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Impact of yogasana-pranayama practice on blood pressure and resting heart rate in male adolescents boys

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Abstract

Yoga and Physiology both have inter relationships, physiological changes in the human body through yoga is realized by many studies on different illnesses' and disorders of human body organs. There has been limited research regarding yoga's effect on physiological functions in adolescents. The purpose of the present investigation was to examine the effects of Yogasana and Pranayama practice on blood pressure and resting heart rate of male adolescents. The Subjects for the study were adolescent boys studying between 13 to 16 years. Total 80 Subjects studying at a private school were selected through simple random sampling technique for the present investigation. 40 subjects each were placed in treatment as well as control group. All the subjects selected for this study were tested twice prior to treatment (pre-test) and at the conclusion of treatment (post-test) with a time gap of 24 weeks. Selected physiological capability parameters and testing tools were used in the present investigation. Treatment in the form of selected yogic asana along with pranayama was given to selected subjects in the specified treatment group. Twenty four weeks of training included systematic yogasana and pranayama training for six days in a week. In order to examine the hypothesis of the study paired samples "t" test was used. There were significant differences in Systolic Blood Pressure, Diastolic Blood Pressure and Resting Heart rate during pre- test and post-test of experimental group was 112.60 & 106.00, and 67.60 & 60.80 and 73 & 64 respectively, whereas the differences in mean was not significant in control group during pre-test and post-test situations. On the basis of the present investigation it can be concluded that the physiological functions significantly improves in terms of Systolic blood pressure, diastolic blood pressure and resting heart rate in adolescent boys.

Keywords: Health, physiological functions, yogasana, pranayama, systolic blood pressure, diastolic blood pressure and resting heart rate

Introduction

Yoga is oldest spiritual technique of physical and mental exercise known to humanity. Yoga is a psychosomatic-spiritual discipline for achieving union and harmony between our mind, body, and soul and the ultimate union of our individual consciousness with the universal consciousness [1]. Yogic techniques produce consistent physiological changes and have sound scientific basis [2, 3]. Yoga has been practiced for thousands of years. It is based on ancient theories, observations and principles of the mind-body connections. Substantial research has been conducted to look at the physiological benefits of yoga through yoga postures (asanas), yoga breathing (pranayama) and meditation. Yoga has been investigated in relation to a variety of topics with focus in the reduction of symptoms of various diseases and ailments, such as lower back pain, arthritis, diabetes and heart disease [4], as well as the treatment of mental health issues, principally the reduction of stress [5-6]. There has been limited research regarding yoga's effect on systolic and diastolic blood pressure and heart rate in adolescents. In particular, there is a lack of evidence as to whether the practice of yoga can provide sufficient physical activity to improve and/or maintain cardio respiratory endurance, muscular fitness and blood pressure response. The purpose of the present investigation was to examine the effects of Yogasana and Pranayama practice on physiological capacities of male adolescents.

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Fig 1: Yogasana and Pranayama

Methods

The Subjects for the study were adolescent boys studying in 8th to 10th standard and their age ranged between 13 to 16 years. Total 80 Subjects studying at a private schools at Nagpur, Maharashtra were selected through simple random sampling technique for the present investigation. 40 subjects

each were placed in treatment as well as control group. All the subjects selected for this study were tested twice prior to treatment (pre-test) and at the conclusion of treatment (post-test) with a time gap of 16 weeks. The details on physiological parameters and testing tools are given in Table 1.

Table 1: Details on Physiological Capabilities along with Respective Testing Tools

S. No.	Parameters	Testing Tools
1.	Systolic blood pressure	Sphygmomanometer & stethoscope
2.	Diastolic blood Pressure	Sphygmomanometer & stethoscope
3.	Resting heart rate	Radial pulse

Treatment in the form of yogic asana along with pranayama was given to selected subjects in the specified treatment group. Control group did not take part in any form of physical training and observed normal daily routine. Twenty four weeks of training included systematic yoga and pranayama training for six days in a week. The training was scheduled in the morning 80 minutes which included 10 minutes for warm up, 60 minutes for pre-planned treatment and another 10

minutes for cool down. In order to examine the hypothesis of the study paired samples “t” test was used.

Results

The results on physiological capacities during pre and post-test situations of experimental and groups are given in table 2 and 3 respectively.

Table 2: Summary of Results on Physiological Capacities at Pre and Post- test Situations of experimental Group

	Systolic Blood Pressure		Diastolic Blood Pressure		Resting Heart Rate	
	Pressure		Pressure			
	Pre	Post	Pre	Post	Pre	Post
Sample size	40	40	40	40	40	40
Arithmetic mean	112.60	106.60	67.60	60.80	73	64
Standard deviation	7.008	7.178	6.659	6.715	6.77	7.41
Standard error of the mean	1.108	1.135	1.053	1.062	1.0711	1.1723
Paired samples t-mean difference	-6.0 00		-6.80 0		9.2250	
Standard deviation	4.820		4.637		3.3626	
‘t’ value	7.873		9.276		17.351	
Degrees of Freedom	39		39		39	
Two-tailed probability	P = .000		P = .000		P = .000	

Table 3: Summary of Results on Physiological Capacities at Pre and Post- test Situations of Control Group

	Systolic		Diastolic		Resting Heart	
	Blood		Blood		Rate	
	Pressure		Pressure			
	Pre	Post	Pre	Post	Pre	Post
Sample size	40	40	40	40	40	40
Arithmetic mean	110.75	111.95	66.85	72.40	80	2
Standard deviation	6.574	8.706	5.851	5.266	10.86	11.42
Standard error of the mean	1.039	1.377	.925	.833	1.7168	1.8063
Paired samples t-mean different	-1.2 00		-5.55 0		-2.57 50	
Standard deviation	7.130		4.630		9.2290	
't' value	-1.065		-7.582		-1.765	
Degrees of freedom	39		39		39	
Two-tailed	P = .294		P = .000		P = .085	

Table 4: Summary of 't' Test Results on Physiological Capacities at Pre and Post- test Situations of Both Groups.

	Mean ± SD	SEM	't' Value
Systolic Blood Pressure	Experiment (Pre-test)	112.60	1.108
	Experimental (Post-test)	106.60	1.135
	Control (Pre-test)	110.75	1.039
	Control (Post-test)	111.95	1.377
Diastolic Blood	Experiment (Pre-test)	67.60	1.053
	Experimental (Post-test)	60.80	1.062
	Control (Pre-test)	66.85	.925
	Control (Post-test)	72.40	.833
Resting Heart rate	Experiment (Pre-test)	73	1.0711
	Experimental (Post-test)	64	1.1723
	Control (Pre-test)	80	1.7168
	Control (Post-test)	82	1.8063

Table 4 depicts mean of systolic blood pressure during pre-test and post- test of experimental group was 112.60 and 106.60 respectively, whereas the mean of systolic blood pressure during pre-test and post- test of control group was 110.75 and 111.95 respectively. The "t" value in case of experimental group was 7.873. And for control group it was 1.065 respectively,

Diastolic blood pressure during pre-test and post- test of experimental group was 67.60 and 60.80 respectively, whereas the mean of systolic blood pressure during pre-test and post- test of control group was 66.85 and 72.40 respectively. The "t" value in case of experimental group was 9.276 and for control group it was -7.582 respectively,

The resting heart rate during pre-test and post- test of experimental group was 73 and 64 respectively, whereas the mean of resting heart rate during pre-test and post- test of control group was 80 and 82 respectively. The "t" value in case of experimental group was 17.351 and for control group it was -1.765 respectively. In these cases null hypothesis is rejected at .05 level of significance. In case of systolic blood pressure and diastolic blood pressure although there were significant differences in pre and post- test scores of experimental group, significant differences were also observed in control group results.

Discussion

Physiological functions have great implications in determining the physical performance as well as health of an individual. Ray U.S. *et al.* [7] observed significant improvement in VO₂ max after Yogic training. Raju P.S. *et al.* [8] have found a significant increase in oxygen consumption per unit work after yoga training. It also reported that cardiovascular endurance increases due to yoga training [7]. The study by Singh *et al.* demonstrated the beneficial effect of Nadi Shodhana Pranayama on heart rate of youth between the age groups 18-24 [9].

It also observed statistically significant reduction in heart rate after short term Yoga training [10-11]. In case blood pressures there were significant differences in pre and post- test results of experimental group.

There were significant differences observed in pre and post- test results of experimental group in systolic and diastolic blood pressure. The present results are supported by numerous other studies [12].

Conclusion

On the basis of the present investigation it can be concluded that the physiological functions significantly improves in terms of Systolic Blood Pressure, Diastolic Blood Pressure and Resting Heart rate in adolescents by yoga training.

References

1. Madanmohan, Mahadevan SK, Balakrishnan S, Gopalakrishnan M, Prakash ES. Effect of 6 wks yoga training on weight loss following step test, respiratory pressures, handgrip strength and handgrip endurance in young healthy subjects. *Indian J Physiol Pharmacol.* 2008;52:164-70.
2. Chhina CS. The voluntary control of autonomic responses in Yogis. *Proc Int. Union Physiol. Sci.* 1974;10:103-104.
3. Udupa KN, Singh RH. The scientific basis of Yoga. *JAMA.* 1972;220:1365.
4. Raub JA. Psychophysiological effects of hatha yoga on musculoskeletal and cardiopulmonary function: a literature review. *The Journal of Alternative and Complementary Medicine.* 2002;8:797-812.
5. Granath J, Ingvarsson S, Thiele U, Lundberg U. Stress management: a randomized study of cognitive behavioural therapy and yoga. *Cognitive Behaviour Therapy.* 2006;35:3-10.
6. McCaffrey R, Ruknui P, Hatthakit U, Kasetsoomboon P.

- The effects of yoga on hypertensive persons in thailand. *Holistic Nursing Practice*. 2005;19:173-180.
7. Bera TK, Rajapurkar MV. Body composition, cardiovascular endurance and anaerobic power of yogic practitioner. *Indian J Physiol Pharmacol*. 1993;37(3):225-228.
 8. Balasubramanian B, Pansare MS. Effect of Yoga on Aerobic & Anaerobic power of muscles. *Indian J Physiol Pharmacol*. 1991;3(4):281-282.
 9. Singh S, Gaurav V, Prakash V. Effects of a 6-week nadi-shodhana pranayama training on cardiopulmonary parameters, *Journal of Physical Education and Sports Management*. 2011;2(4):44-47.
 10. Kaviraja U, Madan M. Effect of Pranayama training on cardiac function in normal Young volunteers. *Indian J Physiol Pharmacol*. 2002;47(1):27-33.
 11. Kalwale PK, Shete AN, Doiphode RS, Sayeed A, Zingade US. Effect of different duration of pranayama on cardiovascular parameters. *Indian J Physiol Pharmacol*. 2006;52(5):159.
 12. Bharshankar JR, Bharshankar RN, Deshpande VN, Kaore SB, Gosavi GB. Effect of Yoga on cardiovascular system in subjects above 40 years. *Indian J Physiol Pharmacol*; c2003, 47.