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Aerobic Exercise on Muscular Endurance, Cardio Respiratory Endurance, Flexibility and Body Mass Index among Adolescents - An Investigation

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Abstract

The purpose of the study was to find out the effect of aerobic exercise on selected health related physical fitness variables such as muscular endurance, cardio respiratory endurance, flexibility and Body mass index of male adolescents. To achieve the purpose of this study thirty school boys were selected at random from Tirunelveli District. Their age ranged from 14 to 17 years. They were divided in to two groups and designed as Experimental group 'A' and Control group 'B' The Experimental group-A was given aerobic and calisthenics exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group-B is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. The data were collected before and after the exercises programme and statistically analyzed by using analysis of covariance (ANCOVA).The result of this study indicated that muscular endurance, cardio respiratory endurance significantly improved and also it was observed that Body mass Index significantly reduced.

Keywords: Aerobic Exercise, Body Mass Index, Adolescents.

Introduction

Low-impact aerobics are those movements involving large muscle groups used in continuous rhythmic activity. Physical activity is important for physical health, emotional well-being, and achieving a healthy weight. Physical activity may help you control your weight by using excess calories that would otherwise be stored as fat. Aerobic activity is an important adoption to low and moderate-intensity exercise programme and low impact aerobic exercise include activities of muscle strengthens and cardio respiratory fitness. Cardio vascular function, the first physical fitness component, is regarded by fitness experts as the most important of the fitness qualities, particularly in the area of health related physical fitness. The similar study based on study speiser (2005) determine though obesity of subjects should be logically determined by the amount of accumulated body fat, researchers and clinicians have frequently used body mass index (BMI) as obesity estimates because of low cost and simplicity of measurement as compare to measures of adiposity. The vigorous physical activity improves cardiovascular function and thus reduces the incidence of circulatory disease (Bucher,1983) Aerobic exercises is one of the best exercise any kind of people because it is not involved vigorous body movements through this exercise one can able to achieve optimum health in a relatively short period. Bernard (1984) Russell (1982) and Agro (1998) stated that aerobic exercise program significantly reduced the sum of skin folds and significantly improved such as flexibility, muscular endurance and cardio respiratory endurance. Physical exercise may produce extensive change in the respiratory system, the increased stretching of the lung tissue can accommodate more air, so the ;amount of vital capacity may be increased after a period of training programme (Miller and Morehouse,1971)

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Methodology

The purpose of the study was to find out the effect of aerobic exercise on selected health related physical fitness variables such as muscular endurance, cardio respiratory endurance, flexibility and Body mass index of male adolescents**.** To achieve the purpose of this study thirty school boys were selected at random from Tirunelveli Districts. Their age ranged from 12 to 15 years. They were divided in to two groups and designed as Experimental group 'A' and Control group 'B' The Experimental group-A was given aerobic and calisthenics exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group-B is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. To find out the muscular endurance modified sit-ups was used, Cardio-respiratory endurance was assessed by coopers 12 minutes run and walk test, flexibility was measured

by sit and reach test and for Body mass index was calculated by using the measurement of height and weight. Height was measured using a stadiometer to the nearest 1.0cm without shoes. Body weight was measured to the nearest 0.1 kg with weighing machine (BMI=Weight(kg)/Height$M^{2)}$ were used. The data were collected before and after the exercises programme and statistically analyzed by using analysis of covariance (ANCOVA).

Analysis of Data

The data of the above mention variables were collected prior to the training (Pre test) and after twelve weeks of aerobic exercise (Post test) were statistically examined by analysis of covariance and the result have been presented here.

Results

Table I. Analysis of covariance for pre test and post test on muscular endurance of control and experimental group

	Control Group	Experimental Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
Pre Test Mean	72.05	74.90	Between	81.225	1	81.225	1.052
SD	10.92306	5.91964	Within	2932.750	28	77.178	
Post Test Mean	74.85	67.90	Between	483.025	1	483.025	8.673*
SD	9.08020	5.37930	Within	2116.350	28	55.693	
Adjusted Post Test Mean	75.551	67.199	Between	678.799	1	678.799	17.858*
			Within	1406.400	27	38.011	

Table II. Analysis of covariance for pre test and post test on cardio respiratory endurance of control and experimental group

	Experimental Group	Control Group	Source Of Variance	Sum of Squares	df	Mean Squares	'F'
Pre-test Mean	1873.33	1926.66	Between	21333.33	1	21333.3	0.22
SD	357.50	263.13	Within	2758666.7	28	98523.81	
Post-test Mean	2100.00	1866.66	Between	408333.33	1	408333.33	4.59*
SD	364.50	212.69	Within	2493333.3	28	89047.67	
Adjusted Post-test Mean	2124.58	1842.08	Between	593968.95	1	593968.95	108.0*
			Within	148525.05	27	5500.92	

Table III. Analysis of covariance for pre test and post test on flexibility of control and experimental group

	Experimental Group	Control Group	Source Of Variance	Sum of Squares	df	Mean Squares	'F'
Pre-test Mean	14.17	13.70	Between	1.699	1	1.699	1.462
SD	1.06	1.09	Within	32.55	28	1.1636	
Post-test Mean	15.26	13.70	Between	18.57	1	18.57	17.338*
SD	1.00	1.09	Within	29.983	28	1.071	

Adjusted Post-test Mean	15.26	13.70	Between	9.787	1	9.787	38.79*
			Within	6.810	27	0.252	

Table IV. Analysis of covariance for pre test and post test on body mass index of control and experimental group

	Experimental Group	**Control Group**	**Source Of Variance**	**Sum of Squares**	**df**	**Mean Squares**	**'F'**
Pre-test Mean	21.49	22.0	Between	1.37	1	1.37	0.341
SD	2.00	2.01	Within	112.00	28	4.00	
Post-test Mean	20.40	22.32	Between	27.65	1	27.65	7.964*
SD	1.98	1.74	Within	97.20	28	3.5	
Adjusted Post-test Mean	20.40	23.32	Between	18.02	1	18.019	28.217*
			Within	17.241	27	0.639	

*significant at 0.05 level. (The table value required for significance at 0.05 level with df 1 and 27 is 4.20)

It was observed from the above tables that there was significant difference in adjusted post test at 0.05 level significance. It clearly indicates that the experimental group showed significant improvement than the control group on the selected physical fitness variables. These results logically reflect and it may be assumed that the aerobic exercise programme undertaken in this study have greater influence on improvement of the selected physical fitness variables.

Discussion on Findings

The result of the present study indicate that the aerobic exercise group improves significantly in the selected dependent variable namely muscular endurance, cardio respiratory endurance, flexibility and body mass Index. However control group do not show any improvement on the above said variable as it is not involved any of the specific training means. It is inferred from the results of the present study that all the dependent variables are significantly improved due to the influence of 12 weeks of aerobic exercises. The present study findings were also in line with the studies conducted by (Sheales 1987, Agro1998 and Testerman1985).

Conclusions

The result of the study reveals that the aerobic exercises are effective improving in muscular endurance, cardio respiratory endurance, flexibility and significantly reduced the body composition (body mass index) due to 12 weeks of aerobic exercise programme when compared with control group.

References

1. Agro R.A. (1988) 'The effect of low impact and high impact dance excises on selected fitness measures". Completed Research in Health, Physical Education and Recreation,p30-36
2. Bernard A.J. (1984), The effect of excises on fat and relative patterning of skin fold measurements'. Completed research in health, Physical Education and Recreation. p 125-127
3. Bucher ,Charles A, (1958) Administration of school health and physical Education programme,(2nd ed.)Saint Louis; The C.V. Mosby Company.
4. Russel, R.J. (1982), The effect of aerobic dance upon the cardiovascular fitness of women at Washington state University". Completed Research in Health Physical Education and Recreation" 112.
5. Millaer and Laurence, Morehouse . E (1971) Physiology of Exercise, (6th ed.), The C.V. Mosby Company Saint-Louis
6. Tester man E.P. "Training and detraining effect on selected Physic logical fitness in adult black women". Completed Research in Health, Physical education and Recreation, (November 1985); 28-32.