



**INFLUENCES OF AEROBIC TRAINING WITH AND WITHOUT TAPERING ON
SELECTED PHYSICAL FITNESS COMPONENTS
AMONG MALE RACE WALKERS**

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ABSTRACT

The purpose of the study was to find out the influences of aerobic training with and without tapering on selected physical fitness components namely speed, muscular strength, explosive strength, endurance among male race walkers. To achieve the purpose of the study thirty male race walkers have been randomly selected from various colleges in the state of Tamil Nadu, India. The age of subjects were ranged from 18 to 25 years. The subjects had past experience of at least three years in race walking and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. These included speed assessed by 30mts dash, muscular strength assessed by sit ups, explosive strength assessed by standing broad jump, endurance assessed by cooper 12 minutes run. The subjects were randomly assigned into three groups of ten each, such as experimental and control groups. The experimental groups participated in the aerobic training with and without tapering for 5 days a week, one session per day and for 12 weeks each session lasted 90 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. In case 'F' values found to be the significant the Scheffe's test was used as post hoc test. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups. The results of the study showed that there was significant differences exist between aerobic training with and without tapering group and control group. And also aerobic training with and without tapering group showed significant improvement on speed, muscular strength, explosive strength and endurance, compared to control group. When experimental groups were compared aerobic training with tapering group showed significant improvement on speed, muscular strength, explosive strength and endurance

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Introduction

Race walking is a long-distance athletic event. Although it is a foot race, it is different from running where one foot must appear to be in contact with the ground at all times. Aerobic training is the act of exercising to increase stamina and endurance. The term 'endurance training' generally refers to training the aerobic system as opposed to anaerobic. The need for endurance in sports is often predicated as the need of cardiovascular and simple muscular endurance, but the issue of endurance is far more complex

A progressive, nonlinear reduction of the training load during a variables amount of time that is intended to reduce the physiological and psychological stress of daily training and optimize sport performance (Mujika and Padilla 2000). The final preparation for competition is both an art and a science, requiring an understanding of the physiological changes that are occurring and the skills to manage the psychological and emotional state of an athlete as they near the culmination of a hard year of training. Tapering phase are often associate with performance-enhancing psychological changes such as reduced perception of effort, reduced global

mood disturbance, reduced perception of fatigue, and increased vigour (Hooper et al. 1999). A segment of time when the amount of training load are reduced before a competition in an attempt to peak performance at a target time (Thomas and Busso, 2005).

According Howley (1943), Physical fitness components and specific training package are very important factors for athletes. These components of training package are more important to the athletes in the competition periods and for the development of their technical skills. Physical fitness is one's richest possession and cannot be purchased; it has been earned through a daily routine of physical exercise. For many athletes a year of training comes down to one major race when strength, skill, speed, endurance and tactics all need to come together at the right time. The purpose of the study was to find out the influence of Lydiard training with tapering on selected physical and psychological variables among male race walkers.

The Pollster is a race walker, official, coach, administrator, selector, observer attempted to study about the physiological effects of the race walkers. Aerobic training with tapering can help to improve performance in athlete. Little research had done on race walking.

The purpose of the study was to find out the influences of aerobic training with and without tapering on selected physical fitness components namely speed, muscular strength, explosive strength, endurance among male race walkers.

Materials and Methods

To achieve the purpose of the study thirty male race walkers have been randomly selected from various colleges in the state of Tamil Nadu, India. The age of subjects were ranged from 18 to 25 years. The subjects had past experience of at least three years in race walking and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. These included speed assessed by 30mts dash, muscular strength assessed by sit ups, explosive strength assessed by standing broad jump, endurance assessed by cooper 12 minutes run. The subjects were randomly assigned into three groups of ten each, such as experimental and control groups. The experimental groups participated in the aerobic training with and without tapering for 5 days a week, one session per day and for 12 weeks each session lasted 90 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. In case 'F' values found to be the significant the Scheffe's test was used as post hoc test. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups

TABLE-I
Criterion measures

S.No	Criterion measure	Test items	Unit of measurement
1	Speed	30mts dash	In seconds
2	Muscular strength	Sit-ups	In count
3	Explosive strength	Standing broad jump	In centimeters
4	Endurance	Cooper 12minute run	In distance

Training flow chat

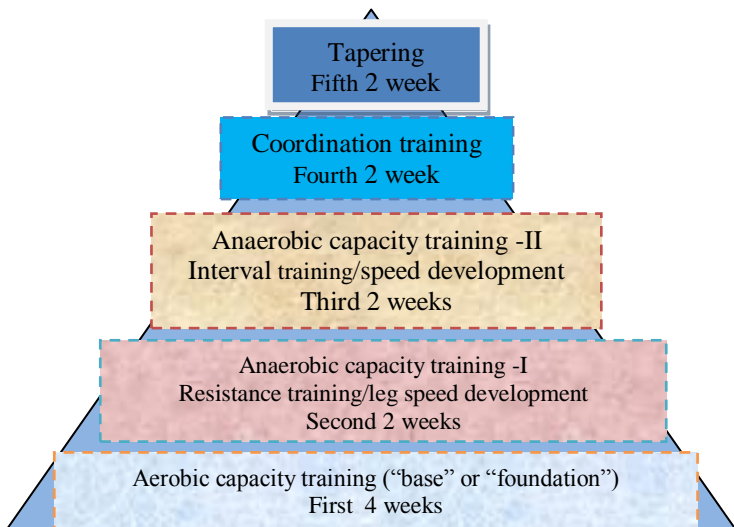


TABLE – II
Descriptive analysis of selected physical fitness components
Among control and experimental groups

S.No	Variables	Group	Pre-Test Mean	SD (±)	Post -Test Mean	SD (±)	Adjusted Mean
1	Speed	CG	4.70	0.26	4.61	0.07	4.61
		ARBTG	4.63	0.17	4.37	0.04	4.37
		ARBWTG	4.59	0.20	4.27	0.09	4.26
2	Muscular strength	CG	29.50	2.91	31.00	2.74	31.16
		ARBTG	31.20	2.39	35.50	0.97	35.43
		ARBWTG	31.50	2.87	39.50	4.83	39.40
3	Explosive strength	CG	1.67	0.21	1.80	0.08	1.80
		ARBTG	1.62	0.26	1.88	0.06	1.88
		ARBWTG	1.66	0.29	2.02	0.06	2.02
4	Endurance	CG	2320.0	91.89	2547.0	96.49	2547.22
		ARBTG	2325.0	100.6	2690.0	77.45	2689.89
		ARBWTG	2325.0	100.6	2840.0	102.1	2839.89

CG= Control group ARBTG= Aerobic training group
ARBWTG = Aerobic training with tapering group

The tables-II the pre, post-test means, standard deviations and adjusted means on selected physical fitness components of male race walkers were numerical presented. The analysis of covariance on selected variables of aerobic training with and without tapering groups and control group is presented in table – III

TABLE – III
Computation of analysis of covariance on selected physical fitness components among male race walkers

S.No	variables	Test	Sum of variance	Sum of squares	df	Mean square	F ratio
1	speed	Pre-test	B.W	0.05	2	0.029	0.62
			W.G	1.26	27	0.047	
		Post-test	B.W	0.60	2	0.30	57.12*
			W.G	0.14	27	0.005	
		Adjusted means	B.S	0.62	2	0.31	62.81*
			W.S	0.12	26	0.005	
2	Muscular strength	Pre-test	B.W	23.267	2	11.63	1.55
			W.G	202.60	27	7.50	
		Post-test	B.W	361.66	2	180.83	17.01*
			W.G	287.00	27	10.63	
		Adjusted means	B.S	308.93	2	154.46	14.16*

			W.S	283.53	26	10.90	
3	Explosive strength	Pre-test	B.W	0.01	2	0.006	0.08
			W.G	1.83	27	0.06	
		Post-test	B.W	0.25	2	0.12	23.93*
			W.G	0.14	27	0.005	
		Adjusted means	B.S	0.25	2	0.12	23.99*
			W.S	0.14	26	0.005	
4	Endurance	Pre-test	B.W	166.66	2	83.33	0.009
			W.G	258500.00	27	9574.07	
		Post-test	B.W	429326.6	2	214663.3	25.00*
			W.G	231810.0	27	8585.55	
		Adjusted means	B.S	428162.4	2	214081.2	24.12*
			W.S	230678.2	26	8872.26	

B.M. –Between mean W.G. – Within groups B.S. – Between sets
W.S. – Within set

*Significant at 0.05level of confidences

(The table values required for significance at 0.05 level of confidence for 2 & 27 and 2 & 26 are 3.35 and 3.37 respectively).

In the table the results of analysis of co variance on speed, muscular strength, explosive strength and endurance. The obtained ‘F’ ratio of 0.62, 1.55, 0.08 and 0.009 for Pre-test means was less than the table value of 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on speed, muscular strength, explosive strength, endurance. The obtained ‘F’ ratio of 57.12, 17.01, 23.93 and 25.00 for Post-test means was greater than the table value of 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on speed, muscular strength, explosive strength and endurance. The obtained ‘F’ ratio of 62.81, 14.16, 23.99 and 24.12 for adjusted means was greater than the table value of 3.37 for df 2 and 26 required for significance at 0.05 level of confidence on speed, muscular strength, explosive strength and endurance. The result of the study indicated that there was a significant difference among the adjusted post test means of aerobic training group, aerobic training with tapering group and control group on speed, muscular strength, explosive strength and endurance.

Since the obtained ‘F’ ratio value was significant further to find out the paier mean difference, the scheffe’s test was employed and presented in table-IV

TABLE – IV

The Scheffe’s test for the differences between the adjusted Post tests paired means on speed, muscular strength, explosive strength, endurance

Control group	Aerobic training	Aerobic training with tapering	Mean difference	Confidence Interval
Speed				
4.61	4.37	.....	0.24*	0.07
4.61	.....	4.26	0.35*	0.07
.....	4.37	4.26	0.11*	0.07
Muscular strength				
31.16	35.43	.....	4.27*	3.80

31.16	.....	39.40	8.24*	3.80
.....	35.43	39.40	3.97*	3.80
Explosive strength				
1.80	1.88	.....	0.08*	0.07
1.80	.....	2.02	0.22*	0.07
.....	1.88	2.02	0.14*	0.07
Endurance				
2547.22	2689.89	.....	142.67*	109.09
2547.22	.....	2839.89	292.67*	109.09
.....	2689.89	2839.89	150*	109.09

*Significant at 0.05level of confidences

From the table-IV, clear that the adjusted post test means are 4.61, 4.37 and 4.26 respectively. The mean differences values are between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group are 0.24, 0.35 and 0.11 respectively speed on are greater than the confidence interval value 0.07 at 0.05 level of confidence. The results of the study showed that there were a significant difference between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group on speed. When experimental groups were compared aerobic training with tapering group showed significant improvement in speed.

From the table-IV, clear that the adjusted post test means are 31.16, 35.43 and 39.40 respectively. The mean differences values are between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group are 4.27, 8.24 and 3.97 respectively muscular strength on are greater than the confidence interval value 3.80 at 0.05 level of confidence. The results of the study showed that there were a significant difference between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group on muscular strength. When experimental groups were compared aerobic training with tapering group showed significant improvement in muscular strength.

From the table-IV, clear that the adjusted post test means are 1.80, 1.88 and 2.02 respectively. The mean differences values are between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group are 0.08, 0.22 and 0.14 respectively explosive strength on are greater than the confidence interval value 0.07 at 0.05 level of confidence. The results of the study showed that there were a significant difference between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group on explosive strength. When experimental groups were compared aerobic training with tapering group showed significant improvement in explosive strength.

From the table-IV, clear that the adjusted post test means are 2547.22, 2689.89 and 2839.89 respectively. The mean differences values are between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group are 142.67, 292.67 and 150 respectively endurance on are greater than the confidence interval value 109.09 at 0.05 level of confidence. The results of the study showed that there were a significant difference between aerobic training group and control group; aerobic training with tapering group and control group & aerobic training group and aerobic training with tapering group on

endurance. When experimental groups were compared aerobic training with tapering group showed significant improvement in endurance.

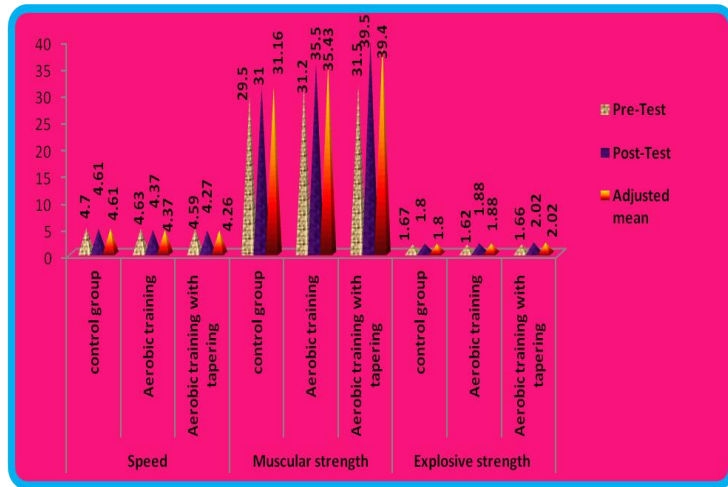


Figure-I The pre, post and adjusted mean values of speed, muscular strength, explosive strength of both control and experimental groups are graphically represented in the figure-I

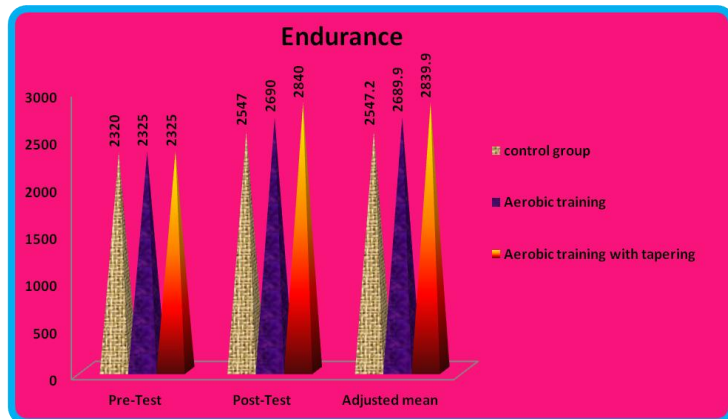


Figure-II The pre, post and adjusted mean values of endurance of both control and experimental groups are graphically represented in the figure-II

Discussion of findings

The results of the study indicate that the experimental group which underwent aerobic training and aerobic training with tapering had showed significant improved in the selected variables namely such as speed, muscular strength, explosive strength and endurance, when compared to the control group. The control did not show significant improvement in any of the selected variables. The past studies on selected physical fitness components also reveals Coutts et al (2007) who had found that tapering had significant improvement in vertical jump, 3-RM squat and 3-RM bench press and chin-up (max) and 10-m sprint performance. Hooper et al (1999) changes in plasma norepinephrine concentration, heart rate after maximal effort swimming and confusion as measured by the Profile of Mood States (POMS) predicted the change in swimming time with tapering ($r^2 = 0.98$); the change in plasma norepinephrine concentration predicted the change in swim time with tapering ($r^2 = 0.82$) by itself. Houmard et al

(1994) 7 days of tapered running improved distance running performance and running economy. A taper regimen of equivalent duration cycle training maintained performance in distance runners.

Conclusions

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

1. The result reveals that the aerobic training with and without tapering groups showed significant difference in all the selected variables such as speed, muscular strength, explosive strength and endurance, when compare with control group.
2. The aerobic training with tapering group showed significant difference in speed, muscular strength, explosive strength and endurance improvement which may be due to 12 weeks of aerobic training with tapering.
3. The control group race walkers did not show significant improvement in any of selected variables.

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