EFFECT OF YOGIC PRACTICES ON SELECTED BIO CHEMICAL, PHYSICAL AND PHYSIOLOGICAL VARIABLES FOR OBESE FEMALE STUDENTS AGING 21 THROUGH 24

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ABSTRACT
Background: In the era of electronic gadgets where there is information and technology are just clicks away the health goals are getting farther and difficult to achieve. Modern Yoga is playing a key role to upgrade our lifestyle and mental peace to achieve the longitivity of life. The objective of the study was the effect of yogic practices on the selected bio chemical variables, physical and physiological variables of obese college students. **Method:** 40 obese college students were selected and categorized in two groups i.e. group 1 (yoga practice group) and group 2 (control group). All the testing and recording were done for both the groups the control group and the yoga practice group on the baseline day and after 12 weeks of training. All the students were assessed on the same day and on the same place hall/laboratory to exclude the environmental factors. The biochemical variables HDL and LDL were assessed in laboratory. The Physiological variables **pulse rate**, **respiratory rate and blood pressure** were recorded in yoga hall. The Body Composition was assessed with the help of **skin folds and BMI**. Total Period of 12 weeks training program was designed and practiced by the students for the purpose of the study. Descriptive analysis and one way analysis of variance ANOVA was done for the purpose of analysis of the data. **Result and Conclusion**: There were significant difference was found in Biochemical variables and Physical Variables. There was also significant difference was found in systolic blood pressure. But no significant difference was found in Respiratory Rate, Pulse Rate and diastolic blood pressure. The findings of the research reviews expresses that the changes in body composition are the result of long term training. Yoga adopting as a lifestyle practice will help improving the status of cardiovascular health and respiratory health.

KEYWORDS: HDL, LDL, BMI and Respiratory Rate.

INTRODUCTION

The importance of yoga is well known. The word “Yoga” from the Sanskrit root you (“yoke”) is generally translated as union of the individual atma (loosely translated to mean soul) with Paramatma, the universal soul**.** Patanjali's writing also became the basis for a system referred to as "Ashtanga Yoga" ("Eight-Limbed Yoga"). This eight-limbed concept is derived from the 29th Sutra of the Book 2 of Yoga Sutras. They are: Yama, Niyama, Asana, Pranayama, Pratyahara,Dharana, Dhyana and Samadhi.
Molecules called lipoproteins carry cholesterol in the blood. Two important kinds of lipoproteins are low-density lipoprotein (LDL) and high-density lipoprotein (HDL). When checking LDL and HDL, doctors often include another type of fat called triglycerides.

- **Total cholesterol** is a measure of the total amount of cholesterol in your blood and is based on the HDL, LDL, and triglycerides numbers.
- **LDL cholesterol** makes up the majority of the body’s cholesterol. LDL is known as “bad” cholesterol because having high levels can lead to plaque buildup in your arteries and result in heart disease and stroke.
- **HDL cholesterol** absorbs cholesterol l and carries it back to the liver, which flushes it from the body. HDL is known as “good” cholesterol because having high levels can reduce the risk for heart disease and stroke.
- **Triglycerides** are a type of fat found in your blood that your body uses for energy. The combination of high levels of triglycerides with low HDL cholesterol or high LDL cholesterol can increase your risk for heart attack and stroke[1].

[1] National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention

LDL (Bad) Cholesterol Level	LDL Cholesterol Category
Less than 100mg/dL	Optimal
100-129mg/dL	Near optimal/above optimal
130-159 mg/dL	Borderline high
160-189 mg/dL	High
190 mg/dL and above	Very High

HDL (Good) Cholesterol Level	HDL Cholesterol Category
Less than 40 mg/dL	A major risk factor for heart disease
40—59 mg/dL	The higher, the better
60 mg/dL and higher	Considered protective against heart disease

Source: National Heart, Lung, and Blood Institute[2]

The Heart Rate/ Pulse Rate is one of our vital sign. It is the number of times our heart contracts or beats in a minute. The pulse rate varies according to the age, rest exercise and health status of the individual. The Pulse Rate and Blood Pressure are two separate measurements and are not necessarily increase or decrease at the same time. One's poor fitness level affects both the indicators of health adversely. Body Mass Index **BMI** is a measure of body fat based on height and weight that applies to adult men and women.

People who have obesity, compared to those with a normal or healthy weight, are at increased risk for many serious diseases and health conditions, including the following:[3],[4],[5]

- All-causes of death (mortality)
- High blood pressure (Hypertension)
- High LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (Dyslipidemia)
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis (a breakdown of cartilage and bone within a joint)
- Sleep apnea and breathing problems
- Some cancers (endometrial, breast, colon, kidney, gallbladder, and liver)
- Low quality of life

The study of 614 residents of a rural farming community in southwestern Japan found that a heart rate greater than 80 beats a minute during a first examination in 1979 predicted the development of obesity and diabetes, which contribute to heart problems[6]. Obesity is characterized by a stiffening of the total respiratory system[7], which is presumed to be due to a combination of effects on lung and chest wall compliance[8]. **Prac**tice of yoga increase muscle strength and cardio respiratory fitness and has limited side affected. This is a cost effective training

[2] The Magzine. NIH Medline Plus. A publication of the National Institutes of Health and the friends of the National Library of Medicine.
[3] NHLBI. 2013. Managing Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel.
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programme because it requires virtually no equipment[9]. In another study the effect of yoga therapy on body mass index and oxidative status was analyzed. The study consisted of 40 obese male and female subjects. The changes in body weight, body mass index, blood sugar MDA level and antioxidants were found statistically significant. According to Godham, he concluded that there is significant decrease in systolic blood pressure, diastolic blood pressure, BMI, LDL and increase in HDL levels in the subjects practicing yoga asanas along with pranayama technique for 3 months duration.[10]

MATERIALS AND METHODS

It is a comparative study between control group and yoga practice group. The group had 40 female college students of 20 to 24 years of age. The female students were chosen having initial BMI of 25 and above for the purpose of study as we will be studying the effect of yogic practices on overweight and obese female college students. They randomly categorized in the control and yoga practice group of 20 each. A written informed consent was obtained from each of the student. On the very baseline day before starting the practice sessions both the groups were given 20 min. complete rest and then the testing of physical, physiological and biochemical variables were done. The blood pressure was recorded with a mercury sphygmomanometer in supine position in the right upper limb by the auscultatory method. In the same resting condition pulse rate and respiratory rate were also taken and recorded. Then and there the blood samples for assessing LDL and HDL were also taken by the laboratory expert. Anthropometry measurements were taken by the trained examiners. The height was measured with the help of standardized stadiometer. The weight measured using a digital weighing scale. The skinfolds were measured with the help of a standardized skinfold caliper. The BMI was estimated using formula BMI= Wt. (in kgs)/Ht.(in mtr)2. The same procedure was done after the completion of the total training period i.e. 12 weeks. The yoga practice session included prayer, warming up exercises, stretching exercises. Various yoga postures of sitting, standing and lying asana. Pranayama, Neti and Dhyan were the equal and important part of the practice session.

RESULT AND DISCUSSION

The influence of Yoga Practice on each criterion variables were analyzed separately and presented below.

Table 1
Analysis of One way variance ANOVA of the Data on HDL, LDL, Pulse Rate, Respiratory Rate, Blood Pressure and BMI for Pre and Post Yoga Practice of Control and Yoga Groups

S.No.	Variables	Groups	N	Mean	SD Deviation	F ratio	Sig.
1	HDL Control	***Pre Trg***	20	53.84	6.96		
	Yoga		20	53.77	7.96		
	HDL Control	***Post Trg***	20	53.35	6.98	**7.314***	4.41
	Yoga		20	58.27	8.59		
2	LDL Control	***Pre Trg***	20	134.52	20.64		
	Yoga		20	137.29	19.04		
	LDL Control	***Post Trg***	20	135.58	20.19	**9.737***	4.41
	Yoga		20	125.12	17.14		
3	Pulse Rate Control	***Pre Trg***	20	80.90	7.52		
	Yoga		20	78.10	4.25		
	Pulse Rate Control	***Post Trg***	20	81.05	6.96	**4.070**	4.41
	Yoga		20	73.30	3.15		
4	Respiratory Rate Control	***Pre Trg***	20	16.60	2.85		
	Yoga		20	18.20	3.13		
	Respiratory Rate Control	***Post Trg***	20	17.60	2.62	**1.672**	4.41
	Yoga		20	14.85	1.26		
5	B.P. Systolic Control	***Pre Trg***	20	13.08	9.36		
	Yoga		20	13.20	9.23		
	B.P. Systolic Control	***Post Trg***	20	13.30	9.09	**.541**	4.41
	Yoga		20	12.15	3.66		

[9] Suchetha Kumari N. Damodara Govinda K.M., Sukesh N. Madhu L.N. Kathyayani. Effect of yoga therapy on Body Mass Index and Oxidative Status. Nitte University Journal of Health Sciences Vol. 1 No.1-3, September 2011.
[10] Godham J et al. Int J Research Med Sci. 2015 May; 3 (5) : 1061-1065. www. msjonline.org

6	B.P. Diastolic Control	***Pre Trg***	20	89.75	6.58		
	Yoga		20	90.50	8.25		
	B.P. Diastolic Control	***Post Trg***	20	89.50	7.76	**1.566**	4.41
	Yoga		20	88.75	5.09		
7	BMI Control	***Pre Trg***	20	29.13	2.69		
	Yoga		20	27.80	2.66		
	BMI Control	***Post Trg***	20	32.00	11.18	**14.463***	4.41
	Yoga		20	24.19	3.80		

***Significant at .05 level of Confidence.**

The table 1 depicts that the mean differences for pre test value has no or very less difference between control and yoga practice groups in all the criterion variables. The mean values for post test are significantly different as for HDL it is 53.35d 58.27 for control and yoga group respectively. For LDL the mean values are 135.58 and 125.12 respectively. Similarly the post test mean values for Pulse Rate, Respiratory Rate, B.P. Systolic and BMI are 81.05, 73.30, 17.60, 14.85, 13.30, 12.15 and 32.00, 24.19 respectively. The table also reveals the "F" ratio for post test on all the criterion variables where there is significant difference was found on HDL, LDL and BMI. As the tabulated 'F' ratio values are 7.314, 9.737 and 14.463 respectively more than the critical 'F' value 4.41 required to be significant at .o5 level of confidence.

The result of the study indicated that the significant difference was found between pre test and post test of yoga practice group on biochemical variables and physical variables than compare to physiological variables.

With the healthy living habits the biochemical, physical and physiological variables of health could be maintained and controlled to the desired levels of health. Regular and continuous negligence and absence of physical activity leads to the substantial loss of health.

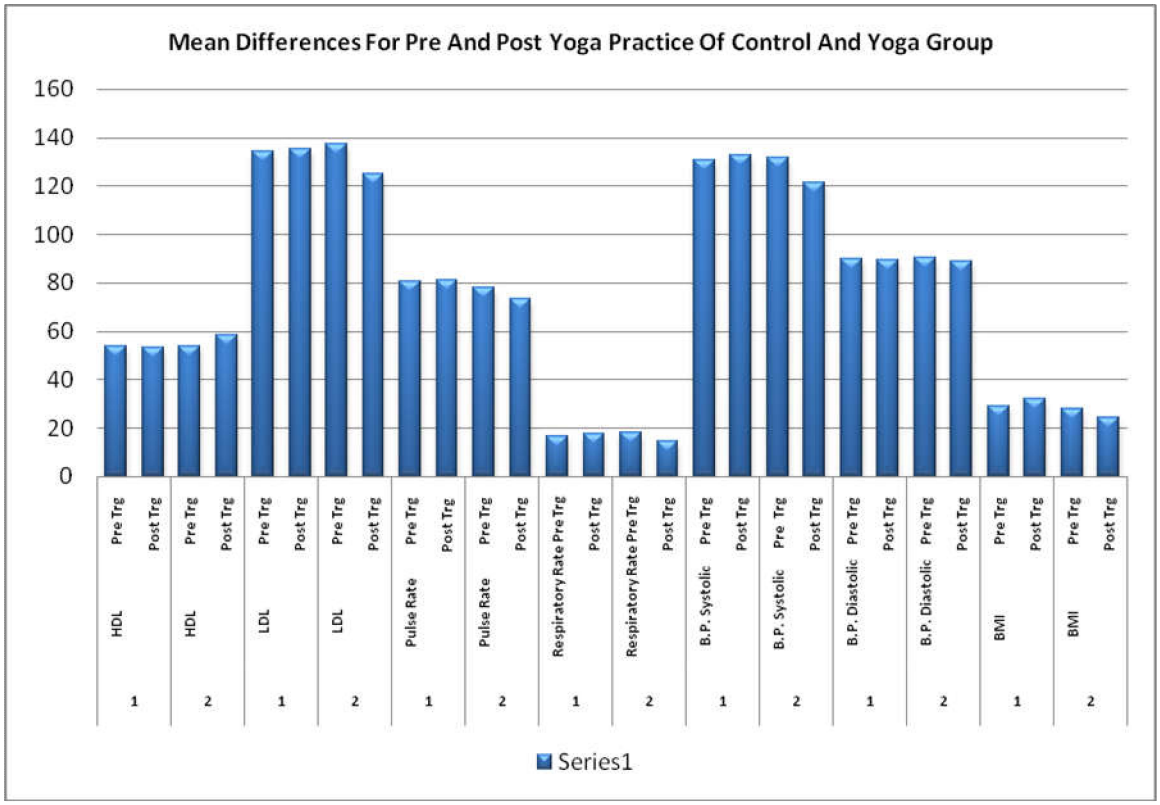

Figure 1: Graphical Representation of Mean Scores of HDL, LDL, Pulse Rate, Respiratory Rate, Blood Pressure and BMI for Pre and Post Yoga Practice of Control and Yoga Groups

CONCLUSION

- There was a significant difference between yoga practice group and control group on HDL, LDL and BMI.
- Also found that there was a significant improvement in the levels of Respiratory Rate, Pulse Rate and Blood Pressure due to yoga practice as revealed by the mean scores.

The prevalence of overweight and obesity is increasing among all ages including children and adults. The research has shown its various harmful effects and greater risks for Type II Diabetes and Cardiovascular diseases at early age of life. Yoga Practice is beneficial for preventing diseases and maintaining good health by regulating the biochemical levels in the body and controlling over the increasing BMI. Yoga practices are safe for all ages, cost effective and result oriented with no side effects, modality to be adopted for future practices.

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