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Effect of selective yogasanas and pranayama practices on selected physiological and biochemical variables among Tamilnadu agricultural university students

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Abstract

The purpose of the study is to find out the effect of selective yogasanas and pranayama practices on selected physiological variables such as pulse rate, vital capacity, percent body fat and biochemical variables such as high density lipoprotein, low density lipoprotein and fasting blood sugar of the Tamil Nadu Agricultural University students. Sixty men students in the age group of 18 to 25 years from the Tamil Nadu Agricultural University, Coimbatore were randomly selected and served as the subjects for the purpose of this study. The subjects (N=60) were randomly divided into three equal groups. Group I- was administered as yogasanas exercise group, Group II-underwent pranayama practice group and the Group III as control group. All the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of 6 weeks, six days in a week throughout the study. Period of six weeks analysis of Co-variance (ANACOVA) is applied to determine the significance of mean difference between the three groups. When F-ratio was found to be significant, the Scheffe's Post Hoc test was applied to test the significance of pairs of adjusted final group means. Practice of the yogasanas and pranayama is significantly effective in promoting desirable changes on dependent variables.

Keywords: Yogasanas, pranayama, pulse rate, vital capacity, percent body fat, fasting blood sugar

Introduction

Human life focuses on physical, mental, social and spiritual aspects. Human health is divided into physical, mental and social dimensions. Autogenic training is a system of very specific auto suggestive formula with a purpose to relieve tension, stress and to eliminate psychosomatic disturbances including many cases of insomnia, obesity, inability to concentrate, high blood pressure, constipation, skin problems, etc. Some people use autogenic training as an aid to meditation, to improve their mental concentration in a focused way. Yoga and autogenic training are useful to the modern man in relieving stress and tension (Joshi *et al*, 1992; Arambula *et al*, 2001) [5, 1] The purpose of any research should be to solve the existing complications of the human being. Research should help the society not only to create better health and happiness among human beings, but also to improve the quality of life.

Methodology

The purpose of this study is to find out the effect of selective yogasanas and pranayama practices on selected physiological variables such as pulse rate, vital capacity, percent body fat and biochemical variables such as high density lipoprotein, low density lipoprotein and fasting blood sugar of the Tamil Nadu Agricultural University students.

Selection of Subjects

Sixty Men students from the Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu in India, were randomly selected and served as the subjects. The selected subjects were in the age group of 18 to 25 years.

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Experimental Design

The study was formulated as a random group design consisting of selective yogasanas and pranayama practice groups. The subjects (N=60) were randomly divided into three equal groups. The groups were assigned the names as follows Group's I - Yogasanas, group II -Pranayama group and group III as control group. All the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of 6 weeks, six days in a week throughout the study. The various tests administered were: prior to training (pre test) and wealth week (post test) of the training Schedule.

Selection of Variables

The selected physiological variables are pulse rate; percent body fat and vital capacity. The selected biochemical variables are high density lipoprotein, low density lipoprotein and fasting blood sugar.

Criteria measures:

1. Physiological variables

Pulse rate was measured by manual method over a period of

one minute and recorded as beats per minute.

Vital capacity was measured by using wet Spiro meter and each reading was recorded in milliliter.

Percent body fat was measured by using Harpenden skin fold caliper and each reading was recorded to the nearest millimeter.

2. Biochemical variables

High density lipoprotein was tested in the biochemical laboratory and the results were recorded in mg%.

Low density lipoprotein was tested in the biochemical laboratory and the results were recorded in mg%.

Fasting blood sugar was tested in the biochemical laboratory and the results were recorded in gm/dl.

Statistical Technique

Analysis of Co-variance (ANACOVA) was applied to determine the significance of mean difference between the three groups. When F-ratio was found to be significant, the Scheffe's Post Hoc test was applied to test the significance of pairs of the adjusted final group means.

Table 1: Analysis of Co-Variance for the Means Difference Adjusted Post Test Means

Variables	Exp. group - I	Exp. group - II	Control group	Source	Sum of Squares	Mean Square	F-Value	TF
Pulse Rate (Beats/minute)	81.28	78.41	83.30	B	241.02	120.51	11.53	3.16
				W	585.57	10.46		
Vital capacity	1180.01	1260.65	1074.34	B	346963.49	173481.74	30.74	
				W	316086.69	5644.41		
% Body Fat	20.67	20.08	21.75	B	28.61	14.30	37.13	
				W	21.57	0.39		
High Density Lipoprot., mg%	48.05	49.47	45.79	B	137.02	68.51	19.30	
				W	198.78	3.55		
Low Density Lipoprot, mg%	112.62	110.75	116.42	B	332.70	166.35	42.65	
				W	218.45	3.90		
Fasting Blood Sugar (Mgs./dl)	106.09	100.97	110.28	B	870.49	435.25	35.84	
				W	680.09	12.15		

* Significant at 0.05 levels Table value in df 2 and 56 was 3.16

Results of Adjusted Means

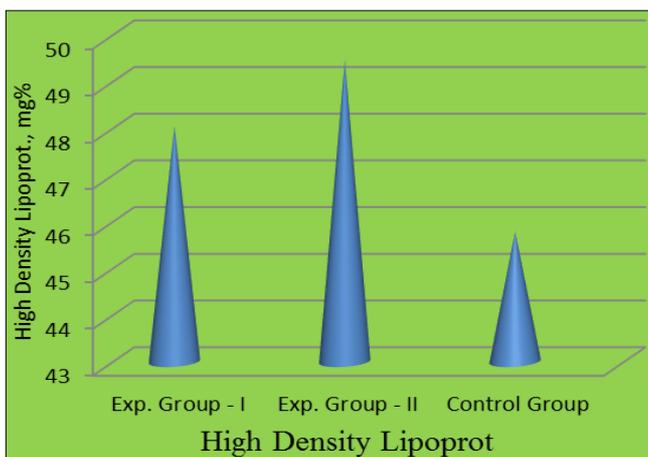
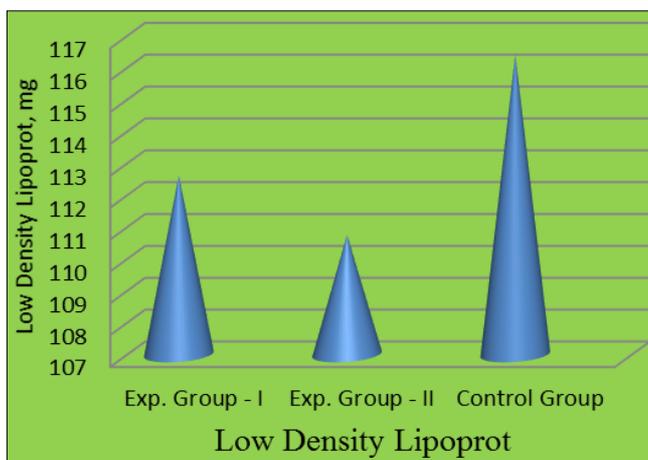
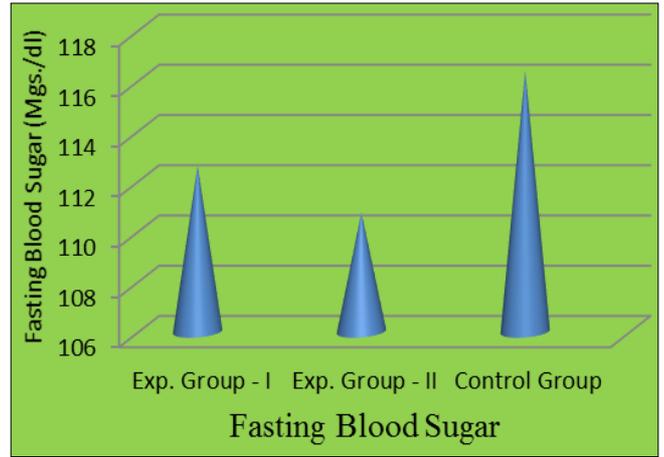
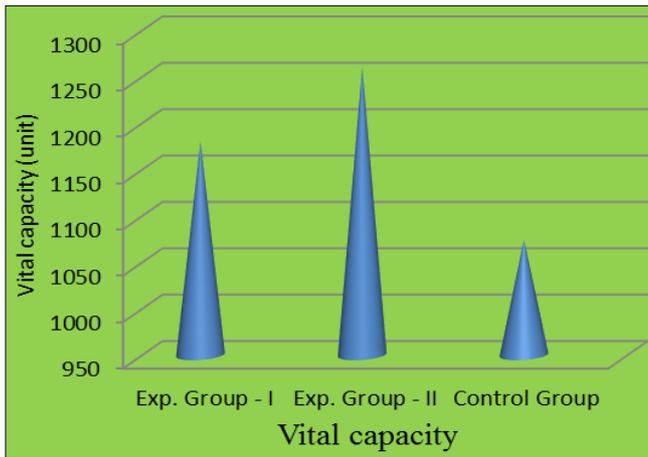
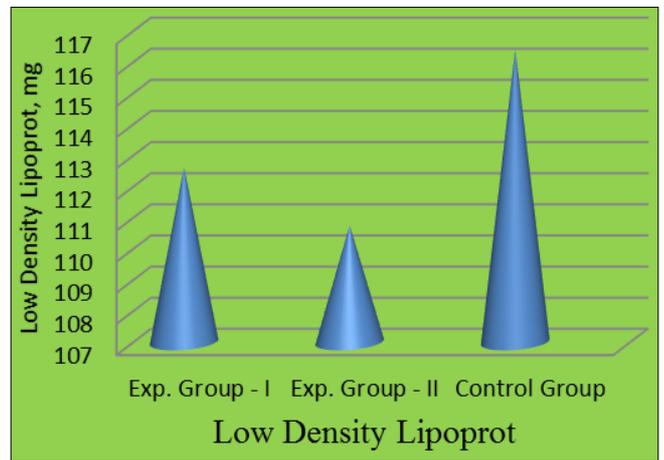
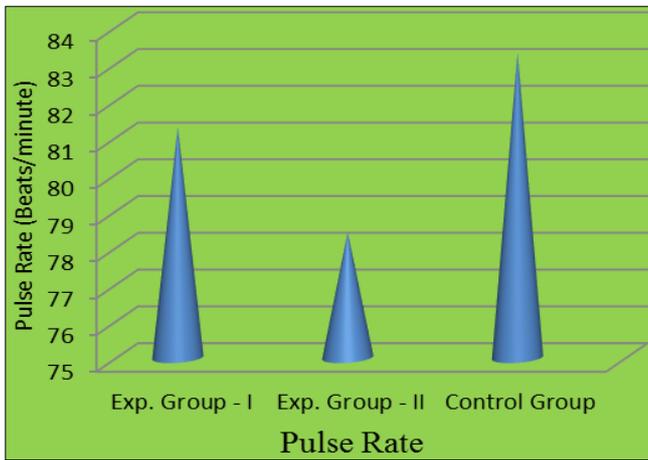
The corresponding F-values needed for significance at 0.05 level is 3.16. The calculated F-values on selected criterion variables are 11.53 (Pulse Rate), 30.74 (Vital capacity, 37.13 (Percent Body Fat), 19.30 (High Density Lipoprotein), 42.65 (Low Density Lipoprotein and 35.84 (Fasting Blood Sugar). Since the obtained F-ratio on criterion variables were higher

than the required table value of 3.16 at 0.05 level of confidence it was found to be significant. Since the observed mean difference among the three groups were found to be statistically significant, in order to find out which of the pairs of group means are significant, the Scheffe's Post Hoc test was applied.

Table 2: Scheffe's Test of Significance between Paired Adjusted Post Test Means

Variables	Experimental Group-I	Experimental Group-II	Control Group	Mean Difference	F-value
Pulse Rate (Beats per minute)	81.28	78.41	-	2.87	7.877*
	81.28	-	83.3	2.02	3.906
	-	78.41	83.3	4.89	22.876*
Vital capacity (Milliliter)	1180.01	1260.65	-	80.64	11.522*
	1180.01	-	1074.34	105.67	19.784*
	-	1260.65	1074.34	186.31	61.501*
Percent Body Fat	20.67	20.08	-	0.59	9.103*
	20.67	-	21.75	1.08	30.577*
	-	20.08	21.75	1.67	73.048*
High Density Lipoprotein (mg %)	48.05	49.47	-	1.42	5.744*
	48.05	-	45.79	3.68	38.189*
	-	49.47	45.79	1.42	5.744*
Low Density Lipoprotein (mg %)	112.62	110.75	-	1.87	8.945*
	112.62	-	116.42	3.8	37.114*
	-	110.75	116.42	5.67	82.499*
Fasting Blood Sugar (mgs./dl)	106.09	100.97	-	5.12	21.444*
	106.09	-	110.28	4.19	14.497*
	-	100.97	110.28	9.13	71.444*

Required value for significance at 0.05 level = 5.545



Discussion of Findings

The results of the study indicate that the selected physiological and biochemical variables of the subjects improved significantly after undergoing the pranayama for a period of 6 weeks. The analysis of co-variance and repeated measures of analysis of variance of pulse rate on pranayama practices showed that there was significant improvement in pulse rate due to 6 weeks of the training. The findings of the study shows that there was a significant improvement in normalizing the pulse rate in pranayama practices group better than the yogasanas exercises group and the control group. Yogasanas and Pranayama practice is now practiced around the world for its physical, physiological, biochemical and spiritual benefits. It reduces the stress and increases relaxation, which may have a favorable effect on heart rates. The present study is confirmed with the results of Pawlow & Jones (2002) [8], Arambula *et al* (2001) [1] and Bhargava *et al* (1988) [2].

The analysis of co-variance of vital capacity on pranayama practice group and yogasanas group showed that there was significant improvement in vital capacity due to 6 weeks of the training. The findings of the study showed that there was significant improvement in increasing the vital capacity in pranayama practice group is better than the yogasanas group and the control group. Yoga and Pranayama training also improves the lung capacity and it was discovered that pranayama caused general health improvement through the enhancement of lung function and improves respiratory capacity of the human being. Asanas tone up the lungs. Pranayama is highly useful in oxygenation being better, tissue hypoxia never comes. The findings of the study were in agreement with the studies reported by Czamara & Michele (2003) [4], Joshi *et al* (1992) [5] and Birkel & Edgren (2000) [3].

The findings of the study showed that there was a significant improvement in controlling the body fat level in combination of pranayama practices group and yogasanas group was better than the control group. The regular yoga practice can help in weight management, and some of the asanas stimulate sluggish glands to increase their hormonal secretions, especially, at has a big effect on our weight because it affects body metabolism. Fat metabolism is also increased and hence fat is converted to muscle energy on losing fat thereby one will have a better muscle tone and a higher vitality level. It reduces anxiety, and yoga deep breathing increases the oxygen delivery to the body cells, including the fat cells.

The analysis of co-variance of high density lipoprotein and low density lipoprotein on small pranayama practice group and yogasanas exercises group showed that there was a significant improvement in controlling the high density lipoprotein and low density lipoprotein due to 6 weeks of the training. The findings of the study showed that there was a significant improvement in normalizing the high density lipoprotein and low density lipoprotein level in pranayama practice group and it was comparatively better than the yogasanas exercises group and control group. The biochemical benefits of yoga such as decrease of LDL cholesterol, glucose and catecholamine triggers the resilience of the body. Yoga balances the weight of the person without losing its strength through the different stretching asanas. Yoga lowers blood sugar and LDL cholesterol and boosts HDL cholesterol. The autogenic technique is one of the self-help which can enable the individual to manage health and other problems like blood sugar, LDL cholesterol etc., more successfully. The present study results are confirmed with the results of Winter (1985) and Vyas & Dikshit (2002).

Conclusions

Practice of the pranayama practices is significantly effective than the yogasanas exercises programme and the control group in promoting desirable changes in selected physiological variables such as pulse rate, vital capacity, percent body fat and biochemical variables such as high density lipoprotein, low density lipoprotein and fasting blood sugar among Tamil Nadu Agricultural University students. Practice of the yogasanas exercises programme is significantly effective than the control group in promoting desirable changes in selected physiological variables such as vital capacity, percent body fat and biochemical variables such as high density lipoprotein, low density lipoprotein, fasting blood sugar among Tamil Nadu Agricultural university students. The present study of Yoga and pranayama Concentrate on proper functioning of all body system and their appropriate condition along with the healthy mind.

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