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Research Article

Effect of pranayama on status of cardio-respiratory endurance in the college students

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■ **ABSTRACT**

The purpose of the present study was to find out the role of Pranayama in developing positive attitude in the college students. Healthy mind remains in healthy body. If mind is fresh it can think positively about the life around the person. The study revealed that the Pranayama results in better physiological effects on body. The study was conducted on 100 male students between the age group of 18-25 years. Four groups consisting of 25 students each were formed. This study was conducted to examine which type of Pranayama group had the maximum effect on the physiological fitness of subjects. Results showed that every type of Pranayama improves the physiological fitness but training of Ujjayi and Bhastrika Pranayama can collectively provide the best results.

■ **Key Words :** Pranayama, Respiratory rate, Pulse rate, Blood pressure, Cardio-vascular endurance

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Healthy mind remains in healthy body. If mind is fresh it can think positively about the life around the person (Sareen, 1995). Yoga is one of the ancient techniques to remain healthy at every stage of the life. It is also known as eight fold Pitched Yoga. There are eight steps in the Yoga. Pranayama the fourth component of the eight fold Pathed Yoga, is the control of 'vital force' or 'cosmic energy' by concentration and regulated breathing. It also signifies life or breathe. Pranayama is the breathing technique of Yoga that unblocks the flow in the body and balances masculine and feminine energy. Breathing correctly froms the diaphragm acts as a natural tranquilizer and calms the nervous system. Inspiring and expiring from nose increases the capacity of lungs and helps in providing more oxygen in the blood flow. According to Hatha Yoga, Pranayamas can be classified under as Sahita Kumbhaka, Surya Bhedi, Ujjayi, Sitali, Bhastrika, Bhramari, Murchha and Kewali.

The first is a breath retention technique, which gives agility, strength and flexibility to the body. They also quieten the mind and the sense organs besides enabling the meditator to control his hunger and thirst. The Surya Bhedi Pranayama consists of inhaling through the right nostril and exhaling through the left. This practice promotes good digestion and through perspiration, it purges the body of all its impurities. Ujjayi Pranayama involves the travel of breath between the nose and the heart only. It acts like an expectorant and increases digestion together with removing all impurities of nerves as well as thoughts. Bhramari Pranayama involves a very concentrated and fixed breathing exercise. It helps in strengthening one's breathe besides quietening the mind and increasing the powers of concentration. This breathing technique is very helpful in the last meditative stage of Samadhi. Murchha Pranayama is an extreme form of breath retention, which only experienced Yogis can achieve. This practice quietens the mind and helps it to reach the near-unconscious state. The last technique of Kewali Pranayama, is a breath retention technique in which, the Yogi stops both inhalation as well as exhalation. This form balances inhalation and exhalation besides helping the mind to concentrate better. This regenerates the blood cells and increases the vitality.

Pranayama develops the efficiency of heart and the endurance capacity of respiratory system and thus yields in the amount of oxygen in the body (Almananda, 1966; Bhole, 1976; Ganguly, *et al.*, 1981; Mansoor and Singh, 2010). In the present study, the Ujjayi and Bhastrika Pranayama was selected for knowing its effect on the physiological parameters of the subject samples.

■ METHODOLOGY

The study was conducted on a total 100 randomly selected boys studying in B.K.Patil College of Physical Education and Dadasaheb Dhanaji Nana Choudhary College of Social Work, Malkapur. Based on their initial performance, they were divided into equal groups. Their age was ranged from 18-25 years. The pre and post tests were 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, cardio-vascular endurance by Canadian home fitness test and respiratory rate and pulse rate by stopwatch.

The groups were :

Group 1: Ujjayi Pranayama group

Group 2: Bhastrika Pranayama group

Group 3: Combined group (both the Pranayamas)

Group 4: Control group means which did not undergo by any treatment.

Treatments :

The experimental group 1, 2 and 3 were given treatment for one hour daily for six days a week for a period of 12 weeks and group 4 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 subjects of group 1 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 2, for eight minutes at a time, with the 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 3. This was repeated three times making total time

Table 1: 't' test and analysis of variance

Variables	Ujjayi mean		't' ratio	Bhastrika mean		't' ratio	Combined group mean		't' ratio	Control group mean		't' ratio	Tabulated 't'
	Pre	Post		Pre	Post		Pre	Post		Pre	Post		
Respiratory rate	18.16	17.40	3.85*	18.00	17.00	6.54*	18.60	17.84	4.23*	17.88	17.60	1.28	2.02
Pulse rate	80.08	78.96	3.70*	80.4	79.56	4.18*	80.2	78.76	3.58*	80.68	80.32	0.48	
Vital capacity (litre)	3.36	3.96	5.66*	3.56	3.92	3.11*	3.56	3.92	3.11*	3.52	3.64	0.84	
Systolic BP (mm/Hg)	120.08	118.88	3.31*	120.4	119.32	3.27*	120.32	119.08	3.64*	120.68	120.88	0.258	
Diastolic BP (mm/Hg)	80.04	78.32	4.78*	80.24	78.96	4.54*	80.28	79.28	4.99*	80.12	79.92	0.41	
Cardio-vascular endurance	87.32	91.72	6.97*	83.92	93.48	6.60*	85.12	94.80	11.24*	87.16	90.24	1.83	

*Indicates significance of value at P=0.05, degree of freedom 48

Table 2: Analysis of variance of the mean

Variables	Source of variance	Sdf	Sum of mean	Sum of square	Obtained 'F'	Tabulated 'F'
Respiratory rate	Among groups	3	3.16	9.48	9.67*	2.68
	Within groups	96	0.3266	31.36		
Pulse rate	Among groups	3	12.2933	36.88	6.81*	
	Within groups	96	1.8033	173.12		
Vital capacity	Among groups	3	0.54666	1.64	5.04*	
	Within groups	96	0.10833	10.40		
Systolic BP	Among groups	3	20.76	62.28	6.06*	
	Within groups	96	3.4225	328.56		
Diastolic BP	Among groups	3	11.0933	33.28	6.94*	
	Within groups	96	1.5966	153.28		
Cardio-vascular endurance	Among groups	3	99.60	298.8	7.14*	
	Within groups	96	13.935	1337.84		

*Indicates significance of value at P=0.05 and tabulated 'F'$_{0.05}$(3,96)=2.68

Table 3: Post hoc analysis of the data on pranayama of 22-25 years students

Group means				Mean difference	Critical difference at level of significance
Ujjayi	Bhastrika	Combined	Control		
Respiratory rate					
17.40	17.00			0.40*	5%= 0.32 and 1%= 0.42
17.40		17.84		0.44**	
17.40			17.60	0.20	
	17.00	17.84		0.84**	
	17.00		17.60	0.60**	
		17.84	17.60	0.24	
Pulse rate					
78.96	79.56			0.60	5%= 0.75 and 1%= 0.99
78.96		78.76		0.20	
78.96			80.32	1.36**	
	79.56	78.76		0.80*	
	79.56		80.32	0.76*	
		78.76	80.32	1.56**	
Vital capacity					
3.96	3.92			0.04	5%= 0.18 and 1%= 0.24
3.96		3.92		0.04	
3.96			3.64	0.32**	
	3.92	3.92		0	
	3.92		3.64	0.28**	
		3.92	3.64	0.28**	
Systolic BP					
118.88	119.32			0.44	5%= 1.03 and 1%= 1.37
118.88		119.08		0.20	
118.88			120.88	2.00**	
	119.32	119.08		0.24	
	119.32		120.88	1.56**	
		119.08	120.88	1.80**	
Diastolic BP					
78.32	78.96			0.64	5%= 0.70 and 1%= 0.93
78.32		79.28		0.96**	
78.32			79.92	1.60**	
	78.96	79.28		0.32	
	78.96		79.92	0.96**	
		79.28	79.92	0.64	
Cardio-vascular endurance					
91.72	93.48			1.76	5%= 2.09 and 1%= 2.77
91.72		94.80		3.08**	
91.72			90.24	1.48	
	93.48	94.80		1.32	
	93.48		90.24	3.24**	
		94.80	90.24	4.56**	

*and** Indicates significance value at P=0.05 and 0.01, respectively

duration of 60 minutes.

Analysis of data :

After twelve weeks training period, the difference between pre and post-tests 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 difference, if any between pre and post- test means of experimental groups was assessed by employing 't' test and analysis of variance is given Table 1.

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

Table 2 reveal that the obtained 'F' values of respiratory rate 9.67, pulse rate 6.81, vital capacity 5.04, systolic B.P. 6.06, diastolic B.P. 6.94 and cardio-vascular endurance 7.14 were much higher than the tabulated 'F'2.68 and required for 'F' ratio to the significant at 0.05 level with (3,96) degree of freedom.

As F-ratio was found significant in all the selected variables. Scheffe's Post-hoc test was applied to test the significance of difference between paired means (4) which are tabulated in Table 3.

Conclusion :

The results and findings can be discussed with the help of the 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.

Ujjayai and Bhastrika Pranayama combined practice group exhibited significant improvement as compared to the other experimental and control groups in cardio-vascular 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 the people mainly amongst youths and can create interest in achieving a normal level of fitness and maintaining their heath by means of practicing Yogic exercise and different types of Pranayamas to tranquilize and channelize one's thoughts with the cosmos and network of its happenings.

■ REFERENCES

Atmananda (1966). *The four Yogas*. Bombay Bharatiya Vidya Bhavan, Bombay (M.S.) INDIA.

Bhole, M.V. (1976). Effect of Kapalbhati on breathe holding time. *Yoga Mimamsa*, **18** (3-4) : 21-26.

Ganguly, S.K., Gharote, M.L. and Jolly, S.R. (1981). Immediate effect of Kapalbhati on cardio-vascular endurance. *Yoga Mimamsa*, **28** (1) : 1-7.

Mansoor, A. and Singh, C.P. (2010). Comparison of selected physical fitness variables of 18 year old male cricket players. *Internat. J. Physical Edu.*, **3** (1&2) : 50-52.

Sareen (1995). *Yogasiksha Avam Yoga dwara Rog Nivaran.* Delhi Khel Sahitya Kendra, DELHI, INDIA.