CHAPTER – IV

ANALYSIS OF THE DATA AND RESULTS OF THE STUDY

This chapter deals with the analysis of data collected from samples under study. The three groups namely aerobic training (ATG) group- I, anaerobic training (AATG) Group- II, and control group - III, were analyzed for the differences in their measures of the physiological and body composition profiles in relation to pre-test, post-test and adjusted post-test scores.

In this study, 45 middle aged obese women those who were residing in and around, Namakkal District, TamilNadu, India were randomly selected and their age ranging between 35 to 45 years. The group mean gains recorded by the various groups during the experimental period of twelve weeks to the criterion measures were tested for the significance by applying 't' test. The groups were not equated in relation to the factors to be examined, hence the difference between means of the three groups in the pre-test had to be taken into account during the analysis of the post-test differences between the group means. This was achieved by the application of the analysis of covariance, where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administered to find out the paired means significant difference. Thus the obtained results were interpreted with earlier studies and presented in this chapter well along with graphical presentations.

4.1 TEST OF SIGNIFICANCE

This is the crucial portion of the thesis arrived at the conclusion by examining the hypothesis. The procedure of testing the hypothesis in accordance with the results obtained in relation to the level of confidence which was fixed at 0.05level.

4.2 RESULTS OF TREATMENT EFFECTS

The following tables illustrate the statistical results of the effect of aerobic and anaerobic training on selected physiological and body composition profiles among middle aged obese women.

TABLE – 4.1

SUMMARY OF 't' RATIO ON SELECTED PHYSIOLOGICAL VARIABLES AND BODY COMPOSITION PROFILES OF AEROBIC TRAINING GROUP (ATG)

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Breath Holding Time	39.40	45.80	6.40	4.83	1.24	5.12*
2	Systolic Blood Pressure	125.53	121.53	4.00	3.58	0.92	4.32*
3	Diastolic Blood Pressure	85.66	82.80	2.86	2.23	0.57	4.97*
4	Resting Pulse Rate	74.26	72.93	1.33	1.44	0.37	3.56*
5	Aerobic Power	56.96	60.92	3.96	1.57	0.40	9.78*
6	Anaerobic Power	559.13	649.33	90.20	66.56	17.18	5.24*
7	Body Weight	78.10	74.69	3.40	2.73	0.70	4.82*
8	Lean Body Mass	51.86	55.79	3.93	1.80	0.46	8.45*
9	Fat Mass	26.24	18.90	7.33	0.94	0.24	30.00*
10	Body Mass Index	31.03	28.98	2.04	2.33	0.60	3.40*

Required table value= 2.14

An examination of table - 4.1 indicates that the obtained ‘t’ ratios were 5.12, 4.32, 4.97, 3.56, 9.78, 5.24, 4.82, 8.45, 30.00 and 3.40 for physiological variables of breath holding time, systolic blood pressure, diastolic blood pressure, resting pulse rate, aerobic power, anaerobic power, body composition profiles of body weight, lean body mass, fat mass and body mass index respectively. The obtained ‘t’ ratios on all the selected variables were found to be greater than the required table value of 2.14 at 0.05 level of significance for 1, 14 degrees of freedom. Hence it was found to be significant. The results of this study showed that 12 weeks practice of aerobic training group were statistically significant and explained its effects positively.

TABLE – 4.2

SUMMARY OF 't' RATIO ON SELECTED PHYSIOLOGICAL VARIABLES AND BODY COMPOSITION PROFILES OF ANAEROBIC TRAINING GROUP (AATG)

S. No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Breath Holding Time	40.13	46.13	6.00	2.00	0.51	11.61*
2	Systolic Blood Pressure	126.66	121.80	4.86	3.75	0.97	5.01*
3	Diastolic Blood Pressure	85.80	81.73	4.06	1.57	0.40	9.97*
4	Resting Pulse Rate	74.40	72.53	1.86	2.06	0.53	3.50*
5	Aerobic Power	56.65	58.59	1.94	0.94	0.24	7.96*
6	Anaerobic Power	553.93	634.86	80.93	74.08	19.12	4.23*
7	Body Weight	77.85	75.42	2.43	3.92	1.01	2.40*
8	Lean Body Mass	51.71	56.28	4.57	2.51	0.64	7.03*
9	Fat Mass	26.14	19.13	7.00	1.42	0.36	19.10*
10	Body Mass Index	31.20	29.03	2.16	3.11	0.80	2.69*

Required table value= 2.14

An examination of table - 4.2 indicates that the obtained ‘t’ ratios were 11.61, 5.01, 9.97, 3.50, 7.96, 4.23, 2.40, 7.03, 19.10 and 2.69 for physiological variables of breath holding time, systolic blood pressure, diastolic blood pressure, resting pulse rate, aerobic power, anaerobic power, body composition profiles of body weight, lean body mass, fat mass and body mass index respectively. The obtained ‘t’ ratios on all the selected variables were found to be greater than the required table value of 2.14 at 0.05 level of significance for 1, 14 degrees of freedom. Hence it was found to be significant. The results of this study showed that 12 weeks practice of anaerobic training group were statistically significant and explained its effects positively.

TABLE – 4.3

SUMMARY OF 't' RATIO ON SELECTED PHYSIOLOGICAL VARIABLES AND BODY COMPOSITION PROFILES VARIABLES OF CONTROL GROUP (CG)

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Breath Holding Time	36.40	36.86	0.46	1.99	0.51	0.90
2	Systolic Blood Pressure	125.73	126.06	0.33	5.05	1.30	0.25
3	Diastolic Blood Pressure	86.26	86.06	0.20	2.30	0.59	0.33
4	Resting Pulse Rate	74.13	74.03	0.10	1.69	0.43	0.28
5	Aerobic Power	56.87	56.98	0.11	0.34	0.08	1.25
6	Anaerobic Power	565.80	566.80	0.60	2.61	0.67	0.88
7	Body weight	79.20	78.81	0.38	1.66	0.43	0.89
8	Lean Body Mass	52.52	52.28	0.23	0.99	0.25	0.89
9	Fat Mass	26.68	26.52	0.15	0.66	0.17	0.89
10	Body Mass Index	30.56	30.41	0.15	0.65	0.16	0.90

Required table value= 2.14

An examination of table - 4.3 indicates that the obtained ‘t’ ratios were 0.90, 0.25, 0.33, 0.28, 1.25, 0.88, 0.89, 0.89, 0.89 and 0.90 for physiological variables of breath holding time, systolic blood pressure, diastolic blood pressure, resting pulse rate, aerobic power, anaerobic power, body composition profiles of body weight, lean body mass, fat mass and body mass index respectively. The obtained ‘t’ ratios on all the selected variables were found to be lesser than the required table value of 2.14 at 0.05 level of significance for 1, 14 degrees of freedom. Hence it was found to be insignificant. The results of this study showed that the control group were statistically insignificant.

TABLE – 4.4

VARIANCE ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON S OF AEROBIC TRAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON BREATH HOLDING TIME

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	40.13	36.40	B	117.37	2	58.68	0.75
	9.41	8.08	W	3248.93	42	77.35	
	46.13	36.86	B	828.93	2	414.46	4.90*
	9.52	8.05	W	3547.86	42	84.47	
	44.67	39.06	B	327.10	2	163.55	15.31*
			W	437.81	41	10.67	

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4.3 RESULTS OF BREATH HOLDING TIME

An examination of table - 4.4 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.75. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on breath holding time was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on breath holding time. The obtained F- ratio for the post-test was 4.90. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the breath holding time used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on breath holding time was 15.31.

The obtained F- ratio on breath holding time among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of breath holding time was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.5.

TABLE – 4.5

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BREATH HOLDING TIME

Aerobic Training Group	AATG	Control Group	Mean Difference	CI Value
45.06	44.67	---	0.31	3.03
45.06	---	39.06	6.00*	3.03
---	44.67	39.06	5.61*	3.03

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.5 confirmed that aerobic training with control group (6.00), anaerobic training with control group (5.61) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.31) at 0.05 level with the CI value of 0.33.

The pre, post and adjusted means on breath holding time were illustrated through bar diagram in Figure-1.

FIGURE – 1

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BREATH HOLDING TIME

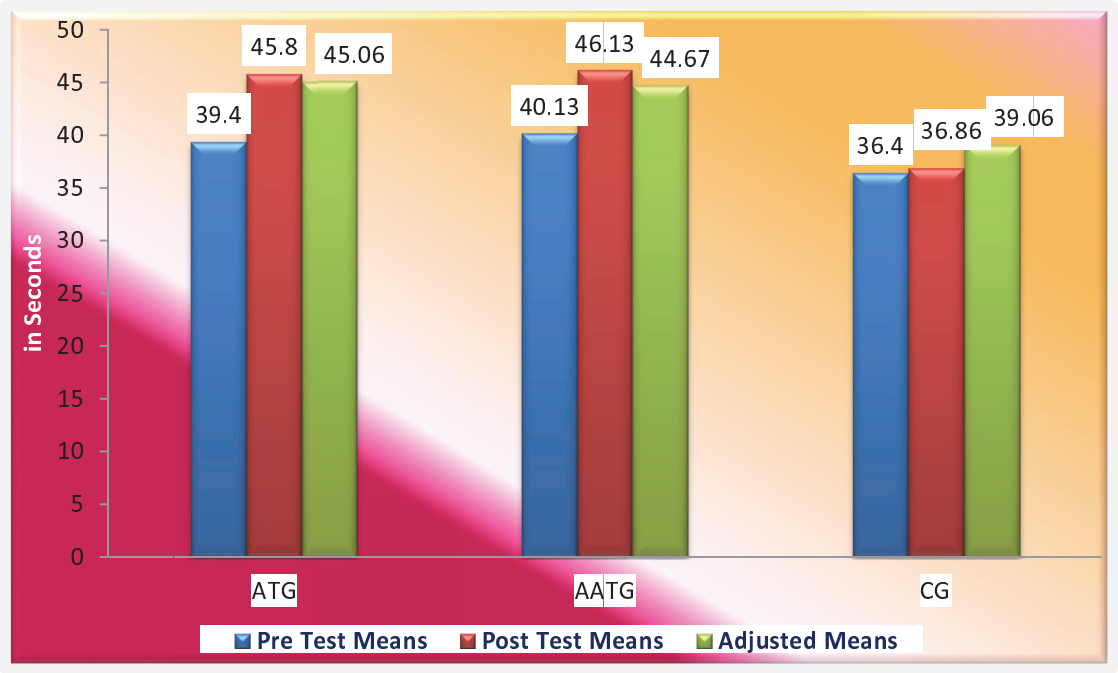

TABLE – 4.6

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS RAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	126.66	125.73	B	10.97	2	5.48	1.00
	2.46	2.31	W	230.00	42	5.47	
	121.80	126.06	B	194.13	2	97.06	12.09*
	2.21	3.32	W	337.06	42	8.02	
	122.05	125.97	B	185.06	2	92.53	12.38*
			W	306.38	41	7.47	

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4.4 RESULTS OF SYSTOLIC BLOOD PRESSURE

An examination of table - 4.6 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 1.00. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on systolic blood pressure was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on systolic blood pressure. The obtained F- ratio for the post-test was 12.09. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F- ratio needed for significance, it was inferred that the mean differences among the three groups on the systolic blood pressure used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on systolic blood pressure was 12.38.

The obtained F- ratio on systolic blood pressure among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of systolic blood pressure was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.7.

TABLE – 4.7

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE

ATG	AATG	Control group	Mean difference	CI Value
121.37	122.05	---	0.68	2.53
121.37	---	125.97	4.60*	2.53
---	122.05	125.97	3.92*	2.53

* Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.7 confirmed that aerobic training with control group (4.60), anaerobic training with control group (3.92) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.68) at 0.05 level with the CI value of 2.53.

The pre, post and adjusted means on systolic blood pressure were illustrated through bar diagram in Figure-2.

FIGURE – 2

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE

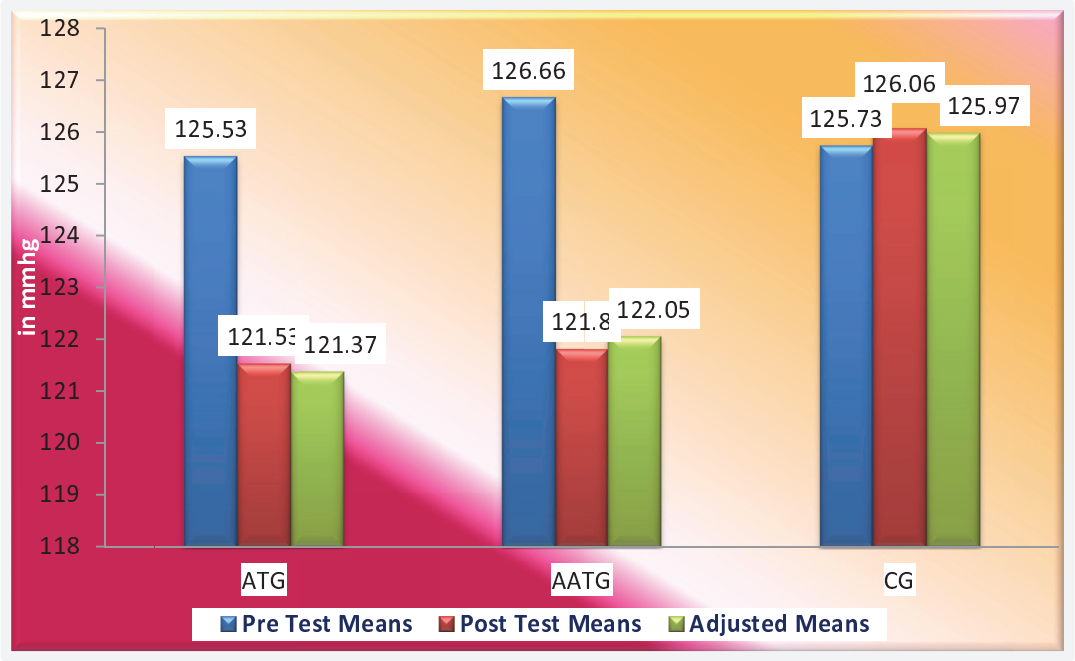

TABLE – 4.8

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS RAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON DIASTOLIC BLOOD PRESSURE

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	86.26	85.91	B	2.97	2	1.48	0.73
	1.75	1.41	W	84.66	42	2.01	
	81.73	86.06	B	152.93	2	76.46	23.56*
	1.62	1.90	W	136.26	42	3.24	
	81.76	85.97	B	139.73	2	69.86	21.85*
			W	131.09	41	3.19	

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4.5 RESULTS OF DIASTOLIC BLOOD PRESSURE

An examination of table - 4.8 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.73. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on diastolic blood pressure was statistically insignificant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on diastolic blood pressure. The obtained F- ratio for the post-test was 23.56. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be lesser than the F- ratio needed for significance, it was inferred that the mean differences among the three groups on the diastolic blood pressure used in the study at the end of the treatment period was statistically insignificant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on diastolic blood pressure was 21.85.

The obtained F- ratio on diastolic blood pressure among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of diastolic blood pressure was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.9.

TABLE – 4.9

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON DIASTOLIC BLOOD PRESSURE

ATG	AATG	Control group	Mean difference	CI Value
82.86	81.76	---	1.10	1.65
82.86	---	85.97	3.11*	1.65
---	81.76	85.97	4.21*	1.65

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.9 confirmed that aerobic training with control group (3.11), anaerobic training with control group (4.21) showed significant differences. There was no significant difference between aerobic training and anaerobic training (1.10) at 0.05 level with the CI value of 1.65.

The pre, post and adjusted means on diastolic blood pressure were illustrated through bar diagram in Figure-3.

FIGURE – 3

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON DIASTOLIC BLOOD PRESSURE

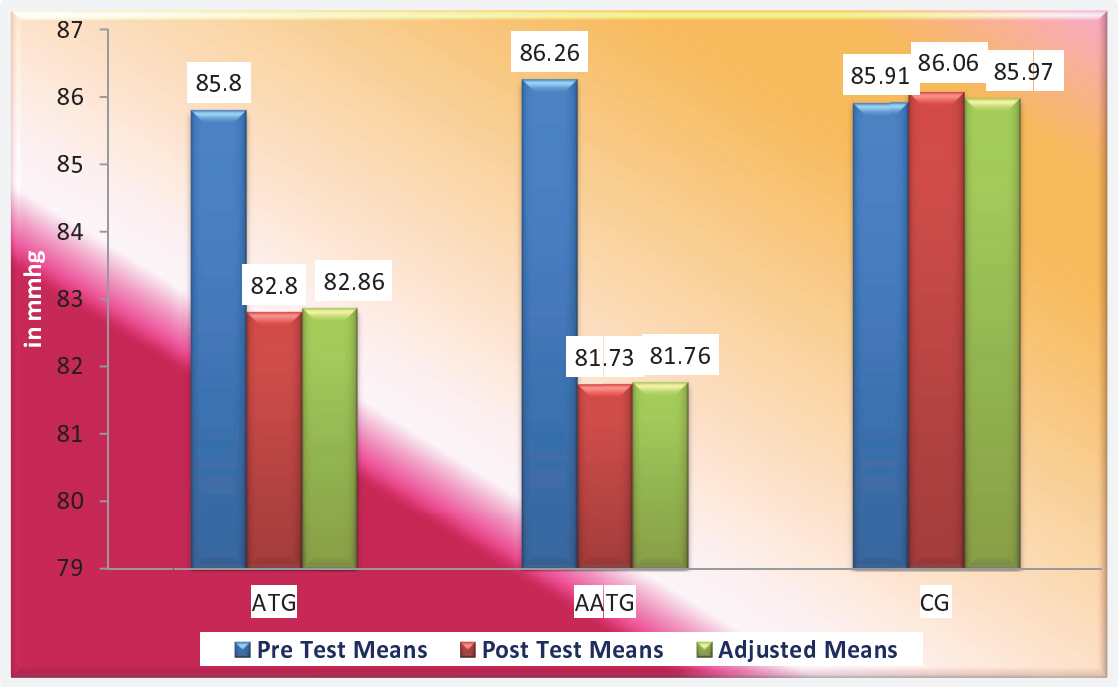

TABLE – 4.10

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS RAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON RESTING PULSE RATE

G	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
26	74.40	74.13	B	0.53	2	0.26	0.12
6	1.72	0.91	W	92.26	42	2.19	
93	72.53	74.03	B	20.80	2	10.40	5.57*
3	0.91	1.92	W	78.40	42	1.86	
93	72.50	74.16	B	22.15	2	11.07	6.16*
			W	73.71	41	1.79	

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4.6 RESULTS OF RESTING PULSE RATE

An examination of table - 4.10 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.12. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on resting pulse rate was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on resting pulse rate. The obtained F-ratio for the post-test was 5.57. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the resting pulse rate used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on resting pulse rate was 6.16.

The obtained F- ratio on resting pulse rate among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of resting pulse rate was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.11.

TABLE – 4.11

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON RESTING PULSE RATE

ATG	AATG	Control group	Mean difference	CI Value
72.93	72.50	---	0.43	1.22
72.93	---	74.16	1.23*	1.22
---	72.50	74.16	1.66*	1.22

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.11 confirmed that aerobic training with control group (1.23), anaerobic training with control group (1.66) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.43) at 0.05 level with the CI value of 1.22.

The pre, post and adjusted means on resting pulse rate were illustrated through bar diagram in Figure-4.

FIGURE - 4

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON RESTING PULSE RATE

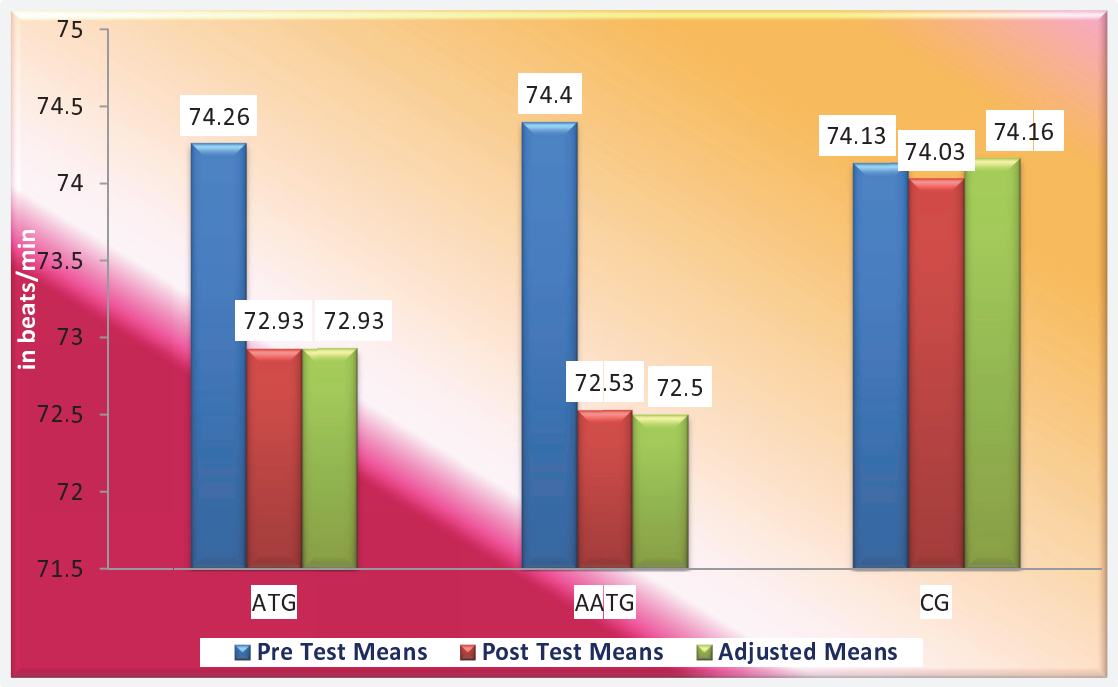

TABLE – 4.12

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON AEROBIC POWER

G	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
6	56.65	56.87	B	0.77	2	0.38	0.04
	2.73	2.65	W	362.48	42	8.63	
2	60.35	56.98	B	136.14	2	68.07	12.49*
	1.43	2.72	W	228.86	42	5.44	
4	60.46	56.95	B	137.90	2	68.95	33.94*
			W	83.28	41	2.03	

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4.7 RESULTS OF AEROBIC POWER

An examination of table - 4.12 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.04. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on aerobic power was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on aerobic power. The obtained F-ratio for the post-test was 12.49. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the aerobic power used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on aerobic power was 33.94.

The obtained F- ratio on aerobic power among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of aerobic power was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.13.

TABLE – 4.13

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON AEROBIC POWER

ATG	AATG	Control Group	Mean Difference	CI Value
60.84	60.46	---	0.38	1.32
60.84	---	56.95	3.89*	1.32
---	60.46	56.95	3.51*	1.32

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.13 confirmed that aerobic training with control group (3.89), anaerobic training with control group (3.51) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.38) at 0.05 level with the CI value of 1.32.

The pre, post and adjusted means on aerobic power were illustrated through bar diagram in Figure-5.

FIGURE – 5

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON AEROBIC POWER

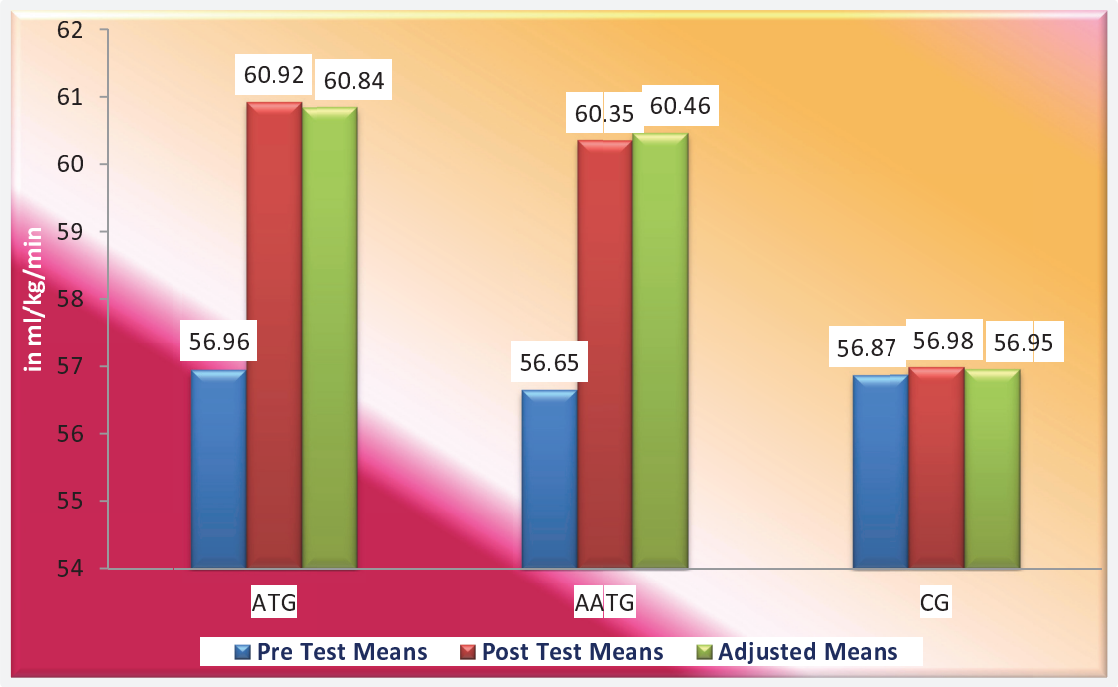

TABLE – 4.14

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS RAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON ANAEROBIC POWER

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	553.93	565.80	B	1061.51	2	530.75	0.08
	83.59	62.47	W	265057.06	42	6310.88	
	634.86	566.40	B	58874.53	2	29437.26	8.12*
	45.79	63.33	W	152170.66	42	3623.11	
	637.85	563.15	B	65754.20	2	32877.10	17.03*
			W	79145.34	41	1930.37	

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4.8 RESULTS OF ANAEROBIC POWER

An examination of table - 4.14 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.08. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on anaerobic power was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on anaerobic power. The obtained F-ratio for the post-test was 8.12. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the anaerobic power used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on anaerobic power was 17.03.

The obtained F- ratio on anaerobic power among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the performance of anaerobic power was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.15.

TABLE – 4.15

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON ANAEROBIC POWER

ATG	AATG	Control Group	Mean Difference	CI Value
649.59	637.85	---	11.74	40.77
649.59	---	563.15	86.44*	40.77
---	637.85	563.15	74.70*	40.77

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.15 confirmed that aerobic training with control group (86.44), anaerobic training with control group (74.70) showed significant differences. There was no significant difference between aerobic training and anaerobic training (11.74) at 0.05 level with the CI value of 40.77.

The pre, post and adjusted means on anaerobic power were illustrated through bar diagram in Figure-6.

FIGURE – 6

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON ANAEROBIC POWER

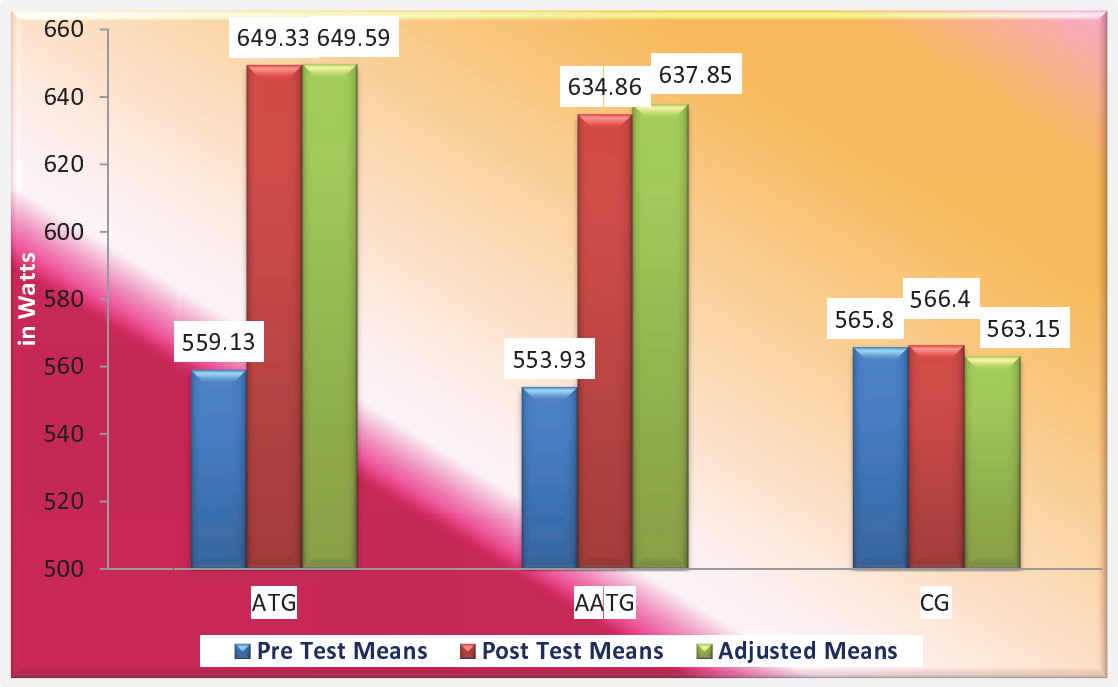

TABLE – 4.16

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS G (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON BODY WEIGHT

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	77.85	79.20	B	15.42	2	7.71	1.51
	2.63	2.29	W	213.33	42	5.07	
	75.42	78.81	B	145.30	2	72.65	12.56*
	2.61	2.05	W	242.94	42	5.78	
	75.54	78.63	B	118.44	2	59.22	10.46*
			W	231.97	41	5.65	

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4.9 RESULTS OF BODY WEIGHT

An examination of table – 4.16 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 1.51. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on body weight was statistically insignificant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on body weight. The obtained F-ratio for the post-test was 12.56. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the body weight used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on body weight was 10.46.

The obtained F- ratio on body weight among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the body weight was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.17.

TABLE – 4.17

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BODY WEIGHT

ATG	AATG	Control Group	Mean Difference	CI Value
74.75	75.54	---	0.78	2.20
74.75	---	78.63	3.88*	2.20
---	75.54	78.63	3.09*	2.20

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.17 confirmed that aerobic training with control group (3.88), anaerobic training with control group (3.09) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.78) at 0.05 level with the CI value of 2.20.

The pre, post and adjusted means on body weight were illustrated through bar diagram in Figure-7.

FIGURE – 7

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BODY WEIGHT

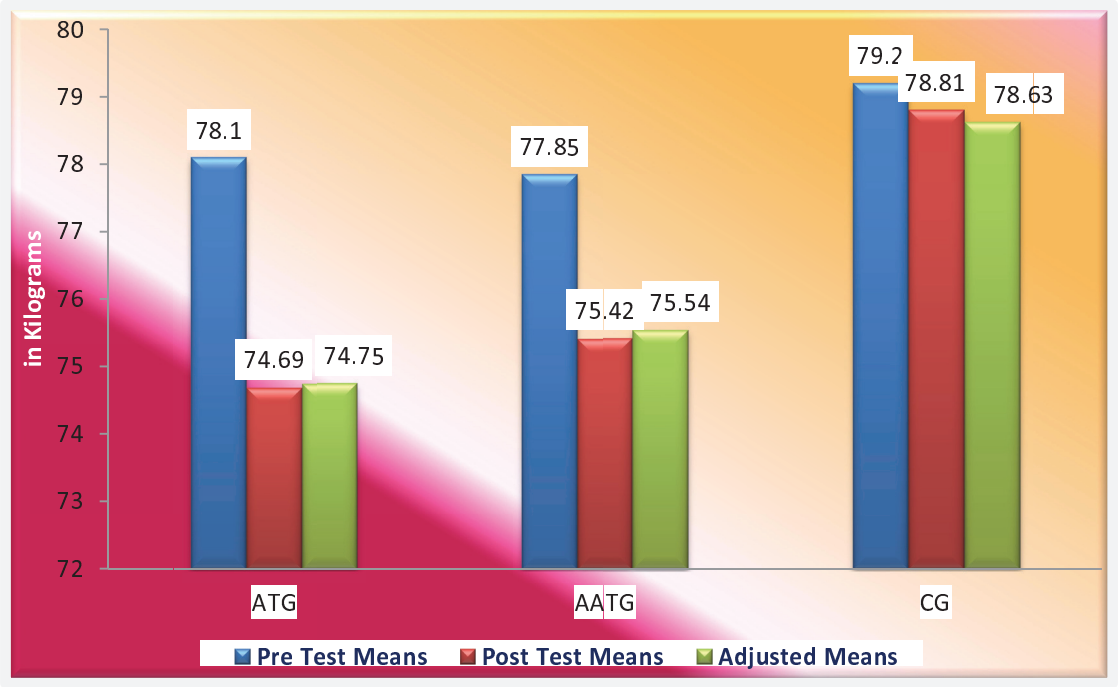

TABLE – 4.18

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON LEAN BODY MASS

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	51.71	52.52	B	5.55	2	2.77	1.51
	1.58	1.37	W	76.80	42	1.82	
	56.28	52.28	B	142.36	2	71.18	28.14*
	1.77	1.23	W	106.22	42	2.52	
	56.35	52.17	B	144.97	2	72.48	29.06*
			W	102.24	41	2.49	

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4.10 RESULTS OF LEAN BODY MASS

An examination of table - 4.18 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 1.51. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on lean body mass was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on lean body mass. The obtained F-ratio for the post-test was 28.14. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F-ratio needed for significance, it was inferred that the mean differences among the three groups on the lean body mass used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on lean body mass was 29.06.

The obtained F- ratio on lean body mass among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the lean body mass was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.19.

TABLE – 4.19

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON LEAN BODY MASS

ATG	AATG	Control Group	Mean Difference	CI Value
55.83	56.35	---	0.52	1.46
55.83	---	52.17	3.66*	1.46
---	56.35	52.17	4.18*	1.46

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.19 confirmed that aerobic training with control group (3.66), anaerobic training with control group (4.18) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.52) at 0.05 level with the CI value of 1.46.

The pre, post and adjusted means on lean body mass were illustrated through bar diagram in Figure-8.

FIGURE – 8

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON LEAN BODY MASS

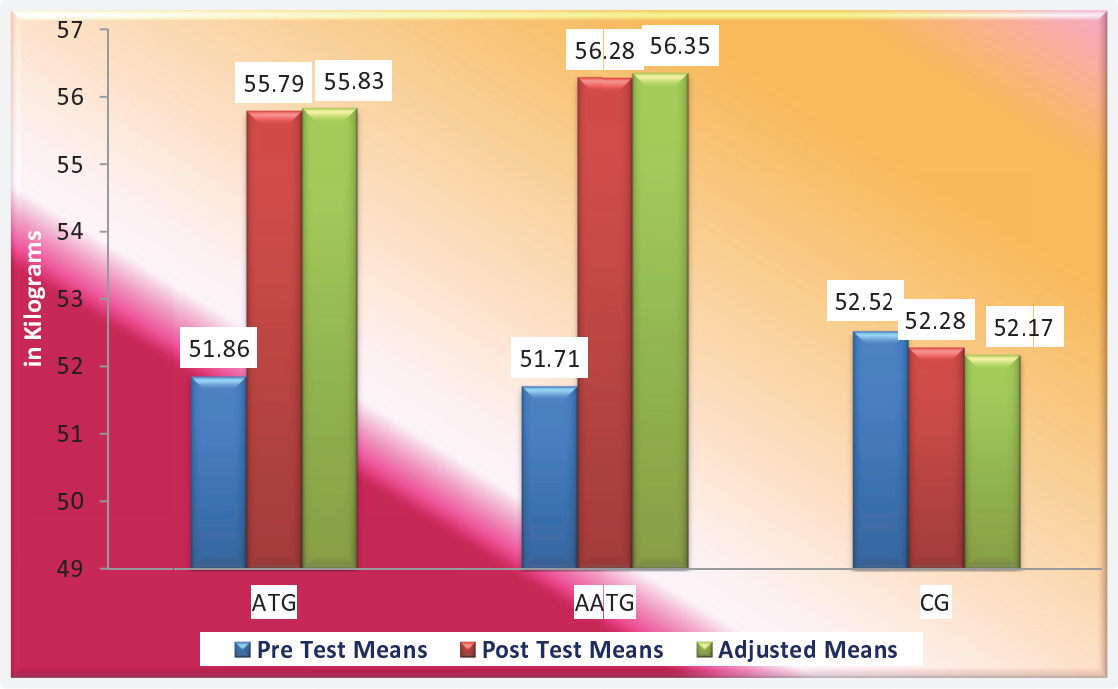

TABLE – 4.20

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS ING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON FAT MASS

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	26.14	26.68	B	2.46	2	1.23	1.51
	1.05	0.91	W	34.13	42	0.81	
	19.13	26.52	B	564.10	2	282.05	418.45*
	0.83	0.82	W	28.31	42	0.67	
	19.18	26.45	B	512.31	2	256.15	395.22*
			W	26.57	41	0.64	

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4.11 RESULTS OF FAT MASS

An examination of table - 4.20 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 1.51. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on fat mass was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on fat mass. The obtained F- ratio for the post-test was 418.45. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F- ratio needed for significance, it was inferred that the mean differences among the three groups on the fat mass used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on fat mass was 395.22.

The obtained F- ratio on fat mass among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the fat mass was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.21.

TABLE – 4.21

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON FAT MASS

ATG	AATG	Control group	Mean difference	CI Value
18.92	19.18	---	0.26	0.74
18.92	---	26.45	7.53*	0.74
---	19.18	26.45	7.27*	0.74

*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.21 confirmed that aerobic training with control group (7.53), anaerobic training with control group (7.27) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.26) at 0.05 level with the CI value of 0.74.

The pre, post and adjusted means on fat mass were illustrated through bar diagram in Figure-9.

FIGURE – 9

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON FAT MASS

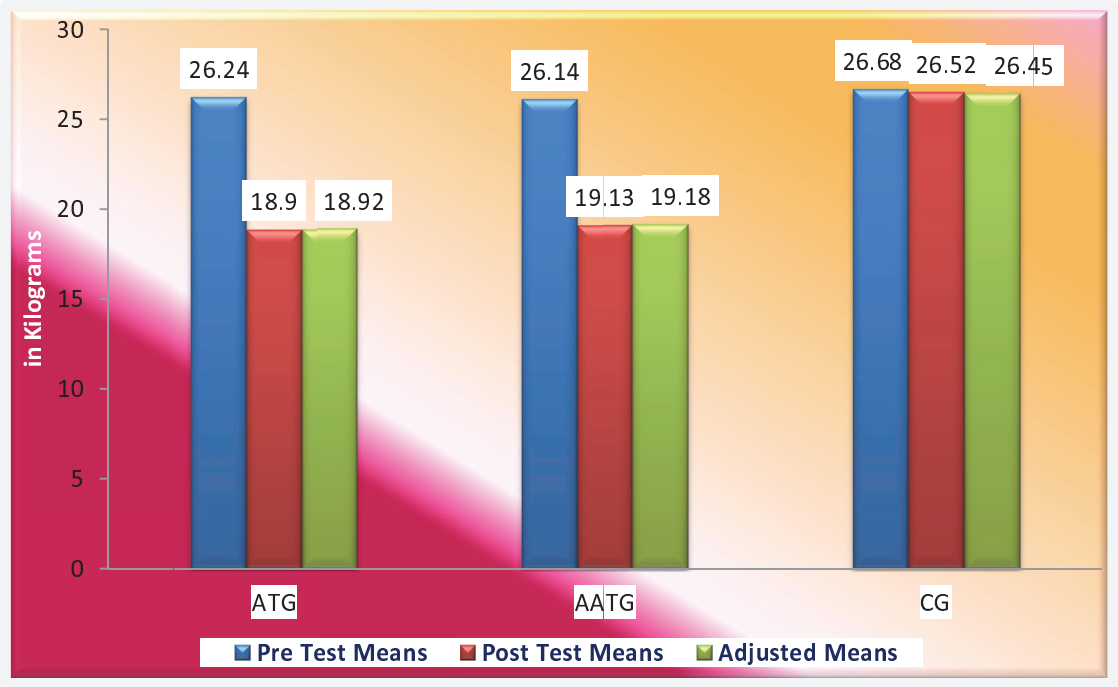

TABLE – 4.22

E ON PRE-TEST, POST-TEST AND ANALYSIS OF COVARIANCE ON POST-TEST MEANS RAINING (ATG), ANAEROBIC TRAINING (AATG) AND CONTROL GROUP ON BODY MASS INDEX

	AATG	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
	31.20	30.56	B	3.25	2	1.62	0.30
	2.74	1.96	W	225.87	42	5.37	
	29.03	30.41	B	19.72	2	9.86	3.31
	1.56	1.88	W	124.77	42	2.97	
	28.96	30.52	B	24.18	2	12.09	4.70
			W	105.28	41	2.56	

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4.12 RESULTS OF BODY MASS INDEX

An examination of table - 4.22 indicated that the results of ANOVA for pre test scores of the aerobic training group and anaerobic training group and control group. The obtained F-ratio for the pre-test was 0.30. It was found to be lesser than the required 'F' ratio of 3.22. By this it was inferred that the mean difference among the three groups at pre-test on body mass index was statistically not significant. Thus the insignificant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the F- test was applied to test the significance of mean difference if any among the aerobic training group and anaerobic training group and control group on body mass index. The obtained F- ratio for the post-test was 3.31. The F-ratio needed for significant differences on the mean, for degrees of freedom 2, 42 was 3.22 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F- ratio needed for significance, it was inferred that the mean differences among the three groups on the body mass index used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the three groups namely aerobic training group and anaerobic training group and control group on body mass index was 4.70.

The obtained F- ratio on body mass index among the three groups was statistically significant since they exceeded the needed F- ratio (3.23) for degree of freedom 2 and 41, at 0.05 level of confidence. From this it was concluded that the body mass index was significantly influenced by the treatments used in this study. To find out which treatment used in the present study is the source for the significance of adjusted means is tested by Scheffe's test. The result of the same is displayed in the table - 4.23.

TABLE – 4.23

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED MEANS OF AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BODY MASS INDEX

ATG	AATG	Control group	Mean difference	CI Value
28.95	28.96	---	0.01	1.48
28.95	---	30.52	1.57*	1.48
---	28.96	30.52	1.56*	1.48

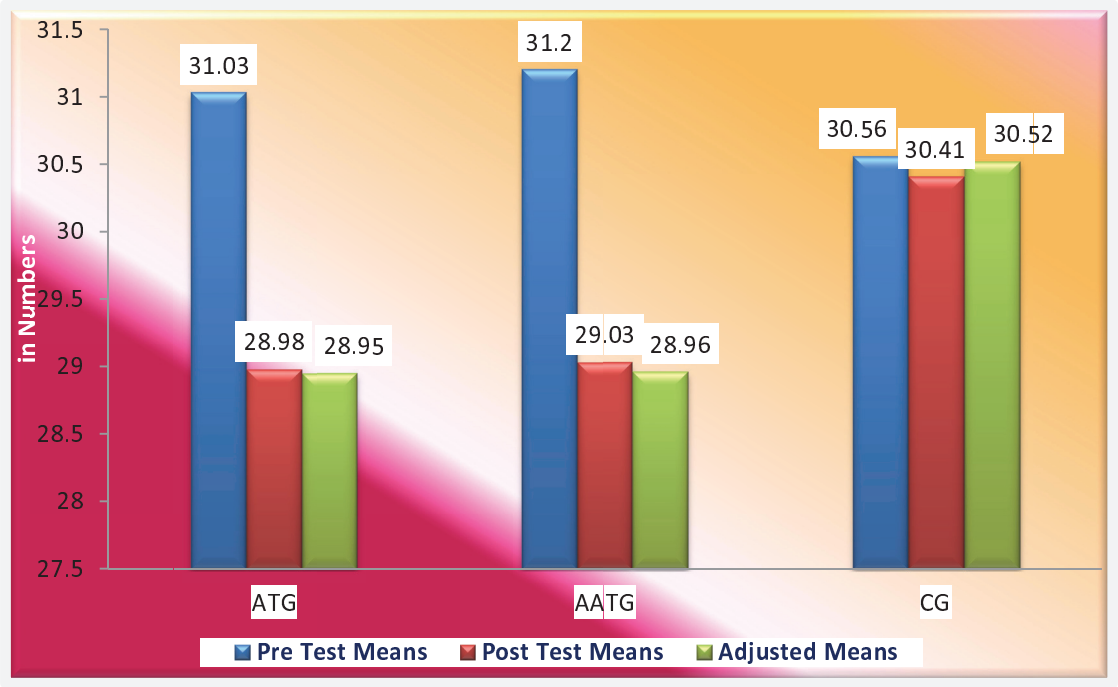
*Significant at 0.05 level of confidence

The multiple comparisons showed in Table 4.23 confirmed that aerobic training with control group (1.57), anaerobic training with control group (1.56) showed significant differences. There was no significant difference between aerobic training and anaerobic training (0.01) at 0.05 level with the CI value of 1.48.

The pre, post and adjusted means on body mass index were illustrated through bar diagram in Figure-10.

FIGURE - 10

PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, AEROBIC TRAINING, ANAEROBIC TRAINING AND CONTROL GROUP ON BODY MASS INDEX



4.13 DISCUSSION ON FINDINGS

The prime intention of the researcher was to effect of aerobic and anaerobic training on selected physiological and body composition profiles among middle aged obese women. The theme behind this study was to observe the influences of aerobic and anaerobic training to develop the selected physiological and body composition profiles of middle aged obese women. To achieve this, two different training packages were designed as aerobic training group (ATG) and anaerobic training group (AATG). The results of the effect of two training packages on variables used in this study are analysed so as to reach the theme of the present study, and sources behind such a similarities and variations observed on variables between the training groups, have been discussed here using scientific studies and logical in nature.

While analyzing the results, it was revealed that there were significant differences found in all the experimental groups.

4.14 RESULTS OF AEROBIC TRAINING PROGRAMME

In testing the aerobic training group, the results reveals that the variables used in the study evidencing that ATG has produced significant improvement positively on physiological variables namely breath holding time (6.40, $P<0.05$), systolic blood pressure (4.00, $P<0.05$), diastolic blood pressure (2.86, $P<0.05$), resting pulse rate (1.33, $P<0.05$), aerobic power (3.96, $P<0.05$) and anaerobic power (90.20, $P<0.05$). The ATG has produced significant improvement positively on body composition profiles namely body weight (3.40, $P<0.05$), lean body mass (3.93, $P<0.05$), fat mass (7.33, $P<0.05$) and body mass index (2.04, $P<0.05$).

4.15 RESULTS OF ANAEROBIC TRAINING PROGRAMME

In testing the anaerobic training group, the results reveals that the variables used in the study evidencing that AATG has produced significant improvement positively on physiological variables namely breath holding time (6.00, $P<0.05$), systolic blood pressure (4.86, $P<0.05$), diastolic blood pressure (4.06, $P<0.05$), resting pulse rate (1.86, $P<0.05$), aerobic power (1.94, $P<0.05$) and anaerobic power (80.93, $P<0.05$). The AATG has produced significant improvement positively on body composition profiles namely body weight (2.43, $P<0.05$), lean body mass (4.57, $P<0.05$), fat mass (7.00, $P<0.05$) and body mass index (2.16, $P<0.05$).

4.16 RESULTS OF CONTROL GROUP

In testing the control group, the results reveals that the variables used in the study evidencing that CG has produced insignificant differences on physiological variables namely breath holding time (0.46, $P>0.05$), systolic blood pressure (0.33, $P>0.05$), diastolic blood pressure (0.20, $P>0.05$), resting pulse rate (0.10, $P>0.05$), aerobic power (0.11, $P>0.05$) and anaerobic power (0.60, $P>0.05$). The CG has produced insignificant differences on body composition profiles namely body weight (0.38, $P>0.05$), lean body mass (0.23, $P>0.05$), fat mass (0.15, $P>0.05$) and body mass index (0.15, $P>0.05$).

4.17 DISCUSSION ON HYPOTHESIS

1. First hypothesis stated that, the effect of aerobic training may improve the selected physiological variables and body composition profiles among middle aged obese women.

The findings of the study showed that there were significant improvement in selected physiological variables and body composition profiles among middle aged obese women form their baseline to post training due to influence of aerobic training. Hence the first hypothesis was accepted on the above said variables.

2. Second hypothesis stated that, the effect of anaerobic training may improve the selected physiological variables and body composition profiles among middle aged obese women.

The findings of the study showed that there were significant improvement in selected physiological variables and body composition profiles among middle aged obese women form their baseline to post training due to influence of anaerobic training. Hence the second hypothesis was accepted on the above said variables.

3. Third hypothesis stated that, the effect of aerobic training may better than the anaerobic training in the improvement of the selected physiological variables and body composition profiles among middle aged obese women.

The findings of the study showed that the aerobic training was better in breath holding time, aerobic power, anaerobic power, body weight and fat mass than anaerobic training group. Hence the third hypothesis was partially accepted on the above said variables.