

*Analysis of Data and  
Results of the Study*

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## **CHAPTER – IV**

### **ANALYSIS OF DATA AND RESULTS OF THE STUDY**

The data collected on cardio-pulmonary, physical fitness and psychological variables due to the influence of high intensity, low intensity and zumba dance were statistically processed and discussed in this chapter.

#### **4.1 OVERVIEW**

The purpose of the study was to find out the effect of varied dance fitness programme with yoga on selected cardio-pulmonary, physical fitness and psychological variables among obese school girls. For this study, eighty subjects were selected and divided into four equal such as high intensity aerobic dance with yoga training group (HI), low intensity aerobic dance with yoga training group (LI), zumba dance with yoga training group (ZD) and control group (CG). Pre-post test was conducted before and after the training period from the four groups and was statistically analyzed to find out the significant improvement if any due to the training of selected variables among the selected subjects.

To test the significant changes made from the base line to post test on all the groups individually '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 have been processed by using analysis of covariance (ANCOVA) to determine if there was any significant difference among the treatment 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.

#### **4.2 LEVEL OF SIGNIFICANCE**

The probability level below, which the investigator rejects, the hypothesis was termed as the level of significance. In analyzing the 't' ratio needed was (2.09) at  $P < 0.05$  level of confidence for the degrees of freedom 1 and 19. In analyzing the analysis of covariance, the F ratio needed was (2.72) at  $P < 0.05$  level of confidence for degrees of freedom 3 and 76.

#### **4.3 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 sufficient for the study. The level of significance was fixed at 0.05 levels.

The test was usually called the test of significance, since the investigator tests 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, then the hypothesis was rejected to the effect that there existed no significant difference among the groups.

#### **4.4 COMPUTATION OF DATA**

This chapter presents the results of the study from the analyses of data. The collected data on the selected variables prior to and after four weeks of with and without psych-up training were statistically analysed by using Analysis of Covariance

(ANCOVA) as recommended by Clarke and Clarke (1984). The analyses were carried out through the descriptive statistics, dependent t-test, the univariate analysis of covariance (one-way ANCOVA) and the post hoc pair wise comparison using the Scheffe's test analysis.

#### 4.5 DISCUSSION ON FINDINGS

For this study, thousand school girls (age 14-17) were selected at random from the Salem district and among them, only eighty subjects who were fallen under the obese and over weight category were selected based on the body mass index score. The results obtained by analysis of data are given in following table.

**TABLE – 4.1**

#### **DETAILS OF SUBJECT'S WEIGHT CATEGORY**

<b>S.No</b>	<b>Age Group</b>	<b>Total No. of Students</b>	<b>Underweight and normal weight</b>	<b>Overweight and obese</b>
1	14	256	177	79
2	15	274	203	71
3	16	215	156	59
4	17	255	202	53

Table 4.1 reveals that the percentage of underweight and normal weight and overweight and obese in each age group in body mass index. The results of survey indicated that among the one thousand students, 738 underweight and normal weight and 262 overweight and obese, that is, (73.8 percent) and (26.2 percent) respectively. In 14 years age group, 256 students were tested among them, 177 student's

underweight and normal weight and 79 overweight and obese. In 15 years age group, 274 students were tested among them, 203 student's underweight and normal weight and 71 overweight and obese. In 16 years age group, 215 students were tested among them, 156 student's underweight and normal weight and 59 overweight and obese. In 17 years age group, 255 students were tested among them, 202 student's underweight and normal weight and 53 overweight and obese.

**TABLE-4.2**

**COMPUTATION OF 't' RATIO ON VO<sub>2</sub> MAX OF EXPERIMENTAL AND CONTROL GROUPS**

**(Score in ml/kg/min)**

<b>Group</b>	<b>Pre test mean</b>	<b>Post test mean</b>	<b>Pre test Std.dev</b>	<b>Post test Std.dev</b>	<b>'t' ratio</b>
<b>HI</b>	22.20	26.65	4.82	4.48	28.99
<b>LI</b>	22.70	25.25	5.07	4.95	16.61
<b>ZD</b>	22.40	23.55	5.48	5.40	14.03
<b>CG</b>	22.25	22.10	4.98	5.03	1.83

Significant at 0.05 level

Table 4.2 show that the 't' ratio on VO<sub>2</sub> max of HI, LI, ZD training group and CG were, 28.99\*, 16.61\*\*and 14.03\*respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.83 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.3**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED POST  
TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
VO<sub>2</sub> MAX**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	22.20	22.70	22.40	22.25	<b>B</b>	3.03	1.01	0.039
					<b>W</b>	1975.95	25.99	
<b>Post test mean</b>	26.65	25.25	23.55	22.10	<b>B</b>	235.93	78.64	3.17*
					<b>W</b>	1885.05	24.80	
<b>Adjusted post test mean</b>	26.83	24.94	23.53	22.23	<b>B</b>	233.00	77.66	272.72*
					<b>W</b>	21.35	0.28	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.3 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.039. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on VO<sub>2</sub> max was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on VO<sub>2</sub> max. The obtained ‘F’

ratio for the post-test was 3.17. The ‘F’ ratio needed for the significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed ‘F’ ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of VO<sub>2</sub> max was statistically significant.

In the adjusted post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on VO<sub>2</sub> max the obtained ‘F’ ratio was 272.72. Since the observed ‘F’ ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of VO<sub>2</sub> max was significantly influenced by the treatments used in this study.

**TABLE-4.4**

**SCHEFFE’S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON VO<sub>2</sub> MAX**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
26.83	24.94	-	-	1.89	0.06
26.83	-	23.53	-	3.3	
26.83	-	-	22.23	4.6	
-	24.94	23.53	-	1.41	
-	24.94	-	22.23	2.71	
-	-	23.53	22.23	1.3	

\*Significant

Table 4.4 shows the adjusted post-test means of the HI, LI, ZD, and CG were 26.83, 24.94, 23.53 and 22.23 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 1.89, 3.3, 4.6, 1.41, 2.71, 1.3 respectively. Since the value of mean difference was higher than the critical value of 0.06. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved VO<sub>2</sub> max significantly than the LI, ZD and CG.

From these results it was inferred that LI had showed better improvement on VO<sub>2</sub> max compared with ZD and CG.

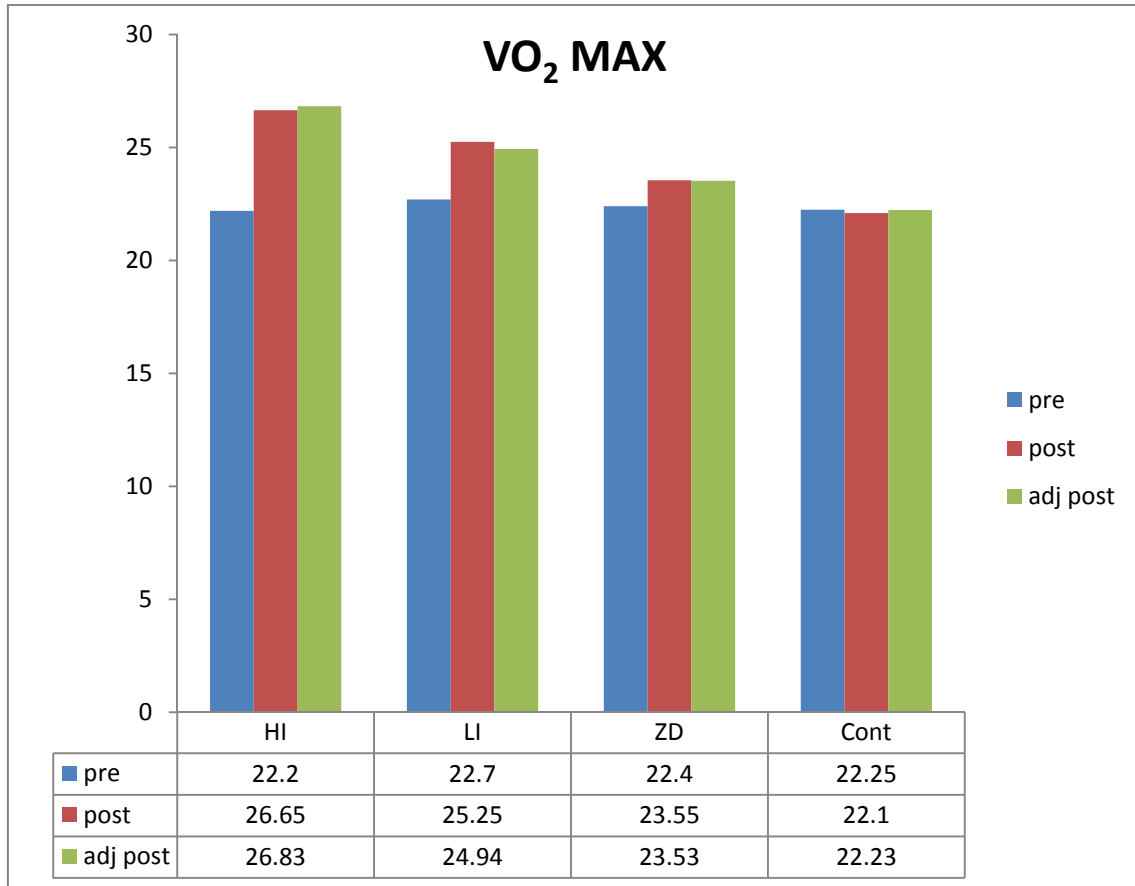
From these results it was inferred that ZD had showed better improvement on VO<sub>2</sub> max compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on VO<sub>2</sub> Max are presented in the following figure 4.1.



**FIGURE – 4.1**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON VO<sub>2</sub> MAX**



**TABLE-4.5**

**COMPUTATION OF ‘t’ RATIO ON BREATH HOLDING TIME OF  
EXPERIMENTAL AND CONTROL GROUPS**

**(Score in seconds)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	26.10	29.15	2.26	2.45	34.61
<b>LI</b>	25.65	27.75	1.63	1.61	30.51
<b>ZD</b>	25.95	27.15	1.90	1.72	13.07
<b>CG</b>	26.55	26.45	1.95	1.98	1.45

Significant at 0.05 level

Table 4.5 show that the ‘t’ ratio on Breathing holding time of HI, LI, ZD training group and CG were, 34.61\*, 30.51\*\* and 13.07\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.45 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.6**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
BREATH HOLDING TIME**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	26.10	25.65	25.95	26.55	<b>B</b>	8.43	2.81	0.73
					<b>W</b>	290.25	3.81	
<b>Post test mean</b>	29.15	27.75	27.15	26.45	<b>B</b>	78.95	26.31	6.76
					<b>W</b>	295.80	3.89	
<b>Adjusted post test mean</b>	29.11	28.16	27.26	25.96	<b>B</b>	106.50	35.50	273.51
					<b>W</b>	9.73	0.13	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.6 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.039. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Breathing holding time was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Breath holding time.

The obtained 'F' ratio for the post-test was 6.76. The 'F' ratio needed for the significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Breathing holding time was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Breathing holding time. The obtained 'F' ratio was 273.15. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Breathing holding time was significantly influenced by the treatments used in this study.

**TABLE-4.7**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
PAIRED ADJUSTED POST-TEST MEANS ON BREATH HOLDING TIME**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
29.11	28.16	-	-	0.95	0.04
29.11		27.26	-	1.85	
29.11	-	-	25.96	3.15	
-	28.16	27.26	-	0.9	
-	28.16	-	25.96	2.2	
-	-	27.26	25.96	1.3	

\*Significant

Table 4.7 shows the adjusted post-test means of the HI, LI, ZD, and CG were 29.11, 28.16, 27.26 and 25.96 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.95, 1.85, 3.15, 0.9, 2.2, 1.3 respectively. Since the value of mean difference was higher than the critical value of 0.04. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved Breath holding time significantly than the LI, ZD and CG.

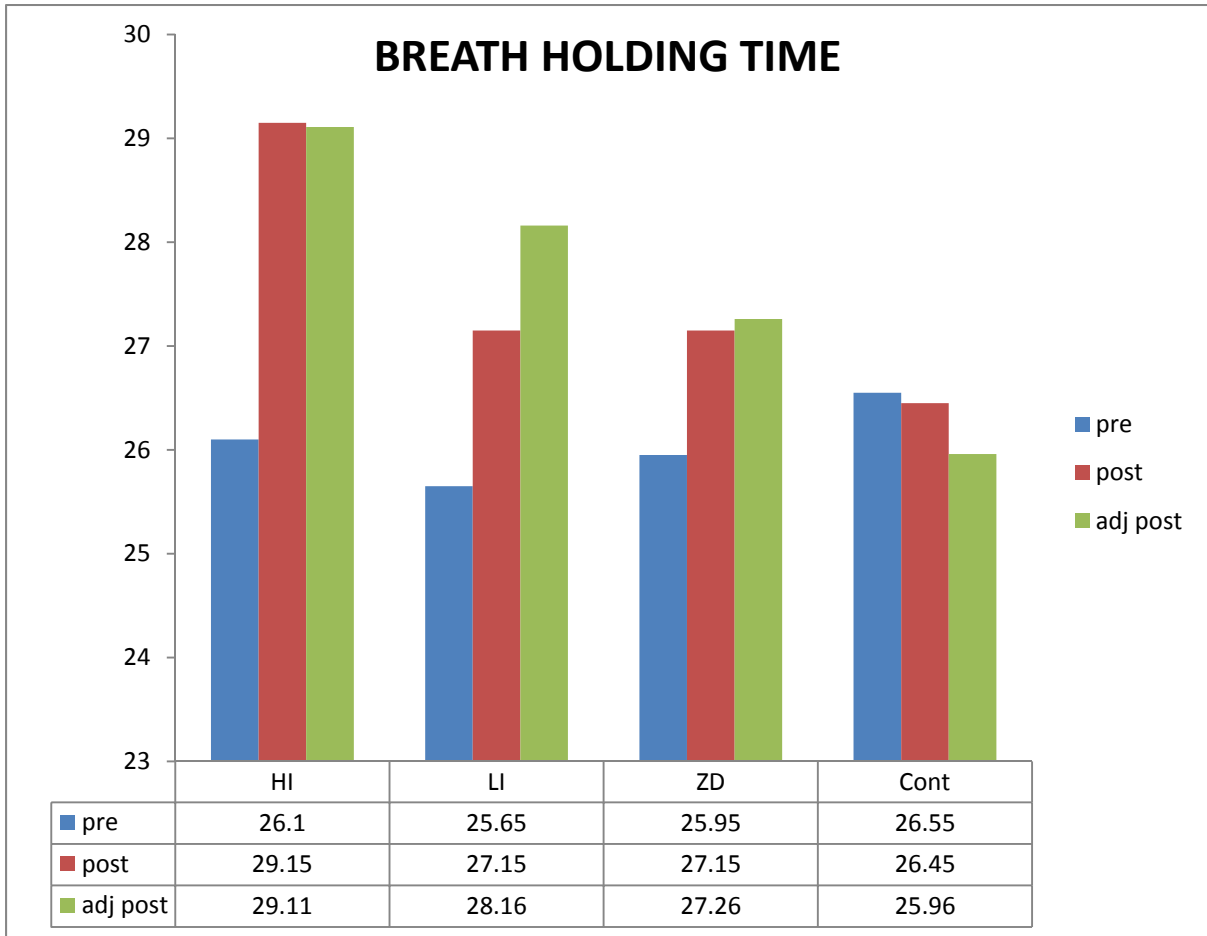
From these results it was inferred that LI had showed better improvement on Breath holding time compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Breath holding time compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on breath holding time are presented in the following figure 4.2.

**FIGURE – 4.2**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON BREATH HOLDING TIME**



**TABLE-4.8****COMPUTATION OF 't' RATIO ON RESTING HEART RATE OF  
EXPERIMENTAL AND CONTROL GROUPS****(Score in numbers)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>'t' ratio</b>
<b>HI</b>	77.80	74.95	2.44	2.39	34.79
<b>LI</b>	77.40	75.65	2.92	3.01	14.22
<b>ZD</b>	77.25	76.30	2.91	3.11	10.78
<b>CG</b>	77.45	77.60	.25	2.11	1.83

Significant at 0.05 level

Table 4.8 show that the 't' ratio on Resting heart rate of HI, LI, ZD training group and CG were, 34.79\*, 14.22\*\*and 10.78 \*respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.83 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.9**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
RESTING HEART RATE**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	77.80	77.40	77.25	77.45	<b>B</b>	3.25	1.08	0.15
					<b>W</b>	534.70	7.03	
<b>Post test mean</b>	74.95	75.65	76.30	77.60	<b>B</b>	76.25	25.41	3.50
					<b>W</b>	550.50	7.24	
<b>Adjusted post test mean</b>	74.62	75.72	76.52	77.62	<b>B</b>	96.18	32.06	174.27
					<b>W</b>	13.79	0.18	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.9 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.15. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Resting heart rate was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Resting heart rate.



The obtained 'F' ratio for the post-test was 3.50. The 'F' ratio needed for the significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Resting heart rate was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Resting heart rate. The obtained 'F' ratio was 174.27. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Resting heart rate was significantly influenced by the treatments used in this study.

**TABLE-4.10**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON RESTING HEART RATE**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
74.62	75.72	-	-	1.1	0.04
74.62		76.52	-	1.9	
74.62	-	-	77.62	3	
-	75.72	76.52	-	0.8	
-	75.72	-	77.62	1.9	
-	-	76.52	77.62	1.1	

\*Significant

Table 4.10 shows the adjusted post-test means of the HI, LI, ZD, and CG were 3.57, 3.47, 3.35 and 3.23 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.1, 1.9, 3, 0.8, 1.9, 1.1 respectively. Since the value of mean difference was higher than the critical value of 0.04. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved Resting heart rate more significantly than the LI, ZD and CG.

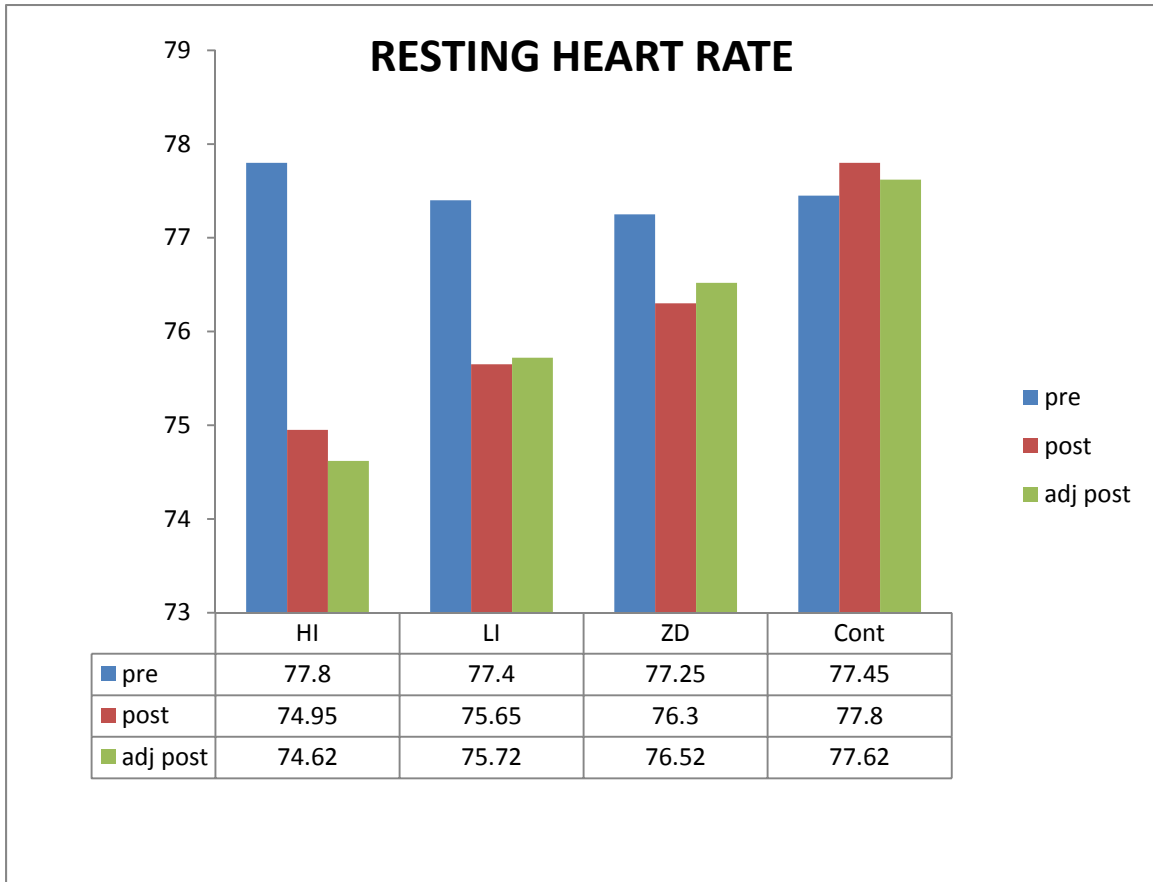
From these results it was inferred that LI had showed better improvement on Resting heart rate when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Resting heart rate when compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on resting heart rate is presented in the following figure 4.3.

**FIGURE – 4.3**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON RESTING HEART RATE**



**TABLE-4.11****COMPUTATION OF 't' RATIO ON VITAL CAPACITY OF  
EXPERIMENTAL and CONTROL GROUPS****(Score in liters/seconds)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>'t' ratio</b>
<b>HI</b>	3.24	3.57	0.13	0.12	22.46
<b>LI</b>	3.25	3.48	0.12	0.13	11.89
<b>ZD</b>	3.22	3.33	0.11	0.13	14.03
<b>CG</b>	3.25	3.24	0.13	0.13	1.45

Significant at 0.05 level

Table 4.11 show that the 't' ratio on Vital capacity of HI, LI, ZD training group and CG were, 22.46\*, 11.89\*\* and 14.03\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.45 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.12**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
VITAL CAPACITY**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	3.24	3.25	3.22	3.25	<b>B</b>	0.01	0.006	0.33
					<b>W</b>	1.23	0.01	
<b>Post test mean</b>	3.57	3.48	3.33	3.24	<b>B</b>	1.28	0.42	24.54
					<b>W</b>	1.32	0.01	
<b>Adjusted post test mean</b>	3.57	3.47	3.35	3.23	<b>B</b>	1.28	0.43	123.66
					<b>W</b>	0.26	0.003	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.12 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.33. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Vital capacity was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Vital capacity. The obtained

'F' ratio for the post-test was 24.54. The 'F' ratio needed for the significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Vital capacity was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Vital capacity. The obtained 'F' ratio was 123.66. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Vital capacity was significantly influenced by the treatments used in this study.

**TABLE-4.13**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON VITAL CAPACITY**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
3.57	3.47	-	-	0.1	0.02
3.57	-	3.35	-	0.22	
3.57	-	-	3.23	0.34	
-	3.47	3.35	-	0.12	
-	3.47	-	3.23	0.24	
-	-	3.35	3.23	0.12	

\*Significant

Table 4.13 shows the adjusted post-test means of the HI, LI, ZD, and CG were 3.57, 3.47, 3.35 and 3.23 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.1, 0.22, 0.34, 0.12, 0.24, 0.12 respectively. Since the value of mean difference was higher than the critical value of 0.02. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved Vital capacity more significantly than the LI, ZD and CG.

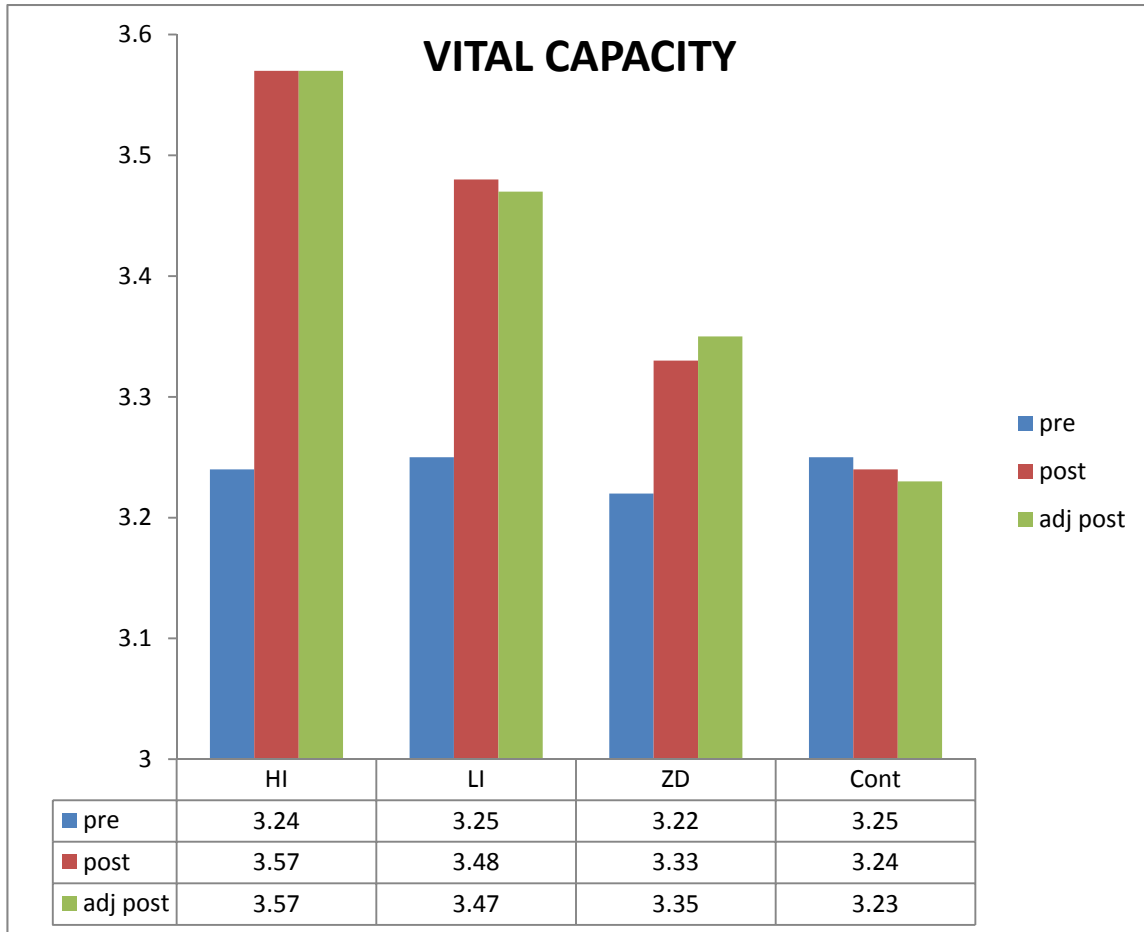
From these results it was inferred that LI had showed better improvement on Vital capacity when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Vital capacity when compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on vital capacity is presented in the following figure 4.4.

**FIGURE – 4.4**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON VITAL CAPACITY**





**TABLE – 4.14**

**DETAILS OF SUBJECT'S WEIGHT CATEGORY**

<b>S.No</b>	<b>Age Group</b>	<b>Total No. of Students</b>	<b>underweight and normal weight</b>	<b>overweight and obese</b>
1	14	256	177	79
2	15	274	203	71
3	16	215	156	59
4	17	255	202	53

Table 4.14 reveals that the percentage of underweight and normal weight and overweight and obese in each age group in body mass index. The results of survey indicated that among the one thousand students, 738 underweight and normal weight and 262 overweight and obese, that is, (73.8 percent) and (26.2 percent) respectively. In 14 years age group, 256 students were tested among them, 177 student's underweight and normal weight and 79 overweight and obese. In 15 years age group, 274 students were tested among them, 203 student's underweight and normal weight and 71 overweight and obese. In 16 years age group, 215 students were tested among them, 156 student's underweight and normal weight and 59 overweight and obese. In 17 years age group, 255 students were tested among them, 202 student's underweight and normal weight and 53 overweight and obese.

**TABLE-4.15**

**COMPUTATION OF ‘t’ RATIO ON BODY COMPOSITION OF  
EXPERIMENTAL AND CONTROL GROUPS**

**(Score in millimeters)**

<b>Groups</b>	<b>Pre – test Mean (Score)</b>	<b>Post - test mean (Score)</b>	<b>Mean Difference (Score)</b>	<b>Standard Error of the Mean</b>	<b>‘t’ ratio</b>
<b>HI</b>	29.50	26.70	1.31	3.18	5.27*
<b>LI</b>	29.25	27.35	1.20	1.46	11.83*
<b>ZD</b>	29.45	28.35	1.19	1.18	15.98*
<b>CG</b>	29.30	29.40	1.08	1.27	1.45

\* Significant at 0.05 level for the degrees of freedom 1 and 19, 2.09

Table 4.15 show that the ‘t’ ratio on body composition of HI, LI, ZD training group and CG were, 5.27\*, 11.83\* \*and 15.98\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since the obtained ‘t’ ratio 1.45 of control group was lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.16**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
BODY COMPOSITION**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Source of variance</b>	<b>Sum of Square</b>	<b>Mean Square</b>	<b>F-ratio</b>
<b>Pre test mean</b>	29.50	29.25	29.45	29.30	<b>B</b>	0.85	0.28	0.19
					<b>W</b>	109.90	1.44	
<b>Post test mean</b>	26.70	27.35	28.35	29.40	<b>B</b>	83.70	27.90	7.30
					<b>W</b>	290.10	3.81	
<b>Adjusted post test mean</b>	26.54	27.50	28.25	29.49	<b>B</b>	93.04	31.01	20.67
					<b>W</b>	112.52	1.50	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.16 show the results of ‘F’ ratio for Pre-test, post-test and adjusted post test scores of HI, LI, ZD, and CG on body composition.

The obtained ‘F’ ratio for the pre-test means of HI, LI, ZD and CG on body composition was 0.19. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on body composition was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on body composition. The obtained ‘F’ ratio for the post-test was 7.30. The ‘F’ ratio needed for the significant differences

on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of body composition was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on body composition. The obtained 'F' ratio was 20.67. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of body composition was significantly influenced by the treatments used in this study.

**TABLE-4.17**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE PAIRED ADJUSTED POST-TEST MEANS OF ON BODY COMPOSITION**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
26.54	27.50	-	-	0.96	0.14
26.54	-	28.25	-	1.71	
26.54	-	-	29.49	2.95	
-	27.50	28.25	-	0.75	
-	27.50	-	29.49	1.99	
-	-	28.25	29.49	1.24	

\* Significant at 0.05 level

Table 4.17 shows the adjusted post-test means of the HI, LI, ZD, and CG were 26.54, 27.50, 28.25 and 29.49 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.96, 1.71, 2.95, 0.75, 1.99, 1.24 respectively. The value of mean difference of adjusted post test means was higher than the critical value of 0.14. Hence, it was found to be statistically significant at 0.05 level of confidence

From the result it was inferred that 12 weeks of HI program had improved body composition more significantly than the LI, ZD and CG.

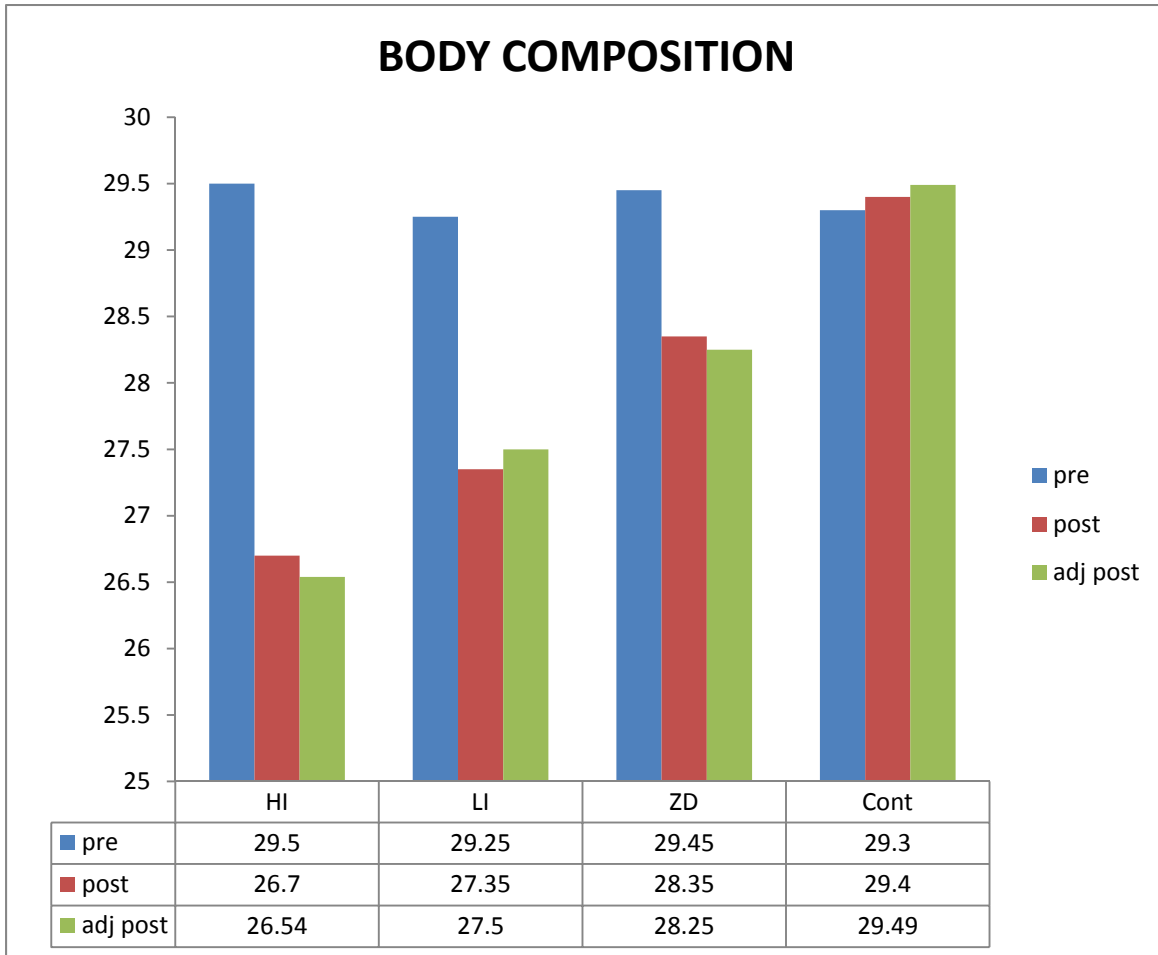
From these results it was inferred that LI had showed better improvement on body composition when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on body composition when compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on body composition are presented in the following figure 4.5.

**FIGURE – 4.5**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON BODY COMPOSITION**



**TABLE-4.18****COMPUTATION OF ‘t’ RATIO ON FLEXIBILITY OF EXPERIMENTAL  
AND CONTROL GROUPS****(Score in centimeters)**

<b>group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	6.05	7.95	1.70	1.53	27.60*
<b>LI</b>	6.15	7.25	0.98	1.06	15.98*
<b>ZD</b>	6.25	6.45	1.11	1.05	2.63*
<b>CG</b>	5.70	5.55	1.03	0.99	1.37

\*Significant at 0.05 level

Table 4.18 show that the ‘t’ ratio on flexibility of HI, LI, ZD training group and CG were, 27.60\*, 15.98\*\* and 2.63\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.37 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.19**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUP ON FLEXIBILITY**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	6.05	6.15	6.25	5.70	<b>B</b>	3.43	1.14	0.74
					<b>W</b>	117.45	1.54	
<b>Post test mean</b>	7.95	7.25	6.45	5.55	<b>B</b>	64.16	21.38	15.23
					<b>W</b>	106.68	1.40	
<b>Adjusted post test mean</b>	7.93	7.14	6.25	5.85	<b>B</b>	51.76	17.25	137.03
					<b>W</b>	9.44	0.12	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence.

Table 4.19 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.74. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on flexibility was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on flexibility. The obtained ‘F’ ratio for the post-test was 15.23. The ‘F’ ratio needed for the significant differences



on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of flexibility was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on flexibility. The obtained 'F' ratio was 137.03. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of flexibility was significantly influenced by the treatments used in this study.

**TABLE- 4.20**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
PAIRED ADJUSTED POST-TEST MEANS OF FLEXIBILITY**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
7.93	7.14	-	-	0.79	0.04
7.93	-	6.25	-	1.68	
7.93	-	-	5.85	2.08	
-	7.14	6.25	-	0.89	
-	7.14	-	5.85	1.29	
-	-	6.25	5.85	0.4	

\*Significant

Table 4.20 shows the adjusted post-test means of the HI, LI, ZD, and CG were 7.93, 7.14, 6.25 and 5.85 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.79, 1.68, 2.08, 0.89, 1.29, 0.4 respectively. Since the value of mean difference was higher than the critical value of 0.04. Hence, it was found to be statistically significant at 0.05 level of confidence

From the result it was inferred that 12 weeks of HI program had flexibility more significantly than the LI, ZD and CG.

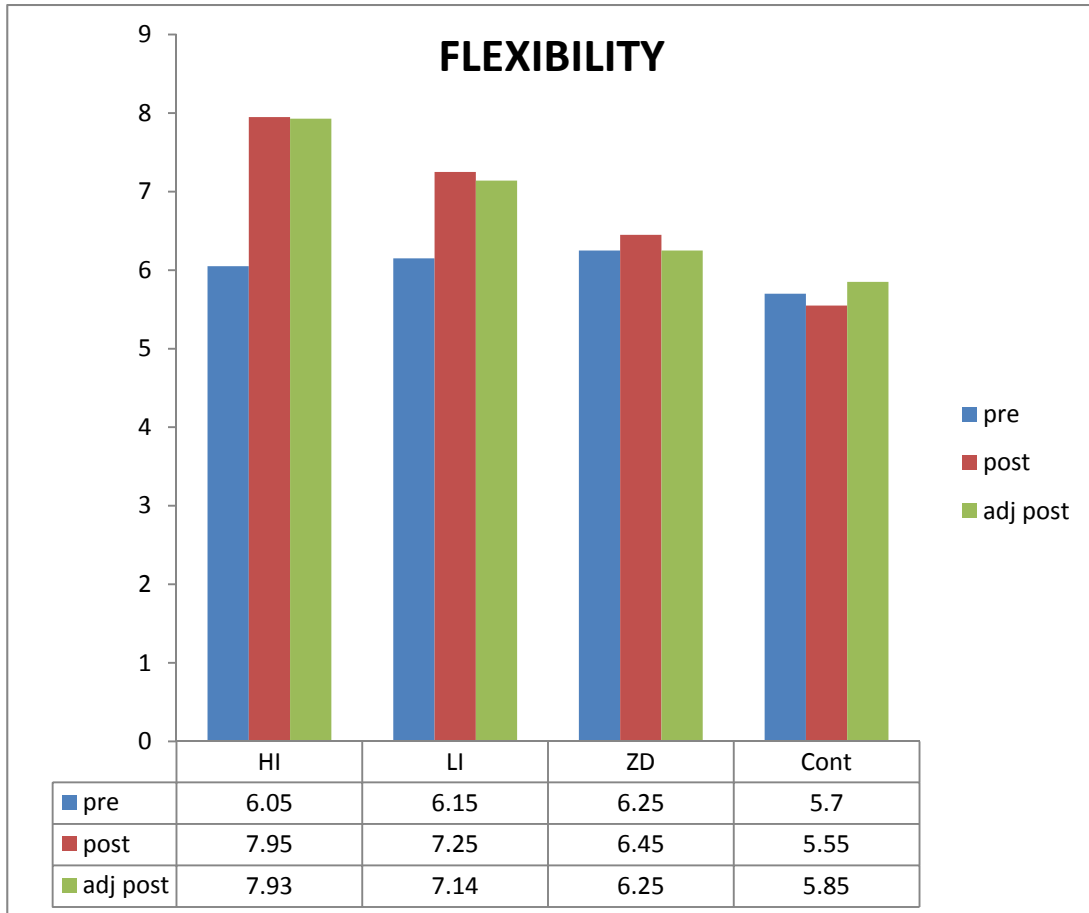
From these results it was inferred that LI had showed better improvement on flexibility when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on flexibility when compared with CG.

The mean of pre ,post and adjusted post test of experimental and control groups on flexibility are presented in the following figure 4.6.

**FIGURE – 4.6**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON FLEXIBILITY**



**TABLE-4.21****COMPUTATION OF ‘t’ RATIO ON MUSCULAR STRENGTH OF  
EXPERIMENTAL AND CONTROL GROUPS****(Score in counts)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	7.85	10.95	0.812	0.82	45.04
<b>LI</b>	7.80	9.85	0.83	0.812	41.00
<b>ZD</b>	7.75	8.80	0.85	0.89	21.00
<b>CG</b>	7.70	7.50	1.03	1.05	1.71

\*Significant at 0.05 level

Table 4.21 show that the ‘t’ ratio on muscular strength of HI, LI, ZD training group and CG were, 45.04\*, 41.00\*\* and 21.00\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.71 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.22**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
MUSCULAR STRENGTH**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	7.85	7.80	7.75	7.70	<b>B</b>	0.25	0.08	0.10
					<b>W</b>	59.70	0.78	
<b>Post test mean</b>	10.95	9.85	8.80	7.50	<b>B</b>	130.25	43.41	53.47
					<b>W</b>	61.70	0.81	
<b>Adjusted post test mean</b>	10.87	9.82	8.82	7.57	<b>B</b>	119.23	39.74	342.59
					<b>W</b>	8.70	0.11	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.22 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.10. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on muscular strength was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on muscular strength. The obtained ‘F’ ratio for the post-test was 53.47. The ‘F’ ratio needed for the significant differences

on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of muscular strength was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on muscular strength. The obtained 'F' ratio was 342.59. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of muscular strength was significantly influenced by the treatments used in this study.

**TABLE-4.23**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON MUSCULAR STRENGTH**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
10.87	9.82	-	-	1.05	0.03
10.87	-	8.82	-	2.05	
10.87	-	-	7.57	3.3	
-	9.82	8.82	-	1	
-	9.82	-	7.57	2.25	
-	-	8.82	7.57	1.25	

\*Significant

Table 4.23 shows the adjusted post-test means of the HI, LI, ZD, and CG were 10.87, 9.82, 8.82 and 7.57 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 1.05, 2.05, 3.3, 1, 2.25, 1.25 respectively. Since the value of mean difference was higher than the critical value of 0.03. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved muscular strength significantly than the LI, ZD and CG.

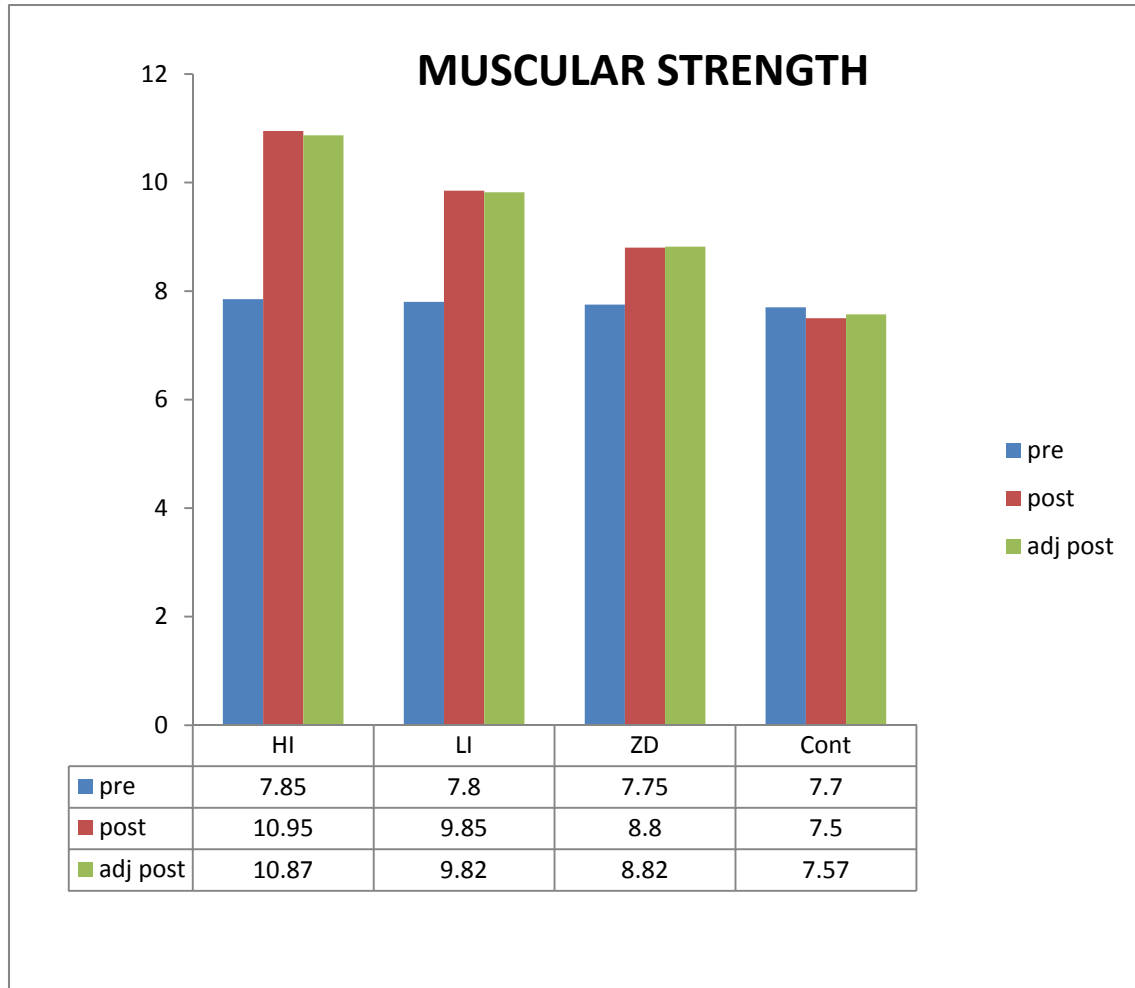
From these results it was inferred that LI had showed better improvement on muscular strength compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on muscular strength compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on muscular strength are presented in the following figure 4.7.

**FIGURE – 4.7**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON MUSCULAR STRENGTH**





**TABLE-4.24****COMPUTATION OF 'T' RATIO ON CARDIO RESPIRATORY  
ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS****(Score in meters)**

<b>group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>'t' ratio</b>
<b>HI</b>	716.25	748.15	21.57	23.03	38.43
<b>LI</b>	716.75	737.05	22.84	22.41	26.91
<b>ZD</b>	716.25	725.40	18.12	18.87	14.83
<b>CG</b>	716.50	715.75	16.31	17.34	1.37

\*Significant at 0.05 level

Table 4.24 show that the 't' ratio on cardio respiratory endurance of HI, LI, ZD training group and CG were, 38.43\*, 26.91\*\* and 14.83\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.37 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.25**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED POST-TEST  
MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON CARDIO  
RESPIRATORY ENDURANCE**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	716.25	716.75	716.25	716.50	<b>B</b>	3.43	1.14	0.003
					<b>W</b>	30056.25	395.47	
<b>Post test mean</b>	748.15	737.05	725.40	715.75	<b>B</b>	11865.33	3955.11	9.36
					<b>W</b>	32114.05	422.55	
<b>Adjusted post test mean</b>	748.34	736.73	725.59	715.68	<b>B</b>	11919.10	3973.03	412.84
					<b>W</b>	721.77	9.62	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.25 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.003. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on cardio respiratory endurance was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on cardio respiratory endurance. The obtained ‘F’ ratio for the post-test was 9.36. The ‘F’ ratio needed for the

significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed ‘F’ ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of cardio respiratory endurance was statistically significant.

In the adjusted post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on cardio respiratory endurance. The obtained ‘F’ ratio was 412.84. Since the observed ‘F’ ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of cardio respiratory endurance was significantly influenced by the treatments used in this study.

**TABLE-4.26**

**SCHEFFE’S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON CARDIO RESPIRATORY  
 ENDURANCE**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
748.34	736.73	-	-	11.61	0.36
748.34	-	725.59	-	22.75	
748.34	-	-	715.68	32.66	
-	736.73	725.59	-	11.14	
-	736.73	-	715.68	21.05	
-	-	725.59	715.68	9.91	
-	-	-	-	-	

\*Significant

Table 4.26 shows the adjusted post-test means of the HI, LI, ZD, and CG were 748.34, 736.73, 725.59 and 715.68 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 11.61, 22.75, 32.66, 11.14, 21.05, 9.91 respectively. Since the value of mean difference was higher than the critical value of 0.36. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved cardio respiratory endurance significantly than the LI, ZD and CG.

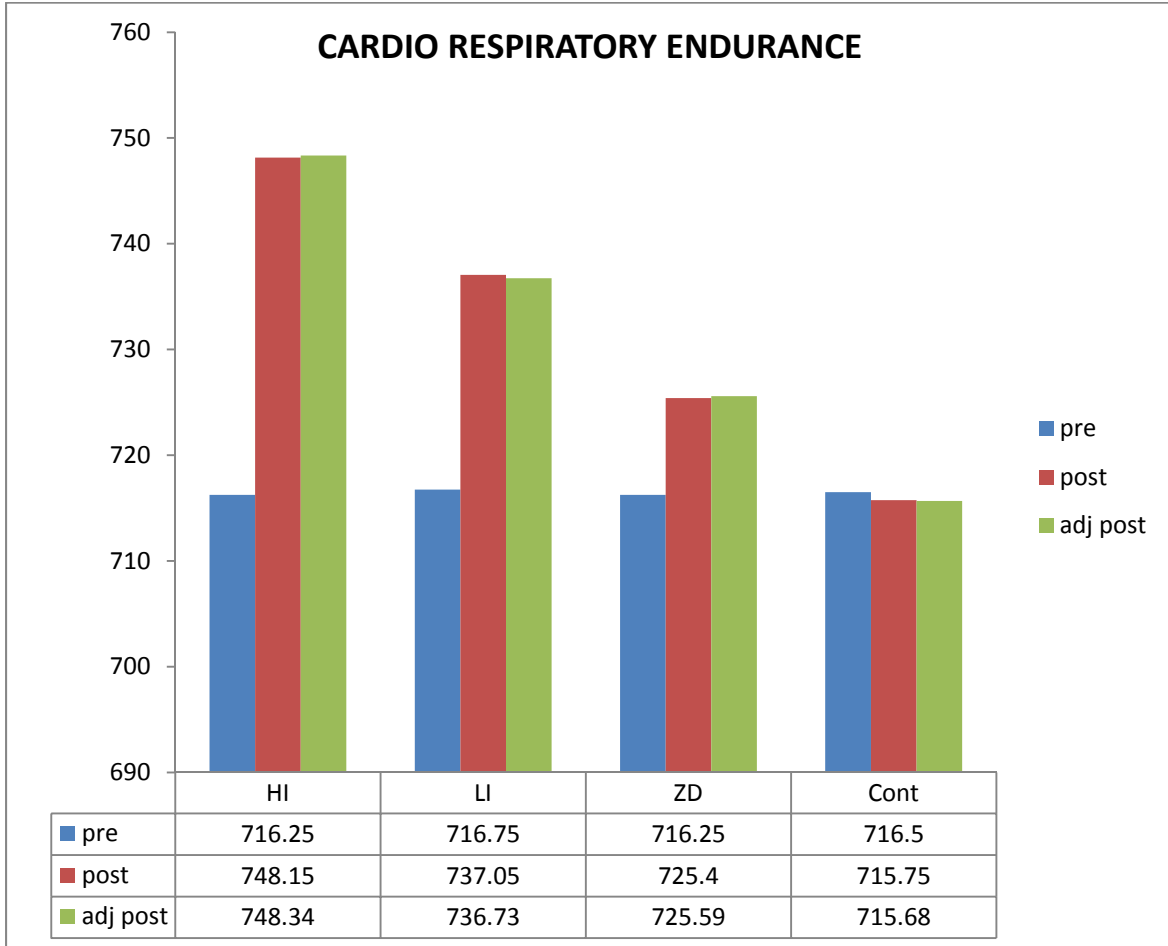
From these results it was inferred that LI had showed better improvement on cardio respiratory endurance compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on cardio respiratory endurance compared with CG.

The mean of pre ,post and adjusted post test of experimental and control groups on cardio respiratory endurance are presented in the following figure 4.8.

**FIGURE – 4.8**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON CARDIO RESPIRATORY  
ENDURANCE**



**TABLE-4.27**

**COMPUTATION OF ‘t’ RATIO ON STRESS OF EXPERIMENTAL AND CONTROL GROUPS**

**(Score in points)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	26.80	23.60	1.82	1.75	34.87
<b>LI</b>	26.85	24.85	1.63	1.63	27.56
<b>ZD</b>	26.95	25.85	1.73	1.81	15.98
<b>CG</b>	26.55	26.65	2.21	2.32	1.45

Significant at 0.05 level

Table 4.27 show that the ‘t’ ratio on Stress of HI, LI, ZD training group and CG were, 34.87\*, 27.56\*\* and 15.98\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.45 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.28**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON STRESS**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	26.80	26.85	26.95	26.55	<b>B</b>	1.73	0.57	0.16
					<b>W</b>	263.65	3.46	
<b>Post test mean</b>	23.60	24.85	25.85	26.65	<b>B</b>	104.03	34.67	9.60
					<b>W</b>	274.45	3.61	
<b>Adjusted post test mean</b>	23.58	24.78	25.68	26.88	<b>B</b>	116.85	38.95	332.10
					<b>W</b>	8.79	0.117	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.28 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.16. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Stress was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Stress. The obtained ‘F’ ratio for the post-test was 9.60. The ‘F’ ratio needed for the significant differences on the

mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Stress was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Stress. The obtained 'F' ratio was 332.10. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Stress was significantly influenced by the treatments used in this study.

**TABLE-4.29**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON STRESS**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
23.58	24.78	-	-	1.2	0.03
23.58	-	25.68	-	2.1	
23.58	-	-	26.88	3.3	
-	24.78	25.68	-	0.9	
-	24.78	-	26.88	2.1	
-	-	25.68	26.88	1.2	

\*Significant



Table 4.29 shows the adjusted post-test means of the HI, LI, ZD, and CG were 23.58, 24.78, 25.68 and 26.88 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 1.2, 2.1, 3.3, 0.9, 2.1, 1.2 respectively. Since the value of mean difference was higher than the critical value of 0.03. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved Stress more significantly than the LI, ZD and CG.

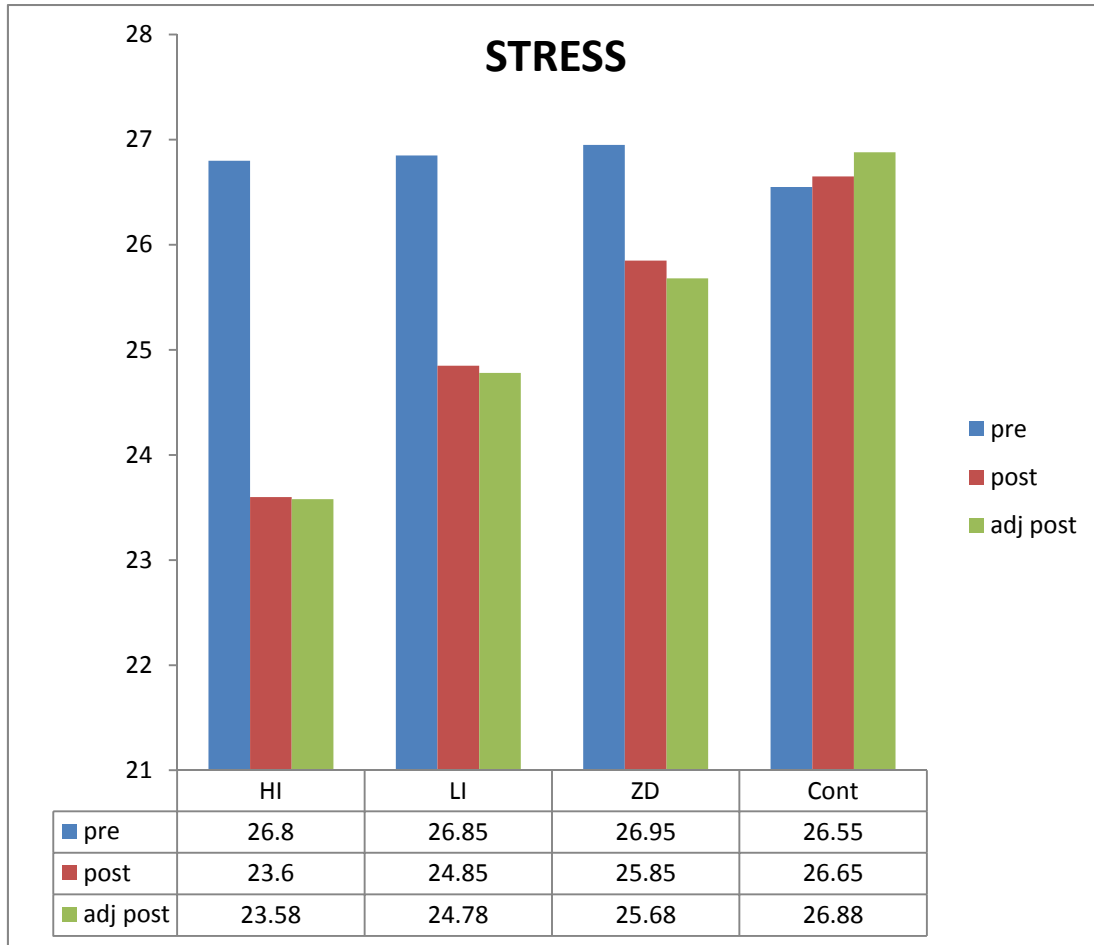
From these results it was inferred that LI had showed better improvement on Stress when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Stress when compared with CG.

The mean of pre ,post and adjusted post test of experimental and control groups on Stress are presented in the following figure 4.9.

**FIGURE – 4.9**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON STRESS**



**TABLE-4.30****COMPUTATION OF ‘T’ RATIO ON ANXIETY OF EXPERIMENTAL AND CONTROL GROUPS****(Score in points)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	20.15	17.10	3.09	3.22	34.61
<b>LI</b>	20.40	18.15	3.78	3.77	22.65
<b>ZD</b>	20.80	19.55	3.59	3.45	10.16
<b>CG</b>	20.05	20.15	3.61	3.64	1.45

Significant at 0.05 level

Table 4.30 show that the ‘t’ ratio on Anxiety of HI, LI, ZD training group and CG were, 34.61\*, 22.65\*\* and 10.16\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.45 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.31**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
ANXIETY**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	20.15	20.40	20.80	20.05	<b>B</b>	6.70	2.23	0.17
					<b>W</b>	949.50	12.49	
<b>Post test mean</b>	17.10	18.15	19.55	20.15	<b>B</b>	113.63	37.87	3.03
					<b>W</b>	947.85	12.47	
<b>Adjusted post test mean</b>	17.29	18.10	19.10	20.44	<b>B</b>	110.70	36.90	195.12
					<b>W</b>	14.18	0.18	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.31 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.17. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Anxiety was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Anxiety. The obtained ‘F’ ratio for the post-test was 3.03 The ‘F’ ratio needed for the significant differences on

the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Anxiety was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Anxiety. The obtained 'F' ratio was 195.12. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Anxiety was significantly influenced by the treatments used in this study.

**TABLE-4.32**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON ANXIETY**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
17.29	18.10	-	-	0.81	0.04
17.29		19.10	-	1.81	
17.29	-	-	20.44	3.15	
-	18.10	19.10	-	1	
-	18.10	-	20.44	2.34	
-	-	19.10	20.44	1.34	

\*Significant

Table 4.32 shows the adjusted post-test means of the HI, LI, ZD, and CG were 17.29, 18.10, 19.10 and 20.44 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 0.81, 1.81, 3.15, 1, 2.34, 1.34 respectively. Since the value of mean difference was higher than the critical value of 0.04. Hence, it was found to be statistically significant at 0.05 level of confidence

From the result it was inferred that 12 weeks of HI program had improved Anxiety more significantly than the LI, ZD and CG.

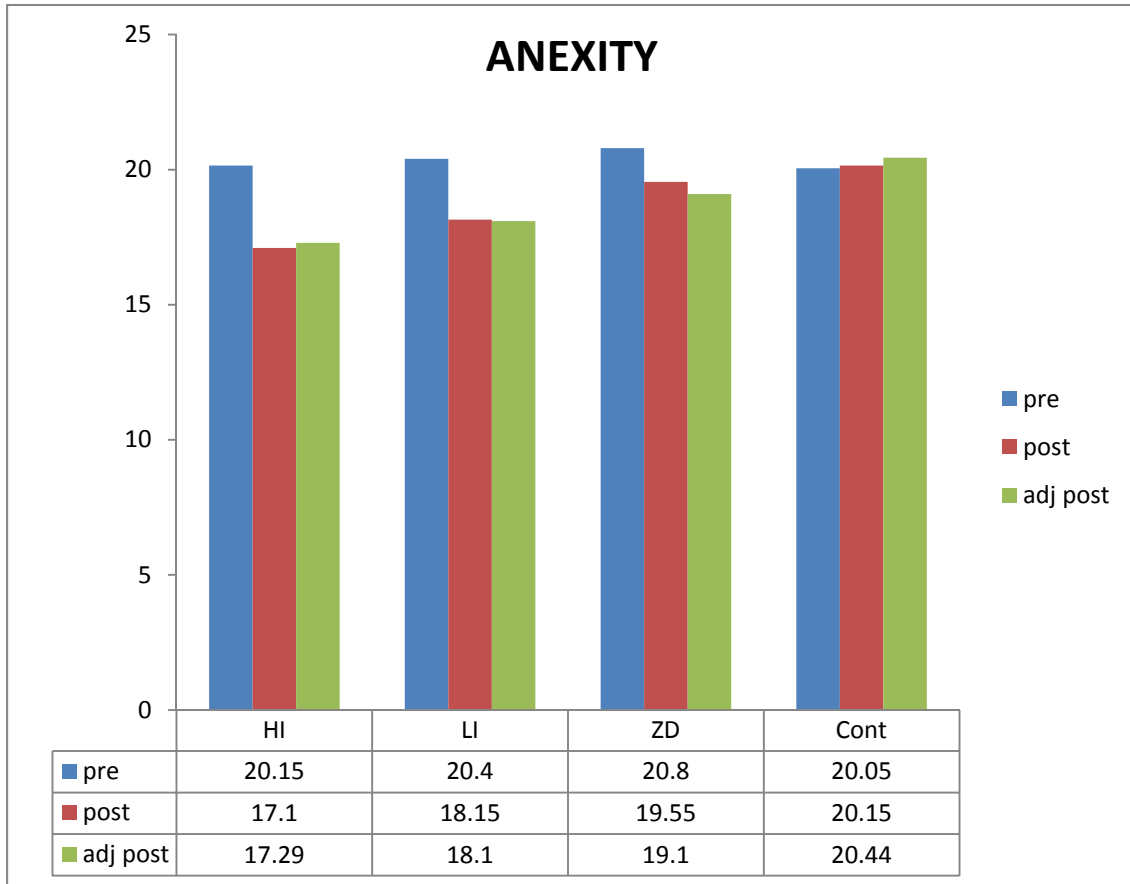
From these results it was inferred that LI had showed better improvement on Anxiety when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Anxiety when compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on anxiety are presented in the following figure 4.10.

**FIGURE – 4.10**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON ANXIETY**



**TABLE-4.33****COMPUTATION OF ‘t’ RATIO ON ACHIEVEMENT MOTIVATION OF  
EXPERIMENTAL AND CONTROL GROUPS****(Score in points)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>‘t’ ratio</b>
<b>HI</b>	16.95	20.05	4.04	4.09	31.00
<b>LI</b>	16.85	18.90	3.80	3.69	23.26
<b>ZD</b>	16.65	17.80	3.08	3.12	14.03
<b>CG</b>	16.70	16.55	2.53	2.50	1.83

Significant at 0.05 level

Table 4.33 show that the ‘t’ ratio on Achievement motivation of HI, LI, ZD training group and CG were, 31.00\*, 23.26\*\* and 14.03\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.83 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.



**TABLE-4.34**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
ACHIEVEMENT MOVATION**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	16.95	16.85	16.65	16.70	<b>B</b>	1.13	0.37	0.03
					<b>W</b>	888.25	11.68	
<b>Post test mean</b>	20.05	18.90	17.80	16.55	<b>B</b>	134.65	44.88	3.86
					<b>W</b>	882.90	11.61	
<b>Adjusted post test mean</b>	19.88	18.83	17.93	16.63	<b>B</b>	114.11	38.04	242.46
					<b>W</b>	11.76	0.15	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.34 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG.

The obtained ‘F’ ratio for the pre-test was 0.03. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Achievement motivation was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Achievement motivation. The obtained ‘F’ ratio for the post-test was 3.86The ‘F’ ratio needed for the

significant differences on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Achievement motivation was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Achievement motivation. The obtained 'F' ratio was 242.46. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Achievement motivation was significantly influenced by the treatments used in this study.

**TABLE-4.35**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON ACHIEVEMENT  
 MOTIVATION**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
19.88	18.83	-	-	1.05	0.04
19.88		17.93	-	1.95	
19.88	-	-	16.63	3.25	
-	18.83	17.93	-	0.9	
-	18.83	-	16.63	2.2	
-	-	17.93	16.63	1.3	

\*Significant

Table 4.35 shows the adjusted post-test means of the HI, LI, ZD, and CG were 19.88, 18.83, 17.93 and 16.63 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 1.051.95, 3.25, 0.9, 2.2, 1.3 respectively. Since the value of mean difference was higher than the critical value of 0.04. Hence, it was found to be statistically significant at 0.05 level of confidence

From the result it was inferred that 12 weeks of HI program had improved Achievement motivation more significantly than the LI, ZD and CG.

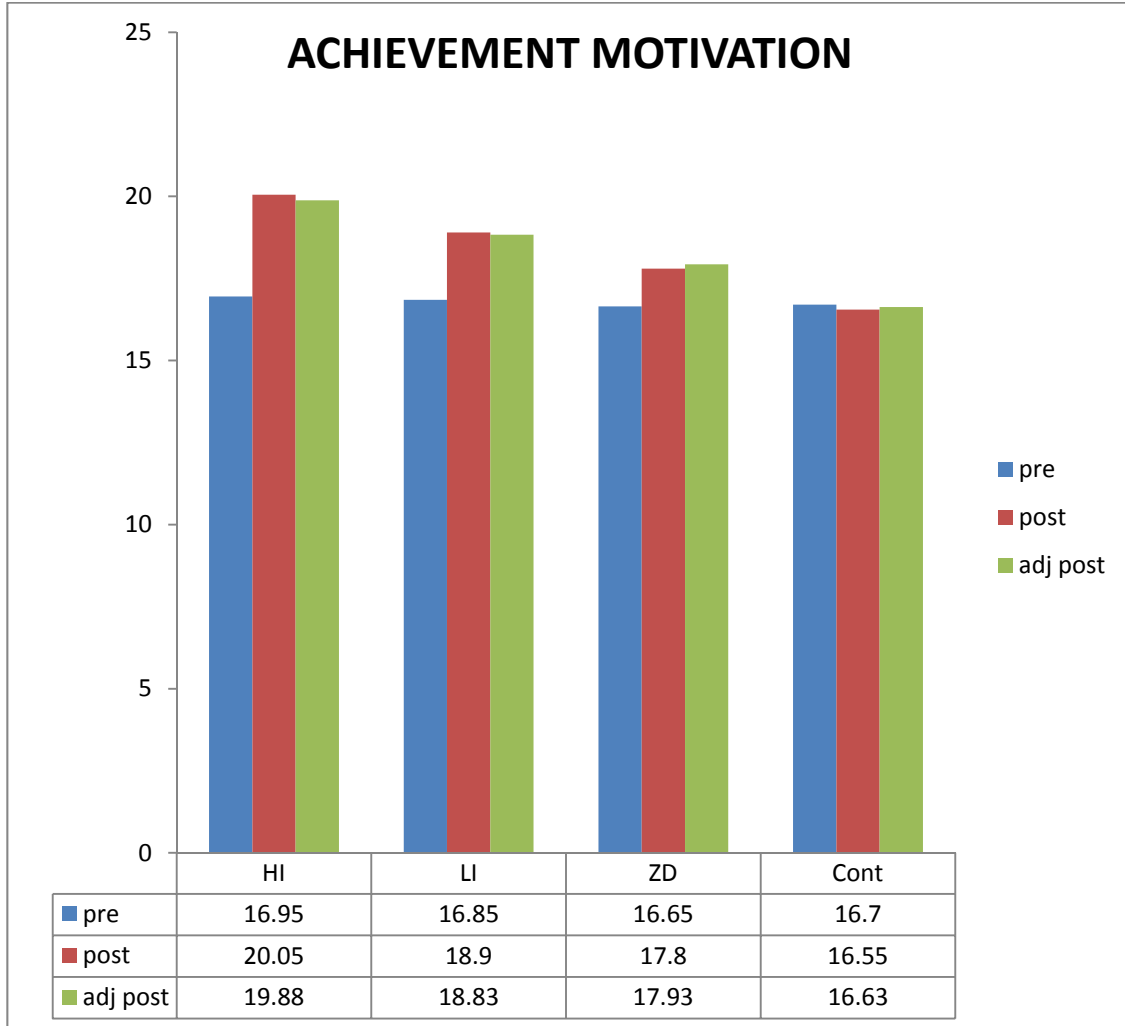
From these results it was inferred that LI had showed better improvement on Achievement motivation when compared with ZD and CG.

From these results it was inferred that ZD had showed better improvement on Achievement motivation when compared with CG.

The mean of pre, post and adjusted post test of experimental and control groups on achievement motivation are presented in the following figure 4.11.

**FIGURE 4.11**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON ACHIEVEMENT  
MOTIVATION**



**TABLE-4.36****COMPUTATION OF 't' RATIO ON SELF-CONCEPT OF EXPERIMENTAL  
AND CONTROL GROUPS****(Score in points)**

<b>Group</b>	<b>Pre Test mean</b>	<b>Post Test mean</b>	<b>Pre test Std.Dev</b>	<b>Post test Std.Dev</b>	<b>'t' ratio</b>
<b>HI</b>	139.65	151.95	13.47	13.13	19.83
<b>LI</b>	139.70	147.80	14.65	15.11	16.13
<b>ZD</b>	139.65	143.05	14.07	13.99	15.28
<b>CG</b>	139.85	139.75	14.53	14.62	1.45

Significant at 0.05 level

Table 4.36 show that the 't' ratio on Self confidence of HI, LI, ZD training group and CG were, 19.83\*, 16.13\*\* and 15.28\* respectively. Since, these values were higher than the required table value of 2.09, it was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Since, the T values 1.45 of control group were lesser than the required table value of 2.09, it was found to be statistically insignificant at 0.05 level of confidence for the degrees of freedom 1 and 19.

**TABLE-4.37**

**ANALYSIS OF COVARIANCE ON PRE, POST AND ADJUSTED  
POST-TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON  
SELF-CONCEPT**

<b>Mean</b>	<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>S.V</b>	<b>S.S</b>	<b>M.S</b>	<b>F</b>
<b>Pre test mean</b>	139.65	139.70	139.65	139.85	<b>B</b>	0.538	0.17	0.001
					<b>W</b>	15309.85	201.44	
<b>Post test mean</b>	151.95	147.85	143.05	139.75	<b>B</b>	1722.000	574.00	2.82
					<b>W</b>	15438.200	203.13	
<b>Adjusted post test mean</b>	152.01	147.86	143.11	139.61	<b>B</b>	1765.113	588.37	167.75
					<b>W</b>	263.052	3.50	

Table F – ratio at 0.05 level of confidence for 3 and 76 (df) = 2.72, 3 and 75 (df) = 2.72

\*Significant at 0.05 level of confidence

Table 4.37 show the results of ‘F’ ratio for Pre-test scores, post-test and adjusted post test scores of HI, LI, ZD, and CG

The obtained ‘F’ ratio for the pre-test was 0.001. It was found to be lesser than the required table value of 2.72 for the degrees of freedom 3 and 76. Hence, it was inferred that the mean difference among four groups at pre-test on Self confidence was statistically insignificant at 0.05 level of confidence.

In the post-test data analysis, the ‘F’ ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Self confidence. The obtained ‘F’ ratio for the post-test was 2.82. The ‘F’ ratio needed for the significant differences

on the mean, for degrees of freedom 3 and 76 was 2.72 at 0.05 level of confidence. Since the observed 'F' ratio on this variable was higher than the table value needed for significance, it was inferred that the mean differences among four groups at post-test of Self confidence was statistically significant.

In the adjusted post-test data analysis, the 'F' ratio was applied to test the significance of mean differences among the HI, LI, ZD, and CG on Self confidence. The obtained 'F' ratio was 167.75. Since the observed 'F' ratio was greater than the required table value of 2.72 for degrees of freedom 3 and 75 at 0.05 level of confidence, it was concluded that the performance of Self confidence was significantly influenced by the treatments used in this study.

**TABLE-4.38**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE  
 PAIRED ADJUSTED POST-TEST MEANS ON SELF-CONCEPT**

<b>HI</b>	<b>LI</b>	<b>ZD</b>	<b>CG</b>	<b>Mean Difference</b>	<b>Confidential Interval</b>
152.01	147.86	-	-	4.15	0.21
152.01		143.11	-	8.9	
152.01	-	-	139.61	12.4	
-	147.86	143.11	-	4.75	
-	147.86	-	139.61	8.25	
-	-	143.11	139.61	3.5	

\*Significant

Table 4.38 shows the adjusted post-test means of the HI, LI, ZD, and CG were 152.01, 147.86, 143.11 and 139.61 respectively.

The absolute mean differences between the HI with LI, HI with ZD, HI with CG, LI with ZD, LI with CG, ZD with CG was 4.15, 8.9, 12.4, 4.75, 8.25, 3.5 respectively. Since the value of mean difference was higher than the critical value of 0.21. Hence, it was found to be statistically significant at 0.05 level of confidence.

From the result it was inferred that 12 weeks of HI program had improved Self confidence more significantly than the LI, ZD and CG.

From these results it was inferred that LI had showed better improvement on Self confidence when compared with ZD and CG.

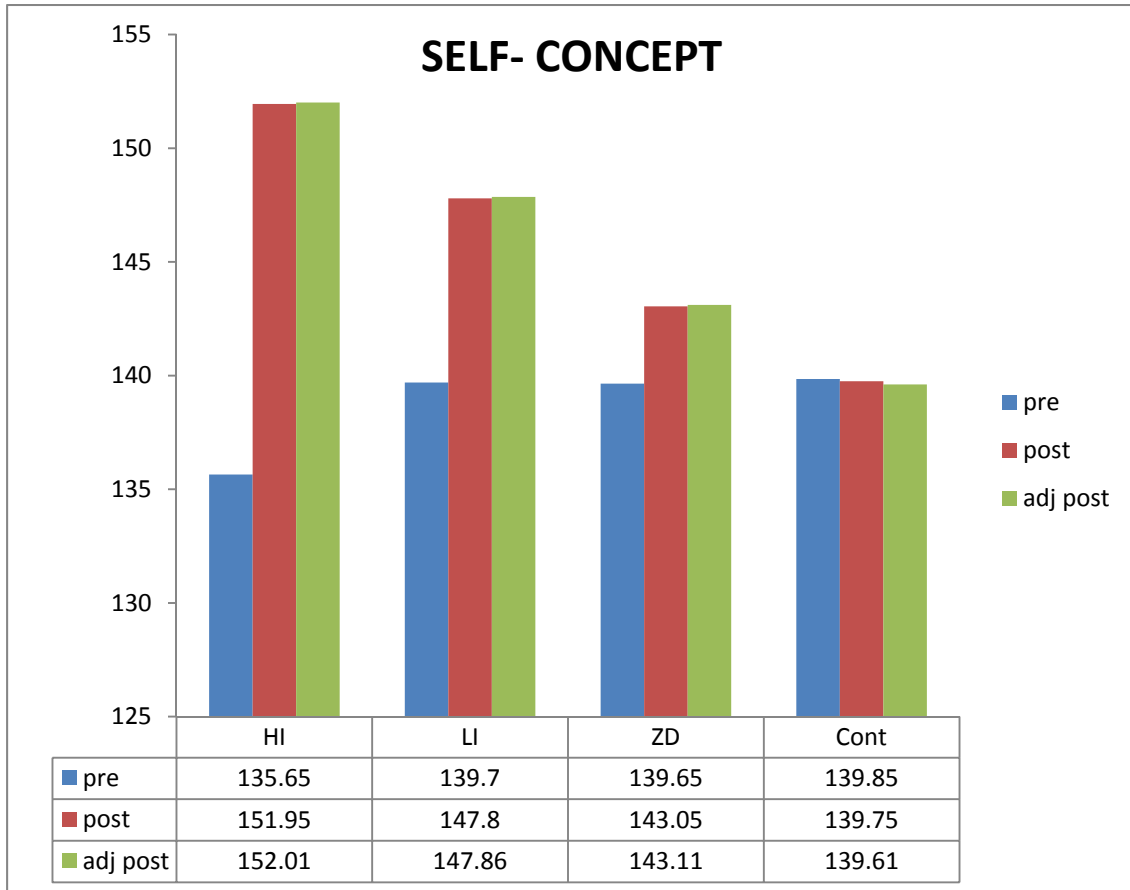
From these results it was inferred that ZD had showed better improvement on Self confidence when compared with CG.

The means of pre, post adjusted post test experimental and control groups on self -concept following figure 4.12.



**FIGURE – 4.12**

**THE MEAN OF PRE, POST AND ADJUSTED POST TEST OF  
EXPERIMENTAL AND CONTROL GROUPS ON SELF -CONCEPT**



## **4.5 DISCUSSION ON THE FINDINGS**

The results of this study showed that the subjects participated in varied dance fitness program with yoga training for the period of twelve weeks were able to improve their performance in cardio-pulmonary, physical and psychological variables. After analyzing the results the researcher found that there were significant differences among the experimental and control group and there was a significant improvement over cardio-pulmonary, physical and psychological variables of experimental groups. Detailed discussions on the discussion of the selected variables were followed.

### **VO<sub>2</sub>MAX**

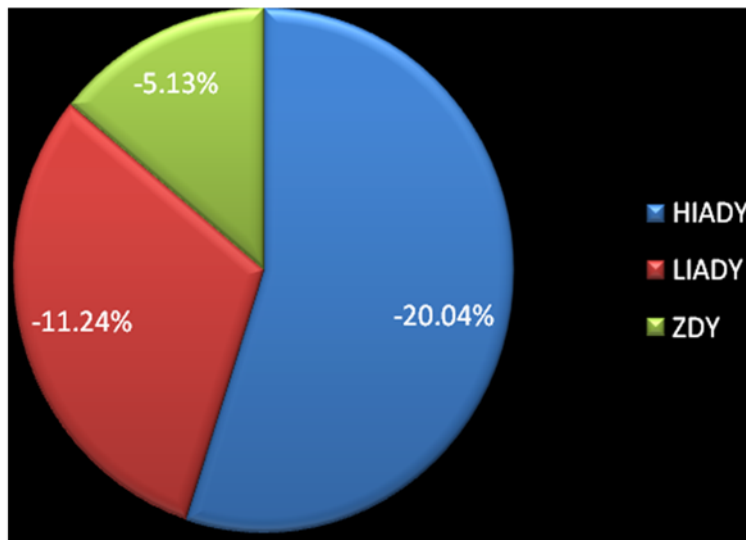
The effects of twelve weeks training interventions have improved the nature of body composition. The body composition development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 22.2 to post 26.65, low intensity aerobic training with yoga (LI) effect from pre 22.7 to post 25.25, zumba dance training with yoga (ZD) effect from pre 22.4 to post 23.55.

The percentage of improvement on VO<sub>2</sub> Max of high intensity aerobic training with yoga (HI) was -20.04, low intensity aerobic training with yoga (LI) was -11.24, zumba dance training with yoga (ZD) was -5.13. The result shows that high intensity aerobic training with yoga group improved the VO<sub>2</sub> Max than other three groups.

The percentage of improvement on VO<sub>2</sub> Max represented in the following figure 4.13.

**FIGURE – 4.13**

**PERCENTAGE OF IMPROVEMENT IN VO<sub>2</sub> MAX AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA GROUPS**



The result of the present study was in line with the following studies which the results are in concurrence. **Barene (2014)** who conducted a 12 weeks' practice of soccer and zumba which were found to be significantly improved the VO<sub>2</sub> max peak among female hospital employees. The result of the study was also concurrence. **Mikalacki et al., (2011)** reported the level of significance was improved the value of Fitness Index (FITIND) and VO<sub>2</sub> max had developed due to pole walking as a result at 3 months among elderly women. **Mivachi et al., (2009)** found out that prediction of VO<sub>2</sub> max with daily step counts predicted and predicted VO<sub>2</sub> max correlated well with measured VO<sub>2</sub> max suggesting that step count is useful for VO<sub>2</sub> max in Japanese

women. **Arnulfo Ramos- Jimenez et al., (2009)** studied that improvement on VO<sub>2</sub> max had increased due to Hatha Yoga training group of 11 weeks among middle aged and older women.

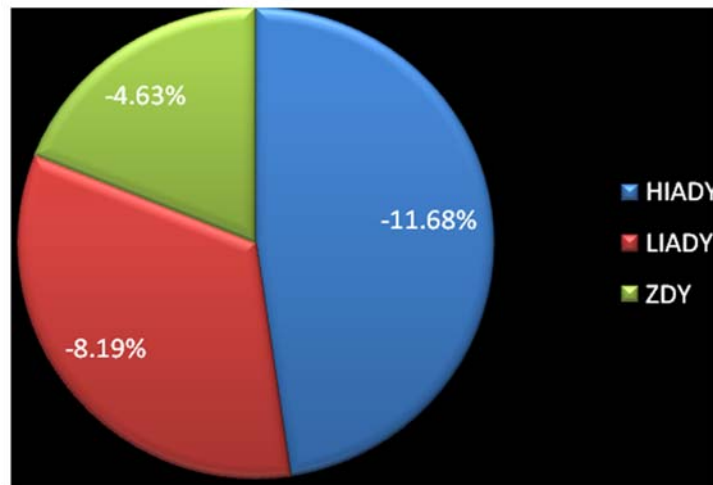
## **BREATH HOLDING TIME**

The effects of twelve weeks training interventions have improved the nature of breath holding time. The breath holding time development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 26.1 to post 29.15, low intensity aerobic training with yoga (LI) effect from pre 25.65 to post 27.75, zumba dance training with yoga (ZD) effect from pre 25.95 to post 27.15. The percentage of improvement on breath holding time of high intensity aerobic training with yoga (HI) was -11.68, low intensity aerobic training with yoga (LI) was -8.19, zumba dance training with yoga (ZD) was -4.63. The result shows that high intensity aerobic training with yoga group improved the breath holding time than other three groups.

The percentage of improvement on breath holding time represented in the following figure 4.14.

**FIGURE – 4.14**

**PERCENTAGE OF IMPROVEMENT IN BREATH HOLDING TIME  
AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW  
INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC  
DANCE WITH YOGA GROUPS**



The result of this study on breath holding time was in line with the result of the following experimental studies. Yaşar Köroğlu, 2021 conducted a study to search the effect of respiratory muscle training on aerobic, anaerobic endurance, and respiratory parameters in primary school students. The result of the study concluded that five-week respiratory muscle training positively affects aerobic and anaerobic endurance, respiratory functions, respiratory muscle strength of primary school students compared to students who do regular training.

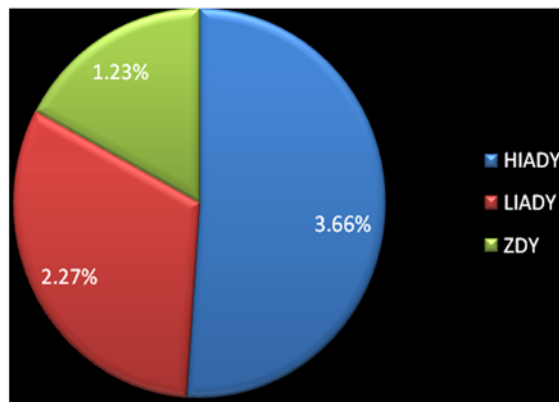
## **RESTING HEART RATE**

The effects of twelve weeks training interventions have improved the nature of resting heart rate. The resting heart rate development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 77.8 to post 74.95, low intensity aerobic training with yoga (LI) effect from pre 77.4 to post 75.65, zumba dance training with yoga (ZD) effect from pre 77.25 to post 76.3. The percentage of improvement on resting heart rate of high intensity aerobic training with yoga (HI) was 3.66, low intensity aerobic training with yoga (LI) was 2.27, zumba dance training with yoga (ZD) was 1.23. The result shows that high intensity aerobic training with yoga group improved the resting heart rate than other three groups.

The percentage of improvement on resting heart rate represented in the following figure 4.15.

**FIGURE – 4.15**

**PERCENTAGE OF IMPROVEMENT IN RESTING HEART RATE AMONG  
HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY  
AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE  
WITH YOGA GROUPS**



The result of this study on resting heart rate was incorporated with the result of the experimental study conducted by Arwa and Nedal (1895) who investigated the effect of such aerobic exercise for three weeks, specifically continuous treadmill running, on lung function (fvc, fev1, ratio of fev1/fvc, and mvv) in inactive yet healthy male individuals. Results of the study showed significant improvement after high-intensity aerobic exercise of different intensities on the pulmonary function of inactive healthy subjects.

**VITAL CAPACITY**

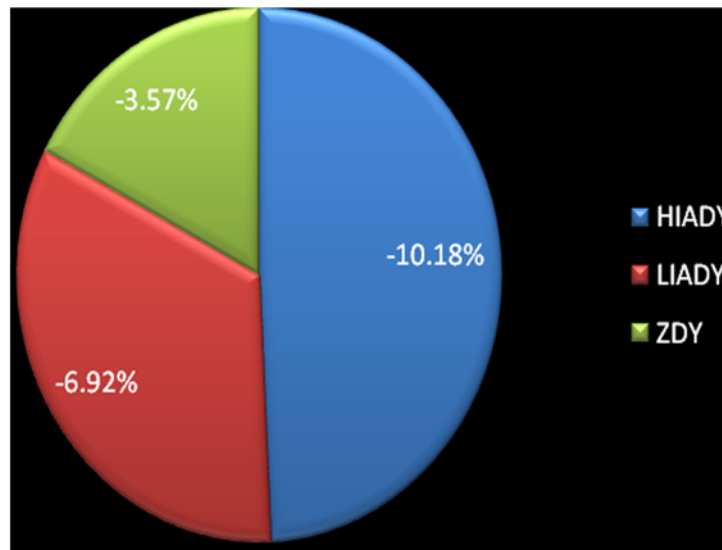
The effects of twelve weeks training interventions have improved the nature of vital capacity. The vital capacity development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 3.24 to post 3.57,

low intensity aerobic training with yoga (LI) effect from pre 3.25 to post 3.48, zumba dance training with yoga (ZD) effect from pre 3.22 to post 3.33. The percentage of improvement on vital capacity of high intensity aerobic training with yoga (HI) was -10.18, low intensity aerobic training with yoga (LI) was -6.92, zumba dance training with yoga (ZD) was -3.57. The result shows that high intensity aerobic training with yoga group improved the vital capacity than other three groups.

The percentage of improvement on vital capacity represented in the following figure 4.16.

**FIGURE – 4.16**

**PERCENTAGE OF IMPROVEMENT IN VITAL CAPACITY AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA GROUPS**





The result of this study on vital capacity was in accordance with the result of the experimental study conducted by Gulam (2017) on the effect of aerobic dance and pranayama on selected physiological variables.

Result of the study revealed that there was a significant difference in pulse rate, forced vital capacity (FVC), forced expiratory volume in first second (FEV1) and pulse rate and peak expiratory flow rate (PEFR) between pre and post test in aerobic dance group-(A) and pranayama experimental group-(B) are significant. But control group-(C) in all four variables are not significant. The result of the present study was also in lie with Cali and Craig (2011) who conducted study to determine whether high-intensity interval training (HIT) would increase respiratory muscle strength and expiratory flow rates more than endurance training (ET). The result of the study revealed that both whole-body exercise training and HIT are effective in increasing inspiratory muscle strength with HIT offering a time-efficient alternative to ET in improving aerobic capacity and performance.

## **BODY COMPOSITION**

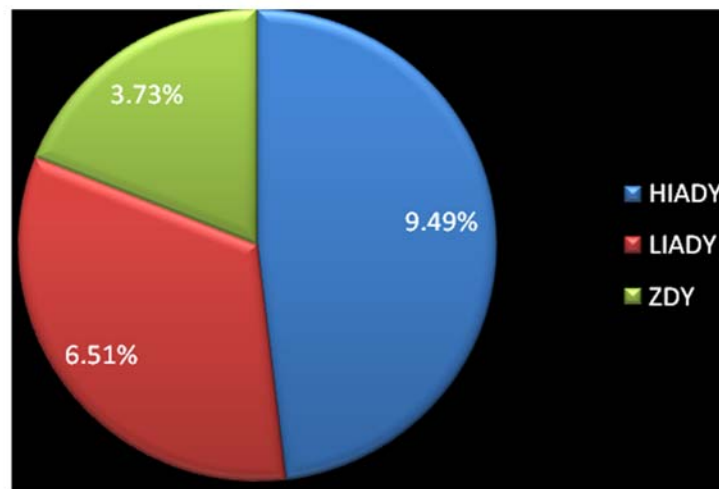
The effects of twelve weeks training interventions have improved the nature of body composition. The body composition development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 29.5 to post 26.7, low intensity aerobic training with yoga (LI) effect from pre 29.25 to post 27.35, zumba dance training with yoga (ZD) effect from pre 29.45 to post 28.35. The percentage of improvement on body composition of high intensity aerobic training with yoga (HI) was 9.49 low intensity aerobic training with yoga (LI) was

6.51, zumba dance training with yoga (ZD) was 3.73. The result shows that high intensity aerobic training with yoga group improved the body composition than other three groups.

The percentage of improvement on body composition represented in the following figure 4.17.

**FIGURE – 4.17**

**PERCENTAGE OF IMPROVEMENT IN BODY COMPOSITION AMONG  
HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY  
AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE  
WITH YOGA GROUPS**



The result of this study on body composition was incorporated with the result of **Taghian et al., (2011)** who carried out a study on the effects of a 12-week aerobic training on body composition, statistically significant differences were determined in weight, percentage of fatty tissue, the body mass index, hip volume and certain

biochemical parameters between the two groups. The conclusion stated that a 12-week moderate aerobic exercise program leads to control of body weight among overweight individuals and a reduction in cardiovascular factors of risk of disease. The result of present study was also in line with Evirm et al., 2011 who made a study on eight weeks aerobic-dance exercises program and the result stated that significant improvement shown in weight change and Resting pulse rate, body fat percentage, body composition parameters and lean body mass in overweight women.

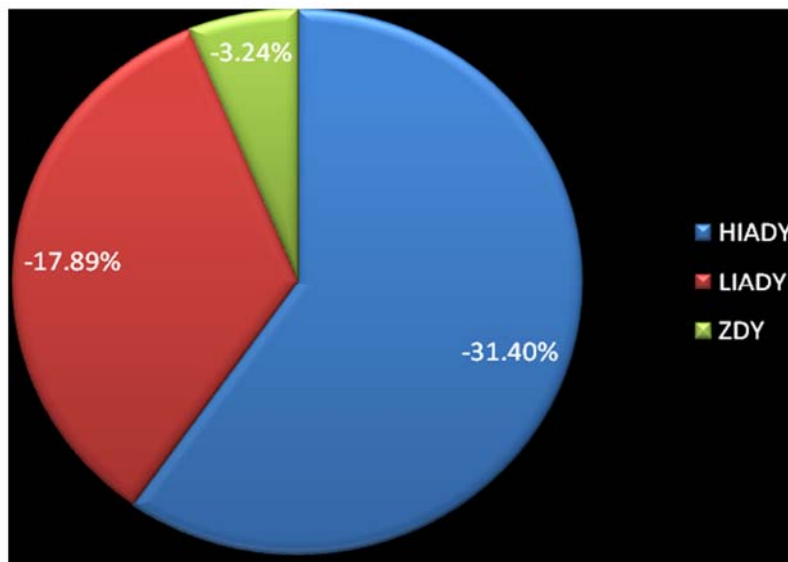
## **FLEXIBILITY**

The effects of twelve weeks training interventions have improved the nature of flexibility. The flexibility development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 6.05 to post 7.95, low intensity aerobic training with yoga (LI) effect from pre 6.15 to post 7.25, zumba dance training with yoga (ZD) effect from pre 6.25 to post 6.45. The percentage of improvement on flexibility of high intensity aerobic training with yoga (HI) was -31.40 low intensity aerobic training with yoga (LI) was -17.89, zumba dance training with yoga (ZD) was -3.24. The result shows that high intensity aerobic training with yoga group improved the flexibility than other three groups.

The percentage of improvement on flexibility represented in the following figure 4.18.

**FIGURE – 4.18**

**PERCENTAGE OF IMPROVEMENT IN FLEXIBILITY AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA GROUPS**



The result of this study on flexibility was incorporated with the result of **Swathi et al, 2015** who conducted a study on the effect of aerobic and Zumba training and its result concluded that the physical fitness variables namely cardio respiratory endurance, abdominal strength and flexibility are significantly improved.

It is also concluded that the physical fitness variables namely cardio respiratory endurance, abdominal strength and flexibility are significantly improved due to zumba training. The present study's result is also in line with **Zahra et al., (2015)** who suggested that there cannot be a significant difference between the effects of these exercises on flexibility and balance. However, the results showed that aerobics

is more effective than yoga in improving anaerobic capacity, muscular endurance, and agility in women.

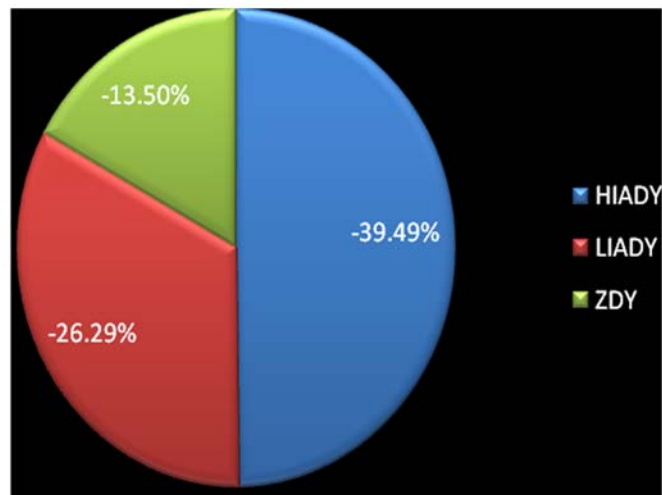
## **MUSCULAR STRENGTH**

The effects of twelve weeks training interventions have improved the nature of muscular strength. The muscular strength development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 7.85 to post 10.95, low intensity aerobic training with yoga (LI) effect from pre 7.8 to post 9.85, zumba dance training with yoga (ZD) effect from pre 7.75 to post 8.8. The percentage of improvement on muscular strength of high intensity aerobic training with yoga (HI) was -39.49 low intensity aerobic training with yoga (LI) was -26.29, zumba dance training with yoga (ZD) was -13.50. The result shows that high intensity aerobic training with yoga group improved the muscular strength than other three groups.

The percentage of improvement on muscular strength represented in the following figure 4.19.

**FIGURE – 4.19**

**PERCENTAGE OF IMPROVEMENT IN MUSCULAR STRENGTH AMONG  
HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY  
AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE  
WITH YOGA GROUPS**



The result of this study on muscular strength was in line with the result of **Chanelle et al., (2009)** who concluded in their study that the aerobic-based physical activity programme improved aerobic endurance, muscular strength and muscular endurance, and the tone of the body.

**Hopkins et al., (1990)** reported that 12 weeks of low impact aerobic dance, the group improved significantly on all functional fitness components.

**Vairavasundaram et al., (2014)** showed that significant improvement in all the selected physical variables namely agility, explosive power, muscular strength endurance and flexibility among handball players. **Mathewos et al., (2013)** evaluated

that aerobic exercise has positive effect on improvement of cardiovascular endurance, muscular strength, muscular endurance and flexibility. **Justin et al., (2009)** investigated that best to structure dance programs for older adults to maximize gains in physical function while ensuring participant safety and enjoyment.

**Sovova E et al., (2015)** found out that maximum oxygen consumption significantly higher performance in Yoga group as a result of 2 years among normal population.

### **CARDIO RESPIRATORY ENDURANCE**

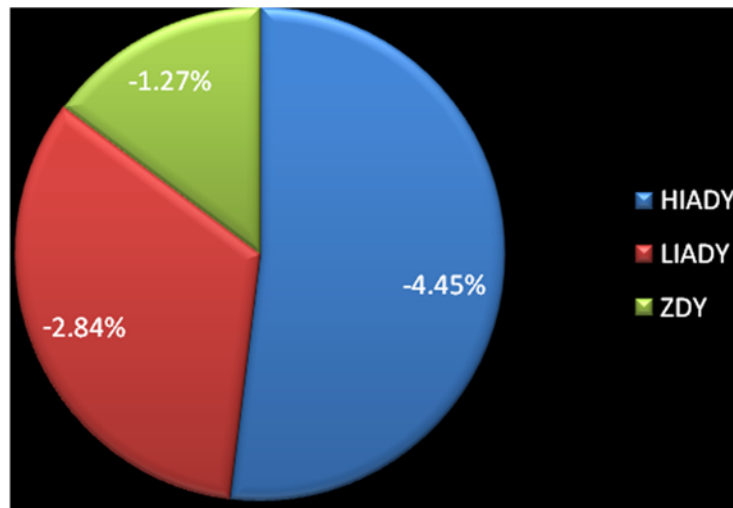
The effects of twelve weeks training interventions have improved the nature of cardio respiratory endurance. The cardio respiratory endurance development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 716.25 to post 748.15, low intensity aerobic training with yoga (LI) effect from pre 716.75 to post 737.05, zumba dance training with yoga (ZD) effect from pre 716.25 to post 725.4.

The percentage of improvement on cardio respiratory endurance of high intensity aerobic training with yoga (HI) was -4.45 low intensity aerobic training with yoga (LI) was -2.84, zumba dance training with yoga (ZD) was -1.27. The result shows that high intensity aerobic training with yoga group improved the cardio respiratory endurance than other three groups.

The percentage of improvement on cardio respiratory endurance represented in the following figure 4.20.

**FIGURE – 4.20**

**PERCENTAGE OF IMPROVEMENT IN CARDIO RESPIRATORY  
ENDURANCE AMONG HIGH INTENSITY AEROBIC DANCE WITH  
YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA  
DANCE AEROBIC DANCE WITH YOGA GROUPS**



The result of this study on cardio respiratory endurance was incorporated with the result of **De Meersman, Bagiella, Brondolo et al., (2011)** analysed that whether the regular aerobic exercise improves fitness parameters and the result of his study strongly recommended that inclusion of aerobic activities of moderate intensity, with a duration of exercise of at least 30 minutes during the day, with a frequency of five days a week. The aforementioned recommendations hold for individuals aged 18 to 65 years.

**Haskell et al., (2007)** conducted a an aerobic training program and the obtained results justified that the application of the aerobic model of exercise, as one of the models of improvement of certain fitness components, cardio respiratory fitness and body composition.



## STRESS

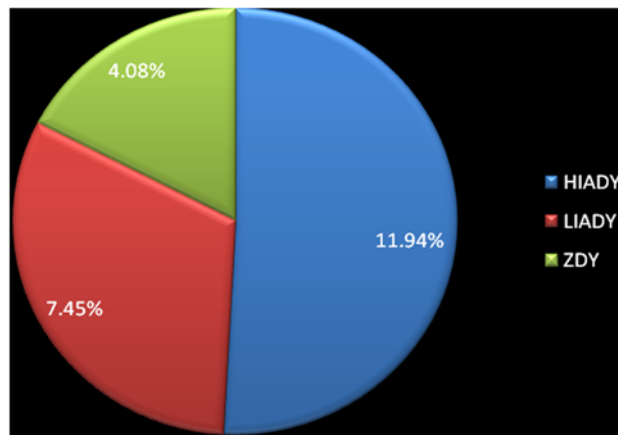
The effects of twelve weeks training interventions have improved the nature of stress. The stress development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 26.8 to post 23.6, low intensity aerobic training with yoga (LI) effect from pre 26.85 to post 24.85, zumba dance training with yoga (ZD) effect from pre 26.95 to post 25.85.

The percentage of improvement on stress of high intensity aerobic training with yoga (HI) was 11.94 low intensity aerobic training with yoga (LI) was 7.45, zumba dance training with yoga (ZD) was 4.08. The result shows that high intensity aerobic training with yoga group improved the stress than other three groups.

The percentage of improvement on stress represented in the following figure 4.21.

**FIGURE – 4.21**

**PERCENTAGE OF IMPROVEMENT IN STRESS AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA**



The result of this study on stress was in accordance with the result of Biswas, (2021) conducted a study on effect of aerobics dance on stress to find out the effect of Aerobics dance Training on stress among the girl students. The program continued for six weeks with integral Aerobics dance practice. Result of the study concluded that participants of the specific training program experienced a significant reduction of stress. It was concluded that Aerobic dance has a highly positive impact in the management of stress and its related problems.

**Shilpa et.al (2015)** conducted a study to find out the effect of Dance Aerobics on Stress in Physiotherapy students by using PSS score and concluded that there is significant reduction of Perceived Stress by Dance Aerobics Intervention on stress among physiotherapy students.

## **ANXIETY**

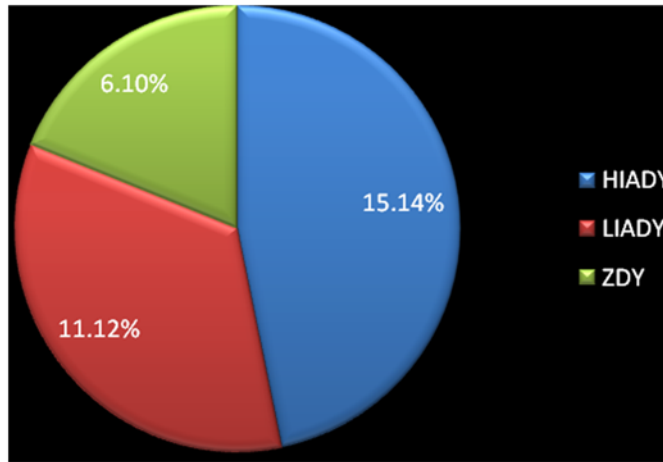
The effects of twelve weeks training interventions have improved the nature of anxiety. The anxiety development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 20.15 to post 17.1, low intensity aerobic training with yoga (LI) effect from pre 20.4 to post 18.15, zumba dance training with yoga (ZD) effect from pre 20.8 to post 19.55.

The percentage of improvement on anxiety of high intensity aerobic training with yoga (HI) was 15.14 low intensity aerobic training with yoga (LI) was 11.12, zumba dance training with yoga (ZD) was 6.10. The result shows that high intensity aerobic training with yoga group improved the anxiety than other three groups.

The percentage of improvement on anxiety represented in the following figure 4.22.

**FIGURE – 4.22**

**PERCENTAGE OF IMPROVEMENT IN ANXIETY AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA**



The result of this study on anxiety was in line with the result of **Boggiti et al., (2015)** who concluded that twelve weeks yogic exercises significantly altered anxiety, aggression, self-confidence of the inter university hockey players.

It was proved significantly that six weeks autogenic exercises significantly altered anxiety, aggression, self-confidence, achievement concluded that twelve weeks yogic exercises significantly altered anxiety, aggression, self-confidence of the inter university hockey players. It was concluded that six weeks autogenic exercises significantly altered anxiety, aggression, self-confidence, achievement.

## **ACHIEVEMENT MOTIVATION**

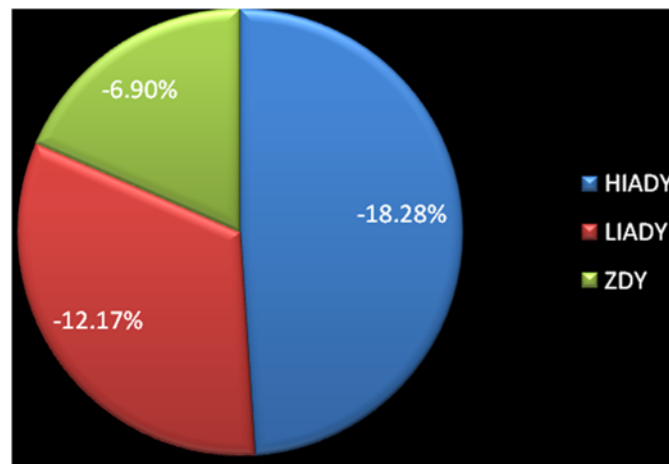
The effects of twelve weeks training interventions have improved the nature of achievement motivation. The achievement motivation development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 16.95 to post 20.05 low intensity aerobic training with yoga (LI) effect from pre 16.85 to post 18.9, zumba dance training with yoga (ZD) effect from pre 16.65 to post 17.8.

The percentage of improvement on achievement motivation of high intensity aerobic training with yoga (HI) was -18.28 low intensity aerobic training with yoga (LI) was -12.17, zumba dance training with yoga (ZD) was -6.90. The result shows that high intensity aerobic training with yoga group improved the achievement motivation than other three groups.

The percentage of improvement on achievement motivation represented in the following figure 4.23.

**FIGURE – 4.23**

**PERCENTAGE OF IMPROVEMENT IN ACHIEVEMENT MOTIVATION  
AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW  
INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC  
DANCE WITH YOGA**



The result of this study on achievement motivation was accordance with the result with **Stella et.al, 2018** conducted an experimental study on Effect of Dance Aerobic Programs on Intrinsic Motivation and Perceived Task Climate in Secondary School Students. The experimental group followed an aerobic dance intervention program while the control group only followed the typical physical education program of the school.

Result of the study revealed that dance aerobic activities can affect positively on a large number of Secondary School students to include regular physical activity in their adult lives and to promote children's and adolescents' perceived physical competence, intrinsic motivation, and enjoyment through PE classes. **Khawla et al. 2021**, examined the effect of an aerobic dance program as part of physical education (PE)

classes on aspects of primary school children's executive functions inhibition, working memory, and cognitive flexibility. A two-way mixed model repeated measures ANOVA revealed that this 8-week aerobic dance program promoted EF development among primary school children with a significant effect on participants' cognitive flexibility and inhibition and working memory and proved.

### **SELF-CONCEPT**

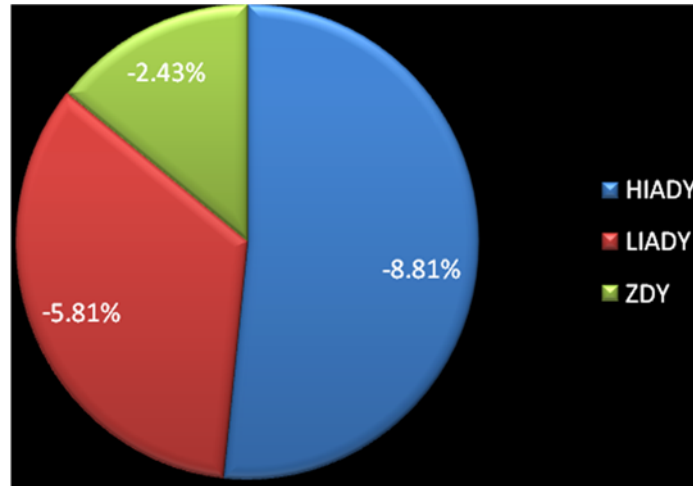
The effects of twelve weeks training interventions have improved the nature of self-concept. The self-concept development of both training was discussed below. The high intensity aerobic training with yoga (HI) effect from pre 139.65 to post 151.95, low intensity aerobic training with yoga (LI) effect from pre 139.7 to post 147.8, zumba dance training with yoga (ZD) effect from pre 139.65 to post 143.05.

The percentage of improvement on self-concept of high intensity aerobic training with yoga (HI) was -8.81 low intensity aerobic training with yoga (LI) was -5.81, zumba dance training with yoga (ZD) was -2.43. The result shows that high intensity aerobic training with yoga group improved the achievement motivation than other three groups.

The percentage of improvement on self-concept represented in the following figure 4.24.

**FIGURE -4.24**

**PERCENTAGE OF IMPROVEMENT IN SELF- CONCEPT AMONG HIGH INTENSITY AEROBIC DANCE WITH YOGA, LOW INTENSITY AEROBIC DANCE WITH YOGA, ZUMBA DANCE AEROBIC DANCE WITH YOGA**



The result of this study on self-concept was in line with the result of **Olena et. al, 1987**, who assessed the effect of “aerobics” on self-concepts of college women. Significant differences were noted in mean self-concepts between the control group and the aerobics group. The aerobics group scored higher on 7 of the 9 subscales and on the total positive or global self-concept score. **Bonne et al, 1993**, examined relationship between short-term changes in self-concept and mood associated with aerobic dance participation. Analyses revealed significant positive changes for aerobic dance participants on specific dimensions of mood, whereas controls showed minimal changes. Similar analyses for self-concept revealed significant, but weak changes on 10 of 13 scales by aerobic participants but higher than control group.

Thus the present study revealed that varied dance fitness program with yoga training, as part of the overall training process, can be considered a useful tool for the improvement of cardio-pulmonary, physical and psychological among school girls and various studies were also in accordance with the results.

#### **4.6 DISCUSSION ON HYPOTHESES**

1. It was hypothesized that the high intensity aerobic dance with yoga training would have significant improvement on selected cardio-pulmonary, physical and psychological variables among school girls. The results of the study indicated that high intensity aerobic dance with yoga training improved the selected cardio-pulmonary, physical and psychological variables among school girls. Hence, the first hypothesis was accepted.
2. It was hypothesized that the low intensity aerobic dance with yoga training would have significant improvement on selected cardio-pulmonary, physical and psychological variables among school girls. The results of the study indicated that low intensity aerobic dance with yoga training improved the selected cardio-pulmonary, physical and psychological variables among school girls. Hence, the second hypothesis was accepted.
3. It was hypothesized that the zumba dance with yoga training would have significant improvement on selected cardio-pulmonary, physical and psychological variables among school girls. The results of the study indicated



that zumba dance with yoga training improved the selected cardio-pulmonary, physical and psychological variables among school girls. Hence, the third hypothesis was accepted.

4. It was hypothesized that varied dance fitness programme with yoga training would have similar changes on selected cardio-pulmonary, physical and psychological variables among school girls. The result of the study indicated that the varied dance fitness programme with yoga training produced different changes significantly in the improvement on selected cardio-pulmonary, physical and psychological variables among school girls. Hence, the fourth hypothesis was rejected.