3.17.2.(b) For 4 to 6 weeks

The selected bench step aerobics step was performed continuously one by one without break for the duration of each 2 minutes. In these weeks, the subjects performed totally 2 sets, each set consisting of 16 minutes. In between each set, 3 minutes of recovery time was allowed.

Aerobic Dancing	Duration of each step	No of Sets	Recovery In between sets
Step and touch			
Step up			
Step up with turning			
V step	2 minutes	2	3 minutes
Knee backward bend			
Stepping side ways			
Side kick			
Step and kick			

3.17.2.(c) For 7-9 weeks

The selected bench step aerobics were performed by the subjects for 7-9 weeks. Each step was performed continuously one by one without break for the duration of each 2 minutes. In these weeks, the subjects performed totally 2 sets, each set consisting of 16 minutes. In between each set, 1 minute of recovery time was allowed.

Aerobic Dancing	Duration of each step	No of Sets	Recovery In between step
Step and touch			
Step up			
Step up with turning			
V step	2 minutes	2	1 minute
Knee backward bend			
Stepping side ways			
Side kick			
Step and kick			

3.18. STATISTICAL TECHNIQUES

The pre and post - test random group design was used as an experimental design in which forty five untrained women college students were selected as subjects. The selected subjects were divided into three groups of fifteen subjects each. Ancova was used to find out significant adjusted post - test mean difference of three groups with respect to each parameter and Scheffe's post hoc test was used to find out pair-wise comparisons between groups with respect to each parameter. The level of confidence fixed to test the hypotheses at 0.05 levels.

CHAPTER IV
ANALYSIS AND INTERPRETATION OF DATA

The statistical analysis of data collected pertaining to experimental study on the effects of different intensity of bench step aerobic dance on selected pulmonary variables of untrained college women forthwith presented in this chapter. The selected subjects were initially tested on pulmonary variables used in this study and this was considered as the pre-test. After assessing the pre-test, the subjects in the experimental group - 1 and group - 2 were treated with their respective treatments for five days a week and for a duration of nine weeks.

The statistical tool of analysis of covariance (Ancova) was applied to determine whether the different intensity of aerobic dance training, produced significantly different improvements in selected variables after nine weeks of training. If the mean difference was significant the pairs of adjusted final group mean was tested for significance by applying Scheffe's post hoc test. To test the obtained results 0.05 level of significance was chosen, which was considered appropriate for the purpose of study.

The influence of low intensity of bench step aerobic dance (group one), moderate intensity of bench step aerobic dance (group two) on selected pulmonary variables of untrained college women was analyzed separately for each variable and presented in table I to VIII.

4.1. RESULTS AND DISCUSSIONS

TABLE – I
ANALYSIS OF COVARIANCE ON TIDAL VOLUME
OF DIFFERENT GROUPS
(scores in ml)

Test Conditions		Group 1 LI- BSAD	Group 2 MI- BSAD	Group 3 C G	SV	SS	Df	MS	'F' Ratio
Pre test	Mean	440.67	442.67	441.33	Between	31.11	2	15.56	0.08
	S.D.	15.69	12.89	10.87	Within	7960.00	42	189.52	
Post test	Mean	491.33	577.33	449.33	Between	127720.00	2	63860.00	364.42*
	S.D.	17.46	9.98	9.29	Within	7360.00	42	175.24	
Adjusted post test	Mean	492.05	576.44	449.51	Between	124907.55	2	62453.78	1162.04*
					Within	2203.55	41	53.75	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

4.2. RESULTS OF TIDAL VOLUME

The pre test mean and standard deviation on tidal volume of G1, G2, and G3 were 440.67±15.69, 442.67± 12.89 and 441.33±10.87 respectively, the obtained pre test F value of 0.08 was lesser than the required table F value of 3.222.hence the pre test mean value low intensity bench step aerobic dance, moderate intensity bench step aerobic dance and control group on tidal volume, before start of the respective treatments were found to be in significant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post test mean and standard deviation on tidal volume scores of G1, G2, and G3 were 491.33 ±17.46, 577.33±9.98 and 449.33±9.29 respectively. The obtained post test F value of 364.42 was greater than the required table F value of 3.222. Hence the post – test mean value of tidal volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus the result obtained proved that the interventions namely low and moderate intensity bench step aerobic dance on tidal volume produced significantly different improvements between the training groups.

The adjusted post test mean on tidal volume scores of G1, G2, and G3 were 492.05, 576.44 and 449.51 respectively. The obtained adjusted post-test F value 1162.04 was greater than the required table F value of 3.226. Hence the post test mean value of tidal volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 41. Since the observed F value on adjusted post test mean among the groups such as low intensity and moderate intensity bench step aerobic dance on tidal volume, produced significantly different improvements between the training groups.

In order to find out which intervention programme used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test. The results of the same were presented in the table I (a)

TABLE - I (A)
**SCHEFFE'S POST HOC TEST MEAN DIFFERENCES ON TIDAL VOLUME
AMONG THREE GROUPS**
(scores in ml)

Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	Mean Differences	Confidence Interval Value
492.05	576.44		84.39*	6.79
492.05		449.51	42.54*	6.79
	576.44	449.51	126.93*	6.79

* Significant at .05 level of confidence.

4.2.1. Results of Post - hoc test on TIDAL VOLUME:

Comparison 1:

The paired mean difference of group 1 and 2 was 84.39. The obtained mean difference value of these comparisons was greater than the confidence interval value of 6.79. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 2:

The paired mean difference of group 1 and 3 was 42.54. The obtained mean difference value of these comparisons was greater than the confidence interval value of 6.79. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 3:

The paired mean difference of group 2 and 3 was 126.93. The obtained mean difference value of these comparisons was greater than the confidence interval value of 6.79. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

The adjusted post test mean values were shown in the figure 1.

FIGURE – 1
THE ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL AND CONTROL GROUPS ON TIDAL VOLUME
(scores ml)
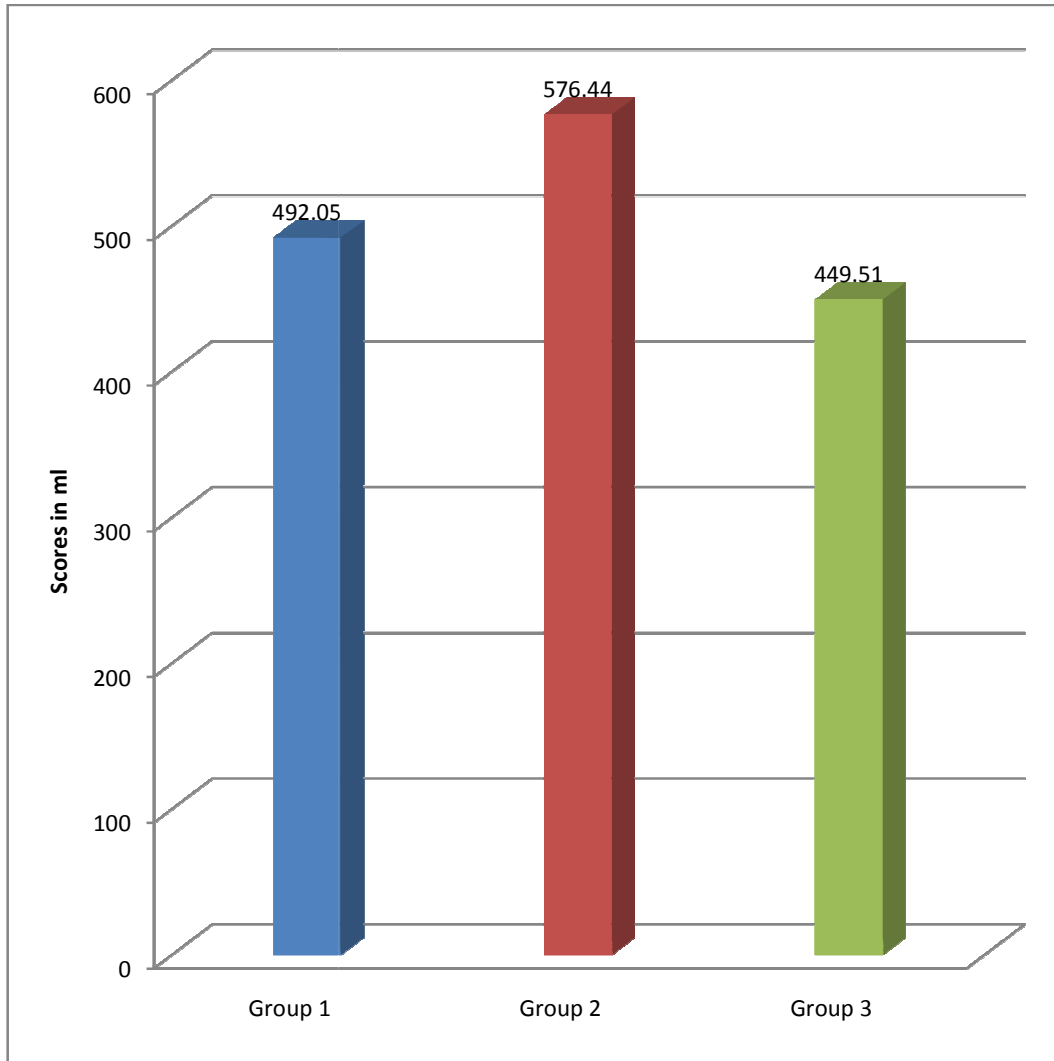
Low Intensity of Bench Step Aerobic Dance

Moderate Intensity of Bench Step Aerobic Dance

Control Group

TABLE – II
ANALYSIS OF COVARIANCE ON INSPIRATORY RESERVE VOLUME OF DIFFERENT GROUPS
(scores in ml)

Test Conditions		Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	SV	SS	Df	MS	'F' Ratio
Pre test	Mean	1840.00	1848.00	1845.33	Between	497.78	2	248.89	0.39
	S.D.	28.52	25.87	17.84	Within	27013.33	42	643.17	
Post test	Mean	1910.67	2004.67	1856.00	Between	169631.11	2	84815.56	128.94*
	S.D.	21.75	33.04	16.65	Within	27626.67	42	657.78	
Adjusted post test	Mean	1913.52	2002.38	1855.43	Between	163758.61	2	81879.31	203.82*
					Within	16470.34	41	401.72	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

4.3. RESULTS OF INSPIRATORY RESERVE VOLUME

The pre test mean and standard deviation on inspiratory reserve volume of G1, G2, and G3 were 1840.00±28.52, 1848.00±25.87 and 1845.33±17.84 respectively, the obtained pre test f value of 0.39 was lesser than the required table f value of 3.222.hence the pre test mean value low intensity bench step aerobic dance, moderate intensity bench step aerobic dance and control group on inspiratory reserve volume, before start of the respective treatments were found to be in significant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post test mean and standard deviation on inspiratory reserve volume scores of G1, G2, and G3 were 1910.67 ±21.75, 2004.67±33.04 and 1856.00±16.65 respectively. The obtained post test F value of 128.94 was greater than the required table F value of 3.222. Hence the post – test mean value of inspiratory reserve volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 42 thus the result obtained proved that the interventions namely low and moderate intensity bench step aerobic dance on inspiratory reserve volume, produced significantly different improvements between the training groups.

The adjusted post – test mean and standard deviation of inspiratory reserve volume scores of G1, G2, and G3 were 1913.52, 2002.38 and 1855.43 respectively. The obtained adjusted post-test F value 203.82 was greater than the required table F value of 3.226. Hence the post test mean value of inspiratory reserve volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 41. Since the observed F value on adjusted post test mean among the groups such as low intensity and moderate intensity bench step aerobic dance on inspiratory reserve volume, produced significantly different improvements between the training groups.

In order to find out which intervention programme used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test. The results of the same were presented in the table II (a)

TABLE - II (A)
**SCHEFFE'S POST HOC TEST MEAN DIFFERENCES ON INSPIRATORY
RESERVE VOLUME AMONG THREE GROUPS**
(scores in ml)

Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	Mean Differences	Confidence Interval Value
1913.52	2002.38		88.86*	18.57
1913.52		1855.43	58.09*	18.57
	2002.38	1855.43	146.95*	18.57

* Significant at .05 level of confidence.

4.3.1. Results of Post - hoc test on inspiratory reserve volume:

Comparison 1:

The paired mean difference of group 1 and 2 was 88.86. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.57. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 2:

The paired mean difference of group 1 and 3 was 58.09. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.57. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 3:

The paired mean difference of group 2 and 3 was 146.95. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.57. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

The adjusted post test mean values were shown in the figure 2.

FIGURE – 2
**THE ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL AND
CONTROL GROUPS ON INSPIRATORY RESERVE VOLUME**
(scores in ml)
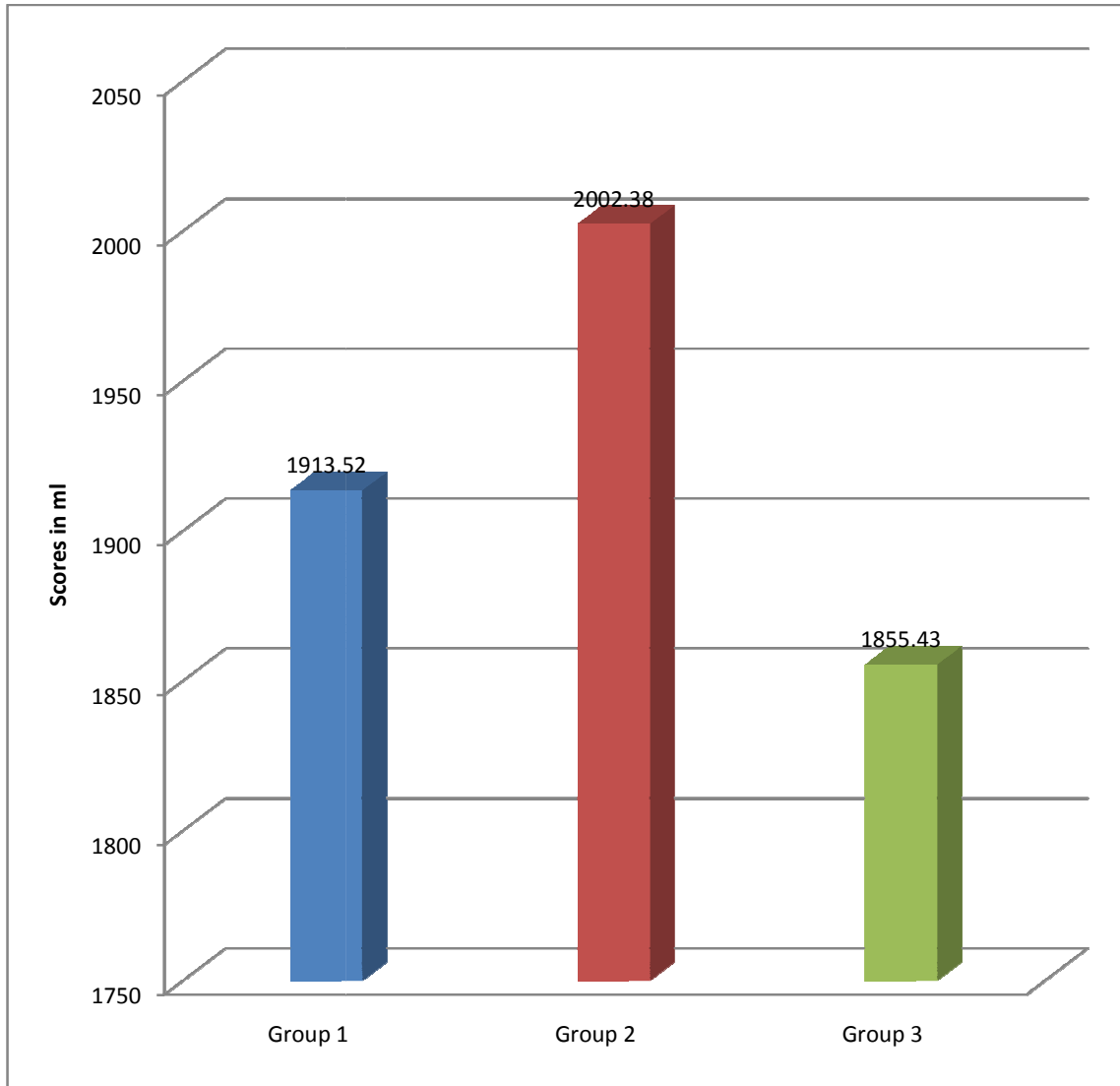
■ Low Intensity of Bench Step Aerobic Dance

■ Moderate Intensity of Bench Step Aerobic Dance

■ Control Group

TABLE -III
ANALYSIS OF COVARIANCE ON EXPIRATORY RESERVE VOLUMEOF
DIFFERENT GROUPS
(SCORES IN ML)

Test Conditions		Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	SV	SS	Df	MS	'F' Ratio
Pre test	Mean	739.33	743.33	740.00	B	137.78	2	68.89	0.45
	S.D.	11.81	13.50	10.33	W	6426.67	42	153.02	
Post test	Mean	799.33	903.33	749.33	B	185160.00	2	92580.00	244.24*
	S.D.	17.31	25.21	11.23	W	15920.00	42	379.05	
Adjusted post test	Mean	801.45	900.01	750.54	B	170439.99	2	85219.99	858.44*
					W	4070.20	41	99.27	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

4.4. RESULTS OF EXPIRATORY RESERVE VOLUME

The pre test mean and standard deviation on expiratory reserve volume of G1, G2, and G3 were 739.33±11.81, 743.33±13.50 and 740.10±10.33 respectively. The obtained pre test F value of 0.45 was lesser than the required table F value of 3.222. Hence the pre test mean value low intensity bench step aerobic dance, moderate intensity bench step aerobic dance and control group on expiratory reserve volume, before start of the respective treatments were found to be in significant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post test mean and standard deviation on expiratory reserve volume scores of G1, G2 and G3 were 799.33 ±17.31, 903.33±25.21 and 749.33±11.23 respectively. The obtained post test F value of 244.24 was greater than the required table F value of 3.222. Hence the post – test mean value of expiratory reserve volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 42 thus the result obtained proved that the interventions namely low and moderate intensity bench step aerobic dance on expiratory reserve volume, produced significantly different improvements between the training groups.

The adjusted post – test mean on expiratory reserve volume scores of G1, G2 and G3 were 801.45, 900.01 and 750.54 respectively. The obtained adjusted post-test F value 858.44 was greater than the required table F value of 3.226.hence the post test mean value of expiratory reserve volume, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 41. Since the observed F value on adjusted post test mean among the groups such as low intensity and moderate intensity bench step aerobic dance on expiratory reserve volume, produced significantly different improvements between the training groups.

In order to find out which intervention programme used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test. The results of the same were presented in the table III (a)

TABLE - III (A)
SCHEFFE'S POST HOC TEST MEAN DIFFERENCES ON EXPIRATORY
RESERVE VOLUME AMONG THREE GROUPS
(scores in ml)

Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	Mean Differences	Confidence Interval Value
801.45	900.01		98.57*	9.23
801.45		750.54	50.91*	9.23
	900.01	750.54	149.47*	9.23

* Significant at .05 level of confidence.

4.4.1. Results of Post - hoc test on expiratory reserve volume:

Comparison 1:

The paired mean difference of group 1 and 2 was 98.57. The obtained mean difference value of these comparisons was greater than the confidence interval value of 9.23. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 2:

The paired mean difference of group1 and 3 was 50.91. The obtained mean difference value of these comparisons was greater than the confidence interval value of 9.23. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 3:

The paired mean difference of group 2 and 3 was 149.47. The obtained mean difference value of these comparisons was greater than the confidence interval value of 9.23. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

The adjusted post test mean values were shown in the figure 3.

FIGURE – 3
THE ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL AND CONTROL GROUPS ON EXPIRATORY RESERVE VOLUME
(scores in ml)
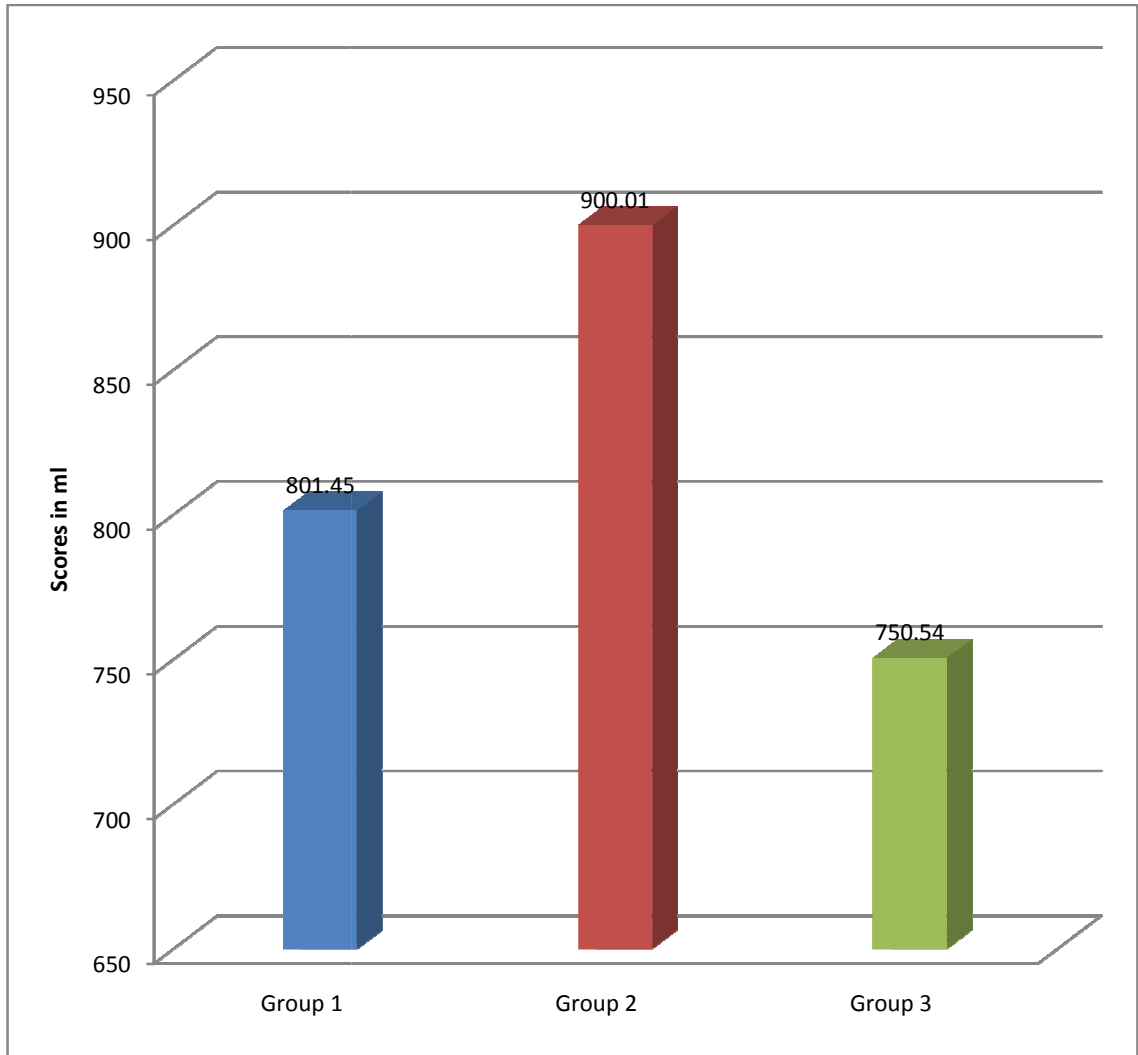
- ■ Low Intensity of Bench Step Aerobic Dance
- ■ Moderate Intensity of Bench Step Aerobic Dance
- ■ Control Group

TABLE – IV
ANALYSIS OF COVARIANCE ON INSPIRATORY CAPACITY
OF DIFFERENT GROUPS
(scores in ml)

Test Conditions		Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	SV	SS	Df	MS	'F' Ratio
Pre test	Mean	2280.67	2290.67	2286.67	B	760.00	2	380.00	0.32
	S.D.	39.41	34.15	25.47	W	50520.00	42	1202.86	
Post test	Mean	2402.00	2582.00	2305.33	B	591444.44	2	295722.22	291.19*
	S.D.	29.48	37.81	23.34	W	42653.33	42	1015.56	
Adjusted post test	Mean	2405.85	2578.64	2304.85	B	572667.14	2	286333.57	716.34*
					W	16388.45	41	399.72	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

4.5. RESULTS OF INSPIRATORY CAPACITY

The pre test mean and standard deviation on inspiratory capacity of G1, G2, and G3 were 2280.67±39.41, 2290.67±34.15 and 2286.67±25.47 respectively, the obtained pre test   F value of 0.32 was lesser than the required table F value of 3.222.hence the pre test mean value low intensity bench step aerobic dance, moderate intensity bench step aerobic dance and control group on inspiratory capacity, before start of the respective treatments were found to be in significant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post test mean and standard deviation on inspiratory capacity scores of G1, G2 and G3 were 2402.00 ±29.48, 2582.00±37.81 and 2305.33±23.34 respectively. The obtained post test F value of 291.19 was greater than the required table F value of 3.222.hence the post – test mean value of inspiratory capacity, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 42 thus the result obtained proved that the interventions namely low and moderate intensity bench step aerobic dance on inspiratory capacity, produced significantly different improvements between the training groups.

The adjusted post test mean on inspiratory capacity scores of G1, G2, and G3 were inspiratory capacity scores of G1, G2, and G3 are 2405.85, 2578.64 and 2304.85 respectively. The obtained adjusted post-test F value 716.34 was greater than the required table F value of 3.226.hence the post test mean value of inspiratory capacity, showed significant at 0.05 level of confidence for the degrees of freedom 2 and 41. Since the observed F value on adjusted post test mean among the groups such as low intensity and moderate intensity bench step aerobic dance on inspiratory capacity, produced significantly different improvements between the training groups.

In order to find out which intervention programme used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test. The results of the same were presented in the table IV (a)

TABLE - IV (A)
SCHEFFE'S POST HOC TEST MEAN DIFFERENCES ON
INSPIRATORY CAPACITY AMONG THREE GROUPS
(SCORES IN ML)

Group 1 LI-BSAD	Group 2 MI-BSAD	Group 3 C G	Mean Differences	Confidence Interval Value
2405.85	2578.64		172.79*	18.52
2405.85		2304.85	100.99*	18.52
	2578.64	2304.85	273.78*	18.52

* Significant at .05 level of confidence.

4.5.1. Results of Post - hoc test on inspiratory capacity:
Comparison 1:

The paired mean difference of group 1and 2 was 172.79. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.52. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.
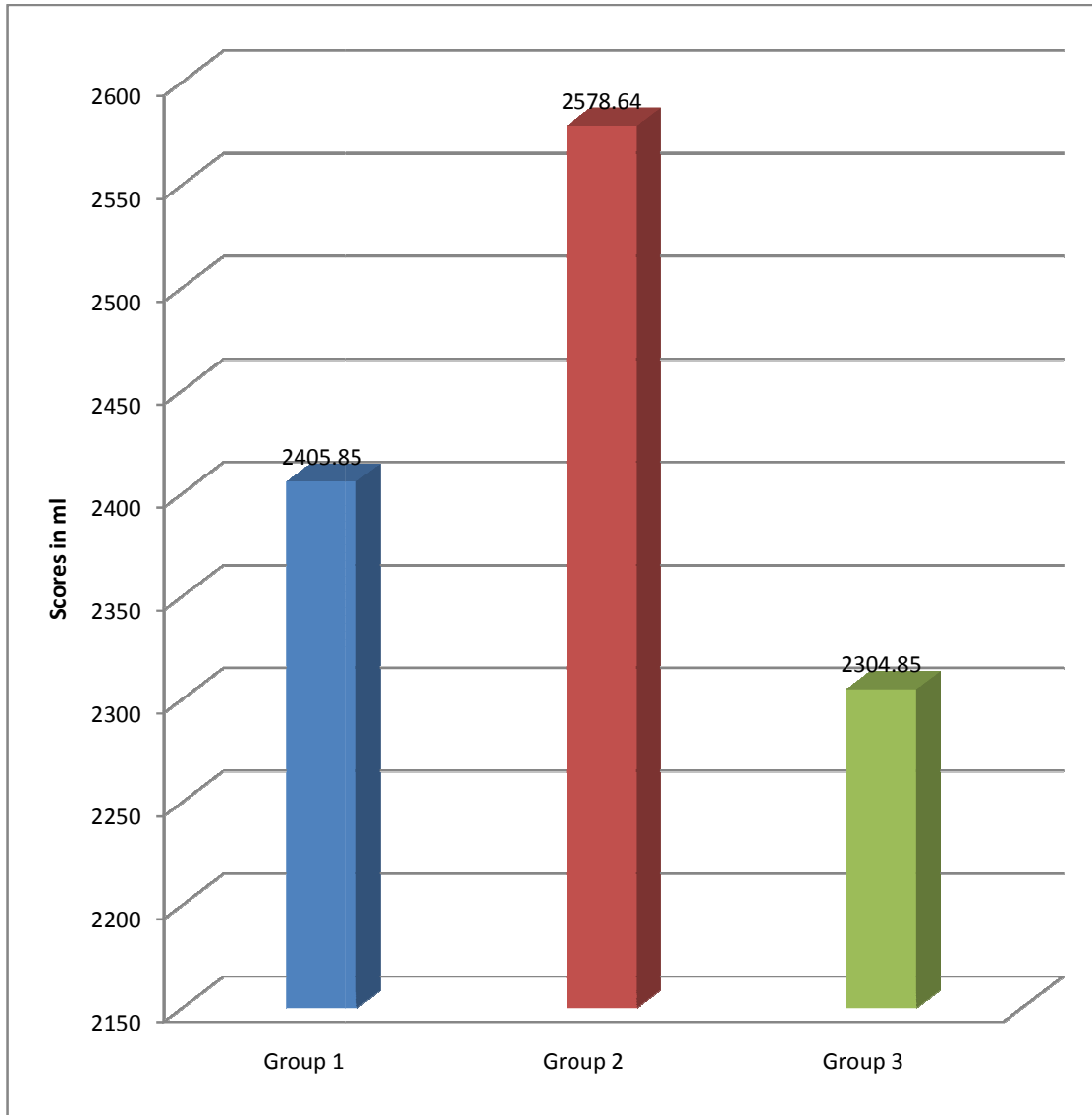
Comparison 2:

The paired mean difference of group 1and 3 was 100.99. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.52. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

Comparison 3:

The paired mean difference of group 2 and 3 was 273.78. The obtained mean difference value of these comparisons was greater than the confidence interval value of 18.52. This comparison accurately showed that both training programmes produced significant difference at 0.05 levels.

The adjusted post test mean values were shown in the figure 4.

FIGURE – 4

**THE ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL AND
CONTROL GROUPS ON INSPIRATORY CAPACITY**

(scores in ml)

Low Intensity of Bench Step Aerobic Dance

Moderate Intensity of Bench Step Aerobic Dance

Control Group