



Investigation of the Changes in Total Cholesterol after Twelve Weeks of Yogic Practices and Physical Exercises among Middle Aged Men

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Abstract

The purpose of the study is to investigate the changes on total cholesterol in response to yogic practices and physical exercises among middle aged men. To achieve the purpose of the study 45 middle aged men were selected as subjects. The subjects were selected in the age group of 40 to 45 years and they were randomly assigned into three equal groups of 15 each. Experimental group-I performed yoga practices, experimental group-II performed physical exercises and group III acted as control. The total cholesterol was selected as dependent variable. The data collected from the three groups prior to and post experimentation on selected dependent variable was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test. The result of the study produced significant changes in total cholesterol of the middle aged men due to yogic practices and physical exercises.

Keywords: Yogic Practices, Physical Exercises, Total cholesterol.

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Introduction

Yoga is an ancient art, harmonizing system of development for the body, mind and spirit together. In sports it is generally seen that sports person get injured frequently due to improper flexibility, coordination as well as they do not get proper relaxation after their work out. In this regard, yoga practices are perfect for elimination of stiffness, improving coordination and preventing injuries. Even though, after injuries occurring in the body, these can easily be cured by doing yoga practice. The stretching and breathing practices of yoga help athletes to improve their performance and maintain their bodies. Practices of Dhyana (Meditation) maintain physical, mental and emotional energy, which make better concentration and endurance. Moreover, relaxation technique allows releasing body and mind from fatigue and weakness and has calming impact on mind (Jain, 2003). Yogic postures tone up the body and the mind whereas physical exercise affects mainly the body. The caloric requirement in yogic asanas varies from 0.8 to 3calories per minute while the caloric requirement of a physical exercise varies from 3 to 20 calories per minute. The main purpose of physical exercise is to increase the circulation of the blood and the intake of oxygen. This can be done by yoga's simple movements of the spine and various joints of the body with deep breathing, but

without violent movements and asanas, the various blood vessels are pulled and stretched and blood is equally distributed to every part of the body. The stretched and blood is equally distributed to every part of the body. The stretched muscles and ligaments during yoga practices are immediately relaxed muscles. Fatigue appears after doing physical exercises. Physical exercises are repetitive movements whereas yoga exercise involves very little movement and only postures maintained for a period of time. Physical exercises lay emphasis on strong movements of muscles whereas yoga opposes violent movements.

Tension increases and nerves are more tightened through physical exercise. Nerves and body muscles are relaxed by yoga. Yogic exercise aims at both prevention and treatment of various diseases. Breathing exercise aims at both prevention and treatment of various diseases. Breathing exercises like pranayama including Kapalabhati is very effective for keeping the lungs healthy and prevent lung infections. With deep breathing air circulates to every part of the lungs whereas with most other physical exercises, there is mainly an increase in the respiratory rate. However, physical exercise wastes more energy due to quick movements and more lactic acids are formed in the muscle fibres. But energy is not wasted in yoga practices. Yoga postures and breathing exercises unlike physical exercises do not strain the cardio vascular system, and they improve one's physical fitness and endurance.

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Methodology

Subjects and Variables

The purpose of the study is to investigate the changes on total cholesterol in response to yoga and physical exercises among middle aged men. To achieve the purpose of the study 45 middle aged men were selected as subjects. The subjects were selected in the age group of 40 to 45 years and they were randomly assigned into three equal groups of 15 each. Experimental group-I performed yoga practices, experimental group-II performed physical exercises and group III acted as control. Venous blood specimens were withdrawn after overnight fasting (12-14 hours) from the subjects of experimental and control groups. Total cholesterol was estimated by Enzymatic calorimetric method.

Training Protocol

During the training period, the experimental groups underwent for yoga training six days a week for eight weeks. The yogasana exercise included in this training programme were Sugasana, Vajrasana, Viparitarakani, Sarvangasana, Bhujangasana, Matsyasana, Ardha matsyendrasana, Trikonasana, Vrksasana, and Savasana respectively. The training programme was conducted in the morning sessions from 6 `O'clock onwards. The experimental group-II performed physical exercises six days per week for eight weeks. In the present study, the physical exercise protocol consisted of one set of six stretches, starting

with slow followed by fast repetitions and 10s periods of rest. Repeated stretches were performed, alternating left and right sides.

Statistical Technique

The data collected from the experimental and control groups on total cholesterol was statistically analyzed by paired 't' test to find out the significant differences if any between the pre and post test. Further, percentage of changes was calculated to find out the chances in selected dependent variable due to the impact of experimental treatment. The data collected from the three groups prior to and post experimentation on total cholesterol was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test. In all the cases the level of confidence was fixed at 0.05 level for significance.

Result

The descriptive analysis of the data showing mean and standard deviation, range, mean differences, 't' ratio and percentage of improvement on total cholesterol of experimental and control groups are presented in table-I

Table I. Descriptive Analysis of the Pre and Post Test Data and 'T' Ratio on Total Cholesterol of Experimental and Control Groups

Group	Test	Mean	Standard Deviation	Range	Mean Differences	't' ratio	Percentage of Changes
Yogic Practices	Pre test	219.87	17.78	47.00	6.74	8.87	3.07%
	Posttest	213.13	17.81	49.00			
Physical Exercises	Pre test	223.33	13.88	44.00	11.66	5.69	5.55%
	Posttest	211.67	15.15	46.00			
Control Group	Pre test	221.73	16.68	44.00	0.74	2.44	0.33%
	Posttest	222.47	16.65	43.00			

Table t-ratio at 0.05 level of confidence for 14 (df) =2.15

*Significant

Table-I shows that the mean, standard deviation, range and mean difference values of the pre and post test data collected from the experimental and control groups on total cholesterol. Further, the collected data was statistically analyzed by paired 't' test to find out the significant differences if any between the pre and post data. The obtained 't' values of yoga, physical exercises and control groups are 8.87, 5.69 and 2.44 respectively which are greater than the required table value of 2.15 for significance at 0.05 level for 14 degrees

of freedom. It revealed that significant differences exist between the pre and post test means of experimental and control groups on total cholesterol. The result of the study also produced 3.07% percentage of changes in total cholesterol due to yoga practices, 5.55% of changes due to physical exercises and 0.33% of changes in control group. The pre and post test data collected from the experimental and control groups on total cholesterol is statistically analyzed by using analysis of covariance and the results are presented in table-II.

Table II. Analysis of Covariance on Total Cholesterol of Experimental and Control Groups

	Yogic Practices Group	Physical Exercises Group	Control Group	S o v	Sum of Squares	Df	Mean squares	'F' ratio
Pre test Mean SD	219.87	223.33	221.73	B	90.31	2	45.16	0.17
	17.78	13.88	16.68	W	11018.0	42	262.33	
Post test Mean SD	213.13	211.67	222.47	B	1029.51	2	514.76	1.87
	17.81	15.15	16.65	W	11534.8	42	274.64	
Adjusted Post test Mean	214.87	210.02	222.38	B	1162.86	2	581.43	23.43*
				W	1017.38	41	24.81	

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) = 3.23, 2 and 41 (df) = 3.23

*Significant

Table-II shows that the adjusted post-test means on total cholesterol of yoga, physical exercises and control groups are 214.87, 210.02, and 222.38 respectively. The obtained 'F' value of 23.43 on total cholesterol was greater than the required table value of 3.23 of 2, 42 df at 0.05 level of confidence. Hence, it was concluded that significant differences exist between the

adjusted post test means of yoga, physical exercises and control groups on total cholesterol. Since, the obtained 'F' value in the adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to find out the paired mean difference, and it is presented in table-III.

Table III. Scheffe's Post Hoc Test for the Differences among Paired Means of Experimental and Control Groups on Total Cholesterol

Yogic Practices Group	Physical Exercises Group	Control Group	Mean Difference	Confidence Interval
214.87	210.02		4.85	4.62
214.87		222.38	7.51*	4.62
	210.02	222.38	12.36*	4.62

*Significant at 0.05 level

As shown in table-III the Scheffe's post hoc analysis proved that significant mean differences existed between yoga and control groups, physical exercises and control groups on total cholesterol. Since, the mean differences 7.51 and 12.36 are higher than the confident interval value of 4.62 at 0.05 level of significance. However, no significant mean differences existed between yoga and physical exercises groups, since, the mean differences 4.85 is lesser than the confident interval value of 4.62 at 0.05 level of significance. Hence, it is concluded that due to the effect of yoga and physical exercises the total cholesterol of the subjects was significantly altered. It is also concluded that no significant differences existed between yoga and physical exercises groups in altering total cholesterol.

Discussion

The results of the study indicate that the experimental groups namely physical exercise group and yogic practices groups have significantly improved the total cholesterol level. The result of the present study is in conformity with the findings of the previous research

studies. Many previous studies have shown that long term low intensity aerobic exercise is beneficial and increases the HDL level (Hata & Nakajima 2000; Halverstadt et al., 2007; Ring-Dimitriou et al., 2007; Marti et al., 1990 and Dragusha et al., 2010). The above finding can also be substantiated by observations made by the following authors. Tikkanen, Hamalainen and Harkonen (1999) concluded 12 month home-based exercise training significantly increases HDL-C level in healthy men. Kelley, Kelly and Tran (2004) observed an increase of 3% for HDL-C. Leon and Sanchez (2001) concluded that aerobic exercises appeared to decrease the TC and LDL increases the HDL in men and women. Buyukyazi (2005) compared the lipid profiles of master athletes, recreational athletes and sedentary workers and concluded that habitual physical training favorably altered the serum lipid and lipoprotein profiles. Similarly, Lippi et al., (2006), while debating the levels of exercise required to produce beneficial/deleterious alterations in lipid profiles, conclude and recommend regular exercise as a means of favorably altering lipid profile and reducing risks for cardiovascular disease.

It is a known fact that the yogic practices and physical training are best suited for developing physiological and bio-chemical variables. Yogic practices and physical training improve the total cholesterol for the same task. Physical exercise refers to the variety of exercise that stimulates heart function and lungs activity for a time period sufficiently long to produce beneficial changes in the body. The heart is always able to deliver sufficient oxygen rich blood to muscles. So that they can derive energy from fat and glycogen aerobically, since it increases the efficiency of heart circulation and muscles.

Conclusion

It is concluded that due to the effect of physical exercises and yogic practices the total cholesterol of the middle aged people was significantly altered. Hence it is concluded from the results of the study that systematically and scientifically designed physical exercises and yogic practices may be given due recognition and be implemented properly in order to improve the health condition of the middle aged people.

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