CHAPTER – IV

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The data collected on selected Motor Fitness Variables, Physiological and Psychological Variables of college men were statistically processed and discussed in this chapter.

One hundred and twenty college men were divided into four groups such as pilates training (PT), plyometric training (PLT), combined pilates and plyometric training (PPT) and control group (CG). To test the significant changes were made from the base line to post test on all the groups individually and 't' test was applied. The significance of the means of the obtained test results was tested at 0.05 level of confidence. The collected data had been processed by using Analysis of Covariance (ANCOVA) to determine if there was any significant difference among the treatment in means of each variable. When analysis of covariance showed significant differences between treatment means, Scheffe's post hoc test was applied to test the significance of difference between the paired adjusted means at 0.05 level of confidence. The data were analysed by using the SPSS software.

4.1 LEVEL OF SIGNIFICANCE

The probability level is below which the investigator rejects. The hypothesis was termed as the level of significance. In analyzing, the't' ratio was needed (2.045) at $P<0.05$ level of confidence for the degrees of freedom 1 and 29. In analyzing, the analysis of covariance, the F ratio were needed (2.70) at $P<0.05$ level of confidence for degrees of freedom 3,116 and 3,115.

4.2 TEST OF SIGNIFICANCE

This is the crucial portion of the thesis in arriving at conclusions by examining the hypothesis. The procedure of accepting the hypothesis or rejecting the hypothesis in accordance with the results obtained in relation to the level of significance was considered suffi confidence intervalent for the study. The level of significance was fixed at 0.05 level.

The test was usually called as the test of significance, since the investigator tested whether the difference between base line and post test was significant or not. If the obtained F-ratio was less than the table F – ratio, at $P<0.05$ level, the hypothesis would be rejected to the effect that there was no significant difference among the groups.

Table - 4.1

Computation of 't' ratio on Speed of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group (Scores in seconds)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	8.02	0.28	7.83	0.33	2.12*
Plyometric training group (PLT)	8.05	0.20	7.79	0.33	3.97*
Combination of pilates and plyometric training group (PPT)	8.04	0.27	7.76	0.28	3.71*
Control Group(CG)	8.05	0.25	8.06	0.25	1.07

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.1 shows that the't' ratio's on speed of PT, PLT, PPT were 2.12, 3.97 and 3.71 respectively. Since, these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio between pre and post test of control group 1.07 was lesser than the required table value of 2.045, it was found to be statistically not significant.

From the results, It was inferred that PT, PLT, and PPT produced a significant improvement in the speed of college men.

Table - 4.2

Analysis of covariance on Pre, Post and Adjusted Post test means on speed of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in seconds)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	8.02	8.05	8.04	8.05	B / S	3	0.02	0.01	0.12
					W / S	116	7.47	0.06	
Post-test Mean	7.83	7.79	7.76	8.06	B / S	3	1.62	0.54	5.93*
					W / S	116	10.57	0.09	
Adjusted Post-test Mean	7.84	7.79	7.76	8.06	B / S	3	1.67	0.56	6.34*
					W / S	115	10.12	0.09	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.2 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on speed.

The obtained 'F' ratio for the pre test in means of PT, PLT, PPT and CG on speed was 0.12. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on speed was 5.93. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test in means of PT, PLT, PPT and CG on speed was 6.34. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of speed among PT, PLT and PPT.

Table - 4.3

Scheffe's Post hoc test for the differences between the paired and adjusted Post-test means of speed

(Scores in seconds)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
7.84	7.79			0.05	0.22
7.84		7.76		0.08	
7.84			8.06	0.22	
	7.79	7.76		0.03	
	7.79		8.06	0.27*	
		7.76	8.06	0.30*	

* Significant at 0.05 level

Table 4.3 revealed that the mean differences between the paired and adjusted post test means of all groups.

The mean difference between PLT and CG, PPT and CG and PT and CG were 0.27 seconds, 0.30 seconds and 0.22 seconds respectively. The values of mean difference were higher

and equalent to the confidence interval value of 0.22. It is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT, PT and PPT, PLT and PPT were 0.05 seconds, 0.08 seconds, and 0.03 seconds respectively. The values of mean difference were lesser than the confidential interval value of 0.22. and it is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on speed of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in speed when compared with PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on speed is presented in figure 4.1

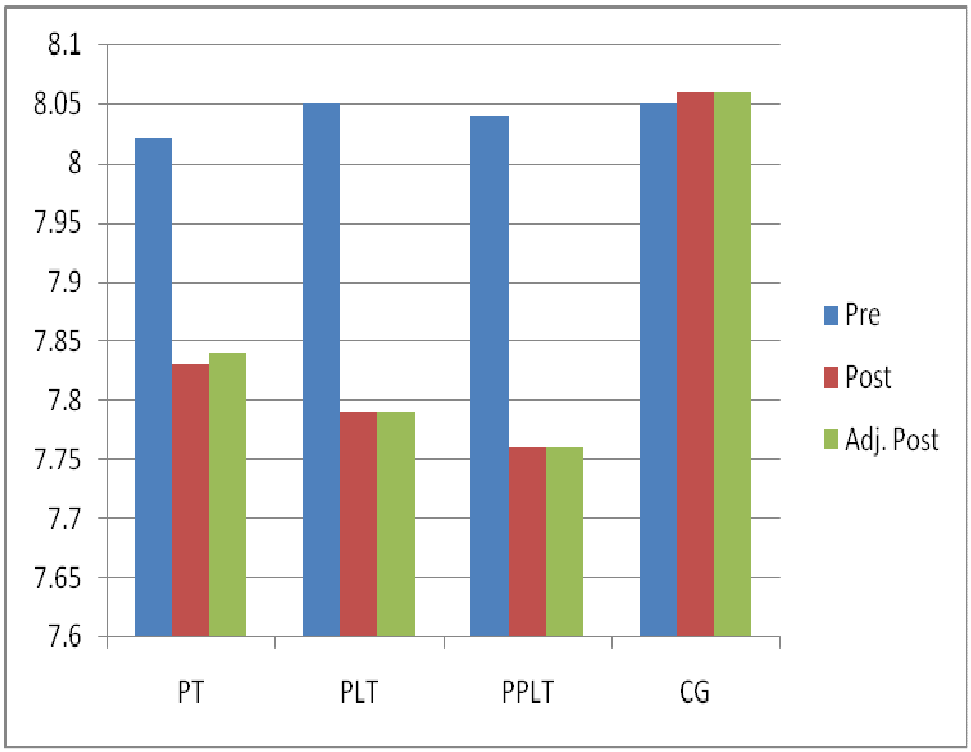

Figure 4.1 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on Speed (scores in seconds)

Table - 4.4

Computation of 't' ratio on flexibility of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group (Scores in centimeters)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	9.87	0.81	11.95	0.92	39.33*
Plyometric training group (PLT)	9.90	0.76	12.06	1.31	8.23*
Combination of pilates and plyometric training group (PPT)	9.93	0.90	13.29	1.47	10.06*
Control Group(CG)	9.93	0.78	9.90	0.71	0.33

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.4 shows that the 't' ratio's on flexibility of PT, PLT, PPT were 39.33, 8.23 and 10.06 respectively. Since, these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio between pre and post test of control group was 0.33 lesser than the required table value of 2.045. It was found to be statistically not significant.

From the results, it was inferred that, PT, PLT, and PPT produced a significant improvement in flexibility of college men.

Table - 4.5

Analysis of covariance on Pre, Post and Adjusted Post test means on flexibility of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in centimeters)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	9.87	9.90	9.93	9.93	B / S	3	0.09	0.03	0.05
					W / S	116	77.40	0.67	
Post-test Mean	11.95	12.06	13.29	9.90	B / S	3	177.16	59.05	45.20*
					W / S	116	151.54	1.34	
Adjusted Post-test Mean	11.97	12.06	13.28	9.89	B / S	3	177.61	59.20	48.81*
					W / S	115	139.49	1.21	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.5 reveals the computation of 'F' ratio's of pre test, post test and adjusted post test by means of PT, PLT, PPT and CG on flexibility.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on flexibility was 0.05. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom of 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further the 'F' ratio for post test by means of PT, PLT, PPT and CG on flexibility was 45.20. The 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116.hence it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on flexibility was 48.81. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom of 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improving flexibility among PT, PLT and PPT.

Table - 4.6

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of flexibility

(Scores in centimeters)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
11.97	12.06			0.09	0.81
11.97		13.28		1.31*	
11.97			9.89	2.08*	
	12.06	13.28		1.22*	
	12.06		9.89	2.17*	
		13.28	9.89	3.39*	

* Significant at 0.05 level

Table 4.6 revealed that the mean differences between the paired and adjusted post test means of all groups.

The mean difference between PT and PLT, PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 1.31 centimeters, 2.08 centimeters and 1.22 centimeters, 2.17 centimeters and

3.39 centimeters respectively. The values of mean difference were higher than the confidence interval value of 0.81. It is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT was 0.09 centimeters. The value of mean difference was less than the confidence interval value of 0.81.It is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on flexibility of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in flexibility when compared with PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on flexibility is presented in figure 4.2

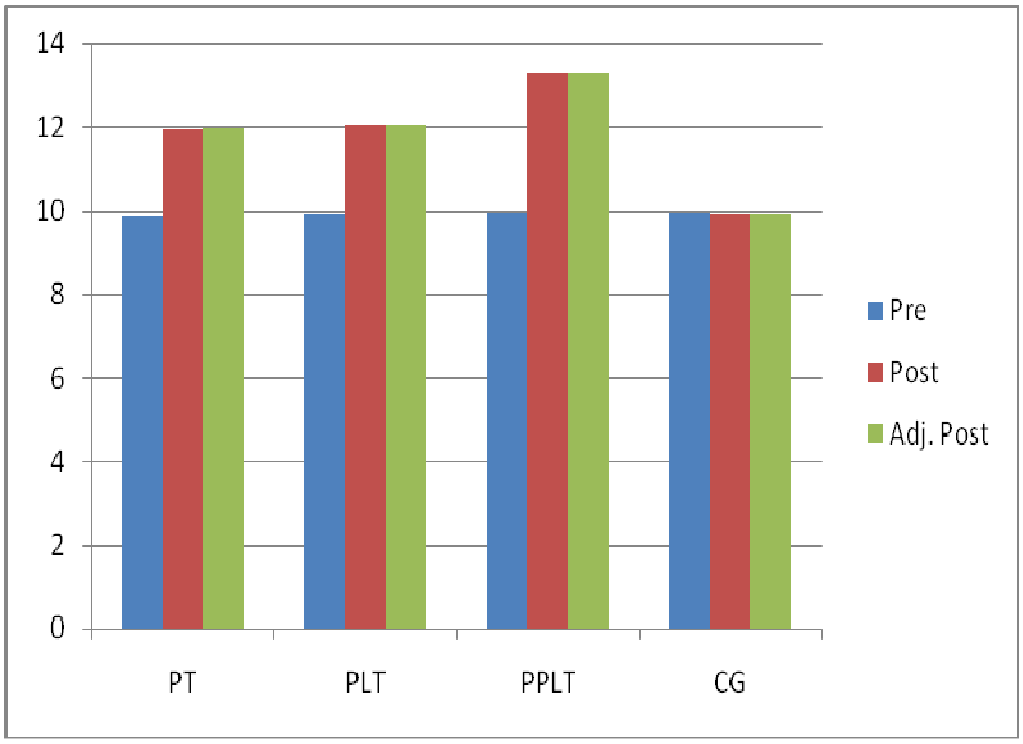

Figure 4.2 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on flexibility

Table - 4.7

Computation of 't' ratio on agility of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group (Scores in seconds)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	11.14	0.54	10.97	0.23	1.50
Plyometric training group (PLT)	11.21	0.27	10.26	0.39	18.43*
Combination of pilates and plyometric training group (PPT)	11.15	0.37	9.98	0.54	16.40*
Control Group(CG)	11.14	0.27	11.15	0.25	0.55

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.7 shows that the 't' ratios on agility of PLT, PPT were 18.43 and 16.40 respectively. Since, these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio's between pre and post test of PT and control group were 1.50 and 0.55 that was less than the required table value of 2.045. It was found to be statistically not significant.

From the results, it was inferred that the PLT and PPT produced a significant improvement in agility of college men.

Table - 4.8

Analysis of covariance on Pre, Post and Adjusted Post test means on agility of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in seconds)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	11.14	11.21	11.15	11.14	B / S	3	0.09	0.03	0.19
					W / S	116	17.13	0.15	
Post-test Mean	10.97	10.26	9.98	11.15	B / S	3	28.04	9.35	66.29*
					W / S	116	16.34	0.14	
Adjusted Post-test Mean	10.98	10.24	9.98	11.16	B / S	3	28.74	9.58	84.73*
					W / S	115	13	0.11	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.8 reveals the computation of 'F' ratios on pre test, post test and adjusted post test by means of PT, PLT, PPT and CG on agility.

The obtained 'F' ratio for the pre test means of PT, PLT, PPT and CG on agility was 0.19. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom of 3 and 116. It was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on agility was 66.29. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on agility was 84.73. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of agility among PT, PLT and PPT.

Table - 4.9

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of agility

(Scores in seconds)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
10.98	10.24			0.74*	0.24
10.98		9.98		1.00*	
10.98			11.16	0.18	
	10.24	9.98		0.26*	
	10.24		11.16	0.92*	
		9.98	11.16	1.18*	

* Significant at 0.05 level

Table 4.9 revealed that the mean differences between the paired and the adjusted post test means of all groups.

The mean difference between PT and PLT, PT and PPT, PLT and PPT, PLT and CG, and PPT and CG were 0.74 seconds, 1.00 seconds, 0.26 seconds, 0.92 seconds and 1.18 seconds

respectively. The values of mean difference were higher than the confidence interval value of 0.24.It is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and CG was 0.18 seconds. The value of mean difference was less than the confidence interval value of 0.24. It is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on agility of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in agility when compared to PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on agility is presented in figure 4.3

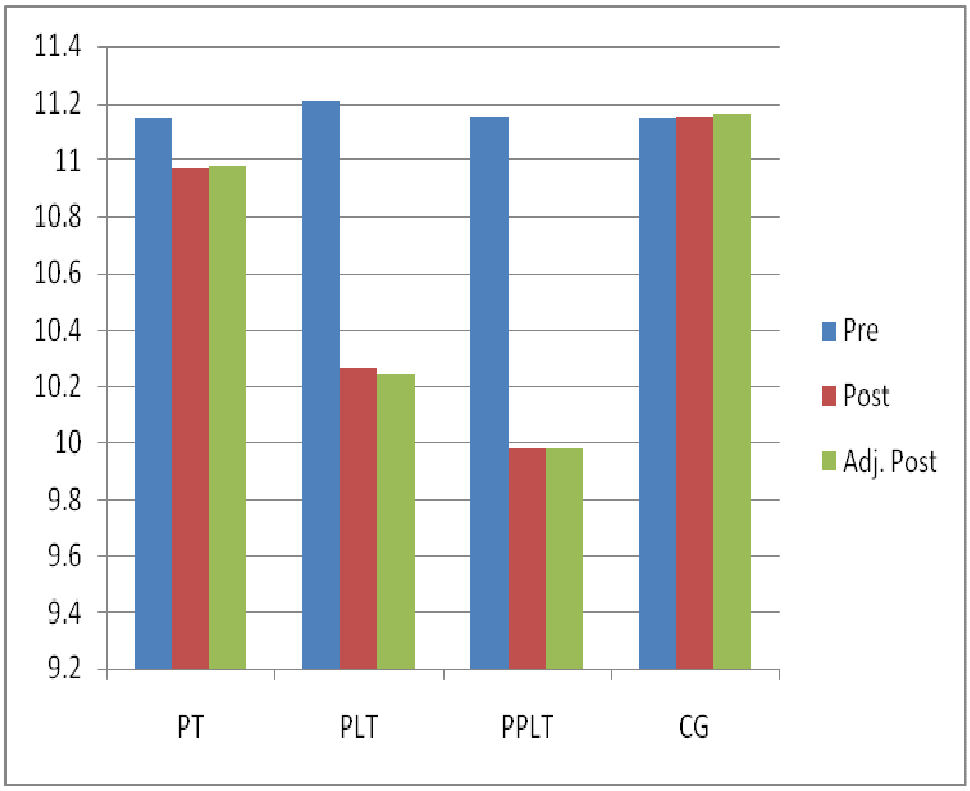

Figure 4.3 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on agility

Table - 4.10

Computation of 't' ratio on muscular strength and endurance of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in numbers)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	13.03	1.40	15.30	1.70	5.82*
Plyometric training group (PLT)	13.00	1.08	15.50	1.97	5.88*
Combination of pilates and plyometric training group (PPT)	13.03	1.10	16.93	1.05	18.99*
Control Group(CG)	13.07	1.51	12.80	1.40	2.28*

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.10 shows that the 't' ratios on muscular strength and endurance of PT, PLT, PPT and CG were 5.82, 5.88 and 18.99 and 2.28 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29.

From the results, it was inferred that, PT, PLT, PPT and CG produced a significant improvement in muscular strength and endurance of college men.

Table - 4.11

Analysis of covariance on Pre, Post and Adjusted Post test means on muscular strength and endurance of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in seconds)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	13.03	13.00	13.03	13.07	B / S	3	0.07	0.02	0.01
					W / S	116	191.80	1.65	
Post-test Mean	15.30	15.50	16.93	12.80	B / S	3	265.40	88.47	35.82*
					W / S	116	286.48	2.47	
Adjusted Post-test Mean	15.30	15.51	16.93	12.79	B / S	3	267.35	89.12	39.30*
					W / S	115	260.80	2.27	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.11 reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on muscular strength and endurance.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on muscular strength and endurance was 0.01. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on muscular strength and endurance was 35.82. Since the 'F' value was higher than the required table value of 2.70

for the degrees of freedom 3 and 116. it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test by means of PT, PLT, PPT and CG on muscular strength and endurance was 39.30. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results, it was inferred that there was a significant difference in improvement of muscular strength and endurance among PT, PLT and PPT.

Table - 4.12

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of muscular strength and endurance

(Scores in numbers)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
15.30	15.51			0.21	1.10
15.30		16.93		1.63*	
15.30			12.79	2.51*	
	15.51	16.93		1.42*	
	15.51		12.79	2.72*	
		16.93	12.79	4.14*	

* Significant at 0.05 level

Table 4.12 reveals that the mean differences between the paired and the adjusted post test means of all groups.

The mean difference between PT and PPT, PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 1.63 numbers, 2.51 numbers, 1.42 numbers, 2.72 numbers and 4.14 numbers respectively. The values of mean difference were higher than the confidence interval value of 1.10.It is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT was 0.21 numbers. The value of mean difference was lesser than the confidence interval value of 1.10, it is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on muscular strength and endurance of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in muscular strength and endurance when compared with PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on agility is presented in figure 4.4

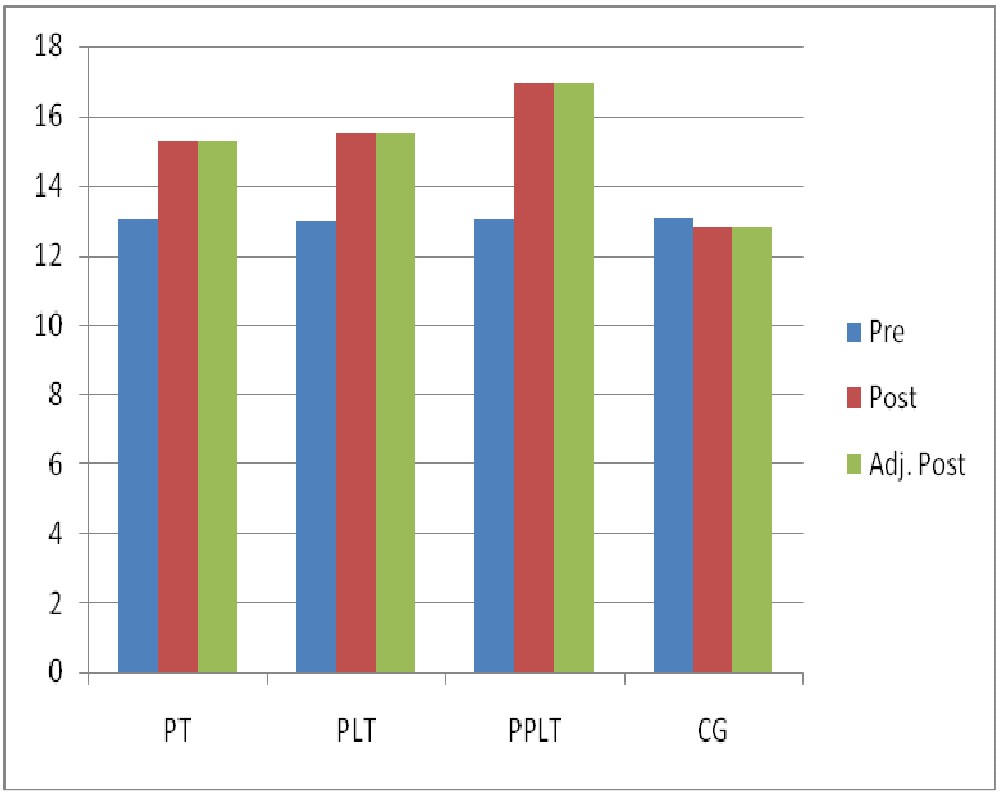

Figure 4.4 Bar diagram shows pre, post and adjusted post test means of Pilates Training Group, Plyometric Training Group, Combined Pilates and Plyometric Training Group and Control Group on muscular strength and endurance

(Scores in numbers)

Table - 4.13

Computation of 't' ratio on resting pulse rate of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in beats per minute)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	82.03	6.47	80.80	6.11	2.96*
Plyometric training group (PLT)	82.07	4.21	81.07	4.17	12.04*
Combination of pilates and plyometric training group (PPT)	82.03	4.17	80.31	3.96	19.37*
Control Group(CG)	82.00	3.23	81.27	4.45	1.20

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.13 shows that the 't' ratios on resting pulse rate of PT,PLT, and PPT were 2.96, 12.04, and 19.37 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 29. Further, the obtained't' ratios between pre and post test of control group was 1.20 that was less than the required table value of 2.045, it was found to be statistically not significant.

From the results, it was inferred that, the PT, PLT, and PPT produced a significant improvement in resting pulse rate of college men.

Table - 4.14

Analysis of covariance on Pre, Post and Adjusted Post test means on resting pulse rate of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in beats per minute)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	82.03	82.07	82.03	82.00	B / S	3	0.07	0.02	0.001
					W / S	116	2541.80	21.91	
Post-test Mean	80.80	81.07	80.31	81.27	B / S	3	198.36	66.12	2.93*
					W / S	116	2621.23	22.60	
Adjusted Post-test Mean	80.80	81.04	78.10	81.30	B / S	3	198.78	66.26	15.24*
					W / S	115	500.09	4.35	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.14 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on resting pulse rate.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on resting pulse rate was 0.0001. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test by means of PT, PLT, PPT and CG on resting pulse rate was 2.93.The 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 116, hence it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on resting pulse rate was 15.24. Since the 'F' value was greater than the required table value of 2.70

for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results, it was inferred that there was a significant difference in improvement of resting pulse rate among PT, PLT and PPT.

Table - 4.15
Scheffe's Post hoc test for the differences between the paired Adjusted Post-test means of resting pulse rate
(Scores in beats per minute)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
80.80	81.04			0.24	1.53
80.80		78.10		2.70*	
80.80			81.30	0.50	
	81.04	78.10		2.94*	
	81.04		81.30	0.26	
		78.10	81.30	3.20*	

* Significant at 0.05 level

Table 4.15 reveals that the mean differences between the paired and the adjusted post test means of all groups.

The mean difference between PT and PPT, PLT and PPT, and PPT and CG were 2.70 beats per minute, 2.94 beats per minute, 3.20 beats per minute respectively. The values of mean difference were higher than the confidence interval value of 1.53.It is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT, PT and CG and was PLT and CG were 0.24 beats per minute, 0.5 beats per minute and 0.26 beats per minute. The values of mean difference were lesser than the confidence interval value of 1.53, it is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on resting pulse rate of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in resting pulse rate when compared to PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on resting pulse rate is presented in figure 4.5

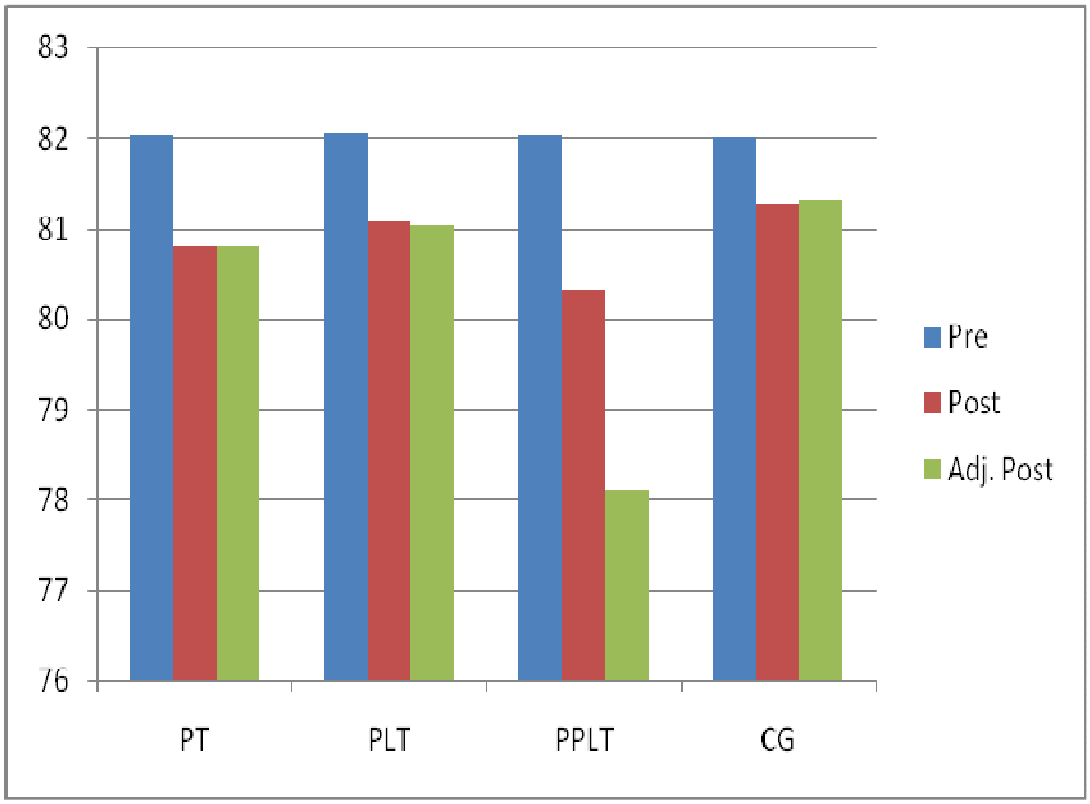

Figure 4.5 Bar diagram shows pre, post and adjusted post test means of Pilates Training Group, Plyometric Training Group, Combined Pilates and plyometric training group and Control Group on resting pulse rate (Scores in beats per minute)

Table - 4.16

Computation of 't' ratio on $V0_2$ max of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in ml/kg/min)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	36.91	2.79	37.70	2.77	13.15*
Plyometric training group (PLT)	36.91	2.12	38.41	2.12	142.80*
Combination of pilates and plyometric training group (PPT)	36.63	3.49	39.91	3.39	22.00*
Control Group(CG)	36.57	3.01	36.51	3.07	0.11

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.16 shows that the 't' ratios on Vo_2 max of PT, PLT, and PPT were 13.15, 142.80 and 22.00 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 29. Further, the obtained't' ratio between pre and post test of control group 0.11 was lesser than the required table value of 2.045. It was found to be statistically not significant.

From the results, it was inferred that, PT, PLT, and PPT produced a significant improvement in Vo_2 max of college men.

Table - 4.17

Analysis of covariance on Pre, Post and Adjusted Post test means on Vo_2 max of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in ml/kg/min)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	36.91	36.91	36.63	36.57	B / S	3	2.90	0.96	0.12
					W / S	116	975.33	8.41	
Post-test Mean	37.70	38.41	39.91	36.51	B / S	3	181.61	60.54	7.31*
					W / S	116	960.41	8.28	
Adjusted Post-test Mean	37.56	38.28	40.02	36.67	B / S	3	181.36	60.46	26.57*
					W / S	115	261.69	2.28	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.17 reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on Vo_2 max.

The obtained 'F' ratio for the pre test means of PT, PLT, PPT and CG on Vo_2 max was 0.12. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on Vo_2 max was 7.31. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on Vo_2 max was 26.57. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of Vo_2 max among PT, PLT and PPT.

Table - 4.18

Scheffe's Post hoc test for the differences between the paired Adjusted Post-test means of Vo_2 max

(Scores in ml/kg/min)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
37.56	38.28			0.72	1.11
37.56		40.02		2.46*	
37.56			36.67	0.89	
	38.28	40.02		1.74*	
	38.28		36.67	1.61*	
		40.02	36.67	3.35*	

* Significant at 0.05 level

Table 4.18 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and PPT, PLT and PPT and PLT and CG and PPT and CG were 2.46 ml/kg/min, 1.74 ml/kg/min, 1.61 ml/kg/min and 3.35 ml/kg/min respectively. The

values of mean difference were higher than and equalent to the confidence interval value of 1.11.and it is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT, and PT and CG were 0.72 ml/kg/min, 0.89 ml/kg/min respectively. The values of mean difference were lesser than the confidence interval value of 1.11 and it is found to be statistically not significant at 0.05 level of confidence.

From, these results, it was inferred that PPT produced better improvement on Vo_2 max of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in Vo_2 max when compared to PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on Vo_2 max is presented in figure 4.6

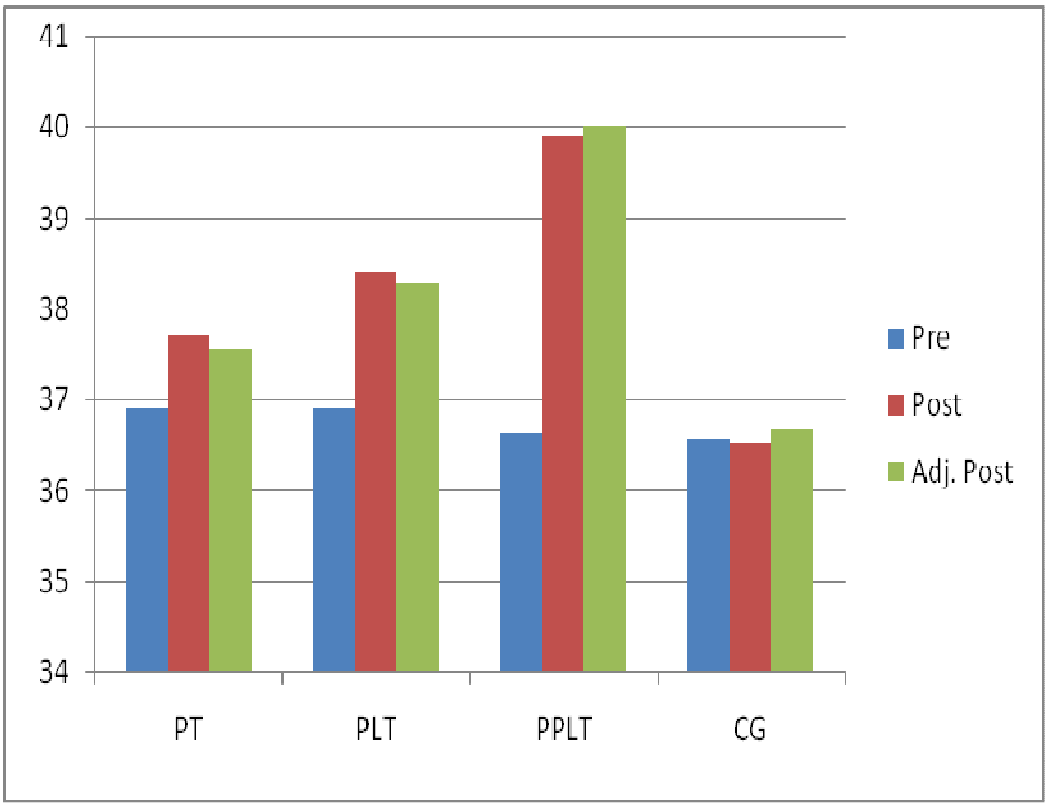

Figure 4.6 Bar diagram showing pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on Vo_2 max

Table - 4.19

Computation of 't' ratio on anaerobic power of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in kg/meter/sec)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	569.44	58.52	570.36	59.47	2.14*
Plyometric training group (PLT)	568.17	56.87	592.21	58.87	20.95*
Combination of pilates and plyometric training group (PPT)	565.66	57.84	607.65	56.66	17.58*
Control Group(CG)	567.93	59.32	572.27	58.59	1.04

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.19 shows that the't' ratios on anaerobic power of PT, PLT, and PPT were 2.14, 20.95, and 17.58 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 29. Further, the obtained't' ratio between pre and post test of control group 1.04 was lesser than the required table value of 2.045, it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in anaerobic power of college men.

Table - 4.20

Analysis of covariance on Pre, Post and Adjusted Post test means on anaerobic power of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in kg/meter/sec)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	569.44	568.17	565.66	567.93	B / S	3	222.40	74.13	0.02
					W / S	116	392213.17	3381.15	
Post-test Mean	570.36	592.21	607.65	572.27	B / S	3	28189.77	9396.59	2.76*
					W / S	116	395713.87	3411.33	
Adjusted Post-test Mean	568.75	591.85	609.74	572.15	B / S	3	32576.62	10858.87	58.88*
					W / S	115	21209.24	184.43	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.20 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test by means of PT, PLT, PPT and CG on anaerobic power.

The obtained 'F' ratio for the pre test means of PT, PLT, PPT and CG on anaerobic power was 0.02. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test by means of PT, PLT, PPT and CG on anaerobic power was 2.76. Since the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on anaerobic power was 58.88. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of anaerobic power among PT, PLT and PPT.

Table - 4.21

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of anaerobic power

(Scores in kg/meter/sec)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
568.75	591.85			23.10*	9.94*
568.75		609.74		40.99*	
568.75			572.15	3.40	
	591.85	609.74		17.89*	
	591.85		572.15	19.70*	
		609.74	572.15	37.59*	

* Significant at 0.05 level

Table 4.21 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and PLT, PT and PPT, PLT and PPT, PLT and CG and PPT and CG were 23.10 kg/meter/sec, 40.99 kg/meter/sec, 17.89 kg/meter/sec, 19.70 kg/meter/sec and 37.59 kg/meter/sec respectively. The values of mean difference were higher than the confidence interval value of 9.94 and it is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and CG was 3.40 kg/meter/sec. The value of mean difference was less than the confidence interval value of 9.94 and it is found to be statistically not significant at 0.05 level of confidence.

From, these results, it was inferred that PPT produced better improvement on anaerobic power of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in anaerobic power when compared to PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on anaerobic power is presented in figure 4.7

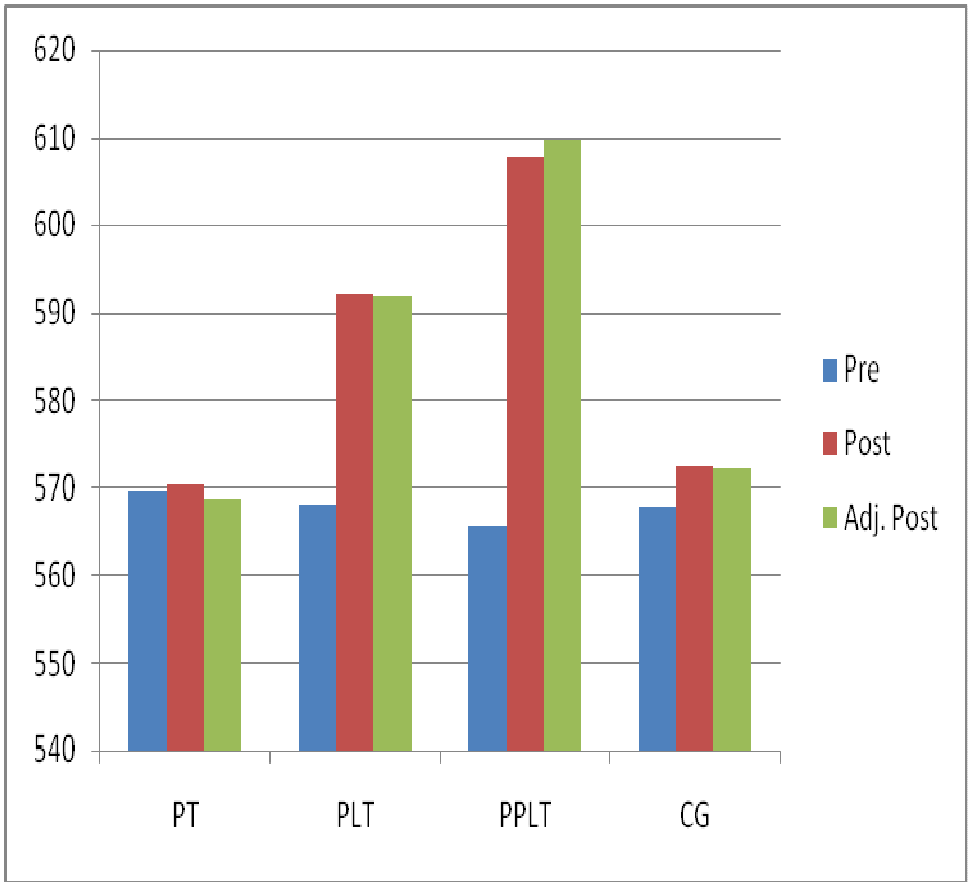

Figure 4.7 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on anaerobic power

Table - 4.22

Computation of 't' ratio on Breath holding time of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in seconds)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	30.97	1.67	38.29	4.18	10.81*
Plyometric training group (PLT)	30.87	2.46	36.20	7.71	4.85*
Combination of pilates and plyometric training group (PPT)	30.97	2.91	42.83	6.60	9.62*
Control Group(CG)	30.87	3.39	30.95	3.33	1.06

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.22 shows that the't' ratios on breath holding time of PT, PLT, PPT were 10.81, 4.85 and 9.62 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio between pre and post test of control group 1.06 was less than the required table value of 2.045 and it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in breath holding time of college men.

Table - 4.23

Analysis of covariance on Pre, Post and Adjusted Post test means on Breath holding time of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in seconds)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	30.97	30.87	30.97	30.87	B / S	3	0.03	0.10	0.01
					W / S	116	834.87	7.20	
Post-test Mean	38.29	36.20	42.83	30.95	B / S	3	2187.84	729.28	22.14*
					W / S	116	3820.25	32.93	
Adjusted Post-test Mean	38.23	36.26	42.78	31.00	B / S	3	2140.64	713.55	29.65*
					W / S	115	2767.36	24.06	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.23 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on breath holding time.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on breath holding time was 0.01. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on breath holding time was 22.14. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116. it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test by means of PT, PLT, PPT and CG on breath holding time was 29.65. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results, it was inferred that there was a significant difference in improvement of breath holding time among PT, PLT and PPT.

Table - 4.24

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of breath holding time

(Scores in seconds)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
38.23	36.26			1.97	3.59
38.23		42.78		4.55*	
38.23			31.00	7.23*	
	36.26	42.78		6.52*	
	36.26		31.00	5.26*	
		42.78	31.00	11.78*	

* Significant at 0.05 level

Table 4.24 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and PPT, PT and CG, PLT and PPT, PLT and CG and PPT and CG were 4.55 seconds, 7.23 seconds, 6.52 seconds, 5.26 seconds and 11.78 seconds respectively. The values of mean difference were higher than the confidence interval value of 3.59 and it is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT is 1.97 seconds. The values of mean difference were less than the confidence interval value of 3.59 and it is found to be statistically not significant at 0.05 level of confidence.

From these results, it was inferred that PPT produced better improvement on breath holding time of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PLT training produced better improvement in breath holding time when compared to PT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on breath holding time is presented in figure 4.8

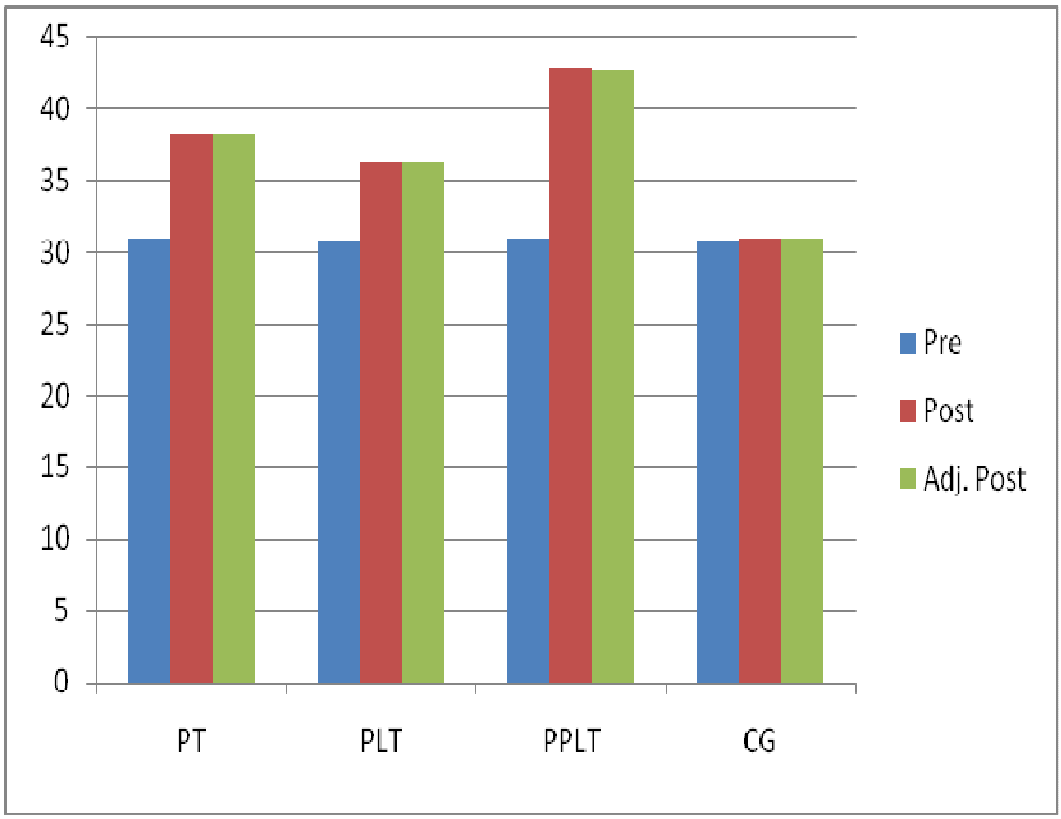

Figure 4.8 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and control Group on breath holding time

Table - 4.25

Computation of 't' ratio on stress of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group (Scores in points)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	28.00	1.85	25.03	1.92	12.02*
Plyometric training group (PLT)	28.10	1.53	26.50	1.73	7.95*
Combination of pilates and plyometric training group (PPT)	28.47	1.85	24.20	1.81	13.74*
Control Group(CG)	27.17	2.39	27.33	2.54	0.87

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.25 shows that the't' ratios on stress of PT, PLT, PPT were 12.02, 7.95 and 13.74 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio between pre and post test of control group 0.87 was less than the required table value of 2.045 and it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in stress of college men.

Table - 4.26

Analysis of covariance on Pre, Post and Adjusted Post test means on stress of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	28.00	28.10	28.47	27.17	B / S	3	27.13	9.04	2.42
					W / S	116	4304.33	3.74	
Post-test Mean	25.03	26.50	24.20	27.33	B / S	3	179.53	59.84	14.59*
					W / S	116	475.93	4.10	
Adjusted Post-test Mean	24.98	26.37	23.77	29.96	B / S	3	279.01	93.00	56.59*
					W / S	115	188.98	1.64	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.26 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on stress.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on stress was 2.42. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on stress was 14.59. Since the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test by means of PT, PLT, PPT and CG on stress was 56.59. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of stress among PT, PLT and PPT.

Table - 4.27

Scheffe's Post hoc test for the differences between the paired Adjusted Post-test means of stress

(Scores in points)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
24.98	26.37			1.39*	0.94
24.98		23.77		1.21*	
24.98			29.96	4.98*	
	26.37	23.77		2.60*	
	26.37		29.96	3.59*	
		23.77	29.96	6.19*	

* Significant at 0.05 level

Table 4.27 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and PLT, PT and PPT, PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 1.39 points, 1.21 points, 4.98 points, 2.60 points, 3.59 points and

6.19 points respectively. The values of mean difference were higher than the confidence interval value of 0.94 and it is found to be statistically significant at 0.05 level of confidence.

From these results, it was inferred that PPT reduced the level of stress of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PT training reduced the level of stress when compared with PLT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on stress is presented in figure 4.9

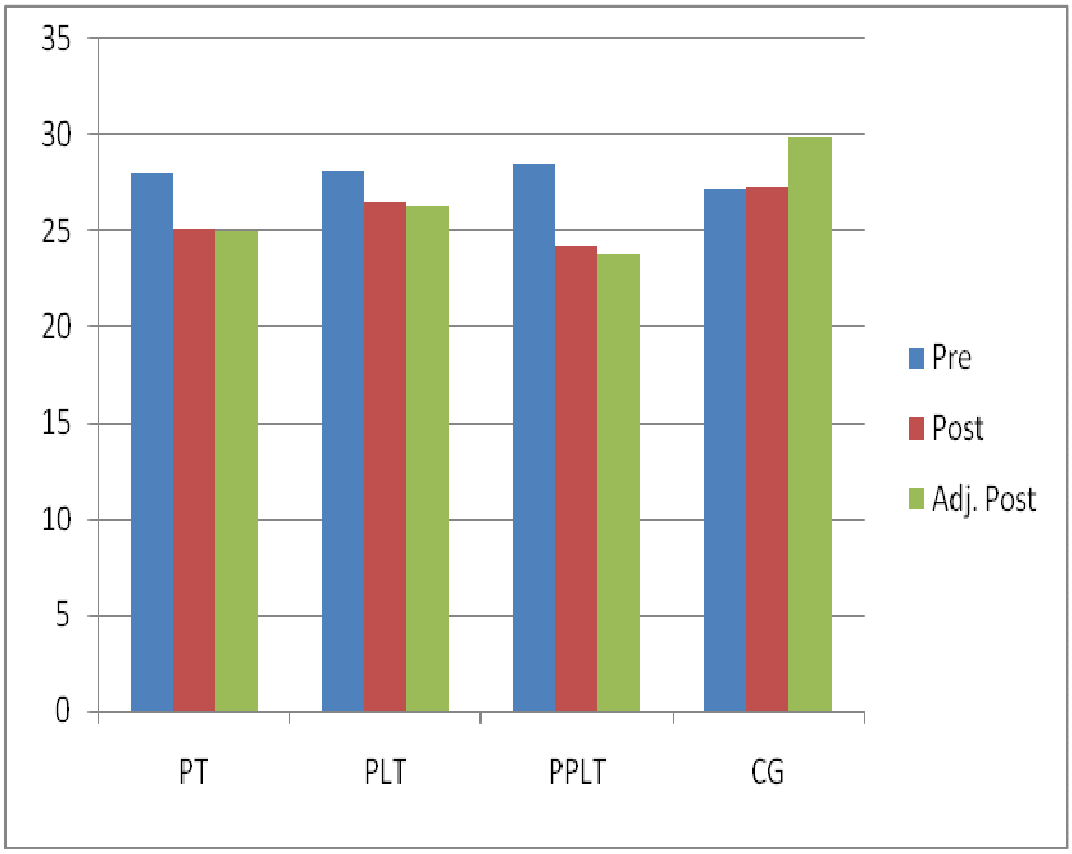

Figure 4.9 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on stress

Table - 4.28

Computation of 't' ratio on anxiety of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	32.83	4.00	29.47	4.47	14.19*
Plyometric training group (PLT)	32.00	4.16	29.80	4.39	9.70*
Combination of pilates and plyometric training group (PPT)	33.57	4.15	28.83	4.27	16.95*
Control Group(CG)	32.60	4.21	32.93	3.19	0.97

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.28 shows that the't' ratios on anxiety of PT, PLT, PPT were 14.19, 9.70 and 16.95 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1and 29. Further, the obtained't' ratio between pre and post test of control group 0.97 was less than the required table value of 2.045 and it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in anxiety of college men.

Table - 4.29

Analysis of covariance on Pre, Post and Adjusted Post test means on anxiety of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	32.83	32.00	33.57	32.60	B / S	3	37.77	12.59	0.74
					W / S	116	198.73	17.08	
Post-test Mean	29.47	29.80	28.83	32.93	B / S	3	300.69	100.23	5.91*
					W / S	116	1966.30	16.95	
Adjusted Post-test Mean	29.39	30.50	28.01	33.07	B / S	3	402.44	134.15	60.62*
					W / S	115	254.50	2.21	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.29 reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on anxiety.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on anxiety was 0.74. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116 it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test means of PT, PLT, PPT and CG on anxiety was 5.91. Since the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test by means of PT, PLT, PPT and CG on anxiety was 60.62. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improvement of anxiety among PT, PLT and PPT.

Table - 4.30

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of anxiety

(Scores in points)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
29.39	30.50			1.11*	1.09
29.39		28.07		1.32*	
29.39			33.07	3.68*	
	30.50	28.07		2.43*	
	30.50		33.07	2.57*	
		28.07	33.07	5.00*	

* Significant at 0.05 level

Table 4.30 reveals that the mean differences between the paired and adjusted post test means of all groups.

The mean difference between PT and PLT, PT and PPT, PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 1.11 points, 1.32 points, 3.68 points, 2.43 points, 2.57 points and

5.00 points respectively. The values of mean difference were higher than the confidence interval value of 1.09 and it is found to be statistically significant at 0.05 level of confidence.

From these results, it was inferred that PPT reduced the level of anxiety of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PT training reduced the level of anxiety when compared to PLT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on anxiety is presented in figure 4.10

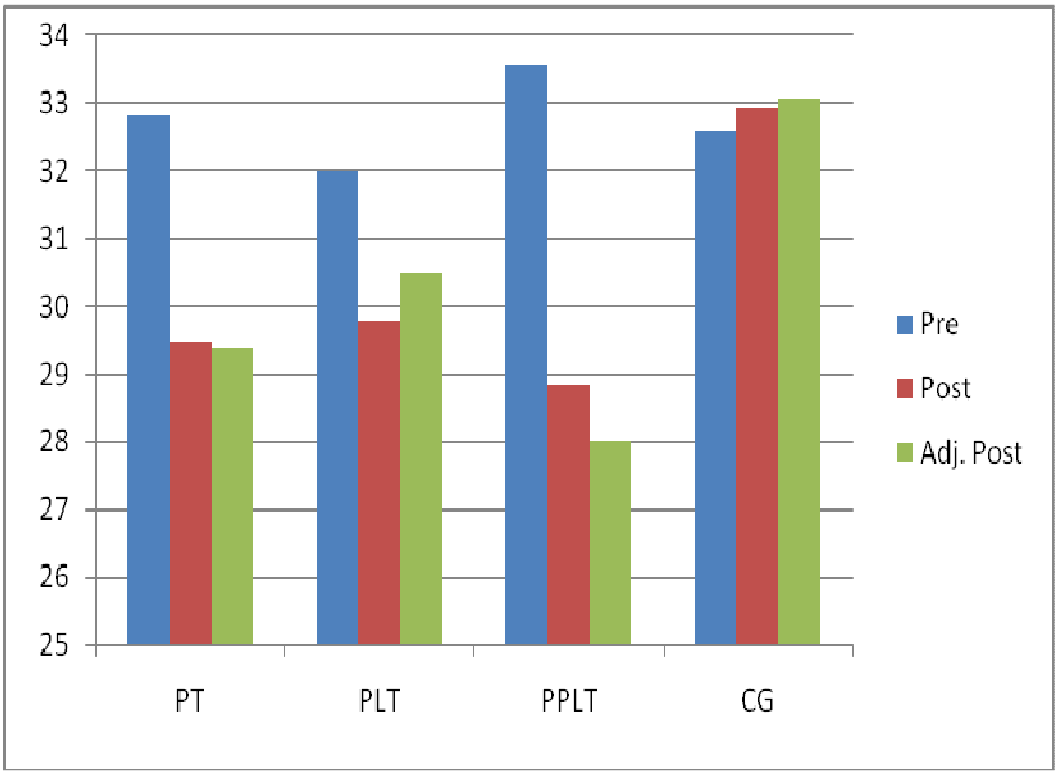

Figure 4.10 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on anxiety

Table - 4.31

Computation of 't' ratio on aggression of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	87.20	5.27	78.50	5.40	12.20*
Plyometric training group (PLT)	87.80	5.42	82.63	5.29	9.75*
Combination of pilates and plyometric training group (PPT)	88.43	3.52	77.03	4.11	14.93*
Control Group(CG)	86.70	6.66	86.93	5.73	0.65

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.31 shows that the't' ratios on aggression of PT, PLT, PPT were 12.20, 9.75 and 14.93 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 29. Further, the obtained't' ratio between pre and post test of control group 0.65 was less than the required table value of 2.045 and it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in aggression of college men.

Table - 4.32

Analysis of covariance on Pre, Post and Adjusted Post test means on aggression of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	87.20	87.80	88.43	86.70	B / S	3	50.60	16.87	0.59
					W / S	116	3303.27	28.48	
Post-test Mean	78.50	82.63	77.03	86.93	B / S	3	1786.63	595.54	22.29*
					W / S	116	3099.30	26.72	
Adjusted Post-test Mean	78.76	82.43	76.34	87.58	B / S	3	2132.43	710.81	72.07*
					W / S	115	1134.24	9.86	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.32 reveals the computation of 'F' ratio's on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on aggression.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on aggression was 0.59. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further the 'F' ratio for post test means of PT, PLT, PPT and CG on aggression was 22.29. Since the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of PT, PLT, PPT and CG on aggression was 72.07. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in the improvement of anxiety among PT, PLT and PPT.

Table - 4.33

Scheffe's Post hoc test for the differences between the paired Adjusted Post-test means of aggression

(Scores in points)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
78.76	82.43			3.67*	2.30
78.76		76.34		2.42*	
78.76			87.58	8.82*	
	82.43	76.34		6.09*	
	82.43		87.58	5.15*	
		76.34	87.58	11.24*	

* Significant at 0.05 level

Table 4.33 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and PLT, PT and PPT, PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 3.67 points, 2.42 points, 8.82 points, 6.09 points, 5.15 points and 11.24 points respectively. The values of mean difference were higher than the confidence interval value of 2.30 and it is found to be statistically significant at 0.05 level of confidence.

From, these results, it was inferred that PPT reduced the level of aggression of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PT training reduced the level of aggression when compared to PLT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on aggression is presented in figure 4.11

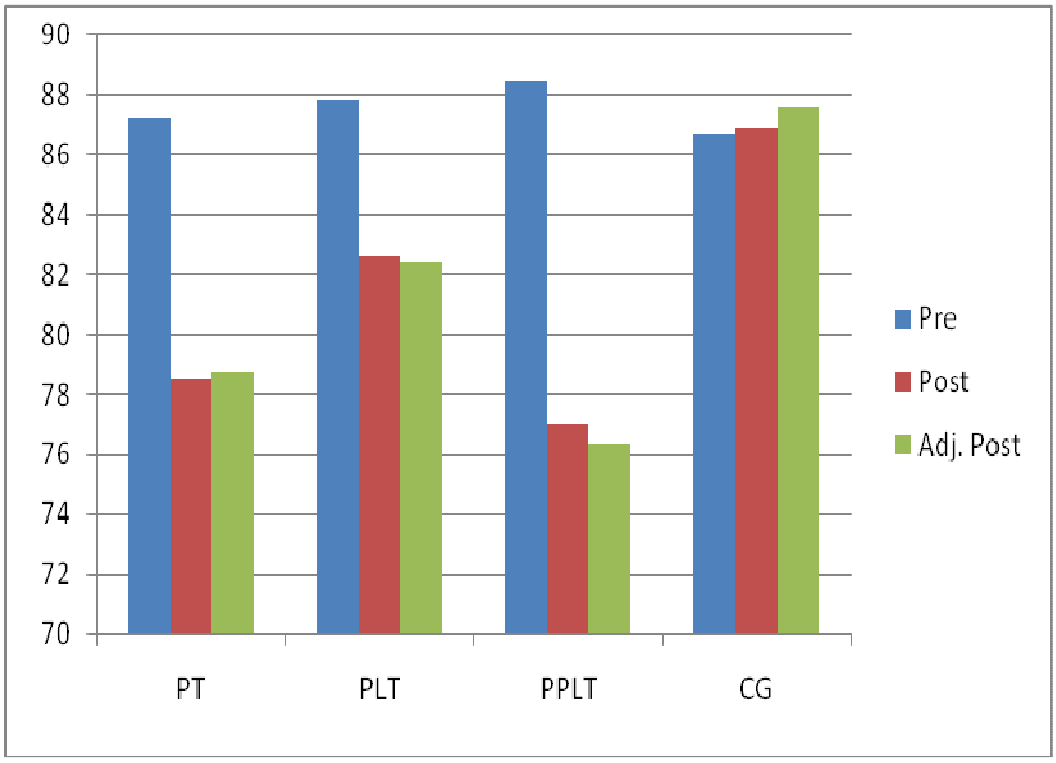

Figure 4.11 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on aggression

Table - 4.34

Computation of 't' ratio on mood state of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Groups	Pre - test mean	Pre - test SD(±)	Post - test mean	Post - test SD(±)	't' ratio
Pilates training group (PT)	62.90	3.36	56.57	3.67	7.96*
Plyometric training group (PLT)	62.33	3.31	57.97	3.76	6.12*
Combination of pilates and plyometric training group (PPT)	62.47	3.29	54.50	3.59	11.54*
Control Group(CG)	61.70	2.76	61.93	2.43	0.94

* Significant at 0.05 level for the degrees of freedom 1 and 29, (2.045).

Table 4.34 shows that the 't' ratios on mood state of PT, PLT, PPT were 7.96, 6.12 and 11.54 respectively. Since these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 29. Further, the obtained't' ratio between pre and post test of control group 0.94 was less than the required table value of 2.045 and it was found to be statistically not significant.

From the results, it was inferred that all the three PT, PLT, and PPT produced a significant improvement in mood state of college men.

Table - 4.35

Analysis of covariance on Pre, Post and Adjusted Post test means on mood state of pilates training group (PT), plyometric training group (PLT), combination of pilates and plyometric training group (PPT) and Control Group

(Scores in points)

Test	Pilates training group (PT)	Plyometric training group (PLT)	Pilates and plyometric training group (PPT)	Control Group (CG)	Source of variance	df	Sum of Square	Mean Square	F-ratio
Pre-test Mean	62.90	62.33	62.47	61.70	B / S	3	22.17	7.39	0.73
					W / S	116	1179.13	1.17	
Post-test Mean	56.57	57.97	54.50	61.93	B / S	3	885.29	295.10	25.40*
					W / S	116	1347.70	11.62	
Adjusted Post-test Mean	56.31	57.97	54.45	62.23	B / S	3	978.97	326.33	33.89*
					W / S	115	1107.28	9.63	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 4.35 reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of PT, PLT, PPT and CG on mood state.

The obtained 'F' ratio for the pre test by means of PT, PLT, PPT and CG on mood state was 0.73. Since the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically not significant at 0.05 level of confidence.

Further, the 'F' ratio for post test by means of PT, PLT, PPT and CG on mood state was 25.40. Since the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test by means of PT, PLT, PPT and CG on mood state was 33.89. Since the 'F' value was greater than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence.

From the results it was inferred that there was a significant difference in improving of mood state among PT, PLT and PPT.

Table - 4.36

Scheffe's Post hoc test for the differences between the paired and the adjusted Post-test means of mood state

(Scores in points)

Pilates training group (PT)	Plyometric training group (PLT)	Pilates and Plyometric training group (PPT)	Control Group (CG)	Mean difference	Confidence Interval
56.31	57.97			1.66	2.27
56.31		54.45		1.86	
56.31			62.23	5.92*	
	57.97	54.45		3.52*	
	57.97		62.23	4.26*	
		54.45	62.23	7.78*	

* Significant at 0.05 level

Table 4.36 reveals that the mean differences between the paired adjusted post test means of all groups.

The mean difference between PT and CG, PLT and PPT, PLT and CG, and PPT and CG were 5.92 points, 3.52 points, 4.26 points, and 7.78 points respectively. The values of mean difference were higher than the confidence interval value of 2.27 and it is found to be statistically significant at 0.05 level of confidence.

Further, the mean difference between PT and PLT, and PT and PPT were 1.66 points and 1.86 points respectively. The values of mean difference were lesser than the confidence interval value of 2.27 and it is found to be statistically not significant at 0.05 level of confidence.

From, these results, it was inferred that PPT improved the mood state of college men than the other training groups of PT, PLT and CG.

Further, twelve weeks of PT training improved the mood state when compared to PLT and Control Group.

Mean values of pre, post and adjusted post test of PT, PLT and PPT Group on mood state is presented in figure 4.12

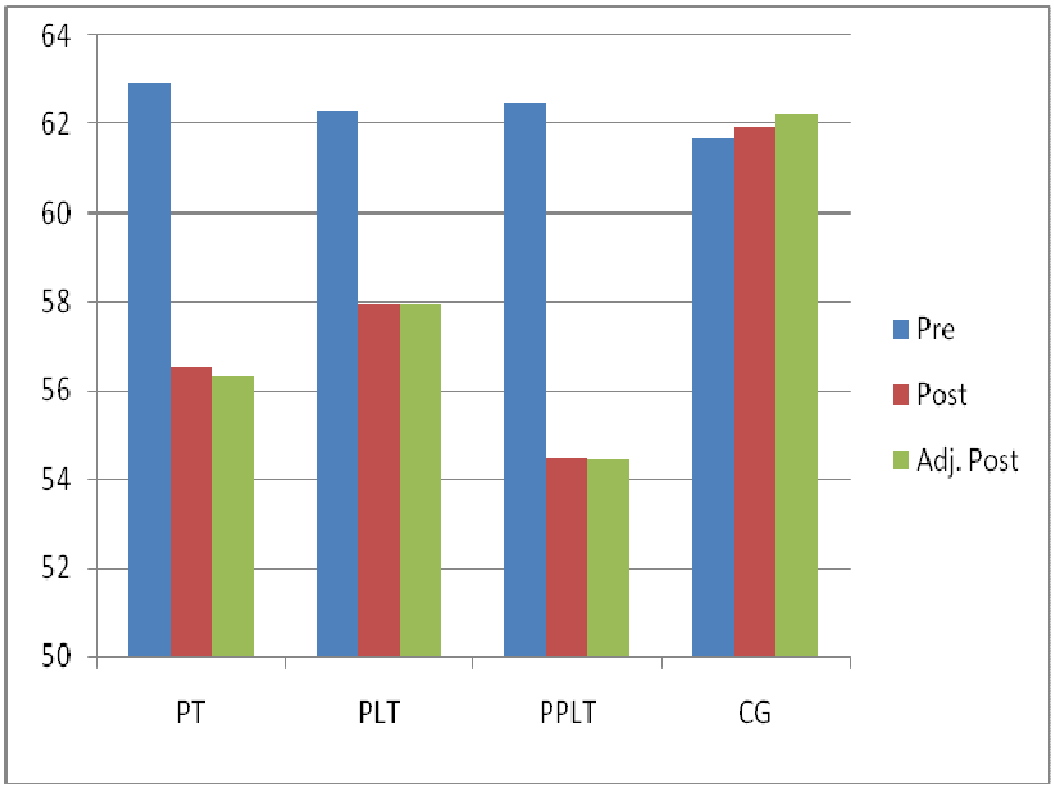

Figure 4.12 Bar diagram shows pre, post and adjusted post test means of pilates training group, plyometric training group, combined pilates and plyometric training group and Control Group on mood state

(Scores in points)

4.3 DISCUSSION ON FINDINGS

Pilates Training is intended to improve general body flexibility and health by emphasizing 'core' (truncal) strength, posture, and coordination of breathing and movement. Joseph Pilate noted that mobilizing early in rehabilitation resulted in a reduced covalescence period after musculoskeletal injuries. The plyometric drills usually involve stepping, starting and changing direction in an explosive manner. These movements are components, which can assist in developing agility. Plyometrics activities are used in sports such as football, tennis, or other sporting events, in which motor fitness are useful for the athletes. **(Parsons and Jones, 1998)**

The results of the findings were discussed under the following pertinent areas of Pilates Training (PT), Plyometric Training (PLT), and combination of Pilates and Plyometric Training (PPLT).

In this study, the subjects who underwent PT, PLT, and PPLT were able to improve their motor fitness, physiological and psychological variables on 't' Test. Therefore, it is found that there is a positive relationship between pilates, plyometric training and improvements of motor fitness, physiological, and psychological variables. This improvement in physiological variables is beneficial for college students who require health related fitness while performing their work and support the result from other studies.

The following section deals with PT, PLT, and PPLT programme compared with a control group over the selected variables.

4.3.1 Motor fitness variables:

The effect of the Pilates and Plyometric Training may actually be synergistic, with their combined effects being greater that each programme performed alone.

In the present study, 12 week of pilates training programme, parametric test and independent sample t- tests revealed statistically significant ($p<05$), gains and improvement in speed (2.36%), flexibility (21.07%), muscular strength (17.42%) and found no significant improvement in agility.

The plyometric training improved speed, flexibility, agility, and muscular strength over 3.23%, 21.81%, 8.47%, and 19.23% respectively and also found significant differences in comparison from base line to post test.

Speed, flexibility, agility and muscular strength and endurance were improved by the combination of pilates and plyometric training over 3.48%, 33.84%, 10.49%, and 29.93% respectively. However, there were no statistical significant changes over speed, flexibility, agility and muscular strength and endurance of control group.

It is noted that the subjects of combination of pilates and plyometric training (PPLT) group had greatly improved their results, in speed times (3.48% vs 3.23% and 2.36%), flexibility(33.84% vs 21.82% and 21.07%), agility (10.49% vs 8.47% and 1.53), and muscular strength and endurance (29.93% vs 19.23% and 17.42%) better than other training groups PT, PLT.

When the influence of PPLT is kept constant the PLT produced better result over speed (3.23% vs 2.36%) flexibility (21.82% vs 21.07%), agility (8.47% vs 1.53%) and muscular strength and endurance (19.23% vs 17.42%) than PT.

The greatest increase of 33.84% was found in flexibility and the least increase was found in agility 1.53%.

Speed:

This study provides some interesting facts regarding, initial insights into potential benefits of Pilates and plyometric exercise. 12 week training improved speed of college men. Finding of this study was very well supported by **Gomez et.al.,(2008)** 6 week plyometric training improved speed of students. Speed and power of female high school soccer players improved positively (**Siegler et al, 2003**)

Flexibility:

The result of the present study demonstrated that the Pilates Training improved flexibility of college men. **Stephen (2012)** Pilates Training elongates the spine increasing elasticity of muscles and the flexibility of joints of cross fit athletes. Eight weeks of pilates training significantly improved flexibility of adult novice practitioners **Kate et.al.,(2009**).

Agility:

The improvement in the agility of the students participated in this study was in line with the literature **Miller et al., (2006**) conforming that plyometric training for 6 weeks improve athletes agility. **Santana et al., (2010)** revealed that strength, agility and flexibility improved significantly by Pilates training in mountain bike cyclist. **Michael et al., (2006)** that plyometric training can be an effective training technique to improve an athlete's agility. **Thomas et al., (2009)** expressed that plyometric training is associated with the improvement of agility.

Muscular strength endurance:

Present study explores that Pilates Training and plyometric training significantly improved the muscular strength of college men. This finding is supported by **wang** *et al.,* **(2012)** 8 weeks of Pilates Training improve the abdominal strength in young dancers. Twelve weeks of Pilates exercise programme improve the muscular endurance and flexibility of women by lower limb plyometric training **Comp** *et al.,* **(2008)** improved explosive strength in female soccer players. **Manolopoudos** *et al.,* **(2008)** plyometric training had improved the strength and power.

Despite the fact that the results of the modern Pilates mat exercise and plyometric exercise were generally positive, some limitations to the study are also worth mentioning. The findings that there was relatively greater improvement in flexibility compared to speed, agility and muscular strength in exercise groups was probably due to exercise protocol that was used in this study. It is put in the other way that the reason for the insignificant result on agility with Pilates training may be due to the early fatigue in the muscles.

The positive influence of Pilates and Plyometric Training on the improvement of flexibility and muscular strength is registered. The timing of speed and agility were reduced (improved) in the final measuring. From the results it is inferred that implemented experimental programme had its effects on the male subjects.

As a result, the flexibility and muscular strength are very important for the detection of speed and agility. The most important findings of the present study was that there was a clear response to effects of 12 weeks of pilates and plyometric programme on motor fitness.

These positive changes in motor fitness variables were more pronounced by following the implementation of combination Pilates and Plyometric Programme in college men. Thus, this research demonstrates that Pilates and Plyometric Programme is a useful exercise modal for motor fitness development.

4.3.2 Physiological variables:

In this present study by keeping the short term or acute adaptation the physiological variables of resting pulse rate, Vo_2 max, anaerobic power and breath holding time were selected to explore the changes due to pilates and plyometric training. The exercise which were selected for 12 weeks pilates and plyometric programme involved movement of the body in various direction like twisting , jumping, bounding, hopping etc., and all these types of exercises helped to improve the resting pulse rate, Vo_2 max, anaerobic power and breath holding time. The improvement in all these components might be directly influenced the improvement of motor fitness and psychological parameter because of the exposure to the pilates and plyometric training programme.

The result of the study speculated that Pilates Training (PT) reduced resting pulse rate and improved Vo_2 max and breath holding time over 1.50%, 2.14% and 23.6% and anaerobic power over 0.16 respectively, by finding significant differences in comparison between base line and post test.

The observed improvement (reduced) in resting pulse rate, Vo_2 max, anaerobic power and breath holding time was due to the influence of Plyometric Training (PLT) which were 1.23%, 4.06%, 4.23% and 17.27% respectively.

The combination of pilates and plyometric training programme (PPLT) significantly reduced resting pulse rate (2.09%) and improved Vo_2 max, anaerobic power and breath holding time over 8.95%, 7.42%, 38.30% respectively.

However, there were no statistically significant changes in resting pulse rate,Vo_2 max, anaerobic power and breath holding time of control group.

It is noted that the subjects of combination of Pilates and plyometric training group greatly improved their result in resting pulse rate (2.09% vs 1.23% and 1.50%) Vo_2 max (8.95% vs 4.06% and 2.14%), and anaerobic power (7.42% vs 4.23% and 0.16%) and breath holding time (38.30% vs 17.27% and 23.6%) than PLT and PT.

When the influence of PPLT is kept constant, the PLT produced better result over Vo_2 max (4.06% vs 2.14%), anaerobic power (4.23% vs 0.16%) than PT group. In the case of breath holding time and resting pulse rate, the Pilates (PT) Training improved better (23.6% vs 17.27 and 1.50% vs 1.23%) than plyometric training (PLT).

The greater increase of 38.30% was found in breath holding time and in Vo2 max it was 8.95%. The least increase was found in anaerobic power 0.16%.

From the result of the present study, it is referred that the improvement in physiological variables indicates an improved function of the internal organ system (cardiovascular, respiratory as well as o_2 uptake at the level of the cell). This may be due to implementing Pilates and plyometric experimental program.

Difference between the mean of pre and post test of resting pulse rate, Vo_2 max, anaerobic power and breath holding time of exercise groups was proved to be higher compared to the control group. The findings of the study are in line with **Brown** *et.al.,***(2010)** plyometrics enhanced Vo_2 max in college aged men and women. Plyometric agility training program by **Grieco** *et.al* **(2012)** increased the Vo_2 max of the female soccer players and 16 weeks mat pilates program significantly increased peak Vo_2 in patients with heart failure.

Eight weeks of combined aerobic and Pilates program produced significant gain in Vo_2 peak and anaerobic threshold which was denoted by **Wolkdoff** *et.al* **(2010).** Plyometric Training by **Gomez** *et al.,***(2008)** with weight training, significantly increases anaerobic

capacity **Vino and Kumaresan (2012)** revealed that 12 weeks of plyometric significantly improve the breath holding time of volley ball players. **Cakmakci (2012)** 10 weeks of Pilates Training has a positive effect on fat percentage.

The present investigation concluded that a combination of Pilates and Plyometric Training produced better result over selected physiological variables of resting heart rate, Vo_2 max, anaerobic power and breath holding time. The improvement in heart rate, Vo_2 max, and anaerobic power may be the reason for the improvement in breath holding time of the subjects in this study. The influence of Pilates and Plyometric Training over motor fitness parameters like, speed, flexibility, agility and muscular strength might have direct influence to the physiological parameters of heart rate, Vo_2 max, anaerobic power and breath holding time.

4.3.3 Psychological variables:

The enhancement of mood is maximized when engaged with light to moderate intensity exercise without interpersonal competition. Psychological benefits included increasing self esteem, increasing sense of mastery, control in the lives and mood, providing a distraction to anxieties and remunation, reducing stress, anxiety, depression and improving sleep pattern (**Helliker, 2005**).

In the present investigation, the Psychological factors of stress, anxiety, aggression and mood state were selected. In order to observe the changes Pilates and Plyometric Training were employed.

The results of the present study indicate that PT produced significant reduction in stress, anxiety, and aggression and improvement in mood state of college men over 10.61%, 10.23%, 9.98% and 10.06% respectively, when comparing the baseline with post test.

The observed reduction in stress, anxiety, and aggression and improvement in mood state due to the influence of PLT were 5.69%, 6.88%, 5.89% and 7.00% respectively.

Stress, anxiety, aggression and mood state explored significant improvement due to combination of PPLT over 14.99%, 14.12%, 12.89% and 12.76% respectively. However,

there were no significant changes over stress, anxiety, aggression and mood state of control group.

The combination of pilates and plyometric (PPLT) reduced stress (14.99% vs 10.61% and 5.69%), anxiety (14.12% vs 10.23% and 6.88%.), aggression (12.89% vs 9.98% and 5.89%) and improved mood state (12.76% vs 10.06% and 7.00%) better than other training groups of PT and PLT.

When the influence of PPLT is kept constant, PT produced better results over stress (10.61% vs 5.69%), anxiety (10.23% vs 6.88%) aggression (9.98% vs 5.89%) and mood state (10.06% vs 7.00%) than PLT group.

The improvements in the psychological parameter like stress, anxiety, aggression and mood state might be a direct impact of changes in the motor fitness and physiological parameters due to the influence of Pilates and Plyometric Training program. The improvement in mood state and reduction in the stress may be reason for reduction in the anxiety and aggression of the subject in this study.

The findings of this study are very well supported by **Hag berg (2001)**. The postures and breathing techniques involved in Pilates can reduce stress and anxiety. Fifteen weeks Pilates Training and Taijiquan Training improved mood state and reduced stress in college students (**Caldwere** *et al.,***2000)**.Pilates exercise improves mood state in women who are recovering from breast cancer (**Keays** *et.al.,* **2008**), **Karen** *et.al,* **(2009)**. Pilates and Taijiquan Training are effective exercises to improve mood and strength in college aged adults.

The result of the present study reveals a significant reduction in stress, anxiety, aggression and improvement in mood state.

From the results of the present study, it is confirmed that all the three groups involved will the pilates training, plyometric training and a combination of Pilates and plyometric training for a period of twelve weeks which produced significant changes over motor fitness parameters of speed time (reduced), flexibility (improved), agility time (reduced) and muscular strength (increased), Physiological variables of resting pulse rate(reduced),Vo_2 max (increased), anaerobic power (improved) and breath holding time (increased) and

psychological variables of stress (reduced),anxiety (reduced), aggression (decreased) and mood state (enhanced).

This improvement could be due to the neuromuscular adaptation, such as increase inhibition of antagonist muscle as well as a better activation and contraction of synergistic muscles or increase in muscle fiber size (**Jeffrey, 1992).**

The implemented Pilates and plyometric model consisted of a combination of numerous movement and hand swing in different directions on different plains with simultaneous skips and leg movements. These are the probable factors which that led to the changes of motor fitness, physiological and psychological parameters at the end of the experimental programme.

It is stated that a combination of Pilates and Plyometric Training (PPLT) had significantly better change scores than Pilates Training and Plyometric separately done on motor fitness, physiological and psychological variables of college men. Therefore these results are in accordance on the previous studies.

The other findings of this study were, the development on stress, anxiety, aggression, mood state and breath holding time which was better in pilates training group compared with plyometric training group. This may be due to the postures and breathing techniques involved in Pilates training. In all other cases such as speed, agility, flexibility, muscular strength, resting pulse rate, Vo_2 max, and anaerobic power by the plyometric training produced better results.

The discrepancy between these results and the results of previous studies might be attributed to several reasons, such as training experience, level of the subjects, the training programme, the intensity used and the duration of the training programme.

Before the implication of these findings are presented, it is necessary to discuss the following delimitations of the current investigation. First, the participants were recruited from a single college based on certain characteristics. Therefore, with a fairly homogenous population, it is possible that adolescent male of similar age with different characteristic would have responded differently to the different combination of Pilates and plyometric

training intervention under taken in the present study. Thus the positive effects noted in the present investigation may not have been observed in other population. Second, the presence of no-exercise group (true control) made it easy to pinpoint the exact benefits of Pilates and plyometric training that may have had on the selected variables. Finally, the length of training invention in the current study was sufficient to produce suitable changes in the selected areas.

4.4 DISCUSSION ON HYPOTHESES

1. The first hypothesis of the study stated that there would be significant changes in motor fitness, physiological and psychological variables of college men by practicing Pilates training. The results of the study indicated that out of twelve variables selected, the following nine variables namely speed, flexibility, muscular strength, resting pulse rate, Vo_2 max, breath holding time, stress, anxiety, aggression, and mood state showed that there were significant changes due to Pilates training. Hence, the investigator's first hypothesis was accepted on the above mentioned variables.
2. However, in the case of agility there was no significant change. Hence, the investigator's first hypothesis was rejected in the case of agility variables.

   The second hypothesis of this study stated that the plyometric training would produce significant changes in motor fitness, physiological and psychological variables of college men. The results revealed that motor fitness, physiological and Psychological variables improved significantly due to influence of plyometric training. Hence, the second hypothesis of the investigator was accepted.

3. The third hypothesis of the study stated that the combination of Pilates and Plyometric Training would produce significant changes over motor fitness, physiological and psychological variables of college men. The results revealed that combination of Pilates and Plyometric Training produced significant changes over motor fitness, physiological and psychological variables of college men. Hence, the third hypothesis of was also accepted.

4. The fourth hypothesis of this study stated that the Pilates training, plyometric training and combination of Pilates and plyometric training would produce similar results over motor fitness, physiological and psychological variables of college men. The results revealed that there was a significant difference in improvement of motor fitness, physiological and psychological variables of college men among Pilates training, plyometric training and combination Pilates and plyometric training. Hence, the fourth hypothesis of the investigator was rejected.