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An association of anthropometric and physical fitness variables of cricket players with the performance of running between the wickets

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Abstract
The purpose of the present study was to find out the relationship of Running between the wickets performance of the Cricket players with selected Anthropometric Variables (Height and Arm Length) and Physical fitness variables (Speed, Agility and Flexibility). Fifteen male Cricket players were participated as subjects in the present study. The samples were selected from Department of Physical Education Cricket match practice group, G. G. V. Bilaspur, Chhattisgarh on the basis of purposive sample selection technique. The age of the subjects was ranging between 21 to 28 years. The mean and SD of the age of the subject was 24.533 and 2.263. The age of the subjects were recorded on basis of date of birth mentioned in the 10th (High School) mark sheet certificates. To know the nature of the data descriptive statistics i.e. mean, standard deviation were calculated. To know the relationship of selected anthropometric and physical fitness variables with the running between the wickets performance of Cricket players Pearson product-moment correlations were calculated. All the statistics were calculated with the help of SPSS 16.0 version software. The findings of the study shows that there are significant relationships of running between the wickets performance with selected anthropometric variables Height ($r = -.916$, $p<.05$), Arm Length ($r = -.852$, $p<.05$) and selected physical fitness variables Speed ($r = .709$, $p<.05$), Agility ($r = .806$, $p<.05$), Flexibility ($r = -.898$, $p<.05$).

Keywords: Cricket, running between the wickets, anthropometric, physical fitness

Introduction
Cricket is a game which is played in the twenty two yard pitch. The players participate with full effort to win the match and play with the sentiment global companionship so it is also called "Gentleman Game". Cricket is accepted to have been played in the sorted out structure many years prior. Cricket was familiar with North America by the English colonies in the seventeenth century presumably before it had even achieved the north of England [9]. In the eighteenth century, it began in different parts of the earth. It was acquainted with the West Indies by colonists [9] and to India by British East India Company sailors in the primary portion of the century [2]. It started in Australia nearly when the colonization started in 1788. After wards, New Zealand and South Africa followed in the mid nineteenth century [2].
Anthropometric parameters are a set of noninvasive, quantitative technique for determining an human size, shape, proportion, composition by measuring, recording, and analyzing specific dimension of the body. Anthropometry has a rich custom in sports sciences and sports medicine. Though, in diverse times, different terms were used like dynamic anthropometry, sports anthropometry, biometry, physiological anthropometry, anthropometrical, kin anthropometry etc. by scientists to create some relationships between the body structure and the specialized functions required for various tasks [24]. In fact, it is well established that each individual is unique. The extent of human variability is so that no two persons can ever be exactly the same. There are two fundamental causes for this variation. One is the genes present at birth from parents and the other is the infinity of environment which acts upon individuals from cradle to grave. Therefore, scientists have for all time been fascinated by the phenomenon of human variation. In the populations, the law of chance operates as a whole and people in general tend to drop along a curve of normal division on all traits [25].
In prior time physical fitness has been characterize from alternate points of view and evaluated

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by utilizing various strategies. The origination of physical wellness taking into account military or athletic reason which has survived hundreds of years since the old Chinese and Athenian [31]. In twentieth century, the meaning of physical wellness has moved gradually towards a work-or living-related origination. Physical fitness is capacity to perform every day assignment with vitality and readiness without under weakness and still appreciate relaxation time interests and to meet the unpredicted crises. Physical wellness is characterized as an arrangement of capacity to complete physical capacity [28]. Customary physical activity is a vital part to stay fit and solid. It keeps us dynamic over the long haul and we likewise feel better. Activity can help you to evacuate a few sicknesses like diabetes, avoidance of tumor heart issues.

Objective of the Study
- The Objective of the present study was to find out the relationship of Running between the wickets performance of the Cricket players with selected Anthropometric Variables (Height and Arm Length).
- The Objective of the present study was to find out the relationship of Running between the wickets performance of the Cricket players with selected Physical fitness variables (Speed, Agility and Flexibility).

Hypothesis of the Study
- It was Hypothesized that there will be significant relationship of Running between the wickets performance

with selected Anthropometric Variables (Height and Arm Length) of the Cricket players.
- It was Hypothesized that there will be significant relationship of Running between the wickets performance with selected Physical fitness variables (Speed, Agility and Flexibility) of the Cricket players.

Material and method
Selection of Samples
Fifteen male Cricket players were participated as subjects in the present study. The samples were selected from Department of Physical Education Cricket match practice group, Guru Ghasidas University Bilaspur, Chhattisgarh on the basis of purposive sample selection technique. The age of the subjects was ranging between 21 to 28 years. The mean and SD of the age of the subject was 24.533 and 2.263. The age of the subjects were recorded on basis of date of birth mentioned in the 10th (High School) mark sheet certificates.

Administration of the test
Before the data collection all the participants' were proper introduction, aim and objective of the study were explained by the researcher. All the selected Anthropometric and Physical fitness variables data were collected under the supervision and direction of researcher. Appropriate time was provided between each test items. Spectators were motivated to participants to give the best performance.

Table 1: Selected Variables, their criterion measures and Units of measurement

Sr. N.	Selected variables	N	Criterion measures	Units of measurement
1	Height	15	Stadiometer	Centimeter
2	Arm Length	15	Anthropometric rode	Centimeter
3	Speed	15	50 m run test	Second
4	Agility	15	4x10mt. shuttle run	Seconds
5	Flexibility	15	Sit and reach test	Centimeter
6	Running Between the Wickets	15	Time taken to complete two runs in the pitch of 22 yards	Second

Table 1: Shows the Selected Variables, Criterion Measures and Their Measurement Units

Height
The subject is asked to stand erect barefooted on a plane horizontal surface against a wall, with his heels, back of the shoulders and head touching the wall. In this particular condition the head and face is checked for its being in F.H. plane. The anthropometric rod is kept in front of the subject and the crossbar of the anthropometer is adjusted so that its lower edge touches the highest point of the subject's head. The measurement is recorded from the anthropometer's eye correct up to 0.1 cm.

Arm Length
The arm length was measured with a flexible steel tape. The subject will be asked to stand erect, measurement will be taken from the acromion to the tip of the middle finger measurement was recorded to nearest centimeters.

50 m Run test
To measure the speed researcher was instructed to stand behind the starting line. Researcher instructed that players can use any start according to comfortable position of the players, two attempts were provided and best trial recorded as speed score. On the sound of whistle the stop watch started by the time keeper and stopped when the athlete completed 50 m distance.

10 x 4m Shuttle run test
To measure the agility researcher was instructed to stand behind the starting line. Researcher instructed that players can use any start according to comfortable position of the players, two attempts were provided and best trial recorded as agility score. On the sound of whistle the stop watch started by the time keeper and stopped when the athlete completed 4 shuttles of 10 m distance.

Flexibility
Flexibility was measured by the sit and reach test under the supervision of researcher. Researcher directly instructs the participant about the procedure of sit and reach test. In this particular situation the participant sit in long sitting position, feet should flat and touch with the wall of sit and reach equipment. On command go participant go forward as much as possible. The measurement was recorded to nearest centimeters.

Running between the Wickets performance
Running between the wickets performance was measured on the basis of time taken to complete two run during running between the wickets of the players. On the command go player start running from the strike end and go to non-strike end then finish the race in strike end.

Statistical Analysis

For the purpose of the present study to know the nature of the data descriptive statistics i.e. mean, standard deviation were calculated. To know the relationship of selected anthropometric and physical fitness variables with the running between the wickets performance of Cricket players Pearson product-moment correlations were calculated. All the statistics were calculated with the help of SPSS 16.0 version software.

Result and Findings of the Study

**Table 2:** Descriptive Statistics of selected variables

Variables	N	Mean	SD
Height	15	178.26	2.902
Arm Length	15	65.360	2.684
Speed	15	7.004	.789
Agility	15	8.673	1.064
Flexibility	15	38.345	2.757
Running between the Wickets	15	7.444	.781

Table 2 shows the mean and SD of the selected Anthropometric, Physical Fitness variables and Running between the wickets performance of Cricket players

Table 3: Relationship of selected Anthropometric Variables with Running between the wickets performance

Variables	N	Correlation coefficient (r)	Sig. Value (p-value)
Height	15	-.916*	.000
Arm Length	15	-.852*	.000

Table 3 shows the significance relationship of selected anthropometric variables (Height and Arm length) with Running between the wickets performance of the Cricket players.
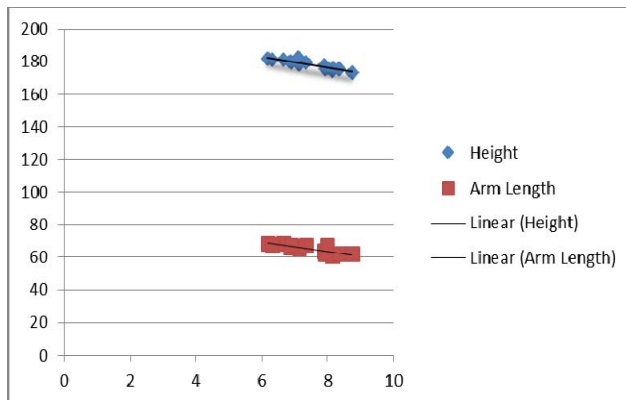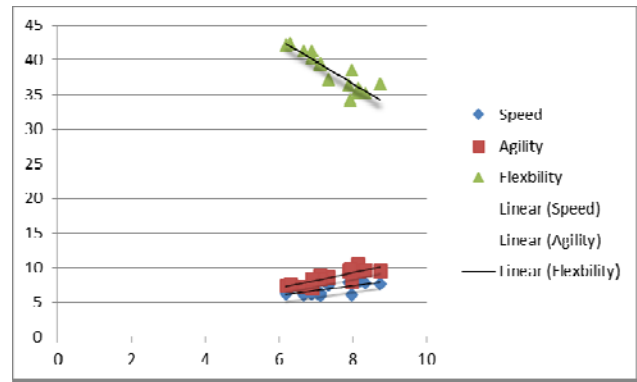

Graph 1: Graphical representation of relationship of selected anthropometric variables with the Running between the wickets performance of Cricket players

Table 4: Relationship of selected Physical Fitness Variables with Running between the wicket performances

Variables	N	Correlation coefficient (r)	Sig. Value (p-value)
Speed	15	.709*	.003
Agility	15	.806*	.000
Flexibility	15	-.898*	.000

Table 4 clearly indicates the significance relationship of selected Physical fitness variables (Speed, Agility and Flexibility) with the Running between the wickets

performance of the Cricket players.

Graph 2: Graphical representation of relationship of selected physical fitness variables with the Running between the wickets performance of Cricket players

Discussion of the Findings

The purpose of the present study was to examine relationships of running between the wickets performance with selected Anthropometric (height and arm length) and physical fitness variables (Speed, Agility and Flexibility). The findings of the study shows that there is significant relationships of running between the wickets performance with Height (r =**-.916**, $p<.05$) the probable reason of this result is height of the players is directly related to the stride length and stride length increase the running ability of the players. The results of the study also indicate that significant relationships of running between the wickets performance with Arm Length (r = -.852, $p<.05$) the arm length play the important role in running between the wickets during dragging the bat on popping crease. If the players have longer arm length they can stretch the arm towards the wicket to drag the bat on popping crease. Significant relationships of running between the wickets performance with Speed of the players was observe (r =.709, $p<.05$). For the best performance of running between the wickets speed is the most dominant factor that plays the important role during the running between the wickets. Agility is the change the direction of the body part quickly and efficiently on the basis of findings of the study it clear that the significant relationships of running between the wickets performance with Agility was found (r =.806, $p<.05$). During running between the wickets player runs and change the direction on the basis of direction and distance of the ball so agility play major role in running between the wickets. Agility is a multi factorial physical capacity and this is affected by strength, speed, balance, flexibility, and muscular coordination (Chaouachi *et al.*, 2009) [12]. parallel results showed by Koklu *et al.* (2015) [23] found significant correlations between CMJ and zigzag agility test in soccer players. Chaouachi *et al* (2009) [12] reported a significant negative correlation between TT and jump test performance in elite male (23 years old) basketball players. In a recent study conducted by Alemdaroglu (2012) [1], he concluded that a significant correlation between CMJ and TT (in professional men (25 years old) basketball players. Flexibility is the range of motion around the joints. Findings of the study shows that significant relationships of running between the wickets performance with Flexibility exists (r = -.898, $p<.05$). Flexibility is the major factor that decides the speed of the players and speed is entirely depends on the running between the wickets performance. Flexibility also play the major role during running and dragging the bat towards the popping crease

because during dragging the bat various joints of the body stretched full range of motion and this is depends on the flexibility of the players.

Conclusions
On the basis of results of the study following conclusions may be drawn:
1. Significant relationship was found between Running between the wickets performance and Height (r =-.916, $p<.05$).
2. Significant relationship was found between Running between the wickets performance and Arm Length (r = -.852, $p<.05$).
3. Significant relationship was found between Running between the wickets performance and Speed (r =.709, $p<.05$).
4. Significant relationship was found between Running between the wickets performance and Agility (r =.806, $p<.05$).
5. Significant relationship was found between Running between the wickets performance and Flexibility(r = -.898, $p<.05$).
   Initially it was hypothesized that there will be no significance relationship of height, arm length, speed, agility and flexibility with the running between the wickets performance of cricket players is not accepted at 0.05 level of significance.

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