Recent Advances in Humanities, Commerce, Management, Engineering, Science & Technology

ISBN: 978-93-94819-13-9
Pub. Date: 30 Sept. 2022
Volume: I

EFFECT OF PLYOMETRIC AND CORE TRAINING ON SKILL RELATED PERFORMANCE VARIABLES AMONG MALE MEDIUM FAST BOWLERS IN CRICKET

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Abstract

Cricket is a team game played by all over the world. It has three skills i.e., batting, bowling and fielding. Pace bowling is very much vital in this game. The purpose of the present study was to find out the effect of plyometric and core training on skill related performance variables among male medium fast bowlers in cricket. 30 male medium fast bowlers aged 18-27 from Guru Ghasidas Vishwavidyalaya and Atal Bihari Vajpayee Vishwavidyalaya was selected. The significant improvement observes in bowling velocities as well as in the throwing distance. It is concluded that Twelve-week plyometric training increases the physiological and skill related performance variables hence improves their performance.

Key words: *plyometric training, Core training, skill related performance etc.*

Introduction

In present day serious games have above and past the athletic exercises of the past, as far as their business esteem, physical capacity of the competitor and the degree of significance that is put on progress. Likewise, Cricket is one of the most demanding and popular team sports in all over the world. It is a bat and ball sport, usually played outdoors natural grass fields. In cricket bowlers try to resist the batter to score, where batter try to scores maximum in the timespan of play. So, both the Skill are similarly important in this game. Basically, bowling is two type – one is pace and another is spin. In Pace bowling various variations are found like as Fast bowling, medium fast bowling, Slow pace bowling etc. In Explosive bowling action; whereby a large amount of force must be generated in a very short period of time. medium Fast bowlers have always been identified as the type of cricket with the highest risk of injury.

Recent time in most of the cricket team specific trainers are recruited for specific purpose and also the specific coach's responsibility reduces the injury of the players. So various training program also implementing like as plyometric, Core exercise. The word Plyometric has been in use since the 1950's in Soviet Olympians. Plyometric is a kind of systematic training for developing speed, power which means explosive power with the help of designated jumping exercises. Moreover, it is helpful to boost the producing muscular force maximum.Core training is- The Exercise program that aims to strengthen muscle groups in lumbopelvic area and the deep muscles that are responsible for stabilizing spine, and done by athlete's own body weight. Core strength trainings and their effects have been analysed by many researchers and results show that they help to development of athlete's motor skills, increasing of balance ability and prevention from sports injuries. The aim of the study is to analyse the effects of plyometric and core training on selected skill related parameters in male medium fast bowlers in cricket.

Material And Method

Subjects

The experimental study design to 30 university level male medium fast bowler aged 17 to 27 years, were purposively selected from Guru Ghasidas Vishwavidyalaya and Atal Bihari Vajpayee Vishwavidyalaya for the twelve weeks plyometric program.

Methodology

The purpose of the study was to find out the effect of plyometric training and core training program on selected skill related performance variables among male medium fast bowlers in cricket. To achieve the purpose of the study 30 male medium fast

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bowlers in the age group 18 to 27 years were selected at random from Guru Ghasidas Vishwavidyalaya and Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur (C.G.). Selected subjects were divided into three groups of experimental I (plyometric training), experimental II (Core training) and control group (only daily routine) for the twelve weeks training period and three alternate days per week. The data pertaining to the variables in this study were examined by using paired sample 't' test to find out the significant differences and analysis of covariance (ANCOVA) for each variable separately in order to determine the differences and tested at 0.05 level of significance and Bonferroni post hoc test also administrated wherever 'f' ratio was tested.

Criterion Measures

	Variables	**Tests**	**Units**	**Tools**
Skill Variables	Bowling Speed	Speed sports radar	Km/h	Speed gun
	Throwing distance	Manual	Meters	Manual

Table-2, Significance of mean gains & losses between pre and post test scores on selected variables of plyometric training group

Paired Samples Test							
	Mean	Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	T	df	Sig. (2-tailed)
Bowling Speed Pre-test & Post-test	107.200 108.700	-1.500	.527	.1667	-9.000	9	.000
Throwing Pre-test & Post-test	64.200 67.600	-3.400	2.503	.791	-4.295	9	.002

The result of the paired "t" test of table- 2 indicates that the obtained 't' ratios were 9.000 and 4.295 beside Sig. (2-tailed) were .000, .002 for Bowling Speed and Throwing distance respectively. The significance level was set at 0.05 level. The results of this study showed that all the variables were statistically significant and explained its effects positively.

Table-3, Significance of mean gains & losses between pre and post test scores on selected variables of core stability training group

Paired Samples Test							
	Mean	Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Bowling Speed Pre-test & Post-test	109.300 111.500	-2.200	.789	.249	-8.820	9	.000
Throwing Pre-test & Post-test	69.700 71.350	-1.650	1.055	.334	-4.944	9	.001

The result of the paired "t" test of table-3 indicates that the obtained 't' ratios were 8.820 and 4.944 beside Sig. (2-tailed) were.000, .001 for Bowling Speed and Throwing distance respectively. The significance level was set at 0.05 level. The results of this study showed that all the variables were statistically significant and explained its effects positively.

Table-4, Significance of mean gains & losses between pre and post test scores on selected variables of control group

Paired Samples Test							
	Mean	Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Bowling Speed Pre-test & Post-test	107.300 107.500	-.200	.78881	.24944	-.802	9	.443
Throwing Pre-test & Post-test	67.600 68.100	-.500	1.43372	.45338	-1.103	9	.299

The result of the paired "t" test of table-4 indicates that the obtained 't' ratios were.802, 1.103 beside Sig. (2-tailed) were.443 and .299 for Bowling Speed and Throwing distance respectively. The significance level was set at 0.05 level. The

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results of this study showed that all the variables were statistically insignificant and explained no positive effects.

Computation of analysis of covariance on performance related fitness components

The following tables illustrate the statistical results of the plyometric training and core training on selected Performance related fitness components among male medium fast bowlers in cricket.

Table-5

Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Bowling Speed Post-test			
F	df1	df2	Sig.
2.305	2	27	.119
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Bowling Speed Pre-test + Group			

The results of the levene`s test in table number 5, show that the value of the F test is 2.305 and is insignificant at 0.05 (Sig.- .119) which means that the null hypothesis stating the same variance is accepted or indicating that the group variances are equal. It means that the assumption of homogeneity of the variance is not violated.

Table-5.1

Univariate Tests						
Dependent Variable: Bowling Speed Post-test						
	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	24.857	2	12.428	38.258	.000	.746
Error	8.446	26	.325			
The F tests the effect of Group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.						
a. Computed using alpha = .05						

A one-way ANCOVA was conducted to compare the impact of Plyometric and Core Stability training in shaping Post-test Bowling Speed scores while controlling Pre-test Bowling Speed scores. Levene`s test and Normality checks were carried out and the assumptions met.

In Table 5.1 shows that F (dfbetween, dfwithin) = Test statistic, p= F (2, 26) =38.258, p=.000. It means there was a significant difference in Bowling Speed post-test between Groups, while adjusting for Bowling Speed pre-test. The partial Eta Squared value indicates the effect size and should be compared with cohen`s guidelines (0.2- small effect, 0.5- moderate effect, 0.8- large effect). It`s seen that for Group the effect size is moderate (0.746). It also explained that 75% of the variance in the dependent variable is explained by the independent variable. So, all the three group has significant effect on Bowling Speed post-test.

Table-5.2

Pairwise Comparisons				
Dependent Variable: Bowling Speed Post-test				
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]
Plyometric	Core Stability	-1.032*	.268	.002
	Control Group	1.284*	.255	.000
Core Stability	Plyometric	1.032*	.268	.002
	Control Group	2.316*	.267	.000
Control Group	Plyometric	-1.284*	.255	.000
	Core Stability	-2.316*	.267	.000
Based on estimated marginal means				
*. The mean difference is significant at the .05 level.				
b. Adjustment for multiple comparisons: Bonferroni.				

The table 5.2 discovered Bonferroni post hoc test method of analysing were used to find shows that the Bonferroni post-hoc method of testing the significance for finding mean difference among plyometric training, core training and control group, following

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significant analysis of co-variance. For the Bowling Speed mean values in order of magnitude, the mean difference between plyometric training and core training group is -1.032*, and significance difference was found (sig[b].002). In the mean variation between plyometric training and control group 1.284*significance difference was found (sig[b].000) then the mean difference between core training and control group is 2.316*and here is also found significance difference (sig[b].000), at 0.05 confidence level. This indicating that in Bowling Speed the experimental groups have significant improvement when compared to control group. Hence there is a positive variation between core training and control group and plyometric training and control group. There is also positive variation between plyometric training and Core Stability on Bowling Speed variable.

Figure-1

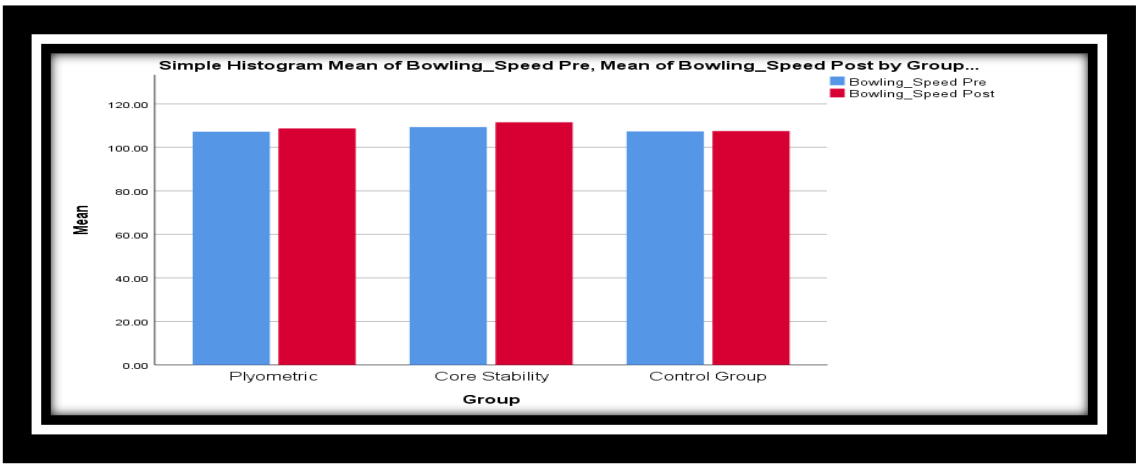

Table-6

The results of the levene`s test in table number 6.1, show that the value of the F test is 1.341 and is insignificant at 0.05 (Sig.-.278) which means that the null hypothesis stating the same variance is accepted or indicating that the group variances are equal. It means that the assumption of homogeneity of the variance is not violated.

Table-6.1

Univariate Tests						
Dependent Variable: Throwing Post-test						
	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	21.892	2	10.946	15.387	.000	.542
Error	18.496	26	.711			

Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Throwing Post-test			
F	df1	df2	Sig.
1.341	2	27	.278
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Throwing Pre-test + Group			

A one-way ANCOVA was conducted to compare the impact of Plyometric and Core Stability training in shaping Post-test Throwing scores while controlling Pre-test Throwing scores. Levene`s test and Normality checks were carried out and the assumptions met. In Table 1.3 shows that F (dfbetween, dfwithin) = Test statistic, p= F (2, 26) =15.387, p=.000, It means there was a significant difference in Throwing post-test between Groups, while adjusting for Throwing pre-test. The partial Eta Squared value indicates the effect size and should be compared with cohen`s guidelines (0.2- small effect, 0.5- moderate effect, 0.8- large effect). It`s seen that for Group the effect size is moderate (0.542). It also explained that 54% of the variance in the dependent variable is

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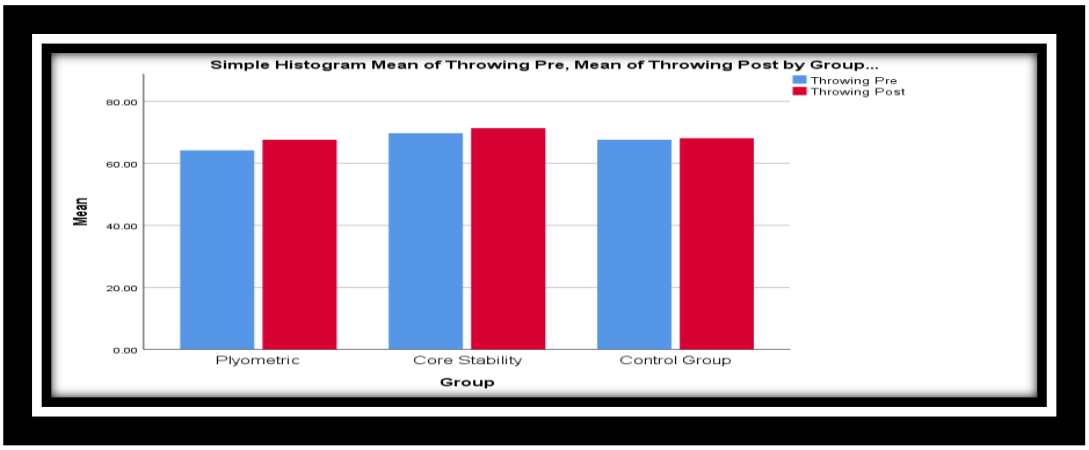
explained by the independent variable. So, all the three group has significant effect on Throwing post-test.

Table-6.2

Pairwise Comparisons				
Dependent Variable: Throwing Post-test				
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]
Plyometric	Core Stability	-.031	.420	1.000
	Control Group	1.799*	.394	.000
Core Stability	Plyometric	.031	.420	1.000
	Control Group	1.830*	.384	.000
Control Group	Plyometric	-1.799*	.394	.000
	Core Stability	-1.830*	.384	.000
Based on estimated marginal means				
*. The mean difference is significant at the .05 level.				
b. Adjustment for multiple comparisons: Bonferroni.				

The table 6.2 discovered Bonferroni post hoc test method of analysing were used to find shows that the Bonferroni post-hoc method of testing the significance for finding mean difference among plyometric training, core training and control group, following significant analysis of co-variance. For the Throwing distance mean values in order of magnitude, the mean difference between plyometric training and core training group is -.031, and no significance difference was found (sig[b]1.000). But in the mean variation between plyometric training and control group 1.799* significance difference was found (sig[b].000) then the mean difference between core training and control group is 1.830* and here is also found significance difference (sig[b].000), at 0.05 confidence level. This indicating that in Throwing distance the experimental groups have significant improvement when compared to control group. Hence there is a positive variation between core training and control group and plyometric training and control group. There is no positive variation between plyometric training and Core Stability on Throwing distance variable.

Figure-2



Conclusion

The results of this study showed that after a 12-week of plyometric and core training, subjects have shown a significant improvement in medium pace bowling velocities as well as throwing distance for both the experimental group (i.e., Experimental-I: -Plyometric, Experimental-II: - Core Training Program) but no improvement was found for control group.

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