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Effect of aqua aerobic and floor aerobic on selected fitness variables among college men students

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Abstract

The purpose of this study was to find out the effect of aqua aerobic and floor aerobic on selected fitness variables among college men students. The selected subjects 60 were randomly divided into groups equally of which experimental Group – I underwent aqua aerobic, group – II underwent floor aerobics and group – III acted as Control Group. The subjects selected for this study were in the age group of 20 – 25 years. The subjects were divided into three groups. Each group consisting of twenty each, namely, experimental group I, experimental group II and control group. The following fitness variables were selected as dependent variables cardiovascular endurance, muscular Strength and muscular endurance the following variables were selected as independent variables aqua aerobics and floor aerobics. The data collected on selected criterion variables were subjected to statistical analyse using analysis of covariance (ANCOVA) to find out the significant difference if any between the groups on selected variables separately.

Keywords: Aerobics, aqua aerobics, floor aerobics

Introduction

Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. (Concise Oxford English Dictionary) Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming up period, followed by at least 20 minutes of moderate to intense exercise involving large muscle groups, and a cooling down period at the end. Both the term and the specific exercise method were developed by Kenneth H. Cooper, M.D., an exercise physiologist, and Col. Pauline Potts, physical therapist, both in the United States Air Force. Dr. Cooper, an avowed exercise enthusiast, was personally and professionally puzzled about why some people with excellent muscular strength were still prone to poor performance at tasks such as long-distance running, swimming, and bicycling. He began measuring systematic human performance using a bicycle ergo meter, and began measuring sustained performance in terms of a person's ability to use oxygen. His ground breaking book, *Aerobics*, was published in 1968, and included scientific exercise programs using running, walking, swimming and bicycling. The book came at a fortuitous historical moment, when increasing weakness and inactivity in the general population was causing a perceived need for increased exercise. It became a bestseller. Cooper's data provided the scientific baseline for almost all modern aerobics programs, most of which are based on oxygen-consumption equivalency. (World Book of Encyclopaedia, 1993) [4] Aerobic exercise and fitness can be contrasted with anaerobic exercise, of which strength training and weight training are the most salient examples. The two types of exercise differ by the duration and intensity of muscular contractions involved, as well as by how energy is generated within the muscle. Initially during aerobic exercise, glycogen is broken down to produce glucose, which is then broken down using oxygen to generate energy. In the absence of these carbohydrates, fat metabolism is initiated instead. The latter is a slow process, and is accompanied by a decline in performance level. This gradual switch to fat as fuel is a major cause of what marathon runner's call "hitting the wall". Anaerobic exercise, in contrast, refers to the initial phase of exercise, or to any short burst of intense exertion, in which the

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glycogen or sugar is consumed without oxygen, and is a far less efficient process. Operating an aerobically, an untrained 400 meter sprinter may "hit the wall" short of the full distance (Bouchard, et.al. 1999) [5]. Fitness in the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel and do our best. More specifically, it is "the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being" (Singh, 1991) [7].

Methodology

Sixty subjects were randomly selected from Chennai and divided into three groups equally of which experimental group – I underwent aqua aerobic, group – II underwent floor aerobic and group – III acted as control group. The subjects age ranged from 20 to 25 years. The fitness variables were

selected as dependent variables Cardiovascular endurance was measured through Cooper’s 12 Minute Run / Walk test Muscular Strength was measured through push ups Muscular Endurance was measured through half squat jump test and they performed touch out, side to side, double side to side, grapevine, cross over aqua, jump on the spot, knee curl, front kick, knee and arm lift, side kick were selected as independent variables aqua aerobics and floor aerobics.

The initial and final scores in selected variables were subjected to statistical treatment using Analysis of Covariance (ANCOVA) to find out whether the mean differences were significant or not through the statistical packages for social sciences (SPSS, version 19.0 for Windows XP) was used to analyze the data. An alpha level of 0.05 was used to determine statistical significance.

Results and discussions

The fitness variable, cardiovascular endurance was measured through Cooper’s 12 minutes run / walk test. The results on the effect of twelve weeks varied aerobic exercises are presented in Table 1.

Table 1: Computation of Analysis of Covariance on Cardiovascular Endurance

	Floor aerobics	Aqua aerobics	Control group	Source of variance	Sum of squares	df	Mean square	Obtained F ratio
Pre-test mean	1789.00	1819.75	1882.50	Between	70835.83	2	45417.92	2.91
				Within	889778.75	57	15610.15	
Post-test mean	2303.50	2347.00	1883.75	Between	7617885.83	2	1308942.92	79.91*
				Within	933668.75	57	16380.15	
Adjusted post-test mean	2318.13	2350.77	1865.35	Between	2711072.31	2	1355536.15	92.27*
				Within	822652.64	57	14690.23	
Mean difference	514.50	527.25	1.25					

(Scores in meters)

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16 *Significant

The obtained F value on pre test scores 2.91 was less than the required F value of 3.16 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F value 79.91 was greater than the required F value of 3.16. This proved that the differences between the post-test

means of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 92.27 was greater than the required F value of 3.16. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe’s Confidence Interval test. The results were presented in Table 2.

Table 2: Scheffe’s Confidence Interval Test Scores on Cardiovascular Endurance

Means			Mean Difference	Required C I
Floor aerobics	Aqua aerobics	Control group		
2318.13	2350.77		32.64	95.44
2318.13		1865.35	452.78*	95.44
	2350.77	1865.35	485.41*	95.44

(Scores in meters)

*significant

The post hoc analysis through Scheffe’s Confidence test proved that due to twelve weeks treatment the floor aerobics exercises group and aqua aerobics exercises group improved cardiovascular endurance than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group, namely aqua aerobics group and floor aerobics group proved that there was no significant difference. The findings of this study is in agreement with the findings of Vikić, et al. (2007) who analyzed the impact of special programmed physical education including dance, aerobics and rhythmic gymnastics on the development of motor and functional abilities and

found significant development of coordination/agility and specific rhythm coordination, functional aerobic ability, repetitive and explosive strength and flexibility, along with significant reduction of overweight and adipose tissue. In this study, the obese engineering college students’ weight and adipose tissue would have significantly reduced and strength and flexibility improved because of varied aerobic exercises which enabled the subjects to perform significantly better in 12 minutes run / walk test.

The fitness variable, muscular strength was measured through push ups. The results on the effect of twelve weeks varied aerobic exercises are presented in Table 3.

Table 3: Computation of Analysis of Covariance on Muscular Strength

	Floor aerobics	Aqua aerobics	Control group	Source of variance	Sum of squares	df	Mean square	Obtained F ratio
Pre-test mean	18.65	18.80	19.70	Between	12.9	2	6.45	2.97
				Within	123.75	57	2.17	
Post-test mean	20.45	20.55	19.95	Between	4.13	2	2.07	0.86*
				Within	136.88	57	2.40	
Adjusted post-test mean	20.72	20.72	19.51	Between	17.52	2	8.76	6.04*
				Within	81.20	56	1.45	
Mean difference	1.80	1.75	0.25					

(Scores in Numbers)

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16 *Significant

The obtained F value on pre test scores 2.97 was less than the required F value of 3.16 to be significant at 0.05 level. This proved that there was no significant difference among the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there no was significant difference among the groups, as the obtained F value 0.86 was less than the required F value of 3.16. This proved that there was no significant difference among the post-test means of the subjects.

The obtained F value of 6.04 was greater than the required table F value of 3.16. This proved that there was significant differences among the means due to twelve weeks varied aerobic exercises on fitness variable, muscular strength.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 4.

Table 4: Scheffe's Confidence Interval Test Scores on Muscular Strength

Means			Mean Difference	Required C I
Floor aerobics	Aqua aerobics	Control group		
20.72	220.72		0.00	0.95
20.72		19.51	1.20*	0.95
	20.72	19.51	1.20*	0.95

(Scores in Numbers)

* Significant

The post hoc analysis through Scheffe's Confidence test proved that due to twelve weeks treatment the floor aerobics exercises group and aqua aerobics exercises group improved muscular strength than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group, namely aqua aerobics group and floor aerobics group proved that there was no significant difference.

The findings of this study is in agreement with the findings of Vikić, *et al.* (2007) who analyzed the impact of special programmed physical education including dance, aerobics and rhythmic gymnastics on the development of motor and functional abilities and found significant development of coordination/agility and specific rhythm coordination, functional aerobic ability, repetitive and explosive strength and flexibility, along with significant reduction of overweight and adipose tissue 171 The findings of the present study is also in agreement with the research findings of Lewis (2005) who observed improvements in submaximal heart and respiration rates, aerobic performance, muscle strength and endurance, gross motor skills, due to aerobic exercises. In this study, the obese engineering college students' weight and adipose tissue would have significantly reduced and strength and flexibility improved because of varied aerobic exercises which enabled the subjects to perform significantly better in push ups.

The fitness variable, muscular endurance was measured through half squat jumps. The results on the effect of twelve weeks varied aerobic exercises is presented in Table 5.

Table 5: Computation of Analysis of Covariance on Muscular Endurance

	Floor aerobics	Aqua aerobics	Control group	Source of variance	Sum of squares	df	Mean square	Obtaine F ratio
Pre-test mean	22.65	22.80	23.70	Between	12.90	2	6.45	3.47*
				Within	10.59	57	1.86	
Post-test mean	25.40	25.00	24.10	Between	17.73	2	8.87	5.02*
				Within	10.60	57	1.76	
Adjusted post-test mean	25.67	25.17	23.66	Between	39.39	2	19.69	21.57*
				Within	51.13	56	8.91	
Mean difference	2.75	2.20	0.40					

(Scores in Numbers)

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16 *Significant

Table 6 shows that the pre-test mean scores of muscular endurance of aqua aerobics exercises group was 22.65, floor aerobics group was 22.60 and control group was 23.70. The post-test means showed improvement over the pre test scores due to twelve weeks varied aerobic exercises and mean values recorded were 25.40, 25.0 and 24.10 respectively.

The obtained F value on pre test scores 3.47 was greater than the required F value of 3.16 to be significant at 0.05 level. This proved that there was significant difference among the groups at initial stage.

The post test scores analysis proved that there was significant

difference among the groups, as the obtained F value 5.02 was greater than the required F value of 3.16. This proved that there was significant difference among the post-test means of the subjects. The obtained F value of 21.57 was greater than the required table F value of 3.16. This proved that there was significant differences among the means due to twelve weeks varied aerobic exercises on fitness variable, muscular endurance. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table VIII

Table 6: Scheffe's Confidence Interval Test Scores on Muscular Endurance

Means			Mean Difference	Required C I
Floor aerobics	Aqua aerobics	Control group		
25.67	25.17		0.50	0.75
25.67		23.66	2.02*	0.75
	25.17	23.66	1.52*	0.75

(Scores in Numbers)

The multiple mean comparisons shown in Table VIII proved that there existed significant differences between the adjusted means of aqua aerobics and control group, floor aerobics and control group. There was no significant difference between aqua aerobics and floor aerobics groups.

Conclusions

1. Aqua and Floor aerobic exercises, significantly improved fitness variable, cardiovascular endurance of the students.
2. There was no significant difference between floor aerobic and aqua aerobic exercises.
3. Aqua and Floor aerobic exercises, significantly improved muscular strength of the college students.
4. There was no significant difference between floor aerobic and aqua aerobic exercises.
5. Aqua and Floor aerobic exercises significantly improved muscular endurance of the college students.
6. There was no significant difference between floor aerobic and aqua aerobic exercises.

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