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Relationship of selected anthropometric and bio-mechanical variables to the performance of medium pace bowling in cricket

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Abstract
The purpose of the study was to analyse the relationship of selected anthropometric and biomechanical variables to the performance of players in medium pace bowling in cricket. Five male cricket players who represented Vidyasagar University Cricket Team at East Zone Cricket Tournament were selected as subjects for this study. Height, sitting height, leg length, arm length, body weight for selected anthropometrical variables and selected biomechanical variables i.e. angle of ankle joint, knee joint, elbow joint, shoulder joint, height of centre of gravity were considered as the variables of the study. The relationship of selected anthropometric and biomechanical variables with the performance of cricket playing was calculated by using Pearson's product moment correlation. For testing hypothesis the level of significance was set at 0.05.The obtained value of co-efficient of co-relations of selected anthropometric variables at the moment release. Only the height and leg length had significant relationship with the performance of subjects in medium pace bowling. In case of biomechanical variables had exhibited significant relationship with the performance of players in medium pace bowling.

Keywords: anthropometrical variables, biomechanical variables, cricket players

Introduction
All movements of material bodies, both men and animals are subject, without exception, to the law of mechanics as every movement involves mechanical movement and the locomotion of parts of mass in space and time it is the only first task of science to recognize this it is necessary to make this qualification, because movement is not only locomotion, but is also a change in quality in fields above the purely mechanical.
Anthropometric measurements were central concerns of the first phase of the scientific era of measurement, which began in the 1860's Current interest in anthropometric measurement focuses on three areas growth measures body type and body composition. These are of such measure include classification prediction of growth pattern and prediction of success in motor abilities as well as assessment of obesity.
Measurement of body sine includes descriptive information as height, weight, and areas, while measure of body proportion describe the relationship between height and weight and among lengths.
Widths and circumference of various body segments. It has been found that top athletes in some sports tend to have those proportion that biomechanical aid the particular performance.
The role of Biomechanics in attaining high performance cannot be over looked. Since it is the only scientific which help to identify the faults in performing technique very precisely. There are basically two methods by which motor skill can be analysed. They are the qualitative and quantitative method. High speed movie film for exactness has been used extensively to examine in great details of the movements of the body which occur to fast for the human eye to detect. In many of the elite sport training and research institution around the world, force applied during high caliber sporting event. While the analysis test have done much to improve understanding of movement and the performance of eliete athletes, the analysis tasks faced by the coach are predominantly qualitative in nature.
So people who are working in this field should have a basic knowledge about how a body moves, what are the major groups of muscles, joints and in what proportions and degree they are to be used to get an optimum output. This approximately can provide an understanding of the nature of any skill, their economic way of execution and their dependent factors which in turn can build into an of the larger scheme of economic movement.
Medium pace bowlers rely more on accuracy and movement of the seam. Spinners must be even more accurate. A loose ball bowled at slow speed is a gift to any batsman. Spin bowlers flight the ball through the air and use a variety of spin off the pitch to deceive the batsman.
One of the most dramatic changes in bowling came about in 1900 when English spinner Bernard Bosanquet first bowled the googly or bosie. This was an off break bowled with a leg break action. This ball has confounded batsmen around the world ever since, and is used extensively by Australian leg break bowlers.

Statement of the Problem
The purpose of the study was to analyses the relationship of selected anthropometric and biomechanical variables to the performance of players in Medium pace bowling in cricket.

Methodology
The objective of the study was to analyse the relationship of selected anthropometric and biomechanical variables to the performance of players in medium pace bowling in cricket. Five male cricket players who represented Vidyasagar University Cricket Team at East Zone Cricket Tournament were selected as subjects for this study. Since the players had

been trained for a considerable period of time, they were considered skilled and their technique was treated as stabilized. The relationship of selected anthropometric and biomechanical variables with the performance of cricket playing was calculated by using Pearson's product moment correlation. For testing hypothesis the level of significance was set at 0.05

Findings

Relationship of Selected Anthropomentric Variables with the Performance of Players in Emdium Pace Bowling

In order to find out the relationship of selected anthropometric variables namely height, sitting height, leg length, arm length and body weight with the performance of subject in medium pace bowling Pearson's product moment correlation was used. The results are present in the table- 1.

Table 1: Relationship of Selected Anthropomentric Variables with the Performance of Players in Medium Pace Bowling

S. No	Variables	Coefficient of correlation
1	Height	0.93*
2	Sitting Height	0.2
3	Arm length	0.35
4	Leg length	0.88*
5	Body weight	0.04

* Significant r. 05(3) = 0.878

The finding of table – 5 revealed that the height and leg length shoed significant relationship (r=0.93 and 0.88 respectively) where the value of coefficient of correlation is higher than the tabulated value (r=0.878) at 0.05 level of significant. All other selected anthropometric variable do not show any significant relationship with the performance of cricketer in medium pace bowling because the obtained value are less than the required value to be significant at 0.05 level of significance.

Relationship of Selected Biomechanical Variables with the Performance of Players in Medium Pace Bowling

In order to ascertain the relationship of selected biomechanical variables namely angle of ankle joint, knee joint, elbow joint, shoulder joint and height of centre of gravity with the performance of subjects in medium pace bowling, the product moment correlations were calculated at moment release. The results are presented in table- 2

Table 2: Relationship of Selected Biomechanical Variables with the Performance of Players in Medium Pace Bowling

S. No	Variables	Coefficient of correlation 'r' at moment Release.
1	Ankle Joint Left leg (Front leg)	0.37
2	Knee Joint Left leg (Front leg)	0.04
3	Elbow Joint (Bowling arm)	0.19
4	Shoulder Joint (Bowling arm)	0.47
5	Ankle Joint Right Leg (Rear leg)	0.7
6	Knee Joint (Rear leg)	0.54
7	Elbow Joint (Left arm)	0.67
8	Shoulder Joint (left arm)	0.22
9	Height of centre of Gravity	0.82

Table – 2 indicates that none of the Biomechanical variable namely angles of ankle joint, Elbow Joint, Shoulder Joint, Knee Joint and Height of centre of gravity at moment release have significant relationship with the performance of the subjects in medium pace bowling. Even though the value of coefficient of correlation in case of ankle joint (Rear leg) and Height of Centre of gravity has exhibited quite high but was not found significant at the selected level of 0.05.

Discussion

The obtained value of co-efficient of correlations of selected anthropometric variables at the moment release. Only the height and leg length have significant relationship with the performance of subjects in medium pace bowling.

In case of biomechanical variables none of the biomechanical variable has exhibited significant relationship with the performance of players in Medium pace bowling. It may be because of small size of the sample. It is a known fact that greater radius of rotation creates greater momentum but angle at elbow joint bowling arm does not exhibited significant relationship which may be due to other reasons.

As a whole the variables which have shown high relationship with the performance must have contributed towards the performance of subject in medium pace bowling. Along with these variables, other motor components also must have contributed to the performance. The other variables do not mean that the variables might have not contributed to the performance. They do contribute to the performance. But the insignificant values of co-efficient of correlation of such variable with the performance might have been due to the small size of the sample and non-availability of sophisticated equipment's.

Since the results have shown significant relationship of few selected biomechanical and anthropometric variables to the performance of players in medium pace bowling, the null hypothesis is rejected, however in case of other variables the hypothesis is accepted.

Conclusions

Bases on the analysis and within the limitations of the present study the following conclusions can be drawn.

1. In anthropometric variable height has shown positive effect on the performance of cricket player in medium pace bowling.
2. Leg length also has shown positive effect on performance of Players in medium pace bowling in cricket.
3. In biomechanical variables only height of centre of gravity of subjects shown relationship i.e. inclination of the body at time of release with the performance of cricketers in medium pace bowling though the obtained value of co-efficient of correlation was not significant.

Recommendations

Based on the conclusions drawn in this study, the following recommendations are made.

1. The results may be used by physical Education Teacher while selecting the cricket players.
2. While selecting Players the variables such as height, leg length may be kept in mind as the factors contributing to the performance of players of in medium pace bowling.
3. The results of the study may be helpful to the Physical Education Teachers and coaches to evaluate the performance of their players.

4. The results of the study may be used by the cricket players for self-evaluation of their performance.
5. Similar studies may be conducted by using sophisticated equipment's and subjects of different level and sex.

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