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Effect of Select Yogasanas and Pranayama Practices on Selected Physiological and Biochemical Variables among University Football Players

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Abstract: ***The purpose of the study is to find out the effect of 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 University football players. Sixty men students in the age group of 18 to 25 years from Acharya Nagarjuna University-Guntur, Andhra Pradesh, were randomly selected and served as the subjects for the present study. The subjects (N=60) were divided into three equal groups. Experimental group I-was administered yogasanas exercise group, Experimental group II-underwent pranayama practices and the third was the control group. All the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of six weeks training schedule. 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. Practice of the yogasanas and pranayama practices is significantly effective in promoting desirable changes in the dependent variables.***

Keywords: Pulse rate, Vital capacity, Percent body fat, Yogasana, Lipoprotein

1. 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 practice autogenic training as an aid to meditate, in order 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; Sakai, 1997; Arambula et al, 2001; Malhotra et al, 2002 Steeter and Kupper, 2002)** 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 good health and happiness among human beings, but also to improve the quality of life as well.

2. Methodology

The purpose of the study was to find out the effect of 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 University football players.

Selection of subjects

Sixty men University football players from Acharya Nagarjuna University, Guntur-Andhra Pradesh in India, were randomly selected and served as the subjects for the purpose of this study. The selected subjects were in the age group of 18 to 25 years.

Experimental design

The study was formulated as a random group design consisting of select yogasanas and pranayama practices groups. The subjects (N=60) were randomly divided into three equal groups. The groups were named as follows: Experimental groups I- yogasanas group, Experimental group II- pranayama group and the third was acted 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 training schedule.

Criterion measures

1) Physiological variables

a) Pulse rate was measured by manual method over a period of one minute and recorded in beats per minute.
b) Vital capacity was measured by using wetspirometer and each reading was recorded in milliliter.
c) Percent body fat was measured by using Harpenden skin-fold caliper and each reading was recorded to the nearest millimeter.

2) Biochemical variables

a) High density lipoprotein was tested in the biochemical laboratory and the results were recorded in mg. %.
b) Low density lipoprotein was tested in the biochemical laboratory and the results were recorded in mg%.
c) 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.

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

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

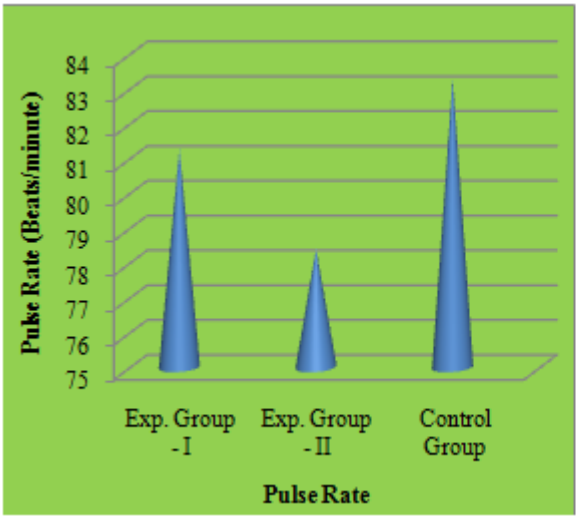
* Significant at 0.05 level (df 2 and 56 was 3.16)

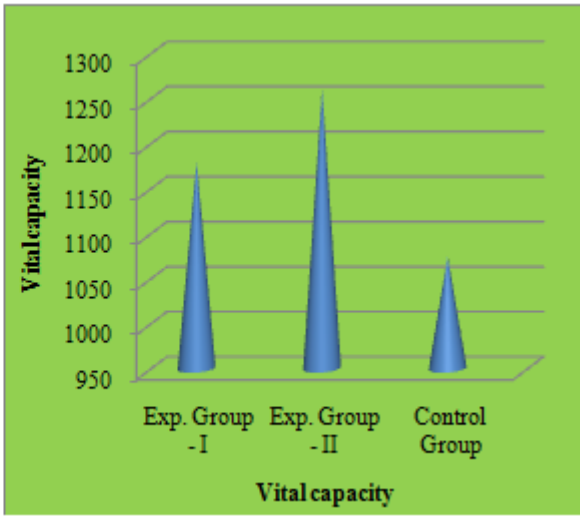
The corresponding F-values needed for significance at 0.05 level is 3.16. The calculated F-values on selected criterion variables are 11.53 (Pulse Rate), 30.74 (Vital capacity, 37.13 (Percent Body Fat), 19.30 (High Density Lipoprotein), 42.65 (Low Density Lipoprotein and 35.84 (Fasting Blood Sugar). 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	M D	F-value
Pulse Rate	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	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	48.05	4947	-	1.42	5.744*
	48.05	-	45.79	3.68	38.189*
	-	4947	45.79	1.42	5.744*
Low Density Lipoprotein	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	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





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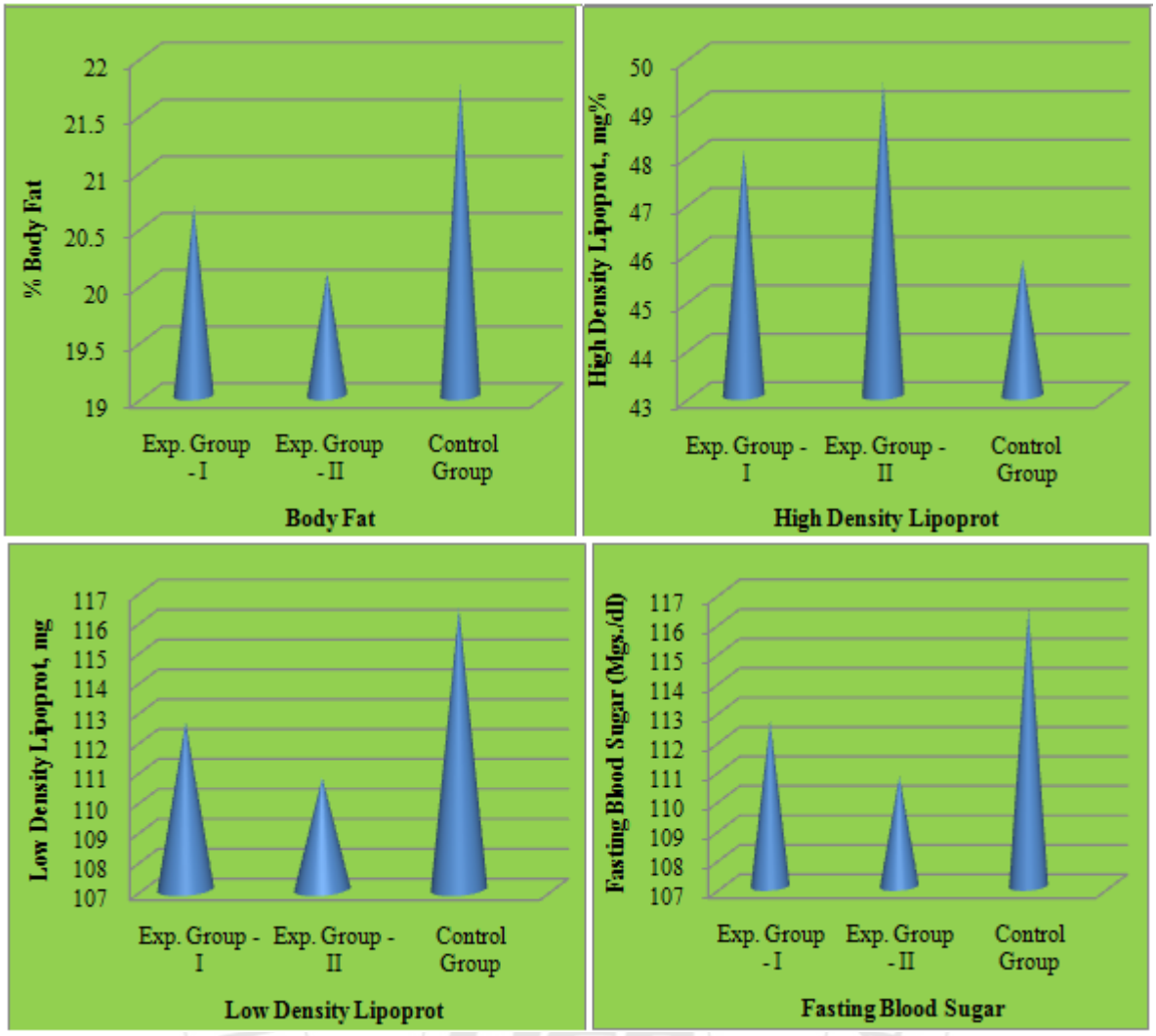

3. Discussion on Findings

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

The analysis of co-variance of vital capacity on Pranayama practices group and yogasanas exercises group showed that there was significant improvement in vital capacity due to 6 weeks of training. The finding of the study showed that there was significant improvement in increasing the vital capacity in Pranayama practices group better than the yogasanas group and control group. Yogasanas and Pranayama practices also improve the lung capacity and it was discovered that pranayama caused general health improvement through the enhancement of lung function and to improve respiratory capacity of the human being. Asans tone up the lungs. Pranayama is highly useful for oxygenation. The findings of the study were in agreement with the studies reported by **Cysarz. and Bussing (2005), Czamara & Michele (2003), Joshi et al (1992) and Birkel and Edgren (2000).**

The findings of the study showed that there was a significant improvement in controlling the body fat level in combination of Pranayama practices, yogasanas group was better than the control group. Health risk associated with too much body fat. The regular yoga practices can help in weight management. Some of the asanas stimulate sluggish glands to increase their hormonal secretions- especially, has a remarkable effect on our weight. This happens due to body metabolism. Fat metabolism is also increased in which fat is converted into muscle energy. In this process fat loss takes place and as a result one can attain better muscle tone, higher vitality level and reduces anxiety. Deep breathing in yoga increases the oxygen delivery to the body cells and also including the fat cells.

The analysis of co-variance of high density lipoprotein and low density lipoprotein on yogasanas exercises and Pranayama practices groups showed that there was a

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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 practices group showed control over the high density lipoprotein and low density lipoprotein level which was better than the yogasanas exercises group and control group. The biochemical benefits of yoga such as decrease of LDL cholesterol, glucose and catecholamine and triggers the resilience of the body. Yoga balances the weight of the person without losing the strength through different types of asanas. Yoga lowers blood sugar and LDL cholesterol and boosts HDL cholesterol. The autogenic technique is one of self supportive method which can enable the individual to manage health and other problems like blood sugar, LDL cholesterol etc., more successfully. The present study confirmed with the results of **Winter (1985) and Vyas and Dikshit (2002).**

4. Conclusions

Practice of the yogasanas exercises program 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 university football players.

Practice of the Pranayama practices is significantly effective than the yogasanas exercises program and 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 university football players.

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