

Impact of Aerobic Training and Elastic Strength Training on Cardiorespiratory Endurance Among College Male Students



Physical Education

KEYWORDS : Aerobic training, plyometric training, cardiovascular endurance.

Anees Ahamed E. K

Assistant Professor, Dept. of Physical Education, MES Ponnani College, Ponnani South, Kerala, India

Dr. George Abraham

Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Tamil Nadu, India

ABSTRACT

The purpose of this study was to provide a comprehensive assessment of the impact of aerobic training and the elastic strength training on cardiovascular endurance. Thirty physically active college male students (n = 30) were taken as a subject and the age of the subjects were ranged between 17 to 22 years. Randomly selected subjects were again divided into three equal groups of ten each (n = 10). The groups were named as an aerobic training group (AG), elastic strength training group (EG) and the control group (CG). Two of the training groups were involved in the training program for twelve weeks duration. The systematic training program was planned three sessions only in a week. The control group didn't do any training protocol for the training duration. Aerobic endurance was taken as a test variable and the test were used for the study was 1500 run test. The time taken to cover the distance was considered as data. The stopwatch was used as an instrument for the study. The pre and the post test timing were analyzed by using the statistical tool of analysis of covariance (ANCOVA) and Scheffe's test was applied as a post hoc test to determine the paired mean difference if any. The level of confidence was fixed at 0.05 in all cases. The result of the study describes that the both training groups have had significant difference ($p \leq 0.05$) as compared with the control group in cardiovascular endurance. It was also concluded that the aerobic training group had better results ($p \leq 0.05$) than the polymeric training group for cardiovascular fitness.

Introduction

Physical exercise has increasingly popular as a method of health environment. Epidemiologic and laboratory students have shown that increased levels of physical activity are associated with longevity and reduced risk of cardiovascular disease (James. et. al. 1989). The strong cardiovascular system and the healthy life of an individual is directly related to his daily physical activities.

Maintenance of physical fitness is needed of the day in human society. In this age of stress and tension, low level of fitness lead towards, the exposure of degenerative and psychosomatic disorders including others in effective suffering. A lot of people live with fitness myths, having their own concepts and theories of fitness and health when it comes to fitness there are many that believe strongly in the dictum 'ignorance is bliss'.

The regular practice of physical exercises is an important factor to reduce morbidity and mortality rates of cardiovascular and all other conditions; there also seems to have further and independent benefits from the practice of physical exercises and improvement of the aerobic condition Mc Ginnis and Foege (1993), which speaks of their being practiced more and more frequently. The American Heart Association recommends individuals to practice physical exercises in most days of the week, every day if possible, with intensity ranging from moderate to strenuous, according to their physical capability, for a period of 30 minutes or more.

Here is the value of the present study and its result. The study describes the effects of aerobic and elastic strength training. The American College of Sports Medicine (ACSM) defines aerobic exercise as "any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature." It is also defined as exercise that increases the need for oxygen. Aerobic exercise is used interchangeably with the terms: cardiovascular exercise and cardio-respiratory exercise. At the same time the plyometric is a form of exercise which involve repeated rapid stretching and contracting of muscles to increase power are referred to as "explosive-reactive" power training (Chu, 1998). Plyometrics are training techniques used by athletes in all types of sports to increase strength and explosiveness. Plyometrics consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue (Baechle and Earle, 2000). Researchers have shown that plyometric training, when used with a periodized strength training program, can contribute

to improvements in vertical jump performance, acceleration, leg strength, muscular power, increased joint awareness, and overall proprioception (Adams et al., 1992; Anderst et al., 1994; Miller et al., 2002).

Materials And Methods

For this study thirty physically active college male students (n = 30) were taken as a subject from Annamalai University, Tamil Nadu. The age of the subjects were ranged between 17 to 22 years and they were selected as a random manner. The selected subjects were further divided into three equal groups of ten each in strength. The groups were named as an aerobic training group (AG), elastic strength training group (EG) and the control group (CG). Two of the training groups were involved in the training program for twelve weeks duration. The systematic training program was planned three sessions only in a week. The control group didn't do any training protocol for the training duration. Aerobic endurance was taken as a test variable and the test were used for the study was 1500 run test. The time taken to cover the distance was considered as a data and the instrument used to measure the same as a stopwatch. The collected pre and the post test timing were analyzed by using the statistical tool of analysis of covariance (ANCOVA) and Scheffe's test was applied as a post hoc test to determine the paired mean difference if any.

Training Protocol

The training programme for aerobic training group was scheduled by five sessions during the week (Monday, Tuesday, Wednesday, Thursday & Friday) and given training for three sessions per week (Monday, Wednesday & Friday) for elastic training group for a period of 8 weeks. Moderate intensity (60 – 70%) was given to both training groups. All the subjects involved in the training programme were questioned about their status throughout the training period. None of them reported any injuries. However, muscle soreness was reported in the early weeks, and it subsided later. Attendance was taken before the commencement of each training session. All the subjects were present for more than 94% of the total training sessions. The data on strength endurance was collected one day prior to the training and immediately after the training programme for criterion variable.

Results And Discussion

Table - I Analysis of Covariance on Cardiorespiratory endurance of Experimental and Control Groups

Test		A G	E G	C G	SOV	SS	df	MS	F
Pre test	Mean	450	454	448	B	195	2	97.5	0.15
	SD	26.77	21.91	27.99	W	17825	27	660	
Post test	Mean	408	443	449	B	10268	2	5134	7.36*
	SD	29.74	21.52	27.26	W	18819	27	697	
Adjusted Post test	Mean	409.02	440.34	452.44	B	10044	1	5022	315.3*
					W	414	26	15.9	

(The table value required for significance at 0.05 level of confidence with df 2 and 27, and 2 and 26 are 3.35 and 3.37 respectively)

Table I indicates that pre and post test mean and standard deviation of experimental and control group on cardiorespiratory endurance. The obtained 'F' value for pre test mean on cardiorespiratory endurance was 0.15, which was lesser than table value of 3.35 for the degree of freedom 2 and 27 at 0.05 level of confidence; hence there was no significant difference in pre test data of experimental and control groups. The analysis of the post and adjusted post test mean data reveals that obtained 'F' value of 7.36 and 315.3 respectively, which were higher than table 'F' of 3.35 and 3.37. Hence there exists a significant difference in cardiorespiratory endurance among the experimental groups and the control group. Scheffe's test was used to find out the paired mean difference and it was displayed in Table II.

Table- II Scheffe's Post Hoc test for the Difference between the Paired Mean on Cardiorespiratory Endurance

Adjusted Post Test Mean			MD	CI
AG	EG	CG		
409.02	440.3	-	31.28*	30.65
409.02	-	452.4	43.38*	
-	440.3	452.4	12.1	

*Significant, ($p \leq 0.05$)

Table II showed that the adjusted post test mean difference in cardiorespiratory endurance between aerobic training group and elastic strength training group, aerobic training group and the control group, elastic strength training group and the control groups were, 31.28, 43.38, 12.1 respectively. The mean difference of aerobic training group and the elastic strength training group and the aerobic training group and control groups are higher than the confident interval value of 30.65. And the mean difference of the elastic strength training group and the control group is lesser than the confident interval value of 30.65. From the table it was clear that the aerobic training group have significant difference against the elastic strength training group and a control group. But there was insignificant occurred between the elastic strength training group and the control group of cardiovascular endurance. The pre, post and adjust post test mean values of experimental groups and control group on cardiovascular endurance was graphically represented in the figure 1.

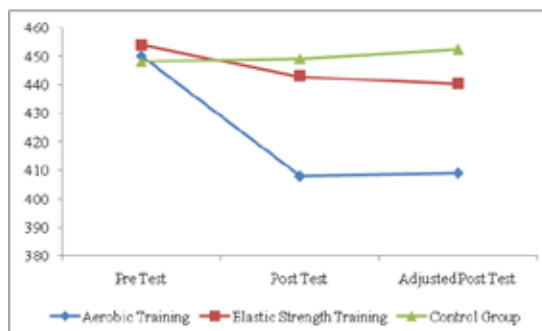


Figure 1: The pre, post and adjusted post test mean values of experimental groups and control group on cardiorespiratory endurance

Discussion

It is well known that aerobic capacity and muscle strength are important elements of fitness in the healthy life environment, as well as the human daily activities. Good aerobic capacity and muscle strength is needed for a competitive sports person and the common people for optimizing their peak performance in deciding workouts. The study of the Vivek (2013) concluded that the aerobic training improved the physical fitness and body compositions among the selected school students. Santosh Singh. et. al (2012) also concluding the role of aerobic training and its influence in cardiovascular efficiency in their study. The result of the study present study points that the aerobic training group have significant improvement as compare with the elastic strength training group and the control group. But there was no significant difference in between the elastic strength training group and the control group on the cardiovascular endurance.

Conclusion

The result of the present study point out that the aerobic training group have significant improvement as compare with the elastic strength training group and the control group. However, there was no significant difference between the elastic strength training group and the control group on the cardiovascular endurance.

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