

# EFFECTS CORE STABILITY TRAINING PROTOCOL ON PHYSICAL FITNESS PARAMETERS OF ADOLESCENT BOYS

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## ABSTRACT

The study was designed to investigate the "Physical fitness parameters response to core stability training on adolescent boys. The experimental group was given core stability training for the period of 8 weeks. The criterion variables were chosen namely balance, explosive power and coordination. All the dependent variables were assessed before and after the training period. The collected data on physical fitness parameters due to effect of core stability training was analyzed by computing mean and standard deviation. In order to find out the significant improvement, 't' test was applied significant level 0.05 of confidence. The study revealed that the physical fitness parameters were significantly improved due to the influence of core stability training.

*Key words: core stability training, balance, explosive power, coordination.*

## Introduction

Core stability training is a form of training meant to increase core musculature strength, endurance and neuromuscular control. Through core stability training, intersegment control of the spine, control of intra-abdominal pressure and global muscular control of trunk movement can be improved. These aspects of core stability can influence the ability for the body to balance in various

dynamic movements and allow for proper force production and segmental control to help prevent injuries. (Alex McCaskey., 2011).

Core stability relates to the bodily region bounded by the abdominal wall, the pelvis, the lower back and the diaphragm, spinal extensor muscle and its ability to stabilize the body during movement. The main muscles involved include the transverses abdominis, the internal and external obliques, the quadratus lumborum and the diaphragm, erector spine and multifidus lumbar. The diaphragm is the main muscle of breathing in the human body and so breathing is important in providing the necessary core stability for moving and lifting. It is the action of these muscles contracting together upon the incompressible contents of the abdominal cavity that provides support to the spine and pelvis during movement. Typically, the core is associated with the body's center of gravity, which is over the region of the second sacrum vertebrae groups and stability that is associated with isometric or static strength. In addition, it is the lumbar spine that is primarily responsible for posture and stability thus providing the strength needed for the stability especially utilized in dynamic sports. Whereas different modes of core stability such as balance have proven to be safe and effective for children and adolescents, core stability increasingly more

popular in schools, sports ground, fitness center facility and modern sports facilities. (Wilson JD.,2001)

**Materials and Methods**

The 30 adolescent boys were randomly selected from the MSST Higher Secondary School, Vadavalli, Coimbatore as subjects and their age ranged from 12 to 14 years. They were divided into two groups. The group - I was considered as an experimental group and group - II was considered as the control group. The control group was not given any exercise and the experimental group was given

core stability for 8 weeks five days per a week. The evaluated parameters were balance (stroke stand test), explosive power (three hop jump), coordination (alternate hand wall toss test). The physical fitness parameters were measured before and after the core stability programme. The collected data on physical fitness parameters due to effect core stability was analyzed by computing mean and standard deviation. In order to find out the significant improvement if any 't' test was applied.

**Table – 4.1**

**Computation of 't' ratio on Balance of Experimental group and Control group**

Variables	Group	Test	Mean	Standard deviation	%	Mean difference	"t' ratio
Balance	Experimental group	Pre	14.83	5.87	35.12%	8.03	12.04
		Post	22.86	7.41			
	Control group	Pre	10.92	3.07	0.18%	0.022	0.62
		Post	10.90	2.96			

*\* Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

The mean value of experimental group on balance among boys in pre and post test values are 14.83 and 22.86, the corresponding standard deviation are 5.87 and 7.41 respectively. The t-value as per the t-test is 12.04 and these values are greater than the required table value of 2.145 for significance at 0.05 levels for 14 degrees of freedom. The

mean value of control group pre and post training are 10.92 and 10.90 the corresponding standard deviation are 3.07 and 2.96 respectively. The t- value as per the t- test is 0.62. Since it is lesser than the critical 't' value 2.145, it is not significant at 0.05 level of confidence.

**Table – 4.2**

**Computation of 't' ratio on Explosive Power of Experimental group and Control group**

Variables	Group	Test	Mean	Standard deviation	%	Mean difference	"t' ratio
Explosive Power	Experimental group	Pre	4.66	0.87	20.88%	1.23	11.47
		Post	5.89	0.72			
	Control group	Pre	4.23	0.49	0.704%	0.04	1.89
		Post	4.26	0.50			

*\* Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

The mean value of experimental group on explosive power among boys in pre and post test values are 4.66 and 5.89, the corresponding standard deviation are 0.87 and 0.72 respectively. The t-value as per the t-test is 11.47 and these values are greater than the required table value of 2.145 for significance at 0.05 levels for 14 degrees of

freedom. The mean value of control group pre and post test values are 4.23 and 4.26 the corresponding standard deviation are 0.49 and 0.50 respectively. The t- value as per the t- test is 1.89. Since it is lesser than the critical 't' value 2.145, it is not significant at 0.05 level of confidence.

**Table – 4.3**

**Computation of 't' ratio on Coordination of Experimental group and Control group**

Variables	Group	Test	Mean	Standard deviation	%	Mean difference	"t' ratio
Coordination	Experimental group	Pre	17.33	1.67	30.28%	7.53	10.82
		Post	24.86	2.64			
	Control group	Pre	18.40	1.50	1.761%	0.333	1.78
		Post	18.73	1.57			

*\* Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

The mean value of experimental group on coordination among boys in pre and post test values are 17.33 and 24.86, the corresponding standard deviation are

1.67 and 2.64 respectively. The t-value as per the t-test is 10.82 and these values are greater than the required table value of 2.145 for significance at 0.05 levels for 14 degrees

of freedom. The mean value of control group pre and post test values are 18.40 and 18.73 the corresponding standard deviation are 1.50 and 1.57 respectively. The t- value as per the t- test is 1.78. Since it is lesser than the critical 't' value 2.145, it is not significant at 0.05 level of confidence.

### Result and Discussion

The results clearly indicated that the balance, explosive power and coordination of experimental group improved due to the influence of 8 weeks core stability training programme. Core stability training is one of the most important fitness levels for adolescence boys is to improve the performance. This study aimed to provide scientific training techniques for improving physical fitness performance of adolescence boys. The subjects who underwent core stability training were able to improve their physical fitness. Therefore, it is found a positive relationship between core stability training and improvements of physical fitness parameters of balance, explosive power and coordination. This improvement in physical fitness is beneficial for athletes who require speed while performing their sport and support the results from compare other studies. In the present study core stability has improved the balance, explosive power and coordination 35.12%, 20.88% and 30.28% respectively by finding significant differences in comparison from baseline to post test.

### Conclusion

Eight weeks of core stability training programme produced significant improvements in the balance, explosive power and coordination of adolescent boys. Core stability training is an appropriate training protocol to bring out desirable changes over physical fitness parameters for

adolescent boys. Thus a continuous and systemic core stability training aimed at maximizing performance capacity should be applied to overall athletes and adolescent level athletes.

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