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**Dr. J Anitha**  
Assistant Professor, Department  
of Statistics and Computer  
Application, Tamil Nadu  
Physical Education and Sports  
University, Chennai, Tamil  
Nadu, India

## Effect of plyometric training and circuit training on vital capacity anaerobic capacity among men volleyball players

**Dr. J Anitha**

### Abstract

The purpose of the study was to find out the effect of plyometric training and circuit training on vital capacity and anaerobic capacity among men volleyball players. Twenty four male volleyball players aged between 18 to 25 years were selected randomly. They were divided into two groups (two experimental and one control group) the experimental group I was given plyometric training and experimental group II was given circuit training for six weeks and control group was not allowed to participate in any training programme. The independent variables is plyometric and circuit training dependent variable is vital capacity and anaerobic capacity. The vital capacity tested by Digital spirometer and anaerobic capacity tested by Margaria kalamian power test and the performance recorded in liters and seconds. The collected data on vital capacity and anaerobic capacity were statistically examined to the 't' test. The 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means. The results of the study reveals that the plyometric training and circuit training had significantly improved the vital capacity and anaerobic capacity.

**Keywords:** Plyometric training, Circuit training, vital capacity, anaerobic capacity, 't' ratio

### Introduction

Interest in this jump training increased during the early 1970's as east European athletes emerged as powers on the world sports scene. As the eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics, and weight lifting, the mystique of their success began to Centre on the training methods. (Donald. A. Chu, 1998).

### Circuit Training

Circuit training was invented in 1953 as effective and efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consequently. It was past paced workout of 15 to 45 seconds per station with little (15-30 seconds) rest or no rest between stations. Today this is known as "circuit weight training" research has shown that it can increase muscular strength and endurance. There is mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is "aerobic circuit training" aerobic station like treadmill, rower or stepper (1 to 5 minute per station) or interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. (Dabir. R. Qureshi, 2012).

### Methodology

The purpose of the study was to find out the effect of plyometric training and circuit training on vital capacity and anaerobic capacity among men volleyball players. To achieve the purpose of the study 24 men volleyball players in the age group 18 to 25 years were selected at random from various engineering college in Chennai, Tamilnadu. Selected subjects were divided in to three groups of experimental I, experimental II and control group. The experimental group I participated combined plyometric training group and experimental group II circuit training group for the training period six weeks three alternate days per week. The control group were maintained their daily routine activities and no special training was given.

### Correspondence

**Dr. J Anitha**  
Assistant Professor, Department  
of Statistics and Computer  
Application, Tamil Nadu  
Physical Education and Sports  
University, Chennai, Tamil  
Nadu, India

### Statistical Techniques

The collected data on speed and muscular endurance were statistically examined to the test. The various hypotheses formulated by the researcher for comparison 't' ratio was

used. 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means.

**Table 1:** Computation of 't' ratio between pre and post test scores of experimental group and control group on vital capacity

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Vital Capacity	Experimental Group	3.75	4.15	0.61	0.42	0.076	11	5.26*
	Control Group	3.72	3.60	0.51	0.41	0.084		1.42

\*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table I shows that the mean values of pre-test and post-test of experimental group in vital capacity were 3.75 and 4.15 respectively. The obtained 't' ratio was 5.26 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in vital

capacity were 3.72 and 3.60 respectively. The obtained 't' ratio was 1.42 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on vital capacity due to combined plyometric and circuit training on male volleyball players.

**Table 2:** Computation of 't' ratio between pre and post test scores of experimental group and control group on anaerobic capacity

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Anaerobic Capacity	Experimental Group	121.20	134.73	15.40	17.11	0.914	11	14.80*
	Control Group	121.03	119.23	15.41	14.41	0.86		2.08

\*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table II shows that the mean values of pre-test and post-test of experimental group in anaerobic capacity were 121.20 and 134.73 respectively. The obtained 't' ratio was 14.80 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in anaerobic capacity were 121.03 and 119.23 respectively. The obtained 't' ratio was 2.08 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on anaerobic capacity due to combined plyometric and circuit training on male volleyball players.

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### Conclusions

1. It was concluded that there was significant improvement in vital capacity due to plyometric and circuit training on men volleyball players.
2. It was concluded that there was significant improvement in anaerobic capacity due to plyometric and circuit training on men volleyball players.
3. The result of the study reveals that plyometric and circuit training would improve college men volleyball players vital capacity and anaerobic capacity significantly.

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