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## Effect of plyometric training with and without weight on breath holding time of hand ball players

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### Abstract

The purpose of the study was to find out the relative effects of plyometric training with and without handheld weights on breath holding time of men hand ballplayers. For this purpose, sixty men handball Players who had participated in inter collegiate handball tournaments from Annamalai University were randomly selected as subjects. The selected subjects were divided at random into three groups of twenty each (n=20). Group I underwent Plyometric training with handheld weights, Group II underwent Plyometric training without handheld weights and Group III acted as Control. The subjects carried out their respective training programmes for three days per week for a period of twelve weeks. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post-test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at .05 level for all the cases. The result of the study concluded that Plyometric training with handheld weights is better than Plyometric training without handheld weights in improving Breath holding time.

**Keywords:** Breath holding time, plyometric training with and without handheld weights

### Introduction

The term training refers to the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies.

Power output and reactive neuromuscular control represents a component of function. Power and reactive neuromuscular control are perhaps the best measures of success in activities that require rapid force production. Plyometric training, also called reactive training, makes use of the stretch shortening cycle to produce maximum force in the shortest period of time and to enhance neuromuscular control, efficient rate of force production, and reduce neuromuscular inhibition. Breath holding time is the amount of work performed using primarily anaerobic energy system.

### Methodology

The purpose of the study was to find out the relative effects of plyometric training with and without handheld weights on breath holding time of men hand ballplayers. For this purpose, sixty men handball Players who had participated in inter collegiate handball tournaments from Annamalai University were randomly selected as subjects. The selected subjects were divided at random into three groups of twenty each (n=20). Group I underwent Plyometric training with handheld weights, Group II underwent Plyometric training without handheld weights and Group III acted as Control. The subjects carried out their respective training programmes for three days per week for a period of twelve weeks. Manual method breath holding time test was conducted to test the breath holding time of the subjects. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted posttest means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at .05 level for all the cases.

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**Breath Holding Time**

The results of the dependent ‘t’-test on the data obtained for Breath Holding Time of the subjects in the pre-test and post-

test of the experimental groups and control group have been analyzed and presented in Table I.

**Table 1:** The Summary of Mean and Dependent ‘T’ Test for the Pre and Post Tests On Breath Holding Time of Experimental Groups and Control Group

	<b>Plyometric Training with handheld weights Group-(I)</b>	<b>Plyometric Training without handheld weights Group-(II)</b>	<b>Control Group-(III)</b>
Pre- test mean	29.25	29.45	29.55
Post-test mean	33.45	31.75	29.25
‘t’-test	4.99*	2.73*	0.34

\* Significant at.05 level.

(Table value required for significance at.05 level for ‘t’-test with df 19 is 2.09)

Table I shows the dependent ‘t’ test values between the pre and post-test means of Plyometric training with handheld weights group, Plyometric training without handheld weights group and Control group were 4.99, 2.73 and 0.34 respectively. Since the obtained ‘t’-test value of experimental groups are greater than the table value of 2.09 with df 19 at.05 level of confidence therefore it is concluded that Plyometric

training with handheld weights group, and Plyometric training without handheld weights group had registered significant improvement in Breath holding time.

The Analysis of covariance (ANCOVA) on Breath Holding Time of Plyometric training with hand held weights group, Plyometric training without hand held weights group and Control group, have been analyzed and presented in Table -II.

**Table 2:** Analysis of Covariance on Breath Holding Time Experimental Groups and Control Group

<b>Adjusted Post-test Means</b>			<b>Source of Variance</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Squares</b>	<b>‘F’ Ratio</b>
<b>Plyometric Training with handheld weights Group-(I)</b>	<b>Plyometric Training without handheld weights Group-(II)</b>	<b>Control Group-(III)</b>					
33.61	31.72	29.13	Between With in	202.03 31.84	2 56	101.02 0.57	177.64*

\* Significant at.05 level of confidence

(Breath holding time scores in seconds)

(The table value required for significance at.05 level with df 2 and 56 is 3.16)

Table II shows that the adjusted post-test mean values of Breath holding time for Plyometric training with handheld weights group, Plyometric training without handheld weights group and Control group are 33.61, 31.72 and 29.13 respectively. The obtained F-ratio of 177.64 for adjusted post-test means is greater than the required table value of 3.16 for df 2 and 56 required for significance at.05 level of confidence. The results of the study indicate that there was a significant

difference among the adjusted post-test means of Plyometric training with handheld weights group, Plyometric training without handheld weights group and Control group on the improvement of Breath holding time.

To determine which of the paired means had a significant difference, the Scheffe’s post hoc test was applied and the results are presented in Table XXVIII.

**Table III:** The Scheffe’s Test for the Differences between the Adjusted Post-test Paired Means on Breath Holding Time

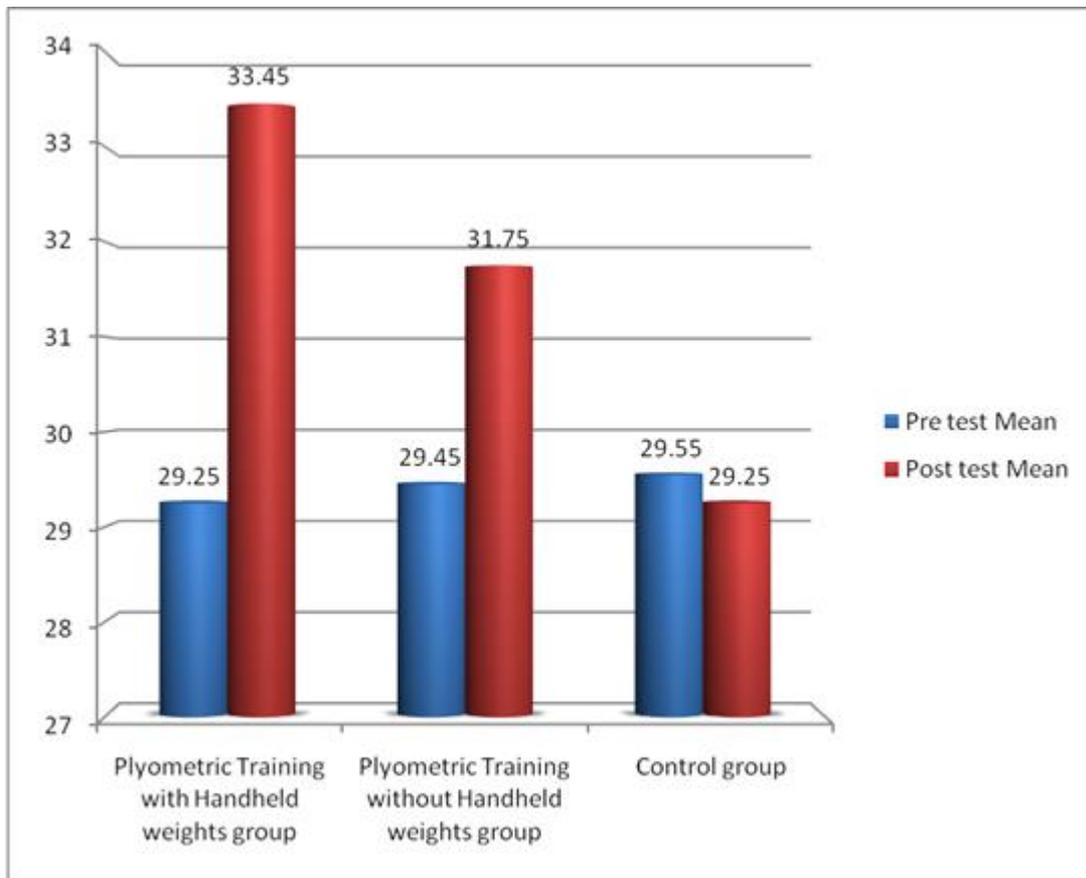
<b>Adjusted Post-test means</b>			<b>Mean Difference</b>	<b>Confidence Interval</b>
<b>Plyometric Training with hand held weights Group-(I)</b>	<b>Plyometric Training without hand held weights Group-(II)</b>	<b>Control Group-(III)</b>		
33.61	31.72		1.89*	0.60
33.61		29.13	4.48*	0.60
	31.72	29.13	2.59*	0.60

\* Significant at.05 level of confidence

Table III shows that the adjusted post-test mean difference on Plyometric training with handheld weights group and Plyometric training without handheld weights group, Plyometric training with handheld weights group and Control group, Plyometric training without handheld weights group and Control group are 1.89, 4.48 and 2.59 respectively. The values are greater than the confidence interval value of 0.60, which shows significant differences at.05 level of confidence. It is inferred from the results that there is a significant difference in Breath holding time between the adjusted post-test means of Plyometric training with handheld weights

group and Plyometric training without handheld weights group, Plyometric training with handheld weights group and Control group, Plyometric training without handheld weights group and Control group. However, the improvement of Breath holding time is significantly higher for Plyometric training with handheld weights group than Plyometric training without handheld weights group and Control group.

The mean values of Plyometric training with handheld weights group, Plyometric training without handheld weights group and Control group on Breath holding time are graphically represented in figure-1



### Conclusion

It may be concluded that Plyometric training with handheld weights is better than Plyometric training without handheld weights in improving Breath holding time.

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