

Research Paper :

Effect of Pranayama on status of cardio respiratory endurance

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ABSTRACT

The purpose of the present study was to find out the effects of Pranayama on status of cardio Respiratory Endurance. The study was conducted on 120 male students between the age group of 13 to 17 yrs. Four groups consisting of 30 students each were formed. This study examined which type of Pranayama group had the maximum effect on the physiological fitness of subjects. Results showed that every type of Pranayamas improves the physiological fitness but training of Ujjayi and Bhastrika Pranayama can collectively provide the best results.

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Pranayama the fourth component of the eightfold Pathed Yoga is the control of 'vital force' or 'cosmic energy' by concentration and regulated breathing. It also signifies life or breath. Pranayama is the breathing technique of yoga that unblocks the flow in the body and balances masculine and feminine energy. Breathing correctly from the diaphragm acts as a natural tranquilizer and calms the nervous system. Inspiring and expiring from nose increases the capacity of lungs and helps providing more oxygen in the blood flow. This regenerates the blood cells and increases the vitality. Pranayama develops the efficiency of heart and the endurance capacity of respiratory system and thus yield in the amount of oxygen in the body (Atmananda, 1966; Bhole, 1976; Ganguly *et al.*, 1981 and Sareen, 1995).

METHODOLOGY

The study was on a total of 120 randomly selected boys studying in Jyotiba High School, Nagpur and based on their initial performance, they were divided into equal groups. Their age was ranging from 13 to 17 years. The pre and post test was employed and analysis of covariance technique was adopted.

The physiological fitness was measured by standardized tools *i.e.* blood pressure with sphygmomanometer and stethoscope, vital capacity by wet spirometer, cardiovascular endurance by Canadian home fitness test and respiratory rate and pulse rate by stopwatch.

The groups were

Group I Ujjayi Pranayama group

Group II Bhastrika Pranayama group

Group III Combined group (both the Pranayamas)

Group IV Control group means which didn't undergo by any treatment.

Treatments:

The experimental group I, II and III were given treatment for one hour daily for six days a week for a period of twelve weeks and group IV was not exposed to any treatment. Experimental groups underwent practice between 6.30 to 7.30 am.

Ujjayi Pranayama:

Ujjayi Pranayama was practiced by the subject of group I for seven minutes at a time, with a rest of three minutes each time for six repetitions, making a total of 57 minutes.

Bhastrika Pranayama:

Bhastrika Pranayama was practiced by the subjects of group II, for eight minutes at a time with a rest of five minutes each time for five repetitions making a total of 60 minutes.

Combination (Ujjayi and Bhastrika Pranayama):

Ujjayi Pranayama was practiced for seven minutes and Bhastrika Pranayama for eight minutes at a time alternately with a rest of three minutes each time by the subjects of group III. This was repeated three times making total time duration of 60 minutes.

Analysis of data:

After 12 weeks training period the differences between pre and post test means of each group in the chosen variables was tested by applying 't' test.

OBSERVATIONS AND DISCUSSION

For each of the chosen variables, the results pertaining to significant differences, if any between pre

and post-test means of experimental groups was assessed by employing ‘t’ test and analysis of variance which is given Table 1.

Since the experimental groups showed significant increases in performance of selected variables, the data were further subjected to analysis of variance to find out if there were any significant differences among the groups. The analysis of variance is shown in Table 2.

Table 2 revealed that the obtained ‘F’ values of respiratory rate 8.44, pulse rate 3.22, vital capacity 6.04, systolic BP 4.25, diastolic BP 4.61 and cardiovascular endurance 6.04 were much higher than the tabulated ‘F’ 2.68 and required for ‘F’ ratio to the significant at 0.05 level with (3,116) degree of freedom.

Conclusion:

The results and findings can be discussed with the

help of following points

- The group trained with Ujjayi Pranayama practice exhibited significant improvement as compared to the control group in pulse rate and vital capacity.

- Bhastrika Pranayama group exhibited significant improvement as compared to the other experimental groups and control group in respiratory rate.

- Ujjayi and Bhastrika Pranayama combined practice group exhibited significant improvements as compared to the other experimental and control groups in cardiovascular endurance, systolic blood pressure and diastolic blood pressure.

By concluding the discussions it can be summarized that yogic exercise mainly the Pranayama is one of the best tonics for developing cardio respiratory endurance and its related responses. This research work may bring awareness amongst peoples mainly amongst the youths

Table 1 : ‘t’ test and analysis of variance

Variables	Ujjayi mean		‘t’ ratio	Bhastrika mean		‘t’ ratio	Combine Grp. mean		‘t’ ratio	Control Grp. mean		‘t’ ratio	Tabulated ‘t’
	Pre	Post		Pre	Post		Pre	Post		Pre	Post		
Respiratory rate	18.3	17.4	3.76*	18.0	17.0	6.39*	18.8	17.8	4.34*	17.86	17.7	1.03 [@]	
Pulse rate	80.2	78.83	3.40*	80.47	79.13	3.21*	80.27	78.37	3.34*	80.6	80.5	0.10 [@]	
Vital capacity (litre)	3.38	3.94	11.85*	3.54	3.83	6.59*	3.54	3.83	6.59	3.53	3.60	1.29 [@]	
Systolic BP (mm/Hg)	120.07	118.93	2.67*	120.27	119.3	2.56*	120.2	119.07	2.83	120.53	120.33	0.30 [@]	1.96
Diastolic BP (mm/Hg)	80.07	78.2	2.45*	80.2	78.93	2.49*	80.33	79.29	2.56	80.13	80.33	0.39 [@]	
Cardiovascular endurance	87.29	91.73	5.52*	83.99	93.42	7.38*	85.02	95.73	10.20	80.84	79.64	1.68 [@]	

Level of significance 0.05, degree of freedom 58

Table 2 : Analysis of variance of the mean difference in selected physiological variables

Variables	Sources of variance	df	Sum of mean	Sum of square	Obtained ‘F’	Tabulated ‘F’
Respiratory rate	Among Groups	3	4.868	14.60	8.44*	2.68
	Within Groups	116	0.5764	66.867		
Pulse rate	Among Groups	3	18.1566	54.47	3.22*	
	Within Groups	116	5.6396	654.197		
Vital capacity	Among Groups	3	0.786	2.36	6.04*	
	Within Groups	116	0.130	12.49		
Systolic BP	Among Groups	3	5.964	17.892	4.25*	
	Within Groups	116	1.4025	162.7		
Diastolic BP	Among Groups	3	6.433	19.3	4.61*	
	Within Groups	116	1.3965	162		
Cardiovascular endurance	Among Groups	3	25.46	6296.34	6.04*	
	Within Groups	116	65.85	2.36		

*indicates significance of value at P=0.05

Tabulated ‘F’_{0.05 (3, 116)} = 2.68

and can create interest in achieving a normal level of fitness and maintaining their health by means of practicing Yogic exercises and different types of Pranayamas to tranquilize and channelize one's thoughts with the cosmos and the network of its happenings.

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