

EFFECT OF EIGHT WEEK SWISS BALL TRAINING ON CORE MUSCLES OF MALE PLAYERS

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Abstract

The purpose of the study was to examine the effect of eight week swiss ball training on core muscle of male players. Fifty Five (30=experimental group & 25= Control group) male players were selected as subjects. All were the players of Inter-University level. In the study swiss ball training was considered as independent variable and core muscles was considered as dependent variable. Core muscles strength was measured by WKC/USA standardized protocol for fitness assessment test. In order to find out the effect of eight week swiss ball training on core muscle, Descriptive Statistic, and Analysis of Covariance (ANCOVA) was used. The level of significance was set at 0.05. Based on the findings and within the limitation of the study it is noticed that practice of selected swiss ball training helped to improve core muscles of Male players. While comparing pre and post test mean score following conclusion were drawn. Core muscles of the subject of experiment group was found to be statistically significant since the obtained "F" value 102.241 was found higher than the tabulated value 4.00 at 0.05 level of significance. The result reveals that there was significant ($p < .05$) effect of swiss ball training on core muscles strength of male players, Core muscles significantly improved after the training program in subjects of experimental group.

Introduction

Functional training is the ability of the neuromuscular system to perform dynamic concentric, eccentric and isometric stabilization contraction. Performing exercise on the swiss ball may increase proprioceptive demands and stress the core muscles that are important for balance and stability in sports (Gambetta, 1999). Now a day's much attention has been given to the role that core fitness plays in sport performance. Performing planks, curlup and back extension on the swiss ball

May be a better method of strengthening core muscles since exercise are performed on an unstable surface. Also this type of functional training could enhance the body ability to improve stability and balance since the core muscles stabilize the axial skeleton (Gambetta, 1999 & Gray, 1995). The use of swiss ball training for core muscles development has been popular for several years. Multiple studies have examined core muscles recruitment during varying types of swiss ball abdominal exercises (Casio-Lima, 2003). The "core" has been used to refer to the lumbopelvic-hip complex, which involves deeper muscles, such as the internal oblique,

transversus abdominis, transversospinalis (multifidus, rotatores, semispinalis), quadratus lumborum, and psoas major and minor, and superficial muscles, such as the rectus abdominis, external oblique, erector spinae (iliocostalis, spinalis, longissimus), latissimus dorsi, gluteus maximus and medius, hamstrings, and rectus femoris (Axler, 1997 & McGill, 1996). Core muscle development is believed to be important in many functional and athletic activities, because core muscle recruitment should enhance core stability and help provide proximal stability to facilitate distal mobility. For optimal core stability, both the smaller, deeper core muscles and the larger, superficial core muscles must contract in sequence with appropriate timing and tension. (McGill, 2003). Core muscles strength is an important part of total fitness program. The function of core is to give stability to the body and generate force for movement. The core is a muscular system that provides the force to stabilize and move body segments. The core could be considered as link between upper and lower extremities (Willardson, 2007).

Methodology

Subjects

Fifty five Inter University male players (30=experimental group, 25= control group) of 18 to 28 years of age were selected for the present study. One experimental and one control groups were made consisting of male players.

Selection of Variables

In the study swiss ball training was considered as independent variable and core muscles was considered as dependent variable.

Criterion Measures

Core muscles strength was measured by WKC/USA standardized protocol for fitness assessment test.

Statistical Technique for Analysis of Data

In order to find out the effect of swiss ball training on core muscle strength, Descriptive Statistics and Analysis of Covariance (ANCOVA) were used. The level of significance was set at 0.05.

TABLE – 1
DESCRIPTIVE STATISTICS OF CORE MUSCLES STRENGTH OF EXPERIMENTAL GROUP AND CONTROL GROUP IN PRE-TEST AND POST-TEST OF

Statistics Descriptive	Experimenta		Control	
	Pre test	Post test	Pre test	Post test
Mean	2.50	6.73	3.40	3.40
Std. Deviation	1.306	1.306	1.306	1.306
Variance	1.707	1.707	1.707	1.707
Skewness	-.447	-.447	-.447	-.447
Kurtosis	-1.082	-1.082	-1.082	-1.082
Range	4.00	4.00	4.00	5.00
Minimum	.00	4.00	.00	1.00
Maximum	4.00	8.00	4.00	6.00

TABLE – 2
ANALYSIS OF VARIANCE - COMPARISON OF MEANS OF CORE MUSCLES STRENGTH TEST IN EXPERIMENTAL GROUP AND CONTROL GROUP OF MALE PLAYERS

	Variance	Sum of Squares	df	Mean Square	'F' Ratio
Pre Test	Between Groups	3.976	1	3.976	2.908
	Within Groups	72.460	53	1.367	
Post Test	Between Groups	172.175	1	172.175	107.096*
	Within Groups	85.207	53	1.608	

*Significant at .05 level

f value required to be significant at 1,53 df = 4.00
In relation to pre test, table 2 revealed that the obtained 'f' value of 2.908 was found to be insignificant at 0.05 level, since this value was found lower than the tabulated value 4.00 at 1, 53 df. In relation to post test, significant difference was found among experimental and control group pertaining to Core Muscles Strength, since f value of 107.096 was found significant at .05 level.

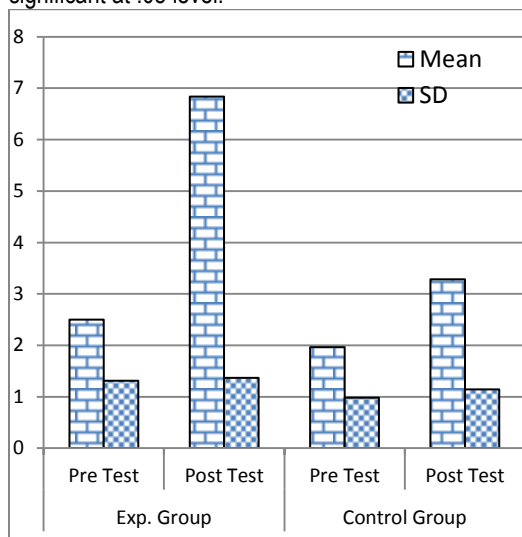


Fig. no.1: Comparison of pre-test and post-test means of experimental and control group in core muscles strength performance

TABLE – 3
ADJUSTED POST TEST MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP IN RELATION TO CORE MUSCLES STRENGTH

Treatment Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental	6.732 ^a	.219	6.293	7.172
Control	3.401 ^a	.240	2.919	3.884

a. Covariates appearing in the model are evaluated at the following values: pretest = 2.2545.

Adjusted means and standard error for the data on Core Muscles Strength of Experimental and Control Groups during post testing had been shown in Table –3 and figure –2. This indicated that the initial differences in the scores were compensated in the post-testing or the effect of covariate was eliminated in comparing the effectiveness of the treatment groups during post-testing.

TABLE – 4
ANALYSIS OF COVARIANCE-COMPARISON OF ADJUSTED POST TEST MEANS OF CORE MUSCLES STRENGTH IN EXPERIMENTAL AND CONTROL GROUPS OF MALE PLAYERS

	Sum of Squares	df	Mean Square	F ratio
Contrast	143.467	1	143.467	102.241*
Error	72.968	52	1.403	

*Significant at .05 level of significance

Table 4 revealed that the obtained 'f' value of 102.241 was found to be significant at 0.05 level, since this value was found higher than the tabulated value 4.00 at 1, 52 df.

Discussions and Conclusion

The primary findings of this investigation was that regular participation in a progressive swiss ball training program produced greater magnitude of improvement in core muscles of the players and it also increases the performance of the players. It has been reported in study that core specially designed exercise program for superficial core muscles (crunches abs) lead to 622% high work as compared to abdominal crunches with average work 312% that of abdominal crunches (Petrofsky et al. 2009). The result of the present study is further supported by others who examined the effect of resistance training on youth (Faigenbaum, 1996). Willardson J.M. (2007) in a study recommended that the during preseason and in-season mesocycles, free weight exercises performed while standing on a stable surface are recommended for increases in core strength and power. Free weight exercises performed in this manner are specific to the core stability requirements of sports-related skills due to moderate levels of instability and high levels of force production. Conversely, during postseason and off-season mesocycles, Swiss ball exercises involving isometric muscle actions, small loads, and long tension times are recommended for increases in core endurance. Furthermore, balance board and stability disc exercises, performed in

conjunction with plyometric exercises, are recommended to improve proprioceptive and reactive capabilities, which may reduce the likelihood of lower extremity injuries. Escamilla et al. (2010) in a study reported that high core muscle activity during the pike, roll-out, knee-up, and skier exercises, compared to the crunch and bent knee sit up exercises, suggests that these exercises are good alternatives to traditional abdominal exercises for core muscle recruitment. Finally, results shows that the participants who followed the treatment of swiss ball training improve their core muscles than participants in control group.

Conclusion

Core muscles of the subject of experiment group was found to be statistically significant since the obtained "F" value 102.241 was found higher than the tabulated value 4.00 at 0.05 level of significance. The result reveals that there was significant ($p < .05$) effect of swiss ball Training on core muscles strength of Male Players, Core muscles significantly improved after the training program in subjects of experimental group.

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