



Effect of aerobic dance with music on selected health related fitness parameters among adolescent school girls

Dr. Pintu Sil

Assistant Professor, State Institute of Physical Education for Women, Hastings House, Alipore, Kolkata, West Bengal, India

Abstract

Purpose: The purpose of the study was to find out the effectiveness of six weeks aerobic dance exercises with music on Selected Health Related Fitness Parameters among Adolescent School Girls.

Materials and Methods: A total of 20 adolescent girls student were randomly chosen from the class VIII of a Govt. secondary school of Kolkata. The age of the student was in between 13 to 14 years. The body fat percentage (PBF), muscular strength (MS) and muscular endurance (ME) were considered as criterion measure of this study. The instruments and tools used in this study to collect the data was AAHPERD Health Related Physical Fitness Test and skin fold calipers. Aerobic dance exercise programme was scheduled as five days per week basis for a period of six weeks continuously. The exercise set was repeated 4 times in each day. Duration of the exercise programme was 45 minutes per day. Single experimental group design was adopted for this study. The mean and standard deviation were used as descriptive statistics. Difference between post test means and pre test mean were computed by t-test. Only 0.05 level of significance was considered in this study. All calculations were done using Excel 2007 software.

Results: Results revealed that the pre-test mean value for PBF, MS and ME were 25.27, 22.52 Kg and 21.04 t/m respectively. The post-test mean value for PBF, MS and ME were 24.06, 27.61 Kg and 26.43 t/m respectively. The statistical calculations revealed that both the t-value for MS ($t=2.30$) and ME ($t=2.47$) for pre and post test were statistically significant ($p<0.05$). But the computed t-value for PBF ($t=0.33$) between pre and post test was found statistically insignificant ($p>0.05$).

Conclusion: On the basis of results the study was concluded that six-week aerobics dance practice has significant effect on muscular strength and muscular endurance but has insignificant effect on body fat percentage among the adolescent school girls.

Keywords: exercise benefits, aerobic dance, health related fitness, adolescent school girls

Introduction

Aerobic means "with oxygen", and refer to the use of oxygen in the body's metabolic or energy-generating process. Aerobic activity is any physical activity that makes sweat, causes to breathe harder and gets heart beating faster than at rest. It strengthens heart and lungs and trains cardiovascular system to manage and deliver oxygen more quickly and efficiently throughout the body^[1]. Aerobic exercise refers to exercise that involves or improve oxygen consumption by the body. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended period of moderate to intense exercise involving large muscle groups, and a cooling down period at the end.

During aerobic exercise, the large muscles in legs, hips and arms moves and body responds quickly by breathing faster and more deeply. The heartbeat accelerates, increasing blood flow to the muscles and lungs. Capillaries widen to take more oxygen to the active muscles and carry away carbon dioxide and lactic acid. During exercise the body releases endorphins, which are natural painkillers that create an enhanced sense of well-being. Aerobic exercise has a number of positive effects, from reducing health risks and maintaining healthy body weight, to managing chronic conditions and boosting mood. People who exercise aerobically may actually live longer than those who don't.

The "American Journal of Clinical Nutrition" in 1995 reported that adding aerobic exercise to a low-carb diet resulted in favorable effects on body composition, physical activity and total daily energy expenditure^[2]. Studies on effect of aerobic exercises are conducting worldwide and most of them have reported its positive benefits on health and well being. DeSouza *et al.* (2000)^[3] in their study indicated that regular aerobic exercise can prevent the age-associated loss in endothelium-dependent vasodilatation and restore levels in previously sedentary middle aged and older healthy men. This may represent an important mechanism by which regular aerobic exercise lowers the risk of cardiovascular disease in this population^[3]. Tanaka, *et al.* (2007)^[4] reported regular aerobic exercise modestly increases HDL-C level and helps to reduce the risk of cardiovascular disease partially through increasing serum levels of high-density lipoprotein cholesterol (HDL-C)^[4]. Results of the study conducted by DiLorenzo *et al.* (1999)^[5] indicated that exercise-induced increases in aerobic fitness have beneficial short-term and long-term effects on psychological outcomes^[5]. The purpose of the study was to find out the effectiveness of six weeks aerobic dance exercises on selected health related fitness parameters- body fat percentage, muscular strength and muscular endurance among adolescent school girls.

Materials and Methods

Subject: A total of 20 adolescent girls student were randomly chosen from the class VIII of a Govt. secondary school of Kolkata. The age of the student was in between 13 to 14 years.

Criterion Measure: The criterion measures in this study were three selected health related fitness parameters, i.e. body fat percentage (PBF), muscular strength (MS) and muscular endurance (ME).

Instruments and Tools Used: The tools used in this study to collect the data was AAPHERD Health Related Fitness Test (1984) [6] and the instrument used is skin fold calipers and grip dynamometer.

Training Schedule: Aerobic dance exercise programme was

scheduled as five days per week basis for a period of six week continuously. The exercise set was repeated 4 times in each day. Duration of the exercise programme was 45 minute per day. The detail of schedule has presented in Table-1 and Table-2. The entire aerobic dance was performed with music with 60 beats per minute repetition. Exercise training schedule was prepared by the researcher with the help of other coaching professionals.

Table 1: Detail of Exercise schedule

Particular	Training Schedule
Total Duration	6 weeks
Frequency	5 days per week
Repetition	4 times
Duration	35 to 45 minutes
Time	3.45 to 4.30pm

Table 2: Detail of Aerobic Dance & Exercise included in programme

Aerobic Dance Exercise	
Days	Exercise schedule
Monday	Jogging- 5 minutes, Stretching- 3 minutes, Free hand exercise-7 minutes, Aerobic Dance exercises -20 min (1-2 week); 25 min (3-4 week); 30 min (5-6 week)
Tuesday	Jogging- 5 minutes, Stretching- 3 minutes, Free hand exercise-7 minutes, Aerobic Dance exercises -20 min (1-2 week); 25 min (3-4 week); 30 min (5-6 week)
Wednesday	Jogging- 5 minutes, Stretching- 3 minutes, Free hand exercise-7 minutes, Aerobic Dance exercises -20 min (1-2 week); 25 min (3-4 week); 30 min(5-6 week)
Thursday	Jogging- 5 minutes, Stretching- 3 minutes, Free hand exercise-7 minutes, Aerobic Dance exercises -20 min (1-2 week); 25 min (3-4 week); 30 min (5-6 week)
Friday	Jogging- 5 minutes, Stretching- 3 minutes, Free hand exercise-7 minutes, Aerobic Dance exercises -20 min (1-2 week); 25 min (3-4 week); 30 min (5-6 week)

Design of the study and statistical procedure adopted

Single group design was adopted for this study. The group was given six weeks of aerobic dance treatment with music. The group was tested before the treatment (Pre test) and again they were tested after six weeks of aerobics dance treatment (Post test). Difference between post test means and pre test mean were analyzed statistically to find out the effect of aerobic dance exercise. The mean and standard deviation were used as descriptive statistics. Difference between post test means and pre test mean were computed by t-test. Only 0.05 level of significance was considered in this study. All calculations were done using Excel 2007 software.

Results and Findings

The mean value and SD of pre-test and post-test data of body

fat percentage (PBF), muscular strength (MS) and muscular endurance (ME) parameters and computed t-values for these parameters have presented in Table-3. It has seen from Table-3 that pre-test mean value of PBF was 25.27, MS was 22.52 Kg and ME was 21.04t/m. The post-test mean value of PBF was 24.06, MS was 27.61 Kg and ME was 26.43 t/m. The t-test was computed for each parameter and also presented in same table which was 0.33 for PBF, 2.30 for MS and 2.47 for ME. Both the computed t-value for the selected parameters MS and ME in this study found statistically significant ($p < 0.05$). Only the t-value for the PBF parameter was found not significant statistically ($p > 0.05$). The results have presented in Graphical form in Figure-1 for PBF, Figure-2 for MS and in Figure-3 for ME.

Table 3: Descriptive and inferential statistics for PBF, MS and ME of pre-test and post-test

Statistical Parameter	Pre Test		Post test		SED	Mn ₁ -Mn ₂	t- value
	Mean	SD	Mean	SD			
PBF (%)	25.27	6.77	24.06	6.03	2.03	0.67	0.33
MS (Kg)	22.52	8.3	27.61	5.17	2.19	5.04	2.30*
ME(t/m)	21.04	6.74	26.43	7.07	2.18	5.39	2.47*

*Significant statistically on 0.05 level.

Findings have shown that t-value the MS and ME of the subjects were significant statistically which indicated that aerobic dance with music of six week duration was sufficient to improve in these health related fitness parameters. Several study reported about the positive health benefits of aerobic

exercises. Aerobic exercise has a number of positive effects, from reducing health risks and maintaining healthy body weight, to managing chronic conditions [2]. James *et al.* (1989) [7] conducted an experimental study consisting four months of aerobic exercise training in which they observed favorable

physiological changes like lower cholesterol levels and lower diastolic blood pressure levels [7]. Another study reported that regular aerobic exercise has significant cardiovascular benefits, including a reduction in incidence of and mortality from coronary artery disease--probably because of positive effects on blood lipid levels and blood pressure. (Mersy, 1991) [8]. Huonker *et al.* (2002) [9] found that in older, healthy men who perform a regular aerobic muscular training in endurance sport disciplines (e.g., walking, jogging or cycling), a decrease of the resting heart rate, a restoration of the primarily lowered heart rate variability, an improvement of the early diastolic left-ventricular filling as well as a significant increase in the VO₂max [9] Seamus *et al.* (2002) [10] reported that aerobic exercise reduces blood pressure in both hypertensive and normotensive persons [10]. Seol-Jung, Eon-ho and Kwang-Jun (2016) [11] reported that the metabolic syndrome risk factors (weight, % body fat, waist circumference, systolic blood pressure, diastolic blood pressure, and HDL-Cholesterol) were significantly improved and resting heart rate was significantly decreased as a result of participating aerobic exercise (60-80%

of maximum heart rate) [11]. Present study also found significant improvement in selected health related fitness parameters after six weeks aerobic dance treatment which was quite similar and supported to the other studies conducted worldwide.

The t-value for the PBF was found not significant statistically in this study though the trend shows slight decrease in PBF after treatment. Therefore trend indicated that aerobic exercise also might be helpful for excess fat reduction or body weight reduction. Present result might be due to the fact that the school girls possessed very normal body fat and of course the intensity of the training load was not high enough to get the reduction of the PBF up to the significant level in this age of girl. The significant effect of aerobic exercise on other selected health related parameters - muscular strength and muscular endurance in this study was might be due to the well design nature of the training and the training load which was sufficient to accomplish the improvement on MS and ME of the selected age group girls.

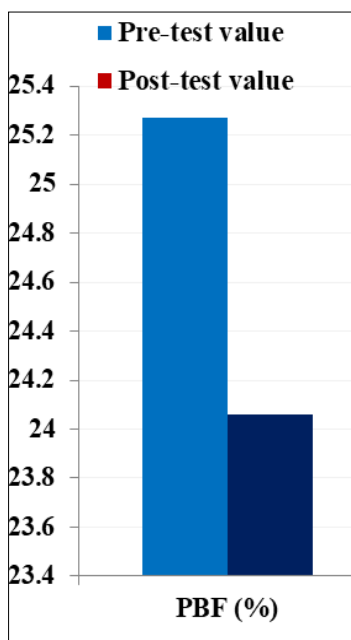


Fig 1: Exercise effect on PBF

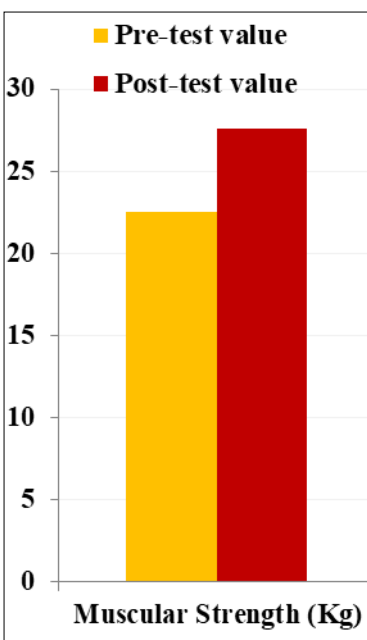


Fig 2: Exercise effect on MS

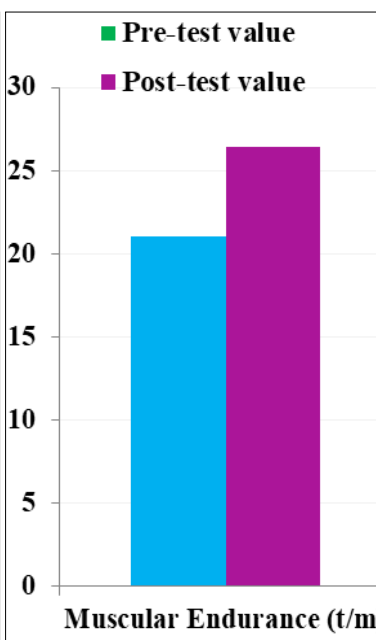


Fig 3: Exercise effect on ME

Conclusions

On the basis of above findings and discussion the following conclusions have been drawn in this study:

- Six-week aerobics dance training significantly improves muscular strength of the adolescences school girls.
- Six-week aerobics dance training significantly improves the muscular endurance of the adolescences girls.

References

1. Ricketts D. Aerobic Exercise and its benefits, Internet Article, available at: <https://www.study.com/academy/lesson>, 2003.
2. Holt B. Long Term Effects of Aerobic Exercise, Internet article, available at: <https://www.livestrong.com/article/329586-long-term-effects-of-aerobic-exercise/>, 2017.
3. Christopher A, DeSouza Linda F, Shapiro Christopher M,

Clevenger Frank A, Dinunno Kevin D Monahan. Hirofumi Tanaka and Douglas R. Seals. Regular Aerobic Exercise Prevents and Restores Age-Related Declines in Endothelium-Dependent Vasodilatation in Healthy Men, *Circulation*, 2000; 102:1351-1357.

4. Kodama S, Tanaka S, Saito K, Shu M, Sone Y, Onitake F, *et al.* Effect of Aerobic Exercise Training on Serum Levels of High-Density Lipoprotein CholesterolA Meta-analysis, *Arch Intern Med.* 2007; 167(10):999-1008.
5. DiLorenzo TM, Bargman EP, RenéeStucky-Ropp Brassington GS, Peter A, Frensch PA, LaFontaine T. Long-Term Effects of Aerobic Exercise on Psychological Outcomes, *Preventive Medicine.* 1999; 28(1):75-85.
6. Aapherd; Aapherd Health Related Physical Fitness Test Technical Manual, American Alliance for Health, Physical Education, Recreation and Dance, Virginia,

USA, 1984.

7. James A, Blumenthal Charles F, Emery David J, Madden Linda K, George R, Edward Coleman Margaret W. Riddle Daphne C. McKee John Reasoner R. and Sanders Williams, Cardiovascular and Behavioral Effects of Aerobic Exercise Training in Healthy Older Men and Women, *Journal of Gerontology*. 1989; 44(5):M147-M157.
8. Mersy DJ. Health benefits of aerobic exercise, *Postgrad Med*. 1991; 90(1):103-7, 110-2.
9. Huonker M, Schmidt-Trucksäss A, Heiss HW, Keul J. Effects of physical training and age-induced structural and functional changes in cardiovascular system and skeletal muscles, *Z Gerontol Geriatr*. 2002; 35(2):151-6.
10. Seamus P Whelton, Ashley Chin, Xue Xin, Jiang He, Effect of Aerobic Exercise on Blood Pressure: A Meta-Analysis of Randomized, Controlled Trials, *Ann Intern Med*. 2002; 136(7):493-503.
11. Seol-Jung Kang, Eon-ho Kim, Kwang-Jun Ko. Effects of aerobic exercise on the resting heart rate, physical fitness, and arterial stiffness of female patients with metabolic syndrome, *J Phys Ther Sci*. 2016; 28(6):1764-1768.