



## EFFECTS OF AEROBIC AND PLYOMETRIC TRAININGS ON SELECTED PHYSIOLOGICAL VARIABLES AMONG COLLEGE WOMEN NETBALL PLAYERS

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### Abstract

*The purpose of the study was to find out the Effects of Aerobic and Plyometric trainings on selected Physiological Variables among college women net ball Players. To achieve this purpose of the study sixty women students were selected. To achieve this purpose of the study, sixty women students of Department of Physical Education, Meenatchi Physical Education College from Thathanur (Ariyalur), Tamil Nadu, India were tested. They were divided into three equal groups of each twenty subjects. It was conducted by aerobic training and Plyometric training each namely aerobic training group, Plyometric training group and control group. The group I aerobic training group, group II Plyometric training group conducted test for three days per week for twelve weeks and group III acted as control. Who did not underwent any special training programme apart from their regular day today physical education curriculum. The following physiological variables namely resting pulse rate and  $VO_2^{max}$  were selected as criterion variables. The resting pulse rate was assessed by Scores in (Radial pulse) Counts per minute and  $VO_2^{max}$  was assessed by using Scores in (Bruce Protocol Stress Test) Cubic Centimeter. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme as pre and post test selection. Analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the groups on each selected criterion variables separately. In all the cases .05 level of confidence was fixed to test the significance, which was considered as appropriate. The results of the study revealed that there was a significant difference between aerobic training group, Plyometric training group and control group on selected criterion variables such as resting pulse rate and  $VO_2^{max}$  and there was an improvement as per selected criterion variables namely resting pulse rate and  $VO_2^{max}$  with respect to aerobic training and Plyometric training.*

**Keywords:** Aerobic, Plyometric, Physiological, Women.

### INTRODUCTION

Netball is an enormously popular sport for girls and women. However, despite its long reign as a major female team sport few academic works have critically examined the place of netball in the development of women's sport and the social construction of gender relations. Archived association minutes and correspondence, newspaper articles and interviews with netball players and administrators are used here to support the contention that netball was designed, promoted and promulgated to enhance the ideals of a 'compliant femininity', a premise that provided a socially legitimated foundation for netball and positioned it as an acceptable activity for women and girls. The way in which women secured and used spaces for their netball participation provides a compelling analogy about the place of women generally in Australian society. The paper builds on Jobling and Barham's work on the history of netball in Australia but views the sport's development using a somewhat different analytical

lens from these authors. It is argued here that the historical development of netball is a potent illustration of the inherent power dimensions and struggles of women in sport. Netball's growth also demonstrates how public expectations of masculinity and femininity shape sport participation.

Since its inception netball has been one of a limited number of sports that were easily accessible for girls to play in schools and in the community. By its very design netball was able to gain public acceptance and popularity. In its modified form netball was not perceived as a threat to male domination of sport, it was termed a 'girls' game'. Netball was therefore allowed to grow with relative freedom from pressures about female suitability. Over many decades netball organisers were able to create and maintain a public image of netball as a feminine sport. Whether this was a strategically planned tactic, or it simply evolved in response to existing social expectations about appropriate female behaviour, is open to debate. In

their social history of the game, Jobling and Barham did not offer comment on this distinct aspect of netball's development. In re-examining the history of netball, this paper explores how this particular game has been used in the mediation of images, rules and regulations and the constructions of feminine identities, masculinity, conformity and resistance in women's sport.

## METHODOLOGY

The purpose of the study was to find out the Effects of Aerobic and Plyometric trainings on selected Physiological Variables among college women net ball Players. To achieve this purpose of the study sixty women students were selected. To achieve this purpose of the study, sixty women students of Department of Physical Education, Meenatchi Physical Education College from Thathanur (Ariyalur), Tamil Nadu, India were tested. They were divided into three equal groups of each twenty subjects. It was conducted by aerobic training and Plyometric training each namely aerobic training group, Plyometric training group and control group. The group I aerobic training group, group II Plyometric training group conducted test for three days per week for twelve weeks and group III acted as control. Who did not underwent any special training programme apart from their regular day today physical education curriculum. The following physiological variables namely resting pulse rate and  $VO_2^{\max}$  were selected as criterion variables. The resting pulse rate was assessed by Scores in (Radial pulse) Counts per minute and  $VO_2^{\max}$  was assessed by using Scores in (Bruce Protocol Stress Test) Cubic Centimeter. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme as pre and post test

selection. Analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the groups on each selected criterion variables separately. In all the cases .05 level of confidence was fixed to test the significance, which was considered as appropriate.

## TRAINING PROGRAMME

During the training period, group I underwent aerobic training, group II underwent Plyometric training, for three days per week for twelve weeks in addition to their regular physical education activity, every day workout lasted about 45-60 minutes including warm-up and warm down exercises. Group III acted as control who did not participate any specific training, however, they perform regular physical education programme.

## STATISTICAL ANALYSIS

The data was collected from three groups at prior to and after completion of the training period on selected criterion variables were statistically examined for significant difference if any, by applying analysis of covariance (ANCOVA). The Scheffe's post hoc test was also applied to know the significant difference between groups. The obtained 'F' ratio was also significant. In all cases .05 level of confidence was utilized to test the significance.

## RESTING PULSE RATE

The analysis of covariance of the data obtained for pre and post test scores on resting pulse rate of aerobic training, Plyometric training and control groups have been presented in Table I.

**TABLE I**  
**ANALYSIS OF COVARIANCE FOR THE PRE AND POST TEST ON**  
**RESTING PULSE RATE OF AEROBIC TRAINING, PLYOMETRIC**  
**TRAINING AND CONTROL GROUPS (IN COUNTS)**

Test	Aerobic Training Group	Plyometric training Group	Control group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
<b>Pre Test</b>								
Mean	67.50	67.75	67.65	Between	0.633	2	0.317	0.42
S.D.	0.83	1.07	0.67	Within	43.300	57	0.760	
<b>Post Test</b>								
Mean	63.45	65.85	67.40	Between	158.433	2	79.217	106.76*
S.D.	0.69	1.09	0.75	Within	42.300	57	0.742	
<b>Adjusted Post Test</b>								
Mean	63.56	65.75	67.39	Between	146.571	2	73.286	313.19*
				Within	13.113	56	0.234	

\* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 57 and 2 and 56 are 3.159 and

3.162 respectively).

Table I shows that the pre test mean values on resting pulse rate of aerobic training, Plyometric training and control groups are 67.50, 67.75 and 67.65 respectively. The obtained 'F' ratio of 0.42 for pre test scores is lesser than the table value of 3.159 for df 2 and 57 required for significance at .05 level of confidence on resting pulse rate. The post test mean values on resting pulse rate of aerobic training, Plyometric training and control groups are 63.45, 65.85 and 67.40 respectively. The obtained "F" ratio value of 106.76 for post test scores is greater than the table value of 3.159 for df 2 and 57 required for significance at .05 level of confidence on resting pulse rate.

The adjusted post test mean values on

resting pulse rate of aerobic training, Plyometric training and control groups are 63.56, 65.75 and 67.39 respectively. The obtained "F" ratio value of 313.19 for adjusted post test scores is greater than the table value of 3.162 for df 2 and 56 required for significance at .05 level of confidence on resting pulse rate.

The results of the study indicated that there was a significant difference among the adjusted post test means of aerobic training, Plyometric training and control groups on resting pulse rate. To determine the significance difference among the three paired means, the Scheffe's test was applied as post hoc test and the results are presented in table II -A.

**TABLE II -A**  
**THE SCHEFFE'S TEST FOR THE DIFFERENCE BETWEEN**  
**PAIRED MEANS ON RESTING PULSE RATE**

Aerobic Training Group	Plyometric Training Group	Control Group	Mean Differences	Confidence Interval Value
63.56	65.75	-	2.19*	0.38
63.56	-	67.39	3.83*	0.38
-	65.75	67.39	1.64*	0.38

\*Significant at .05 level of confidence.

The table II -A shows that the mean difference values between aerobic training group and Plyometric training group, aerobic training group and control group, Plyometric training group and control group 2.19, 3.83 and 1.64 respectively on resting pulse rate which were greater than the required confidence interval value 0.38 at .05 level of confidence.

The results of this study showed that aerobic training group has significantly differed on resting pulse rate when compared to

Plyometric training group and control group. aerobic training group also significantly differed on resting pulse rate when compared to control group.

#### **VO<sub>2</sub><sup>max</sup>**

The analysis of covariance of the data obtained for pre and post test scores on vo<sub>2</sub><sup>max</sup> of aerobic training, Plyometric training and control groups have been presented in Table III.

**TABLE III**  
**ANALYSIS OF COVARIANCE FOR THE PRE AND POST TEST ON**  
**VO<sub>2</sub><sup>max</sup> OF AEROBIC TRAINING, PLYOMETRIC TRAINING**  
**AND CONTROL GROUPS (IN MI/Kg/Min)**

Test	Aerobic Training Group	Plyometric Training Group	Control group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
<b>Pre Test</b>								
Mean	47.30	47.00	47.05	Between	1.033	2	0.517	0.44
S.D.	1.17	0.97	1.10	Within	67.150	57	1.178	
<b>Post Test</b>								

Mean	57.30	54.85	47.35	Between	1075.033	2	537.517	275.23*
S.D.	1.30	1.63	1.23	Within	111.300	57	1.953	
<b>Adjusted Post Test</b>								
Mean	57.14	54.95	47.41	Between	1038.291	2	519.146	472.81*
				Within	61.462	56	1.098	

\* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 57 and 2 and 56 are 3.159 and 3.162 respectively).

Table III shows that the pre tests mean values on vo2max of aerobic training, Plyometric training and control groups are 47.30, 47.00 and 47.05 respectively. The obtained 'F' ratio of 0.44 for pre test scores is lesser than the table value of 3.159 for df 2 and 57 required for significance at .05 level of confidence on vo2max. The post test mean values on vo2max of aerobic training, Plyometric training and control groups are 57.30, 54.85 and 47.35 respectively. The obtained "F" ratio value of 275.23 for post test scores is greater than the table value of 3.159 for df 2 and 57 required for significance at .05 level of confidence on vo2max. The adjusted

post test mean values on vo2max of aerobic training, Plyometric training and control groups are 57.14, 54.95 and 47.41 respectively. The obtained "F" ratio value of 472.81 for adjusted post test scores is greater than the table value of 3.162 for df 2 and 56 required for significance at .05 level of confidence on vo2max. The results of the study indicated that there was a significant difference among the adjusted post test means of aerobic training, Plyometric training and control groups on vo2max. To determine the significance difference among the three paired means, the Scheffe's test was applied as post hoc test and the results are presented in table IV-A.

**TABLE IV-A**  
**THE SCHEFFE'S TEST FOR THE DIFFERENCE BETWEEN**  
**PAIRED MEANS ON VO<sub>2</sub><sup>max</sup>**

Aerobic Training Group	Plyometric Training Group	Control Group	Mean Differences	Confidence Interval Value
57.14	54.95	-	2.19*	0.83
57.14	-	47.41	9.73*	0.83
-	54.95	47.41	7.54*	0.83

\*Significant at .05 level of confidence.

The table IV-A shows that the mean difference values between aerobic training group and Plyometric training group, aerobic training group and control group, Plyometric training group and control group 2.19, 9.73 and 7.54 respectively on vo<sub>2</sub><sup>max</sup> which were greater than the required confidence interval value 0.83 at .05 level of confidence.

The results of this study showed that aerobic training group has significantly differed on vo<sub>2</sub><sup>max</sup> when compared to Plyometric training group and control group. Plyometric training group also significantly differed on vo<sub>2</sub><sup>max</sup> when compared to control group.

## CONCLUSIONS

1. There was a significant difference among aerobic training, Plyometric training and control groups on selected physiological variables namely resting pulse rate and Vo<sub>2</sub><sup>max</sup>, among Women netball players.
2. There was a significant improvement on selected physiological variables namely Vo<sub>2</sub><sup>max</sup> among Women netball players due to aerobic training and Plyometric training.
3. There was a significant reduce on selected physiological variable namely resting pulse rate among women netball players due to aerobic training and Plyometric training.

4. Aerobic training group have improved the selected physiological variables namely  $\text{VO}_2^{\text{max}}$  than Plyometric training group.
5. Aerobic training group significantly reduced resting pulse rate than Plyometric training group.

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