



## Effect of Ballistic Training on Strength of Cricket Players

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**ABSTRACT**

Ballistic training, also called power training, was first used among elite athletes who were looking for a method to develop explosiveness. The word ballistic comes from the Greek word *ballein* which means "to throw." In this type of training the athlete accelerates and releases the weight into "free space." The prevalent objectives of the study were to find out the effect of ballistic training programme on strength of cricket players. 40 cricket players from Delhi/ NCR were selected as the subjects for this study whose age were ranging between 15-20 yrs. Random group design was adopted for distributing the subjects into two equal groups. The control and the experimental assignment were done randomly to both the group. A systematic ballistic training programme for 6 weeks (3Days per week) was given to the experimental group. The control group received no treatment. Pre-test and post-test data were collected on upper extremities strength for both the groups. The data were further analyzed by using one way ANOVA to find out the training effects if any on the participant. The result of the study showed that there was significant improvement on upper extremities strength of the experimental group. Hossam El Sayed El Araby 2010 investigate the effectiveness of using ballistic training to enhance the muscular ability of the arms and legs on the strength and accuracy of high-jump shooting and after obtained the data from pre and post training, result revealed that the planned ballistic training program has a significantly impact on the muscular ability of the arms and leg. P. SIVARAMAN 2012 study revealed that resistance training significant improves in upper extremity strength (shoulders strength). It was concluded that the ballistic exercise training programme was useful in improving the upper extremities strength of cricket players.

**KEYWORDS**

Ballistic training, upper extremities strength, push-up, Rotator External Rotation

**Introduction:**

Cricket resides in an important place among all other sports and games. It is an ultimate sport and is a grand energetic game, giving enjoyment challenging fitness and dedication. Performance in cricket is determined by numerous factors such as skill, technique, tactics, fitness and training. Modern day cricket demands higher level of fitness and the modern sporting managers are on the lookout for training modalities to keep the players fit to perform and to avoid injuries. Beardsley, Chris (23 July 2013) Ballistic training is a form of strength training in which an athlete lifts, accelerates, and then releases the weight, rather than slowly lowering it as in other forms of weight training. The primary advantage to ballistic training is that it allows for maximum acceleration to be applied to the weight, resulting in activation of faster twitch muscle fibers. Fast twitch, also known as type II, fibers are most heavily recruited during explosive movements. Training of these fibers results in better performance on sports that require quick explosive movements such as boxing, sprinting, and football. When we talk about physical performance, we mean sports performance and performance of our body to sustain our daily routine life. So it has been seen many training process have evolve through research for the improvement of specific components of fitness. Ballistic training is one of such training and conditioning process which aims for quick and explosive movement of our muscles. Ballistic training is a very popular form of physical conditioning of healthy individuals that has been extensively studied over the last many years. Ballistic training involves exercises which are designed to produce fast and powerful movements.

**Methodology:** To achieve the purpose of the study 40 cricket players were selected from Delhi/NCR cricket academies. Ages of the selected subjects were ranged between 15-20 years. They were divided in to two equal groups of 20 – 20 each.

**Selection of Variables:** The following variables will be selected for the purpose of the study.

**Upper extremity strength**

- 1.1 Back strength
- 1.2 Shoulder strength

**Treatment programme:** The experimental group was exposed to 6 weeks (3Days per week) of ballistics exercise programme whereas control group was not exposed to any experimental treatment. The ballistics exercise programme incorporated in the training programme was given below :

**Table -1**

S.No.	Exercise Names
1	Rotator External Rotation
2	Kneeling Throw
3	Over Head Medicine Ball Throw
4	Reverse Medicine Ball Throw
5	Sit-up Throw

**Table-2**

CRITERIEN MEASURES		
S.NO.	TOOLS	MEASURES
1	Push-ups	Count for 1 Min. (Shoulder strength)
2	Back dynamometer	Grasp of the bar (Back strength)

**RESULTS AND DISCUSSIONS**

**Results**

To find out the effects of the ballistic exercise training on the participant the means abdomen strength of the pre-test and the post-test data were analyzed as follows.

**Table 3**  
**ANALYSIS OF VARIANCE OF THE MEANS OF EXPERIMENTAL GROUPS AND CONTROL GROUP IN PUSH UP**

	N	Control Group	Experimental Group (A) core stability	SoV	SoS	df	MSS	F-ratio
Pre test	20	36.65	36.90	A	0.625	1	0.625	0.011
				W	2202.35	38	57.95	
				Total	2202.97	39		
Post test	20	37.05	40.50	A	119.02	1	119.023	3.732
				W	1211.95	38	31.893	
				Total	1330.97	39		

**\*Significant at 0.05 level of significance 2.46**

Table 3 depicts that the pre -test means of the control group and Experimental group (ballistics group) are nearly equal that is 36.65, 36.90 respectively. The post-test means of the control group and experimental group is depicted as 37.05 and 40.50 respectively. This also reflects that there are little changes in control group during the post- test with respect to pre- test mean of 36.65. Whereas in the Experimental group the post- test means were depicted as 40.5 respectively. Finally Table 3 depicts that the F ratio of the pre -test mean is 0.011 which is statistically insignificant as this value is less than the tabulated F value of at 2.46 (1, 38) df at 0.05 level of significance. The calculated f ratio in the table for the post- test is depicted as 3.73 this value is statistically significant as this is greater than the tabulated F value of 2.46 at (1, 38) df at 0.05 level of significance.

**Comparison between pre-test and post-test means of control and experimental group of push-ups**

**Table -4**

		N	Mean	Std. Deviation
Push-up pre-test	1.control group	20	36.65	7.23
	2.experimental group	20	36.90	7.97
Push-up post-test	1.control group	20	37.05	5.96
	2.experimental group	20	40.50	5.31

**ANALYSIS OF VARIANCE OF THE MEANS OF EXPERIMENTAL GROUPS AND CONTROL GROUP IN DYNAMOMETER**

**Table-5**

	N	Control Group	Experimental Group (A) core stability	SoV	SoS	df	MSS	F-ratio
Pre test	20	79.75	78.00	A	30.625	1	30.625	0.079
				W	14671.750	38	386.099	
				Total	14702.375	39		
Post test	20	80.50	91.40	A	1188.100	1	1188.100	3.068*
				W	14715.800	38	387.258	
				Total	15903.900	39		

**\*Significant at 0.05 level of significance 2.46**

Table 5 depicts that the pre -test means of the control group and Experimental group (ballistics group) are nearly equal that is 79.75, 78 respectively. The post-test means of the control group and experimental group is depicted as 80.50 and 91.40 respectively. Finally Table 5 depicts that the F ratio of the pre -test mean is 0.079 which is statistically insignificant as this value is less than the tabulated F value of at 2.46 (1, 38) df at 0.05 level of significance. The calculated f ratio in the table for the post- test is depicted as 3.068 this value is statistically significant as this is greater than the tabulated F value of 2.46 at (1, 38) df at 0.05 level of significance. This show that ballistic six training programme effected on the back muscles of cricket players.

**Comparison between pre-test and post-test means of control and experimental group of push-ups**

**Table-6**

		N	Mean	Std. Deviation
dynamometer-pre-test	1.control group	20	79.75	22.79629
	2.experimental group	20	78.00	15.89108
dynamometer-post-test	1.control group	20	80.50	23.58300
	2.experimental group	20	91.40	14.77694

**Discussion:** The results obtained from the statistical score show that the explosive strength and maximum strength of all the experimental groups for the respective variables have shown significant improvement after the ballistic exercise training program. In case of the control group the explosive strength and maximum strength was not significantly improved. This is due to simple fact that the control group was not involved in the training program. External conditions, normal training program and other activity of

both the groups were similar which is because of the fact that both the groups were taken Delhi district level cricket club players. This shows that the ballistic six training program is the only factor which is different in both the groups. So we can conclude that whatever effect is shown in the experimental group is purely due the ballistic six training program. Similar result was found by Yakup Akif Afyon 2014 in his study. He investigated on effect of core stability and plyometrics training on soccer performance and outcome revealed that plyometrics exercise enhance back strength of the players. Mohamed Abd El-Mawgoud Elsayed 2012 study result was also supported that plyometric training exercises significantly improves strength of back muscles. In case of shoulder strength similar result was found by Maya Galal Abd Al-Wahab et al. 2016 in his study showed significant improvement in active shoulder flexion and external rotation. Schulte-Edelmann et al. 2005 investigated the effects of plyometric training of the posterior shoulder and elbow. The plyometric training group (n = 13) showed significant improvement in the power generated in the elbow extensor muscles. It was concluded that plyometric training of the upper extremity enhances power production of the elbow extensor muscles. Due to this systematic approach of the ballistic exercise training program it can be concluded that the experimental group might have shown significant improvement in upper extremities strength.

#### **Conclusion:**

Based on the findings obtained from the present study, the following conclusions are drawn:

Six weeks ballistic exercise training program improves significantly shoulder strength.

Six weeks ballistic exercise training program improves significantly back strength.

The selected ballistic exercise training programme can be used as a training module for the cricket players.

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