



## COMBINED EFFECT OF PLYOMETRIC OWN BODY RESISTANCE AND SWISS BALL TRAINING ON SELECTED BODY COMPOSITION VARIABLES OF SCHOOL LEVEL VOLLEYBALL PLAYERS

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### ABSTRACT

The purpose of this study was to find out the combined effect of plyometric, own body resistance and swiss ball training on the selected body composition variables of school level volleyball players. The investigator selected forty eight (N=48) male volleyball players who represented for their schools from Sri Ramakrishna Mission Vidhyalaya High School, Swami Shivananda Higher Secondary School (English and Tamil medium), and Ranga Swami Naidu Higher Secondary Schools periyanaicken palayam Coimbatore, Tamilnadu, India, were selected as subjects and their ages were ranged from 13 to 15 years. The subjects were divided into two equal groups of twenty four each. Group –I acted as experimental group (Plyometric Own body resistance and Swiss ball trainings (POBRST)). Group –II acted as Control Group (CG). The dependent variables namely total body fat percentage and trunk fat percentage were selected and measured by Tanita Body Composition Monitor for this study. The data was analysed by the use of paired 't' test. The obtained 't' ratio was tested for significance at 0.05 level of confidence. The analysis of the data revealed that there was a significant improvement on the selected criterion variables namely total body fat percentage and trunk fat percentage by the application of plyometric, own body resistance and swiss ball training (POBRST).

**KEYWORDS** : plyometric, own body resistance, swiss ball training, total body fat percentage, trunk fat percentage and Tanita Body Composition Monitor.

### INTRODUCTION

Each team consists of six players. To get play started, a team is chosen to serve by coin toss. A player from the serving team throws the ball into the air and attempts to hit the ball so it passes over the net on a course such that it will land in the opposing team's court (the serve). The opposing team must use a combination of no more than three contacts with the volleyball to return the ball to the opponent's side of the net. These contacts usually consist first of the bump or pass so that the ball's trajectory is aimed towards the player designated as the setter second of the set (usually an over-hand pass using wrists to push finger-tips at the ball) by the setter so that the ball's trajectory is aimed towards a spot where one of the players designated as an attacker can hit it, and third by the attacker who spikes (jumping, raising one arm above the head and hitting the ball so it will move quickly down to the ground on the opponent's court) to return the ball over the net. The team with possession of the ball that is trying to attack the ball as described is said to be on offense. The team on defense attempts to prevent the attacker from directing the ball into their court: players at the net jump and reach above the top (and if possible, across the plane) of the net to block the attacked ball. If the ball is hit around, above, or through the block, the defensive players arranged in the rest of the court attempt to control the ball with a dig (usually a fore arm pass of a hard-driven ball). After a successful dig, the team transitions to offense.

The game continues in this manner, rallying back and forth, until the ball touches the court within the boundaries or until an error is made. The most frequent errors that are made are either to fail to return the ball over the net within the allowed three touches, or to cause the ball to land outside the court. A ball is in if any part of it touches a side line or end line, and a strong spike may compress the ball enough when it lands that a ball which at first appears to be going out may actually be in. Players may travel well outside the court to play a ball that has gone over a side line or end-line in the air. Other common errors include a player touching the ball twice in succession, a player catching the ball, a player touching the net while attempting to play the ball, or a player penetrating under the net into the opponent's court. There are a large number of other errors specified in the rules, although most of them are infrequent occurrences. These errors include back-row or libero players spiking the ball or blocking (back-row players may spike the ball if they jump from behind the attack line), players not being in the correct position when the ball is served, attacking the serve in the front court and above the height of the net, using another player as a

source of support to reach the ball, stepping over the back boundary line when serving, taking more than 8 seconds to serve, or playing the ball when it is above the opponent's court. (Bean and Josh 2002).

### BODY COMPOSITION

Body composition refers to the proportion of fat and fat-free mass in the body. Those with a higher proportion of fat-free mass to a lower proportion of body fat have a healthy body composition. There are several different ways to assess your body composition, and body fat percentage. These include measurement with callipers and tests such as under water body fat tests, the body pod, DEXA Scan, and biometrical impedance. Someone with a body composition that includes excessive body fat is more likely to suffer from weight related health problems. (Sharma J.P. 2010).

### PLYOMETRIC TRAINING

Plyometric training is one of the most effective methods for improving explosive power. A wide variety of athletes can benefit from power training particularly if it is followed by a strength training programme. The purpose of plyometric is to improve the players' capacity to apply more force more rapidly. (Bard Adams, 2008).

### OWN BODY RESISTANCE TRAINING

Own body weight exercises can help stay fit at home, or on the road with little or no equipment. Here are a few of the best own body exercises for maintaining muscle strength and endurance, or creating a great interval training routine at home. Mix and match the exercises to create the perfect workout for traveling, home fitness or simply adding a bit of variety to your typical exercise routine. This can be walking, marching push-ups, sit-ups, and marching in place or stepping side to side. (Elizabeth Quinn 2014).

### SWISS BALL TRAINING

An exercise ball, also known as a Swiss Ball, is a ball constructed of soft elastic with a diameter of approximately 35 to 85 centimetres (14 to 34 inches) and filled with air. The air pressure is changed by removing a valve stem and either filling with air or letting the ball deflate. It is most often used in physical therapy, athletic training and exercise. It can also be used for weight training. The ball, while often referred to as a Swiss ball, is also known by a number of different names, including balance ball, birth ball, body ball, ball, fitness ball, gym ball, Swedish ball, therapy ball, or yoga ball. (Flett, Maureen 2003).

**METHODOLOGY**

For this study, forty eight (N=48) male volleyball players who represented for their schools from Sri Ramakrishna Mission Vidhyalaya High School, Swami Shivananda Higher Secondary School (English and Tamil medium) and Ranga Swami Naidu Higher Secondary Schools periyanaicken palayam Coimbatore, Tamilnadu, India, were selected as subjects and their ages were ranged from 13 to 15 years. The subjects were divided into two equal groups of twenty four each. Experimental Group was given 12 weeks (Duration - 12 weeks, Session - 3 days / week, Duration of one session - One hour) of plyometric, own body resistance and swiss ball training and the control group was not given any specific training. Experimental Group –I (Plyometric Own body Resistance and Swiss ball Trainings (POBRSTG) were given to the experimental group. The subjects were tested in the selected criterion variables namely total body fat percentage and trunk fat percentage by Tanita Body Composition Monitor for this study. Before and after the training period the data were collected. The collected data was treated by using paired t-test. The level of confidence was fixed at 0.05 Level.

**RESULTS OF THE STUDY:**

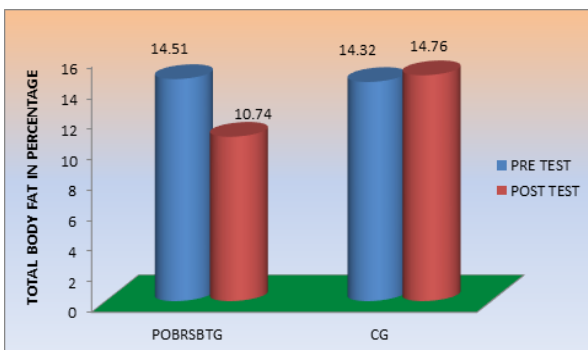
**TABLE-I COMPUTATION OF 't'-RATIO BETWEEN THE PRE AND POST TESTS ON TOTAL BODY FAT PERCENTAGE OF EXPERIMENTAL AND CONTROL GROUPS**

Group	Test	M	SD	$\sigma$	DM	DM	t- ratio	'p' value
Experimental	Pre Test	14.51	7.02	0.54	3.77	6.94*	0.01	
	Post Test	10.74	5.54					
Control	Pre Test	14.32	5.32	0.28	0.44	1.56	0.13	
	Post Test	14.76	4.98					

\* Significance at 0.05 level.

The table I indicates that there was a significant reduction on the total body fat percentage through the plyometric, own body resistance and swiss ball training. It reveals that the obtained t-ratio 6.94 is significant because the 'p' value is lesser than the 0.05 level of confidence. So there was a significant reduction on the total body fat percentage between the pre and post tests of the experimental group, whereas the control group showed no significant reduction. Hence the result indicates that the significant reduction on the total body fat percentage was due to the plyometric, own body resistance and swiss ball (POBRSTG) training alone.

**FIGURE-I FIGURE SHOWING THE MEAN DIFFERENCE OF PRE AND POST TESTS ON TOTAL BODY FAT PERCENTAGE OF EXPERIMENTAL AND CONTROL GROUPS**



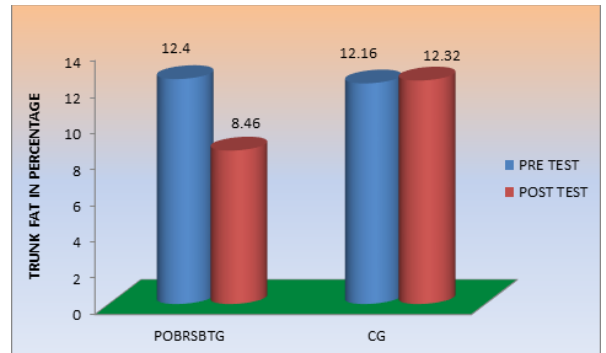
**TABLE-II COMPUTATION OF 'T'-RATIO BETWEEN THE PRE AND POST TESTS ON TRUNK FAT PERCENTAGE OF EXPERIMENTAL AND CONTROL GROUPS**

Group	Test	M	SD	$\sigma$	DM	DM	t- ratio	'p' value
Experimental	Pre Test	12.40	7.96	0.55	3.94	7.12*	0.04	
	Post Test	8.46	5.39					
Control	Pre Test	12.16	3.30	0.28	0.44	1.56	0.13	
	Post Test	12.32	3.15					

\* Significance at 0.05 level.

The table II indicates that there was a significant reduction on the trunk fat percentage through the plyometric, own body resistance and swiss ball training. It reveals that the obtained t-ratio 7.12 is significant because the 'p' value is lesser than the 0.05 level of confidence. So there was a significant reduction on the trunk fat percentage between the pre and post tests of the experimental group, whereas the control group showed no significant reduction. Hence the result indicates that the significant reduction on the trunk fat percentage was due to the plyometric own body resistance and swiss ball (POBRSTG) training alone.

**FIGURE-II FIGURE SHOWING THE MEAN DIFFERENCE OF PRE AND POST TESTS ON TRUNK FAT PERCENTAGE OF EXPERIMENTAL AND CONTROL GROUPS**



**DISCUSSION OF FINDINGS**

The result of the study reveals that the twelve weeks of plyometric, own body resistance and Swiss ball training on the selected dependent variables. There was a significant reduction on total body fat percentage through the plyometric, own body resistance and Swiss ball training (POBRSTG). It reveals that the obtained t-ratio 6.94 is significant because the 'p' value is lesser than the 0.05 level of confidence. So there was a significant reduction on the total body fat percentage between pre and post-tests of experimental group, whereas the control group showed no significant reduction. Hence the result indicates that the significant reduction on the total body fat percentage was due to the plyometric, own body resistance and swiss ball (POBRSTG) training alone. The results of the study were in consonance with the research done by Albetro Carvalho and Paulo Mouro (2014), and Vispute et al (2011).

The result of the study reveals that the twelve weeks of plyometric, own body resistance and swiss ball training on the selected dependent variables. There was a significant reduction on trunk fat percentage through the plyometric, own body resistance and swiss ball training (POBRSTG). It reveals that the obtained t-ratio 3.16 is significant because the 'p' value is lesser than the 0.05 level of confidence. So there was a significant improvement on the trunk fat percentage between pre and post-tests of experimental group, whereas the control group showed no significant reduction. Hence the result indicates that the significant reduction on the trunk fat percentage was due to the plyometric, own body resistance and swiss ball (POBRSTG) training alone. The results of the study were in consonance with the research done by Lamont et al. (2011), Velez et al (2010).

**CONCLUSIONS**

It was concluded that there was a significant reduction on the selected dependent variables namely total body fat percentage and trunk fat percentage by the application of plyometric training, own body resistance training and swiss ball training (POBRSTG).

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