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EFFECT OF PHYSICAL FITTNESS, REACTION TIME AND ANXIETY ON PERFORMANCE OF BATSMANAND BOWLER IN CRICKET

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Abstract:

Cricket performance is influenced not only by technical skills but also by several physical and psychological factors that determine the effectiveness of players during competitive situations. The present study examines the effect of physical fitness, reaction time, and anxiety on the performance of batsmen and bowlers in cricket**.** Physical fitness contributes to endurance, agility, and strength, which are essential for sustained performance during long matches. Reaction time plays a crucial role in enabling players to respond quickly to dynamic game situations such as fast deliveries, fielding actions, and strategic decision-making. Anxiety, a psychological factor, can significantly influence concentration, confidence, and overall performance during high-pressure match conditions. The study aims to analyze how these variables interact and impact the efficiency of batsmen and bowlers. Understanding the relationship among physical fitness, reaction time, and anxiety can help coaches, trainers, and sports psychologists design effective training programs to enhance player performance and maintain psychological stability in competitive cricket environments.

Keywords: *Cricket, Artificial Intelligence, Sports, Physical Fitness, Performance, Indian Cricket*

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1. Introduction

Cricket is a highly competitive sport that demands a combination of physical ability, psychological stability, and quick decision-making for optimal performance. Among the various determinants of success in cricket, physical fitness, reaction time, and anxiety play a crucial role in influencing the effectiveness of both batsmen and bowlers. Physical fitness contributes to endurance, agility, strength, and coordination, enabling players to sustain performance throughout long matches and execute technical skills efficiently. Reaction time is equally important, as batsmen must respond instantly to the speed and movement of the ball, while bowlers need quick reflexes to adapt their delivery and fielding actions (Armstrong et al, 1992). At the same time, psychological factors such as anxiety significantly affect concentration, confidence, and overall game performance. High levels of competitive anxiety may hinder decision-making and motor coordination, whereas controlled anxiety can enhance focus and readiness. Therefore, understanding the combined influence of physical fitness, reaction time, and anxiety on the performance of batsmen and bowlers is essential for improving training methods and performance outcomes in cricket.

Sport is a psycho-Social activity. It has both psychological and social dimensions, besides physical, psychological and technical aspects (Asch, 1956). Man's inners in sports are found in all societies of the world. Most of the nations share a common interest in sports competition, especially at certain times, where people from all nations focus their attentions on the drama of competition. But the quality

of the participation of the athletes and sportsman is determined by their psychological preparation of a team is as much important as teaching the different skills of a game on the scientific lines, The team are prepared not only to play the games, but to win the games and for winning the games, it is not only the proficiency in skills, which bring victory but more important is the spirit of the players with they play and perform their best in the competition. The application of psychological principles to the improvement of performance in sports has received greater attention in these days. There are certain accepted psychological principles which have to be applied, so that their performances coaches, physical educations and sports scientist have always expressed a great need to know more about those psychological principles, which are helpful in improving the motor skills of the players. Self-perceptions of physical fitness and academic achievement were related to 14 field and laboratory indicators of physical fitness and to academic achievement for a large, national representative sample of more than 6,000 Australian boys and girls. Correlations between self-concept and the corresponding external criteria increased steadily in both the physical and academic domains. Consistent with predictions from frame-of-reference models, relations were stronger controlling for gender and age, suggesting that the self-concept are formed relative to other students of a similar age and gender. Fitness self-concept was most strongly related to some individual measures (e.g., 1-6K run, 50M dash, push-ups, skin fold thickness, long jump and body girth scores) and some. Components of fitness (e.g. Cardiovascular endurance, power, dynamic strength and body composition) than others (Marsh, 1993)

2. Rationale of Study

There are many occasions in sports where speed or reaction and speed of movement are very vital factors (Finkenberg et al., 1991). In general, fast reactions are characteristics of great athletes in the sport races and events are won by a fraction of seconds, the role of reaction time becomes very significant. It may be stated that quick or fast reactions distinguish the average from the superior performance in many motors' skill. Individual who reaches quicker and faster have an obvious advantage over those who are slower. Theodorakis, et al. 1991 studied One hundred fifty-two women (aged 18-45 years) participating in a physical fitness program completed the Greek version of the Body Cathexis Scale. Results show high internal consistency. Item analysis correlations were. 29-.68, split-half r was .89, and Chronbach Al- pha was .92. Factor analysis revealed 6 factors that explained 52.5% of the total variance: Physical Fitness, Total Appearance, Health and Skills, Face, Ears and Chin, and Extremities. Higher body satisfaction was observed on Health and Skills, Ears and Chin, and Extremities. Age group was not associated with overall body satisfaction.

3. Significance of study

Cricket is the International game: Day by day it is becoming to more and more popular. But review of literature shows that in India very few attempts have been carried out. On cricket and Cricket players very few studies are there. This study will be helpful to the cricket coaches and players. Anxiety players a paramount role in sports (Campbell et al.1990). It is the challenge in sports participation which produces anxiety. How an athlete handles the anxiety determines how successful he would be. Anxiety may be a positive motivation force with successful performances in sports because in the competitive sports, participants are expected to win and great demands are made upon them to succeed.

Porat et al. (1989) selected 20 girls (aged 7 to 9 years) for one year study that assessed the role of psychological variables (i.e., self-concept, locus of control and anxiety) in competitive gymnastics. Subjects were administered the Tennessee Self-concept Scale, a Locus of Control Scale for children, and the State-Trait Anxiety Scale. Following the year of practice, participated in gymnastics competitions. Ten psychological measures accounted for 49% of the performance variance. The best predictor was trait anxiety.

4. Aim of the Study

Performance of cricket players differ from each other and similarly single players perform differently in different situations. The present study aimed at examining the physical fitness, reaction time and anxiety of cricket players whose performance differ from each other, & similarly differ in different situations.

5. Objectives of the study

The following objectives were used for carrying out the present study. -

1. To examine the physical fitness of the batsman and bowler in cricket and to find out its effect on performance of batsman and bowler
2. To examine the reaction time of batsman and bowler in cricket and to find out its effect on performance of batsman & bowler
3. To study the anxiety level of the batsman and bowler in cricket and to and to find out its effect on performance of batsman and bowler
4. To study the association between low reaction time and performance of batsman & bower

- **Hypotheses:**

1. Physically fit batsman performs significantly better than physically unfit batsman.
2. Physically fit bowler performs significantly better than physically unfit bowler.
3. Batsman taking low RT performs significantly better than the batsman taking high R.T.
4. Bowler taking low RT performs significantly better than the bowler taking high R.T.
5. Low anxiety level batsman performs significantly better than the high anxiety level batsman.
6. Low anxiety level bowler performs significantly better than the high anxiety level bowler.

6. Research Methodology:

Sample: Effective sample consisted of 320 cricket players selected through random sampling method. Their age range from 18 to 25 years**.**

- **Tools used for data collection**

For measurement of several factor standardize tests were used. They are as follows:

1. Sinha's comprehensive Anxiety test: SCAT has been used to measure the anxiety level of cricket players. It is very famous, reliable & valid tool for measuring anxiety level.
2. Reaction Time: Chronoscope has been used to measure the reaction time of cricket players.
3. Physical fitness Test: A battery of physical fitness test has been used to measure physical fitness.

Procedures of Data Collection: The paper pencil test was administered on small group of Ss. comprising 20 to 25 Ss in each group before administering each scale, proper report was found and the instruction laid down author of the scale were followed strictly. A battery of physical fitness test was given to the Ss on ground and measurements were noted down.

Variable of Study:

Independent variables: Physical faintness, Reaction time, Anxiety

Dependent variables: Performance of bastman, Performance of bowler.

Design of the study: In the present study there were three in- dependent factors each factor varies in two ways. Thus, a 2x2x2 balanced factorial design was used.

The Statically treatment of data: Collected data were classified in eight groups than they were treated first by mean and standard deviation, later on the data were treated by three-way ANOVA.

7. **Results**

Table 1.1 Means and Standard Deviation of eight classified groups of performance of cricket players

	Mean	**S.D.**	**N**
AIBICI	11.2	2	30
A1B1C2	8.99	1.89	30
A1B2C1	9.99	1	30
A1B2C2	10.22	1.4	30
A2B1C1	9.81	1.66	30
A2B1C2	8.22	1.7	30
A2B2C1	9.22	2.11	30
A2B2C2	7.88	1.89	30

A1: Physically Fit Players

B1: Low Reaction Time

C1: Low Anxiety

A2: Poor Physically Fit Players

B2: High Reaction Time

C2: High Anxiety

Table no. 1.1 shows the means and standard deviation values of eight classified groups here large score indicates better performance where as low score indicates poor performance. In the view of if the means & Sd of performance of players are considered then it is found that group A1B1C1 had better performed group among the all eight groups where as A2B1C1 and A2B2C2 had most poor performed groups. Examination of means and standard deviations makes it clear that the eight groups exhibited better internal consistency. Careful examination of mean value reviews that four groups of physically better fit subjects have relatively good performance than remaining four groups of physically poor fit subjects. However only on the basis of means and standard deviations inferences cannot be drawn hence the data were treated by three way ANOVA. Complete summary of three way ANOVA of performance of cricket players is given in Table 1.2

Table 1.2 Complete Summary of Three Way ANOVA of Performance of Cricket Players

Source of variations	Sum of Squares	DF	MSS	F
A: Physical Fitness	190.75	1	190.75	61.14
B. Reaction Time	99.12	1	99.12	31.77
C: Anxiety	89.44	1	89.44	20.67
A X B	64.01	1	64.01	20.52
A X C	9.88	1	9.88	3.17
B X C	8.85	1	8.85	2.81
AXBXC	5.45	1	5.45	1.75
Error Within	725.88	232	3.13	
Total	1193.38	239.00		

*Significant at 0.0 level

Table 1.2 shows that main effect A is highly significant at 0.01 level. It is clear that compare to the physically poor fit subjects, the physically better fit subjects had significantly given better performance. This result supports the assumption of the study. Low reaction time subjects and high reaction time subjects are represented by main effect B. From the above table it is seen that main effect B is associated with f value of 31.77 which is significant at 0.01 level. It shows that Low reaction time subjects and High reaction time subjects differ from each other significantly on performance. From the Table 1.2 one can see that the first interaction effect Ax B is significant at 0.01 level it is associated with F value at 20.67 which for 1 and 232 df is significant at 0.01 level. Significant interaction effect indicates that physical fitness and reaction time is dependent on each other. Interaction effect Ax C, Bx C and Ax B x Cis not significant. Which indicate that physical fitness and anxiety and reaction time and anxiety were independent. Similarly physical fitness, reaction time and anxiety were independent. On the basis of result following conclusion were drawn:

1. Performance of the physically fit batsman was significantly better than the unfit batsman.
2. Performance if physically fit bowler was significantly better than the physically unfit bowler.
3. Batsman having low R.T. performed significantly better than the bowler having high R.T.
4. Bowlers having low R.T. Performed significantly better than the bowler having high R.T.
5. Low anxiety level batsman performed significantly better than the high anxiety level batsman.

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