

Relevance of Anthropometric Measures on Strength Endurance in Cricketers

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Abstract

Objective: The objective of the study was to find out the relationship of strength endurance and anthropometric characteristics. Methodology: The subjects for the present study were selected from B.H.U. The total number of subjects for the present study was 20 male batsmen who participated in inter university cricket tournament. The data was collected during the morning sessions of B.H.U university cricket camp 2013-14. The level of insignificance chosen was 0.05. Results: Result of the study revealed that there was insignificant relation among male inter university batsman with strength endurance. Conclusion: Based on the findings and within the limitation of the study, it was concluded that the male inter university batsman in cricket have good anthropometry characteristics and have insignificant relationship with Strength endurance.

Key Words: *Strength Endurance, anthropometry, characteristics, cricket, batsman*

INTRODUCTION-

Cricket is a field-based popular team game in most Commonwealth countries. In the past, it was played solely within a specific season (winter in Asian countries and summer in western countries). But the game has gained so much popularity in the last few decades that it is now played throughout the year. Cricketers are therefore exposed to more demanding schedules, with longer periods of training and practicing. The increased workload may be one of the contributing factors to the increased incidence of injuries (Davies et al.2008).

Anthropometry is the study of human body measurement for use in anthropological classification and comparison. The use of such data as skull dimensions and body proportions in the attempt to classify human beings into racial, ethnic, and national groups has been largely discredited, but anthropometric techniques are still used in physical anthropology and paleoanthropology, especially to study evolutionary change in fossil hominid remains.

Anthropometric measurements are used to assess the size, shape and composition of the human body. Learn about common methods used to gather these measurements, such as BMI, waist-to-hip ratio, skin-fold test and bioelectrical impedance.

Strength endurance is a form of training designed to enhance muscle endurance and prime mover strength. An example of strength endurance for the chest would be performing the bench press followed immediately by a stability ball push-up. The strength exercise of a bench press is performed in a stable environment, while the next exercise, the stability ball push-up is unstable. The principle behind this method of training is to work the prime movers in the first exercise and then work the stabilization muscles when the prime movers are fatigued. This type of training consists of the second phase of the National Academy of Sports Medicine's Optimum Performance Training model. The primary goal is to improve enhance joint stabilization, increase lean body mass and improve overall work capacity.

The study was undertaken to account the data of relationship between selected physical variables and anthropometric characters of university level cricket players. The collected data was helpful in selection, assessment of the player, analyzing the player by comparing with other set.

Methodology

The subjects for the present study were selected from B.H.U. The total numbers of subjects for the present study were 20 male batsmen who participated in inter university cricket tournament. The study was conducted on the basis of available literature on anthropometric characteristic, physical Fitness and their test finding of the related research studies. Keeping in mind the specific purpose of the study of cricket players the Body weight, Standing height, Total arm length, Biacromial diameter, Elbow diameter, Knee Diameter, Upper arm circumference, Calf circumference were selected in anthropometric and physical characteristic. All the anthropometric characteristics were measured by anthropometric kit and physical characteristics were measured by different specific test. The Correlation design was used for the study. A single group of units of analysis was obtained preferably randomly; each individual was measured on all selected variables at more or less the same time. The data were collected at Banaras Hindu University camp at B.H.U Varanasi and Regional Sports Stadium sigra at Varanasi. Necessary instructions were given to the subjects before administration of the test. For analyzing data gather descriptive statistic as well as correlation was used for achieving the objectives of the study. The level of significance was set at 5%.

CRITERIAN MEASURES

For Anthropometric Characteristics

All the anthropometric characteristics were measured by anthropometric kit.

Body Weight- Weighing Machine

Standing Height- Steel Tape

Arm Length- Steel Tape

Biacromial Diameter- Anthropometric Compass

Elbow Diameter- Calliper

Knee Diameter- Calliper

Upper Arm Circumference- Steel Tape

Calf Circumference- Steel Tape

For physical fitness

Strength Endurance- It was measured by sits up test recorded in number of sit ups done.

Administration of Anthropometric Characteristics

Body Weight: The subjects were allowed to wear vest and were made to stand at the centre of the weighing machine. The weight was recorded from the indicator of dial to a nearest half of kilogram.

Standing Height: Subjects were made to stand erect without shoes against a marked scale on the wall. The heels, buttock, and back were touching the wall. The subjects were instructed to keep the heel together, head straight, and hold a full breath in while measurement was taken. A stiff hard board was held horizontally on the head and touching the scale marked on the wall. The subjects were asked to step out and readings indicated by the hardboard were recorded. This was repeated twice to ensure accurate measurement and heights were recorded to the nearest half a cm.

Arm Length: Arm length was measured with the flexible steel tape. The subjects were made to stand erect, arm completely hung, relaxed by the side of the body and arm length were taken from the acromin process, the point just above the shoulder joint to the tip of the middle finger. The arm lengths were recorded to nearest half cm.

Biacromial Diameter: The subjects were asked to stand erect with shoulder dropping a little forward. The investigator marked the acromial points with a skin marking pencil. While standing at the back of the subjects the tip of two crossbars of anthropometric compass made

contract to acromial points. The distance between both the points of compass was measured by the steel tape.

Elbow Diameter: Either in the sitting position or in the standing position the subjects were asked to bend their arms at an angle of 90 degree. The forearms and upper arms made right angle while upper arms was in horizontal directions and forearms in the vertical direction. The tester stands opposite the subject and applied the two points of calliper to the outer edge points at the lower end of the humerus. The calliper made an angle of 45 degree to the axis of upper arm and forearm.

Knee Diameter: The subject was asked to sit down on a horizontal surface with their lower leg hanging and having clothing on knees. The arms of sliding calliper of the anthropometric compass applied on the outer points of the condyle of femur.

Upper Arm Circumference: Subjects were instructed to stand erect with arms hung loosely by the side of the body. Arms girth was taken with the help of flexible steel tape at the level of half way between the tip of the acromial process, a point just on the top of the shoulder and the elbow joint. These levels were marked on the skin first then the tape was placed around the arms so that it remains in light contact with the skin all around. The measurements were being recorded to the nearest half cm.

Calf Circumference: Subjects were asked to place the foot on the stool with thigh parallel to the ground and calf girth was measured with flexible steel tape at the maximum circumference of the calf in a plane at right angle to its long axis. In this position the calf muscle remained quite relaxed. Calf girth was recorded to the nearest half cm.

ADMINISTRATION OF PHYSICAL VARIABLES

Strength Endurance- Sit up test

The subject lied in supine position with knees bent .the subject kept their both hands behind the head. Subject had flexed maximum no. of time and get back in 30 seconds.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The anthropometric characteristics as well as physical fitness present in relation to the University cricket players namely, the anthropometric characteristics a Body Weight, standing height, Total arm length, biacromial diameter, Elbow diameter, and the following physical fitness components strength endurance were collected on 20 male batsmen of inter university level Cricket players with age ranging from 19 to 28 years.

Table – 1: Correlation of Strength Endurance and Selected Anthropometry Characteristics of Male Batsmen Inter University cricket players.

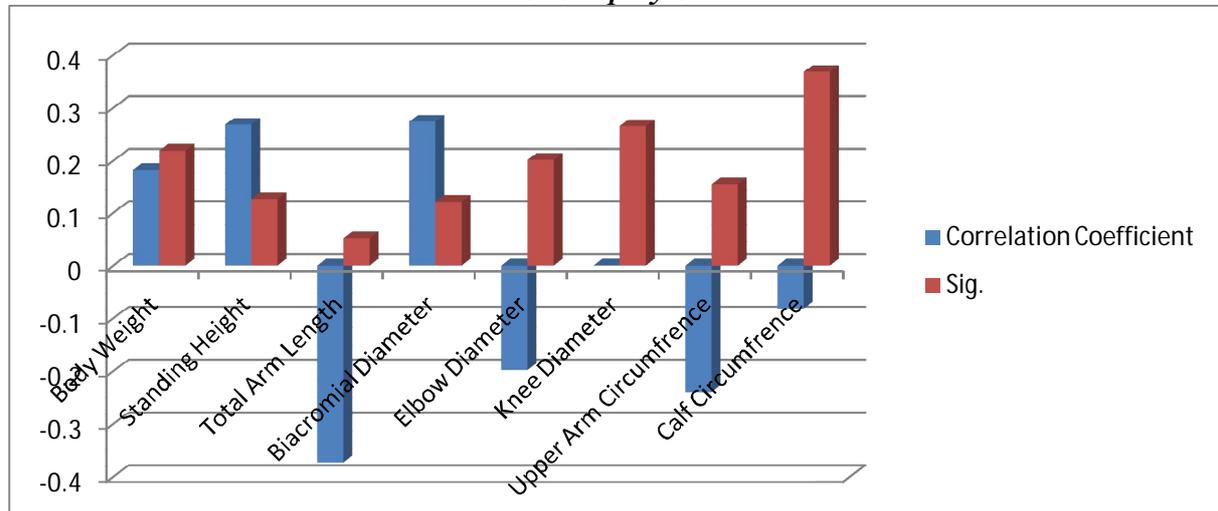
Selected Physiological Variables	Correlation Coefficient	Sig.
Body Weight	.183	.219
Standing Height	.268	.126
Total Arm Length	-.373	.053
Biacromial Diameter	.274	.121
Elbow Diameter	-.198	.202
Knee Diameter	-.149	.265
Upper Arm Circumference	-.239	.155
Calf Circumference	-.081	.368

** $p < .01$ & * $p < .05$

Table revealed that the data was found between Strength Endurance and Body Weight ($r = .183, p > .05$) Strength Endurance and Standing height ($r = .268, p > .05$) Strength Endurance and Total arm length($r = -.373, p > .05$), Strength Endurance and Biacromial Diameter($r = .274, p > .05$), Strength Endurance and Elbow Diameter($r = -.198, p > .05$), Strength endurance and Knee Diameter ($r = -.149, p > .05$), Strength endurance and Upper arm circumference ($r = -$

.239, $p > .05$), Strength endurance and Calf circumference ($r = -.081$, $p > .05$), an insignificant relationship was found as the value of coefficient of correlation was insignificant at 0.05 level.

Graphical Presentation of Correlation Coefficient and Significance in relation to Strength Endurance with Anthropometrics characteristics of Male Batsmen Inter University Cricket players.



DISCUSSION OF FINDINGS

Anthropometric measurement is a means of studying the bodies shape, size and composition. Anthropometry can be a very vital factor to determine the performance of an athlete. Different Anthropometrical requirements are for different games. As far as cricket is concerned specific Anthropometrical characteristics are required for different areas of the game. That is batting, bowling and fielding. Today cricket has become an important athletic activity, specifically by the introduction of one day and Twenty-Twenty cricket.

Batting is one of the important areas of the cricket game. A batsman requires perfect eye hand coordination, eye leg coordination and great reflexes. These coordinative abilities are also dependent on Anthropometrical measurement of the batsmen body to some extent. Batting not only requires coordination and reflexes but also a high level of endurance especially during running between the wickets hence here also comes the role of the anthropometry of the body.

The findings of the present study clearly indicate that there is a significant relationship of strength endurance with the Anthropometric characteristics. This may be attributed to the fact that strength endurance of anybody is highly dependent on anthropometric characteristics hence a significant relationship was clearly evident in cases of the batsmen in the cases of strength endurance, speed, agility. There was no significant relationship found in the batsmen. This may be due to the fact that the batsmen chosen for the present studies were of University level and might have gone through similar kind of training that is required for batsmen of this level.

Summary

At present competitions are very tough and challenging. Human beings by nature are competitive and ambitious for their excellence. Thus this can only be possible and achieved through scientific, systematic and planned sports training as well as channelling them into appropriate games and sports by finding out their potentialities. Physical fitness components and anthropometric characteristic of an athlete plays a vital role in channelling them into their specialized fields. These elements help out to find the potentials of the players as well as help

in exploring their hidden reserves. Anthropometric measurement consists of objective measurement of structure and functions of the body. The measurement of the structure includes items such as weight, total height and width, the depth, the circumference of the chest etc. The measurement of functions includes such as pulse rate, arterial and venous, blood pressure, muscles strength, basal metabolic rate, estimation from cardio-vascular posture and breathing capacity etc. Physical fitness is the sum of five motor ability/components namely speed, strength, flexibility, endurance and agility. These fitness components are the basic pre-requisites of human performance depend to greater extent on these abilities. Physical fitness is the capacity to carry out our various reasonable well forms of physical activities without being unduly tired.

In the present scenario the game of cricket gets totally commercialized. Today lot of money, different types of playing format, conditions, and tournaments are introduced in the game of cricket. Now cricketers play more no. of matches and face a high risk of injury. Achieving and maintain the high standards and fulfilling the spectator demand became difficult. So it is very much required that the players achieve high level of physical fitness and should be trained according to their anthropometric characteristics.

Physical fitness are the most important contribution factors for the better performance in all sport and game so is in cricket the game of cricket require considerable amount of physical fitness and mastery of skill. A cricket player ought to possess specific speed strength power agility endurance in abundance so as to term and master the technique of the game.

Conclusion

Based on the findings and within the limitation of the study, it is concluded that the male inter university batsman in cricket have good anthropometry characteristics and have insignificant relationship with strength endurance.

Recommendations: It is recommends that:

- A study may be conducted with the subjects belonging all over India.
- Similar study may be conducted with the application of more variables.
- A similar Study may be conducted to include other variables which can be found out by both intensive and extensive research study.
- Similar type of study may be repeated by selecting larger sample with larger geographical area.
- Study may also be conducted by selecting variables, which have been not covered in the present study.
- Biomechanical Research is needed to investigate how this anthropometric characteristic occurs so that appropriate interventions can be developed.
- Continued research is required to provide scientific evidence for batting workload guidelines.
- Further study is required to determine the reason why players who play cricket infrequently suffer more injuries.

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