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Study of Psycho-Physiological Analysis of State Level Cricketers: Batters and Bowlers

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Abstract Sports psychology studies how psychology affects athletic performance, physical exertion, exercise, and sports. Heart rate variability is a well-known system for estimating cardiac autonomic modulations. It has lately made strides in specialised ECG processing, heart rate variability evaluation, physiologic appreciation and interpretation, and clinical and practical operation. Power spectral analysis of heart period (R- R) and arterial pressure short-term variability revealed a high frequency (HF) element corresponding to respiratory exertion and a low frequency (LF) element corresponding to vasomotor swells. Our thing was to assess the utility of similar distant measures in factual clinical situations compared to current contact point assessment approaches.

Key words: Cricket; Bowlers; Batsman; Psychology; Physiology

Introduction

Sports psychology studies how psychology affects athletic performance, physical exertion, exercise, and sports. Heart rate variability is a well-known system for estimating cardiac autonomic modulations. It has recently made strides in technical ECG processing, heart rate variability evaluation, physiologic appreciation and interpretation, and clinical and practical operation. Power spectral analysis of heart period (R- R) and arterial pressure short-term variability revealed a high frequency (HF) element corresponding to respiratory exertion and a low frequency (LF) element corresponding to vasomotor swells. Our thing was to assess the mileage of analogous distant measures in factual clinical situations compared to current contact point assessment approaches (**Malik, M. (1998).** A high frequency (HF) element corresponding to respiratory exertion (roughly0.25 Hz) and a low frequency (LF) element corresponding to vasomotor swells (roughly0.10 Hz) are revealed by power spectral analysis of heart period(R- R) and arterial pressure short- term variability (**Malliani, A.,**

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Pagani, M., & Lombardi, F. (1994). Oxygen achromatism (SpO2), respiratory rate (RR), and heart rate (HR). Our thing was to assess the utility of similar distant measures in factual clinical situations in comparison to current contact point assessment approaches (**Chenuel, B. (2021)**

Methodology:

The purpose of the study is to compare the psychological variable (anxiety) and physiological variable (heart rate and SPO_2) among state-level batsmen and bowlers. The subjects for the study were 60 state-level batsmen and 60 state-level bowlers. In order to test the hypothesis ANOVA test has been performed.

Result:

The data collected on the anxiety level, heart rate, and SPO_2 for state-level cricket players and a comparative study have been done. The results were analysed and shown below in the table.

Table:1 Anxiety Level in Cricket Players

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
Anxiety Level Batsman	60	882	14.7	14.28136
Anxiety Level Bowlers	60	1166	19.43333	9.266667

Table 1 shows that state-level bowlers have higher anxiety levels than batsmen. To know whether this difference is statistically significant ANOVA test has been performed.

Table:2 ANOVA test for comparing anxiety

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	672.13333	1	672.1333	57.08618	0.000	3.921478
Within Groups	1389.3333	118	11.77401			
Total	2061.4667	119				

Table 2 shows that p-value = 0.000, which is less than the level of significance 0.05. Hence at a 5% level of significance, we can conclude that there is a significant difference between the anxiety levels of batsmen and bowlers.

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Table:3 Heart Rate in Cricket Players

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
Heart Rate Batsman	60	8439	140.65	326.6381356
Heart Rate Bowlers	60	8926	148.7666667	373.6056497

Table 3 shows that state-level bowlers have higher heart rates than batsmen. To know whether this difference is statistically significant ANOVA test has been performed.

Table:4 ANOVA test for comparing heart rates

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1976.408333	1	1976.408333	5.644915028	0.019116	3.921478
Within Groups	41314.38333	118	350.1218927			
Total	43290.79167	119				

Table 4 shows that p-value = 0.019, which is less than the significance level of 0.05. Hence at a 5% level of significance, we can conclude that there is a significant difference between the heart rates of batsmen and bowlers.

Table:5 SPO_2 level in Cricket Players

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
SPO2 level in Batman	60	5842	97.36667	0.914124
SPO2 level in Bowler	60	5836	97.26667	0.944633

Table 5 shows that state-level batsmen have slightly higher SPO_2 levels than bowlers. To know whether this difference is statistically significant ANOVA test has been performed.

Table:6 ANOVA test for comparing SPO_2 level

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.3	1	0.3	0.322796	0.571012	3.921478
Within Groups	109.6667	118	0.929379			
Total	109.9667	119				

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Table 6 shows that p-value = 0.571, greater than the significance level of 0.05. Hence at a 5% level of significance, we cannot conclude that there is a significant difference between the SPO_2 levels of batsmen and bowlers.

Conclusion: Within the limitations of the present study and based on the obtained results, it was concluded that at a 5% level of significance, it could be concluded that there is a significant difference between the anxiety levels and heart rates of batsmen and bowlers, but it cannot be concluded that conclude that there is a significant difference between the SPO_2 levels of batsmen and bowlers.

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