

EFFECT OF AEROBIC TRAINING RESISTANCE TRAINING AND CONCURRENT TRAINING ON VO₂ MAX AMONG COLLEGE BOYS

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ABSTRACT

The purpose of the study was to find out the effect of aerobic training, resistance training and concurrent training Vo₂ max among collegel boys. To achieve this purpose of the study, sixty college students were selected as subjects who were from the Acharya Nagarjuna University affiliated Colleges in Guntur. The selected subjects were aged between 18 to 22 years. They were divided into four equal groups of fifteen each, Group I underwent aerobic training, Group II underwent resistance training, Group III underwent concurrent training and Group IV acted as control i.e they did not participate in any special training apart from their regular curricular activities. The subjects were tested on selected criterion variable such as Vo₂ max prior to and immediately after the training period. The selected criterion variable such as Vo₂ max was determined through treadmill exercise. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was a significant difference among the experimental and control group on Vo₂ max.

KEYWORDS: Vo₂ max -aerobic training-resistance training-concurrent training-sports.

1. INTRODUCTION

The basic objective of diversions planning is to extend distinctive genuine structures to acknowledge positive modification in order to enhance wearing execution. To achieve this objective, guides and contenders methodically applied different planning measures including over-weight, distinction and development, dealt with out what is typically named periodisation. The utilization of these gauges incorporates the control of various program plan factors including choice of movement, demand of planning works out/works out, getting ready power (load and emphasis), rest periods among sets and activities/exercises and getting ready repeat and volume in order to give times of lift and recovery, with the successful equality of these components realizing positive modification. Enthusiastic exercise insinuates practice that incorporates or improve oxygen use by the body. High-affect getting ready extended cardio-respiratory constancy, which therefore extended Vo₂ max, by virtue of it extended component of hemoglobin. Hindrance getting ready is a basic bit of

an adult work out timetable and of a sufficient capacity to overhaul quality, strong constancy and keep up fat free mass. Resistance getting ready incorporates practice in which the muscles apply a power against an outside load. It is most normally suggested as weight planning. Such a planning program should be individualized, dynamic and unequivocal to the extent the way in which muscles are presumably going to be used in the picked amusement. The physiological response to dynamic energetic exercise is a development in oxygen usage and heartbeat that parallels the intensity of the constrained development and a curvilinear augmentation in stroke volume. There is a dynamic addition in systolic circulatory strain, with upkeep of or a slight decrease in the diastolic heartbeat and a specialist reaching out of the beat weight. The cardiovascular framework made out of the heart, veins and blood, reacts typically to the expanded requests of activity. With couple of exemptions, the cardiovascular reaction to practice is straightforwardly relative to the skeletal muscle oxygen requests for some random rate of work and oxygen take-up (VO₂) increments directly with expanding rates of

work. An individual's most extreme oxygen take-up (VO₂ max) is an element of cardiovascular yield (Q) increased by the blood vessel blended venous oxygen (A-VO₂) contrast. Heart yield in this way assumes a vital job in taking care of the oxygen requests for work. As the rate of work increments in an about straight way to meet the expanding the oxygen request, however just up to the point where it achieves its maximal limit (Q max). VO₂ max (additionally maximal oxygen utilization, maximal oxygen take-up, top oxygen take-up or maximal high-impact limit) is the greatest rate of oxygen utilization as estimated amid gradual exercise, most regularly on a mechanized treadmill.[1][2] Maximal oxygen utilization mirrors the vigorous physical fitness of the individual, and is a critical determinant of their perseverance limit amid delayed, sub-maximal exercise. The name is gotten from V - volume, O₂ - oxygen, max - most extreme. VO₂ max is communicated either as a flat out rate in (for instance) liters of oxygen every moment (L/min) or as a relative rate in (for instance) milliliters of oxygen per kilogram of weight every moment (e.g., mL/(kg•min)). The last articulation is frequently used to look at the execution of continuance sports competitors. In any case, VO₂max by and large does not differ straightly with weight, either among people inside an animal groups or among species.

1.1 Objectives of the study: The main objective of the study was to assess the effect of aerobic training, resistance training and concurrent training on Vo₂ max which would help to enhance physical fitness of college boys. The present study was designed to obtain the data on the college boys from Acharya Nagarjuna University.

1.2 Statement of the problem

The purpose of the study was to determine the effect of aerobic training, resistance training and concurrent training on Vo₂ max among college boys.

1.3 Delimitations

1. The study was delimited to Acharya Nagarjuna University affiliated colleges.

2. The study was delimited to 60 college students, their age was 18 to 22 years.

3. The study was restricted to the dependent variable is Vo₂ max and independent variables are aerobic training, resistance training and concurrent training.

1.4 Significance of the Study

1. The findings of the study may be helpful for college students to apply aerobic, resistance and concurrent training which will help in better health and fitness.

2. The findings of the study would be helpful for the exercise physiologist to know the role of Vo₂ max influence their physical fitness.

3. The results of the study may be helpful to fitness trainers, coaches, physical educationist and exercise physiologists to design proper training protocol for other populations.

2. METHODOLOGY

In the present examination all of the understudies thinking about in higher enlightening establishments' of Acharya Nagarjuna University district were considered as masses for the examination. An agent trial of 60 students in the age of 18-22 years was picked as test for the examination. The picked individuals were isolated into four social events. Social occasion I encountered oxygen devouring getting ready, group II experienced resistance planning, hoard III experienced synchronous getting ready and assembling IV go about as control gathering. The test clusters experienced two months of planning in their particular exercise. For this examination subordinate variable is Vo₂ max.

2.1 Test Administration – Estimation of Vo₂ max

VO₂ max (maximal oxygen uptake) was predicted using a sub maximal treadmill test on a motor driven treadmill. The test began at a speed with which each subject could jog comfortably. After 3 minutes when a steady state heart rate (HR) was achieved, the speed and heart rate was recorded VO₂ max was predicted using the following formula.

Scoring

The estimated VO₂ max can be calculated in ml/kg/min.

$$\text{VO}_2 \text{ max} = 54.07 - 0.1938 \times \text{Body weight} + (4.47 \times \text{Speed}/1.6) - 0.1453 \times \text{heart rate} + 7.62 \times \text{gender}$$
 where: speed = km/h
 gender = 1 for men, 0 for women
 body weight = kg.

2.2 Analysis of Data: The data obtained were analyzed by analysis of covariance (ANCOVA). Analysis of covariance was computed for any number of experimental groups, the obtained 'F' ratio compared with critical F value for significance. When the F ratio was found to be significant, scheffe's post hoc test was used to find out the paired mean significant difference.

3. RESULTS

Findings: The statistical analysis comparing the initial and final means of Vo₂ max due to aerobic, resistance and concurrent training have been presented in Table I.

Table. I: Computation of Analysis of Covariation ON VO₂ MAX.

Test	E.G. I	E.G. II	E.G. III	C.G.	F
PRE TEST	37.45	37.25	37.83	38.47	1.46
POST TEST	42.59	41.21	42.16	38.33	19.27*
ADJUSTED	42.85	41.65	42.09	37.70	124.88*

(The table value required for significance at .05 level with df 3 & 56 is 2.70 and 3 & 55 is 2.72).

Table I shows the dismembered data of Vo₂ max. The Vo₂ max pre suggests were 37.45 for the oxygen devouring getting ready social occasion, 37.25 for the resistance planning gathering, 37.83 for synchronous getting ready get-together and 38.47 for the control gathering. The resultant 'F' extent of 1.46 was not enormous at .05 levels demonstrating that the three social occasions were no important assortment. The post test suggests were 42.59 for the oxygen expending getting ready social affair, 41.21 for the restriction planning gathering, 42.16 for concurrent getting ready get-together and 38.33 for the control gathering. The resultant 'F' extent of 19.27 at .05 level showing that was

an imperative differentiation. The qualification between the reasonable post-test strategies for 42.85 for the vivacious getting ready social affair, 41.65 for the block planning gathering, 42.09 for synchronous planning gathering and 37.70 for the control collect yield on 'F' extent 124.88 which was basic at .05 level. The consequences of the investigation demonstrate that there is a critical distinction among vigorous preparing, opposition preparing, simultaneous preparing and control bunches on the Vo₂ max. To figure out which of the matched methods had a critical distinction, Scheffe's post-hoc test was connected and the outcomes are displayed in Table II.

Table. II: Scheffe's test for the Difference Between the Adjusted Post-Test Paired Means OF VO₂ MAX.

Adjusted Post-Test Means				Mean Diff.	Class Interval
Aerobic Training	Resistance Training	Concurrent Training	Control Group		
42.85	41.65			1.20*	0.81
42.85		42.09		0.75	
42.85			37.70	5.14*	
	41.65	42.09		0.45	
	41.65		37.70	3.95*	
		42.09	37.70	4.39*	

The balanced post test mean distinction of Vo₂ max between oxygen consuming preparing gathering and obstruction preparing bunch was 1.20, vigorous preparing gathering and control assemble was 5.14, opposition preparing gathering and control aggregate was 3.95 and simultaneous preparing gathering and control amass was 4.39, which were higher than the required certainty interim estimation of 0.81. Nonetheless, all the trial bunches have critical distinction when contrast with the control gathering and furthermore there was a noteworthy contrast among vigorous and opposition preparing gathering. There was no huge distinction between the oxygen consuming opposition preparing gathering and simultaneous preparing gathering and furthermore obstruction preparing gathering and simultaneous preparing gathering.

4. DISCUSSION/CONCLUSIONS

The results of the study proved that there were significant differences between control group and aerobic training, resistance training and concurrent training group. The eight weeks of experimental treatment significantly influence on Vo₂ max content in college students. However, there were no significant difference between experimental groups. The above

results are supported by Mughal and others (2001) and Zabihoiah Tarasi and others (2011).

5. RECOMMENDATIONS

1. It was recommended that adequate steps may be taken to include aerobic, resistance and concurrent training in the physical education curriculum as these exercises significantly improves the Vo₂ max of the subjects.
2. Similar study may be conducted on a larger population.
3. Similar study may be undertaken and its influence on psychological and biochemical parameters may be assessed.

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