

## EFFECT OF ASANAS AND PILATES ON BODY COMPOSITION OF YOUNG SEDENTARY WOMEN

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### Abstract

The purpose of this study was to determine if Yoga Asanas and Pilates exercise could reduce Weight, BMI, body fat %, LBM and visceral fat % of young sedentary women. 54 female students in age group 18 to 24 years from Devi Ahilya University were randomly selected and served as the subjects. The selected subjects were divided into three equal groups, two experimental groups (Asanas group & Pilates exercise group) and one control group. Each group consisting of 18 subjects each. Three days per week exercise programme was followed for both the experimental group i.e. Asanas group and Pilates Exercise group. For 8 weeks, whereas control group was not given any exercise program and were performed their regular routine. The Asanas and Pilates exercise were being selected on the basis of their benefit for the Abdominal, Hips and Thigh areas. The duration of every week workout was initially 20 to finally 45 minutes. Weight, BMI, body fat %, LBM and visceral fat % measured by using Tanita body composition analyzer before and after the training program for both experimental and control groups. To find out the significance of the difference between the pre and post test data of each group paired 't' test was applied and to find out between group significance of the difference analysis of covariance (ANCOVA) was applied. Whenever the F ratio for adjusted post test mean was found significant, the Tukey HSD test was applied to determine the paired adjusted final mean differences. For all analysis, the level of significant was fixed at 0.05. The result of this study shows that the Asanas training programme was found to be effective in reducing Body Fat % whereas the Pilates training programme were found to be effective in reducing in Weight, BMI, Body fat %, Visceral Fat %, of the subjects.

**Keywords:** Asanas and Pilates Young Sedentary Women

### Introduction

Today yogic exercises have become popular throughout the world sporting environment. Now a day's coaches and physical education scientist are trying to provide

scientific basis to calibre and potential of yogic exercise. Yoga is all about good, the blood surging through your veins, the energy pulsating through your nerves, the bliss coursing through your whole being. Best of all, yoga is apt for all, regardless of age, colour, caste, creed or religion; from the healthiest to the sickest,. And here are some of the specific and immense benefits of yoga: A benefit of yoga brings down stress and enhances powers of relaxation. Boosts physical strength, stamina and flexibility bestows greater powers of concentration and self control which inculcates impulse, control helps in rehabilitation of old and new enhancing mental clarity, boosts functioning of the immune system, enhance posture and muscle tone, improves blood circulation,-result in healthy glowing skin, cleanse and improves overall organ functioning. It is one of the ancient ways of exercise and more than that was the lifestyle of the ancient India. Pilates is a body conditioning routine that helps build flexibility in muscles, strength and endurance in the legs, abdominals, arms, hips, and back. It puts emphasis on spinal and pelvic alignment, breathing to relieve stress and allow adequate oxygen flow to muscles, developing a strong core or centre (tones abdominals while strengthening the back), and improving coordination and balance. Pilates' flexible system allows for different exercises to be modified in range of difficulty from simple to complex which can be used for begins to advances users. Intensity can be increased over time as the body conditions and adapts to the exercises. No muscle group is under or over trained. It enhances core strength and brings increased reach, Flexibility and agility. Joseph H. Pilates believed that mental and physical healths are inter-related.

### Methodology

For the purpose of this study 54 female hostel students Devi Ahilya University were tested body composition by using Tanita body composition Analyzer their age ranged from 18 to 24 years. The selected 54 subjects were divided into three equal groups, two experimental groups and one control group each group consisting of 18 subjects. Two experimental groups i.e. Yoga Asana

group and Pilates exercise group, and control group who did not participated any training program except their daily routine.

For the 8 weeks training program, the Asanas and Pilates exercise were being selected on the basis of their benefit for the Abdominal, Hips and Thigh areas. The Asanas or Pilates Exercise were being taught and practiced in simple to complex way. The duration of everyday workout was 20 minutes in first two weeks and then 25 minutes in third and fourth weeks. Then the duration of training program in fifth and sixth weeks increased up to 35 minutes and in seven and eight weeks the duration was of 45 minutes. In the start of program a brief warm up session was kept to minimise the injuries. Keeping in the mind the ability of the subjects, brief rest intervals was also provided and use of water in between workout were allowed in both the experimental group. The training program was conducted in evening session from 6:30 to 7:30 pm.

Height was measured by Stadiometer, Weight, BMI, LBM, body fat % and visceral fat % were tested by using Tanita body composition analyzer before and after the training program for both experimental and control groups. To find out the significance of the difference between the pre and post test data of each group paired 't' test was applied and to find out between group significance of the difference analysis of covariance (ANCOVA) was applied. Whenever the F ratio for adjusted post test mean was found significant, the Tukey HSD test was applied to determine the paired adjusted final mean differences. For all analysis the level of significant was fixed at 0.05.

**Results of the Study**

Table 1  
PRE AND POST TEST MEANS & PAIRED 'T' TEST OF BODY COMPOSITION FOR ASANAS GROUP

Variable	Per Test Mean	Post Test Mean	SEDM	't' test
Weight (kg)	53.2111	53.2056	.07342	.076
BMI	21.2000	21.1944	.03281	.169
Body Fat %	32.2889	31.7167	.20273	2.823*
LBM	35.7072	36.2189	.50740	-1.008
Visceral Fat %	3.22	3.22	0	0

\*Significant at 0.05 level Tabulated 't' 0.05 (17) = 1.74  
# Pre test mean - Post test mean = 0 so no further values are found.

Table 1 clearly reveals that the significant differences was found between the Pre test and Post test means of Body fat %, of data. The 't' value is greater than tabulated 't' value of 1.74. The Pre test and Post test mean differences were not found significant in Weight, BMI, LBM, Visceral Fat % of data. 't' value of all above

values are less than tabulated 't' value of 1.74. Thus no significant difference was found between the Pre test and Post test means of above variables.

Table 2  
PRE AND POST TEST MEANS & PAIRED 'T' TEST OF BODY COMPOSITION FOR PILATES GROUP

Variable	Pre test mean	Post test mean	SEDM	't' value
Weight (Kg)	57.44	56.45	0.280	3.543*
BMI	23.02	22.66	0.110	3.283*
Body fat%	34.28	32.58	0.326	5.187*
LBM	37.28	37.50	0.243	0.919
Visceral fat %	04.27	03.94	0.114	2.915*

\*Significant at 0.05 level Tabulated 't' 0.05 (17) = 1.74

Table 2 clearly shows that the significant differences were found between the Pre test and Post test mean of Weight, BMI, Body fat %, Visceral fat % of data. 't' value of all above values are greater than tabulated 't' value of 1.74. The pre test and post test mean differences was not found significant in LBM of data. The value is less than tabulated 't' value of 1.74.

Table 3  
PRE AND POST TEST MEANS & PAIRED 'T' TEST OF BODY COMPOSITION FOR CONTROL GROUP

Variable	Per Test mean	Post Test mean	SEDM	't'
Weight	59.033	59.411	0.2826	1.336
BMI	23.550	23.744	0.1408	1.381
Body fat %	35.066	34.555	0.3558	1.437
LBM	37.660	38.399	0.1513	4.886*
Visceral Fat %	4.6667	4.8333	0.1457	1.144

\*Significant at 0.05 level Tabulated 't' 0.05 (17) = 1.74

Table 3 clearly reveals that the significant difference were found between the Pre and Post test means of only one variable i.e. LBM, as calculated 't' is greater than the tabulated 't' of 1.74. (Because it was found that the one girl was involved in a fitness training programme on her own in a health centre.) Whereas the mean difference of pre and post test of other variables i.e. Weight, BMI, Body fat %, Visceral Fat %, were not found significant at .05 levels as their 't' values are less than tabulated 't' o 1.74.

Table 4  
ANALYSIS OF COVARIANCE ON WEIGHT FOR TWO EXPERIMENTAL AND CONTROL GROUP

Group	Var.	SS	df	MSS	'f'
Pre test Mean	BG	326.06	2	163.03	1.87
	WG	4434.80	51	86.95	
Post Test Mean	BG	346.82	2	173.41	1.99
	WG	4425.51	51	86.77	
Adjusted Final Mean	BG	18.08	2	9.04	9.04*
	WG	50.01	50	1.00	

\*Significant at 0.05 level Tabulated 'F' 0.05 (2, 50) = 3.18

Table 4 clearly shows that 'F' value for adjusted post-test mean 9.04\* for two experimental and control group were found Significant at 0.05 level. The 'F' value needed for Significant at 0.05 level with df (2, 50) tabulated value 3.18.

Table 5  
 PAIRED ADJUSTED FINAL MEANS AND DIFFERENCE BETWEEN MEANS ON WEIGHT FOR TWO EXPERIMENTAL AND CONTROL GROUP

Control Group	Asanas Group	Pilates Group	Mean Difference	Critical Difference
56.96	56.53	-	0.42	0.67
56.96	-	55.57	1.38*	0.67
-	56.53	55.57	0.96*	0.67

\*Significant at 0.05 level

Table 5 clearly reveals that there is no significance difference between Control group and Asanas group, whereas Pilates group is significantly different than Asana group and Control group. And control group significance differences than Asanas group and Pilates group mean difference (1.38, 0.96) having minimum weight.

Table 6  
 ANALYSIS OF COVARIANCE ON BODY MASS INDEX FOR TWO EXPERIMENTAL AND CONTROL GROUP

	SV	SS	df	MSS	'f'
Pre Test Mean	BG	54.73	2	27.36	2.04
	WG	683.70	51	13.40	
Post Test Mean	BG	58.96	2	29.48	2.29
	WG	655.00	51	12.84	
Adjusted Final Mean	BG	2.93	2	1.46	7.66*
	WG	9.55	50	0.19	

\*Significant at 0.05 level Tabulated 'F' 0.05 (2, 50) = 3.18

Table 6 clearly indicates that 'F' value for adjusted post-test mean 7.66\* for two experimental and control group were found Significant at 0.05 level. The 'F' value needed for Significant at 0.05 level with df (2, 50) tabulated value 3.18.

Table 7  
 PAIRED ADJUSTED FINAL MEANS AND DIFFERENCE BETWEEN MEANS ON BODY MASS INDEX FOR TWO EXPERIMENTAL AND CONTROL GROUP

Control Group	Asanas Group	Pilates Group	Mean Difference	Critical Difference
22.81	22.55	-	0.27	0.29
22.81	-	22.44	0.57*	0.29
-	22.55	22.44	0.30*	0.29

\*Significant at 0.05 level

Table 7 clearly reveals that there is no significance difference between Control group and Asanas group, whereas Pilates group is significantly different than Asana group and Control group. And control group significance differences than Asanas group and Pilates group mean difference (0.57, 0.30) having minimum body mass index.

Table 8  
 ANALYSIS OF COVARIANCE ON BODY FAT PERCENTAGE FOR TWO EXPERIMENTAL AND CONTROL GROUP

	SV	SS	Df	MSS	'f'
Pre test Mean	BG	73.84	2	36.92	1.17
	WG	1597.34	51	31.32	
Post Test Mean	BG	76.13	2	38.06	1.16
	WG	1672.37	51	32.79	
Adjusted Final Mean	BG	15.92	2	7.96	4.74*
	WG	83.95	50	1.68	

\*Significant at 0.05 level Tabulated 'F' 0.05 (2, 50) = 3.18

Table 8 clearly shows that 'F' value for adjusted post-test mean (4.74\*) for two experimental and one control group were found Significant at 0.05 level. The 'F' value needed for Significant at 0.05 level with df (2, 50) tabulated value 3.18.

Table 9  
 PAIRED ADJUSTED FINAL MEANS AND DIFFERENCE BETWEEN MEANS ON BODY FAT PERCENTAGE TWO EXPERIMENTAL AND CONTROL GROUP

Control Group	Asanas Group	Pilates Group	Mean Difference	Critical Difference
33.37	33.30	-	0.07	0.87
33.37	-	32.19	1.19*	0.87
-	33.30	32.19	1.12*	0.87

\*Significant at 0.05 level

Table 9 clearly shows that there is no significance difference between Control group and Asanas group, whereas Pilates group is significantly different than Asana group and Control group. And control group significance differences than Asanas group and Pilates group mean difference (1.19, 1.12) having minimum body fat percentage.

Table 10  
ANALYSIS OF COVARIANCE ON LEAN BODY MASS FOR TWO EXPERIMENTAL AND CONTROL GROUP

	SV	SS	Df	MSS	'F'
Pre test Mean	BG	38.62	2	19.31	1.40
	WG	703.68	51	13.79	
Post Test Mean	BG	43.26	2	21.63	1.52
	WG	721.66	51	14.15	
Adjusted Final Mean	BG	2.67	2	1.33	0.66
	WG	101.32	50	2.03	

\*Significant at 0.05 level Tabulated 'F'  $F_{0.05}(2, 50) = 3.18$

Table 10 shows that 'F' value for adjusted post-test mean (0.66) for two experimental and control group were not found Significant at 0.05 level. The 'F' value needed for Significant at 0.05 level with df (2, 50) was 3.18. This finding indicates that there have no significant difference in between the two experimental and control group and further analysis is not required.

TABLE 11  
ANALYSIS OF COVARIANCE ON VISCERAL FAT PERCENTAGE FOR TWO EXPERIMENTAL AND CONTROL GROUP

	SV	SS	df	MSS	'F'
Pre test Mean	BG	20.11	2	10.05	2.41
	WG	212.72	51	4.17	
Post Test Mean	BG	23.44	2	11.72	2.48
	WG	240.56	51	4.71	
Adjusted Final Mean	BG	2.33	2	1.16	5.73*
	WG	10.15	50	0.20	

\*Significant at 0.05 level Tabulated 'F'  $F_{0.05}(2, 50) = 3.18$

Table 11 reveals that 'F' value for adjusted post-test mean (5.73\*) for two experimental and one control group were found Significant at 0.05 level. The 'F' value needed for Significant at 0.05 level with df (2, 50) tabulated value 3.18.

Table 12  
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCE BETWEEN MEANS ON VISCERAL FAT PERCENTAGE TWO EXPERIMENTAL AND CONTROL GROUP

Control Group	Asanas Group	Pilates Group	Mean Difference	Critical Difference
4.20	4.09	-	0.11	0.30
4.20	-	3.71	0.48*	0.30
-	4.09	3.71	0.38*	0.30

\*Significant at 0.05 level

Table 12 indicates that there is no significance difference between Control group and Asanas group,

whereas Pilates group is significantly different than Asana group and Control group. And control group significance differences than Asanas group and Pilates group mean difference (0.48, 0.38) having minimum visceral fat %.

**Conclusion**

The findings from this study shows that the Asanas training programme was found to be effective in reducing Body Fat %, And The Pilates training programme were found to be effective in reducing in Weight, BMI, Body fat %, Visceral Fat %, of the subjects. When between group analysis was done the findings concluded that Pilates exercise group has found superior than Asanas group and Control group in reducing Weight, BMI, Body Fat %, Visceral Fat %. But no significant difference were found between Asanas group and Control group in reducing all above variables. Also No significant difference was found between Pilates group, Asanas group and Control group for LBM.

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