

Influence of Core Stability Training on Static and Dynamic Balance Among Volleyball Players

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Abstract-The aim of the present study was to examine the influence of core stability training on static balance and dynamic balance among volleyball players. To achieve the purpose of the study twenty four male volleyball players were selected randomly as subjects from Thoothukudi District, Tamilnadu, India and their age were ranged from 18 to 25 years. The volleyball players were assigned at random into two groups of each twelve player (N=12). Group-I underwent core stability training and Group-II acted as control that did not attend any special training other than their daily routine physical activities. The duration of the training period was restricted to eight week for four days per week and a session per day. The pre and post data were collected before and immediately after the training period. The selected variables such as static balance and dynamic balance were measured by stork stand balance test and 'Y' balance test respectively. The collected data from the two groups prior to and after the experimental treatments on selected variables such as static balance and dynamic balance were statistically analyzed by using the statistical technique of dependent-'t' test and analysis of covariance (ANCOVA). In all the cases 0.05 level of confidence was fixed as a level of confidence. The result of the study indicated that core stability training group had shown significantly improved on static balance and dynamic balance among volleyball players. However the control group had not shown any significant improvement on any of the selected variables such as static balance and dynamic balance.

Keywords- Core Stability Training, Static balance, Dynamic Balance, Stork Stand Balance Test, Y Balance Test, Volleyball Players

1. INTRODUCTION

Core stability, simply stated, is the functional stability of the trunk. This definition can be extended to the ability to maintain trunk-controlled motion while there are forces attempting to change its position [1]. The term, core stability, can be defined as simply or complex as needed for an individual author's purpose. Core stability will be defined as the ability of the trunk to maintain (stabilize) its positioning while forces are being applied to it [2].

Core stability, on the other hand, is a more ambiguous term. Perhaps more important than strength, core stability is the ability of passive and active stabilizers in the lumbo pelvic region to maintain appropriate trunk and hip posture, balance and control during both static and dynamic movement [3]. The core strength training is a commonly used method that we should well on for athletic performance. The core training method differs from weight-lifting exercises in practice and it aims to improve core muscle strength [4].

Volleyball is a highly competitive game and it demands high motor abilities. The prime physical qualities essential area static balance, balance, explosive power, flexibility, muscular endurance, muscular strength and speed. In Volleyball, the performance of skills during a jump as in spiking, blocking, jump-pass, or dive pass when the contact with the ground is lost, demands a high level of static balance and accuracy in spatial movements. Such movements depend on the training of the body systems [5].

Training is a systematic process of repetitive, progressive exercise or work involving learning process and acclimatization. The training load can be increased gradually or step by step is result in strong and faster adaptation process and more effective reaction from the organism [6].

Dynamic balance can be defined as —the ability to maintain a base of support with minimal movement [7]. The definition of static balance is to perform a task while maintaining a stable position [8].

The purpose of the present study was to examine the impact of core stability training with speed drills on static balance and dynamic balance among volleyball players.

2. METHODOLOGY

2.1 Participants

To achieve the purpose of the study twenty four (n=24) male volleyball players were selected randomly as subjects from Thoothukudi District, Tamilnadu, India and their age were ranged from 18 to 25 years.

2.2 Procedures

The volleyball players were assigned at random into two groups of each twelve players (N=12). Group-I underwent core stability training and Group-II acted as control that did not attended any special training other than their daily routine physical activities. The duration of the training period was restricted to eight weeks for four days per week and a session per day.

2.3 Variables and Measurement

The pre and post data were collected before and immediately after the training period. The selected variables such as static balance and dynamic balance were measured by stork stand balance test and 'Y' balance test respectively.

2.4 Statistical Analyses

Data was analysed by using dependent-'t' test and analysis of covariance (ANCOVA). In all the cases the level of confidence was fixed at 0.05 significant.

3. ANALYSIS OF DATA

Table 1. Means and Dependent 'T'-Test for Pre and Post Tests on Static Balance and Dynamic Balance of Experimental and Control Groups

Criterion variables	Mean	Experimental Group	Control Group
Static balance	Pre test	24.52	24.55
	Post test	29.17	24.61
	't'-test	7.08*	0.87
Dynamic Balance	Pre test	60.17	59.83
	Post test	68.46	60.44
	't'-test	11.07 *	1.67

*Significant at .05 level. (Table value required for significance at .05 level for 't'-test with df 11 is 2.20)

From the table 1 the dependent-'t'-test values of static balance and dynamic balance between the pre and post tests means of experimental group were greater than the table value 2.20 with df 11 at 0.05 level of confidence, it was concluded that the experimental group had significant improvement in the static balance and dynamic balance between while compared to control group.

3.1 Computation of Analysis of Covariance

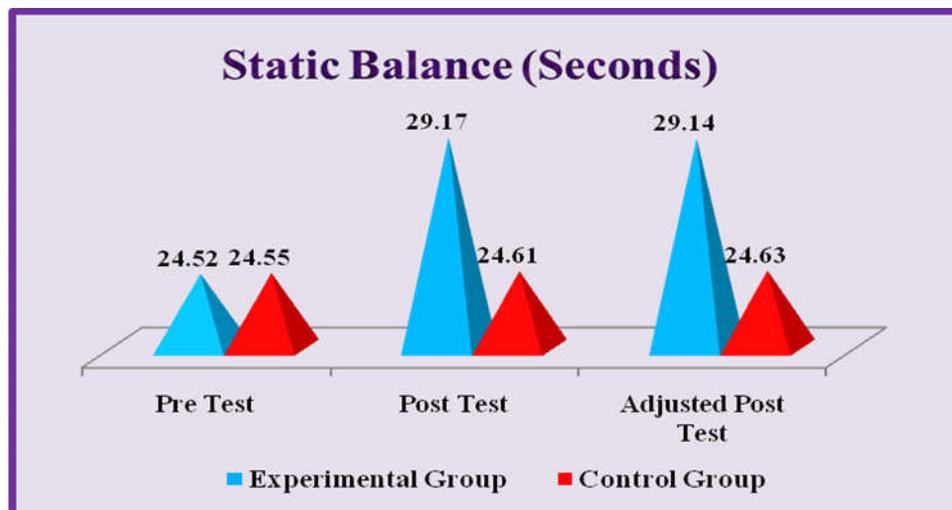
The descriptive measures and the results of analysis of covariance on the criterion measures were given in the following tables.

Table 2. Means and Dependent 'T'-Test for Pre and Post Tests on Static Balance and Dynamic Balance of Experimental and Control Groups

Variables	Experimental Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Square	F-ratio
Static Balance (Adjusted Post Mean)	29.14	24.63	BG	286.57	1	286.57	70.41*
			WG	85.47	21	4.07	
Dynamic Balance (Adjusted Post Mean)	69.01	60.76	BG	239.03	1	239.03	31.66*
			WG	158.55	21	7.55	

* Significant at 0.05 level. Table value for df 1, 21 was 4.32.

The above table indicates that the adjusted mean value on static balance and dynamic balance of experimental group and control group were 29.14 & 24.63 and 69.01 & 60.76 respectively. The obtained F-ratio of 70.41 and 31.66 for adjusted mean was greater than the table value 4.32 for the degrees of freedom 1 and 21 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental group and control group on static balance and dynamic balance.



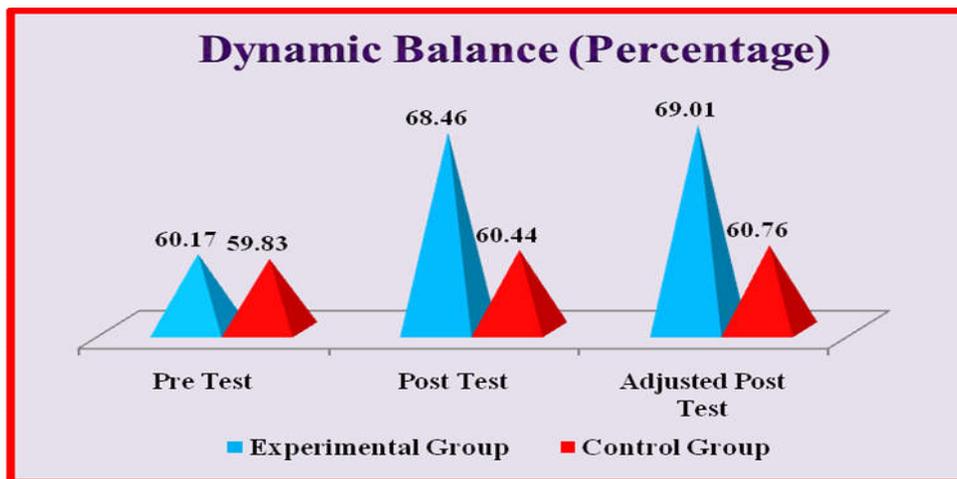


Figure 1. Pre test, post test and adjusted post test mean values of experimental group and control group on static balance and dynamic balance.

4. DISCUSSION ON FINDINGS

The findings of this study had clearly revealed that the influence of core stability training shows positive changes on selected dependent variables such as static balance and dynamic balance among volleyball players. When the exercises were done regularly during the core stability training with speed drills programme for 8 weeks, the subject should have improved the all selected dependent variables such as static balance and dynamic balance. The consistency in determining the significant contribution of core stability training on developing the dependent variables in this study was similar to the findings of other following studies. Gururaj & Arumugam, (2018) evaluated the study on the effect of interval training in varied surfaces on static balance and reaction time among kabaddi players. His study was concluded that the interval training in varied surfaces was given the positive changes among the static balance and reaction time among kabaddi players. Vigneshwaran, (2017) reported the study on impact of core training on speed among soccer players. The researcher concluded the core training was shown the positive changes on speed among soccer players. Arumugam, & Kumar, (2019) evaluated the influence of specific field training on speed and static balance among soccer players. He concluded that the speed and static balance was improved by the specific field training among soccer players. Arumugam, (2015) evaluated the impact of specific balance training on static balance and dynamic balance among hearing impaired students. He concluded that the balance training improved the balance ability among hearing impaired students. Arumugam & Selvaraja, (2020) evaluated the study on the effect of core stability training on balance and core abilities among women soccer players. The researcher concluded that the balance was improved due to the effect of core stability training among soccer players. Arumugam, (2018) conducted the study on the effect of proprioceptive training on dynamic and static balance among soccer players. He concluded that the dynamic and static balance was improved due to the effect of proprioceptive training among soccer players. Arumugam & Sangma, (2019) conducted the study on effect of trampoline training on explosive power and dynamic balance among college students. Vigneshwaran, (2017) evaluated the study on the impact of core training on speed among soccer players. Selvakumar & Vigneshwaran, (2019) analyzed the balance and reaction abilities among school children. From above those supportive studies the researcher intent to conduct this study, the result of my study also indicates that there was a significant changes on static balance and dynamic balance due to the effect of plyometric training associated with speed training among volleyball players when compared to control group. Suriya, P., & Arumugam, S. were conducted a study on effect of Strength-based Training on Anaerobic Power and Fatigue Index among Soccer Players, the result of the study proved that the dependent variables were improved due to the effect of strength-based training.

5. CONCLUSIONS

From the statistical analysis and results of the study the following conclusions were drawn to the study,

1. There was significant improvement on static balance due to the effect of core stability training among volleyball players.
2. There was significant improvement on dynamic balance due to the effect of core stability training among volleyball players.
3. There was a significant difference exists between experimental and control groups on selected dependent variables such as static balance and dynamic balance due to the effects of core stability training among volleyball players.
4. However the control group had not shown any significant improvement on any of the selected variables.

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