



A Comparison Study between the Heart Rate of High and Low Level Male Hockey Players of Delhi

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Abstract

The purpose of the present study was to compare the heart rate between high-level and low-level male hockey players of Delhi. A total of 100 male hockey players (N = 100) aged between 15 to 23 years were selected as subjects. The sample comprised 50 high-level and 50 low-level hockey players representing different hockey academies and competitive levels in Delhi. Descriptive statistics and an independent samples t-test were used to analyze the data. The mean heart rate of high-level players was found to be 129.12 (SD = 12.69), whereas the mean heart rate of low-level players was 144.66 (SD = 14.10). The computed mean difference was -15.54. The independent t-test revealed a statistically significant difference between the two groups ($t = -5.79$, $df = 98$, $p < .001$). The findings indicate that high-level hockey players demonstrate significantly lower heart rates compared to low-level players, suggesting better cardiovascular efficiency and physiological adaptation among higher-performing athletes.

Keywords: Heart Rate, High-Level Players, Low-Level Players, Male Hockey Players, Cardiovascular Efficiency

Introduction

Field hockey is a high-intensity intermittent sport that demands exceptional aerobic and anaerobic capacity, speed, agility, and tactical efficiency. Physiological characteristics, particularly cardiovascular efficiency, are crucial determinants of performance in competitive hockey. Heart rate serves as a reliable indicator of cardiovascular fitness and training adaptation. Well-trained athletes typically exhibit lower resting and submaximal heart rates due to enhanced stroke volume and cardiac efficiency.

(Singh & Kumar, 2023) badminton is a physically demanding sport that requires a high degree of overall fitness. In order to enhance performance and improve the physiological efficiency of college-level badminton players, the implementation of a scientifically structured training programme is essential. The purpose of the present study was to investigate the effects of badminton-specific circuit training on selected physiological variables, namely resting heart rate, resting respiratory rate, vital capacity, and positive breath-holding capacity, among college-level badminton players. The results of the study offer meaningful insights into the effectiveness of circuit training as a means of enhancing the physiological characteristics that are vital for achieving optimal performance in badminton.

(Senthilkumar, 2016) the study sought to examine the relationship between key physiological characteristics and the performance level of elite volleyball players at the national level. The subjects for this study were selected from a group of 45 male volleyball players who had taken part in the mini National competition in the 2013-2014 seasons. Only the Resting Pulse Rate and Respiratory Rate were selected as criteria variables from the physiological parameters. Pulse rate and respiration rate were evaluated using manual techniques. The



evaluation of volleyball proficiency was carried out by three specialists who offered subjective assessments throughout the mini national volleyball tournaments. The criterion score was determined based on the average rating. The statistical method used to assess the association between physiological indicators, such as resting pulse rate and respiratory rate, and volleyball play was the person's product moment correlation (zero order). The results demonstrated a substantial link between these variables.

In India, hockey has long been recognized as a prominent sport, and regions such as Delhi have contributed significantly to the development of competitive players. Understanding physiological differences between high-level and low-level players can provide valuable insight into performance enhancement and training prescription.

Therefore, the present study aimed to compare the heart rate of high-level and low-level male hockey players of Delhi.

Delimitations of the Study

The study was delimited by the following delimitations:

1. Level of participation of Hockey players should be State level.
2. Age ranged for samples should be 15- 23 years.
3. Sample size should be 100 male subjects including 50 low and 50 high level Hockey players.

Objectives of the Study

1. To determine the mean heart rate of high-level male hockey players of Delhi.
2. To determine the mean heart rate of low-level male hockey players of Delhi.
3. To compare the heart rate between high-level and low-level male hockey players.

Hypothesis

Null Hypothesis (H₀): There is no significant difference in heart rate between high-level and low-level male hockey players of Delhi.

Methodology Sample

The study was conducted on 100 male hockey players from Delhi, aged between 15 and 23 years. The subjects were divided into two groups:

- High-Level Players (n = 50)
- Low-Level Players (n = 50)

The sampling technique used was purposive sampling.

Variable

- **Independent Variable:** Level of hockey players (High and Low)
- **Dependent Variable:** Heart Rate

Statistical Techniques



- Descriptive Statistics (Mean and Standard Deviation)
- Independent Samples t-test

Results

Table-1: Descriptive Statistics of Heart Rate

Group	N	Mean	SD
High-Level Players	50	129.12	12.69
Low-Level Players	50	144.66	14.10

The mean heart rate of high-level players (129.12) was lower than that of low-level players (144.66).

Figure-1: Graphical representation of mean values of heart rate of high and low level male players of hockey.

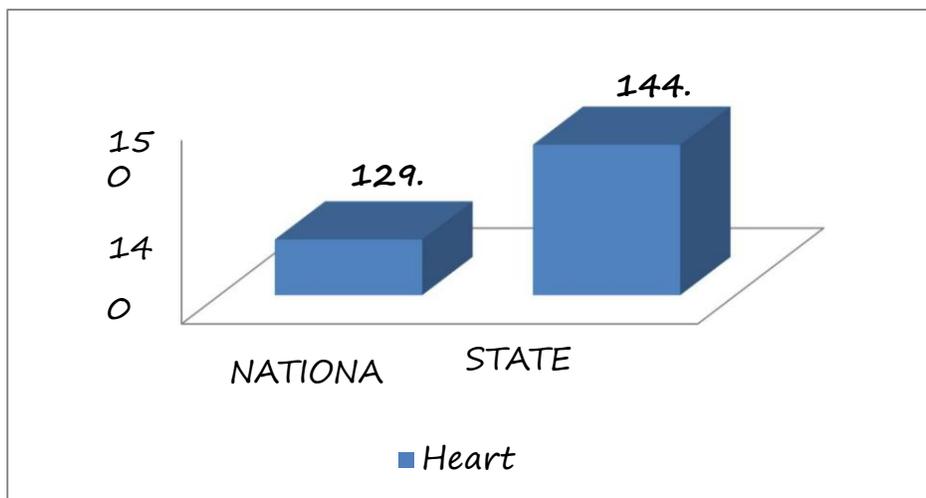


Table-2: Independent t-test Analysis for Heart rate

Heart Rate	Mean Difference	t-value	df	p-value
	-15.54	-5.79	98	.000

The calculated t-value (-5.79) with 98 degrees of freedom was found to be statistically significant at $p < .001$. Therefore, the null hypothesis was rejected.

Discussion

The findings of the study revealed a significant difference in heart rate between high-level and low-level male hockey players. High-level players demonstrated significantly lower heart rates compared to low-level players. This suggests superior cardiovascular conditioning, enhanced stroke volume, and better aerobic efficiency among high-level players.



Lower heart rate among trained athletes is commonly associated with physiological adaptations such as increased cardiac output and improved oxygen delivery mechanisms. These adaptations are critical in high-intensity sports like hockey, where sustained effort and quick recovery are essential. The results are consistent with previous research indicating that trained athletes typically exhibit lower resting and submaximal exercise heart rates compared to less trained individuals.

Conclusion

Based on the findings of the study, it can be concluded that high-level male hockey players of Delhi possess significantly lower heart rates compared to low-level players. The difference is statistically significant ($t = -5.79, p < .001$). This indicates better cardiovascular efficiency among high-level players, which may contribute to superior performance in competitive hockey.

Practical Implications

1. Coaches should emphasize cardiovascular training for low-level players.
2. Regular monitoring of heart rate can help assess training effectiveness.
3. Physiological profiling can assist in talent identification and performance enhancement.

Recommendations for Future Research

1. Future studies may include female hockey players.
2. Additional physiological parameters such as VO_2 max and recovery heart rate may be considered.
3. Comparative studies across different regions or national-level players may provide broader insights.

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