

# The Effect of Resistance Training and Swiss Ball Resistance Training on Balance among Male Handball Players

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**Abstract:** *The purpose of this study was to find out the effect of Resistance Training and Swiss Ball Resistance Training on Balance among Male Handball Players. To achieve the purpose of the study, thirty male handball players were randomly selected as subjects from LNIPE Guwahati and Gwalior during the Inter- University Handball Camp held at LNIPE Guwahati in 2014. The age of the subjects were ranged between 18 to 25 years. The study was formulated as pre and post test random group design, in which thirty subjects were divided into three equal groups. Experimental Group-I (n=10; RT Group) performed the Resistance Training Group. The Experimental Group-II (n=10, SBRT Group) performed Swiss ball resistance training programe. Control group (n=10; C Group) did not undergo any specific training programmed, but they were practiced the regular sports training. The analysis of covariance was used to analyze the significant difference, if any among the groups. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences, if any. The 0.05 level of confidence was fixed at the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as an appropriate. The result of the study indicates due to training on balance has been improved significantly.*

**Keywords:** Resistance Training, Swiss ball training, Balance.

## 1. Introduction

Balance is the ability to maintain stability against the force of gravity. Factors contributing to the balance: the muscles and joints, visual perception center in the balance in the inner ear (semicircular canals), kinesthetic sense (Tomchuk David, 2011).

Sports always necessary factor in everyday activities. Individuals with poor balance, performance of most physical activities are at a loss; it is an even greater risk to fall. Heredity influences balance, but to maintain balance in the person's capacity can be improved. Physical activity and balance can be improved since the critical balance in performance; test should be used to identify individuals balance. The balance of different types of tests should be used for diagnostic purposes specific to a sport or physical activity.

The Swiss ball has two primary functions in a workout program: instability and support. Instability during an exercise forces you to engage your core muscles to maintain your balance, making the exercise more difficult. Training the core with instability helps develop a strong support system for lower extremities and back, which prevents injuries and helps you get the most out of your exercise routine.

An **exercise ball** is a ball constructed of soft elastic with a diameter of approximately 35 to 85 centimeters (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 (Thomas Fahey, 2012).

The Swiss ball can also be used to support your back as you work on developing core stability. For instance, you can place the ball against the wall and lean your back against it as you do a squat. To add lower back support to an abdominal crunch, sit on the ball, walk your feet out in front of you until you are lying back on the ball with a neutral spine, and do crunches from there. Rutherford and Jones (1986) suggested that adaptations from Swiss ball training resulted in better coordination of synergistic and stabilizer muscles. Behm (2002) and colleagues reported the effect of unstable conditions, as induced by sitting on a Swiss ball on force production of the knee extensors.

## 2. Statement of the Problem

The purpose of the study was to find out the effect of Resistance Training and Swiss Ball Resistance Training on Balance among Male Handball Players.

## 3. Methodology

### 3.1 Selection of Subjects

Thirty male handball players were selected from LNIPE Guwahati and Gwalior during the Inter- University Handball Camp held at LNIPE Guwahati in 2014 that have represented at the Inter- University and Inter State tournaments were randomly selected as subjects for the study. This experimental study was administered to only two experimental groups and one control group of 10 subjects each. The age of subjects ranged from 18 to 25 years only.

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### 3.2 Selection of Variable and their Criterion Measures

**Table 1:** Presents The Criterion Measures of Balance Which Were Selected for the Present Study and Were Measured.

**Table 1:** Selected variables and their criterion measures

Variable	Criterion measures
Balance	Stork Balance Stand Test ( <b>Johnson BL, Nelson JK, 1979</b> )

## 4. Experimental Design

This experimental study was administered to only two experimental groups and one control group of 10 subjects each. For this purpose Group I underwent Resistance training, Group II underwent Swiss ball resistance training (A **Swiss ball** is a ball constructed of soft elastic with a diameter of approximately 35 to 85 centimeters and filled with air) in three alternative days for twelve weeks. Group III acted as a control group.

### Training Programme

#### I- Four weeks - Resistance Training

S.no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	10-12	4	70%	2
2.	Half squat	10-12	4	70%	2
3.	Leg press	10-12	4	70%	2
4.	Leg curls	10-12	4	70%	2
5.	Chest press	10-12	4	70%	2

### Training Programme

#### II- Four weeks - Resistance Training

S. no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	10-12	4	80%	2
2.	Half squat	10-12	4	80%	2
3.	Leg press	10-12	4	80%	2
4.	Leg curls	10-12	4	80%	2
5.	Chest press	10-12	4	80%	2

### Training Programme

#### III- Four weeks - Resistance Training

S.no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	12-14	5	90%	2
2.	Half squat	12-14	5	90%	2
3.	Leg press	12-14	5	90%	2
4.	Leg curls	12-14	5	90%	2
5.	Chest press	12-14	5	90%	2

### Training Programme

#### I- Four weeks - Resistance Training with Swiss ball

S.no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	10-12	4	70%	2
2.	Half squat	10-12	4	70%	2
3.	Leg press	10-12	4	70%	2
4.	Leg curls	10-12	4	70%	2
5.	Chest press	10-12	4	70%	2

### Training Programme

#### II- Four weeks - Resistance Training with Swiss ball

S.no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	10-12	4	80%	2
2.	Half squat	10-12	4	80%	2
3.	Leg press	10-12	4	80%	2
4.	Leg curls	10-12	4	80%	2
5.	Chest press	10-12	4	80%	2

### Training Programme

#### III- Four weeks - Resistance Training with Swiss ball

S.no	Name of the exercise	Repetition	Set	Intensity	Rest (Min)
1.	Bench press	12-14	5	90%	2
2.	Half squat	12-14	5	90%	2
3.	Leg press	12-14	5	90%	2
4.	Leg curls	12-14	5	90%	2
5.	Chest press	12-14	5	90%	2

## 5. Statistical Analysis

The data were analyzed by using ANACOVA find out the significance of the mean difference between the groups. The **repeated analysis of variance** was used to find out the significance of the mean difference between the pre and post test.

## 6. Results

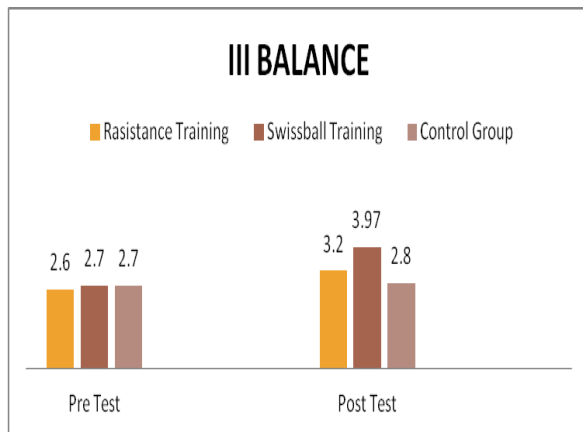
**Table II:** Balance

	R. T.	S.B.T	C.G	SS	DF	Mean Square	F
Pre Test	2.6	2.7	2.7	0.06	2	0.03	0.13
Post Test	3.2	3.97	2.8	6.81	2	3.4	14.32
Adjusted PostMean	3.23	3.93	2.78	6.71	2	3.35	18.28
				4.77	26	0.18	

**Table- II (a)**

R.T	S.B.T	C.G	M.D	C.I.
3.23	3.93	-	0.45	0.06
3.23	-	2.78	0.07	0.06
-	3.93	2.78	1.15	0.06

Table- II (a) shows the Scheffe's post-hoc test result. The ordered adjusted final mean difference for Balance of experimental groups I, II and control group were tested for significant at 0.05 level of confidence against confidential interval value. The mean difference between experimental group I, experimental group II, experiment group I and control group and experimental group II and control group were 0.45, 0.07 and 1.15 respectively and it was seen to be greater than the confidential interval value of 0.06. Hence the above comparisons were significant.



## 7. Conclusion

The Balance of Resistance training and Swiss ball resistance training has produced significant improvement on Balance which was greater than the control group of Male handball players. The present study also supported by the study of (Stanton et.al, 2004) examined the effect of Swiss ball exercises on core stability and stated that there is an improvement in core strength among the subjects. The control group did not produce any significant improvement on Balance of Male handball players. Balance was favored to Swiss ball training greater than Resistance training and the control group of Male handball players.

## References

- [1] Tomchuk David, Companion Guide to measurement and Evaluation for Kinesiology, Jones & Bartlett Learning, 2011.
- [2] Thomas Fahey, Study guide and practice e-Study Guide for: Fit and Well, Alternate Edition, Cram101 Textbook Reviews, 2012.
- [3] O.M. Rutherford & D. A. Jones, "The role of learning and coordination in strength training," European Journal of Applied Physiology, 55 (1) pp. 100-5, 1986.
- [4] D.G. Behm, K. Anderson & R.S. Curnew, "Muscle force and activation under stable and unstable conditions," Journal of Strength Conditioning, 16 (3), pp. 416-22, 2002.
- [5] B. L. Johnson & J. K. Nelson, Practical measurements for evaluation in physical education, 4th Edit. Minneapolis: Burgess, 1979.
- [6] R. Stanton, P. R. Reaburn & B. Humphries, "The Effect of Short-Term Swiss Ball Training on Core Stability and Running Economy," Journal of Strength and Conditioning Research, 18(3), Pp. 522-528, 2004.

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