abstract

Introduction: Everybody can participate in game and sports but everybody cannot achieve excellence in sports. Technical and tactical efficiency coupled with psychological and physical efficiency and also physique of the sports persons are some of the essential features which are needful for this purpose. The purpose of the study was to find out the relation between physiques and performance of leg explosive strength that is foot length and foot width and standing broad jump.

Method: For the present study researcher were randomly selected thirty (30) male students and twenty-five (25) female students out of fifty (50) male and fifty (50) female students. The age ranged between 18-22 years, who were regular participated in different sports activities, Subjects were collected from Bethuadahari College, Nadia, and West Bengal, India. The subject was randomly selected for conducting this research work. Foot length was measured by Rod compass, and Foot width was measured by Rod compass and Leg explosive Strength was measured by standing broad jump.

Finding: The findings of this study was r -value between Foot length and leg explosive strength [0.79(<0.05)] of male and [0.83(<0.05)] of female. And Foot width and leg explosive strength [0.65(<0.05)] of male and [0.73(<0.05)] of female.

Result: The results showed that significantly correlated between leg physique status and leg explosive strength of male and female.

Keywords: Physiques, leg explosive strength, foot length; foot width, standing broad jump

Introduction

With all round advancement in the field of sports the new disciplines are emerging out with super specializations. The element of scientific basis of selection is being inducted in the procedures of selections of athletes at various levels in some advanced countries.

The greater propagation of interest regarding a particular type of physique that produces an event. Several investigators have studied the relationship of morphological, anatomical and structural characteristics with physiological and functional phenomena. Most of them have come to the conclusion that a certain correlation exists between the physique or building up the body and the motor capacity.

Everybody can participate in game and sports but everybody cannot achieve excellence in sports. Technical and tactical efficiency coupled with psychological and physical efficiency and also physique of the sports persons are some of the essential features which are needful for this purpose, for example : Longer legs are helpful to take the necessary long strides over hurdles without the loss of time that jumping entails, the throwers of different levels of competition are heavier and latter with long muscular arms and wider shoulders, greater weight is useful, because when object is thrown forward and up-ward an equal and opposite reactive force is exerted the effect of this is less if the athlete is heavier, more if he is lighter. The greater height will be further advantageous by making the blight of the implement longer before it touches the ground.

In an exercise where one's body must be moved as in gymnastic exercises, chin-ups, push-ups and so on, the larger size will be disadvantageous. For activities such as high-jump, pole vault, the size seems to play a decisive role, as in case of taller persons, the center of gravity is at a higher level which is useful in crossing a greater height. Probably for this reason the gymnasts are found to be short and the high jumpers tall.

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According to Hirata in 1996 “The Japanese who are small had better concentration on exercise such as light class boxing, weight lifting etc. Similarly for Americans who are large and lean, such sports, as basketball, volleyball and swimming. Long jumping and short and middle distance running are the best”.

From these few examples, it is evident that the physique has an important role to play in performance of various physical activities. The information’s on body dimensions and body build of sports person or athletes of physical activities are now available in plenty. Explosive leg strength is one of the most important components for jumpers, runners, gymnasts, volley ball players etc. so not only height, weight, musculature, fat composition and many other components influence sports performance, length and width of foot might also play an important role in producing explosive leg strength that results in better sports performance.

The present study on foot characteristics may be useful in choosing a suitable physical activity for an individual whose main objective is competition.

Purpose of the Study

The result of the study will help an athlete to select the event according to his ability based on kinanthropometric measurements. It will help the physical instructors and coaches to place the right person in the right event as well as to advise whether one should be placed in individual or team game. In this modern civilization analyzing the athletes from the scientific point of view, will make them active. In one

word, it will bring new thought in the arena of the physical education.

Methodology

The chapter deals with selection of subject, selection of variable, reliability, description of test and statistical analysis of data.

Selection of Subject

Students at the age group of 18-22 years have been selected. For this purpose 30 boys and 25 girls have been selected randomly from the students of Bethuadahari College, (West Bengal).

No of Subjects	Male	Female	Age
55	30	25	18-22 Years

Each subject has had medical check-up so that any muscular injury in the leg of the subject is identified in order to eliminate injured subjects.

Each subject was given three successive trials for ‘Foot length and Foot width’ and ‘Standing broad jump’ with the interval of the 2-3 minute. The distance and height were recorded and the best performance was considered.

Criterion measures

In the present study, the investigator has considered the following things such as-

Table 1

S. No	Variables	Units	Criterion Measures
1.	Foot Length	Millimeters	Leg Physique Status
2.	Foot Width	Millimeters	Leg Physique Status
3.	Standing Broad Jump	Meters	Explosive Strength

Test Administration

1. Foot Length

It was obtained by measuring distance between Pternion and acropodin.

- a) **Equipment** : Rod Compass
- b) **Description**: The subject stands erect his feet slightly apart and weight evenly distributed on the both feet. Using the rod compass, the maximum length of the foot was measured parallel to the long axis of the foot, between Pternion and acropodian.
- c) **It Score**: Score was recorded nearest to one tenth of an inch.

2. Foot Width

Indicates the breath of foot metatarsal tibial and metatarsal fibular:

- a) **Equipment**: Rod Compass.
- b) **Description**: The subjects stands erect with his feet slightly apart and weight evenly distributed on both the feet. Using Rod cam pass, the distance between metatarsal tibial and metatarsal fibular was measured.
- c) **Score**: Measurements were recorded nearest to one tenth of an inch.

3. Standing Broad jump

It measures the explosive strength of the leg muscle of the subjects.

- a) **Equipment**: Measure tape, lime.

- b) **Description**: The subjects stand behind the marked line. The contestant toes a line 4 feet from the pit and jumped forward from both feet. The nearest point touched by any part of the body at right angles to the take of line, was his jump. Measurements were taken to the nearest inch.
- c) **Scoring**: The best of three trials was recorded.

Statistical Analysis of Data

The study was relation type. The result has been obtained through the application of statistical technique of correlation.

Results and discussion

Procedures for establishing scientific authenticity of the test

All these test were conducted on the same subjects on two different days with a day of rest in between for establishing the reliability of the collected data, for the purpose of the tests, trained physical education graduated working at Bethuadahari College, (West Bengal).were engaged and the instruments used for measuring were of standard instruments, manufactured by reputed concerns and are being widely used for the purpose of measuring body segments and physical traits throughout the world.

Level of Significance

For the purpose of the present study the level of significance was fixed at 0.05 level of confidence.

Table 2: Mean and standard deviation of the variables

Variables	Male N = 30 Mean in cm	SD in cm.	Female N = 25 Mean in cm	SD in cm
Foot length	25.238	1.155	22.938	0.519
Foot width	9.732	0.348	9.132	0.362
Explosive leg strength	247.4	14.4	191.4	16.0

From table-1 it was found that mean foot length of boys and girls being 25.2 cm and 22.93 cm respectively and that of mean foot width being 9.73 cm & 9.13 cm respectively. The explosive leg strength of boys and girls were 274.4 & 191.4 respectively.

From the mean observation, it was clear that the boys were superior to girls in respect of foot length, foot width and explosive leg strength.

Fig. 1, Fig. 2 & Fig. 3 depict the same information which being shown in bar diagram.

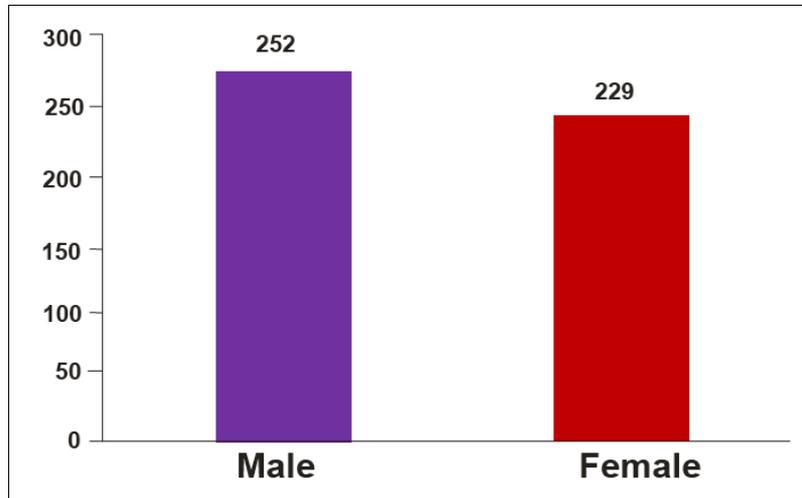


Fig 1: Mean of foot length of male and female.

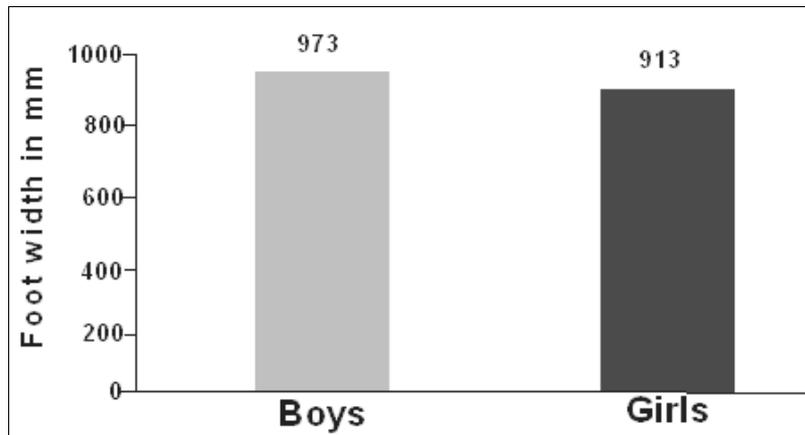


Fig 2: Mean of foot width of male and female.

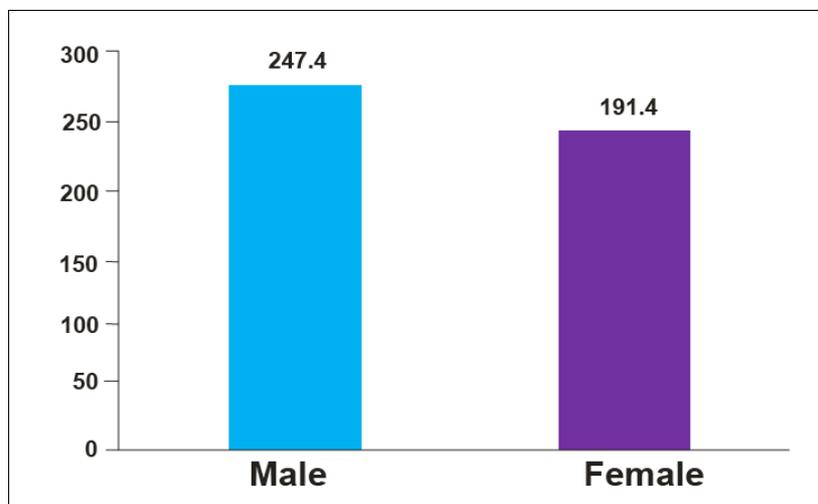


Fig 3: Mean Explosive Leg Strength of Male and Female

Table 3: Relationships between foot measurements and explosive leg strength of male and female

Variables	Male	Female
Foot length & Explosive leg strength	0.7912*	0.8389*
Foot width & Explosive leg strength	0.6585*	0.7356*

*= Critical value of rat 0.05 level of significance is 0.250

From Table-2 it was found that significant relationship exist between foot-length and also foot width and explosive leg strength in case of male and female separately.

Analysis of the Result

The result of the present study indicated greater relationship between foot measurements and explosive leg strength in case of male and female. Explosive leg muscle strength was measured through standing broad jump. Performance in standing broad jump might well be influenced by length of the lower extremity, full length and width, muscle power of the legs and technique. Foot measurements showed that boys of our country have longer and wider foot.

Male were found to be superior than Female in all variable measures.

Summary and conclusions

To live in this techno world, every human being has to face stiff challenge in every walk of life. He or she will be aiming to overcome all sorts of hindrance. There is no exception in the field of sports also. A sportsman can produce top performance if he can achieve and keep-up optimum level in conditional abilities through strenuous physical training. A top class achievement requires technical and tactical and efficiency coupled with mental condition irrespective of sports. Sports specific physique and physical fitness are two of the most important requirements of the competitive sports. If a wrong person [in relation to physique and conditional abilities] is put in to a wrong sport, his achievement can't be at the two top levels. The present study will help the physical educators and coaches to determine the relationship between the leg strength and foot measurement and use this knowledge for the improvement of performance.

In this study 30 male and 25 female have been selected from the students of Bethuadahari College, (West Bengal).

Foot length and width were measured as foot measurement and explosive leg muscle strength was measured through standing broad jump. The obtained data have been statistically analyzed through application of the statistical technique of correlation.

Conclusion

The result of the study helped to arrive the following conclusion:

- 1) The male have greater explosive leg muscle strength than female.
- 2) In respect of foot measurement male were superior both in foot length and width.
- 3) The significant relationship existed between foot measurement and explosive leg muscle strength in case of both male and female.

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