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Effect of yoga therapy on cholesterol level of middle age women

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Abstract
The present study aims to determine the effect of Yoga therapy on cholesterol level [low density lipoprotein (LDL), high density lipoprotein (HDL) and triglyceride levels] of middle aged women. The sample for the study comprises of 30 females between the ages of 35 to 45 years. Sample was further divided into two groups (i) Experimental group (N=15), (ii) Control group (N=15). The subjects of the Experimental group went through a Yoga therapy for six week under the direct supervision of researchers. They performed –suryanamaskar Dhanurasana, Bhujagasana, Sarvangasana, Halasana, Chakarasana, Shalabhasana, Paschimotanasana, Purnmatsyandrasana and Nadishodhana, Sithali, Sitakari, Brahmari, Bhastrika and Kapalbhati Paranayama, shatkarma practices. The Control group was engaged in daily routine work. The subjects of both the groups were tested before and after the experimental period of six week. The data was analyzed statistically by applying ANCOVA. The results show that there is significant change on triglycerides and low density lipoprotein as a result of the experimental training. Since the result has revealed that there is a significance difference, the hypothesis is accepted. And results also show that there is no significant difference between high density lipoprotein as a result of experimental training and thus the hypothesis is rejected.

Keywords: Yoga therapy, triglycerides HDL, LDL

Introduction
Yoga is a (life nothing else in the world) Indian tradition of very old origin for health and happiness. It communicates both sound body and sound mind to the (professional and skilled person). Yoga is a Sanskrit term. It represents Yoke, which symbolically means to join or to unite. Yoga is meant for union or harmony of mind and the body. Yoga is the science of physical and mental health. It synchronizes the functions of the muscle and the mind. It is the only path that can lead to (interested in the whole or the completeness of something) health. Yoga is self-control (or control devise) of the modifications of the mind stuff translation by swami Vivekananda. In later sutras, patanjali explains that ones the mind is properly limited/ held down, then the "Seer" or the "soul, the true self," can rest in its own true nature. Further, as long as the mind is not under control, it continues to assume the form of the "vrittis" or the (disturbing or causing small changes in things) in the mind and these vrittis become the cause of human suffering. In simpler terms, what is definition tells as is that we can be peaceful and happy when we can control the mind; else, the mind continues to control us and we stay in a state of suffering. Yoga is a way of balancing and harmonizing the body emotions. This is achieved by the practice of yogic asanas, pranayama, mudra, bandha, shatkarma and meditation and must be achcan take place with the higher reality. Yoga does not claim to give a cure for life, but it does present a proven method for coping with systematic practice for the realization of higher perceptions.

Methodology
Selection of variable
- Trigylicried
- HDL
- LDL

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Selection of Subject

For the purpose of this study 30 female s were selected from Gwalior district, who did not involved any yogic practice previously and age ranged between 35-45 years were randomly selected. The group was given treatment through six week training program which includes selected yogic practice. The entire participants were directed to assemble in a yoga hall to seek their willingness, to act as subjects. The investigator explained to them the purpose, nature, importance of the experiment and the procedure. Further the role of the subjects during the experimentation and the testing procedure were also explained to them in detail. They were requested to co-operate and participate actively for the same and there cannot have taken for the participation in the study.

Training protocol

Yogic practice classes were offered five times per week, for six weeks. A practice was comprised of 90 minutes of following yoga therapy. The practice was started with the Om chanting followed yoga therapy which was as follows:
Suryanamaskar, Dhanurasana, Bhujagasana, Sarvangasana, Halasana, Chakarasana, Shalabhasana, Paschimotanasana, Purnmatsyandrasana and Nadishodhana, Sithali, Sitakari, Brahmari, Bhastrika and Kapalbhati Paranayama, shatkarma (jal neti and vaman).

Statistical Procedure

The data were analyzed by applying ANCOVA were presented in Table 1, 2 & Table 3.

Table 1: Analysis of Covariance for Pre-test and Post-test Data on trigylicried level of Control Group and Experimental Group

	Control group	Experimental group	Source of variance	Source of square	df	Mean squares	F -ratio
Pre-test mean	112.24	113.35	between	13.300	1	13.400	0.061*
SD	13.878	14.478	within	8810.60	38	231.018	
Post-test mean	118.10	103.80	between	2044.900	1	2044.90	6.991*
SD	14.232	17.785	With in	11115.00	38	292.500	
Adjusted Post-test mean	118.711	103.179	between	2405.090	1	24.05.09	44.799*
			Within	1886.289	37	53.068	

* Significant at 0.05 level.
Required table value at 0.05 level of significance for 1 & 37 degrees of freedom = 4.104 1 & 38 degrees of freedom = 4.096

It is observed from table – 1 that the Pre-test means on triglycerides level of the control and experimental groups are 112.24 and 113.35 respectively. The obtained 'F' ratio value 0.061 for the Pre-test mean is higher than the required table value 4.096 for 1 & 38 degrees of freedom at 0.05 level of significance. This reveals that there is statistically significant difference between the control and the experimental groups on Blood Glucose before the commencement of the experimental training. It is inferred that the random selection of the subjects for the two groups are successful.

The Post-test means on triglycerides of the control and the experimental groups are 118.10 and 14.478 respectively. The obtained 'F' ratio value 6.991 for the Post-test data is greater than the required table value 4.096 for 1 & 38 degrees of freedom at 0.05 levels of significance. It shows that there is a statistically significant difference between the control and the experimental groups on triglycerides level after the experimental training.

The adjusted Post-test means on triglycerides of the control and the experimental groups are 119.71 and 104.18 respectively. The obtained 'F' ratio value of 44.799 for the adjusted Post-test data is greater than the required table value 4.104 for 1 & 37 degrees of freedom at 0.05 level of significance. It reveals that there is significant change on triglycerides as a result of the experimental training. Since the result has revealed that there is a significance difference, the hypothesis is accepted.

Table 2: Analysis of Covariance for Pre-test and Post-test Data on High Density Lipoprotein of Control Group and Experimental Group

	Control group	Experimental group	Source of variance	Sum of squares	Df	Mean squares	F ratio
Pre-test mean	40.35	39.25	between	12.10	1	12.10	0.52*
SD	3.57	5.61	Within	863.50	38	22.71	
Post mean	39.85	41.30	between	54.22	1	54.22	1.32*
SD	7.64	4.62	Within	1483.15	38	41.65	
Adjusted Post-test mean	39.60	42.05	between	80.08	1	80.08	2.10*
			Within	1404.77	37	37.87	

* Significant at 0.05 level.
Required table value at 0.05 level of significance for 1 & 37 degrees of freedom = 4.104 1 & 38 degrees of freedom = 4.096

From the table 2 shows that the Pre-test means on (HDL) High Density Lipoprotein of the control and the experimental groups are 40.35 and 39.25 respectively. The obtained 'F' ratio value 0.52 for the Pre-test mean is lesser than the required table value 4.096 at 0.05 level of confidence. Therefore there is no significant difference between the two groups on High Density Lipoprotein of the training.

The Post-test means on High Density Lipoprotein of the control and the experimental groups are 39.85 and 41.30 respectively. The obtained 'F' ratio value 1.32 for the Post-test data is lesser than the required table value 4.096 for 1 & 38 degrees of freedom at 0.05 level of significance. It shows that there is no statistically significant difference between the control and the experimental groups on High Density Lipoprotein after the experimental training.

The adjusted Post-test means on High Density Lipoprotein of the control and the experimental groups are 39.60 and 42.05 respectively. The obtained 'F' ratio value 2.10 for the adjusted Post-test data is lesser than the required table value 4.104 for 1 & 37 degrees of freedom at 0.05 level of significance. It shows that there is no significant change on High Density Lipoprotein as a result of the experimental training. Since there is no significant difference, the hypothesis has been rejected,

Table 3: Analysis of Covariance for Pre-test and Post-test Data on Low Density Lipoprotein of Control Group and Experimental Group

	Control group	Experimental group	Sum of variance	Sum of squares	Df	Mean squares	F ratio
Pre-test mean	135.00	155.05	Between	7261.01	1	7261.01	10.53*
SD	26.27	26.24	Within	26206.75	38	676.64	
Post-test mean	138.05	123.30	Between	2146.225	1	2146.225	4.004*
SD	24.82	20.24	Within	20352.710	38	525.777	
Adjusted post mean	142.34	115.95	Between	6812.17	1	6812.17	20.327*
			Within	12365.88	37	332.243	

* Significant at 0.05 level.
Required table value at 0.05 level of significance for 1 & 37 degrees of freedom = 4.104 1 & 38 degrees of freedom = 4.096

Table 3 shows that the Pre-test means on (LDL) Low Density Lipoprotein of the control and the experimental groups are 135.000 and 155.05 respectively. The obtained 'F' ratio value 10.531 for the Pre-test mean is greater than the required table value 4.096 for 1 & 38 degrees of freedom at 0.05 level of significance. Hence, it is significant and it reveals that there is statistically significant difference between the control and the experimental groups on Low Density Lipoprotein before the commencement of the experimental Period.

The Post-test means on Low Density Lipoprotein of the control and the experimental groups are 138.05 and 123.30 respectively. The obtained 'F' ratio value 4.004 for the Post-test data is lesser than the required table value 4.096 for 1 & 38 degrees of freedom at 0.05 level of significance. It shows that there is no statistically significant difference between the control and the experimental groups on Low Density Lipoprotein after the experimental period.

The adjusted Post-test means on Low Density Lipoprotein of the control and the experimental groups are 142.34 and 115.95 respectively. The obtained 'F' ratio value 20.327 for the adjusted Post-test data is greater than the required table value 4.104 for 1 & 37 degrees of freedom at 0.05 level of significance. It shows that there is significant change on the Low Density Lipoprotein as a result of the experimental period. Since the result has revealed that there is significant difference, the hypothesis is accepted.

Discussion of Findings
Result of this study revealed significant improvements in the yoga therapy of cholesterol level on middle age women due to the practice of selected yoga therapy i.e. selected asana, pranayama and meditation on selected group that is experimental group, when compared between pre and Post-test triglyceride high density lipoprotein and low density lipoprotein.

Mahajan (1999) [6] determined the effect of yogic lifestyle on the lipid status in angina patients and normal subjects with risk factors of coronary artery disease. The parameters included the estimation of serum cholesterol, triglycerides, HDL, LDL and the cholesterol – HDL ratio. The subjects practicing yoga showed a regular decrease in all lipid parameters except HDL. The effect started from four weeks and lasted for 14 weeks. Thus, the effect of yogic lifestyle on some of the modifiable risk factors could probably explain the Preventive and therapeutic beneficial effect observed in coronary artery disease.

Swahney (1999) [7] conducted a study on Coronary Artery Disease (CAD) regression through life style changes: Vegetarianism, moderate exercise and stress management through Rajayoga meditation. The life style intervention was started with a seven-day stay at Global Hospital & Research Centre, Mount Abu. Detailed biochemical, cardiac, physiological, psychological and hormonal investigations were carried out in these patients before starting the intervention program. Besides causing a 10 to 20% decline in total cholesterol, low-density lipoprotein (LDL) and triglycerides levels, the high-density lipoprotein (HDL) levels showed a slight but definite increase over the basal values.

Conclusion
On the basis of above finding the following conclusions may be drawn:
The effect of yoga therapy i.e. selected asana, pranayama suryanamskar and meditation on cholesterol level of middle age women's. Thus, such training may be recommended to improve health level. The positive results found in the present study might apply to sports persons or any age categorizes to improve health efficiency.

References
1. Bratton R *et al*. Effect of exercise on serum Enzyme levels in untrained males, The Research Quarterly, 1992; 33(2)
2. Champe PC, Harvey RA. Biochemistry, Lippincott Williams and Wilkms, 2 Ed., New York, 1987.
3. Dabre PC. Effect of Aging on Certain Sociological and Psychological Parameters of Yoga Practitioners Dynamic Exercise Practitioners And Inactive Adults". Unpublished Ph.D. Thesis Amravati University, Amravati, 2002.
4. Kaats GR *et al*. Effect of Base Line Total Cholesterol Level in Diet and Exercise Interventions", Journal of The American Nutrition Association. 1999; 02(01).
5. Chinnaswamy, Effects of Asanas and Physical Exercise Selected Physiological and Biochemical Variables, Unpublished M.Phil. Dissertation, Alagappa University, Karaikudi, July, 1992
6. Mahajan S, Reddy KS, Sachdeva U. Yogic Lifestyle Intervention Lipid Profile of Coronary Risk Subjects, Indian Hear J. 1999; 51(1):37-40.
7. Swahney *et al*. Coronary Artery Disease Regression through Life Style Changes: Vegetarianism, Moderate Exercise, Stress Management through Rajayoga Meditation. Defence Institute of Physiology & Allied Sciences, New Delhi, 1999.
8. Kumar *et al*. Effect of yoga life style intervention on body weight and blood chemistry of middle aged women Journal of Exercise Science and Physiotherapy. 2008; 4(2).