

Effect of Selected Yogic, Aerobic Exercises and Combined Yogic and Aerobic Practices on Flexibility (an Experimental Study)



Physical Education

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ABSTRACT

Flexibility is the ability of an individual to move the body and its parts through as wide range of motion as possible without undue strain to the articulations and muscle attachments. Flexibility may be defined as a joint's ability to move freely or normal range of motion. Yogic and aerobic exercises are much more flexible than other physical activities especially in flexion and extension. Flexibility exercises are more conducive to build endurance in movements like running, dancing, swimming and tumbling than short static and weight lifting type of exercise.

Yoga and aerobic are individual activities. Yoga is a traditional Indian system of healing the mind and body through the series of mental, spiritual and physical exercise. Aerobic dance can best be defined as continuous movement exercise with locomotor movement and dance steps performed to music. Aerobic dance provides an opportunity for people of widely different levels of physical ability to participate together with musical accompaniment engaging in exercise and skills which have been choreographed according to the needs of the individual. Yogasana and aerobic develops physical fitness such as strength, flexibility, co ordination and balance.

The purpose of this study is to find out the effect of yogic, aerobic exercises and combined yogic and aerobic practice on flexibility of high school boys. For this study 160 High School Boys were selected randomly. Further they were divided into four groups with 40 subjects in each group, such as yogic group, aerobic group, combined (Yogic and Aerobic) practice group and control group. Hence the difference between mean of four groups in the pre-test had to be taken into account during the analysis of the post-test difference between the mean. This was achieved by the application of co-variance, where the final mean were adjusted for difference in the initial means and the adjusted means were tested for significance. The study proved that flexibility was significantly increased in combined (yogic and aerobic) practice group when compared to other groups.

Introduction

Physical fitness has to be earned through a daily routine of physical exercise. Lack of physical activity is a major cause for many diseases and disability. Hence well organized and properly administered physical activities can effect on health of the students by decreasing respiratory, digestive, nerves and cardiovascular problems. To develop health and fitness through the medium of exercise, recreation, games and sports is one of the prime objectives of education programmes for school children. This is very essential for physical, physiological and psychological development. School counsellors and physical educationists can have an impact on curriculum reforms by collaboratively investing in multi intervention programmes that encompass the psycho physiological spectrum of children within the schools.

Yoga is a balanced action of the body, awareness of breath and steadiness of mind. Bending, stretching and twisting the body while doing asanas will massage and soothe the internal organs. At the end of yoga practice, the body is more relaxed and energized. Regular practice of yoga helps to lead active and healthy life.

Aerobics is continuous movement activity. It affords each participant the benefits of all components of fitness, including development of circulatory, respiratory, cardiovascular and fat metabolism. These activities vary from simple movements like free hand coordinated movements like twisting, jumping and dancing to complicate movements. Regular aerobic dance programme can lay the foundation for an invigorated, enriched and healthy life. The aerobics dance can be practiced by everyone irrespective of size, shape or sex. Work out of aerobics can be divided into four phases, namely warm up, skill review, aerobic and cool down. Each phase of programme is necessary if aerobic dance is to provide the desired benefit. The main advantage of yoga and aerobic exercises is that they do not require large space and lavish equipment. Additionally they can be performed both indoor and outdoor.

Administration of Test

Purpose: To measure the hip and back flexion as well as extension of the hamstring muscles of the legs.

Equipment: The sit and reach box with measuring scale.

Procedure adopted

The subjects were asked to remove their shoes, and sit on a mat with their legs extended forward and touch the box. The measuring scale was placed in between the legs. The subject slowly stretched forward while pushing the flexo measure case (An instrument and for recording flexibility of the subject) as far as down the stick as possible with the finger tips of both hands. The maximum distance reached was recorded with the help of measuring scale.

Scoring: The best of three trials was recorded as final score.

Methodology

- 160 subjects were selected randomly and divided into four groups namely, yogic, aerobic, combined (yogic and aerobic) and control group.
- The age of the subjects was between 14 to 15 years.
- Before training, pre-test were conducted for all the subjects.
- The experimental group underwent yogic, aerobic and combined (yogic and aerobic) exercise training every day morning (except Sunday) for a duration of one hour up to a period of six weeks.
- The control group did not undergo any training.
- After completion of six weeks of training, all the subjects were tested to collect post-test data to determine the cause and effect of training on flexibility.

The list of exercises and training schedule for yogic and aerobic practice are given in Table- 1 and 2 respectively.

Table - 1
THE TRAINING SCHEDULE FOR SELECTED YOGIC EXERCISES

List of Asanas	week	Training Load	Repetitions
Suryanamaskara: Standing posture: Thadasana, Arda chakrasana, Trikonasana, Vrikshasana, Parshava konasana, Uthanasana, Veerabhadrasana. Sitting posture: Padmasana, Parvathasana, Ushtrasana, Janusirasana, Vajrasana, Prone Posture: Bhujangasana, Dhanurasana, Shalabhasana, Ushtrasana Supine Posture: Sarvangasana, Hal asana, Mastyasana, Chakrasana, Jataraparivarthnasana Pranayama: Bramari, Omkar (A.U.M) Relax With Shavasana	1	Medium	1
	2	Considerable	2
	3	Optimum	3
	4	Optimum	3
	5	Considerable	2
	6	Sub maximum	2
	7	Sub maximum	2
	8	Medium	1

Table - 2
LIST OF SELECTED AEROBIC EXERCISES AND TRAINING SCHEDULE

WARM UP ROUTINE		
Movement	Repetitions	Counts
ISOLATIONS		
Neck isolation	8	4 each
Shoulder shrugs	8	4 each
Shoulder circle	4	4 each
Reach stretch	8 times alternative right and left	2 each
Active warm up		
March in place	8	1 each
3 walks and a hop	4 times forward 4 backward	1 each
Grapevine and clip jazz square	4 alternative right and left	4 each

Table - 3
STATIC STRETCHES

Movement	Repetitions	Counts
Lateral stretch	2 alternating left and right	8 each
Across the body stretch	Alternative left and right	8 each
Chest stretch	2 times	8 each
Calf stretch	1 right and left	8 each
Hamstring stretch	1 right and left	8 each
Quadriceps stretch	1 right and left	8 each

Table - 4
AEROBIC DANCE ROUTINE

Steps	Repetitions	Counts
Cross over jumping jacks	8 alternative right and left	2 each (16)
Jump and clap	4	2 each (16)

Run and tap	4	4 in combinations (16)
Jump- kick pattern	4 alternative right and left	2 each
Jump lungs sideways with arm punches	4 alternative right and left	2 each
3 runs and pivot	2	4 in combinations
Repeat jump lunge	4 alternative right and left	2 each
Repeat 3 runs and pivot	2	4 in combinations
Scissors jumping jacks	4	2 each
Run and jump-clap forward and backward	1	8 in combinations
Repeat scissors jacks	4	2 each
Turning walk and clap	2 right and left	4 each
Jump and clap	4	2 each
Repeat jump and clap	2 right and left	2 each
Slide forward	4	2 each
Walk forward and backward roll	8	1 each
Slide alternative right and left	4	2 each
Walk backward shoulder roll	8	1 each
Repeat steps 1 to 4	4	1 each

Warming up and cool down: The aerobic training programme starts with a minimum five minutes of warming up followed by variety of exercises. Each day training ended with systematic and cooldown exercises.

Analysis of Data and Result

- Descriptive statistics like mean, F-value were computed.
- Graphical representation of mean in pre-test, post-test and adjusted (for pre-test) were done using multiple bar plots.
- Analysis of Covariance (ANCOVA) statistical technique was used to find out significant difference in mean among four (three experimental and one control) group.
- To eliminate the source of significant difference, if any, in the previous step, the Scheffe's post-hoc test was carried out.

The difference between mean of four groups in the pre-test had to be taken into account during the analysis of the post-test difference between the mean. The minimum value of F- ratio needed for carrying out analysis of variance and co-variance is 4.41, and the significant value should be 0.05 level. This was achieved by the significant difference between the paired adjusted means. The data were tested through the confidence interval value, by utilizing Scheffe's post-hoc test, in which the obtained mean difference value needed to be greater than the Scheffe's confidence interval value for significant level.

The statistical results are presented in Table 5 and 6 and graphically depicted in fig.1

Table-5
COMPUTATION OF ANALYSIS OF COVARIANCE OF PRE-TEST, POST-TEST AND ADJUSTED POST-TEST ON SIT AND REACH SCORE AMONG FOUR GROUPS

(Scores in Centimetres)

Test	Yogic group	Aerobic Group	Combined group	Control group	Df	F-Value
Pre-test	12.38	12.35	12.33	12.32	3 156	0.78
Post-test	14.75	14.76	16.63	12.24	3 156	8.36*
Adjusted post-test	14.67	14.69	16.68	12.62	3 156	13.33*

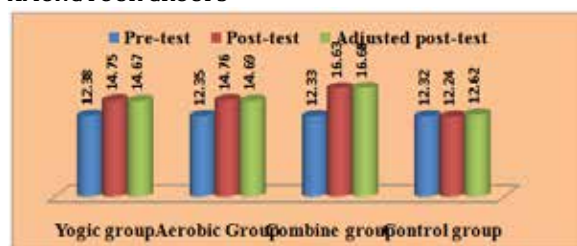
* indicates Significant

Table-3 shows the analysed data on sit and reach, the pre-test mean of sit and reach score is 12.38 in yogic group, 12.35 in aerobic group, 12.33 in combined (yogic and aerobic) practice group and 12.32 in control group. As the obtained F-ratio 0.78 was lesser than the table F-ratio 2.66, the pre-test is significant at 0.05 level of confidence for the degree of freedom 3 and 156.

The post-test mean of sit and reach score was observed to be 14.75 in yogic group, 14.76 in aerobic group, 16.63 in combined (yogic and aerobic) practice group and 12.24 in control group. As the obtained F-ratio of 8.36 was greater than 2.66, the post-test is significant at 0.05 level of confidence for the degree of freedom 3 and 156.

The adjusted post-test mean of sit and reach score is 14.67 in yogic group, 14.69 in aerobic exercise group, 16.68 in combined (yogic and aerobic) practice group and 12.62 in control group. As the obtained (F-ratio 13.33) in the Table-5 was greater than in the control group (F-ratio 2.66). The post-test is significant at 0.05 level of confidence for the degree of freedom 3 and 156.

Figure - 1
MULTIPLE BAR PLOT FOR MEANS OF SIT AND REACH SCORE AMONG FOUR GROUPS



the multiple bar plot Fig-1. The multiple bar plot denotes that there is a increase in adjusted (for pre-test) post-test mean of sit and reach in combined (yogic and aerobic) practice group, when compared with yogic, aerobic and control group. The

Scheffe's post hoc test is resorted to find out the significance of adjusted final mean difference among the four groups. The results are as shown in the Table -6.

Table-6
POST HOC TEST ADJUSTED FINAL MEAN DIFFERENCE ON SIT AND REACH SCORE BETWEEN FOUR GROUPS

Yogic group	Aerobic Group	Combine group	Control group	Mean Difference	Confident Interval
14.67	14.69			0.02	1.98
14.67		16.68		2.01	1.98*
14.67			12.62	2.05	1.98*
	14.69	16.68		1.99	1.98*
	14.69		12.62	2.07	1.98*
		16.68	12.62	4.06	1.98*

The mean difference between yogic and aerobic, yogic and combined (yogic and aerobic) practice group, yogic and control group, aerobic and combined (yogic and aerobic) practice group, aerobic and control group, combined (yogic and aerobic) practice group and control group is 0.02, 2.01, 2.05, 1.99, 2.07, and 4.06 respectively. The mean difference 0.02 is less than the confident interval value of 1.98 in yogic and aerobic group is not significant.

The mean difference 2.01, 2.05, 1.99, 2.07 and 4.06 is higher than the confident interval value of 1.98 in yogic and combined (yogic and aerobic) practice group, yogic and control group, aerobic and combined (yogic and aerobic) practice group, aerobic and control group, combined (yogic and aerobic) practice and control group is significant.

Discussion of findings

The results clearly indicates that, after the six weeks of yogic and aerobic training, the level of flexibility has increased in combined (yogic and aerobic) practice group than the yogic, aerobic and control group. Yoga is a postural pattern, these postural patterns are to be achieved slowly, maintained for some time steadily and released again in a slow and smooth manner. Yogasana and pranayama practices are rhythmic activity that relaxes the whole body and more utilization of oxygen during the practice will certainly effect to improve the rigidity of the body and makes more flexible and also helps in improving neuromuscular coordination. After a yogic activities session the subjects feel rejuvenated and they look at the world in a completely different perspective. Aerobic is a physical activity using the large muscle group rhythmically for an extended period of time with its continuous movement of exercises improves posture and efficiency of organic systems of the body and increases agility, flexibility, balance and coordination. Yogic and aerobic exercises develop flexibility. Hence there is a significant increase in flexibility of combined (yogic and aerobic) practice group.

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