

Cardio-Vascular Profile of School going children with the application of Yogic Asanas and Breathing Techniques

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Abstract

Objectives: To characterize the status of Cardio-Vascular Parameters i.e. - Vital capacity, Maximum breath holding, resting pulse rate, Systolic Pressure and Diastolic Pressure of the school going students and to investigate the post effect of Yogic Asanas & Breathing Techniques on selected Cardio-Vascular Parameters of school going students. Methods: The subjects of the present study were from Rani Laxmi Bai Memorial School, Indira Nagar, Lucknow and therefore the study was delimited to randomly selected 30 boys from class eight standard with their chronological age ranged between 12-15 years. The study was confined to the following selected variables:-Vital capacity, Maximum breath holding, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure. Ten weeks Yogic Asana & Breathing techniques were applied on the school going children. The data for proposed study was prior collected before applying the 10 weeks yogic and pranayama technique and after conducting the program. Results: Significant difference found in Vital Capacity with t—value 2.307, Maximum Breath Holding with t-value 2.589, Resting Pulse Rate with t—value 6.964, but insignificant difference found in Systolic and Diastolic Pressure with t-value 1.870 and 1.997 respectively. Conclusion: The ten weeks Yogic Asanas & Breathing puts a significant effect on Vital Capacity, Maximum Breath Holding Capacity, Resting Pulse Rate but insignificant Difference was found in Systolic and Diastolic Blood Pressure.

KEYWORDS: Vital Capacity, Maximum Breath Holding Capacity, Resting Pulse Rate, Systolic blood pressure, Diastolic blood pressure, Yoga, Pranayama.

Introduction

Man has made incredible progress in almost every walk of life. Things once considered impossible to be achieved have now been achieved by us. What we have achieved and accomplished today, could not have been imagined in their dreams by our past generations. Modern Scientists and researchers have absolutely changed our life-style. Effects of this rejuvenation, that man is completely habituated of a lethargic life style and giving invitation to so many unpredictable diseases i.e. diabetes, cancer, acidity, ulcer, migraine and hypertension. Today, Yoga is considered by the people as an essence of life. Yoga has the surest remedies for man's physical as well as psychological ailments.

Ancient sages of our country have suggested eight stages of Yoga to maintain purity of body, mind and soul and finally communion with God. These eight stages are known as Astangayoga. Asana and Pranayama are the very important part of Astangyoga. Basically, Asana means to remain constant in a particular posture.

Pranayama means the capacity to hold our breathe. Prana with ayama means control over the breathing process is known as pranayama. The Asanas are capable of influencing the breathe movements in a subtle manner. Almost all the asanas have to be done by controlling the breath in a particular manner. There are mainly eight types of pranayama- Surya Bhedi Pranayama, Ujjayi pranayam, Sitkari Pranayama, Shitali Pranayama, Bhastrika Pranayama, Bhramhari Pranayama, Moorcha Pranayama and Kevali Pranayama. Many researches had already conducted in yoga but some exact justification was required for school going children that how what is the importance of Yoga for school going children. For justifying this here is need to conduct an investigation to find out the questions' answer that what will be the effect of different kind of yogic asana and breathing techniques on selected Cardio-Vascular Parameters of school going children.

Purpose of the Study

The specific purposes of this study were as follows:-

- i) To characterize the status of Cardio-Vascular Parameters i.e. - Vital capacity, Maximum breath holding, resting pulse rate, Systolic Pressure and Diastolic Pressure of the school going students.
- ii) To investigate the post effect of Yogic Asanas & Breathing Techniques on selected Cardio-Vascular Parameters i.e. - Vital capacity, Maximum breath holding, resting pulse rate, Systolic blood pressure, Diastolic blood pressure of school going students.

Delimitation of the study

- i) Despite the heterogeneity of living pattern the subjects of the present study were from Rani Laxmi Bai Memorial School, Indira Nagar, Lucknow and therefore the study was delimited to randomly selected 30 boys from class eight standard with their chronological age ranged between 12-15 years.
- ii) The study was confined to the following selected variables:-
 - a) Vital capacity
 - b) Maximum breath holding
 - c) Resting pulse rate
 - d) Systolic blood pressure
 - e) Diastolic blood pressure

Research Methodology

Despite the heterogeneity of living pattern the subjects of the present study were from Rani Laxmi Bai Memorial School, Indira Nagar, Lucknow and therefore the study was delimited to randomly selected 30 boys from class eight standard with their chronological age ranged between 12-15 years.

Asana:

Keeping the feasibility criterion in mind, the following Asanas was selected for the proposed training programme in the study and students was introduced with basic training of Asana-i.e.Suryanamaskar Kriya, Halasana, Matsyasana, Bhujangasana, Dhanurasana, Gomukhasana, Ardhamatsendrasana, Paschimotanasana, Padmasana, Tadasana, Garudasana, Shavasana, Makarasana. In breathing techniques of **Pranayama** students was introduced with basic training of these Pranayamas; Ujjayi, Nadishodhan, Suryabhedan and Bhastrika.

NOTE:

1. Each asana was repeated 2 times
2. This programme was continued for all the phases
3. Total length of training programme: 10 weeks
4. Duration of training programme on each day basis: one hour.
5. Morning Session (7:00a.m. 08:30 a.m.) Duration:- 1:30 Hrs
6. The training programme was repeated in all the six days in a week

Collection of Data

The data for proposed study was prior collected before applying the 10 weeks yogic and pranayama technique and after conducting the program.

Table – 1

Criterion Measures for Cardio-Vascular Parameters

Sl. No.	Physical & Physiological Components	Tools/Test/Equipment Used	Unit of Measurement
1.	Vital capacity	Dry Spiro Meter	Mili litres
2.	Maximum Breath Holding	Stopping one’s inhalation or exhalation	Seconds
3.	Resting Pulse Rate	In resting position	Numbers/min
4.	Systolic Blood Pressure	Sphygmomanometer	mm Hg
5.	Diastolic Blood Pressure	Sphygmomanometer	mm Hg

Statistical Technique

The below mentioned statistical technique was used to fulfill the need of objectives of the study:

1. Descriptive Statistics
2. Paired t-test

(The hypothesis was tested at 0.05 level of significance. The statistical analysis was done with the help of SPSS 20 version)

Results & Findings

To find out the status before and after applying ten weeks yogic and breathing techniques on school going boys’ descriptive statistics was used. Whereas, to find out the significant difference between the means of two scores of pre & post values, paired t-test was applied and the results are presented in table – II.

Table-II: Descriptive and t-test Value of Selected Cardio-Vascular Parameters of School Going Boys

Variables	N	Pre test Mean	SD	Post test Mean	SD	r	t-value
Vital capacity	30	1688.87	376.83	1856.25	224.23	-0.10	2.307*
Maximum Breath Holding	30	32.72	7.04	37.27	10.75	0.27	2.589*
Resting Pulse Rate	30	92.77	9.78	88.97	10.99	0.95	6.964*
Systolic Blood Pressure	30	116.22	3.10	115.05	2.18	-0.09	1.870
Diastolic Blood Pressure	30	79.17	1.67	79.72	3.05	-0.02	1.997

* t-value required to be significant at 2,28 degree of freedom = 2.048

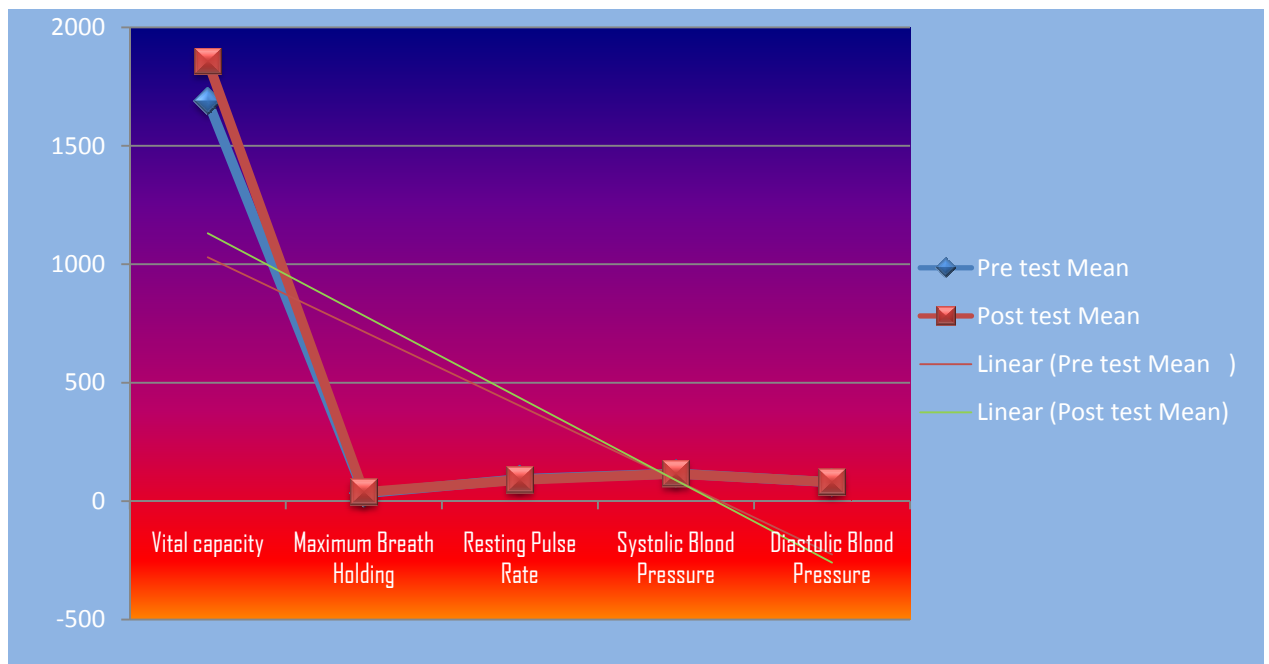
It is evident from the table no. II, that:-

- The computed t-value of Vital capacity was found 2.307, which is more than the tabulated t-value 2.048. Therefore; **significant** difference was found between pre test and post test with the application of 10 weeks Yogic Asanas & Breathing Techniques on Vital capacity of School Going Boys. The mean value of pre test of Vital capacity (1688.87) < post test of Vital capacity (1856.25).
- The computed t-value of Maximum Breath Holding was found 2.589, which is more than the tabulated t-value 2.048. Therefore; **significant** difference was found between pre test and post test with the application of 10 weeks Yogic Asanas & Breathing Techniques on Maximum Breath Holding of School Going Boys. The mean value of pre test of Maximum Breath Holding (32.72) < post test of Maximum Breath Holding (37.27).

- The computed t-value of Resting Pulse Rate was found 6.964, which is more than the tabulated t-value 2.048. Therefore; **significant** difference was found between pre test and post test with the application of 10 weeks Yogic Asanas & Breathing Techniques on Resting Pulse Rate of School Going Boys. The mean value of pre test of Resting Pulse Rate (92.77) > post test of Resting Pulse Rate (88.97).
- The computed t-value of Systolic Blood Pressure was found 1.870, which is less than the tabulated t-value 2.048. Therefore; **insignificant** difference was found between pre test and post test with the application of 10 weeks Yogic Asanas & Breathing Techniques on Systolic Blood Pressure of School Going Boys. The mean value of pre test of Systolic Blood Pressure (116.22) < post test of Systolic Blood Pressure (115.05).
- The computed t-value of Diastolic Blood Pressure was found 1.997, which is more than the tabulated t-value 2.048. Therefore; **insignificant** difference was found between pre test and post test with the application of 10 weeks Yogic Asanas & Breathing Techniques on Diastolic Blood Pressure of School Going Boys. The mean value of pre test of Diastolic Blood Pressure (79.17) < post test of Diastolic Blood Pressure (79.72).

Furthermore, the Mean Value of Selected Cardio-Vascular Parameters of School Going Boys with the application of 10 weeks Yogic Asanas & Breathing Techniques are presented with the help of figure no. I

Figure No. I: Graphical Representation of Mean Value of Selected Cardio-Vascular Parameters of School Going Boys with the application of 10 weeks Yogic Asanas & Breathing Techniques



Discussions of Findings

In the present study the ten weeks Yogic Asanas & Breathing puts a significant effect on Vital Capacity, Maximum Breath Holding Capacity, Resting Pulse Rate, but insignificant Difference was found in Systolic and Diastolic Pressure. Yoga improves cardio-respiratory efficiency as reported by Madanmohan et al (2008) that yoga training of six weeks duration attenuates the sweating response to step test and produces a marked increase in respiratory pressures and endurance in 40 mm Hg test in both male and female subjects. In their another study, (Madanmohan, 1992) they reported that twelve weeks of yoga practice results in significant increase in maximum expiratory pressure, maximum inspiratory pressure, breath holding time after expiration, breath holding time after inspiration, and hand grip strength. Joshi et al (1992) have also demonstrated that six weeks of pranayam breathing course resulted in improved ventilatory functions in the form of lowered respiratory rate, and increases in the forced vital capacity, forced expiratory volume at the end of First, second, maximum voluntary ventilation, peak expiratory flow rate, and prolongation of breath holding time. Increase in inhalation and exhalation process, pressures suggests that yoga training improves the potency of respiratory muscles, which are as like skeletal muscles. Yogic techniques involve isometric contraction which can increase skeletal muscle strength. Breath holding time depends on initial lung volume. Greater lung volume decreases the rate and amplitude of involuntary contractions of respiratory muscles, therefore the discomfort of breath holding decreases. During yoga practice, one consistently and consciously over-rides the stimuli to respiratory centers, thus acquiring control over the respiration. This, along with improved cardio-respiratory performance may explain the prolongation of breath holding time in yoga and pranayama trained subjects. In the present study on School Going Boys with the application of 10 weeks Yogic Asanas & Breathing Techniques most of the cardiovascular parameters are significant as compared to pre test. Vital Capacity was improved by asana and pranayam practices. This may be due to the reason that pranayama is related to the breathing exercise. So it will have significant effects on the lungs volume of an individual.

The term Breath Holding Time generally represents to some extent the aerobic and anaerobic potentiality of an individual. The study revealed that asana and pranayam group resulted into significant improvement in Breath Holding Time that pranayama is specially meant to make control over breathing capacity; therefore significant difference was found. Based on available evidence a prudent recommendation is to include exercise in most therapeutic program to manage hypertension. Both systolic and Diastolic Blood Pressure can be in normal range and remain almost constant after the application of Yogic Asanas & Breathing Techniques.

Conclusion: The ten weeks Yogic Asanas & Breathing puts a significant effect on Vital Capacity, Maximum Breath Holding Capacity, Resting Pulse Rate but insignificant Difference found in Systolic and Diastolic Blood Pressure.

References

1. Bhardwaj Satish Kumar.(2012).Effect of pranayam on hemoglobin level of under graduate college- girls. An International Multidisciplinary Research Journal Volume: 2, Issue: 9; 131-135.
2. Goel, B.B. Natural Health & Yoga, All India Nature Cure Federation, Delhi 2010:pp no.188-192.
3. Madanmohan, Mahadevan SK, Balakrishnan S, Gopalakrishnan M, Prakash ES. Effect of six weeks yoga training on weight loss following step test, respiratory pressures, handgrip strength and handgrip endurance in young healthy subjects.(2008) Indian Journal of Physiology and Pharmacology; 52: 164-170.
4. Madanmohan, Thombre DP, Balakumar B, Nambinarayanan TK, Thakur S, Krishnamurthy N, Chandrabose A. (1992).Effect of yoga training on reaction time, respiratory endurance and muscle strength. Indian Journal of Physiology Pharmacology.; 36:229-33
5. McCall, Robert B.(1990).“Fundamental Statistics for the Behavioral Sciences” 5th edition. New York: Harcourt Brace Jovanovich.
6. P.D.Sharma. (2007).Yoga:Yogasana and Pranayama for Health. Mumbai: Navneet Publications(INDIA)Limited,Bhavani Shankar Road,Mumbai.
7. Sharma P D, Yogasana and Pranayama for Health, (Ahemdabad: Gala Publications, 1989): 7-9.
8. Sunil Kumar Sharma. (2008). Practical Yoga. New Delhi: Sports Publication,Darya Ganj,New Delhi.
9. Telles, Nagarathna R and Nagendra HR. (1994). Breathing through a particular nostril can alter metabolism and autonomic activities. Indian Journal of Physiology & Pharmacology, 38, 133 - 137.
10. Tobin A. Silver. (May 2005).Effects of 12 Weeks of Yoga Training in Selected Measures of Balance, Fitness, and Mood. A Thesis,Faculty of the Department of Sport and Exercise Sciences
11. Verma J. Prakash.(2000.) “Sports Statistics”. Gwalior: Venus Publications.