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## Aqua yoga- versus land-based yoga in obese women: Effects on lipid profiles levels

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### Abstract

The main intention of this research was to assess the impact of an 8 week yoga practice protocol carried out yoga in water to improve overall physical function and blood lipid profile levels in a group of women with overweight subjects and to compare this aqua yoga practice with yoga in land practice, and the control group. Elevated levels of High Density Lipo Protein, (HDL), total cholesterol and Low Density Lipoprotein (LDL) are important risk factors for coronary heart disease. Another established predictor of cardiovascular disease is obesity. Obesity and overweight are widespread phenomena and they have reached spreads quickly and affects many individuals in developed countries.

**Methods:** For achieving this purpose 45 obese people were randomly allocated to three groups: Aqua yoga group (AYG), land yoga group (LYG), and control group (CG). AYG and LYG followed a 2-month, twice-weekly. AYG training for practiced aquayoga in body temperature, while LYG did it in a land-based environment.

**Results:** After the intervention, high-density lipoprotein (HDL-C) was maintained in AYG and LYG. The test of enzymatic colorimetric showed a decreased in both training groups (AYG – 37.98, P, 0.05; LYG – 37.35, P, 0.05), with a significantly greater increase in AYG. Low-density lipoprotein (LDL-C) was maintained in AYG and LYG. The enzymatic colorimetric test showed a decreased in both training groups (AYG – 179.28, P, 0.05; LYG – 182.37, P, 0.05), with a significantly changed in AYG. In both water and land-based yoga were resulting in good in improving the HDL-C and in reducing Low-density lipoprotein. Aqua yoga appeared a better practice to improve quality of fitness. Practising Yoga poses in Swimming pools reduce the stress enhance the Physical, mental and biochemical of the obese women.

**Keywords:** Aqua yoga, yoga, and lipid profile

### Introduction

Lord Patanjali with his yogic method helps us to eradicate the root cause of disease by bringing Sarirasuddhi (sarira = body; suddhi= cleanliness), manasuddhi (mana = mind), karmasuddhi (karma = action), chittasuddhi (chitta = consciousness) and as a result of all these that of atmasuddhi (atma= soul). Lord Patanjali says 'Heyam dukham anagitam' which means that the pain is yet to come can be and is to be avoided. Therefore, Yoga is a science of preventing sufferings. Lord Patanjali offers Astanga Yoga as a curative and preventive measure.

A Dramatic change Lifestyle involving working style, Dietary habits, sleeping patterns, sedentary lifestyle and lack of physical activity. The organic body functions on the biochemical constituents of the humors (doshas), constitutes or ingredients (dhatu) and impurities (mala). The high level of blood lipids and the excess amount of fat in our body are the main risk factors for cardiovascular diseases and atherosclerotic diseases. The consciousness which is involved in yogic practice changes the biochemistry of the body through proper blood circulation and metabolism.

### Methods and materials

The researcher randomly selected 45 obesity women randomly selected from various professionals of Chennai and their age was between 25 to 40 years and randomly divided into two groups as experimental groups and one the control group. group I underwent aqua yoga practices, practices of asana in water, group II yoga practices weekly two days i.e. Saturday and Sunday, per day their training was 90 minutes for a period of two months, and group III

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not practiced yoga and they went for the daily routine. HDL-C and LDL-C were selected as criterion variables all the subjects were tested at before training and after training period.

**Results of HDL- C**

The Analysis of Covariance on the data obtained for HDL-C of pre and post-test of Aqua Yoga (AYG), yoga practices (YG) and control (CG) groups have been presented in Table I.

**Table 1:** Analysis of Covariance of Data on HDL-C of Aqua yoga, Yoga inland, and the Control groups

	Aqua Yoga	Yoga in Land	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre-test mean	37.07	35.76	36.19	B	13.23	2	6.61	2
SD	1.94	1.66	1.84	W	138.79	42	3.30	
Post-test mean	38.6	36.85	35.73	B	62.59	2	31.29	11.38*
SD	1.75	1.69	1.53	W	115.54	42	2.75	
Adjusted Post test mean	37.98	37.35	35.86	B	34.64	2	17.32	55.18*
				W	12.87	41	0.314	

\* F(0.05) (2, 42 and 2, 41) = 3.22, \*Significance at 0.05 level of confidence

Post hoc test analyses the adjusted post-test means of HDL-C of the AYG, YLG and the control group (CG) are 37.98, 37.35 and 35.86 respectively. The obtained 'F' ratio value for the adjusted post-test was 55.18, which was higher than the table value 3.22 with df 2 and 41 required for significance at

0.05 level. It indicates that there was a significant difference among the adjusted post-test means of HDL-C of the AYG, YG and the control groups (CG). To find out which of the paired means had a significant difference, the Scheffe's post-hoc test is applied and the results are presented in Table II.

**Table 2:** Scheffe's Test for Differences of the Adjusted Post-Test Paired Means of HDL-C

Adjusted Post Test Means			DM	CI
Aqua Yoga	Yoga Group	Control Group		
37.98	37.35		0.63*	0.52
37.98		35.86	2.12*	
	37.35	35.86	1.49*	

\*Significant at 0.05

Table II shows that the adjusted post-test mean difference in HDL-C between AYG and YG, AYG and CG and between YG and CG are 0.63, 2.12 and 1.49, respectively and statistically significant at 0.05 level of confidence. It is interpreted that there is a significant difference in HDL-C among the groups. However, Aqua yoga group is to be found better in increasing the level of HDL-C in blood than yoga

practice in the land group.

**Results of LDL- C**

The Analysis of Covariance on the data obtained for LDL-C of pre and post-test of Aqua Yoga (AYG), yoga inland (YLG) and control (CG) groups have been presented in Table III.

**Table 3:** Analysis of Covariance of Data on LDL-C of aqua yoga, yoga inland, and control groups

	Aqua Yoga	Yoga in Land	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre-test Mean	185.4	186.87	186	B	16.31	2	8.16	1.14
SD	3.69	1.81	2.14	W	3.133	42	7.17	
Post-test Mean	178.78	182.93	185.6	B	354.37	2	177.18	13.63*
SD	4.70	1.79	3.69	W	545.88	42	12.99	
Adjusted Post test Mean	179.28	182.37	185.66	B	303.41	2	151.70	16.08*
				W	386.88	41	9.44	

\* F (0.05) (2, 42 and 2, 41) = 3.22, \*Significance at 0.05 level of confidence

Post hoc analyses the adjusted post-test means of LDL-C of the AYG, YLG and the control group (CG) are 179.28, 182.37 and 185.66 respectively. The obtained 'F-ratio value was 16.08, which was higher than the table value 3.22 with degrees of freedom(df) 2 and 41 required for significance at 0.05 level. It indicates that there was a significant difference

among the adjusted post-test means of LDL-C of the AYG, YLG and the control group (CG).

To find out which of the paired means had a significant difference, the Scheffe's post-hoc test is applied and the results are tabulated in Table IV.

**Table 4:** Scheffe's Test for Differences of the Adjusted Post-Test Paired Means of LDL-C

Adjusted Post Test Means			DM	CI
Aqua Yoga	Yoga Group	Control Group		
179.28	182.37		3.09*	0.08
179.28		185.66	6.38*	
	182.37	185.66	3.29*	

\*Significance at 0.05

Table IV shows that the adjusted post-test mean difference in LDL-C between AYG and YLG, AYG and CG and between YLG and CG are 3.09, 6.38 and 3.29, respectively which

were statistically significant at 0.05 level of confidence. It is concluded that there is a significant difference in LDL-C among the groups. However, Aqua yoga group is to be found

better in reducing the level of LDL-C in blood than yoga practice in the land group.

### **Discussion**

The result of the research on lipid profile shows that the experimental groups namely Aqua yoga group (AYG), and yoga in a land group (YLG) had significantly changed after the two months of training. Besides, the analysis of the data indicated that there was a level of significant difference between the AYG and YLG on all the selected dependent variables. Moreover, Aqua yoga training showed better results in the entire selected dependent variables than the YLG.

Yoga in water it increases the resistance as stated in the Newton's second Law of Motion "the acceleration of an object is directly proportional to application of force". Therefore water provides is kinetic resistance to movement. Yoga in water practice can be useful for people of fitness in all levels because of the speed of movement and resistance can be dictated by exercise tolerance.

### **Conclusion**

In conclusion, both the yoga in water and yoga in land programs used in this study significant changes in lipid levels measurements after two months of training. The present research demonstrated that a two-month program of aqua yoga, yoga in land and to alter on Lipid profile levels. Aqua yoga training is better than the yoga inland to reduce on percent LDL-C and increase the HDL-C. It was concluded from the results of the research that the physical exercises and yoga practices groups showed influence of Aqua yoga and yoga practices significantly increased the level of HDL cholesterol, when compared with a control group, systematic and well-planned aqua yoga and yoga practice programs significantly changed the LDL cholesterol in obese women.

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