



INVESTIGATION OF THE CHANGES ON SELECTED PHYSIOLOGICAL PARAMETERS IN RESPONSE TO AEROBIC TRAINING AMONG WOMEN VOLLEYBALL PLAYERS

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ABSTRACT

The primary purpose of this study was to determine whether aerobic training has an effect on physiological parameters of women volleyball players. To achieve these purpose 30 women volleyball players, aged 18 to 22 years took part in the study. Subjects were randomly assigned to either high intensity aerobic training (n=15) or control (n=15) group. The training regimen lasted for eight weeks. The selected dependent variables such as resting pulse rate, breath holding time and Vo₂max were assessed using standard tests and procedures, before and after the training regimen. Analysis of covariance was used to determine the significant difference existing between pretest and posttest on selected dependent variables. The analysis of data revealed that due to the



impact of eight weeks of aerobic training the selected physiological parameters of women volleyball players have significantly changed.

KEYWORDS: Aerobic training, physiological parameters.

INTRODUCTION:

A good aerobic exercise program can help one live a longer, healthier life and enhance one's well being. One will get a multitude of benefits if one does one's aerobic workout on a regular basis even if the intensity is low or short in duration. It's fun to keep a log of one's workouts that track one's progress to see how far one have come

in one's pursuit of fitness. Aerobic exercise is an extended activity that makes one breathe hard while using the large muscle groups at a regular, even pace. Aerobic activities help to make one's heart stronger and more efficient. During the early part of exercise, one's body uses stored carbohydrate and circulating fatty acids (the building blocks of fat molecules) for energy.

An additional cardiovascular benefit of aerobic exercise is that it helps to normalize blood pressure, especially in people whose blood pressure is somewhat elevated. Aerobic exercise makes the heart

stronger and a more efficient pump. Resting heart rate usually decreases after exercise training because the heart can pump more blood per beat. Therefore, it needs to beat fewer times to circulate the amount of blood. In many ways, exercise is the antithesis of aging. Aerobic exercise gives us the ability to maintain an independent lifestyle and increases the likelihood that we will enjoy during post-retirement years (Brehm, 2010).

In aerobic exercise the heart rate increases substantially, but never reaches its maximum level. The heart is always able to deliver sufficient oxygen-rich blood to muscles, so that they can derive energy from fat and glycogen aerobically. Aerobic exercises builds stamina for sports and it also is the most important form of exercise for health, since it increases the

efficiency of heart, circulation and muscles. Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body. To do any work we need energy and even while at rest some physiological functions have to be carried within our body and for that purpose some calories of energy will be burnt. As the intensity and duration of work increases the demand for the fuel in the working muscles also increases.

METHODOLOGY

Subjects and Variables

The purpose of this study was to examine the effect of aerobic training on physiological parameters among women volleyball players. For the purpose of this study, thirty women volleyball players in the age group of 18 to 22 years were recruited, with their consent. The age, height and weight of the selected subjects averaged 20.15 ± 1.65 years. The selected participants were randomly assigned to both the aerobic training and control groups of 15 each. The selected dependent variables were assessed using standard tests and procedures, before and after the training regimen. The variables and tests used are presented in table-I.

Table I: Dependent Variables and Test

Sl. No.	Variables	Tests / Instruments	Unit of Measurement
1.	Resting Pulse Rate	Blood Pressure Monitor	Counts
2.	Breathe Holding Time	Manual Method	Seconds
3.	VO ₂ max	One mile run	ml

Training Protocol

The experimental group underwent the aerobic training programme three days per weeks for eight weeks. Training sessions consist of a 30-minute aerobic exercise period with a warming-up and cooling-down period of 5 and 3 minutes, respectively. The cardiovascular load during the training period is individually adjusted and increased from a level of 80% to 95% of the heart rate reserve (HRR). HRR is the difference between the predicted maximum heart rate and the measured resting heart rate.

Experimental Design and Statistical Procedure

The experimental design used for the present investigation was random group design involving thirty subjects. Analysis of covariance (ANCOVA) was used as a statistical technique to determine the significant difference, if any, existing between pretest and posttest data on selected dependent variables. The level of significance was accepted at $P < 0.05$.

Results

The descriptive analysis of data collected on selected physiological parameters before and after eight weeks of aerobic training is presented in table-II.

Table II: Computation of Mean and Standard Deviation on Selected Physiological Parameters

Variables	Groups	Pretest		Posttest	
		\bar{x}	σ	\bar{x}	σ
Resting Pulse Rate	Experimental	71.03	3.27	67.14	1.76
	Control	70.63	2.15	70.16	1.46
Breathe Holding Time	Experimental	35.57	2.70	39.87	2.65
	Control	36.07	2.91	36.94	2.90
VO ₂ max	Experimental	2.99	0.16	3.28	0.23
	Control	3.02	0.15	3.03	0.11

Analysis of Covariance was used to determine the significant impact of aerobic training on selected physiological parameters and it is presented in table-III.

Table III: Analysis of Covariance on Selected Physiological Parameters of Aerobic Training and Control Groups

Variables	Groups	Adjusted Mean	SOV	Sum of Squares	df	Mean Square	'F' ratio
Resting Pulse Rate	Experimental	68.74	B	64.03	1	64.03	31.30*
	Control	70.66	W	55.23	27	2.05	
Breathe Holding Time	Experimental	39.35	B	20.11	1	20.11	25.51*
	Control	36.71	W	21.28	27	0.79	
VO ₂ max	Experimental	3.17	B	0.94	1	0.94	11.75*
	Control	3.02	W	2.28	27	0.08	

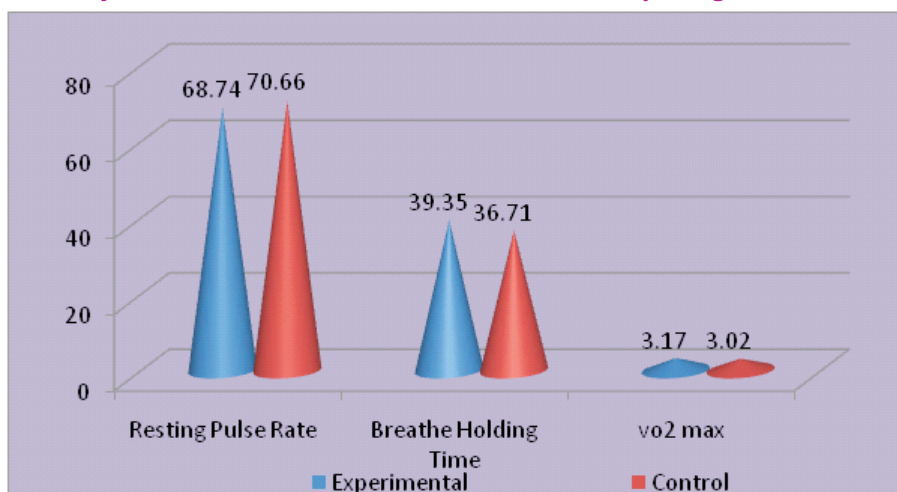
Required table value for significance at 0.05 level of confidence for df of 1 and 27 is 4.21

* Significant at 0.05 level.

The findings of the study shows that significant difference existing between aerobic training and control group on resting pulse rate, breath holding time and Vo₂max, since the obtained 'F' ratio of 31.30, 25.51 and 11.75 respectively are greater than the table value of 4.21 for significance at 0.05 level of confidence for df of 1 and 27. It was concluded that eight weeks of aerobic training significantly altered the selected physiological parameters of volleyball players.

The adjusted post test mean values on selected physiological parameters namely resting pulse rate, breath holding time and Vo₂max were graphical represented in figure-I.

Figure-I: Adjusted Post Test Mean Values on Selected Physiological Parameters



DISCUSSION

Aerobic training is a progressive physical conditioning programme that stimulates cardio respiratory activity for a time period sufficiently long to produce beneficial changes in the body. Aerobic exercises builds stamina for sports and it also is the most important form of exercise for health, since it increases the efficiency of heart, circulation and muscles. Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body. In this present study pulse rate, breath holding time, systolic blood pressure, diastolic blood pressure and Vo₂max are altered considerably after exercise. Several studies (Simao, Polito & Lemos, 2003; MacDougall et al., 1992; Stone et al., 1991; Fleck, 1988) confirm the findings of this study.

Most of the previous studies also show a substantial increase in maximum oxygen consumption following aerobic training. During exercise, VO₂max increases in direct proportion to the rate of work. A person's

Vo₂max is in part genetically determined; it can be increased through training until the point that the genetically possible maximum is reached (Jorgensen et al., 1977). Increase in VO₂max generally range from 15 to 20 percent following a 6-month training period (Wilmore & Costill, 1994). A six-week training period can result in increases in Vo₂max in participants undergoing high intensity (Hickson et al., 1981) and lower intensity training (Cunningham & Cantu, 1990).

CONCLUSION

The result of the present study shows that due to the effect of eight weeks of aerobic training the selected physiological parameters namely resting pulse rate, breathe holding time and Vo₂max of the volleyball players have significantly changed.

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