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## Effect of yoga on cardio respiratory system and body composition of university male students

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### Abstract

The aim of the present study was to investigate the effect of yoga on Cardio Respiratory system and Body Composition of sixty male student's age ranging from 19 to 22 years from Kalasalingam Academy of Research & Education (Deemed to be University) Krishnankoil, Tamil Nadu, India were selected as the subject of the study. The subject was randomly distributed in two groups. One group is designated as experimental group and other one as control group. The study was restricted to the following variables: vital capacity, resting pulse rate, breath holding time, blood pressure and body composition. Sarvangasana, halasana, naukasana, bhujangasana, dhanurasana, ustrasana, gomukasana, paschimatasana, ardha-matsyendrasana, savasana and pranayama was used for yogic training. Analysis of covariance was applied to study the effect of yoga on cardio respiratory system and body composition and are significant at  $P < 0.05$ . A longterm effect of yoga proved useful and significant differences was observed in vital capacity, resting pulse rate, breath holding time, blood pressure and body composition.

**Keywords:** Yoga, cardio respiratory system, body composition

### Introduction

Cardiovascular problem and heart diseases are common problems of modern times. Many conditions like improper diet, lifestyle, sleeping pattern and negative thinking trigger heart diseases and affect the cardiovascular health. These problems are witnessed now not only in the old-age but also the young generations are falling prey to such impairments. The way of life today needs to be changed to improve the cardiovascular health. Yoga is India's precious gift to the World. Yoga is holistic, preventive as well as curative for all heart related problems. Modern medicines and drugs are expensive and have various side effects. These are in fact more curative rather than preventive. In turn, yoga is easy to learn and has many benefits. Yoga is an economical and alternative system of healing. It helps in relieving stress, enhancing health and improving fitness. It is today being widely used to prevent and treat various diseases of the heart. It results in wholesome healing. The Yogic way of life helps in the prevention of cardiovascular diseases and, in fact, helps in improving the cardiovascular health. Our body, mind and spirit are intricately interrelated and constantly influence one another. The science of yoga that is holistic has been designed to have subtle effect on our whole being, body, mind as well as spirit. The all pervasive stress and stress-induced disorders like hypertension and angina are fast growing epidemics and bane of today's modern society. The science of yoga is the best method for prevention as well as management of stress and stress-induced disorders. To improve your cardiovascular health, a complete yoga program should be a way of your life. Four main parts; First involves exercises (Asanas), especially the Sun salutation set of yoga exercises are recommended. At least 4-5 cycles a day help to strengthen the health of the heart and help to prevent heart attack. Second, breath control (pranayama) – proper breathing through the expansion of lungs; Third, sleep control (yoga nidra) – time and lastly mind control (meditation). Yoga training promotes emotional and physiological balances which invariably have an effect on the cardiovascular health. The benefits are enhanced heart health, lowered blood pressure, reduced chronic stress, boosted immune system and overall improvement in the cardiovascular health of an individual. Also there is an improved management of day to day stress, improvement of cardiorespiratory functions and overall fitness.

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In the following ways, Yoga can be used to improve cardiovascular health (Patricia October 8, 2008) [15]. Therefore it will be worthwhile to investigate the effect of yoga on cardio respiratory system and body composition of male student's of sports potentialities through Yogic practices for enhancing health and upliftment of overall fitness and thereby such study is being undertaken.

**Method and Materials**

Out of one hundred and twenty, sixty male student's age ranging from 19 to 22 years. Kalasalingam Academy of Research & Education (Deemed to be University) Krishnan oil, Tamil Nadu, India were randomly selected as the subject of the study. The subjects were assigned at random to experimental and control group. Each group consists of thirty students. The study was conducted for a period of 12 weeks in the month of July to September. Sixty subjects were assembled in the university indoor stadium in the morning for five days a week for 45 minutes. The variables undertaken under Cardio Respiratory System are Vital Capacity, Resting Pulse Rate, Systolic, Diastolic and Total Body Fat Percentage.

The following asanas was administered during the training to study the effect of yoga on cardio respiratory system and body composition are (a) sarvangasana, (b) halasana, (c) naukasana, (d) Bhujangasana (e) dhanurasana, (f) ushtrasana, (g) gomukhasana, (h) paschimatanasana (i) ardhamatsyendrasana, (j) savasana, (k) pranayama – vastrikasana and anulom – vilom. The data for various cardio-respiratoryvariable and body composition was collected twice, once before the start of the study and next after the completion of twelve weeks of experimental treatment. In order to investigate the existence of significant effect of yoga on cardio respiratory system and body composition of students of Kalasalingam Academy of Research & Education (Deemed to be University) Krishnankoil, Tamil Nadu, India in pre and post-test result's the analysis of covariance statistics was used. In case of existence of significant difference, the post hoc test (L.S.D test) was used in order to investigate the significant difference between the pair group means. For testing the mean difference, the level of significance was set at 0.05 level of confidence.

**Table 1:** Analysis of covariance for vital capacity of university male student's under experimental and control group categories.

Mean	Experimental	Control		SS	DF	MSS	F-ratio
Pre Test	3.33	3.36	A	0.02	1	0.02	0.07
			W	14.93	58	0.26	
Post test	3.65	3.34	A	1.44	1	1.44	5.57*
			W	15.01	58	0.26	
Adjusted Post Test	3.67	3.33	A	1.73	1	1.73	29.15*
			W	3.38	57	0.06	

\* Significant at 0.05 level of confidence.  
 F.05 (1, 58) = 4.00, A = Among mean variance.  
 F.05 (1, 57) = 4.00, W = Within group variance.

**Table 2:** Analysis of covariance for resting pulse rate of university male student's under experimental and control group categories

Mean	Experimental	Control		SS	DF	MSS	F-ratio
Pre Test	70.03	70.40	A	2.02	1	2.02	0.27
			W	428.17	58	7.38	
Post test	68.17	69.87	A	43.35	1	43.35	4.19*
			W	599.63	58	10.34	
Adjusted Post Test	68.35	69.68	A	26.46	1	26.46	9.04*
			W	166.92	57	2.93	

\* Significant at 0.05 level of confidence.  
 F.05 (1, 58) = 4.00 A = Among mean variance.  
 F.05 (1, 57) = 4.00 W = within group variance.

**Table 3:** Analysis of covariance for systolic blood pressure of university male student's under experimental and control group categories.

Mean	Experimental	Control		SS	DF	MSS	F-ratio
Pre Test	118.00	117.73	A	1.07	1	1.07	0.02
			W	2717.87	58	46.86	
Post test	113.87	117.17	A	163.35	1	163.35	4.24*
			W	2233.63	58	38.51	
Adjusted Post Test	113.76	117.27	A	185.24	1	185.24	22.46*
			W	470.05	57	8.25	

\* Significant at 0.05 level of confidence.  
 F.05 (1, 58) = 4.00 A = Among mean variance.  
 F.05 (1, 57) = 4.00 W = within group variance

**Table 4:** Analysis of covariance for diastolic blood pressure of university male student's under experimental and control group categories.

Mean	Experimental	Control		SS	DF	MSS	F-ratio
Pre Test	73.27	73.07	A	0.60	1	0.60	0.02
			W	1587.73	58	27.38	
Post test	70.33	73.87	A	96.27	1	96.27	4.19*
			W	1334.13	58	23.00	
Adjusted Post Test	69.00	72.03	A	109.27	1	109.27	26.24*
			W	1237.39	57	4.17	

\* Significant at 0.05 level of confidence.  
 F.05 (1, 58) = 4.00 A = Among mean variance.  
 F.05 (1, 57) = 4.00 W = within group variance.

**Table 5:** Analysis of covariance for total body fat of university male student's under experimental and control group categories.

Mean	Experimental	Control		SS	DF	MSS	F-ratio
Pre Test	18.07	18.85	A	8.92	1	8.92	0.91
			W	570.11	58	9.83	
Post test	16.48	18.57	A	65.56	1	65.56	5.06*
			W	752.00	58	12.97	
Adjusted Post Test	16.77	18.29	A	34.45	1	34.45	4.59*
			W	447.65	57	7.85	

\* Significant at 0.05 level of confidence.

F.05 (1, 58) = 4.00 A = Among mean variance.

F.05 (1, 57) = 4.00 W = within group variance.

### Discussion of findings

The analysis of variance was used for findings the effect of selected yogic asanas and pranayama on cardio-respiratory system and body composition on male students of Kalasalingam Academy of Research & Education (Deemed to be University) Krishnankoil, Tamil Nadu, India. It was observed that there were significant differences in vital capacity, resting pulse rate, breath holding time, blood pressure and total body fat percentage of body composition. Yogic exercise involves physical, mental and spiritual task in a comprehensive manner. It brings about the behavioural changes. Yoga in long duration affects hypothalamus and brings about decrease in the systolic and diastolic blood pressure through its influence on vasomotor centre, which leads to reduction in sympathetic tone and peripheral resistance. The relaxation and exercise components of yoga have a major role to play in the treatment and prevention of high blood pressure (hypertension) and body composition. There are many poses in Yoga that can improve the health of the heart by improving blood circulation. They also help in the removal of toxic waste from the body and regulate the hormones to keep us healthy. Pranayama, an important part of Yoga, if practiced regularly under the guidance of a trained practitioner, can help control breathing and is an effective cardiovascular yoga exercise. Breathing, in turn, can help regulate the flow of blood and relax a perturbed mind (Raphaelhager 2009) [16].

### Conclusions and Recommendations

It was concluded that twelve weeks of Yoga training programme through asanas and pranayama was found to be effective in bringing about significant improvement in respect to vital capacity, resting pulse rate, breath holding time, blood pressure and total body fat percentage of body composition. It is recommended that a similar study may be undertaken for female students at various age levels. It is further recommended that a similar study may be undertaken by selecting a large sample of athletes, cardiac patients etc. Additional studies may be conducted specifically and extensively on other yogic kriyas, bandha, other pranayama methods etc.

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