*Original Research Article*

# Impact of Yoga on Cholesterol and Triglyceride among the Middle Aged Men

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## ABSTRACT

The randomly selected subjects (N=30) were grouped into two groups, namely control group and experimental group respectively, each consisting of fifteen subjects. Pre tests were conducted for all the subjects on selected psychological variables such as blood cholesterol and triglycerides. The experimental group participated in their respective treatment for six weeks. The post tests were conducted on the above said dependent variables after a period six weeks. The difference between the initial and final means was considered as the effect of respective effects on the subjects. The statistical significance was analyzed through ANCOVA. In all cases 0.05 levels was fixed to test the hypothesis of the study. **Depended Variables**: 1.Cholesterol (Total Cholesterol), 2.Triglycerides, **Independent Variables**: Yoga, **Hypothesis**: There would be significant improvement health conditions of middle aged men due to the yoga on biochemical variables such as, total cholesterol and triglycerides than the control group. **Results**: The results presented proved that the yoga improved overall health conditions of the middle aged men, assessed through biochemical variables blood cholesterol and triglycerides with significant improvement. 1. Cholesterol (Total Cholesterol): The pre test mean on experimental group was 127.54, and control group was 123.54 and the obtained 'F' value was 1.31, which was less than the required 'F' value of 4.20 to be significant. 2.Triglycerides: The pre test mean on experimental group was 183.01, and control group was 180.25 and the obtained 'F' value was 0.43, which was less than the required 'F' value of 4.20 to be significant.

*Key words*: Yoga, Cholesterol, Triglycerides.

## INTRODUCTION

There is lack of scientific research to find out the influence of yoga on different groups of people and on different variables such as biochemical to contribute and lay scientific foundations of the benefits of yoga among middle aged men, this research was undertaken. The purpose of the study was to find out the effect the yoga on selected biochemical variables among middle aged men. To achieve the purpose of the study, thirty middle aged men subjects in the age group of thirty to forty five years were selected and they were assigned into two different groups, namely, experimental group and control group consisting of fifteen subjects in each group. Experimental group was considered as yoga group and control group was not provided with any special training. The requirements of the

experimental procedures, testing as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and prior to the administration of the study, the investigator got the individual consent from each subject.

**Statement of the Problem:** The purpose of the study was to determine the effect of yoga on selected biochemical variables among middle aged men.

**Hypothesis:** There would be significant improvement health conditions of middle aged men due to the yoga on biochemical variables such as, total cholesterol and triglycerides than the control group.

**Significance of the Study:** Being India a thickly populated country in the world, the health problems of the middle aged men increases day by day in different dimensions, it become utmost necessity to find ways and means, especially suitable physical activity such as yoga.

## MATERIALS AND METHODS

**Selection of Variables:** The research scholar reviewed the various scientific literatures pertaining to middle aged men and yogic practices on biochemical variables from books, journals, periodicals, magazines and research papers. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected.

**Dependent Variables:** 1.Cholesterol (Total Cholesterol), 2.Triglycerides

**Independent Variables:** Yoga

**Experimental Design:** The randomly selected subjects (N=30) were grouped into two groups, namely control group and experimental group respectively, each consisting of fifteen subjects. Pre tests were conducted for all the subjects on selected biochemical variables such as cholesterol and triglycerides. The experimental group participated in their respective treatment, six

weeks of yoga. The post tests were conducted on the above said dependent variables after a period six weeks. The difference between the initial and final means was considered as the effect of respective effects on the subjects. The mean differences were subjected to statistical treatment using ANCOVA.

**Criterion Measures:** By the literature, and in consultation with professional experts, the following variables were selected as the criterion measures in this study. Biochemical variables blood cholesterol and Triglycerides were determined through blood samples analyzed through laboratory.

**Reliability of Data:** The reliability of data was ensured by establishing the instrument reliability, tester's competency and subject reliability:

1. Instrument Reliability - The blood samples obtained by qualified personnel from reputed blood testing laboratory and analyzed for accurate measurements and the same was taken as reliable.

2. Tester's Competency - Reliability was established by the test-retest processes. Six subjects from all the three groups were tested on selected variables. The repeated measurement of individuals on the same test is done to determine reliability. It is a univariate not a bivariate situation; it makes sense then to use a univariate statistics like the interaclass correlation coefficient (Baumgartner and Jackson, 1975). The intraclass correlation coefficient obtained for test-retest data are presented in Table I.

Table I. Intra Class Correlation Coefficient of Test – Retest Scores

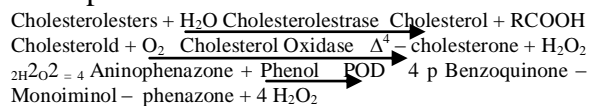| S.No | Variables | Coefficient of Correlation |
|---|---|---|
| 1 | Blood Cholesterol (Total Cholesterol) | 0.83* |
| 2 | Triglycerides | 0.84* |

* Significant at 0.05 level

## Measurements of Bio-Chemical Variables:

**Blood Collection:** The subject was asked to sit on an arm chair comfortably. An examination of the superficial vein of the left fore arm was made to select the site for venous puncture. The skin was cleared with spirit and allowed to dry. A tourniquet was tied around the upper arm. The subject was asked to flex and extend the wrist joint to make the veins more prominent. Thumb of the left hand was placed on the lower part of the cleared area and gentle traction was given to fix the vein. A 3 ml sterilized syringe with needle was used to puncture the vein and blood flowed in the syringe. Five millimeter of blood was collected from each subject and stored in a stoppered container with anticoagulant.

**Total Cholesterol:** Enzymatic calorimetric method recommended by Siedal et al., and Kuattermann et al., was applied for estimation of cholesterol. Bio-chemistry analyzer (Model RA-50) was used for this purpose.
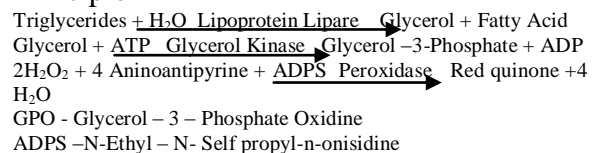
Principle:

Cholesterolesters + $H_2O$ Cholesterolestrase Cholesterol + RCOOH
Cholesterold + $O_2$ Cholesterol Oxidase $\Delta^4$ – cholesterone + $H_2O_2$
$_{2H}2_O2 = _4$ Aninophenazone + Phenol POD 4 p Benzoquinone – Monoiminol – phenazone + 4 $H_2O_2$

Procedure: Ten μl of serum, standard and distilled water was incubated with 1000 μl of reagent at 37° C for 5 minutes and

the absorbance of the sample and standard were read at 546 nm within one hour against reagent blank. Serum cholesterol is expressed a mg/dl.

Triglycerides: Triglycerides were estimated by enzymatic calorimetric method. Bio-chemistry analyses (Model RA –50) was used for this purpose

Principle:

Triglycerides $+ H_2O$ Lipoprotein Lipare Glycerol + Fatty Acid
Glycerol + ATP Glycerol Kinase Glycerol –3-Phosphate + ADP
$2H_2O_2$ + 4 Aninoantipyrine + ADPS Peroxidase Red quinone +4 $H_2O$
GPO - Glycerol – 3 – Phosphate Oxidine
ADPS –N-Ethyl – N- Self propyl-n-onisidine

The intensity of purple coloured complex formed during the reaction is directly proportional to the triglyceride concentration in the sample and is measured at 546 nm.

Procedure: To ten μl of the sample, one ml of the reagent was added and mixed and incubated for 5 minutes at 37°C. The readings were taken and the final colour is stable for at least 30 minutes. Triglycerides are expressed as mg/dl.

*Statistical Technique:* The data collected from the subjects were treated statistically, by Analysis of co-variance was used to find out the adjusted mean difference among the treatment groups.

Flow Chart Showing the Methodology adapted in the Study
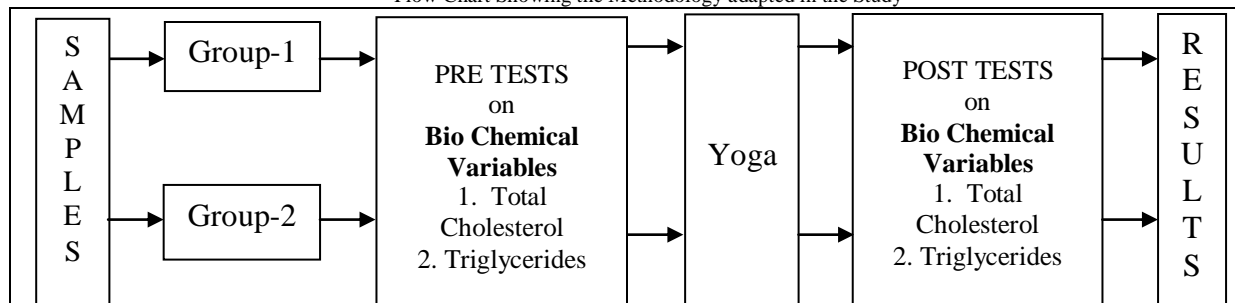


**Test of Significance**: As Clarke and Clarke say, "these data must be analyzed in ways appropriate to the research design. Such analysis can only be appropriate to the research design and can only accomplish through the application of pertinent statistics". This is the vital portion of thesis achieving the conclusion by examining the hypotheses. The procedure of testing the hypotheses was either by

accepting the hypotheses or rejecting the same in accordance with the results obtained in relation to the level of confidence. The test was usually called the test of significance since we test whether the differences between two groups or within many group scores were significant or not. In this study, if they obtained 'F' value were greater than the table value, the null hypotheses were rejected to the effect that there existed significant difference among the means of the groups compared and if the obtained values were lesser than the required values, then the null hypotheses were accepted to the effect that there existed no significant differences among the means of the groups under study.

## RESULTS AND DISCUSSION

**Results on Blood Cholesterol:** The initial and final means on Yoga training group and control group on Blood Cholesterol among middle aged men, through Analysis of Covariance (ANCOVA) is presented in Table II.

Table II. Computation of analysis of covariance on blood cholesterol.

| | Experimental Group | Control | Source of Variance | Sum of Squares | df | Mean Squares | Obtained F |
|---|---|---|---|---|---|---|---|
| Pre Test Mean | 127.54 | 123.54 | Between | 120.48 | 1 | 120.48 | 1.31 |
| | | | Within | 2575.30 | 28 | 91.98 | |
| Post Test Mean | 113.35 | 122.98 | Between | 696.20 | 1 | 696.20 | 7.49* |
| | | | Within | 2602.80 | 28 | 92.96 | |
| Adjusted Post Test Mean | 111.38 | 124.95 | Between | 1319.27 | 1 | 1319.27 | 295.30* |
| | | | Within | 120.62 | 27 | 4.47 | |
| Mean Diff | 14.19 | 0.55 | | | | | |

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

Table III. Computation of analysis of covariance on triglycerides

| | Experimental group | Control | Source of variance | Sum of squares | df | Mean squares | Obtained F |
|---|---|---|---|---|---|---|---|
| Pre Test Mean | 183.01 | 180.25 | Between | 57.13 | 1 | 57.13 | 0.43 |
| | | | Within | 3701.65 | 28 | 132.20 | |
| Post Test Mean | 174.58 | 178.88 | Between | 138.67 | 1 | 138.67 | 0.99 |
| | | | Within | 3937.63 | 28 | 140.63 | |
| Adjusted Post Test Mean | 173.51 | 179.95 | Between | 306.90 | 1 | 306.90 | 4.87* |
| | | | Within | 1699.75 | 27 | 62.95 | |
| Mean Diff | -8.43 | -1.37 | | | | | |

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

The pre test mean on experimental group was 127.54, and control group was 123.54 and the obtained 'F' value was 1.31, which was less than the required 'F' value of 4.20 to be significant. Hence, it was not significant and the groups were equal at initial stage. The comparison of post test means, experimental group 113.35 and control group 122.98 proved to be significant at 0.05 levels as the obtained F value 7.49 was greater than the required table 'F' value of 4.20 to be significant at 0.05 levels. Taking into consideration the initial and final mean values adjusted post test means were calculated and the obtained F value of 295.30 was greater than the required 'F' value to be significant 4.21 and hence, there was significant difference. Thus, it was proved that experimental group gained mean difference on, Blood Cholesterol -14.19 was due to the yoga given to middle aged men, and the difference was found to be significant at 0.05 levels. The initial, post and adjusted means values of experimental and control group on Blood Cholesterol is presented in

Figure 1 for better understanding of the results of this study.

**Results on Triglycerides** : The initial and final means on Yoga training group and control group on Triglycerides among middle aged men, through Analysis of Covariance (ANCOVA) is presented in Table III.

The pre test mean on experimental group was 183.01, and control group was 180.25 and the obtained 'F' value was 0.43, which was less than the required 'F' value of 4.20 to be significant. Hence, it was not significant and the groups were equal at initial stage. The comparison of post test means, experimental group 174.58 and control group 178.88 proved to be significant at 0.05 levels as the obtained 'F' value 0.99 was lesser than the required table F value of 4.20 to be significant at 0.05 levels. Taking into consideration the initial and final mean values adjusted post test means were calculated and the obtained 'F' value of 4.87 was greater than the required 'F' value to be significant 4.21 and hence, there was significant difference. Thus, it was proved that experimental group reduced mean difference on, Triglycerides 8.43 was due to the yoga given to middle aged men, and the difference was found to be significant at 0.05 levels. The initial, post and adjusted means values of experimental and control group on Triglycerides is presented in Figure II for better understanding of the results of this study.

The formulated hypothesis No.1 stated that there would be significant improvement in health conditions of middle aged men due to the yoga on biochemical variables total cholesterol and triglycerides. The results presented in Table II proved that total cholesterol of the middle aged men was significantly reduced due to the yoga among middle aged men. The results presented in Table III proved that triglycerides of the middle aged men were significantly reduced due to the yoga and thus the results proved that the health conditions of the middle aged men were favorably altered by the yoga and the formulated hypothesis was accepted at 0.05 levels.

## CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn: 1.It was concluded that biochemical variable, total cholesterol was significantly reduced due to the yoga among middle aged men and improved their health conditions than the control group, 2.It was concluded that biochemical variable, triglycerides was significantly reduced due to the yoga among middle aged men and improved their health conditions than the control group.

## REFERENCES

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2. Kuattermann et al., Total Cholesterol. Method. Enzymatic colorimetric method, p.143. (http://shodhganga.inflibnet.ac.in/bitstream/10603/5602/12/12_chapter%203.pdf)

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