

Effect of Hatha Yoga and Aerobic Dance practice on selected Systolic Blood Pressure and Diastolic Blood Pressure on Adolescent Girls

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Abstract

Yoga is an ancient Indian Philosophy. The purpose of the study was to evaluate acute physiological response, to find out the changes if any in blood pressure (S. B. P. & D. B. P.) following the Yoga and aerobic dance practices. The total subjects were 120 divided into four groups and their age ranges from 12–16 years. The duration of total practice period were 6 weeks (3 days in a week for 30 minutes). Pre test and post test data were analyzed by paired 't' test method. For obtaining the significant differences ANCOVA method was adopted. (Garrett, 1981). The organised Yoga and aerobic dance program definitely improved their performance in selected physiological potentialities.

Keywords: Yoga, Aerobic dance, Systolic Blood Pressure, Diastolic Blood Pressure

Introduction

Yoga is an art, a science, a philosophy, a culture and to a few, religion all in unison. Any reference to yoga must symbolize the integrated whole and not any part of it. It is a science of life which helps man to attain their highest potential and highest state of consciousness. It uses various physiological techniques involving asanas, Pranayamas etc.

The origin of hatha yoga developed in India. In Sanskrit, 'Ha' means 'Sun' and 'Tha' means Moon. 'Hatha' means 'forceful' implying that powerful work must be done to purify the body. Yoga means to yoke, or to join two things together, hence hatha yoga is meant to join together sun (masculine, active) energy with the moon (feminine, receptive) energy, thus producing balance and greater power in an individual. It is the branch of Yoga which concentrates on physical health and mental well being. Hatha Yoga uses bodily postures (asanas) with the goal of bringing about a sound healthy body and clear, peaceful mind.

Aerobic exercise, such as aerobic dance, is a fun way to get fit. Aerobic dance is a popular exercise in adolescent pupil. Aerobic exercise describes any type of exercise, typically performed at moderate level of intensity for extended period of time that increases the heart rate. In this article an attempt has been made to observe the improvement occur in the physiological variables following aerobic and yoga practices among the adolescent girls.

Purpose of the Study

The purposes of the study are described below:

- i) To observe the impact of hatha yoga and aerobic dance practice of adolescent girls.
- ii) To find out the changes if any, in physiological response in systolic blood pressure and diastolic blood pressure following the Yoga and aerobic dance practices.

Methodology

The total subjects were one hundred and twenty (120) selected from the school of Rabindra Vidyapith High School, Santipur, Nadia and age ranging from 12–16 years. All the subjects possessed sound physique. All the subjects were divided into four groups i.e. Hatha Yoga, aerobic dance, combined and control groups.

Practice Schedule

The total period of treatments was 6 weeks and each group practiced three days in a week and duration was 30 minutes which supervised exercise program for experimental subjects and control group continued usual activity. The subjects practiced the Asanas and Pranayamas.

Yoga Group: Practiced Tadasana, Tratyaka, Kati Chakrasana, Surya Namaskar, Sarbangasana Halasana, Paschimotha asana and Pranayamas were Nadi Sodhana, Kapalbhati, Bhamari, Yoga-Nidra.

Aerobic Dance Group: Practiced aerobic dance with music.

Combined Group: Practiced Yoga 15 min. / day and aerobic 15 min. / day approximately.

Control Group: The control group subjects were continued usual activity.

Criteria Measured

The personal data age, height, weight were measured by school record, stadiometer, weighing machine respectively. On the other hand selected physiological parameters such as systolic blood pressures and diastolic blood pressure were measured by sphygmomanometer.

Results and Discussion

Table – 1(a)

Pre-test:- (Mean, SD) of Yoga, Aerobic Dance, Combined and Control Variables.

	Yoga Gr. (Mean ± SD)	Aerobic DanceGr. (Mean ± SD)	Combined Gr. (Mean ± SD)	Control Gr. (Mean ± SD)
Personal Data				
Age	13.77 ± 1.25	13.8 ± 0.81	14.67 ± 0.99	14.90 ± 0.92
Height	141.70 ± 6.10	149.37 ± 4.43	151.37 ± 9.08	150.30 ± 8.54
Weight	38.67 ± 5.96	42.23 ± 4.72	42.70 ± 7.00	40.77 ± 5.16
Physiological Variables				
Systolic Blood Pressure	115.33± 4.40	117.47 ± 3.97	115.90 ± 3.82	116.63 ± 6.78
Diastolic Blood Pressure	68.70 ± 3.98	69.53 ± 2.29	68.67 ± 4.82	69.27 ± 4.17

Table – 1(b)

Post-test : - (Mean, SD) of Yoga, Aerobic Dance, Combined and Control Variables.

	Yoga Gr. (Mean ± SD)	Aerobic Dance Gr.(Mean ± SD)	Combined Gr. (Mean ± SD)	Control Gr. (Mean ± SD)
Personal Data				
Weight	37.13 ± 5.48	40.20 ± 4.24	41.70 ± 6.22	41.33 ± 5.40
Physiological Variables				
Systolic Blood Pressure	117.30± 2.98	117.40 ± 2.18	117.73 ± 2.41	117.60 ± 5.93
Diastolic Blood Pressure	67.43 ± 2.81	67.60 ± 2.13	67.37 ± 3.06	68.90 ± 3.76

Personal Criteria

The age, height and weight of the subjects had been considered as personal variable.

Age: Mean scores and standard deviation of four groups of age were 13.77 ± 1.25 , 13.8 ± 0.81 , 14.67 ± 0.99 and 14.90 ± 0.92 years respectively in Table – 1(a).

Height: Mean scores and standard deviation of four groups of height were 141.70 ± 6.10 , 149.37 ± 4.43 , 151.37 ± 9.08 and 150.30 ± 8.54 cm. respectively in Table–1(a).

Weight: Mean scores and standard deviation of four groups of weight in pre-test were 38.67 ± 5.96 , 42.23 ± 4.72 , 42.70 ± 7.00 and 40.77 ± 5.16 kg respectively in Table–1(a) and Fig. No. 1. Post test weights mean and SD were 37.13 ± 5.48 , 40.20 ± 4.24 , 41.70 ± 6.22 and 41.33 ± 5.40 kg respectively in Table No. – 1(b) and Fig. 1. After completion of the training programme mean scores of weight of all experimental groups were decreased slightly.

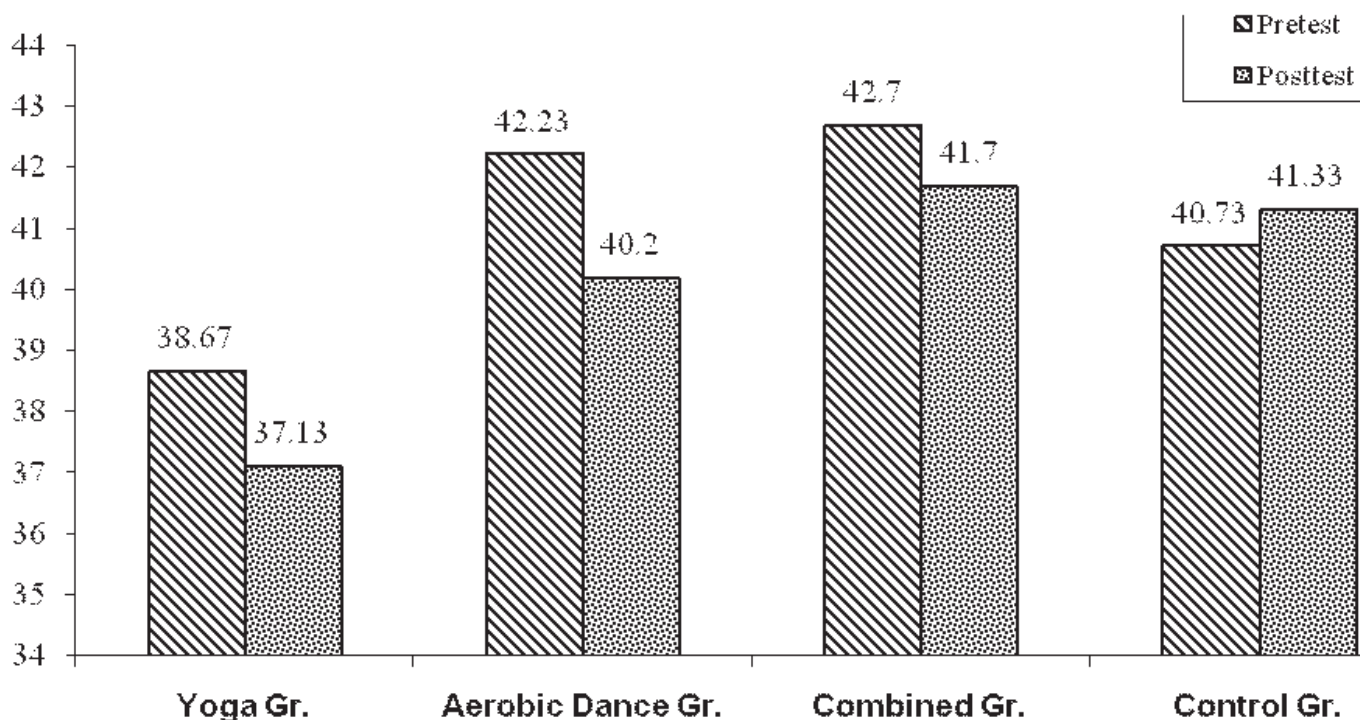


Fig. 1: Pretest and Posttest of weight of four groups

Regarding training programme body weight a great variation may be observed among the various researchers following training, McIntosh (1983), Whatley et al. (1994), Pollock et al (1975), Shome (Basu) (1998) found decrease in body weight following training.

Physiological Variables

Physiological variables measured in this study were systolic blood pressure, and diastolic blood pressure of four groups.

Systolic Blood Pressure:

Table – 2, Analysis of Variance (ANOVA) for SBP among the Four Groups

	Source of variation	SS	df	MS	F
Pre-test	Between Groups	76.87	3	25.62	1.07
	Within Groups	2773.80	116	23.91	
	Total	2850.67	119		
Post-test	Between Groups	3.47	3	1.14	0.08
	Within Groups	1584.57	116	13.66	
	Total	1587.99	119		

$F_{0.05} = 2.68$, $F_{0.01} = 3.96$, F is not significant at both levels.

Table – 3, Analysis of Covariance (ANCOVA) for SBP among the Groups

Source of Variation	Df	$SS_{X.Y}$	$SS_{Y.X}$	$MS_{Y.X}(V_{Y.X})$	$F_{Y.X}$	$SD_{Y.X}$
Among Gr. Means	3	0.47	25.28	8.43	1.28	2.56
Within Gr. SS	115	1516.20	755.79	6.57		
Total	118	1516.67	781.07			

$F_{0.05} = 2.68$, $F_{0.01} = 3.96$, F is not significant at both levels.

Table – 4, Significance of differences among adjusted Y means of SBP

Variables	SED	df	Diff. Adjusted Means	Sig. at 0.05 or 0.01 level
Yoga Gr. vs. Aerobic Dance Gr.	0.66	115	1.07	NS
Yoga Gr. vs. Combined Gr.	0.66	115	0.12	NS
Yoga Gr. vs. Control Gr.	0.66	115	0.41	NS
Aerobic Dance Gr. vs. Combined Gr.	0.66	115	1.19	NS
Aerobic Dance Gr. vs. Control Gr.	0.66	115	0.66	NS
Combined Gr. vs. Control Gr.	0.66	115	0.53	NS

NS is not significant.

From Table–1(a) & 1(b) it was found that mean scores and SD of SBP before training of all the groups were 115.33 ± 4.40 , 117.47 ± 3.97 , 115.90 ± 3.82 and 116.63 ± 6.78 and after training were 117.30 ± 2.98 , 117.40 ± 2.18 , 117.73 ± 2.41 and 117.60 ± 5.93 respectively.

Participating in Yoga and aerobic programme the SBP of all the experimental groups found more or less same. Since all the mean scores of SBP were not equal, ANOVA and ANCOVA were done to find out Table–2, Table–3 and Table–4 are not significant.

According to Waltin and Schendel (1973), Dey (1990), Shome (Basu) (1998), Lotounav (1971) the SBP was not significant effect on six week training programme.

Diastolic Blood Pressure

Table – 5, Analysis of Variance (ANOVA) for DBP among the Four Groups

	Source of variation	SS	df	MS	F
Pre-test	Between Groups	16.49	3	5.50	0.36
	Within Groups	1788.30	116	15.42	

	Source of variation	SS	df	MS	F
Post-test	Total	1804.79	119		
	Between Groups	47.09	3	15.70	1.75
	Within Groups	1042.23	116	8.98	
	Total	1089.33	119		

$F_{0.05} = 2.68$, $F_{0.01} = 3.96$, F is not significant at both levels.

Table – 6, Analysis of Covariance (ANCOVA) for DBP among the Groups

Source of Variation	Df	SS_{XY}	SS_{YX}	$MS_{YX}(V_{YX})$	F_{YX}	SD_{YX}
Among Gr. Means	3	13.11	38.21	12.74		
Within Gr. SS	115	873.77	615.31	5.35	2.38	2.31
Total	118	886.88	653.51			

$F_{0.05} = 2.68$, $F_{0.01} = 3.96$, F is not significant at both l

Table-7, Significance of differences among adjusted Y means of DBP

Variables	S_{ED}	Df	Diff. Adjusted Means	Sig. at 0.05 or 0.01 level
Yoga Gr. vs. Aerobic Dance Gr.	0.60	115	0.24	NS
Yoga Gr. vs. Combined Gr.	0.60	115	0.05	NS
Yoga Gr. vs. Control Gr.	0.60	115	1.19*	0.05
Aerobic Dance Gr. vs. Combined Gr.	0.60	115	0.19	NS
Aerobic Dance Gr. vs. Control Gr.	0.60	115	1.43*	0.05
Combined Gr. vs. Control Gr.	0.60	115	1.24*	0.05

*Sig. at 0.05 level, NS is not significant.

From Table-1(a) & 1(b) it was found that mean scores and SD of DBP before training of all the groups were 68.70 ± 3.98 , 69.53 ± 2.29 , 68.67 ± 4.82 and 69.27 ± 4.17 and after training were 67.43 ± 2.81 , 67.60 ± 2.13 , 67.37 ± 3.06 and 68.90 ± 3.76 respectively.

Participating in Yoga and aerobic programme all the experimental groups decreases their DBP (Table 1(a) and 1(b)). Since all the mean scores of DBP were not equal, ANOVA was computed Table-5 to find out that F value was not significant. ANCOVA Table-6 was done to find out not significant. In post test DBP of aerobic dance group was lower than other three groups. After six weeks exercise programme DBP was decreased 0.05 level of confidence in all experimental groups in compare to control group which was shown in the Table-7.

Frank (1964), Lotounov (1971) found significant decrease in DBP and it was also found by Waltin and Schedel (1973), Shome (Basu) (1998).

Conclusion

On the basis of the results and discussions, the conclusions may be drawn

1. Means scores of weight of all the experimental groups of adolescent girls were decreased in their body weight. Aerobic dance group was decreased in relatively more than other three groups.
2. No significant differences occurred in all the groups of Systolic Blood Pressure.
3. In Diastolic Blood Pressure all the three experimental groups were decreased significantly, except control group.
4. The organized yoga and aerobic dance programme in which the girls subjects participated for about six weeks definitely improved their performance in selected physiological potentialities.

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