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Effect of Aerobic Dance, Aquarobics and Combined Training on Selected Bio-Motor Variables of Engineering College Students

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Abstract

The purpose of the study was to find out the effect of aerobic dance, aquarobics and combined training on selected bio-motor variables of engineering college students. To achieve the purpose of the present study, forty five engineering college students from Tamilnadu, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen each. Group I acted as Experimental Group I (Aerobic dance training), Group II acted as Experimental Group II (Aquarobics training) Group III acted as Experimental Group II (Combined training). The study was formulated as a true random group design, consisting of a pre-test and post-test. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their selected variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The combined training had shown significant improvement in all the selected biomotor variables of engineering college students than the aerobic dance and aquarobics training group.

Keywords: Aerobic, Aquarobic, Speed, Shoulder Strength, Flexibility.

Introduction

Aerobic exercise is a moderate intensity workout that extends over a certain period of time and uses oxygen in this process. Aerobics has become the most happening workout trend among the youth. Not only is performing aerobic exercise interesting, but also is very beneficial for health. There are different types of aerobics like fitness walking, jogging, swimming, kickboxing, inline skating, bicycling etcetera. In line skating or rollerblading is one of the most popular sports that are luring millions of people into trying it. It helps to strengthen lower back and works a great deal in enhancing cardiovascular development. Kickboxing is extremely useful for quick weight loss, as it helps in burning about 350-450 calories during a 50 minute workout session. At the initial level, kickboxing consists of some basic stretches and cardio warm up.

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, but in its absence, fat metabolism is initiated instead. The latter is a slow process, and is accompanied by a decline in performance level. The switch to fat as fuel is a major cause of what marathon runners call "hitting the wall". Anaerobic exercise, in contrast, refers to the initial phase of exercise, or any short burst of intense exertion, in which the glycogen or sugar is consumed without oxygen, and is a far less efficient process. Operating anaerobically, an untrained 400 meter sprinter may "hit the wall" short of the full distance (Cooper, 1985).

Aquarobics may also be called aqua aerobics or water aerobics. It is essentially comparable to an aerobics class set in a gym, but instead takes place in a pool. Some aquarobics classes are well suited to even non-swimmers, while others include some portions of lap swimming. The principles behind aquarobics are two-fold. Traditional aerobics classes cause significant stress to the body because the feet are landing on hard wood, or worse, concrete floors. Aquarobics, because it takes place in water, means less impact to the bones and joints. Additionally, aquarobics is a bit more work for the body because one has to move one's body through the resistance of water, which burns more calories, more quickly. A thirty-minute jog on land will burn about 240 calories, while the same jog in the water will burn about 100 calories more.

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Methodology

The purpose of the study was to find out the effect of aerobic dance, aquarobics and combined training on selected bio-motor variables of engineering college students. To achieve the purpose of the present study, forty five engineering college students from Tamilnadu, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen each. Group I acted as Experimental Group I (Aerobic dance training), Group II acted as Experimental Group II (Aquarobics training) Group III acted as Experimental Group II (Combined training). The study was formulated as a true random group design, consisting of a pre-test and post-test. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their selected variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Results

Table I. Computation of analysis of covariance of mean of aerobic dance, aquarobics and combined training groups on speed

	ADT	AQT	CT	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	7.55	7.59	7.58	**BG**	0.01	2	0.008	0.94
				WG	0.33	42	0.008	
Post-Test Means	7.22	7.23	7.03	**BG**	0.41	2	0.20	73.16*
				WG	0.11	42	0.003	
Adjusted Post-Test eans	7.22	7.24	7.03	**BG**	0.41	2	0.20	71.42*
				WG	0.11	41	0.003	

An examination of table - I indicated that the pre test means of aerobic dance training, aquarobics and combined training groups were 7.55, 7.59 and 7.58 respectively. The obtained F-ratio for the pre-test was 0.94 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant differences between the experimental and combined training training groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of the aerobic dance training, aquarobics and combined training groups were 7.22, 7.23 and 7.03 respectively. The obtained F-ratio for the post-test was 73.16 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of the aerobic dance training, aquarobics and combined training groups were 7.22, 7.24 and 7.03 respectively. The obtained F-ratio for the adjusted post-test means was 71.42 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on speed. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-II.

Table II. The scheffe's test for the differences between the adjusted post test paired means on speed

Adjusted Post-test means			Mean Difference	Required CI
Aerobic Dance Training	Aquarobics Training	Combined Training		
7.22	7.24	---	0.02	0.05
7.22	---	7.03	0.19*	
---	7.24	7.03	0.21*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in table II proved that there existed significant differences between the adjusted means of aerobic dance training with combined training group (0.19), aquarobics training with combined training group (0.21). There was no significant difference between aerobic dance training and aquarobics training group (0.02) at 0.05 level of confidence with the confidence interval value of 0.05.

Figure I. Pre post and adjusted post test differences of the aerobic dance, aquarobics and combined training groups on speed

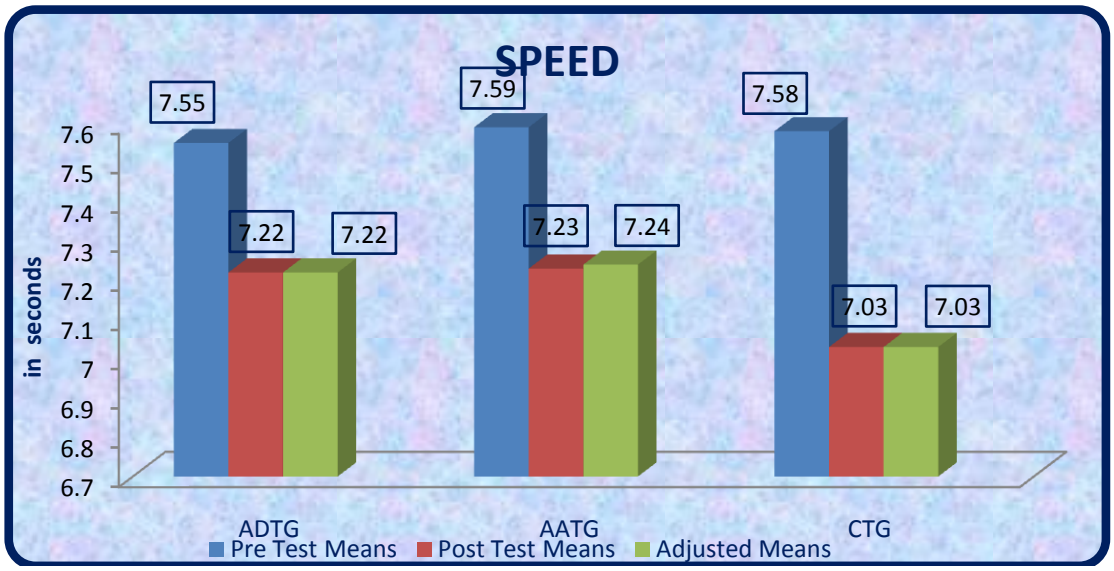


Table III. Computation of analysis of covariance of mean of aerobic dance, aquarobics and combined training groups on shoulder strength

	ADT	AQT	CT	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	8.26	8.33	8.60	**BG**	0.93	2	0.46	0.42
				WG	45.86	42	1.09	
Post-Test Means	10.40	10.86	13.66	**BG**	93.64	2	46.82	48.35*
				WG	40.66	42	0.96	
Adjusted Post-Test Means	10.38	10.85	13.69	**BG**	94.56	2	47.28	48.93*
				WG	39.61	41	0.96	

An examination of table – III indicated that the pre test means of aerobic dance training, aquarobics and combined training groups were 8.26, 8.33 and 8.60 respectively. The obtained F-ratio for the pre-test was 0.42 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant differences between the experimental and combined training groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of the aerobic dance training, aquarobics and combined training groups were 10.40, 10.86 and 13.66 respectively. The obtained F-ratio for the post-test was 48.35 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of the aerobic dance training, aquarobics and combined training groups were 10.38, 10.85 and 13.69 respectively. The obtained F-ratio for the adjusted post-test means was 48.93 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on shoulder strength. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table IV.

Table IV. The scheffe's test for the differences between the adjusted post test paired means on shoulder strength

Adjusted Post-test means			Mean Difference	Required CI
Aerobic Dance Training	Aquarobics Training	Combined Training		
10.38	10.85	---	0.47	0.90
10.38	---	13.69	3.31*	
---	10.85	13.69	2.84*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in table IV proved that there existed significant differences between the adjusted means of aerobic dance training with combined training group (3.31), aquarobics training with combined training group (2.84). There was no significant difference between aerobic dance training and aquarobics training group (0.47) at 0.05 level of confidence with the confidence interval value of 0.90.

Figure II. Pre post and adjusted post test differences of the aerobic dance aquarobics and combined training groups on shoulder strength

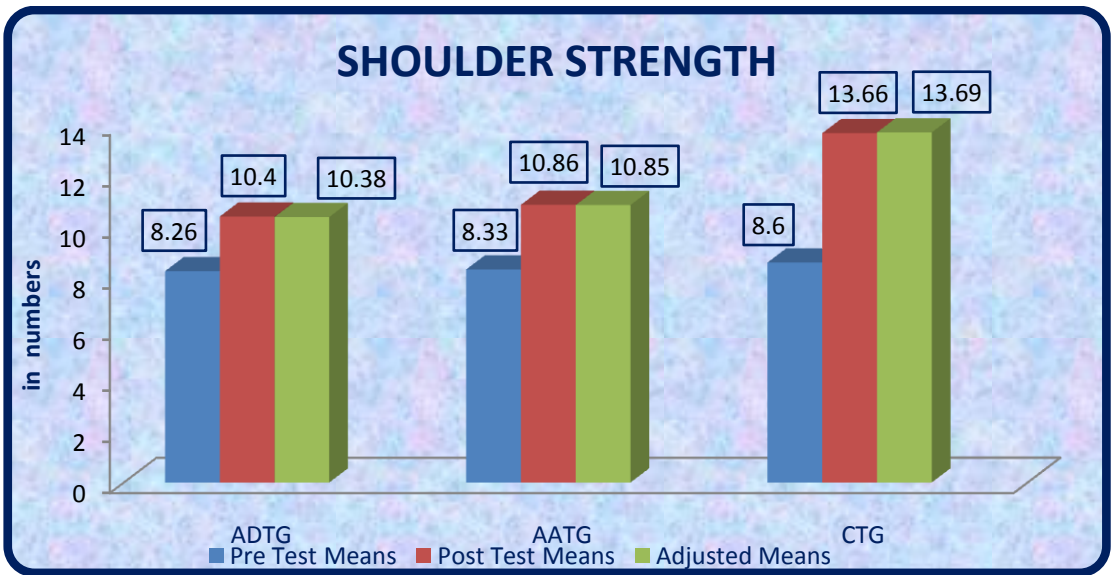


Table V. Computation of analysis of covariance of mean of aerobic dance, aquarobics and combined training groups on flexibility

	ADT	AQT	CT	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	34.26	34.46	34.33	**BG**	0.40	2	0.20	0.13
				WG	61.60	42	1.46	
Post-Test Means	39.53	39.80	44.06	**BG**	194.13	2	97.06	62.65*
				WG	65.06	42	1.54	
Adjusted Post-Test Means	39.52	39.78	44.08	**BG**	195.67	2	97.838	63.16*
				WG	63.50	41	1.54	

An examination of table - V indicated that the pre test means of aerobic dance training, aquarobics and combined training groups were 34.26, 34.46 and 34.33 respectively. The obtained F-ratio for the pre-test was 0.13 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and combined training groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of the aerobic dance training, aquarobics and combined training groups were 39.53, 39.80 and 44.06 respectively. The obtained F-ratio for the post-test was 62.65 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of the aerobic dance training, aquarobics and combined training groups were 39.52, 39.78 and 44.08 respectively. The obtained F-ratio for the adjusted post-test means was 63.16 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on flexibility. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-VI.

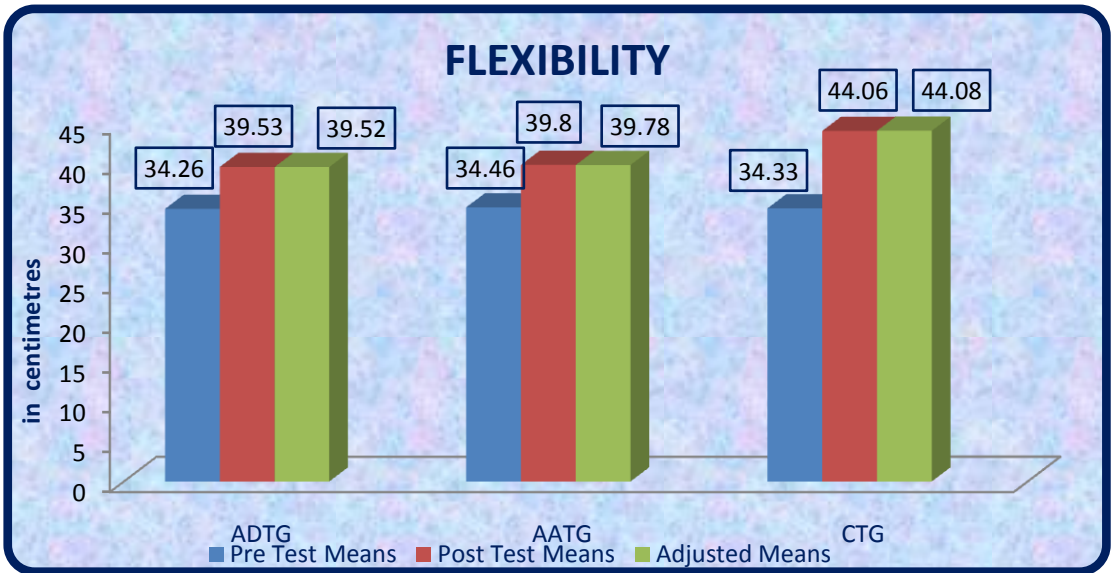
Table VI. The scheffe's test for the differences between the adjusted post test paired means on flexibility

Adjusted Post-test means			Mean Difference	Required CI
Aerobic Dance Training	**Aquarobics Training**	**Combined training group**		
39.52	39.78	---	0.26	0.26
39.52	---	44.08	4.56*	
---	39.78	44.08	4.30*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in table VI proved that there existed significant differences between the adjusted means of aerobic dance training with combined training group (4.56), aquarobics training with combined training group (4.30). There was no significant difference between aerobic dance training and aquarobics training group (0.26) at 0.05 level of confidence with the confidence interval value of 0.26.

Figure III. Pre post and adjusted post test differences of the aerobic dance aquarobics and combined training groups on flexibility



Conclusions

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

1. The aerobic dance training had shown significant improvement in all the selected bio-motor variables of engineering college students after undergoing aerobic dance training for a period of twelve weeks.
2. The aquarobics training had shown significant improvement in all the selected bio-motor variables of engineering college students after undergoing aquarobics training for a period of twelve weeks.
3. The combined training had shown significant improvement in all the selected bio-motor variables of engineering college students after undergoing combined training for a period of twelve weeks.
4. The combined training had shown significant improvement in all the selected bio-motor variables of engineering college students than the aerobic dance and aquarobics training group.

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