



Effect of Yogasana and Physical Exercise on Breath Holding Time High Density Lipoprotein and Total Cholesterol among Female Rural Graduates

Dr.S.Chidambara Raja

Associate Professor, Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu, India.

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Abstract

The purpose of the present study was to find out the effect of yogasana and physical exercise on breath holding time, high density lipoprotein and total cholesterol among female rural graduates. For this purpose, thirty female rural graduates around Chidambaram town, Cuddalore district, Tamilnadu studying various courses in Annamalai University, were selected as subjects. The age of the subjects were ranged from 18 to 23 years. They were divided into three equal groups, each group consisted of ten subjects, in which experimental group - I underwent yogasana practice, experimental group - II underwent physical exercise and group - III acted as control that did not participate in any special activities apart from their regular curricular activities. The training period for the study was six days (Monday to Saturday) in a week for twelve weeks. Prior and after the experimental period, the subjects were tested on breath holding time, high density lipoprotein and total cholesterol. Breath holding time was assessed by holding the breath after a deep inhalation for maximum duration in seconds of the subject. High density lipoprotein and total cholesterol were tested after taking 5 ml of blood samples by venous puncture method, by using Boehringer Mannheim Kit Method. The Analysis of Covariance (ANCOVA) was applied to find out any significant difference between the experimental groups and control group on selected criterion variables. The result of the study shows that the yogasana and physical exercise groups were decreased the total cholesterol and increased the high density lipoprotein and breath holding time significantly ($P > .05$). It was concluded from the results of the study that yogasana and physical exercise has bring positive changes in breath holding time, high density lipoprotein and cholesterol as compare to the control groups.

Keywords: Yogasanas, Physical Exercise, Breath Holding Time, HDL, Total Cholesterol, Boehringer Mannheim Kit Method.

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Introduction

Yoga is one of the most ancient cultural heritages of India. The word *yoga* in Sanskrit means “to unite”, and so *yoga* can be said to connote a unitive discipline. In this sense, it is an exercise in moral and mental cultivation that generates good health (*arogya*), contributes to longevity (*chirayu*), and the total intrinsic discipline culminates into positive and perennial happiness and peace.[1] Yoga is one of the orthodox systems of Indian philosophy. It was collated, coordinated and systematized by Patanjali in his classical work, the Yoga Sutras, which consists of 185 terse aphorisms. Yoga is a complete science of life that originated in India many thousands of years ago. It is the oldest system of personal development in the world, encompassing body, mind and spirit.[2]

Recent scientific studies of the effects of yoga and meditation on health validates its ability to improve virtually every aspect of our functioning—brain

function, hormonal function, sleep, mood, balance, etc. More active practices followed by relaxing ones lead to deeper relaxation than relaxing practices alone, documented by research from Swami Vivekananda yoga research foundation near Bangalore city and possibility of neuroplasticity bringing about changes in the hypothalamic–pituitary–pancreatic axis.[3] The improvement in the lipid levels after yoga could be due to increased hepatic lipase and lipoprotein lipase at cellular level, which affects the metabolism of lipoprotein and thus increase uptake of triglycerides by adipose tissues.[4,5] Direct stimulation of the pancreas by the postures can rejuvenate its capacity to produce insulin.[6] Regeneration of pancreatic beta cells could occur by yoga exercises that promote blood circulation in the region of the pancreas and yoga asanas that stimulate the meridian of pancreas also could assist in some diabetic patients.[7] Pranayama practices, stretches the lung tissue producing inhibitory signals from action of slowly adapting receptors and hyperpolarising currents. These inhibitory signals coming from cardiorespiratory region involving vagi are believed to synchronize neural elements in the brain leading to changes in the autonomic nervous system; and a resultant condition

Correspondence

Dr.S.Chidambara Raja,
E-mail: rajadi42@gmail.com, Ph: +9194435 40215

characterized by reduced metabolism and parasympathetic dominance.[8] significantly improve the quality of imaging. The new branch of ultrasound scanning, known as intraoperative ultrasound, makes it possible to avoid some of the surgeries that were previously unavoidable when applying ultrasound-guided treatment to the musculoskeletal system.

An article published in (Bendigo, Victoria (PRWEB) on April 11, 2008) read: Chinese Olympic to Investigate Australian Technology in Sports Injury Recovery. In 1996 the Chinese Olympic team came 4th in the total medal count. In 2000 they were 3rd and in 2004 they were 2nd. Now they have a burning desire to be number 1 in the medal count on their home soil and they have left no stone unturned in their quest, including taking the latest breakthrough in injury recovery from Australia and using it against us. Snubbed by the Australian Institute of Sport and overlooked by Australian team coaches across the nation, a new method fully developed by the Elmore Oil Company for rapidly increasing the rate of recovery from soft tissue injury, is being looked at by the Chinese in their bid for fame. And the result, we all had seen. Chinese stood on top of medal tally in 2008 Olympics.

For the very purpose of study extensive reviewing and investigation was carried through the scientific literature available and discussions were held with experts, professionals, injured sports persons, physiotherapist and doctors in many part of the world.

Methodology

The purpose of the present study was to find out the effect of yogasana and physical exercise on breath holding time, high density lipoprotein and total cholesterol among female rural graduates. For this purpose thirty female rural graduates around Chidambaram town, Cuddalore district, Tamilnadu studying various courses in Annamalai University were selected as subjects. The age of the subjects were ranged from 18 to 23 years. *Design:* The selected subjects were

divided into three equal groups, each group consisted of ten subjects, in which group - I (n=10) underwent yogasana practice, experimental group - II (n=10) underwent physical exercise and group - III (n=10) acted as control, which did not participate in any special activities apart from their regular curricular activities. Yogasana and physical exercise was conducted six days (Monday to Saturday) per week for twelve weeks. The researcher consulted with the yoga experts and physical education professionals and selected the following variables as criterion variables: 1. breath holding time, 2. high density lipoprotein and 3. total cholesterol. The breath holding time was assessed by asking the subject to hold the breathe for maximum duration after a deep inhalation and it was recorded in seconds, high density lipoprotein and total cholesterol were assessed by using the Boehringer Mannheim Kit method. For the purpose of collection of data the subjects were asked to report at early morning, one day prior and one day after experimental period, in fasting condition. 5 ml of blood was collected from each subject by venous puncture method and the blood thus collected was stored in small bottles for pre and post-test for measuring the high density lipoprotein and cholesterol.

Analysis of covariance (ANCOVA) was applied to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate. After applying the analysis of covariance, the result of this study shows that there was a significant increase in breath holding time, decrease in total cholesterol and high density lipoprotein levels.

Results

The data collected on breath holding time, high density lipoprotein and cholesterol among yogasana practice group, physical exercise group and control group were analyses and presented in the following tables.

Table – I. Analysis of covariance on selected criterion variables among exercise groups and control group

<i>Variable Name</i>	Group Name	Yogasana Practice Group	Physical Exercise Group	Control Group	'F' Ratio
Breath Holding (in seconds)	Pre-test Mean ± S.D	30.32 ± 1.22	30.55 ± 1.16	30.81 ± 1.59	0.889
	Post-test Mean ± S.D.	32.86 ± 1.58	32.19 ± 1.77	29.66 ± 2.11	20.73*
	Adj. Post-test Mean	33.367	32.881	29.773	44.509*
High Density Lipoprotein (mg/dl)	Pre-test Mean ± S.D	41.82 ± 1.99	41.09 ± 2.17	40.79 ± 2.54	1.978
	Post-test Mean ± S.D.	43.02 ± 2.80	43.98 ± 2.83	41.06 ± 2.49	42.339*

	Adj. Post-test Mean	43.862	43.558	41.089	54.897*
Total Cholesterol (mg/dl)	Pre-test Mean \pm S.D	189.32 \pm 15.9	189.99 \pm 13.6	190.11 \pm 11.7	1.61
	Post-test Mean \pm S.D.	187.29 \pm 12.9	187.13 \pm 13.5	190.93 \pm 12.7	26.709*
	Adj. Post-test Mean	187.834	187.351	190.431	41.572*

*Significant .05 level of confidence. (The table values required for significance at .05 level of confidence with df 1 and 28 and 1 and 27 were 4.20 and 4.21 respectively).

Table – I shows that pre and post test means 'f' ratio of yogasana practice group, physical exercise group and control group on breath holding time were 0.880 ($p > 0.05$) and 20.73 ($p < 0.05$). The adjusted post test mean 'f' ratio value of experimental groups and control group was 44.509 ($p < 0.05$), which was significant at 0.05 level of confidence. The pre and post test means 'f' ratio of yogasana practice group, physical exercise group and control group on high density lipoproteins were 1.978 ($p > 0.05$) and 42.339 ($p < 0.05$). The adjusted post test

mean 'f' ratio value of experimental groups and control group was 54.897, which was significant at 0.05 level of confidence. The pre and post test means 'f' ratio of yogasana practice group, physical exercise group and control group on total cholesterol were 1.61 ($p > 0.05$) and 26.709 ($p < 0.05$). The adjusted post test mean 'f' ratio value of experimental groups and control group was 41.572, which was significant at 0.05 level of confidence.

Table II. Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Selected Criterion Variables

Adjusted Post-test Mean on Breath Holding Time				
Yogasana Practice Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval at .05 level
33.367	32.881		0.557	2.34329
33.367		29.773	3.594*	2.34329
	32.881	29.773	3.108*	2.34329
Adjusted Post-test Mean on High Density Lipoproteins				
Yogasana Practice Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval at .05 level
43.862	43.558		0.304	1.66592
43.862		41.009	2.853*	1.66592
	43.558	41.009	2.549*	1.66592
Adjusted Post-test Mean on Total Cholesterol				
Yogasana Practice Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval at .05 level
187.834	187.351		0.483	1.947299
187.834		190.431	2.597*	1.947299
	187.351	190.431	3.30*	1.947299

* Significant at .05 level of confidence.

Table – II shows that the Scheffé S Test for the difference between adjusted post-test mean on resting

pulse rate of yogasana practice group and control group (3.658) and physical exercise group and control group

(5.03), which were significant at .05 level of confidence. There was a significant difference on high density lipoproteins between yogasana practice group and control group (4.91) and physical exercise group and control group (5.168) and also there was a significant difference on total cholesterol between yogasana practice group and control group (3.389) and physical exercise group and control group (4.651) which was significant at 0.05 level of confidence after the respective training programme.

Conclusions

The experimental groups such as, yogasana and physical exercise groups have achieved a significant improvement in selected criterion variables such as breath holding time, high density lipoprotein [9] and total cholesterol [10,11,12] when compared with the control group. It was also found that there was no significant difference was found between the yogasana practice group and physical exercise group on selected criterion variables.

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