



COMPARATIVE STUDY ON STRENGTH AND REACTION TIME IN CRICKET AND BADMINTON STATE LEVEL PLAYERS

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Abstract

Introduction: Cricket and Badminton are physically demanding sports. These are comprised several specialisms requiring different skills and types of fitness. Those game require eye to hand coordination, reaction ability, hand grip strength, shoulder strength, abdominal strength, flexibility etc. In cricket, two hand grip strength is used to control the various shot in cricket skills, when holding the bat. Similarly badminton, one hand grip strength is used to control accuracy during the play. Strength is essential to carry out the functions of the shoulder, abdomen and leg etc. **Objectives:** of the present study to compare the handgrip strength, shoulder strength, abdominal muscles strength, leg explosive strength between cricket and badminton state level players. To compare the reaction time between cricket and badminton state level players. **Methodology:** The researcher was selected state level 20 cricket players and 20 badminton players their age range 17 to 25 years, from place like, Krishanath College, Kalyani Town Club, Hooghly District Sports Association and Kalyani University. Total of 5 strength (left handgrip, right handgrip, shoulder, leg explosive and abdominal muscle) and reaction time were selected for the study. The data were collected using standard equipment and tests (Hand Grip Dynamometer, Push up, Sit up, Standing broad jump & Ruler Drop Test). Descriptive statistics (mean and standard deviation) and inferential statistics (paired sample t value) were used for data analysis. **Findings and Conclusion:** The findings of the present study was not significant of left handgrip strength, right handgrip strength, shoulder strength and abdominal muscles strength of cricket and badminton state level players. But leg explosive strength and reaction time were found significant difference at 0.05 level between cricket and badminton state level players.

Introduction

Body strength is one of the most important ingredients parameter of sports field. Cricket is a coordinative game as well as includes strength, balance and endurance etc. for bowling, throwing and batting. Badminton also requires coordination, strength and other fitness parameters. Therefore, the researcher intends to compare selected body strength variables and reaction time of cricket & Badminton players. Cricket and Badminton are physically demanding sports. These are comprised several specialisms requiring different skills and types of fitness. Those game require eye to hand coordination, reaction ability, hand grip strength, shoulder strength, abdominal strength, flexibility etc.

Hand grip strength dynamometry is used to measure force generated by flexor mechanism of hand and forearm. Hand grip strength is very important when it comes to sports. Before a player begins playing a hand grip strength test is important for determining a player's workout. Hand grip strength determines a player's readiness for sports. In golf, hand grip strength is used to control the power a golfer hits a golf ball. The angle at which a golfer hits

the ball determines how far the ball goes. In cricket, two hand grip strength is used to control the various shot in cricket skills, when holding the bat. Similarly badminton, one hand grip strength is used to control accuracy during the play. Strength is essential to carry out the functions of the shoulder, abdomen and leg etc. Many different muscles are required to power the shoulder because of the need to control both humero-scapular and scapula-thoracic positions and to allow the vast range of motions of these articulations. Strength of the abdominal muscles are important in promoting good posture and correct pelvic alignment, the latter of which is particularly important to low back health. In test of training the muscles of this region, it is difficult to isolate specific abdominal muscles. Hand grip strength is a physical trait that plays an important role providing effectiveness and efficiency during daily work and sports activities. Moreover, in terms of performance, hand grip is an important indicator in many sports. Muscle strength and power are decisive in individual and team sports' successful performance (Newton et al., 1994).

The reaction times required in various professional sports are often of the order of a fraction of a second. To be successful, top-level sportsmen have to train for hours on end day in day out. That's what ultimately enables them to not only react in time, but more importantly react in a productive manner. Dr. C. Krishnamoorthi, M. Suresh, N. Kodeeswaran - Based on the findings and within the limitation of the study it is noticed that practice of shadow training helped to improve reaction time and agility of cricket players at college level. It was also seen that there is progressive improvement in the selected criterion variables of shadow training group of tennis players after eight weeks of shadow training programme. Further, it also helps to improve reaction and agility.

However, two popular sports that are compared Cricket and Badminton. While both sports involve hitting a ball, they vastly differ in terms of gameplay, equipment and rules. Badminton is a racket sports that is played between two teams of two or four players with shuttlecock and racket, which is hit back and forth over a net. Cricket, on the other hand is a bat and ball that played between two teams of eleven players. The objective is to score runs by hitting the ball and running between two set of wickets. Both sports involve different types of physical fitness parameters like, muscular strength, muscular endurance, cardiovascular endurance, body fat composition, balance, coordination flexibility, agility, power and reaction time etc. Cricket players' arm fat index and dominant and non-dominant hand grip strength were correlated. Charushila R. et al (2017).

Objectives:

- To compare the handgrip strength, shoulder strength, abdominal muscles strength, leg explosive strength between cricket and badminton state level players.
- To compare the reaction time between cricket and badminton state level players.

Methodology

Study Population - Cricket and Badminton state level players.

Sample size – The sample of the study were totally 40 players consisting of 20 cricket players and 20 badminton players.

Research Design – Comparative study.

Place of Data Collection- 1) Krishanath College 2) Kalyani Town Club 3) Hooghly District Sports Association, 4) Kalyani University

Inclusion Criteria

- Male Cricket and Badminton state level players.
- Age group: 17 to 25 years old.
- Playing for at least 2 years.

Exclusion Criteria

- Novice players (played for less than 2 years)
- Any recent upper limb injuries or lower limb injuries.
- Recent wrist fractures.
- Elite players.

Criterion Measures

- Hand Grip Dynamometer: To measure the handgrip strength.
- Push up: Shoulder strength.
- Sit up: Abdominal Muscular Strength.
- Standing broad jump: Leg explosive strength.
- Ruler Drop Test: To measure reaction time.

Statistical Procedure:

The row data were tabulated for the purpose of results analysis. The mean, standard deviation and t test was used for significance of mean difference in the selected body strength and reaction time of cricket players and badminton players compared by using the statistical formula. All the statistical calculation was carried out with the help of Microsoft Excel Software (2013).

Results

Table 1:

Showed that mean, sd and t-value on BMI of cricket and badminton state level players.

Variables	Group	Mean \pm SD	SEM	df	t-value
BMI	Cricket	22.07 \pm 3.49	0.78	38	1.25 ^{NS}
	Badminton	20.81 \pm 2.83	0.63		

NS- Non-Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -1 that the mean and SD value of BMI (body mass index) of state level cricket players was 22.07 \pm 3.49 and badminton player was 20.81 \pm 2.83 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was 1.25 which is not significant at 0.05 level.

Table 2:

Showed that mean, sd and t-value on left hand strength of cricket and badminton state level players.

Variables	Group	Mean \pm SD	SEM	df	t-value
Left Hand Strength	Cricket	38.75 \pm 6.69	1.51	38	0.64 ^{NS}
	Badminton	39.55 \pm 5.62	1.26		

NS- Non-Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -2 that the mean and SD value of left handgrip strength of state level cricket players was 38.75 \pm 6.69 and badminton players was 39.55 \pm 5.62 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was 0.64 which is not significant at 0.05 level.

Table 3:

Showed that mean, sd and t-value on right hand strength of cricket and badminton state level players.

Variables	Group	Mean \pm SD	SEM	df	t-value
Right Hand Strength	Cricket	36.65 \pm 6.69	1.50	38	-1.05 ^{NS}
	Badminton	38.45 \pm 4.39	0.98		

NS- Non-Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -3 that the mean and SD value of right handgrip strength of state level cricket players was 36.65 \pm 6.69 and badminton players was 38.45 \pm 4.39 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was 1.05 which is not significant at 0.05 level and df was 38.

Table 4:

Showed that mean, sd and t-value on shoulder strength of cricket and badminton state level players

Variables	Group	Mean \pm SD	SEM	df	t-value
Shoulder Strength	Cricket	29.8 \pm 10.15	2.27	38	0.64 ^{NS}
	Badminton	27.75 \pm 10.11	2.26		

NS- Non-Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -4 that the mean and SD value of shoulder strength of state level cricket players was 29.8 \pm 10.15 and badminton players was 27.75 \pm 10.114 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was 0.64 which is not significant at 0.05 level and df was 38.

Table 5:

Showed that mean, sd and t-value on abdominal muscular strength of cricket and badminton state level players.

Variables	Group	Mean ± SD	SEM	df	t-value
Abdominal Muscular Strength	Cricket	35.60±7.49	1.68	38	-0.21 ^{NS}
	Badminton	36.05±5.63	1.26		

NS- Non-Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -5 that the mean and SD value of abdominal muscular strength of state level Cricket players was 35.60±7.49 and badminton players was 36.05±5.63 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was -0.21467 which is not significant at 0.05 level and df was 38.

Table 6:

Showed that mean, sd and t-value on leg explosive strength of cricket and badminton state level players.

Variables	Group	Mean ± SD	SEM	df	t-value
Leg Explosive Strength	Cricket	2.06±0.05	0.05	38	-3.28 S
	Badminton	2.37±0.12	0.08		

S- Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -6 that the mean and SD value of leg explosive strength of state level cricket players was 2.06±0.05 and badminton players was 2.37±0.12 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was -3.28 which is significant at 0.05 level and df was 38.

Table 7:

Showed that mean, sd and t-value on reaction time of cricket and badminton state level players.

Variables	Group	Mean ± SD	SEM	df	t-value
Reaction Time	Cricket	5.37±0.8	0.20	38	2.37 S
	Badminton	4.69±0.81	0.20		

S- Significant at 0.05 level. Degree of Freedom -38; Table Value-2.02

It was observed from table -7 that the mean and SD value of reaction time of state level cricket players was 5.37±0.8 and badminton players was 4.69±0.81 respectively. Also calculated the mean difference between cricket and badminton players. The calculated t-value was 2.37 S which is significant at 0.05 level and df was 38.

Discussion on Findings

The findings of the present study was not significant of left handgrip strength, right handgrip strength, shoulder strength and abdominal muscles strength of cricket and badminton state level players. But leg explosive strength found significant difference at 0.05 level between cricket and badminton state level players. Previous studies have been reported that significant difference of handgrip strength between hockey players and badminton players the handgrip strength is hockey players greater than badminton players (Rai P. 2023). The researcher was not agree with previous study because, environmental factors or psychological effect of players.

In the present study, reaction time was found significant difference at 0.05 level between cricket and badminton state level players. Playing badminton is beneficial in improving eye–hand reaction time (Dube et al, 2014). Wicket keepers are having more reaction time in compression of bowlers and batsman (Sangwan et al, 2018). The researcher was partially agree with previous study.

Conclusions

In conclusion, the result of this present study:

- There was no significant difference between cricket and badminton state level players of variables i.e. left handgrip strength, right handgrip strength, shoulder strength and abdominal muscles strength.
- There was significant difference between cricket and badminton state level players of leg explosive strength.
- There was significant difference between cricket and badminton state level players of reaction time.

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