

CHAPTER - IV

RESULTS AND DISCUSSIONS

4.1 OVERVIEW

This chapter deals with the analysis of data collected from the subjects under the study. The purpose of this study was to find out the influence of Asanas and pranayama on selected physical psychological physiological and hematological variables among Degree College students. For this present study degree college students were selected from Andhra Pradesh as subjects. Their age was ranging from 19 to 25 years. The selected subjects were divided into four groups namely experimental group I (Asanas practices) experimental group II (pranayama practices), experimental group III (combined practices (Asanas and pranayama), and control group (no training). The subjects were analyzed with the differences in the measures of selected physical variables such as agility, cardiovascular endurance and flexibility, psychological variables such as anxiety, aggression and stress, physiological variables such as pulse rate, mean arterial blood pressure and vital capacity and biochemical variables such as hemoglobin, red blood cells and white blood cells.

The subjects were selected randomly but the groups were not equated in relation to factors to be examined hence the difference between the means and four groups pre and post test were taken into an account during the analysis of covariance, where the final means were adjusted for difference in the initial means and the adjusted means were tested for significance difference. When the adjusted post test means were significant the Scheffe's post hoc test was administered to find out the paired means significant differences.

4.2 TEST OF SIGNIFICANCE

There could be the critical portion of the thesis in arriving at the conclusion by examining the hypothesis. This procedure of testing the hypothesis was done by accepting the research hypothesis or rejecting the same in accordance with the results in relation to the level of confidence fixed by 0.05 level of confidence.

4.3. LEVEL OF SIGNIFICANCE

The probability level below which the hypothesis is rejected is termed as the level of significance. The 'F' ratio obtained by analysis of covariance was compared at 0.05 level of significance. In analysis of covariance of 'F' ratio of 2.77 is needed for significance at the 0.05 level of confidence for the degrees freedom 2 and 56.

4.4 COMPUTATION OF ANALYSIS OF COVARIANCE AND SCHEFFE'S POST HOC TEST

The following tables illustrate the statistical result on the influence of Asanas, pranayama and combined practices on agility, cardiovascular, flexibility, anxiety, aggression, stress, pulse rate, mean arterial blood pressure, vital capacity, hemoglobin, red blood cells and white blood cells among degree college students. The ordered adjusted means and differences between the means of the groups under study were given in the following tables.

4.5. RESULTS ON AGILITY

The physical variable agility was measured through shuttle run. The results on the Influence of Asanas pranayama and combined practices on agility among degree college students are presented in table XII.

TABLE XII
COMPUTATION OF ANALYSIS OF COVARIANCE ON AGILITY

(Total Scores in seconds)

	EX.GR. I	EX.GR. II	EX.GR. III	Control	S V	SS	df	MS	Obtained F
Pre Test Mean	11.43	11.39	11.65	11.35	B	0.78	3	0.26	1.20
					W	12.05	56	0.22	
Post Test Mean	10.10	10.13	9.67	10.80	B	9.77	3	3.26	12.35*
					W	14.78	56	0.26	
Adjusted Post Test Mean	10.11	10.14	9.64	10.81	B	10.00	3	3.33	12.63*
					W	14.52	55	0.26	
Mean Diff	1.33	1.26	1.98	0.55					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XII shows that the pre test mean scores of Agility (Experimental group I (Asanas group) was 11.43. Experimental group I (Pranayama group) was 11.39, Experimental Group III Combined (Asanas and pranayama practices) was 11.65 and control group was 11.35. The obtained F value on pre test scores 1.20 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama practices) and mean values recorded were 10.10, 10.13, 9.67 and 10.80 respectively. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 12.35 was greater than the required F value of 2.77. This proved that the differences between the post test means of the subjects were significant.

Taking into consideration of the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 12.63 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama) practices on the Physical variable Agility.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XIII.

TABLE - XIII
SCHEFFE`S POST-HOC TEST FOR AGILITY

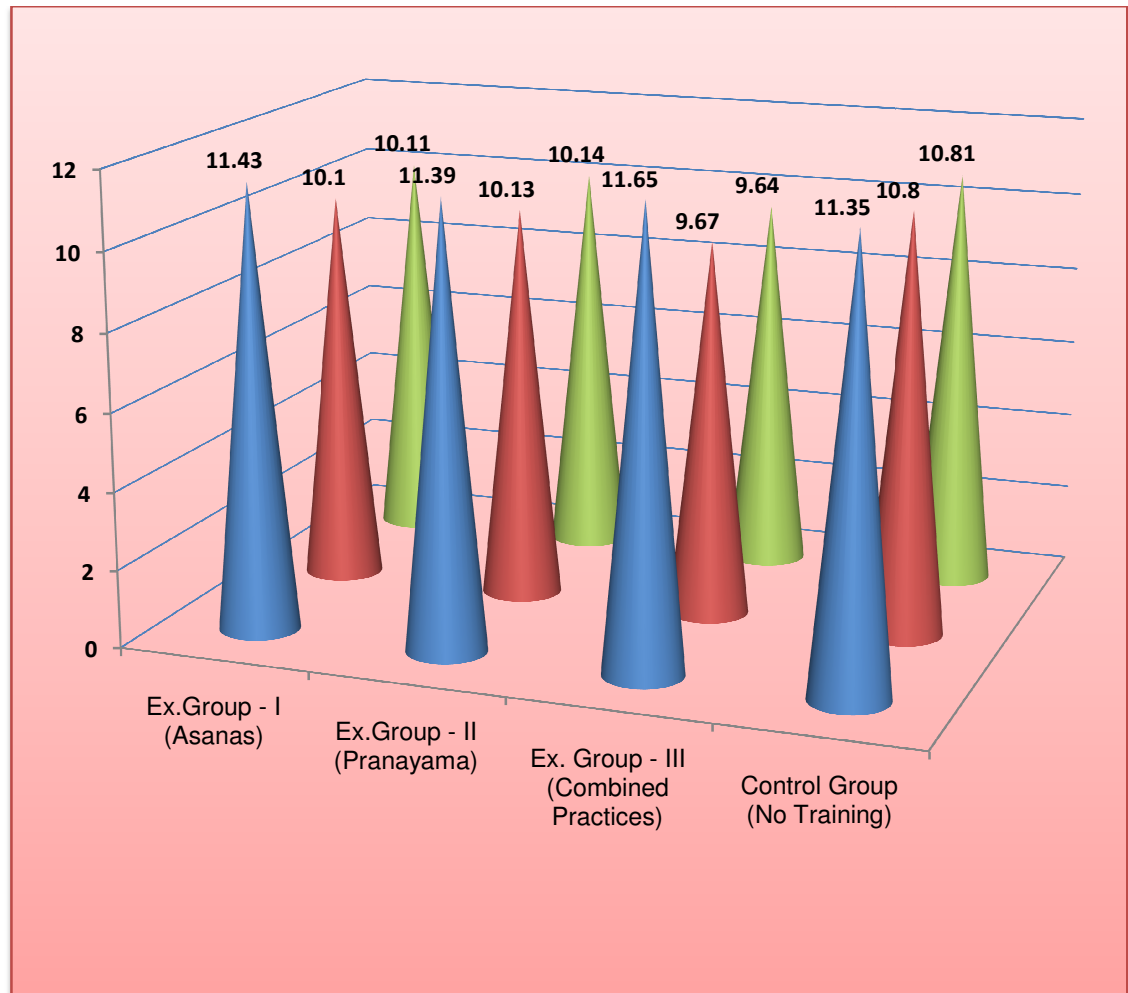
Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined Practices)	Mean Differenc	Required C.I
10.81	10.11			0.71*	0.54
10.81		10.14		0.67*	
10.81			9.64	1.17*	
	10.11	10.14		0.03	
	10.11		9.64	0.47	
		10.14	9.64	0.50	

* Significant

Table - XIII shows that there was significant difference between Asanas and control group, Pranayama group and control group, and combined (Asanas and Pranayama) practices group and control group. The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure-41.

FIGURE - 41

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON AGILITY



4.5.1 DISCUSSIONS ON THE FINDINGS OF AGILITY

The results presented in table XII showed that the obtained adjusted means on agility among Asanas group was 10.11 followed by Pranayama group with the mean value of 10.14 followed by combined group (Asanas and pranayama practices) mean value of 9.64 and control group mean value of 10.81. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.20, 12.35 and 12.63 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77 .

The post hoc analysis through Scheffe`s confidence test proved that due to twelve weeks treatment of Asanas and Pranayama and Combined practices (Asanas and pranayama) groups showed significant improvement in agility than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely Asanas group and Pranayama group and Combined group (Asanas and pranayama practices) proved that there was no significant difference.

The result of this study on agility has in line with the study conducted by **Bal and Kaur (2009)**, **Amandeep Singh, Sukhdev Singh and Vishaw Gaurav (2011)**, **Reddy and Kumar (2001)**. Further, **Lohan and Rajesh (2002)** also found that the combined group of Asanas and pranayama practices significant improvement in agility among boys between age group 12-16 years.

4.6 RESULTS ON FLEXIBILITY

The Physical variable of flexibility was measured through sit and reach test. The results on the Influence of Asanas Pranayama and combined practices on flexibility among degree college students are presented in table XIV.

TABLE XIV
COMPUTATION OF ANALYSIS OF COVARIANCE ON FLEXIBILITY

(Total Scores in centimeters)

	EX. GR. I	EX. GR. II	EX. GR. III	Control	SV	SS	df	MS	Obtained F
Pre Test Mean	23.93	23.40	23.40	24.47	B	11.73	3	3.91	1.01
					W	215.87	56	3.85	
Post Test Mean	28.47	28.53	30.33	23.47	B	392.07	3	130.69	18.55*
					W	394.53	56	7.05	
Adjusted Post Test Mean	28.46	28.56	30.36	23.42	B	383.57	3	127.86	17.87*
					W	393.49	55	7.15	
Mean Diff	4.53	5.13	6.93	1.00					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XIV shows that the pre test mean scores of flexibility (Experimental group I - Asanas was 23.93. Experimental group II - Pranayama was 23.40, Experimental Group III Combined (Asanas and pranayama) practices was 23.40 and control group was 24.47. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama) practices and mean values recorded were 28.47, 28.53, 30.33 and 23.47 respectively.

The obtained F value on pre test scores 1.01 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 18.55 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 17.87 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Physical variable flexibility.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XV.

TABLE – XV
SCHEFFE’S POST-HOC TEST ON FLEXIBILITY

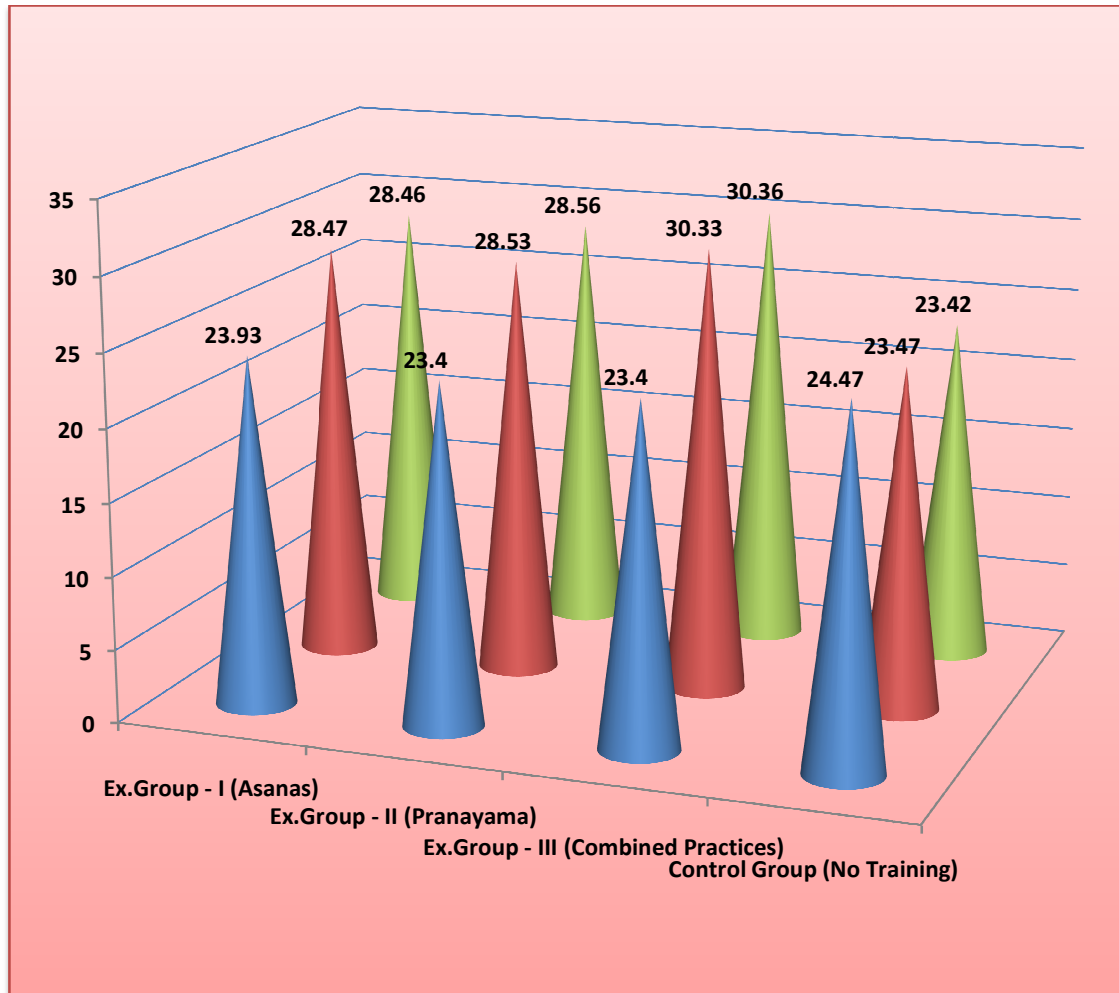
Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined Practices)	Mean Difference	Required C.I
23.42	28.46			5.04*	2.82
23.42		28.56		5.14*	
23.42			30.36	6.94*	
	28.46	28.56		0.10	
	28.46		30.36	1.90	
		28.56	30.36	1.80	

* Significant

Table- XV shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group. The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 42.

FIGURE – 42

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON FLEXIBILITY



4.6.1 DISCUSSIONS ON THE FINDINGS OF FLEXIBILITY

The results presented in table XIV showed that the obtained adjusted means on flexibility among Asanas group was 28.46 followed by Pranayama group with the mean value of 28.56 followed by combined group (Asanas and pranayama practices) mean value of 30.36 and control group mean value of 23.42. The difference among pre test scores, Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.01, 18.55 and 17.87 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68 .

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment the Asanas group and Pranayama group and Combined group (Asanas and pranayama practices) there was significant improvement in flexibility than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely Asanas group and Pranayama and Combined group (Asanas and pranayama practices) proved that there was no significant difference.

The result of this study on flexibility has in line with the study conducted by **Reddy and Kumar (2001)**, **Tiken, Kosana, Joy and Inaobi (2002)**, **Chen et.al, (2009)**. Further, **Bharatha priya and Gopinath (2011)** studied the effect of yogic practice on flexibility among school boys. Finding of flexibility shows significant improvement due to the twelve weeks yogic practice when compared to the control group.

4.7 RESULTS ON CARDIOVASCULAR ENDURANCE

The physical variable cardio vascular endurance was measured through 12 minutes run and walk. The results on the Influence of Asanas, Pranayama and combined practices on cardio vascular endurance among degree college students are presented in table XVI.

TABLE XVI

COMPUTATION OF ANALYSIS OF ON CARDIO VASCULAR ENDURANCE

(Total Scores in Meters)

	EX. GR. I	EX. GR.II	EX. GR.III	Control	SV	SS	df	MS	F
Pre Test Mean	1828.00	1840.67	1829.00	1773.00	B	41390.00	3	13796.67	1.85
					W	417233.33	56	7450.60	
Post Test Mean	2033.33	2020.67	2115.00	1768.00	B	1013924.58	3	337974.86	44.42*
					W	426066.67	56	7608.33	
Adjusted Post Test Mean	2032.80	2019.47	2114.41	1770.32	B	919875.42	3	306625.14	39.69*
					W	424944.99	55	7726.27	
Mean Diff	205.33	180.00	286.00	5.00					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55 (df) is 2.77.

Table XVI shows that the pre test mean scores of cardiovascular endurance experimental group I (Asanas) was 1828. Experimental group II (Pranayama) was 1840.67, Experimental Group III (Combined Asanas and pranayama practices) was 1829.00 and control group was 1773.00. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama practices) and mean values recorded were 2033.33, 2020.67, 2115.00 and 1768.00 respectively.

The obtained F value on pre test scores 1.85 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 44.42 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 39.69 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Physical variable cardiovascular endurance.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XVII.

TABLE - XVII

SCHEFFE'S POST-HOC TEST ON CARDIOVASCULAR ENDURANCE

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean Difference	Required C.I
1770.32	2032.42			262.48*	92.69
1770.32		2019.47		249.16*	
1770.32			2114.41	344.10*	
	2032.42	2019.47		13.32	
	2018.62		2114.41	81.61	
		2019.47	2114.41	94.94*	

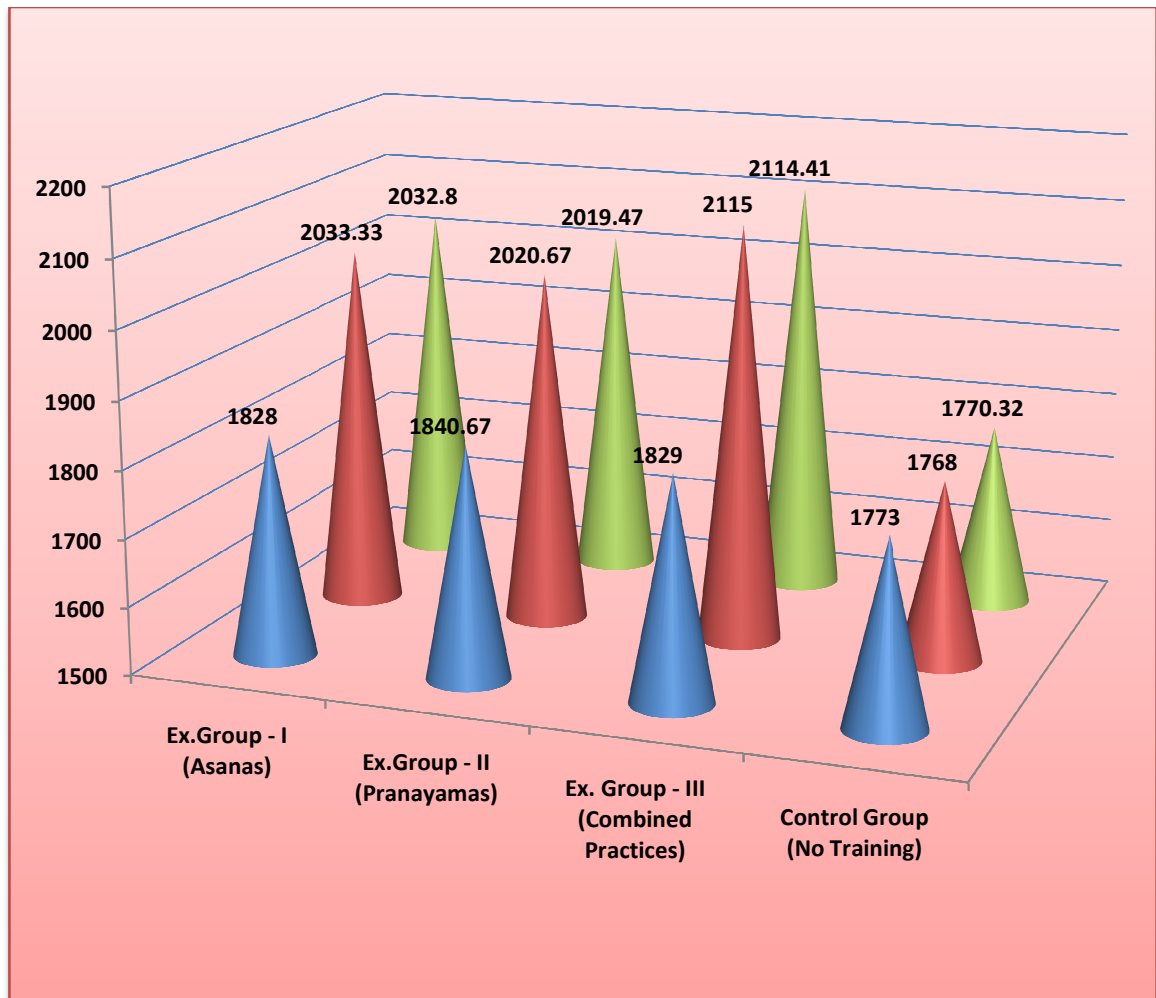
* Significant

Table-XVII shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group. Further, the post hoc analysis between the experimental group namely Pranayama and Combined group (Asanas and pranayama practices) proved that there was significant difference.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 43.

FIGURE -43

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON CARDIOVASCULAR ENDURANCE



4.7.1 DISCUSSIONS ON THE FINDINGS OF CARDIOVASCULAR ENDURANCE

The results presented in table XVI showed that the obtained adjusted means on cardiovascular endurance among Asanas group was 2032.80 followed by Pranayama group with the mean value of 2019.47 followed by combined group (Asanas and pranayama practices) mean value of 2114.41 and control group mean value of 1770.32. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.85, 44.42 and 39.69 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77 .

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant improvement in cardio vascular endurance than control group and the differences were significant at 0.05 level. Further, the post hoc analysis between the experimental group namely Pranayama and Combined group (Asanas and pranayama practices) proved that there was significant difference.

The result of this study on cardiovascular endurance has in line with the study conducted by **Tran, Holly, Iashbrook, Amsterdam (2001), Sekar babu and Kulothugan (2011)** and also **Selvakumar, Chandrasekar and Pushparaj (2011)** found cardiovascular endurance shows significant improvement due to the practices of yoga when compared to the control group.

4.8. RESULTS ON ANXIETY

The psychological variable anxiety was measured through standard questionnaire. The results on the Influence of Asanas, Pranayama and combined practices on anxiety among degree college students are presented in table XVIII.

TABLE XVIII
COMPUTATION OF ANALYSIS OF COVARIANCE ON ANXIETY

(Total Scores in No's)

	EX. GR. I	EX. GR. II	EX. GR. III	Control	SV	SS	df	M S	Obtained F
Pre Test Mean	35.47	35.40	36.60	33.27	E	87.12	3	29.04	1.21
					V	1345.87	5	24.03	
Post Test Mean	21.27	18.93	17.13	35.00	E	2968.98	3	989.66	22.66*
					V	2445.60	5	43.67	
Adjusted Post Test Mean	21.15	18.84	16.54	35.80	E	3201.05	3	1067.02	26.56*
					V	2209.81	5	40.18	
Mean Diff	14.20	16.47	19.47	1.73					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XVIII shows that the pre test mean scores of anxiety Experimental group I (Asanas) was 35.47. Experimental group II (Pranayama) was 35.40, Experimental Group III Combined (Asanas and pranayama practices) was 36.60 and control group was 33.27. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama practices) and mean values recorded were 21.27, 18.93, 17.13 and 35.00 respectively.

The obtained F value on pre test scores 1.21 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant

difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 22.66 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 26.56 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Psychological variable anxiety.

Since significant changes were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XIX.

TABLE – XIX
SCHEFFE'S POST-HOC TEST ON ANXIETY

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
35.80	21.15			14.65*	6.68
35.80		18.84		16.96*	
35.80			16.54	19.26*	
	21.15	18.84		2.31	
	21.15		16.54	4.61	
		18.84	16.54	2.30	

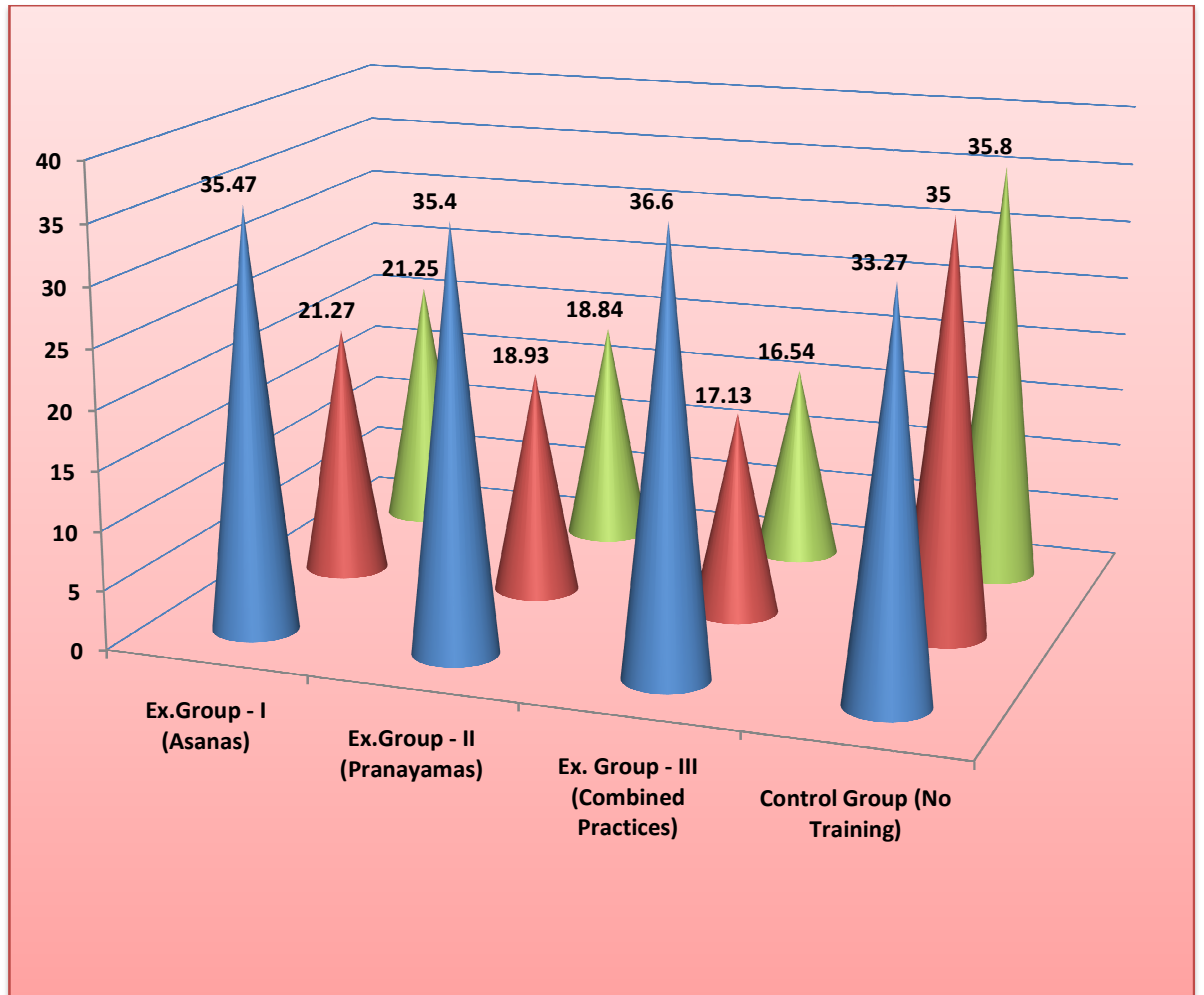
* Significant

Table-XIX shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 44.

FIGURE - 44

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON ANXIETY



4.8.1 DISCUSSIONS ON THE FINDINGS OF ANXIETY

The results presented in table XVIII showed that the obtained adjusted means on anxiety among Asanas group was 21.15 followed by Pranayama group with the mean value of 18.84 followed by combined group (Asanas and pranayama practices) mean value of 16.54 and control group mean value of 35.80. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.21, 22.66 and 22.56 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant changes in anxiety than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group proved that there was no significant difference.

The result of this study on anxiety has in line with the study conducted by **Ray et al (2001), Chidambara Raja, (2010), Brown and Gerbarg (2009), Siddha Samadhi, (2008), Gupta et al., (2006), Javnbakht, Hejazi Kenari and Ghasemi (2009)**. Further, **Pallav Sengupta, (2012)**, found Yoga is reported to reduce anxiety and also **Stueck et al., (2005)** determined yoga, and other meditation and social interaction exercises decreased anxiety.

4.9 RESULTS ON AGGRESSION

The psychological variable aggression was measured through standard questionnaire. The results on the Influence of Asanas, Pranayama and combined practices on aggression among degree college students are presented in table XX.

TABLE XX
COMPUTATION OF ANALYSIS OF COVARIANCE ON AGGRESSION
(Total Scores in Marks)

	EX. GR. I	EX. GR. II	EX. GR. III	Control Group	S V	SS	df	MSs	Obtained F
Pre Test Mean	109.33	105.67	111.33	108.53	B	248.45	3	82.82	1.11
					W	4171.73	56	74.50	
Post Test Mean	96.40	97.53	94.93	107.40	B	1439.87	3	479.96	6.63*
					W	4055.87	56	72.43	
Adjusted Post Test Mean	96.18	98.60	94.02	107.46	B	1555.91	3	518.64	8.04*
					W	3548.54	55	64.52	
Mean Diff	12.93	8.13	16.40	1.13					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XX shows that the pre test mean scores of aggression Experimental group I (Asanas) was 109.33. Experimental group II (Pranayama) was 105.67, Experimental Group III Combined (Asanas and pranayama practices) was 111.33 and control group was 108.53. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas & Pranayama) and mean values recorded were 96.40, 97.53, 94.93 and 107.40 respectively.

The obtained F value on pre test scores 1.11 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 6.63 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 8.04 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Psychological variable of aggression.

Since significant changes were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXI.

TABLE - XXI

SCHEFFE'S POST-HOC TEST ON AGGRESSION

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
107.46	96.18			11.28*	8.47
107.46		98.60		8.87*	
107.46			94.02	13.44*	
	96.18	98.60		2.41	
	96.18		94.02	2.16	
		98.60	94.02	4.58	

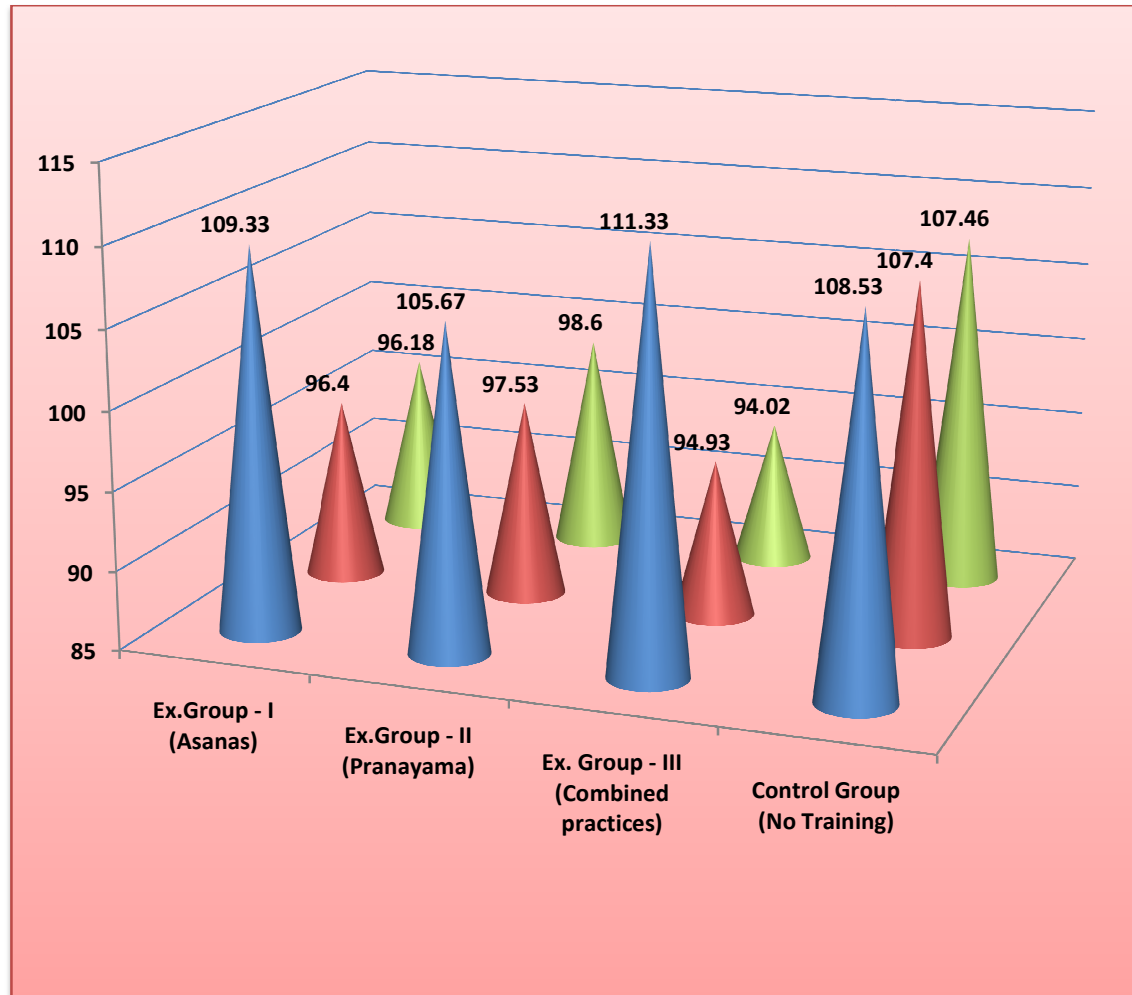
* Significant

Table-XXI shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure -45.

FIGURE - 45

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON AGGRESSION



4.9.1 DISCUSSIONS ON THE FINDINGS OF AGGRESSION

The results presented in table XX showed that the obtained adjusted means on aggression among Asanas group was 96.18 followed by Pranayama group with the mean value of 98.60 followed by combined group (Asanas and pranayama practices) mean value of 94.02 and control group mean value of 107.46. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.11, 6.63 and 8.04 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant changes in aggression than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental groups proved that there was no significant difference.

The result of this study on aggression has in line with the study conducted by **Stueck et al., (2005)**, **Deshpande, Nagendra and Raghuram, (2008)**. Similarly **Dhivya Laxmi and Murugavel, (2013)** found significant improvement on aggression of experiment group due to the effects of asanas, pranayama and core training when compared to the control group. **Deshpande, Nagendra and Raghuram, (2008)** stated that an eight week intervention of an integrated yoga module decreased verbal aggressiveness in the yoga group.

4.10 RESULTS ON STRESS

The psychological variable stress was measured through standard questionnaire. The results on the Influence of Asanas, Pranayama and combined practices on stress among degree college students are presented in table XXII.2

Table XXII

COMPUTATION OF ANALYSIS OF COVARIANCE OF ON STRESS

(Total Scores in marks)

	EX. GR. I	EX. GR. II	EX. GR. III	Control Group	SV	SS	df	M S	Obtained F
Pre Test Mean	64.13	66.80	68.47	66.27	B	143.78	3	47.93	1.14
					W	2346.80	56	41.91	
Post Test Mean	44.33	55.93	42.07	67.60	B	6230.18	3	2076.73	16.99*
					W	6844.80	56	122.23	
Adjusted Post Test Mean	44.91	55.84	41.55	67.64	B	6264.05	3	2088.02	17.15*
					W	6694.32	55	121.71	
Mean Diff	19.80	10.87	26.40	1.33					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXII shows that the pre test mean scores of stress Experimental group I (Asanas) was 64.13. Experimental group II (Pranayama) was 66.80, Experimental Group III Combined (Asanas and pranayama practices) was 68.47 and control group was 66.27. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas & Pranayama) and mean values recorded were 44.33, 55.93, 42.07 and 67.60 respectively.

The obtained F value on pre test scores 1.14 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 16.99 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 17.15 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Psychological variable stress.

Since significant changes were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXIII.

TABLE - XXIII

SCHEFFE'S POST-HOC TEST ON STRESS

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
67.64	44.91			22.73*	11.63
67.64		55.84		11.80*	
67.64			41.55	26.09*	
	44.91	55.84		10.92	
	44.91		41.55	3.36	
		55.84	41.55	14.29*	

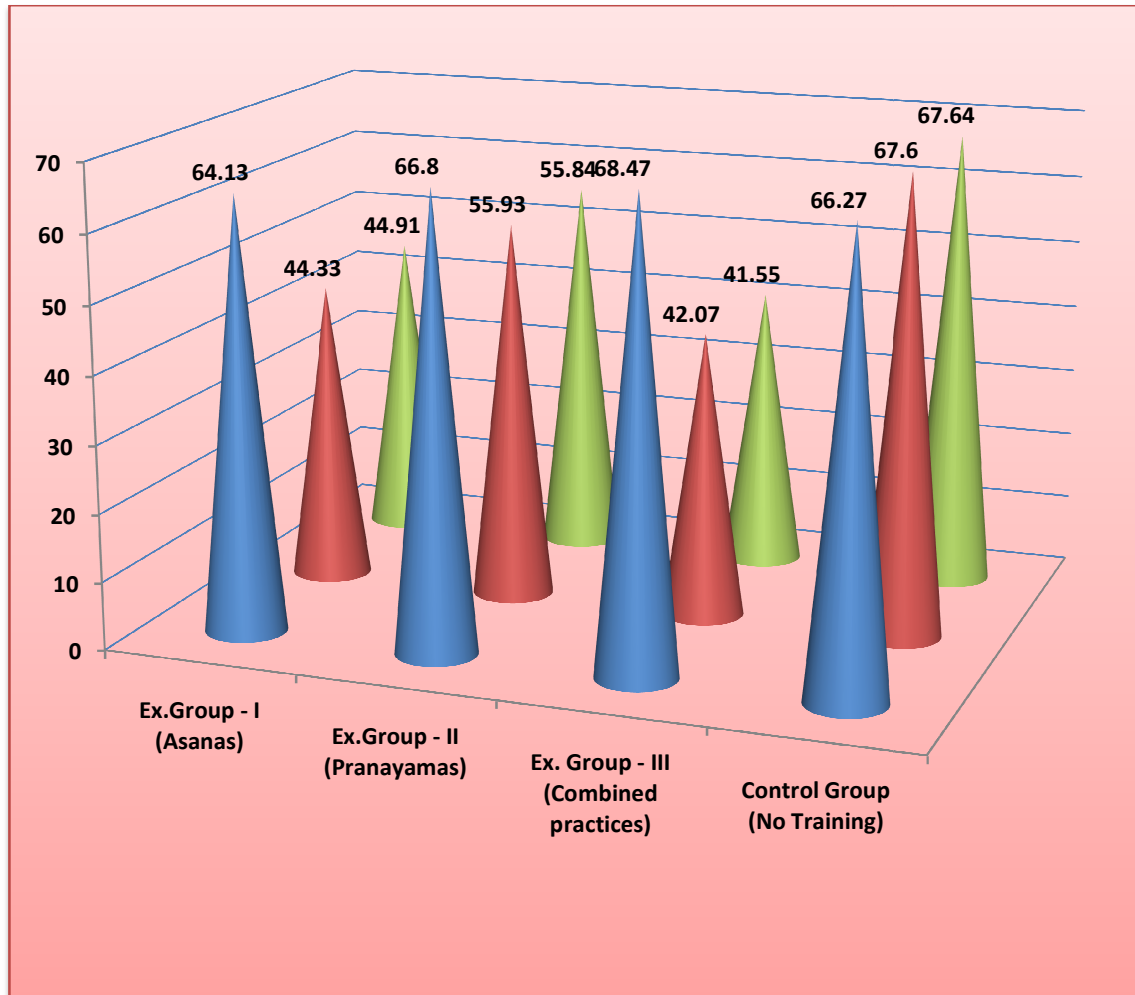
* Significant

Table-XXIII shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 46.

FIGURE - 46

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON STRESS



4.10.1 DISCUSSIONS ON THE FINDINGS OF STRESS

The results presented in table XXII showed that the obtained adjusted means on stress among Asanas group was 44.91 followed by Pranayama group with the mean value of 55.84 followed by combined group (Asanas and pranayama practices) mean value of 41.55 and control group mean value of 67.64. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.14, 16.99 and 17.15 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77 .

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant changes in stress than control group and the differences were significant at 0.05 level. Further, the post hoc analysis between the experimental group namely Pranayama and Combined group (Asanas and pranayama practices) proved that there was significant difference.

The result of this study on stress has in line with the study conducted by **Pallav Sengupta,(2012), Gupta et al., (2006), Brown and Gerbarg (2005)**. Similarly **Stueck et al., (2005)** founded that 21 students participate in a 15-session program of relaxation, yoga, and other meditation and social interaction exercises. Significant effects were seen in a comparison immediately after the training: improved stress coping abilities.

4.11 RESULTS ON PULSE RATE

The physiological variable pulse rate was measured Citizens make digital portable blood Pressure monitor. The results on the Influence of Asanas, Pranayama and combined practices on pulse rate among degree college students are presented in table XXIV.

TABLE XXIV

COMPUTATION OF ANALYSIS OF COVARIANCE ON PULSE RATE

(Total Scores in Beats / minute)

	EX. GR. I	EX. GR. II	EX. GR. III	Control Group	SV	SS	df	M S	Obtained F
Pre Test Mean	74.40	74.73	75.80	76.07	B	29.38	3	9.79	1.39
					W	393.87	56	7.03	
Post Test Mean	69.20	69.13	68.60	75.67	B	506.58	3	168.86	16.68*
					W	567.07	56	10.13	
Adjusted Post Test Mean	69.76	69.47	68.24	75.13	B	413.55	3	137.85	19.14*
					W	396.14	55	7.20	
Mean Diff	5.20	5.60	7.20	0.40					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXIV shows that the pre test mean scores of pulse rate Experimental group I (Asanas) was 74.40. Experimental group II (Pranayama) was 74.73, Experimental Group III Combined (Asanas and pranayama practices) was 75.80 and control group was 76.07. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and pranayama practices) and mean values recorded were 69.20, 69.47, 68.24 and 75.13 respectively.

The obtained F value on pre test scores 1.39 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 16.68 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 19.14 was greater than the required F value of 2.77. This proved that there was a significant difference among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the Physiological variable pulse rate.

Since significant reduction were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXV.

TABLE - XXV
SCHEFFE'S POST-HOC TEST FOR PULSE RATE

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
75.13	69.76			5.37*	2.83
75.13		69.47		5.65*	
75.13			68.24	6.89*	
	69.76	69.47		0.29	
	69.76		68.24	1.52	
		69.47	68.24	1.24	

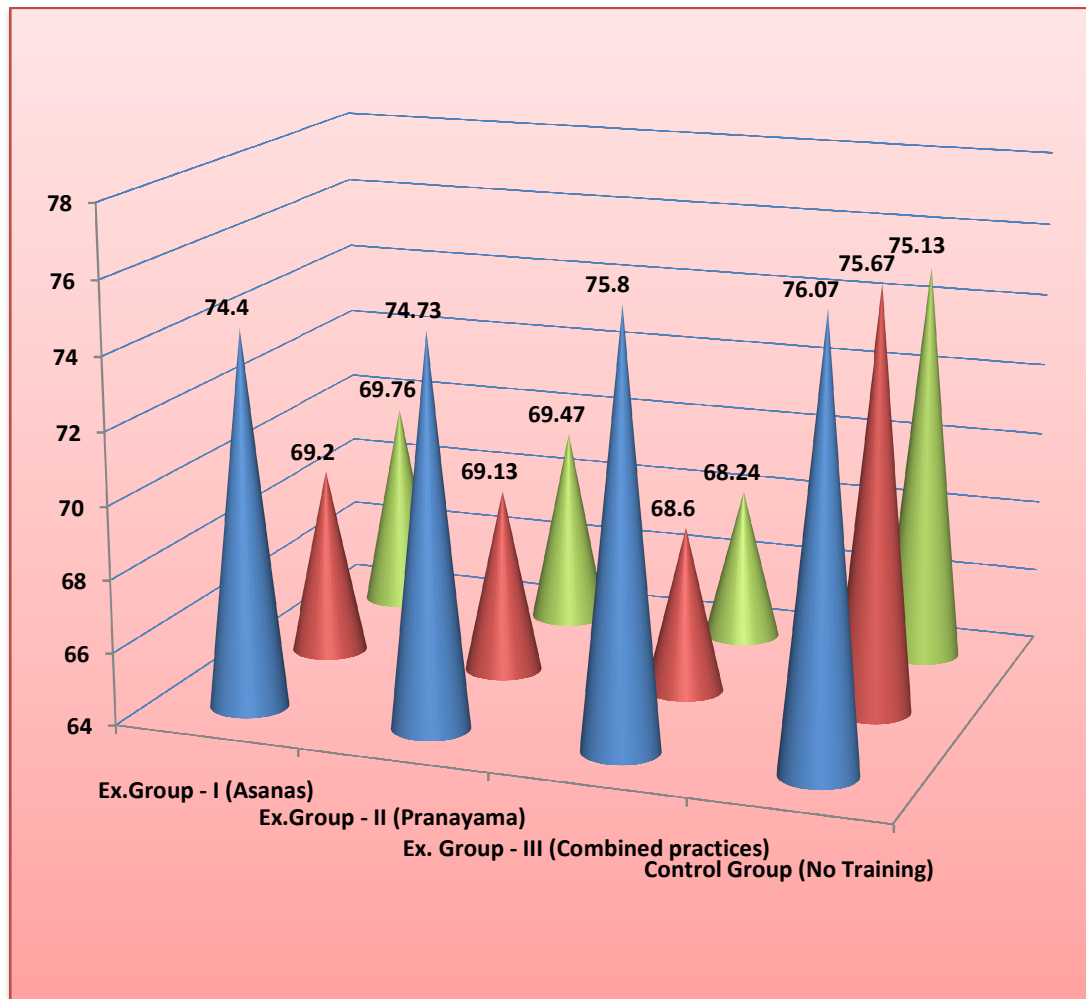
* Significant

Table-XXV shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 47.

FIGURE - 47

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES
OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP
ON PULSE RATE



4.11.1 DISCUSSIONS ON THE FINDINGS OF PULSE RATE

The results presented in table XXIV showed that the obtained adjusted means on pulse rate among Asanas group was 69.20 followed by Pranayama group with the mean value of 69.13 followed by combined group (Asanas and pranayama practices) mean value of 68.60 and control group mean value of 75.67. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.39, 16.68 and 19.14 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.77.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant reductions in pulse rate than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely Asanas group and Pranayama and Combined group (Asanas and pranayama practices) proved that there was no significant difference.

The result of this study on pulse rate has in line with the study conducted by **Indu Mazumdar, Avinash Suryavanshi (2010), Punithavathi, (2010), Divesh Chaudhary and Mohammad Ahsan, (2012)**. Further, **Sasi Kumar, Sivapriya and Shyamala Thirumeni, (2011)** evaluated the effects of a 45 days daily practice of suryanamaskar on heart rate (HR) in school students of both sexes. The results showed that the heart rate (HR) decreased significantly after the practice of suryanamaskar.

4.12 RESULTS ON MEAN ARTERIAL BLOOD PRESSURE

The performance variable of mean arterial blood pressure was measured through Stethoscope, Sphygmomanometer. The results on the Influence of Asanas, Pranayama and combined practices on mean arterial blood pressure among degree college students is presented in table XXVI.

TABLE XXVI

COMPUTATION OF ANALYSIS OF COVARIANCE ON MEAN ARTERIAL BLOOD PRESSURE

(Total Scores in mmHg)

	EX. GR. I	EX. GR. II	EX. GR. III	Control	SV	SS	df	MS	Obtained F
Pre Test Mean	98.30	97.57	99.81	97.57	B	50.48	3	16.83	1.26
					W	746.12	56	13.32	
Post Test Mean	95.52	95.27	93.61	99.90	B	324.78	3	108.26	6.68*
					W	908.23	56	16.22	
Adjusted Post Test Mean	95.52	95.40	93.34	100.03	B	346.54	3	115.51	7.19*
					W	883.83	55	16.07	
Mean Diff	2.78	2.30	6.20	2.33					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXVI shows that the pre test mean scores of mean arterial blood pressure Experimental group I – (Asanas) was 98.30. Experimental group II (Pranayama) was 97.57, Experimental Group III Combined (Asanas and pranayama practices) was 99.81 and control group was 97.57. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and Pranayama) and control group mean values recorded were 95.52, 95.27, 93.61 and 99.90 respectively.

The obtained F value on pre test scores 1.26 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 6.68 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 16.46 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the physiological variable mean arterial blood pressure.

Since significant changes were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXVII.

TABLE - XXVII

SCHEFFE'S POST-HOC TEST ON MEAN ARTERIAL BLOOD PRESSURE

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
100.03	95.52			4.51*	4.23
100.03		95.40		4.63*	
100.03			93.34	6.69*	
	95.52	95.40		0.12	
	95.52		93.34	2.18	
		95.40	93.34	2.06	

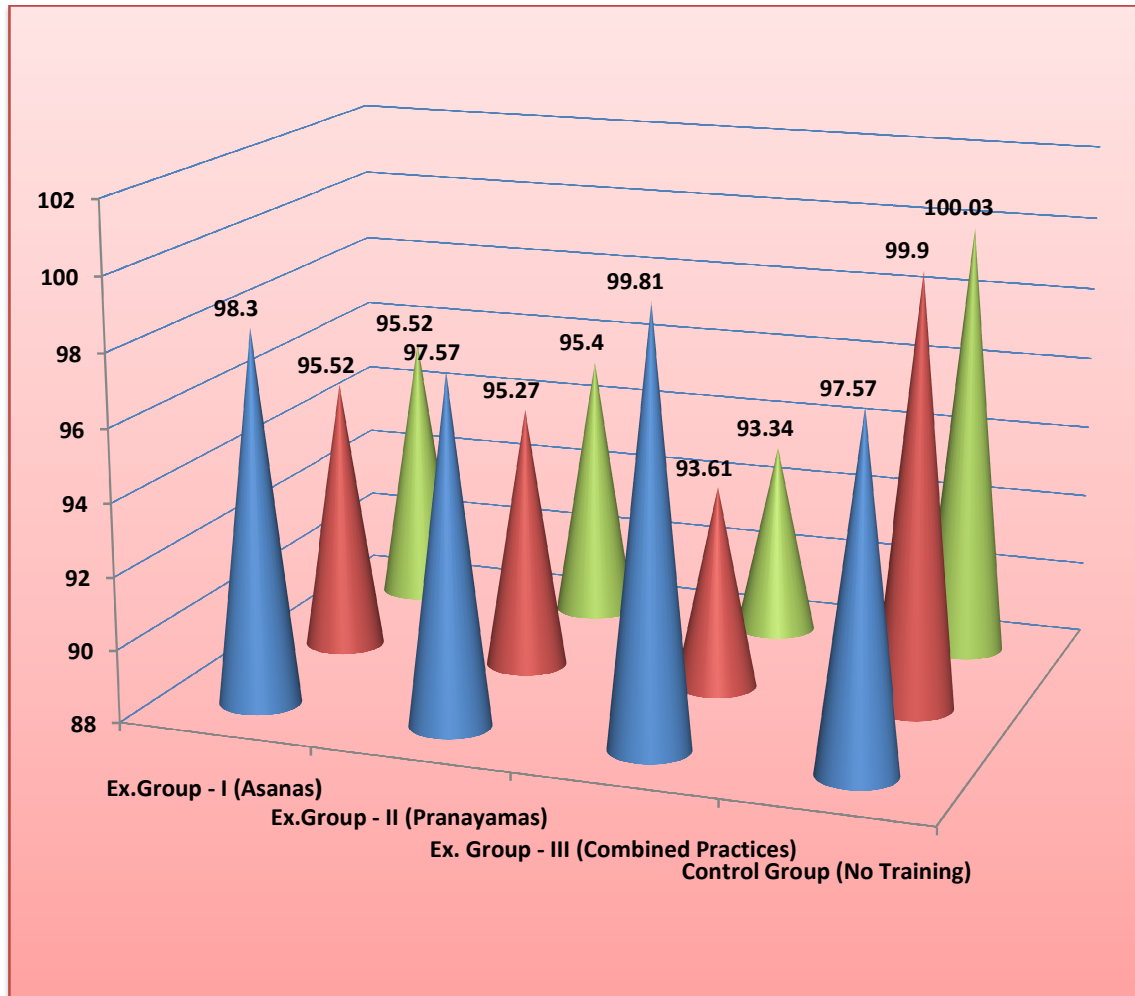
* Significant

Table-XXVII shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 48.

FIGURE – 48

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON MEAN ARTERIAL BLOOD PRESSURE



4.12.1 DISCUSSIONS ON THE FINDINGS OF MEAN ARTERIAL BLOOD PRESSURE

The results presented in table XXVI showed that the obtained adjusted means on Mean arterial blood pressure among Asanas group was 95.52 followed by Pranayama group with the mean value of 95.40 followed by combined group (Asanas and pranayama practices) mean value of 93.34 and control group mean value of 100.03. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.26, 6.68 and 7.19 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68 .

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment the Asanas, Pranayama and Combined practices (Asanas and pranayama) proved that there was significant improvement in Mean arterial blood pressure than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental groups proved that there was no significant difference.

The result of this study on Mean arterial blood pressure has in line with the study conducted by **Kartik. Patel, Neeraj Mahajan, and Kena Jasani, (2011), Neethi and Chidambara Raja, (2011), Cohen et al., (2013), Prasoon Somvanshi, Shirley Telles, and Acharya Balkrishna, (2011).** Further, **Thounaojam Shantikumar Singh, (2011)** found the mean systolic and diastolic blood pressure were reduced significantly due to yoga practice in normal female subjects.

4.13 RESULTS ON VITAL CAPACITY

The physiological variable of vital capacity was measured through spirometer. The results on the Influence of Asanas, Pranayama and combined practices on vital capacity among degree college students are presented in table XXVIII.

TABLE XXVIII
COMPUTATION OF ANALYSIS OF COVARIANCE ON VITAL CAPACITY

(Total Scores in ml)

	EX. GR. I	EX. GR. II	EX. GR. III	Control Group	SV	SS	df	M S	F
Pre Test Mean	3300.00	3310.00	3296.67	3186.67	B	151666.67	3	50555.56	1.24
					W	2290666.67	56	40904.76	
Post Test Mean	3638.33	3623.33	3940.00	3190.00	B	4285447.92	3	1428482.64	11.22*
					W	7128666.67	56	127297.62	
Adjusted Post Test Mean	3641.94	3628.29	3943.16	3178.28	B	4271153.86	3	1423717.95	11.05*
					W	7086781.45	55	128850.57	
Mean Diff	338.33	313.33	643.33	3.33					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXVIII shows that the pre test mean scores of vital capacity (Experimental group I (Asanas) was 3300.00. Experimental group II (Pranayama) was 3310.00, Experimental Group III Combined (Asanas and pranayama practices) was 3296.67 and control group was 3186.67. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas and Pranayama) and mean values recorded were 3638.33, 3623.33, 3940.00 and 3190.00 respectively.

The obtained F value on pre test scores 1.24 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 11.22 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 16.46 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the physiological variable vital capacity.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXIX.

TABLE - XXIX

SCHEFFE'S POST-HOC TEST FOR VITAL CAPACITY

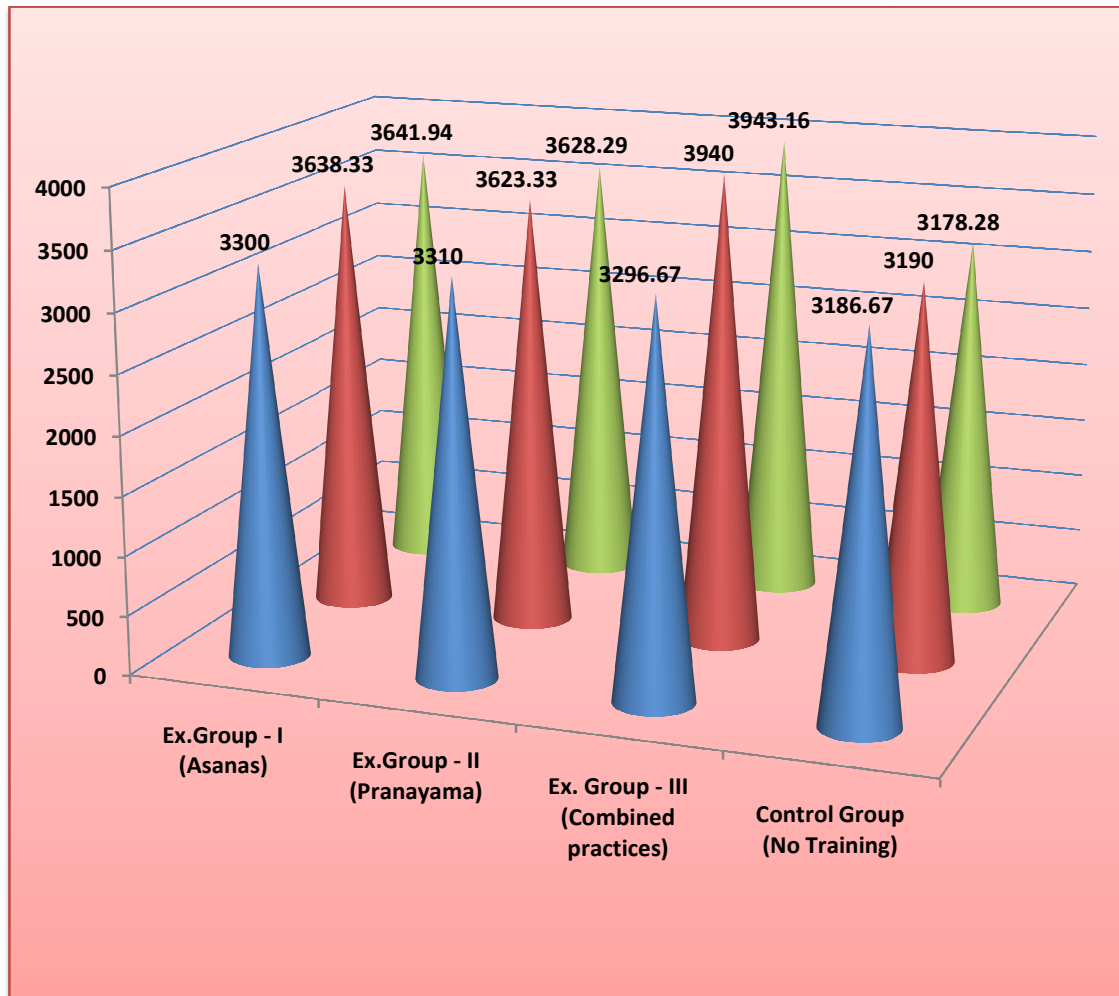
Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
3178.28	3641.94			463.66*	378.53
3178.28		3628.29		450.01*	
3178.28			3943.16	764.87*	
	3641.94	3628.29		13.65	
	3641.94		3943.16	301.22	
		3628.29	3943.16	314.86	

* Significant

Table-XXIX shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure -49.

FIGURE - 49
BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES
OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON
VITAL CAPACITY



4.13.1 DISCUSSIONS ON THE FINDINGS OF VITAL CAPACITY

The results presented in table XXVIII showed that the obtained adjusted means on vital capacity among Asanas group was 3641.94 followed by Pranayama group with the mean value of 3628.29 followed by combined group (Asanas and pranayama practices) mean value of 3943.16 and control group mean value of 3178.28. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.24, 11.22 and 11.05 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68 .

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant improvement in vital capacity than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely Asanas group and Pranayama and Combined group (Asanas and pranayama practices) proved that there was no significant difference.

The result of this study on vital capacity has in line with the study conducted by **Kartik et al, (2011)**, **Bhowmik et al., (2010)**. Similarly, **Dhivya Laxmi and Murugavel, (2013)** stated that Significant improvement was found on vital capacity of experiment group due to the effects of Asanas, pranayama and core training when compared to the control group.

4.14 RESULTS ON HEMOGLOBIN

The biochemical variable of hemoglobin was measured through blood test from standard laboratory. The results on the Influence of Asanas, Pranayama and combined practices on hemoglobin among degree college students are presented in table XXX.

TABLE XXX

COMPUTATION OF ANALYSIS OF COVARIANCE ON HEMOGLOBIN

(Total Scores in g/dl)

	EX. GR. I	EX. GR. II	EX. GR. III	Control	SV	SS	df	M S	Obtained F
Pre Test Mean	9.82	10.25	10.22	10.23	B	1.93	3	0.64	1.02
					W	35.39	56	0.63	
Post Test Mean	12.89	12.98	13.61	10.41	B	89.69	3	29.90	53.22*
					W	31.45	56	0.56	
Adjusted Post Test Mean	13.00	12.94	13.58	10.38	B	91.41	3	30.47	62.10*
					W	26.99	55	0.49	
Mean Diff	3.07	2.73	3.39	0.19					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXX shows that the pre test mean scores of hemoglobin Experimental group I (Asanas) was 9.82. Experimental group II (Pranayama) was 10.25, Experimental Group III Combined (Asanas and pranayama practices) was 10.22 and control group was 10.23. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas & Pranayama) and control group mean values recorded were 12.89, 12.98, 13.61 and 10.41 respectively.

The obtained F value on pre test scores 1.02 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 53.22 was greater than the required F value of 2.77. This proved that the, differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 62.10 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the performance variable hemoglobin.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXXI.

TABLE - XXXI
SCHEFFE'S POST-HOC TEST ON HEMOGLOBIN

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
10.38	13.00			2.63*	0.74
10.38		12.94		2.56*	
10.38			13.58	3.20*	
	13.00	12.94		0.07	
	13.00		13.58	0.58	
		12.94	13.58	0.65	

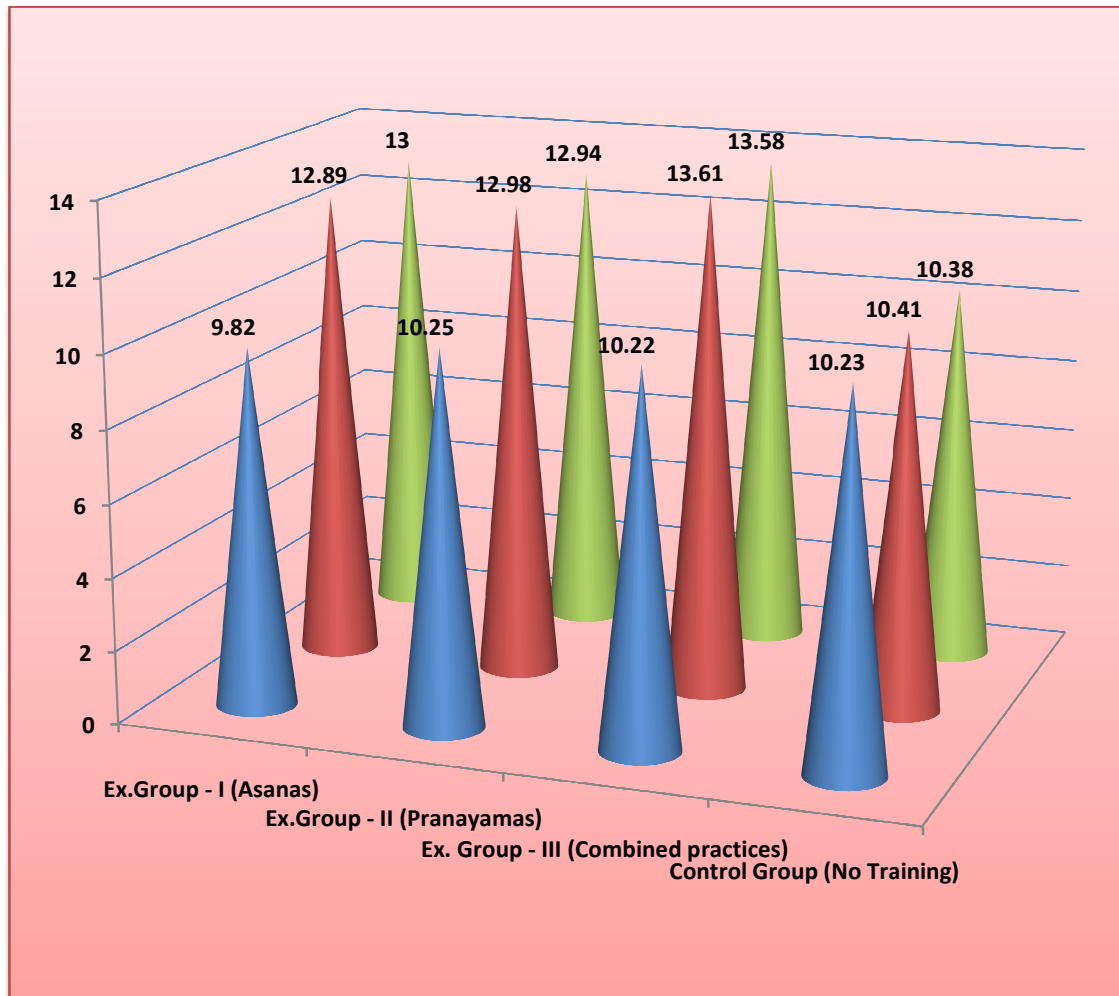
* Significant

Table-XXXI shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 50.

FIGURE – 50

**BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES
OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON
HEMOGLOBIN**



4.14.1 DISCUSSIONS ON THE FINDINGS OF HEMOGLOBIN

The results presented in table XXX showed that the obtained adjusted means on Hemoglobin among Asanas group was 13.00 followed by Pranayama group with the mean value of 12.94 followed by combined group (Asanas and pranayama practices) mean value of 13.58 and control group mean value of 10.38. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.02, 53.22 and 62.10 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) showed there was significant improvement in Hemoglobin than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental groups proved that there was no significant difference.

The result of this study on Hemoglobin has in line with the study conducted by **Krishna Sharma, et al., (2014), Purohit Geetanjali, et al., (2013) , Kasundra, Thumar and Mungra (2010), Jore, et al., (2011)**. Similarly, **Chandrashekhar Karpoor, and Deshpande, (2011)**, observed the changes induced by yogic practices in hematological parameters. . After 6 weeks of yoga training there was significant increase in Hb%.

4.15 RESULTS ON RED BLOOD CELL

The biochemical variable of red blood cell was measured through blood test from standard laboratory. The result on the Influence of Asanas, Pranayama and combined practices on red blood cell among degree college students is presented in table XXXII.

TABLE XXXII

COMPUTATION OF ANALYSIS OF COVARIANCE ON RED BLOOD CELL

(Scores in mmol/L)

	EX. GR. I	EX. GR. II	EX. GR. III	Control Group	SV	SS	df	MS	Obtained F
Pre Test Mean	4.67	4.94	4.88	4.64	B	1.04	3	0.35	1.22
					W	15.98	56	0.29	
Post Test Mean	5.54	5.70	5.98	4.82	B	10.87	3	3.62	12.52*
					W	16.21	56	0.29	
Adjusted Post Test Mean	5.55	5.69	5.97	4.83	B	10.10	3	3.37	11.49*
					W	16.11	55	0.29	
Mean Diff	0.86	0.75	1.09	0.19					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXXII shows that the pre test mean scores of red blood cells Experimental group I (Asanas) was 4.67. Experimental group II (Pranayama) was 4.94, Experimental Group III Combined (Asanas and pranayama practices) was 4.88 and control group was 4.64. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas & Pranayama) and mean values recorded were 5.54, 5.70, 5.98 and 4.82 respectively.

The obtained F value on pre test scores 1.22 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 12.52 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 11.49 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the hematological variable red blood cells.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXXIII.

TABLE - XXXIII
SCHEFFE'S POST-HOC TEST ON RED BLOOD CELL

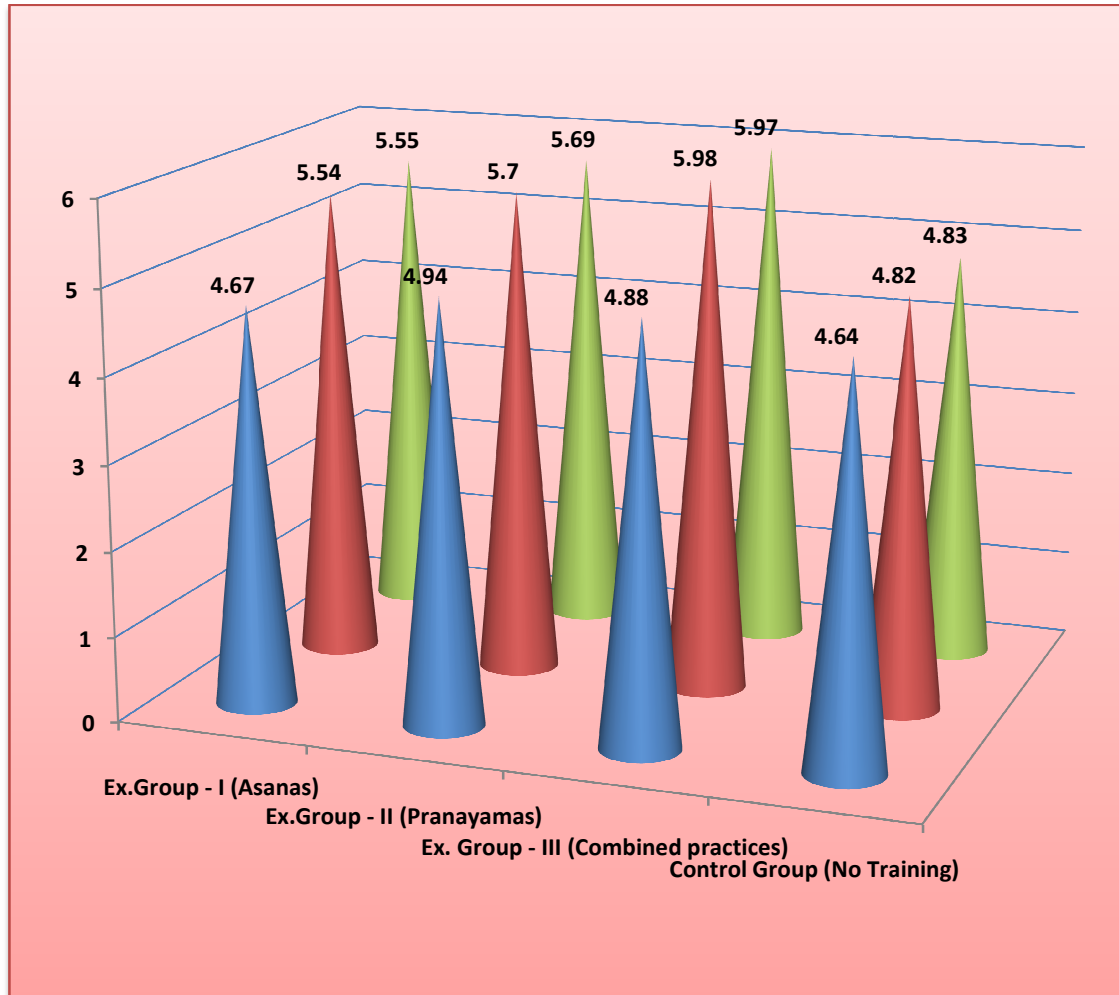
Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
4.83	5.55			0.71*	0.57
4.83		5.69		0.85*	
4.83			5.97	1.13*	
	5.55	5.69		0.14	
	5.55		5.97	0.42	
		5.69	5.97	0.28	

* Significant

Table-XXXIII shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 51.

FIGURE - 51
BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES
OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON
RED BLOOD CELL



4.15.1 DISCUSSIONS ON THE FINDINGS OF RED BLOOD CELL

The results presented in table XXXII showed that the obtained adjusted means on Red blood cells among Asanas group was 5.55 followed by Pranayama group with the mean value of 5.69 followed by combined group (Asanas and pranayama practices) mean value of 5.97 and control group mean value of 4.83. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.22, 12.52 and 11.49 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment the Asanas group and Pranayama group and Combined group (Asanas and pranayama practices) there was significant improvement in Red blood cells than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental groups proved that there was no significant difference.

The result of this study on Red blood cell has in line with the study conducted by **Purohit Geetanjali, et al., (2013)**, **Jore, et al., (2011)**, **Karpoor Chandrashekhar, (2012)**. **Kasundra, Thumar and Mungra (2010)** also proved that Pranayama training showed Significant difference in pre-test and post-test of experimental groups on blood components of Red Blood Cell. Similarly, **Rajendran (2013)** observed that changes induced by yogic practices and exercise and Combination of both shows that the Red blood cell count increases significantly.

4.16 RESULTS ON WHITE BLOOD CELL

The hematological variable of white blood cell was measured through blood test from standard laboratory. The result on the Influence of Asanas, Pranayama and combined practices on white blood cell among degree college students is presented in table XXXIV.

TABLE XXXIV

COMPUTATION OF ANALYSIS OF COVARIANCE ON WHITE BLOOD CELL

((Scores in thousands/ mm³)

	EX. GR. I	EX. GR. II	EX. GR. III	Control	SV	SS	df	M S	Obtained F
Pre Test Mean	5.21	5.19	5.24	5.26	B	0.04	3	0.01	1.36
					W	0.57	56	0.01	
Post Test Mean	6.32	6.28	6.49	5.23	B	14.89	3	4.96	205.63*
					W	1.35	56	0.02	
Adjusted Post Test Mean	6.31	6.28	6.49	5.23	B	14.43	3	4.81	197.25*
					W	1.34	55	0.02	
Mean Diff	1.11	1.09	1.25	0.03					

* Significant at 0.05 level of confidence for 3 and 56 (df) is 2.77, 3 and 55(df) is 2.77.

Table XXXIV shows that the pre test mean scores of mean arterial blood pressure Experimental group I (Asanas) was 5.21. Experimental group II (Pranayama) was 5.19, Experimental Group III Combined (Asanas and pranayama practices) was 5.24 and control group was 5.26. The post test means showed differences due to Twelve weeks of Asanas, Pranayama and Combined (Asanas & Pranayama) and mean values recorded were 6.32, 6.28, 6.49 and 5.23 respectively.

The obtained F value on pre test scores 1.36 was lesser than the required F value of 2.77 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 205.63 was greater than the required F value of 2.77. This proved that the differences between the post test mean of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 197.25 was greater than the required F value of 2.77. This proved that there was Significant differences among the means due to Twelve weeks of Asanas, Pranayama and Combined practices (Asanas and pranayama practices) on the hematological variable white blood cell.

Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test. The results were presented in table XXXV.

TABLE - XXXV

SCHEFFE'S POST-HOC TEST ON WHITE BLOOD CELL

Control Group	Experimental Group – I (Asanas)	Experimental Group – II (Pranayama)	Experimental Group – III (Combined)	Mean difference	Required C.I
5.23	6.31			1.08*	0.16
5.23		6.28		1.05*	
5.23			6.49	1.26*	
	6.31	6.28		0.03	
	6.31		6.49	0.18*	
		6.28	6.49	0.21*	

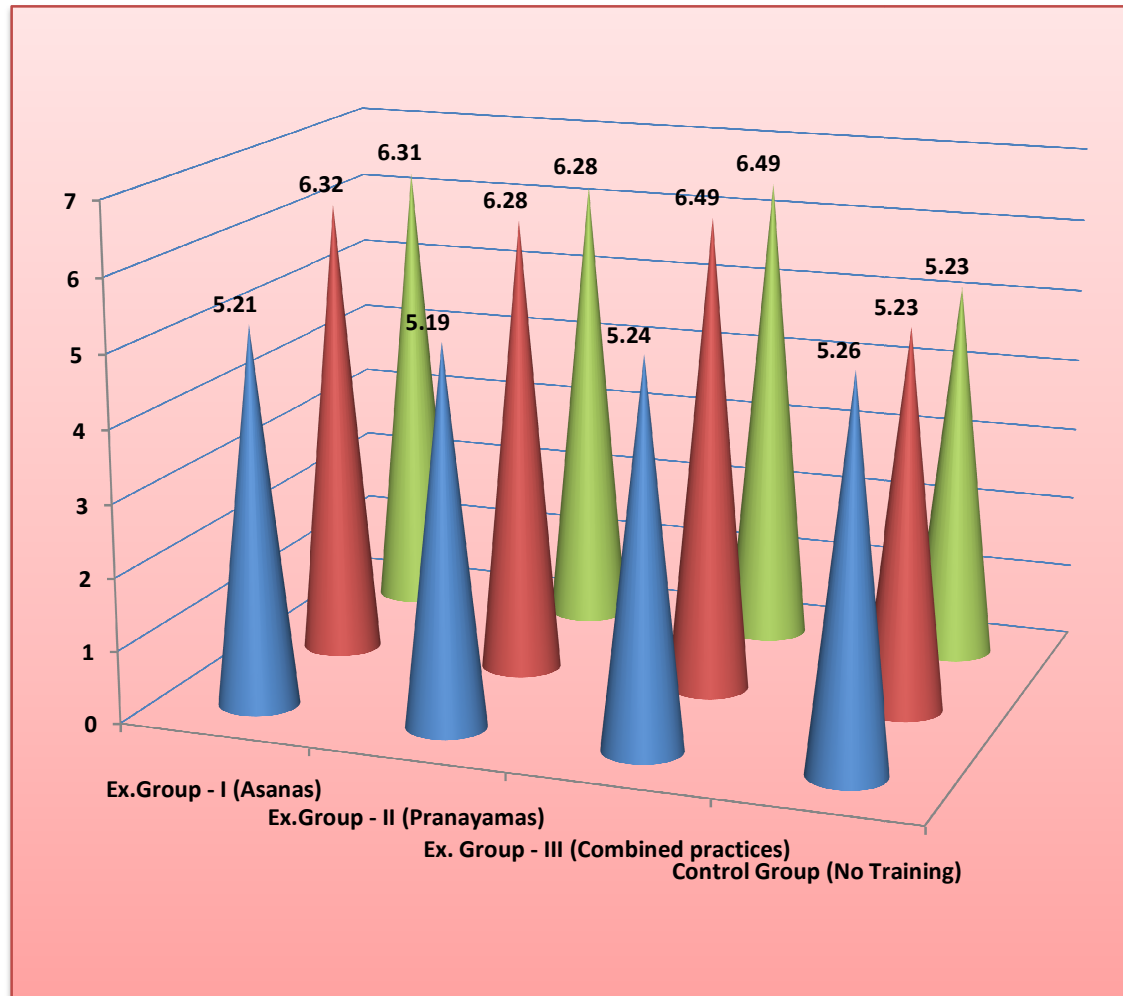
* Significant

Table-XXXV shows that there was significant difference between Asanas and control group and Pranayama group and control group, combined practices (Asanas and Pranayama practices) group and control group.

The obtained pre, post and adjusted mean values were presented through bar diagram for better understanding of the results of the study in figure - 12.

FIGURE – 12

**BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED POST-TEST VALUES
OF EXPERIMENTAL GROUP I, II, III & CONTROL GROUP ON
WHITE BLOOD CELL**



4.16.1 DISCUSSIONS ON THE FINDINGS OF WHITE BLOOD CELL

The results presented in table XXXIV showed that the obtained adjusted means on white blood cell among Asanas group was 6.31 followed by Pranayama group with the mean value of 6.28 followed by combined group (Asanas and pranayama practices) mean value of 6.49 and control group mean value of 5.23. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 1.36, 205.63 and 197.25 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 2.68.

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment of Asanas, Pranayama and Combined practices (Asanas and pranayama) there was significant improvement white blood cell than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely Asanas group and Pranayama and Combined group (Asanas and pranayama practices) proved that there was significant difference.

The result of this study on Mean arterial blood pressure has in line with the study conducted by **Purohit Geetanjali, et al., (2013)**, **Kasundra, Thumar and Mungra (2010)**. Similarly, **Krishna Sharma, et al., (2014)** found yoga therapy showed significant improvement in white blood cell among experimental group when compared to control group.

4.17 DISCUSSION ON HYPOTHESES

1. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physical variable of Agility. According to **Table VII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
2. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physical variable of Flexibility. According to **Table IX** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
3. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physical variable of Agility. According to **Table XI** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
4. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physical variable of Strength. According

to **Table XIII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.

5. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physical variable of Flexibility. According to **Table XV** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
6. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physiological variable of Cardio vascular endurance. According to **Table XVII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
7. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physiological variable of pulse rate. According to **Table XIX** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas &

- Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
8. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physiological variable of Mean arterial blood pressure. According to **Table XXI** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
 9. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in physiological variable of vital capacity. According to **Table XXIII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.
 10. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in hematological variable of hemoglobin. According to **Table XXV** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research

hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.

11. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in hematological variable of red blood cell. According to **Table XXVII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.

12. It was hypothesized that there would be significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group in hematological variable of white blood cell. According to **Table XXVII** it was proved that there was significant difference between Asanas group, Pranayama group, Combined group (Asanas & Pranayama) and control group and hence the research hypothesis was accepted and null hypothesis rejected at 0.05 level of confidence.

Thus the researcher has successfully completed the study and presented the results clearly and proceeded with the summary and conclusions along with recommendations in the next chapter.