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A Comparative Study of Muscular Strength and Muscular Power among Cricket Players

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Abstract

Thus the aim of this study was to determine the role of muscular strength and muscular power among cricket players. To obtain data, the investigators had selected For the purpose of present study, One Hundred Seventy Seven (N=177), Male District, State and National Level Cricket Players between the age group of 21-25 years (Mean ± SD: age 22.89±1.76 years, height 176.04±4.18 cm, body mass 73.76±4.63 kg) were selected. The subjects were purposively assigned into three groups: Group-A: District Level Cricket Players (n_1=80); Group-B: State Level Cricket Players (n_2=65); Group-C: National Level Cricket Players (n_3=32). The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. In all the analyses, the 5% critical level ($p<0.05$) was considered to indicate statistical significance. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA). For further analysis Post-Hoc Test (Scheffe's Test) was applied. It is concluded from the above findings that significant differences were found among district, state and national level cricket players on the sub-variables; muscular strength, muscular power.

Keywords: Muscular strength and muscular power.

Introduction

Physical fitness is the ability to perform daily activities willingly and actively. Physical fitness includes not only components of sports but those of health as well. Regular physical activity prevents or limits weight gain, and gain in body mass index (BMI). The National College Health Risk Behavior Survey reported that 35% of American college students are overweight[1]. This is not surprising considering that more than two thirds of American adult population are classified as overweight[2], making weight gains America's leading health problem. Motor performance can be defined as a capacity to performance motor skills and qualities make up majority of motor performance test pattern include speed, power agility reaction time hand eye coordination balance and other physical fitness parameter such as endurance strength. Every sport requires a specific fitness or Physiological status, the game of badminton requires different physiological status than a long distance runner or a basketball player. Some games need different fitness for different places like in football and hockey, Physiological requirement of player playing at different positions are different. And in some games like cricket every skill requires a different physiological status; the batsmen may have different physiological status than a pace bowler or wicketkeeper. This promoted us to undertake this study with the aim to determine the muscular strength and muscular power among cricket players.

Methodology

Selection of Subjects: For the purpose of present study, One Hundred Seventy Seven (N=177), Male District, State and National Level Cricket Players between the age group of 21-25 years (Mean ± SD: age 22.89±1.76 years, height 176.04±4.18 cm, body mass 73.76±4.63 kg) were selected. The subjects were purposively assigned into three groups: Group-A: District Level Cricket Players (n_1=80). Group-B: State Level Cricket Players (n_2=65). Group-C: National Level Cricket Players (n_3=32)

Subject's Demographics of District Level Cricket Players (n_1=80), State Level Cricket Players (n_2=65) and National Level Cricket Players (n_3=32) are displayed in table-1.

Selection of Variables: With the above criteria's in mind, the following variables was selected for the present study: **Muscular Strength and Muscular Power**

Statistical Technique Employed: The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. In all the analyses, the 5% critical level ($p<0.05$) was considered to indicate statistical significance. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA). For further analysis Post-Hoc Test (Scheffe's Test) was applied.

Table-1
Subject's Demographics of District Level Cricket Players (n_1=80), State Level Cricket Players (n_2=65) and National Level Cricket Players (n_3=32)

Variables	Sample Size (N=177)			
	Total (N=177)	District Level Cricket Players (n_1=80)	State Level Cricket Players (n_2=65)	National Level Cricket Players (n_3=32)
Age	22.89±1.76	22.88±1.183	22.72±1.18	23.25±1.060
Body Height	176.04±4.183	175.33±3.94	176.16±4.08	177.87±4.23
Body Mass	73.76±4.63	73.92±4.60	73.6±4.77	73.68±4.38

Table-2
Analysis of Variance (ANOVA) results with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Strength

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-value	P-value (Sig.)
Between Groups	2687.856	2	1343.928	59.416	.000
Within Groups	3935.715	174	22.619		
Total	6623.571	176			

*Significant at 0.05 $F_{0.05}$ (2,174)

Results and Discussion

Results: It can be seen from table-2 that significant differences were found with regard to the sub-parameter Muscular Strength among District, State and National level Cricket Players as the P-value (Sig.) .000 was found smaller than 0.05 level of significance (P<0.05). Since the obtained F-ratio 59.416 was found significant, therefore, Scheffe's post-hoc test was employed to study the direction and significance of differences between paired means among District, State and National level Cricket players on the sub-parameter Muscular Strength. The results of Scheffe's post hoc test have been presented in table-3.

From table 3, the following conclusions can be drawn: It has been observed from the table-3 that mean difference between District and State level Cricket Players was found 6.59231*. The State level Cricket Players (51.2923) had exhibited significantly better on Muscular Strength than their counterpart District level Cricket Players (44.7000). The mean difference between District and National level Cricket Players was found 9.51875*. The National level Cricket Players (54.2188) had exhibited significantly better on Muscular Strength than their counterpart District level Cricket Players (44.7000). The mean difference between State and National level Cricket Players was found 2.92644. The National Level Cricket Players (54.2188) had exhibited significantly better on Muscular Strength than their counterpart State level Cricket Players (51.2923). The graphical representation of responses has been exhibited in (figure-1).

Discussions: The results of table 2 shows significant differences were found with regard to the sub-parameter Muscular Strength among District, State and National level Cricket Players. Since the obtained F-value was found significant, therefore, Scheffe's post-hoc test was employed to study the direction and significance of differences between paired means among District, State and National level Cricket on the sub-parameter Muscular Strength. In table 3 paired mean value of national level cricket players was found better than other two groups thereby, showing that national level cricket players were exhibited significantly than the district and state level cricket players. The findings of the present study were supported by Singh et.al[3] showed that all the physical fitness components i.e., Muscular strength and Endurance, Flexibility and speed Patiala football Players were found to be better than Amritsar football Players. Finally the researcher concluded that the Patiala football Players were more fit as compare to Amritsar football players. Ghuman and Singh[4] to find out the significant differences of gross motor proficiency on the sub-variables; muscular strength between district and state level volleyball players. When they compared the mean values of both the groups, it has been found that state level players have performed significantly better on muscular strength.

It is evident from table 4 that significant differences were found with regard to the sub-parameter Muscular Power among District, State and National level Cricket Players as the P-value (Sig.) .000 was found smaller than 0.05 level of significance (P<0.05). Since the obtained F-ratio 197.166 was found

significant, therefore, Scheffe's post-hoc test was employed to study the direction and significance of differences between paired means among District, State and National level Cricket players on the sub-parameter Muscular Power. The results of Scheffe's post hoc test have been presented in table-5.

Table-3
Analysis of Scheffe's post hoc test with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Strength

Means		Mean Difference	P-value (Sig.)
District Level Cricket Players (44.7000)	State Level Cricket Players (51.2923)	-6.59231*	.000
	National Level Cricket Players (54.2188)	-9.51875*	.000
State Level Cricket Players (51.2923)	District Level Cricket Players (44.7000)	6.59231*	.000
	National Level Cricket Players (54.2188)	-2.92644*	.019
National Level Cricket Players (54.2188)	District Level Cricket Players (44.7000)	9.51875*	.000
	State Level Cricket Players (51.2923)	2.92644*	.019

*Significant at 0.05

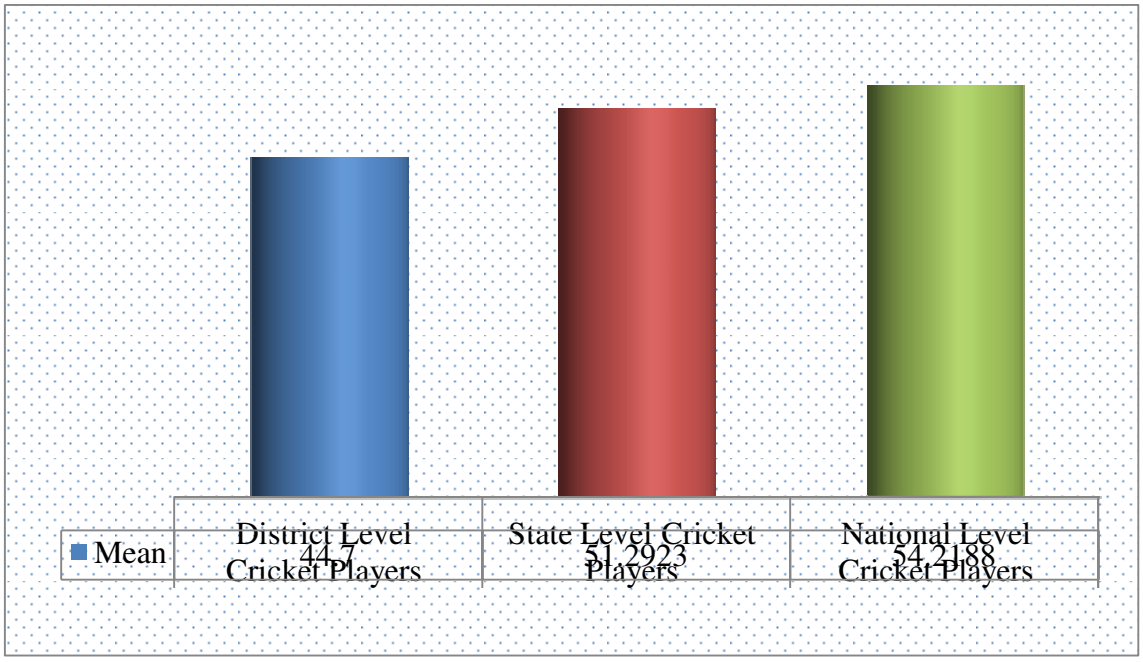

Figure-19
Graphical representation of mean scores with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Strength

Table-4
Analysis of Variance (ANOVA) results with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Power

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-value	P-value (Sig.)
Between Groups	.802	2	.401	197.166	.000
Within Groups	.354	174	.002		
Total	1.156	176			

*Significant at 0.05 $F_{0.05}$ (2,174)

From table 5, the following conclusions can be drawn: It has been observed from the table-5 that mean difference between District and State level Cricket Players was found .08867*. The State level Cricket Players (2.3149) had exhibited significantly better on Muscular Power than their counterpart District level Cricket Players (2.4069).

The mean difference between District and National level Cricket Players was found .18063*. The National level Cricket Players (2.4069) had exhibited significantly better on Muscular Power than their counterpart District level Cricket Players (2.2263).

The mean difference between State and National level Cricket Players was found .09195. The National Level Cricket Players (2.4069) had exhibited significantly better on Muscular Power than their counterpart State level Cricket Players (2.3149). The graphical representation of responses has been exhibited in (figure-2).

Table-5
Analysis of Scheffe's post hoc test with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Power

Means		Mean Difference	P-value (Sig.)
District Level Cricket Players (2.2263)	**State Level Cricket Players (2.3149)**	-.08867*	.000
	National Level Cricket Players (2.4069)	-.18063*	.000
State Level Cricket Players (2.3149)	**District Level Cricket Players (2.2263)**	.08867*	.000
	National Level Cricket Players (2.4069)	-.09195*	.000
National Level Cricket Players (2.4069)	**District Level Cricket Players (2.2263)**	.18063*	.000
	State Level Cricket Players (2.3149)	.09195*	.000

*Significant at 0.05

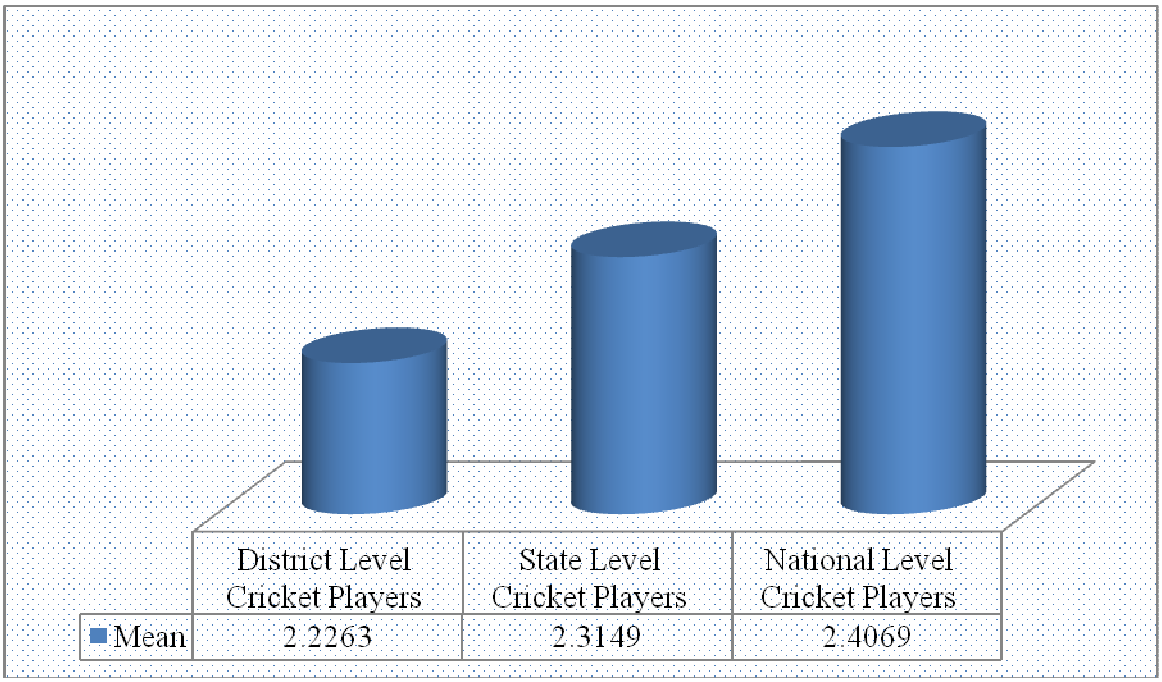

Figure-2
Graphical representation of mean scores with regard to Psychomotor Abilities among District, State and National level Cricket Players on the sub-parameter Muscular Power

Discussions: The results of table-4 that significant differences were found with regard to the sub-parameter Muscular Power among District, State and National level Cricket Players as the P-value (Sig.) .000 was found smaller than 0.05 level of significance (P<0.05). Since the obtained F-ratio 197.166 was found significant, therefore, Scheffe's post-hoc test was employed to study the direction and significance of differences between paired means among District, State and National level Cricket on the sub-parameter Muscular Power. In table 5 paired mean value of national level cricket players was found better than other two groups thereby, showing that national level cricket players were exhibited significantly than the district and state level cricket players. The findings of the present study were supported by Bhadoria et al[5] in their study they found that muscular power showed significant difference between volleyball and handball players. In arm and shoulder girdle strength significant difference was found between volleyball and handball players. In another study conducted by Singh et al[3] to find out the significant differences of motor fitness components of elite male weight lifters and power lifters. In their study they concluded that the group difference between weight lifters and power lifters with regards to power found to be statistically significant. Galal et al.[6] demonstrate that Greek players were performed better in 30 m sprint (p<0.01) and standing long jump (p<0.01). German players outperform in hand spread (p=0.03).

Conclusions

Based on the findings of this study, the following conclusions were drawn: It is concluded from the above findings that significant differences were found among district, state and national level cricket players on the sub-variables; muscular strength, muscular power.

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