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Effect of simplified Kundalini Yoga on low density lipoprotein and high density lipoprotein among middle aged obese women

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Abstract---The purpose of the study was to find out the effect of Simplified kundalini yoga on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) among middle aged obese women. It was hypothesized that there would be significant differences due to Simplified kundalini yoga on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) among middle aged obese women than the Control group. For the purpose of the study, 30 middle aged obese women were selected randomly from Chennai between the age group of 40 and 50 years and were divided into two groups, the Experimental group and the Control group having 15 subjects each. Pre-tests were taken for all the subjects of the Experimental group and the Control group on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) before the training program. Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) were measured in a standardized laboratory. The Experimental group practiced Simplified kundalini yoga for twelve weeks, excluding Sundays and the Control group was given no training. After the experimental period of twelve weeks, post-tests were taken on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) on both the groups. The obtained data was subjected to statistical treatment using Analysis of co-variance (ANCOVA) to find out the significant differences between the Experimental group and the Control group. The test of significance was fixed at 0.05 level of confidence. The results of the study on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) showed that Low Density Lipoprotein (LDL) significantly decreased and High

Density Lipoprotein (HDL) significantly increased due to the practices of Simplified kundalini yoga than the control group among middle aged obese women. Hence the hypothesis was accepted at 0.05 level of confidence.

Keywords---simplified Kundalini Yoga, obesity, Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL), middle age.

Introduction

Obesity is a medical condition where excessive body fat accumulates, inflicting an adverse effect on health. One becomes obese when one takes in more calories than the body is able to use. If the Body Mass Index (BMI) is 30 or over, it is considered to be obese. Obesity problems are widely prevalent in the present and will continue to worsen with time because of abnormal food habits, stress and sedentary life style. Obesity can cause problems like Diabetes, High blood pressure, Cholesterol, Heart diseases, Stroke etc. Simplified kundalini yoga will help to overcome obesity.

Purpose of the study

The purpose of the study was to find out the effect of Simplified kundalini yoga on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) among middle aged obese women.

Hypotheses

It was hypothesized that there would be significant differences due to Simplified kundalini yoga on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) among middle aged obese women than the Control group.

Review of related literature

Lee J A et.al., (2012) conducted a study on the effects of yoga exercise on serum adiponectin and metabolic syndrome factors in obese postmenopausal women. Sixteen healthy postmenopausal women aged 54.50 ± 2.75 years with more than 36% body fat were randomly assigned to either a yoga exercise group ($n = 8$) or to a "no exercise" control group ($n = 8$). The variables of body composition, visceral fat, serum adiponectin, and metabolic syndrome factors were measured in all the participants before and after the 16-week study. To analyze the data 't' test was used. The test of significance was fixed as 0.05 level of confidence. It was concluded that the body weight, percentage of body fat, lean body mass, body mass index, waist circumference, and visceral fat area had significantly decreased. High-density lipoprotein cholesterol and adiponectin had significantly increased, but total cholesterol, triglyceride, low-density lipoprotein cholesterol, blood pressure, insulin, glucose, and homoeostasis model assessment–insulin resistance had significantly decreased. Serum adiponectin concentrations were significantly correlated with waist circumference, high-density lipoprotein cholesterol, diastolic blood pressure, and homoeostasis model assessment–insulin

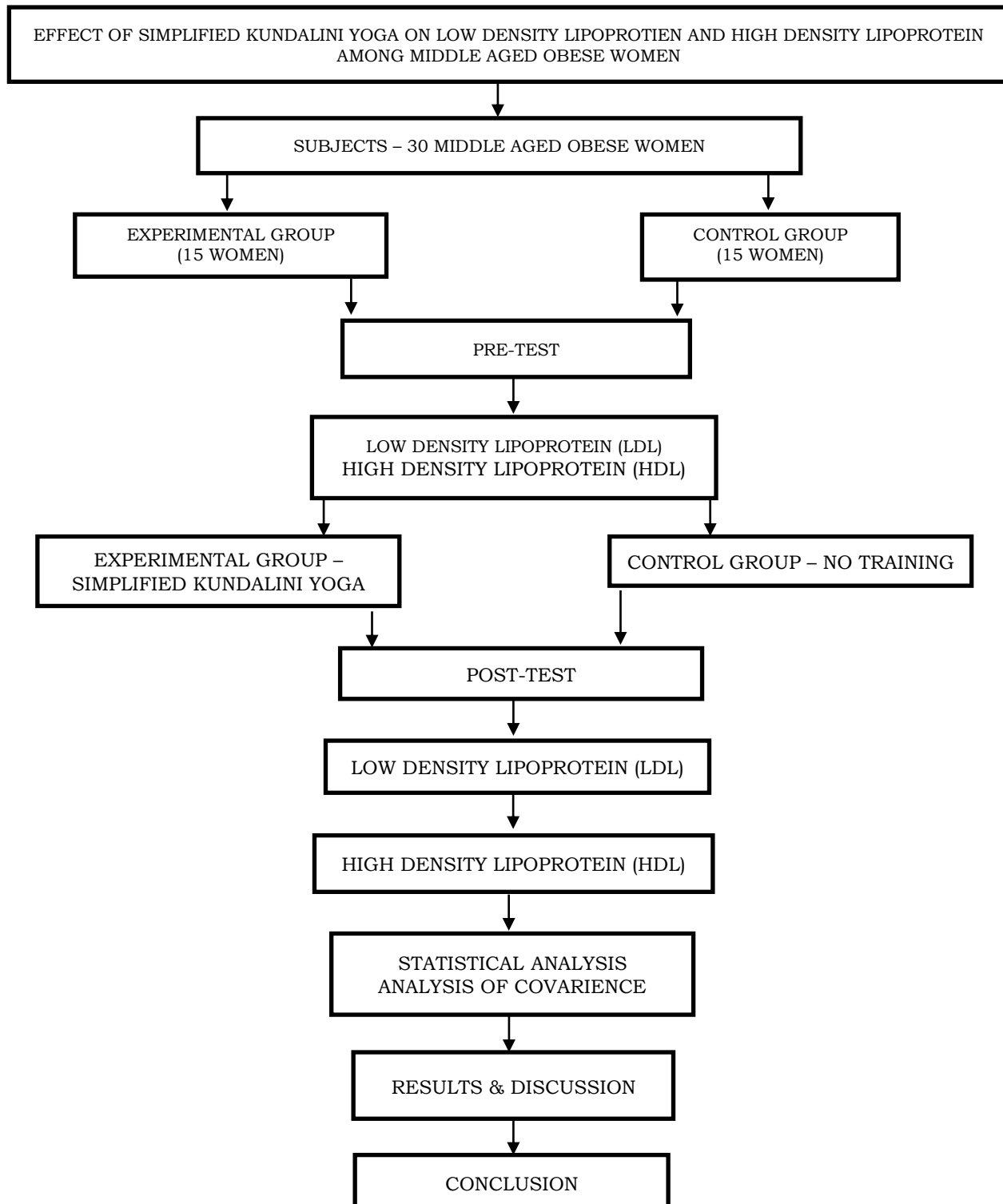
resistance in the post yoga exercise group. It was concluded that yoga exercise improves adiponectin level, serum lipids, and metabolic syndrome risk factors in obese postmenopausal women. Consequently, yoga exercise will be effective in preventing cardiovascular disease caused by obesity in obese postmenopausal Korean women.

Telles S et.al., (2010) conducted a study on Short Term Health Impact of Yoga and Diet Change Program on Obesity. A single group of 47 persons were assessed on the first and last day of a yoga and diet change program, with six days of the intervention between assessments. The assessments were: body mass index (BMI), waist and hip circumferences, mid-arm circumference, body composition, hand grip strength, postural stability, serum lipid profile and fasting serum leptin levels. Participants practiced yoga for five hours every day and had a low fat, high fiber, vegetarian diet. Last and first day data were compared using a t-test for paired data. Following the six day residential program, participants showed a decrease in BMI (1.6 percent), waist and hip circumferences, fat-free mass, total cholesterol (7.7 percent decrease), high density lipoprotein (HDL) cholesterol (8.7 percent decrease), fasting serum leptin levels (44.2 percent decrease) and an increase in postural stability and hand grip strength ($p < 0.05$, all comparisons). A six days yoga and diet change program decreased the BMI and the fat-free mass. Total cholesterol also decreased due to reduced HDL levels. This suggests that a brief, intensive yoga program with a change in diet can pose certain risks. Benefits seen were better postural stability, grip strength (though a 'practice effect' was not ruled out), reduced waist and hip circumferences and a decrease in serum leptin levels.

Methodology

For the purpose of the random group experimental study, 30 middle aged obese women were selected randomly from Chennai between the age group of 40 and 50 years and were divided into two groups, the Experimental group and the Control group having 15 subjects each. Pre-tests were taken for all the subjects of Experimental group and the Control group on selected biochemical variables Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) before the training. Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) were measured using blood sample in a standardized laboratory. The Experimental group practiced Simplified kundalini yoga for twelve weeks, excluding Sundays and the Control group was given no training during the course of the experiment. After the Experimental period of twelve weeks, post-tests were taken for all the subjects of Experimental group and the Control group on selected biochemical variables, Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL). The obtained data from the two groups before and after the training period were statistically analysed using ANCOVA to determine the significant differences between the Experimental group and the Control group. The test of significance was fixed at 0.05 level of confidence.

Flow chart showing methodology adopted for the study



Results and Discussions

The data pertaining to the variables collected from the two groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant differences and tested at 0.05 level of confidence.

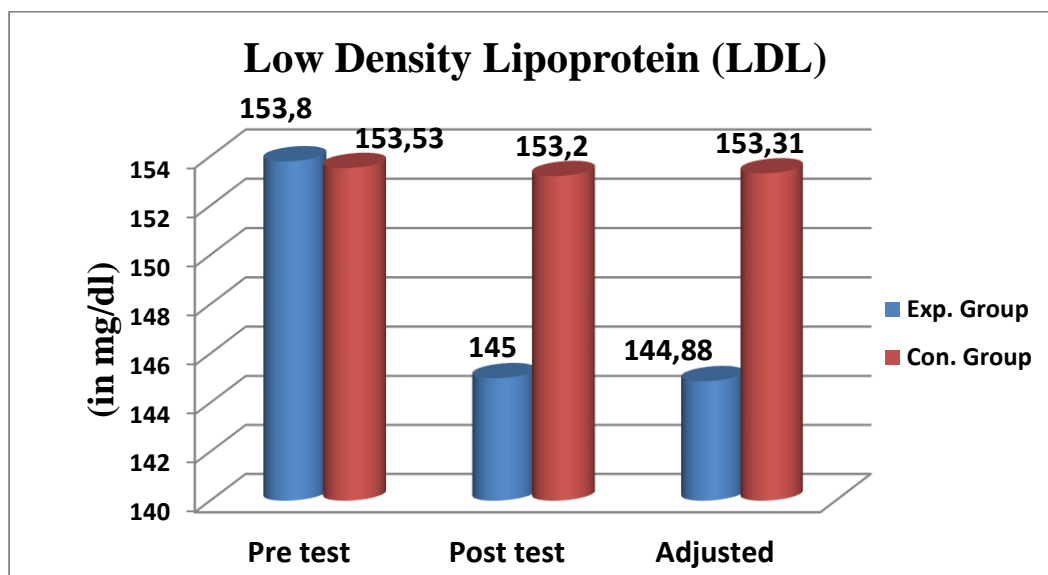
ANALYSIS OF CO-VARIANCE (ANCOVA) OF THE MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON LOW DENSITY LIPOPROTEIN - LDL (SCORES IN mg/dl)

TEST	EXP GROUP	CON GROUP	SV	SS	DF	MS	F
Pre test	153.8	153.53	Between	0.53	1	0.53	0.02
			Within	650.13	28	23.21	
Post test	145	153.2	Between	504.3	1	252.15	10.85*
			Within	650.4	28	23.22	
Adjusted	144.88	153.31	Between	531.91	1	265.95	38.23*
			Within	187.81	27	6.95	
Mean gain	8.8	0.33					

* Significant at 0.05 level of confidence (Table F ratio at 0.05 level of confidence for df 1 and 28 = 4.20, 1 and 27 = 4.21).

The obtained F - ratio value for the Low Density Lipoprotein (LDL) was greater than the table value. This indicates that there was a significant difference among the post-test and adjusted post-test means of the Simplified kundalini yoga group than the Control group on Low Density Lipoprotein (LDL). The above findings can also be substantiated by the observations of experts **Lee J A et.al., (2012)**. The pre-test, post-test and the adjusted post-test mean values of Experimental group and Control Group on Low Density Lipoprotein (LDL) are graphically presented below.

BAR DIAGRAM SHOWING THE MEAN DIFFERENCE AMONG EXPERIMENTAL GROUP AND CONTROL GROUP ON LOW DENSITY LIPOPROTEIN – LDL



The Analysis of Co-variance (ANCOVA) on High Density Lipoprotein (HDL) among Experimental group and Control group of middle-aged obese women were analyzed and presented in the following table.

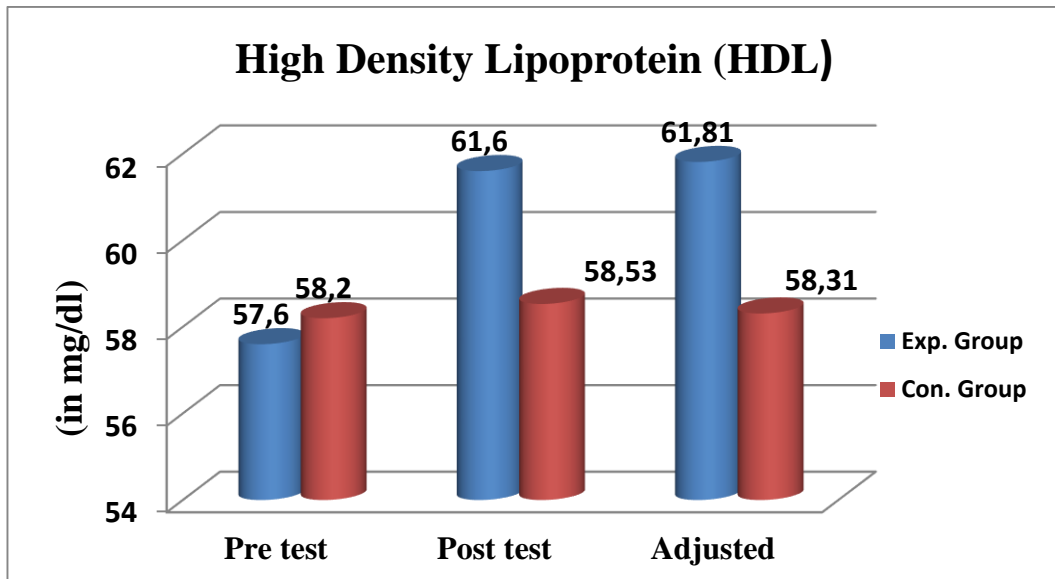
ANALYSIS OF CO-VARIANCE (ANCOVA) OF THE MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON HIGH DENSITY LIPOPROTEIN - HDL (SCORES IN mg/dl)

TEST	EXP GROUP	CON GROUP	SV	SS	DF	MS	F
Pre test	57.6	58.2	Between	2.7	1	2.7	0.99
			Within	76	28	2.71	
Post test	61.6	58.53	Between	70.53	1	35.26	10.14*
			Within	97.33	28	3.47	
Adjusted	61.81	58.31	Between	88.76	1	44.38	20.82*
			Within	57.53	27	2.13	
Mean gain	4	0.33					

* Significant at 0.05 level of confidence (Table F ratio at 0.05 level of confidence for df 1 and 28 = 4.20, 1 and 27 = 4.21).

The obtained F - ratio value for the High Density Lipoprotein (HDL) was greater than the table value. This indicates that there was a significant difference among the post-test and adjusted post-test means of the Simplified kundalini yoga than the Control Group on High Density Lipoprotein (HDL). The above findings can also be substantiated by the observations of experts **Telles S et.al., (2010)**. The pre-test, post-test and the adjusted post-test mean values of Experimental group and Control Group on High Density Lipoprotein (HDL) are graphically presented in the following Figure.

BAR DIAGRAM SHOWING THE MEAN DIFFERENCE AMONG EXPERIMENTAL GROUP AND CONTROL GROUP ON HIGH DENSITY LIPOPROTEIN - HDL



The results of the study on selected variables such as Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) showed that Low Density Lipoprotein (LDL) significantly decreased and High Density Lipoprotein (HDL) significantly increased in the Experimental group due to the influence of Simplified kundalini yoga than the Control group.

Discussion on hypothesis

It was hypothesized that there would be significant differences due to Simplified kundalini yoga on Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) among middle aged obese women than the Control group. The obtained results proved that Low Density Lipoprotein (LDL) significantly decreased and High Density Lipoprotein (HDL) significantly increased in the Experimental group than the Control group among middle aged obese women due to the influence of Simplified kundalini yoga. Hence the hypothesis was accepted at 0.05 level of confidence.

Conclusion

Based on the results obtained, the following conclusion was drawn. It was concluded that Simplified kundalini yoga significantly decreased Low Density Lipoprotein (LDL) and increased High Density Lipoprotein (HDL) than the control group among middle aged obese women. Hence Simplified kundalini yoga is good for all.

Conflict of interest

There is no conflict of interest with reference to the above study “Effect of Simplified kundalini yoga on Low Density Lipoprotein and High Density Lipoprotein among middle aged obese women.”

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- No external source of funding has been arranged.
- The research was conducted for the healthy living of the subjects who volunteered to resolve their pain through Simplified kundalini yoga. Hence ethical clearance is not needed for this research.

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