



## Training and Detraining Effect of Aerobic Training and Physical Training on Physical Performance Parameters among College Men Students

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### Abstract

*Purpose of the study was to evaluate the training and detraining effect of aerobic training and physical training on physical performance parameters among college men students. To achieve this purpose of the study forty five (N=30) college men students were selected from Alagappa arts & science College, Karaikudi, Tamil Nadu state, India, during the year 2016-17. The subject's age ranges from 17 to 23 years. The selected subject were divided into two equal groups consists of fifteen subject each namely two experimental groups from college students. Subjects were randomized to two groups –aerobic group and Physical exercise (PE) group after the baseline assessment. All the subjects were assessed for muscular endurance and cardio respiratory endurance, 3 weeks Post intervention and 3 weeks after detraining. Cardio respiratory endurance was measured cooper 12 min run/walk test count by meters and muscular endurance was sit ups count by max attempt per minute. The results suggest that the improvement in the physical performance is largely by the increase in the cardio respiratory and muscular endurance in the aerobic group. In conclusion, the study presents the efficacy of aerobic to improve cardio respiratory and muscular endurance with 3 weeks of training in the pediatric group. However, the effect of the training does not last after 3 weeks detraining.*

**Keywords:** Aerobic training, Physical training, Detraining, Cardio respiratory endurance and Muscular endurance.

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### Introduction

Sports training must be understood as a specialised process of all-round physical conditioning aimed at the methodical preparation of Athletes. Sport training is the total process of preparation of sportsmen, through different means and forms for better performance. The sports performance is the result and expression of the total personality of the sports man. The educational aspect of sports training is unfortunately overlooked frequently by coaches and physical education teachers in India. Training programmes in athletics aim directly at the improvement of performance. That too, the interval training involves the aerobic quality of muscles fit for the activity. Interval training, as a means of improving the aerobic endurance, is mostly included in all the athletic training programmes. Physical detraining has been investigated through two major approaches by observing changes following total bed rest for extended periods of time and by observing changes in trained individuals as they cease formal physical training and become physically inactive. The results of these various studies will be discussed individually, according to the specific components of physical training. Hickson"

et. al. found that, once the desired level of aerobic training had been reached, the frequency or the duration of training session could be reduced by as much as two thirds without any adverse effect on physical condition. But if subjects decreased the intensity of training sessions, there was a substantial loss of aerobic power over the first 6 weeks of observation. Similarly, gains in strength could be sustained by one session of isokinetic exercise a week, provided that the intensity of contractions was not reduced.

### Methodology

Thirty men college students of age 17 to 23 years from Alagappa Arts & Science College, Karaikudi were selected as subjects at random to undergo the training. They were divided into two groups namely aerobic training group (Experimental group I) and physical training group (Experimental group II) each consists of 15 subjects. The experimental groups (I & II) were subjected to six weeks of aerobic and physical training respectively. The experimental groups I used aerobic exercises of travel, forward, backward, sideways, grapevine (feet alternately cross in front and behind), in circles (in place, but change direction faced), whirlpool, ladder, downward (alternate 2 exercises, do 8, 6, 4, 2 reps each), upward (as upward, but start with smaller number of reps) and The experimental group II used physical exercises of Neck rotation, Hand rotation (back

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to front, circular movements, flex and extend), Hip rotation, Knee rotation, Feet rotation, Leg exercises (back and forward, leg rotation), Leg to hand exercise, Body twist with hands straight, Leg to hand cross touch, Forward and back ward bending and Leg stretch the load given were progressively increased from 50%,60%,70% intensity level aerobic exercises and physical exercises drills respectively for one hour per day for three days a week for a period of six weeks. The subjects of all the two groups were tested on cardio respiratory endurance and muscular endurance prior to and after the training period. To ascertain cardio respiratory endurance was used and accordingly Cooper's 12 Minutes run / Walk Test was administered mean value count by meters. To

ascertain muscular endurance was used and accordingly sit-ups test was administered mean value count by maximum attempt per minute.

### Statistical Technique

The following statistical procedures were used. The "t" ratio was calculated to find out the significance of the difference between the mean of the initial and final test of the experimental group. The significance of the difference among the means of experimental group was found out by pre-test. The data were analyzed and dependent 't' test was used with 0.05 levels as confidence.

## Results and Discussion

**Table I.** Analysis of 't'-ratio for the pre and post tests of experimental groups on cardio respiratory endurance for college men students (Cooper 12min run/walk counts means in meters)

Groups	Mean		Mean Difference	S.D	Standard Error	't' ratio
	Pre	Post				
Experimental I	2034.7	2136.7	102	53.745	13.87	7.35*
Experimental II	2036.7	2098.7	62	46.475	.12	5.167*

\*Significance at .05 level of confidence. (The table value required for 0.05 level of significant with df of 14 is 2.14)

The Table-I shows that the mean values of pre-test and post-test of aerobic training group on cardio respiratory endurance were 2034.7 and 2136.7 respectively. The obtained 't' ratio was 7.35, since the obtained 't' ratio was greater than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The mean values of pre-test and post-test of experimental group on cardio respiratory endurance were 2034.7 and 2098.7 respectively. The obtained 't' ratio was 5.167 since the obtained 't' ratio was greater than

the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between aerobic training group compare better than the physical training group in cardio respiratory endurance. It may be concluded from the result of the study that two experimental groups improved in cardio respiratory endurance due to six weeks of aerobic training and physical training.

**Table II.** Analysis of 't'-ratio for the pre and post tests of experimental groups on muscular endurance for college men students (Muscular endurance counts means in maximum attempt per minute)

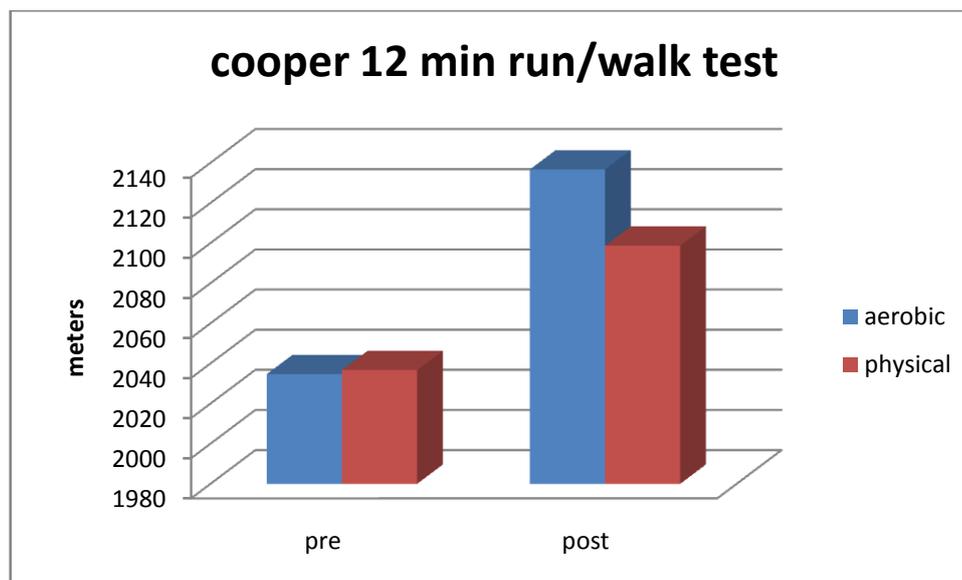
Groups	Mean		Mean Difference	S.D	Standard Error	't' ratio
	Pre	Post				
Experimental I	25.13	30.86	5.73	2.086	.5386	10.644*
Experimental II	25	29.8	4.8	1.89	.489	9.798*

\*Significance at .05 level of confidence. (The table value required for 0.05 level of significant with df of 14 is 2.14)

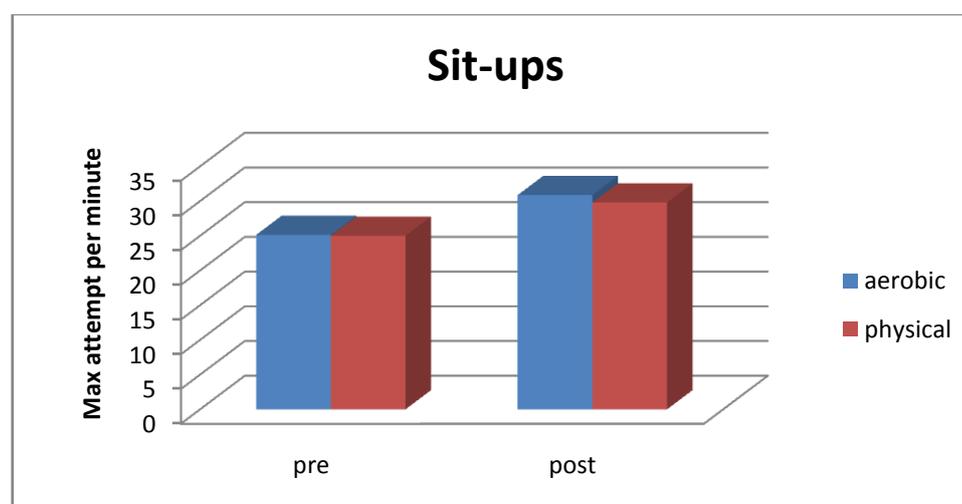
The Table-II shows that the mean values of pre-test and post-test of aerobic training group on muscular endurance were 25.13 and 30.86 respectively. The obtained 't' ratio was 10.644, since the obtained 't' ratio was greater than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The mean values of pre-test and post-test of experimental group on muscular endurance were 25 and 29.8 respectively. The obtained 't' ratio was 9.798 since the obtained 't' ratio

was greater than the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between aerobic training group compare better than the physical training group in cardio respiratory endurance. It may be concluded from the result of the study that two experimental groups improved in muscular endurance due to six weeks of aerobic training and physical training.

**Figure I.** Mean values of aerobic training group and physical training Group on cardio respiratory endurance (means in meters)



**Figure II.** Mean values of aerobic training group and physical training Group on Muscular endurance (means in max attempt per/min)



### Discussion of Finding

Aerobic development and maintenance is an ongoing process. VO<sub>2</sub> max, the body's ability to taken in and utilize oxygen, begins to decline at about day 10 of no training, but then continues to decrease over time. Significant reductions in VO<sub>2</sub> max begin to occur within 2 to 4 weeks of detraining. This immediate decline is related to a decreased cardiac output and decreased blood volume<sup>1</sup>. Studies of runners show VO<sub>2</sub> max drops about 6% after 4 weeks<sup>2</sup>, 19% after 9 weeks<sup>3</sup> and by 11 weeks of no running, drops by 20-25%! However, any deficit caused by taking a couple of weeks off at the end of the season or for an injury, can be made up with a few weeks of good training. Mujika (2000) from a cardio respiratory perspective, within 4-8 weeks of suspended training, blood volume, stroke volume and cardiac output

decrease. The body loses its ability to move large volumes of blood. This occurs partly because heart muscle size can actually decrease over time. Less muscle mass impairs the heart's ability to contract forcefully. Maximal heart rate increases, and at submaximal intensities, heart rate response is higher. Recovery heart rate also steadily increases as time off increases. Ventilatory efficiency will diminish after short layoffs from training.

### Conclusions

From the analysis of the data the following conclusions are drawn,

1. Aerobic training group was possessed greater cardio respiratory endurance than the physical training group.

2. Aerobic training group was possessed greater muscular endurance than the physical training group.
3. During the detraining period, the effect of muscular endurance and cardio respiratory endurance of physical training group has decreased faster when compare to the aerobic training group.

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