Effect of Pranayama on Selected Cardio Respiratory Parameters among Inter Collegiate Athletes

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ABSTRACT

The purpose of the present study was to find out the effect of Pranayama practices on selected Cardio Respiratory parameters among Inter Collegiate Athletes. For this purpose, 30 inter Collegiate athletes were selected as subjects from the College and they were divided randomly in to two equal groups with 15 each as experimental and control group. Both the group undergone usual athletic training in the evening two hours and in addition experimental group underwent pranayama practice daily morning 60-minutes and the control group not given pranayama practice. The training period for this study was 6 weeks in a schedule of 5 days in a week. The pre and post test were conducted prior and after the training programme on the selected cardio respiratory parameters of resting heart rate, breath holding time and respiratory rate. The collected data's were statistically analyzed by using ANCOVA to find out the significant difference between the groups, if any. The significant level was fixed at 0.05 levels. It was concluded from the result of the study that the experimental group done the pranayama practice had significant impact on the selected Cardio Respiratory parameters of resting heart rate, breath holding time and respiratory rate among inter collegiate athletes. Further the mean value indicated that the experimental group considerably reduced the resting heart rateand respiratory rateand increased the breath holding time than control group.

KEYWORDS

Pranayama, Resting Heart Rate, Breath Holding Time and Respiratory Rate

INTRODUCTION

Pranayama is the practice of breath control. The word prana refers not only to breath, but also to air and life itself.- Christy Turlington.

Pranayama is an ancient Yoga technique, which makes use of voluntary regulation of breathing and calms the mind. It differs from other forms of exercises as it mainly focuses on the sensations in the body. Pranayama thus acts directly on the various functions of the body and affords benefits in a positive way. Regular, slow and forceful inspiration and expiration for a longer duration during the Pranayama practice, leading to strengthening of the respiratory muscles. It impact on the efficiency of

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cardiovascular function. Pranayama literally means to pause, extend and regulate the prana, the life force of the breath. It is an ancient system of working with the breath through specific techniques and retentions, which enact a direct effect on the nervous system and on the mind /consciousness (Elonne Stockton, 2015).

There are plenty of research studies conducted in Pranayama in relation to cardio respiratory parameter and almost all the studies have given very strong inputs in improving the cardio respiratory efficiency. Ananda Kumar (2009) found that the Yoga and Pranayama practice significant reduction in resting pulse rate and respiratory rate. Joshi et al (1992) and Telles et al (1993) found significant reduction in respiratory rate, after short term Yoga practices. Pramanik et al (2009) found that slow pace Bhastrika Pranayama effects the blood pressure and heart rate and improves the efficiency of the respiratory parameters. Lakshmi Chand (2016) found that the breath holding time is improved due to Pranayama practice. TomarRakesh & Singh, Neelima (2011) found that Ujjayi Pranayama was benevolent to a significant reduction in resting pulse rate and beneficial effects of regular breathing exercises on cardio-vascular functions in normal healthy individuals. Turankar et al (2013)investigated that regular practice of slow breathing has been shown to improve cardiovascular and respiratory functions. Upadhyay Dhungel et al (2008) found that the Pranayama practice decreased the pulse rate.

Objectives of the Study

The core aim of the present study was to find out the effect of Pranayama practices on selected cardio respiratory parameters of resting heart rate, breath holding time and respiratory rate among inter collegiate athletes.

METHODOLOGY

The selection of subjects, variables, training procedure and statistical techniques are explained below.

Subject

Thirty inter-collegiate athletes were selected as subjects for the study and they were randomly divided into two groups equally with fifteen each as experimental and control group. The age groups of the subjects were eighteen to twenty five years.

Training Procedure

The experimental and control groups were practiced athletics training evening two hours and apart from athletics training experimental group undergone one hour Pranayama practice in a schedule of morning one hour for a period of six weeks. The Pranayama practice includes Kapalabati, Bramhari, NadiSuddhi, Bhastrika, Suryabhedan, Ujjayi, Bhramariand Shitali.

Testing Procedure

The pre and post test were conducted prior and after the training programme on the selected cardio respiratory variables of resting heart rate, breath holding time and respiratory rate. All the tests were carried out with standardized procedure.

Statistical Procedure

The analysis of covariance (ANCOVA) was used as a statistical tool to determine the significant difference on the data of pre and post mean obtained for resting heart rate, breath holding time and respiratory rate between control and experimental group. The level of significance was fixed at 0.05 level of confidence.

RESULTS & DISCUSSION

The analysis of covariance on the data obtained on resting heart rate, breath holding time and respiratory rate of pre and post-tests are tabulated and presented in the Tables 1, 2 and 3.

Table-1: Computation of Analysis of Covariance on Resting Heart Rate (Beat per Minute)

Test	Group		SV	Sum of Squares	df	Mean Square	F value
	Exp.	Control					
Pre test	72.4	70.66	B	24.3	1	24.3	0.799
			W	851.2	28	30.4	
Post test	65.6	69.8	B	132.3	1	132.3	5.322*
			W	696	28	24.609	
Adjusted Mean	64.93	70.46	B	223.547	1	223.857	26.65*
			W	226.455	27	8.387	

*Significant at 0.05 level of confidence

It was observed from the Table 1 that there was no significant difference in the pre-test ($F=0.799 < 4.20$). The significant differences were observed in post-test ($F=5.322 > 4.20$) for df 1 and 28 at 0.05 level of confidence and adjusted post-test ($F=26.65 > 4.21$) for df 1 and 27 at 0.05 level of confidence.

There was a significant difference in resting heart rate and mean score indicated that the experimental group reduced the level of resting heart rate than control group due to six weeks Pranayama practice.

Table-2: Computation of Analysis of Covariance on Respiratory Rate (Count per Minute)

Test	Group		SV	Sum of Squares	df	Mean Square	F value
	Exp.	Control					
Pre test	19.265	18.133	B	9.633	1	9.633	0.835
			W	322.667	28	11.523	
Post test	16.067	17.866	B	24.3	1	24.3	4.906*
			W	138.666	28	4.952	
Adjusted Mean	15.866	18.066	B	35.261	1	35.261	9.696*
			W	98.390	27	3.644	

*Significant at 0.05 level of confidence

It was observed from the above Table 2 that there was no significant difference in the pre-test (F=0.835<4.20). The significant difference were observed through post test (F=4.906>4.20) for df 1 and 28 and also on adjusted post-test (F=9.696 > 4.21) for df 1 and 27 at 0.05 level of confidence. There was a significant difference in respiratory rate and mean score indicated that the experimental group reduced respiratory rate than control group, due to six-week Pranayama practice.

Table-3: Computation of Analysis of Covariance on Breath Holding Time (Count in Seconds)

Test	Group		SV	Sum of Squares	df	Mean Square	F value
	Exp.	Control					
Pre test	35.46	33.66	B	24.3	1	24.3	1.578
			W	431.066	28	15.395	
Post test	40.86	34	B	353.633	1	353.633	18.011*
			W	549.733	28	19.633	
Adjusted Mean	40.00	34.86	B	188.052	1	188.052	32.529*
			W	156.084	27	5.780	

*Significant at 0.05 level of confidence

It was observed from the above Table 3 that there was no significant difference in the pre-test (F=1.578<4.20). The significant difference were observed through post-test (F=18.011>4.20) for df 1 and 28 and also on adjusted post-test (F=32.529 > 4.21) for df 1 and 27 at 0.05 level of confidence. There was a significant difference in breath holding time and mean score indicated that the experimental group increased breath holding time than control group, due to six-week Pranayama practice.

CONCLUSION

Based on the result of the study the following conclusions were drawn:

1. Pranayama practice is benevolent to improve the cardiorespiratory parameters of resting heart rate, breath holding time and respiratory rate among inter collegiate athletes.
2. Result of the study proved that there is a significant difference in resting heart rate, breath holding time and respiratory rate among inter collegiate athletes due to six weeks pranayama practice.

RECOMMENDATION

Pranayama training may be included as one of the athletics training schedule to improve the cardio respiratory efficiency.

REFERENCES

Ananda Kumar, P. (2009). Effects of Yogasanas and Suryanamaskar Practices on selected Motor Fitness, Psychological and Physiological variables among Diabetic Patients. UnpublishedM.Phil Thesis, Tamil Nadu Physical Education Sports University.

Elonne Stockton, (2015). Pranayama – What is It and Why Do It? Retrieved on 02-05-2017 form http://www.centeredyoga.com/article-elonne-april-2015.html

Joshi, L.N., Joshi, V.D.&Gokhale,L.V. (1992). Effect of shortterm pranayama practice on breathing rate and ventilatory functions of lung. Indian Journal of Physiology and Pharmacology, 36(2), 105-108.

Lakshmi Chand (2016). An Impact of Pranayama on breath holding time of School Student of District Rewari.International Journal Physical Education. Sport and Health, 3(1), 57-59.

Pramanik, T., Sharma HO, Mishra, S., Mishra, A., Prajapati, R., &Singh, S. (2009). Immediate effect of slow pace bhastrika pranayama on blood pressure and heart rate.Journal of Alternative Complementary Medicine, 15(3), 293-295.

Telles, S., Nagarathna, R., Nagendra, H.R. & Desiraju, T. (1993). Physiological changes in sportsteachers following three months of training in Yoga. Indian Journal of Medical Sciences, 47, 235-238.

Tomar, Rakesh & Singh, Neelima (2011). Effect of ujjayi pranayama on selected physiological variables.Physical Education & Sport/Science. Movement & Health, 11 (1), 140-146.

Turankar, A.V., Jain, S., Patel, S.B., Sinha, S. R., Joshi, A.D., Vallish, B.N., Mane, P.R., & Turankar, S.A. (2013). Effects of slow breathing exercise on cardiovascular functions,pulmonary functions & galvanic skin resistance in healthy human volunteers. IndianJournal of Medical Research, 137 (5), 916-921.

Upadhyay Dhungel,K., Malhotra,V., Sarkar, D.& Prajapati, R. (2008). Effect of alternate nostril breathing exercise on cardiorespiratory function. Nepal Medical College Journal, 10(1), 25-27.

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