

Effects of Aerobic and Anaerobic Training on Speed Performance variable of Inter-collegiate Basketball Players

A.Davis SelvaKumar,

Ph. D Research Scholar, Department of Physical Education, Thiruvalluvar University, Vellore, Tamilnadu, India.

Dr.P.V.Shelvam,

Dean, Faculty of Education, Annamalai University, Chidabaram, Tamilnadu, India.

Abstract- The purpose of the study was to find out the effects of aerobic and anaerobic training on Speed performance of Basketball players. To achieve this purpose of the study, forty five (N=45) men Basketball players who have participated in inter Collegiate Basketball tournament, in Thanjavur district of Tamilnadu during the year 2018-2019 were randomly selected as subjects. Their age ranged from 18 to 21 years. The subjects were divided at random into three groups of fifteen in each (n=15). Group-I underwent Aerobic Training, Group-II underwent Anaerobic Training and group-III acted as the Control group. The dependent variables selected for this study was Speed. Speed was assessed by Fifty meters run test. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. 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 assessment 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 0.05 level for all the cases. The results of the study showed that Anaerobic Training group has been found to be better than the aerobic training group and Control group in developing Speed.

Keywords – Aerobic Training, Anaerobic Training, Speed

I. INTRODUCTION

The term 'physical activity' has been often used interchangeably with 'exercise' and in turn 'physical fitness'. Although exercise and physical activity share common elements, they are not equivalent. Exercise is in fact a sub-category of physical activity and has been defined by Corbin and Dowell (1980) as "any planned, structured and repetitive bodily movement performed to improve or maintain one or more components of physical fitness".

The word training means 'an organized and systematic instructional process which aims at improving an individuals' ability to play their assigned roles effectively and meaningfully. However, this kind of understanding of the term training cannot be applied to the concept of sports training.

Aerobic exercise is sometimes known as "cardio" -- exercise that requires pumping of oxygenated blood by the heart to deliver oxygen to working muscles. Aerobic exercise stimulates the heart rate and breathing rate to increase in a way that can be sustained for the exercise session. In contrast, anaerobic ("without oxygen") exercise is activity that causes you to be quickly out of breath, like sprinting or lifting a heavy weight. Examples of aerobic exercises include cardio machines, spinning, running, swimming, walking, hiking, aerobics classes, dancing, cross country skiing, and kickboxing. There are many other types(Baechle,1994).

Anaerobic means 'without oxygen'. During anaerobic work, involving maximum effort, the body is working so hard that the demands for oxygen and full exceed the rate of supply and the muscles have to rely on the stored recovers of fuel. In this case waste product accumulate, the chief one being lactic acid. The muscles, being starved of oxygen, take the bodies into a state know as oxygen debt. The body's stored fuel soon runs out and activity ceases with pain.

Many workout routines utilize periods of intense activity as a part of their regimen. Increasing anaerobic capacity has been shown to have a number of health benefits, including better athletic performance and increased metabolism.

Speed is the ability to move the body or a part of the body as rapidly as possible from one point to another. Speed is the rate of movement, or the amount of time it takes for a body or object to travel between two points. Speed usually refers to running speed, as in the sprints in track or in football. However, speed can be performed as leg speed in soccer kicking, arm speed in throwing a basketball, and body speed (acceleration) necessary in fast break. Speed is related to strength and power. In fact, all skill-related components contribute to speed. Speed requires the expenditure of a large amount of energy in a short period. Age is a factor in attaining speed. Speed is the amount of distance covered in a given amount of time. Acceleration is how quickly you get to top speed (Singh, 1984).

II. METHODOLOGY

The present study was to find out the effects of aerobic and anaerobic training on Speed performance of Basketball players. To achieve this purpose of the study, forty five (N=45) men Basketball players who have participated in inter Collegiate Basketball tournament, in Thanjavur district of Tamilnadu during the year 2018-2019 were randomly selected as subjects. Their age ranged from 18 to 21 years. The subjects were divided at random into three groups of fifteen in each (n=15). Group-I underwent Aerobic Training, Group-II underwent Anaerobic Training and group-III acted as the Control group. The dependent variables selected for this study was Speed. Speed was assessed by Fifty meters run test. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variable. All the subjects of the three groups were tested on selected criterion variables at prior to and immediately after the training programme.

III. ANALYSIS OF THE DATA

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

In order to examine the significance differences among Aerobic Training, Anaerobic Training and Control group of speed dependent t- test was applied and it was presented in the Table-1.

Table – 1

Summary of mean standard deviation and dependent 't' test for the pre and post tests on Speed of Experimental groups and Control group (Speed is expressed in Seconds)

Test	Descriptive Statistics	Aerobic Training Group	Anaerobic Training Group	Control Group
Pre Test	Mean	7.73	7.66	7.70
	SD (\pm)	0.11	0.17	0.14
Post Test	Mean	7.09	6.74	7.67
	SD (\pm)	0.16	0.20	0.23
"t" Test		12.67*	13.66*	0.41

* Significant at 0.05 level.

The table value required for 0.05 level of significance with df 14 is 2.15.

Table-1 shows that the pre-test mean and standard deviation of Speed values of Aerobic Training group, Anaerobic Training group and Control group are 7.73 ± 0.11 , 7.66 ± 0.17 and 7.70 ± 0.14 respectively. The post-test mean and standard deviation are 7.09 ± 0.16 , 6.74 ± 0.20 and 7.67 ± 0.23 respectively.

The obtained dependent t-ratio values between the pre and post test means on Speed of Aerobic Training group, Anaerobic Training group and Control group are 12.67, 13.66 and 0.41 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that aerobic training group and anaerobic training group had registered significant decrease in Speed.

The analysis of covariance on Speed of the pre, post, and adjusted test scores of Aerobic Training group, Anaerobic Training group and Control group have been analyzed and presented in Table – 2.

Table – 2

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Speed of Experimental groups and Control group

Test	Aerobic Training Group	Anaerobic Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	7.73	7.66	7.70	Between groups	0.04	2	0.02	0.83
				Within groups	0.91	42	0.02	
Post-Test Mean	7.09	6.74	7.67	Between groups	6.58	2	3.29	78.27*
				Within groups	1.77	42	0.04	
Adjusted Post-Test Mean	7.04	6.78	7.67	Between sets	6.24	2	3.12	246.01*
				Within Sets	0.52	41	0.02	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23 (Speed scores are in Seconds)

Table-2 shows that the obtained F-ratio value 0.83 for pre test mean of Aerobic Training group, Anaerobic Training group and Control group on Speed is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 74.78.27 on Speed is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 246.01 for adjusted post test mean of Aerobic Training group, Anaerobic Training group and Control group on Speed is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Aerobic Training group, Anaerobic Training group and Control group on Speed.

Since, three groups are compared and whenever the obtained 'F' ratio for adjusted post test is found to be significant, Scheffe's test is used to find out the paired mean difference and it is presented in Table-3.

Table – 3

Scheffe's test for the difference between paired means on Speed

Aerobic Training Group	Anaerobic Training Group	Control Group	Mean Difference	Confident Interval Value
7.04	6.78	---	0.26*	0.10
7.04	---	7.67	0.62*	0.10
---	6.78	7.67	0.89*	0.10

*Significant at 0.05 level of confidence.

Table-3 shows that the mean difference values of Aerobic Training group and Anaerobic Training group, Aerobic Training group and Control group, Anaerobic Training group and Control group are 0.26, 0.62 and 0.89 respectively, which are greater than the confidence interval value of 0.10 on Speed at 0.05 level of confidence.

The results of the study showed that there was a significant difference between Aerobic Training group and Anaerobic Training group, Aerobic Training group and Control group, Anaerobic Training group and Control group on Speed.

The above data also reveal that Anaerobic Training group had shown better performance than Aerobic Training group and Control group in Speed.

The pre and post test mean values of Aerobic Training group, Anaerobic Training group and Control group on Speed are graphically represented in the Figure -1.

The adjusted post mean values of Aerobic Training group, Anaerobic Training group and Control group on Speed are graphically represented in the Figure -2.

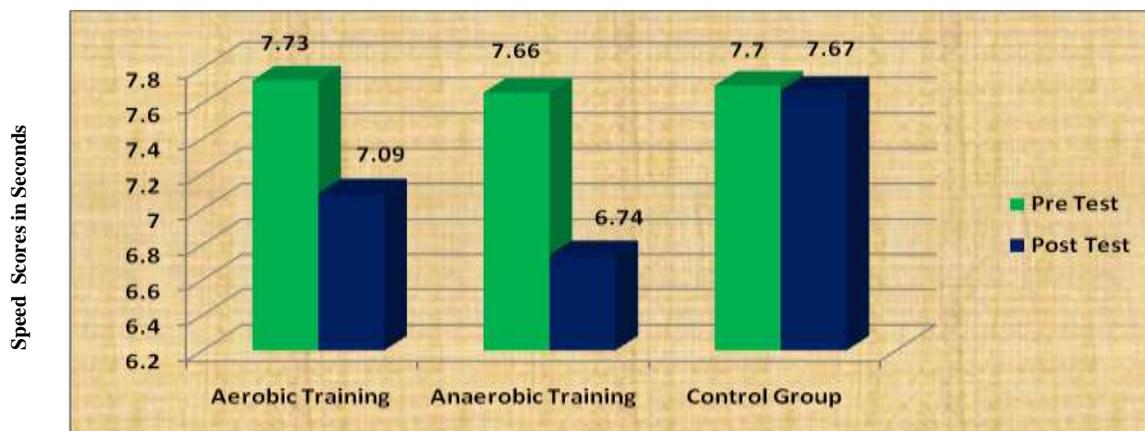


Fig – 1: The Pre and Post test Aerobic Training group, Anaerobic Training group and Control group on Speed

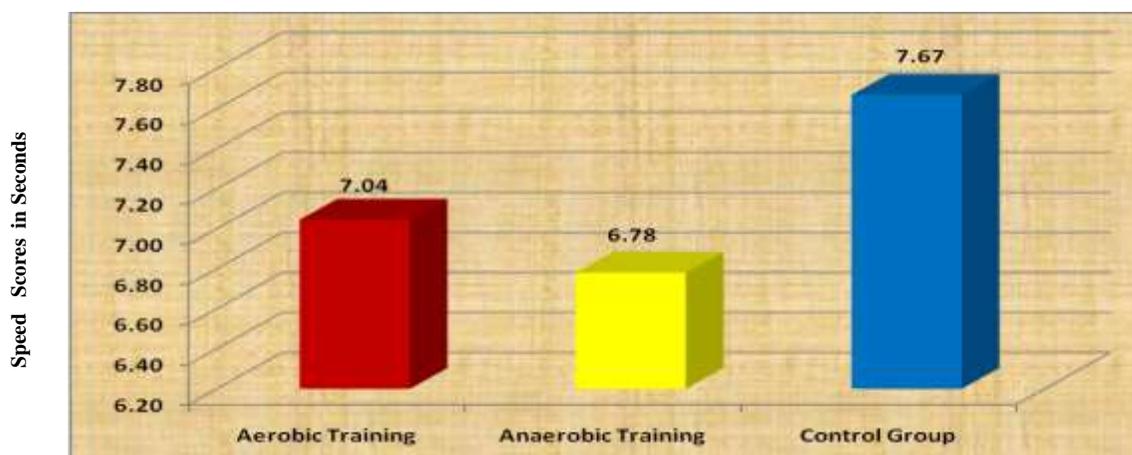


Fig – 2: The Adjusted Post Test Mean Values of Aerobic Training group, Anaerobic Training group and Control group on Speed

IV.CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The Aerobic Training group and Anaerobic Resistance Training group had registered significant improvement on Speed.
2. When the Experimental groups were compared with each other, the Anaerobic Training group was found to be greater than the Aerobic Training programme, and Control group on the increase of selected criterion variable namely Speed.

REFERENCES

- [1] Baechle Thomas R. (1994), *Essential of Straining Training and Conditioning* Champaign Illinois: Human Kinetics Publishers, p.319.
- [2] Corbin, CB and Dowell, LJ (1980), *Concepts in Physical Education with Laboratories and Experiments*, C Brown Publishers, Dubuque, IA.
- [3] Singh Hardayal (1984) *Sports Training*, Netaji Subhas National Institute of Sports, Patiala.