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IMPACT OF A THREE-MONTH YOGIC TRAINING PROGRAM ON CHOLESTEROL LEVELS IN OBESE INDIVIDUALS

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Abstract: The objective of the research was to investigate the effects of a three-month yogic training program on cholesterol levels in individuals with obesity. A total of thirty participants were randomly selected from the Gwalior District in Madhya Pradesh, ensuring that none had any health conditions other than obesity. These participants were divided into two groups: the Experimental Group and the Control Group, each consisting of 15 individuals. All subjects had a body mass index (BMI) of 25 or higher. Over the course of three months, the Experimental Group engaged in a yoga training program that lasted 60 minutes and occurred five days a week, while the Control Group did not partake in any form of training. Cholesterol levels were assessed at the beginning of the study and again after three months. The data was analyzed using the paired t-test. Results indicated a significant reduction in total cholesterol levels ($p<0.05$) in the Experimental Group following the three-month yoga program, whereas the Control Group exhibited only a minimal decrease in cholesterol levels. This suggests that consistent yoga practice can significantly enhance the health status of overweight males by reducing total cholesterol levels.

KEYWORDS: Yogic Training, Obesity, Asanas, Pranayama, Meditation, Yoga Nidra, Total cholesterol.

INTRODUCTION:

According to Poll 2013 (Ng et al., 2014) Obesity is recognized globally as a significant risk factor for human health. India ranks third among the top ten countries with the highest percentage of obese individuals, following the United States and China. The increasing rates of obesity in India can be primarily attributed to the consumption of fast food and junk food, alongside the rapid urbanization occurring in the country. Coronary artery disease (CAD) is the most likely cause of death associated with obesity. When compared to Europeans and other Asian nations, Indians exhibit significantly higher incidences of early coronary artery disease and related mortality (Anand et al., 2000).

A poll conducted in the UK (WHEC, 2011) indicates that women experience poorer health and higher rates of disability compared to men throughout much of their lives. Nevertheless, women tend to be less cognizant of their susceptibility to these health issues. The sedentary lifestyles of Indian women, often due to their roles as homemakers and caregivers, are likely contributing factors to their obesity, although this remains unverified. Consequently, addressing female obesity has emerged as an increasingly urgent global concern. Incorporating physical activities such as yoga into daily routines may reduce the prevalence of coronary artery disease (CAD) and potentially mitigate health complications associated with obesity. Numerous health conditions have been demonstrated to respond positively to yoga, including asthma (Taskinen, 2002), type II diabetes (Mooradian, 2009), hypertension (Ebnezar, Nagathna, Yogitha, & Nagendra, 2012), irritable bowel syndrome (Brands, Purperhart & Deckers-Kocken, 2011), as well as mental health issues such as depression, anger, and anxiety (Shapiro et al., 2007), and sleep disorders

(Krauss, 2005). Additionally, individuals who practice yoga often report feeling rejuvenated and exhibit increased stamina (Podder, 2007).

The information indicates that yoga is increasingly recognized as an effective approach for alleviating cardiac problems in obese women. The main contributor to cardiac complications is the accumulation of fatty substances within human tissues, including cholesterol, triglycerides, and other associated compounds (Nelson & Cox, 2008). Cholesterol serves as the primary steroid and a crucial component of cell membranes, facilitating the transport of fatty acids. It plays a vital role in the synthesis of various biomolecules, such as bile acids, steroid hormones, and vitamin D. Conversely, elevated cholesterol levels can lead to the formation of gallstones and various cardiovascular issues. Conditions such as atherosclerosis, hypertension, and other heart-related diseases are often associated with high cholesterol. Additionally, triglycerides, another type of lipid, act as a stored energy reserve essential for daily activities. However, excessive accumulation of cholesterol and triglycerides, often due to overeating or insufficient physical activity, can result in overweight and obesity. An increase in triglycerides, which are a major component of low-density lipoprotein, is linked to heart diseases, including atherosclerosis. Proper management of triglycerides and cholesterol not only aids in weight loss but also contributes positively to overall health. This discussion will explore the impact of yoga practices on the triglyceride and cholesterol levels in overweight men.

HYPOTHESIS:

It was anticipated that engaging in yoga would significantly reduce total cholesterol levels in overweight men in comparison to the control group.

METHODOLOGY:

A total of thirty participants were randomly selected from the Gwalior District in Madhya Pradesh, ensuring that none had any health conditions other than obesity. These participants were divided into two groups: the Experimental Group and the Control Group, each consisting of 15 individuals. All subjects had a body mass index (BMI) of 25 or higher. Over the course of three months, the Experimental Group engaged in a yoga training program that lasted 60 minutes and occurred five days a week, while the Control Group did not partake in any form of training. Cholesterol levels were assessed at the beginning of the study and again after three months.

All patients underwent pre-tests involving blood withdrawal eight hours post-meal after an overnight fast, in compliance with the guidelines established by the Indian Council of Medical Research. During these pre-tests, total cholesterol levels were evaluated. Before the commencement of the trial, each participant was advised to maintain their usual activities and to avoid initiating any new physical activities during the course of the study.

This research did not follow any specific dietary guidelines. Rather than simply consuming the food, participants were instructed to chew it thoroughly. Over a period of three months, the group practiced their chosen individual yoga routines. Following this three-month period, the group underwent post-testing. A paired t-test was employed to statistically analyze the total cholesterol data collected from the overweight male participants.

For three months, the experimental group received the following training schedule:

TABLE: 1 (THREE MONTHS YOGA MODULE FOR EXPERIMENTAL GROUP)

S. No.	YOGA PRACTICES	FREQUENCY	DURATION	RECOVERY
1.	**Loosening Practices**	5 days/week	2-Minutes	-
2.	**Surya Namaskar**	5 days/week	5-Minutes	30-Seconds
3.	**Asanas**	-	-	60-Seconds
a.	Tadasana	5 days/week	1-Minute	-
b.	Vrikshasana	5 days/week	1-Minute	-
c.	Naukasana	5 days/week	1-Minute	-
d.	Veer Bhadrasana	5 days/week	1-Minute	-
e.	Pavanmuktasana	5 days/week	2-Minutes	-
f.	Markatasana	5 days/week	2-Minutes	-
g.	Bhujangasana	5 days/week	1-Minute	-
h.	Matsyasana	5 days/week	1-Minute	-
i.	Shasankasana	5 days/week	2-Minutes	-
j.	Mandukasana	5 days/week	3-Minutes	-
k.	Paschimottanasana	5 days/week	1-Minute	-
l.	Ardh Matsyendrasana	5 days/week	1-Minute	-
4.	**Kapalbhati**	5 days/week	3-Minutes	-
5.	**Pranayama**	-	-	30-Seconds
a.	Nadishodhan	5 days/week	4-Minutes	-
b.	Suryabhedan	5 days/week	2-Minutes	-
c.	Bhastrika	5 days/week	3-Minutes	-
d.	Bhramari	5 days/week	2-Minutes	-
6.	**YogNidra/ Meditation**	5 days/week	10-Minutes	-

STATISTICAL TECHNIQUE:

To find out the significant difference in Total cholesterol (Pre and Post training) of obese individuals sample paired t-test was used at 0.05 level of significance.

RESULTS:

Mean, Standard deviation and paired‘t’ test in Total Cholestrol between Pre-test and Post yogic training of obese individuals.

Table 2: Total Cholestrol (Pre-Post Training)

EXPERIMENTAL GROUP

Paired Samples Statistics

TOTAL CHOLESTEROL		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRETEST	218.7193	15	4.67538	1.20718
	POSTTEST	195.3020	15	1.55665	.40192

Table 3: Total Cholesterol (Paired Differences) of Experimental Group

Paired Samples Test

TOTAL CHOLESTEROL		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	PRETEST - POSTTEST	23.41733	4.54822	1.17434	19.941	14	.000

Paired Samples Test

TOTAL CHOLESTEROL		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	PRETEST - POSTTEST	1.16867	1.23712	.31942	3.659	14	.003

Table (2&3) displays the mean and standard deviation of Total Cholesterol (for Experimental group) in the pre-test as **218.71 ± 4.675**, while in the post-test, it is **195.30 ± 1.556**. According to Table 3, the "t" value for total cholesterol is **19.941**, the paired difference is about **23.417mg/dL** in between Pre and Post yogic training which is significant at a 0.05 level of significance.

Table 4: Total Cholestrol (Pre-Post Training)

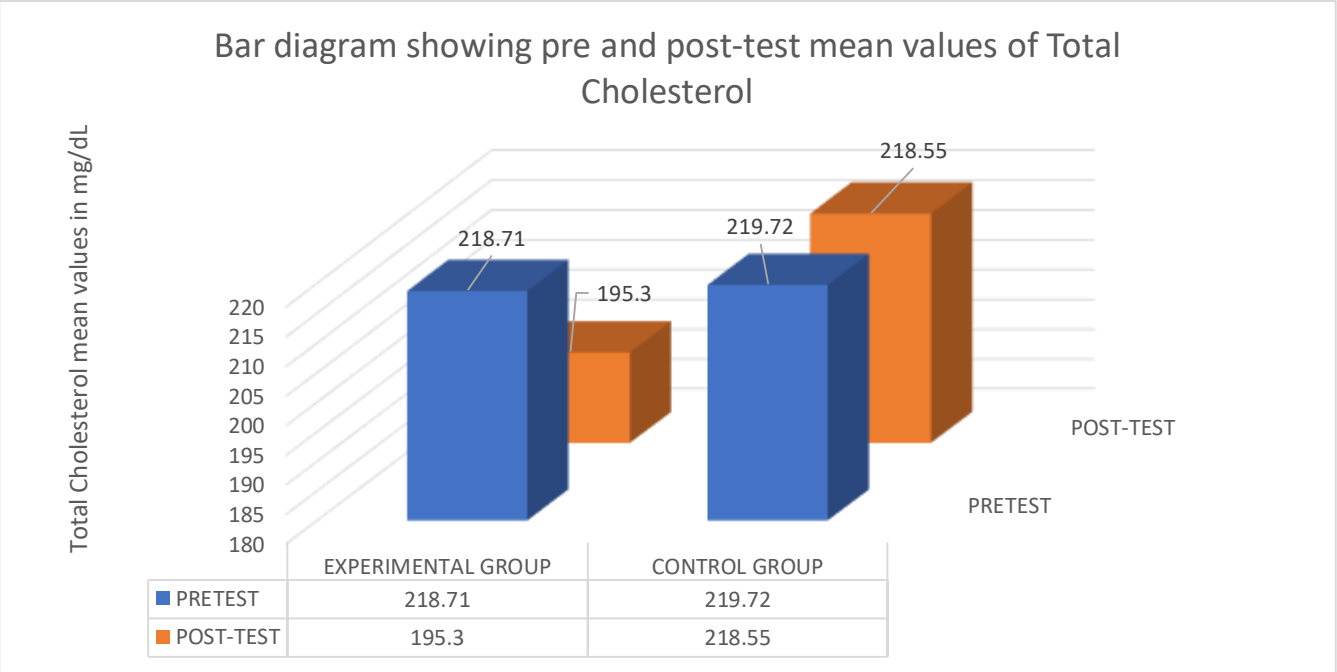
CONTROL GROUP

Paired Samples Statistics

TOTAL CHOLESTEROL		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRETEST	219.7280	15	2.50917	.64787
	POSTTEST	218.5593	15	3.06740	.79200

Table 5: Total Cholesterol (Paired Differences) of Control Group

Table (4&5) displays the mean and standard deviation of Total Cholesterol (for Control group) in the pre-test as **219.72 ± 2.509**, while in the post-test, it is **218.55 ± 3.06**. According to Table 5, the "t" value for total cholesterol is **3.659**, the paired difference is about **1.168mg/dL** in between Pre and Post yogic training.



DISCUSSION:

The aim of the current research was to assess the effects of three months of yoga practice on total cholesterol levels. The findings indicate that engaging in regular yogic activities, including suryanamaskara, asanas, pranayamas, meditation, and yoga nidra, over a three-month period is linked to a notable reduction in total cholesterol levels within the experimental group, with an average decrease of **23.41 mg/dL**. In contrast, the control group exhibited a minor reduction in total cholesterol levels, with an average decrease of merely **1.168 mg/dL.**

Additionally, these findings support previous studies conducted in diverse environments, which demonstrated that yoga practices significantly reduced fat and cholesterol levels in patients with coronary artery disease (Pal et al., 2011). A separate study indicated that the practice of yoga significantly reduced levels of uric acid, triglycerides, and total cholesterol among female patients with diabetes (Chidambara, 2014).

It is widely acknowledged that yogic practices contribute to the maintenance of hormonal balance, which subsequently regulates various bodily systems, including the endocrine system. Individuals who are overweight often experience disturbances in growth and development, metabolism, tissue function, reproduction, sleep patterns, and emotional well-being. The yoga asanas, pranayama, kapalbhati, meditation, and yoga nidra employed in this study are likely to influence the endocrine system of the participants. This influence may facilitate the restoration of endocrine functions to their normal state. The observed effects on total cholesterol and triglyceride levels in overweight men may be associated with this potential modulation of endocrine activity.

CONCLUSION:

The current study has certain limitations, yet it is significant to note that after three months of consistent yoga practice, a considerable reduction in total cholesterol levels was observed.

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