

## **CHAPTER IV**

### **RESULTS AND DISCUSSIONS**

#### **4.1 OVERVIEW**

In this chapter the analysis of data and the results of the study are discussed. The purpose of the study was to find out the efficacy of vinyasa yoga with and without mantra chanting on selected cerebromuscular, cognitive and psychomotor variables among children with cerebral palsy. To achieve the purpose of the study 45 male children with cerebral palsy were selected by simple random sampling method from NIEPMD, Chennai. The age of the subjects ranged from eight to twelve years. The selected subjects were divided into three equal groups with 15 subjects in each group. The experimental group I practiced vinyasa yoga with mantra chanting, experimental group II practiced vinyasa yoga without mantra chanting where as group III were not exposed to any training, they were treated as control group for the study. The experimental period was limited for 22 weeks, monday to friday, minimum of 50 minutes to maximum of 80 minutes per day . The selected cerebromuscular variables were muscle coordination, visual perception, proprioception and cognitive variables were registration. memory, attention and psychomotor variables were static balance, dynamic balance and gait. The subjects were tested on the selected variables prior to and after the experimental period and the collected data were analysed through Analysis of Co- Variance (ANCOVA) to find out the significant differences among the groups. To find out the paired mean difference among the groups scheffe's post hoc test was used at 0.05 level of confidence.

## **4.2 TEST OF SIGNIFICANCE**

This is the vital portion of thesis achieving the conclusion by examining the hypotheses. The procedure of testing the hypotheses was either by accepting the hypotheses or rejecting the same in accordance with the results obtained in relation to the level of confidence. The test was usually called the test of significance since this test used to find out whether the differences between groups or within the groups' scores were significant or not. In this study, if obtained F-value was greater than the table value, the null hypotheses were rejected to the effect that there existed significant difference among the means of the groups compared and if obtained F-values were lesser than the required values, then the null hypotheses were accepted to the effect that there existed no significant differences among the means of the groups under study.

## **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 were compared at 0.05 level of significance, In this study analysis of co- variance of F-ratio 3.22 is needed for significance at the 0.05 level of confidence for the degrees of freedom 2 and 41.

In addition to that, the significant difference between the paired adjusted means were tested by computing the required C.I value utilising the scheffe's post hoc test, in which the obtained means difference value needed to be greater than the scheffe's required C.I value for significance.

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

The following tables illustrate the statistical results of the influence of vinyasa yoga with and without mantra chanting on selected cerebromuscular variables such as muscle coordination, visual perception, proprioception and cognitive variables such as registration, memory, attention and psychomotor variables such as static balance, dynamic balance and gait among children with cerebral palsy. The obtained adjusted means and differences between the groups under study were given in the following tables.

#### **4.5 RESULTS ON MUSCLE COORDINATION**

The cerebromuscular variable muscle coordination was measured by using finger to nose test for upper limb coordination and heel to shin testing for lower limb coordination. The mean scores of pre test and post test were taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on muscle coordination among children with cerebral palsy is presented in the **Table – X**.

**Table – X**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON MUSCLE COORDINATION**  
**(Scores in Seconds)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	48.67	49.07	47.80	B	12.58	2	6.29	1.07
				W	246.67	42	5.87	
Post test	40.07	43.60	47.93	B	465.73	2	232.87	26.19*
				W	373.47	42	8.89	
Adjusted post test	40.29	43.90	47.89	B	559.06	2	279.53	68.52*
				W	167.26	41	4.08	
Mean gain	8.6	5.47	0.13					

\*Significant at 0.05 level of significance.

Table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table X shows that the pre test mean scores of muscle coordination of experimental group I vinyasa yoga with mantra chanting was 48.67, experimental group II without mantra chanting was 49.07 and control group was 47.80. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 40.07, 43.60 and 47.93 respectively. The obtained F – value on pre test scores 1.07 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 26.19 was greater than the required F – value of 3.22. This proved that the differences between the post test mean of the

subjects were significant. Taking in to 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 68.52 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the cerebromuscular variable muscle coordination. Since significant differences were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XI

**Table XI**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF**  
**MUSCLE COORDINATION (Scores in Seconds)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
40.29	43.90		3.61*	1.87
	43.90	47.89	3.99*	1.87
40.29		47.89	7.60*	1.87

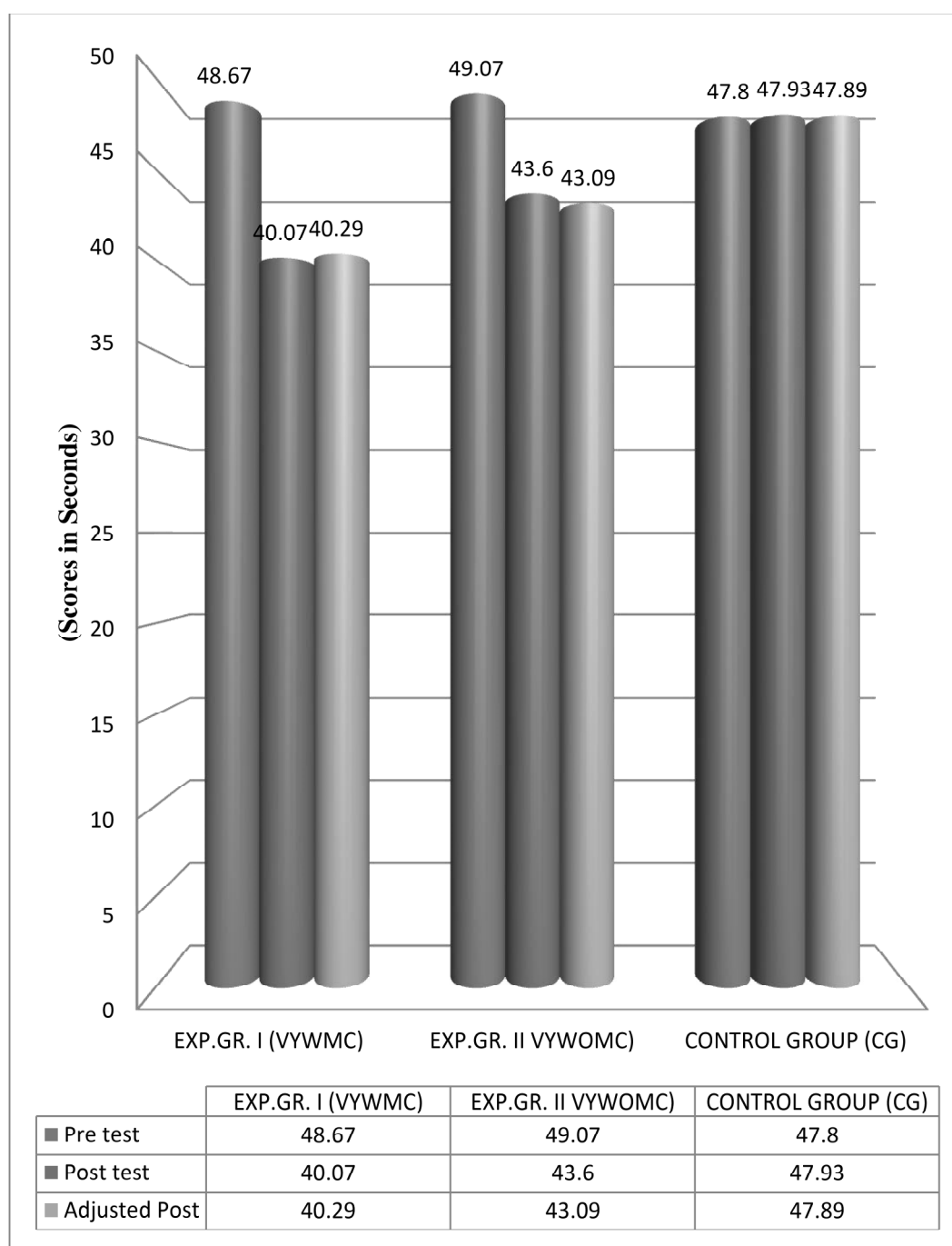
**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exists between the adjusted means of muscle coordination among the groups. Table XI shows that there was significant difference in muscle coordination between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant than vinyasa Yoga without mantrachanting on muscle coordination among the cerebral palsy children.

The pre, post and ordered adjusted mean values on muscle coordination were presented through bar diagram for better understanding of the results of this study in **Figure 26.**

**Figure 26**

**BAR DIAGRAM ON PRE POST AND ORDERED ADJUSTED MEANS OF  
MUSCLE COORDINATION  
(Scores in Seconds)**



#### **4.5.1 DISCUSSION ON THE FINDINGS OF MUSCLE COORDINATION**

The results presented in table X proved that the obtained F – value on the pre test scores was less than the required F – value and the difference was not significant.

The obtained F – value on adjusted mean value was 68.52 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered muscle coordination of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered muscle coordination among cerebral palsy children of experimental groups than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of muscle coordination.

The above findings can also be substantiated by observations made by the investigator **Christensen M.S. et al. 2017**

#### **4.6 RESULTS ON VISUAL PERCEPTION**

The cerebromuscular variable visual perception was measured by using eye hand coordination test. The mean score of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on visual perception among children with cerebral palsy is presented in the **Table – XII**

**Table XII**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON VISUAL PERCEPTION**  
**(Scores in Counts)**

Test	Mean			S V	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	7.00	7.13	6.87	B	0.53	2	0.27	2.1
				W	23.47	42	0.57	
Post test	11.87	10.13	7.00	B	182.53	2	91.27	74.48*
				W	51.47	42	1.23	
Adjusted post test	11.87	10.02	6.98	B	170.48	2	85.24	105.43*
				W	33.15	41	0.81	
Mean gain	4.87	3	0.13					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XII shows that the pre test mean scores of visual perception of experimental group I vinyasa yoga with mantra chanting was 7.00, experimental group II without mantra chanting was 7.13 and control group was 6.87. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 11.87, 10.13 and 7.00 respectively.

The obtained F – value on pre test scores 2.1 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 74.48 was greater than the required F



– value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 105.43 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the cerebromuscular variable visual perception.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XIII

**Table XIII**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF VISUAL**  
**PERCEPTION (Scores in Counts)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
11.87	10.02		1.85*	0.83
	10.02	6.98	3.1*	0.83
11.87		6.98	4.87*	0.83

**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exists between the adjusted means of visual perception among the groups. Table XIII shows that there was significant difference in visual perception between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had

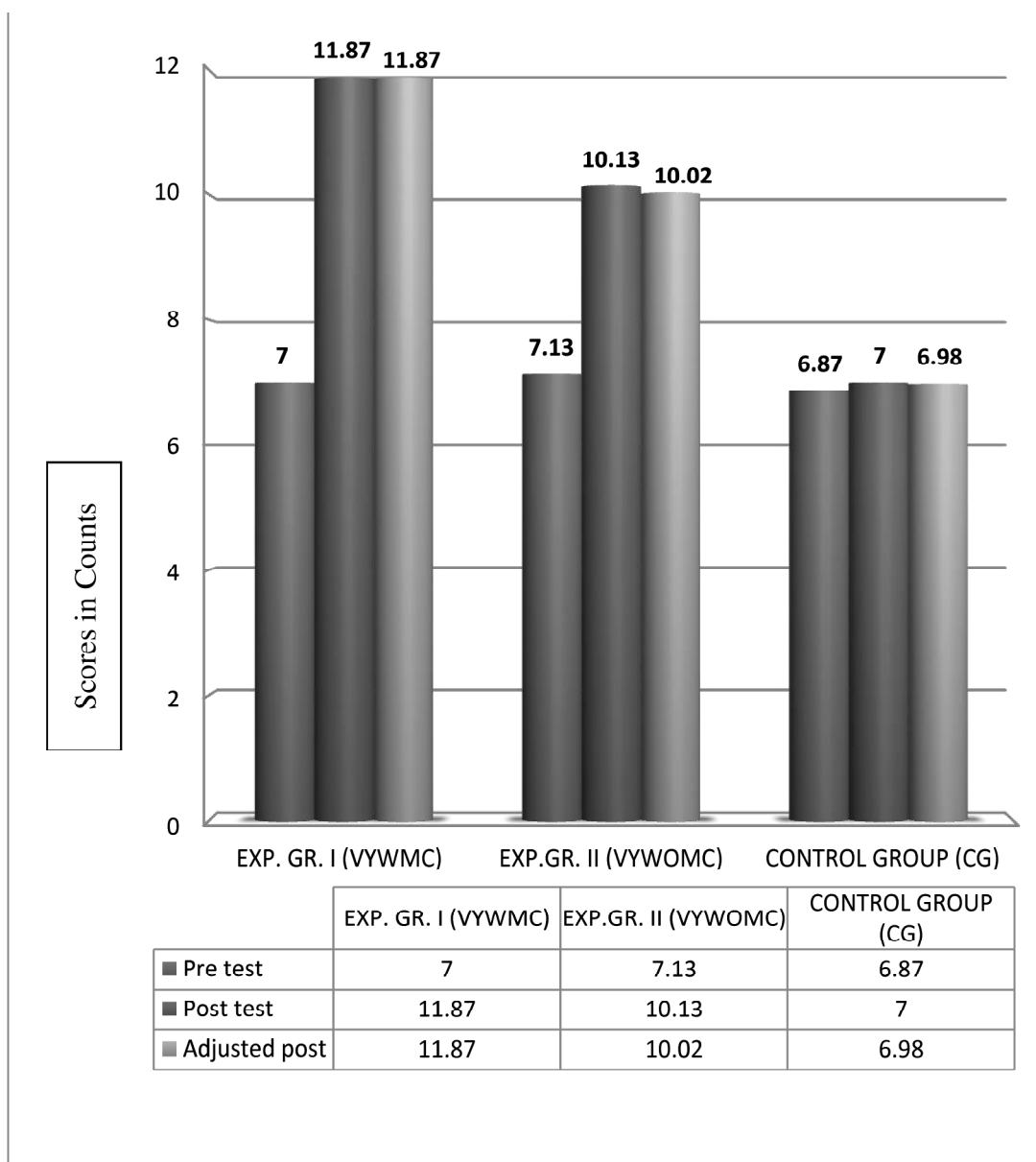
considerably better significant than vinyasa yoga without mantra chanting on visual perception among the cerebral palsy children.

The pre, post and ordered adjusted mean values on visual perception were presented through bar diagram for better understanding of the results of this study in

**Figure 27**

**Figure 27**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF VISUAL PERCEPTION (Scores in Counts)**



#### **4.6.1 DISCUSSION ON THE FINDINGS OF VISUAL PERCEPTION**

The results presented in table XII proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 105.43 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered visual perception of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered visual perception among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of visual perception.

These findings of the study is in agreement with the finding of the researcher **Jose A Berela 2011.**

#### **4.7 RESULTS ON PROPRIOCEPTION**

The cerebromuscular variable proprioception was measured by Hot/cold temperature test . The mean scores of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on proprioception among children with cerebral palsy is presented in the **Table – XIV**

**Table XIV**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON PROPRIOCEPTION**  
**(Scores in Seconds)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	51.20	51.07	51.53	B	1.73	2	0.87	1.62
				W	59.07	42	1.41	
Post test	43.67	47.07	51.40	B	450.71	2	225.36	89.4*
				W	105.87	42	2.52	
Adjusted post test	43.71	47.18	51.44	B	420.53	2	210.27	100.9*
				W	85.41	41	2.08	
Mean gain	7.53	4	0.13					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XIV shows that the pre test mean scores of proprioception of experimental group I vinyasa yoga with mantra chanting was 51.20, experimental group II without mantra chanting was 51.07 and control group was 51.53. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 43.67, 47.07 and 51.40 respectively.

The obtained F – value on pre test scores 1.62 was lesser than the required F – value of 3.22 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 of 89.4 was greater than the required

F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 100.9 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the cerebromuscular variable proprioception.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XV.

**Table XV**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF**  
**PROPRIOCEPTION (Scores in Seconds)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
43.71	47.18		3.48*	1.34
	47.18	51.44	4.26*	1.34
43.71		51.44	7.73*	1.34

**\*Significant at 0.05 level of confidence**

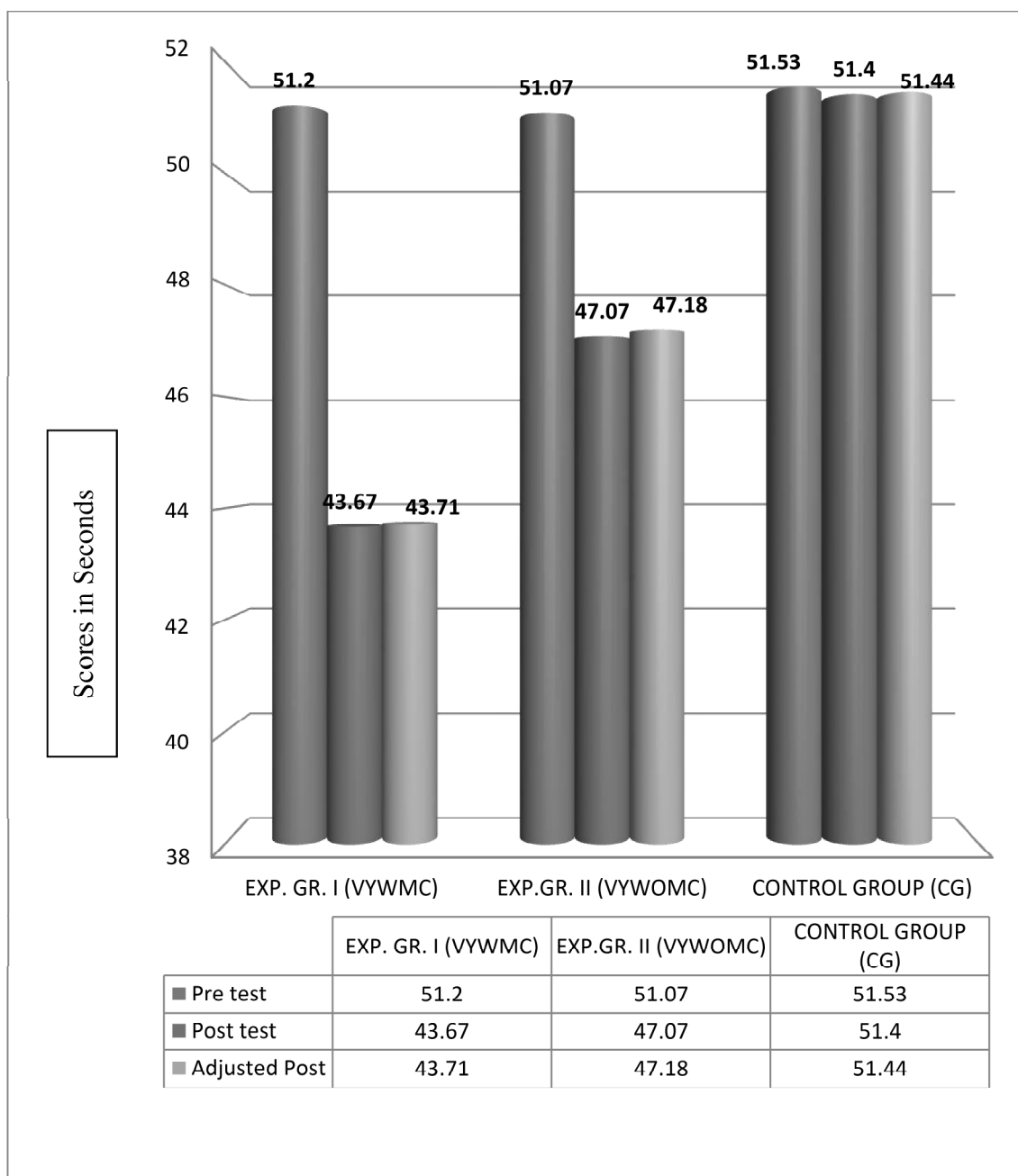
The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of proprioception among the groups. Table XV shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group .It was also proved that vinyasa yoga with mantra chanting had considerably better significant than vinyasa yoga without mantra chanting on proprioception among the cerebral palsy children.

The pre, post and ordered adjusted mean values on proprioception were presented through bar diagram for better understanding of the results of this study in

**Figure 28**

**Figure 28**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF  
PROPRIOCEPTION (Scores in Seconds)**



#### **4.7.1 DISCUSSION ON THE FINDINGS OF PROPRIOCEPTION**

The results presented in table XIV proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 100.9 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered proprioception of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered proprioception among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of proprioception.

The above findings can be supported by the studies conducted by **Belardinelli P 2002**, as his study concluded that proper physical activity improves perceptual process of the brain.

#### **4.8 RESULTS ON REGISTRATION**

The cognitive variable registration was measured by using MMSE questionnaire(Mini Mental State Examination). The mean score of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on registration among children with cerebral palsy is presented in the **Table – XVI**

**Table XVI**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON REGISTRATION**  
**(Scoring in Points)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	1.77	1.80	1.70	B	0.08	2	0.04	2.29
				W	3.73	42	0.09	
Post test	2.60	2.27	1.73	B	5.73	2	2.87	18.62*
				W	6.47	42	0.15	
Adjusted post test	2.59	2.24	1.73	B	5.12	2	2.56	20.29*
				W	5.17	41	0.13	
Mean gain	0.83	0.47	0.03					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XVI shows that the pre test mean scores of registration of experimental group I vinyasa yoga with mantra chanting was 1.77, experimental group II without mantra chanting was 1.80 and control group was 1.70. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 2.60, 2.27 and 1.73 respectively.

The obtained F – value on pre test scores 2.29 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 18.62 was greater than the required



F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 20.29 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the cognitive variable registration. Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XVII

**Table XVII**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF**  
**REGISTRATION (Scores in Points)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
2.59	2.24		0.35*	0.33
	2.24	1.73	0.51*	0.33
2.59		1.73	0.86*	0.33

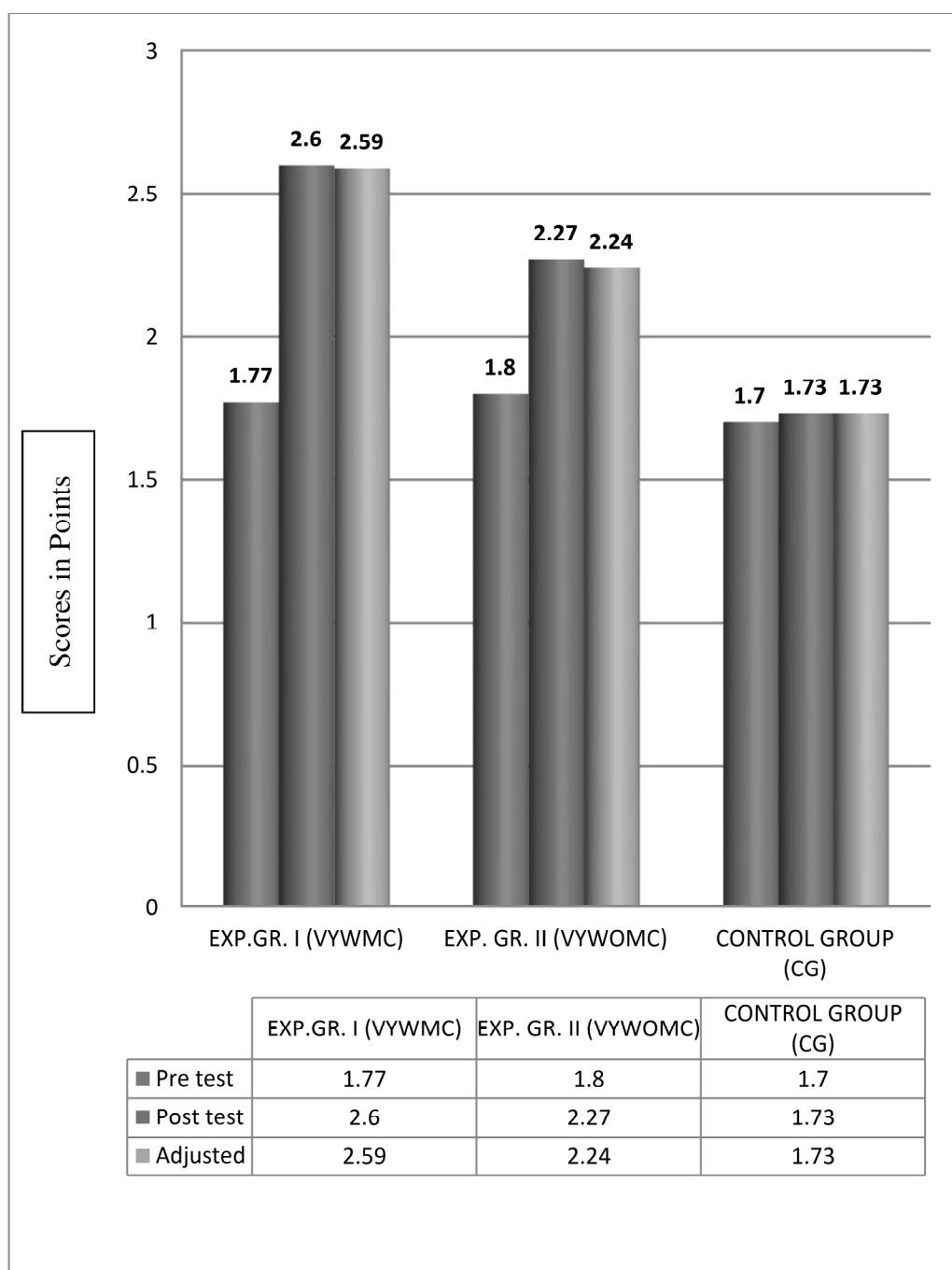
**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of registration among the groups. Table XVII shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting group had considerably better significant than vinyasa yoga without mantra chanting group on registration among the cerebral palsy children.

The pre, post and ordered adjusted mean values on registration were presented through bar diagram for better understanding of the results of this study in **Figure 29**

**Figure 29**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF REGISTRATION  
(Scores in Points)**



#### **4.8.1 DISCUSSION ON THE FINDINGS OF REGISTRATION**

The results presented in table XVI proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 20.29 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered registration of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered registration among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of registration ability.

The above finding is in line with the observations made by the researcher **Rimmer et al. 2010.**

#### **4.9 RESULTS ON MEMORY**

The Cognitive variable memory was measured by using MMSE questionnaire. The mean score of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on memory among children with cerebral palsy is presented in the **Table – XVIII**

**Table XVIII**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON MEMORY**  
**(Scores in Points)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	1.73	1.80	1.67	B	0.13	2	0.07	2.56
				W	7.17	42	0.17	
Post test	2.50	2.20	1.70	B	4.90	2	2.45	14.1*
				W	7.30	42	0.17	
Adjusted post test	2.50	2.16	1.70	B	4.35	2	2.17	17.99*
				W	4.95	41	0.12	
Mean gain	0.77	0.4	0.03					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XVIII shows that the pre test mean scores of memory of experimental group I vinyasa yoga with mantra chanting was 1.73, experimental group II without mantra chanting was 1.80 and control group was 1.67. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 2.50, 2.20 and 1.70 respectively.

The obtained F – value on pre test scores 2.56 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 14.1 was greater than the required

F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 17.99 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the cognitive variable memory.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XIX

**Table XIX**

**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF MEMORY  
(Scores in Points)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
2.50	2.16		0.34*	0.32
2.50		1.70	0.80*	0.32
	2.16	1.70	0.46*	0.32

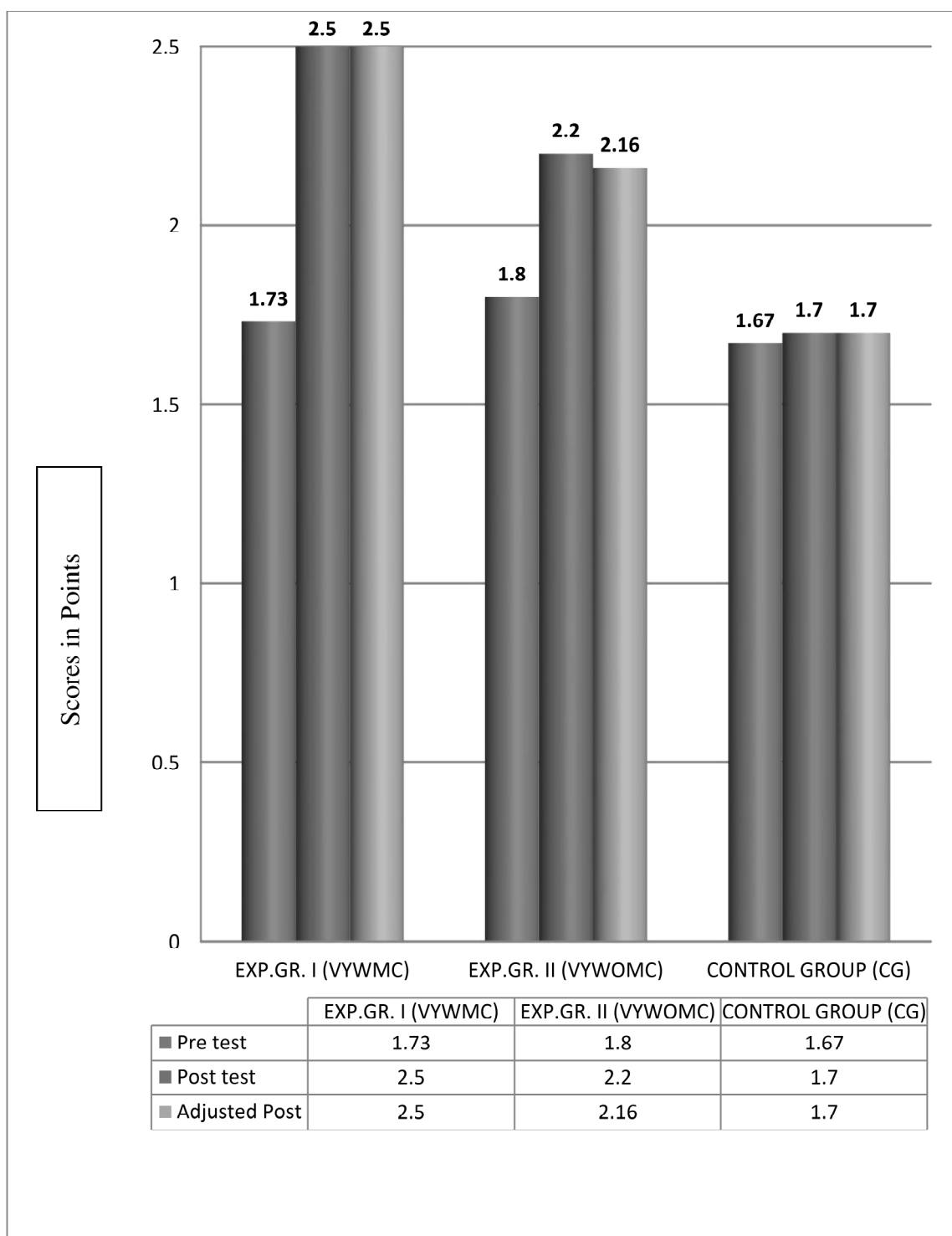
**\*Significantat 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of memory among the groups. Table XIX shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant than vinyasa yoga without mantra chanting on memory among the cerebral palsy children.

The pre, post and ordered adjusted mean values on memory were presented through bar diagram for better understanding of the results of this study in **Figure 30**

**Figure 30**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF MEMORY**  
(Scores in Points)



#### **4.9.1 DISCUSSION ON THE FINDINGS OF MEMORY**

The results presented in table XVIII proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 17.99 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered memory of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered memory among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of memory.

The above findings can also be substantiated by observations made by the researcher **Van rooijen et al. 2014**

#### **4.10 RESULTS ON ATTENTION**

The Cognitive variable attention was measured by using MMSE questionnaire. The mean score of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on memory among children with cerebral palsy is presented in the **Table – XX**

**Table XX**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON ATTENTION**  
**(Scores in Points)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	2.33	2.53	2.47	B	0.31	2	0.16	1.65
				W	10.80	42	0.26	
Post test	3.87	3.27	2.47	B	14.80	2	7.40	16.89*
				W	18.40	42	0.44	
Adjusted post test	3.87	3.23	2.46	B	15.68	2	7.84	19.23*
				W	16.71	41	0.41	
Mean gain	1.54	0.74						

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XX shows that the pre test mean scores of cognitive variable attention of experimental group I vinyasa yoga with mantra chanting was 2.33, experimental group II without mantra chanting was 2.53 and control group was 2.47. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 3.87, 3.27 and 2.47 respectively.

The obtained F – value on pre test scores 1.65 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 16.89 was greater than the required



F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 19.23 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on cognitive variable attention.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XXI.

**Table XXI**

**SCHEFFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF ATTENTION  
(Scores in Points)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
3.87	3.23		0.64*	0.59
3.87		2.46	1.41*	0.59
	3.23	2.46	0.77*	0.59

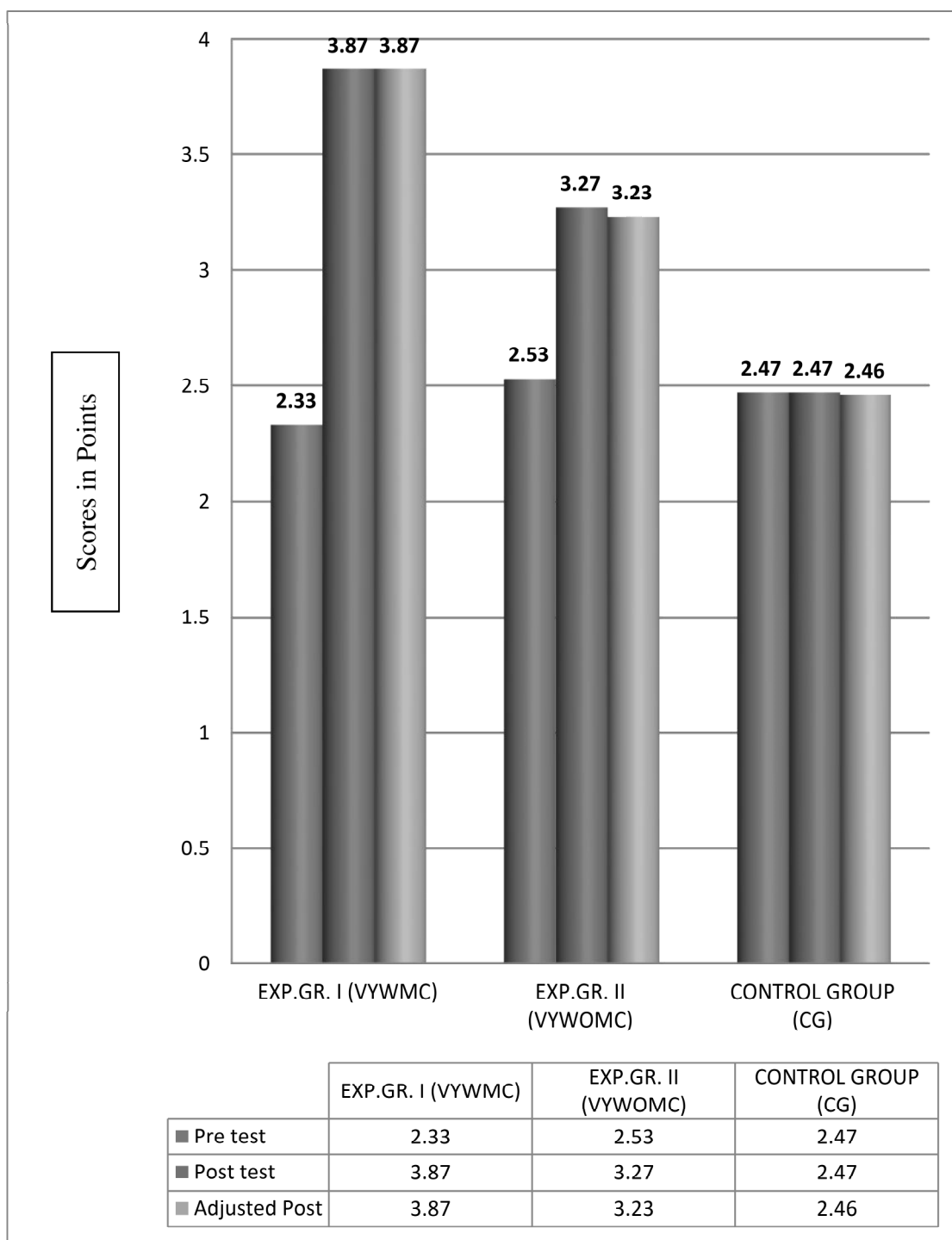
**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of attention among the groups. Table XXI shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant than vinyasa yoga without mantra chanting on attention among the cerebral palsy children.

The pre, post and ordered adjusted mean values on attention were presented through bar diagram for better understanding of the results of this study in **Figure 31**

**Figure 31**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF ATTENTION  
(Scores in Points)**



#### **4.10.1 DISCUSSION ON THE FINDINGS OF ATTENTION**

The results presented in table XX proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 19.23 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered attention of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered attention among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of attention.

The above findings is in line with the observations made by the researcher **Uma k. et al.(1989)**

#### **4.11 RESULTS ON STATIC BALANCE**

The psychomotor variable static balance was measured by using Romberg test for balance. The mean score of pretest and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on static balance among children with cerebral palsy is presented in the **Table – XXII.**

**Table XXII**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON STATIC BALANCE**  
**(Scores in Seconds)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	15.80	15.53	15.67	B	0.53	2	0.27	1.92
				W	21.47	42	0.51	
Post test	20.80	19.33	15.60	B	215.64	2	107.82	115.13*
				W	39.33	42	0.94	
Adjusted post test	20.78	19.33	15.60	B	214.27	2	107.14	113.55*
				W	38.68	41	0.94	
Mean gain	5	3.8	0.07					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XXII shows that the pre test mean scores of static balance of experimental group I vinyasa yoga with mantra chanting was 15.80, experimental group II without mantra chanting was 15.53 and control group was 15.67. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 20.80, 19.33 and 15.60 respectively.

The obtained F – value on pre test scores 1.92 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 115.13 was greater than the required

F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 113.55 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on psychomotor variable static balance.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XXIII

**Table XXIII**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF STATIC**  
**BALANCE (Scores in Seconds)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
20.78	19.33		1.45*	0.90
	19.33	15.60	3.73*	0.90
20.78		15.60	5.18*	0.90

**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of static balance among the groups. Table XXIII shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant than

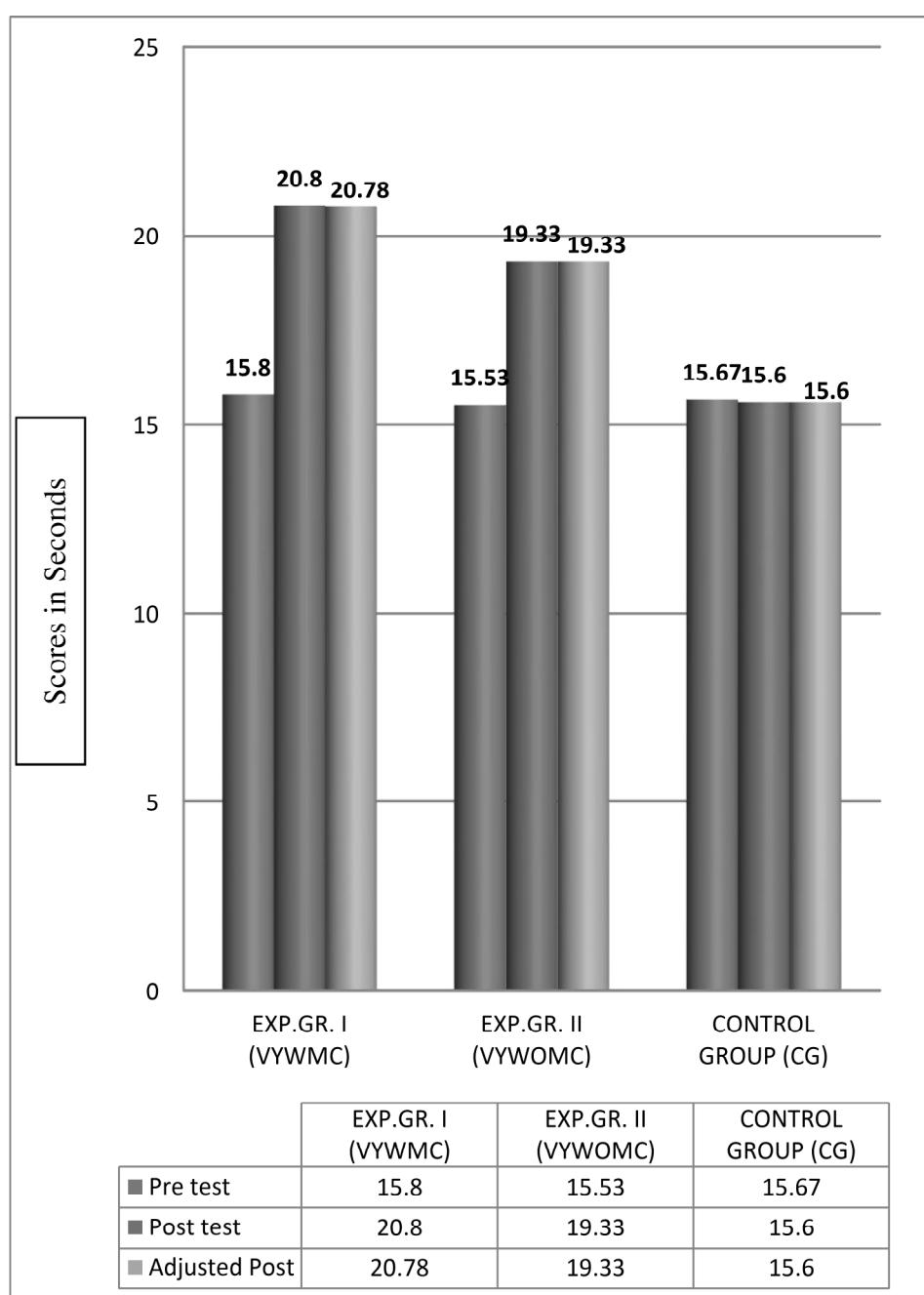
vinyasa yoga without mantra chanting on static balance among the cerebral palsy children.

The pre, post and ordered adjusted mean values on static balance were presented through bar diagram for better understanding of the results of this study in

**Figure 31**

**Figure 31**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF STATIC BALANCE  
(Scores in Seconds)**



#### **4.11.1 DISCUSSION ON THE FINDINGS OF STATIC BALANCE**

The results presented in table XXII proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 113.55 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered static balance of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without Mantra chanting significantly altered static balance among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of static balance.

The above findings resembles the observations made by the investigator **Gatica Rojas. V et al. 2017**

#### **4.12 RESULTS ON DYNAMIC BALANCE**

The psychomotor variable dynamic balance was measured by using TUG test (Timed Up and Go test). The mean score of pre and post tests taken in to consideration for the statistical analysis. The results of efficacy of vinyasa yoga with and without mantra chanting on dynamic balance among children with cerebral palsy is presented in the **Table – XXIV**.

**Table XXIV**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON DYNAMIC BALANCE**  
**(Scores in Seconds)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	25.13	25.20	25.40	B	0.58	2	0.29	2.78
				W	33.73	42	0.80	
Post test	20.0	21.20	25.53	B	254.18	2	127.09	78.34*
				W	68.13	42	1.62	
Adjusted post test	20.07	21.23	25.44	B	235.16	2	117.58	87.95*
				W	54.81	41	1.34	
Mean gain	5.13	4	0.13					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XXIV shows that the pre test mean scores of dynamic balance of experimental group I vinyasa yoga with mantra chanting was 25.13, experimental group II without mantra chanting was 25.20 and control group was 25.40. The post test means showed differences due to 22 weeks of training of vinyasa yoga with and without mantra chanting and control group mean values recorded were 20.00, 21.20 and 25.53 respectively.

The obtained F – value on pre test scores 2.78 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 78.34 was greater than the required



F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 87.95 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on psychomotor variable dynamic balance.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XXV

**Table XXV**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF**  
**DYNAMIC BALANCE (Scores in Seconds)**

MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
20.07	21.23		1.16*	1.07
	21.23	25.44	4.21*	1.07
20.07		25.44	5.37*	1.07

**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of dynamic balance among the groups. Table XXV shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant

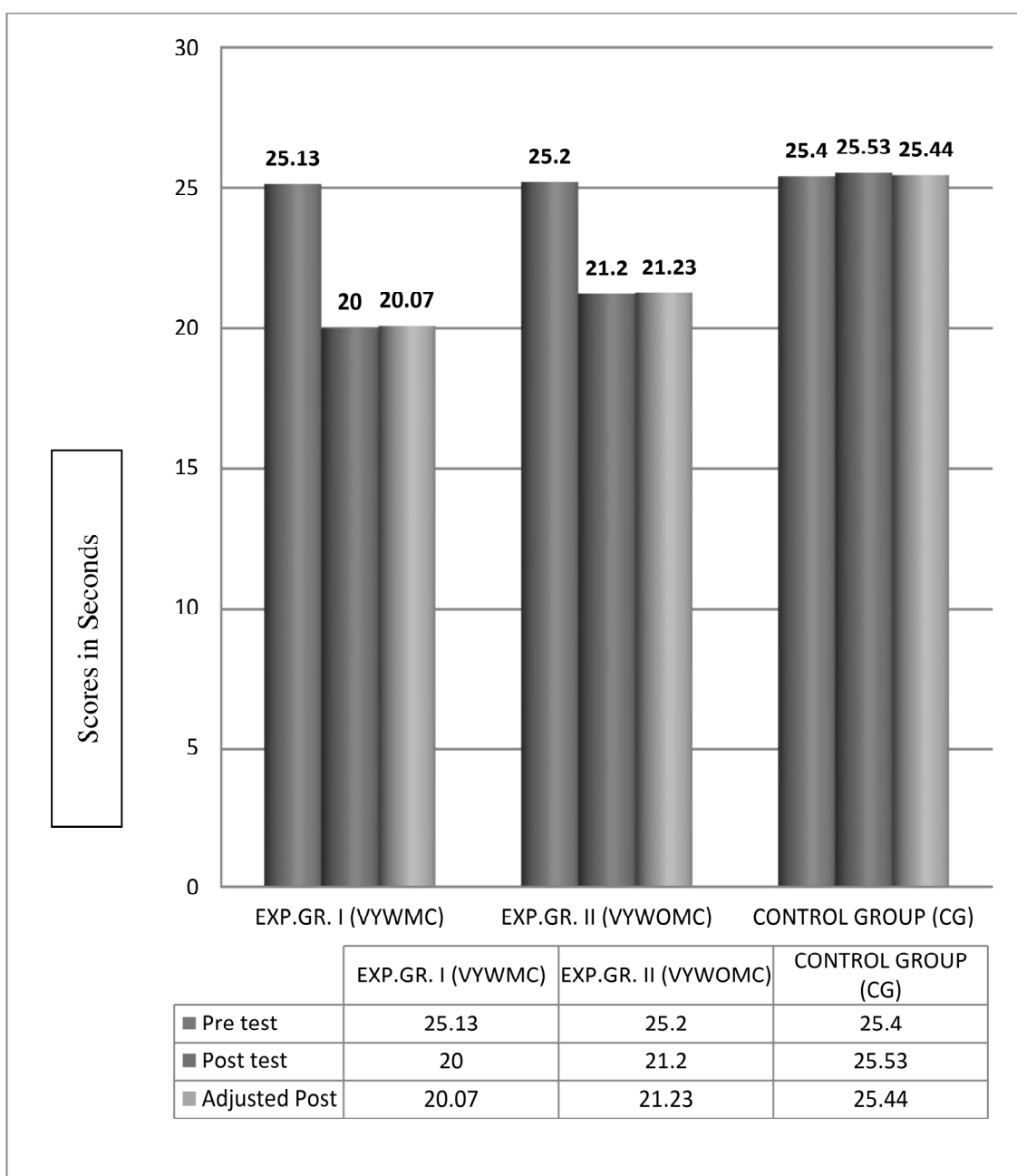
than vinyasa yoga without mantra chanting on dynamic balance among the cerebral palsy children.

The pre, post and ordered adjusted mean values on dynamic balance were presented through bar diagram for better understanding of the results of this study in

**Figure 32**

**Figure 32**

**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF DYNAMIC BALANCE (Scores in Seconds)**



#### **4.12.1 DISCUSSION ON THE FINDINGS OF DYNAMIC BALANCE**

The results presented in table XXIV proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 87.95 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of Vinyasa Yoga with and without Mantra chanting significantly altered dynamic balance of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that Vinyasa Yoga with and without mantra chanting significantly altered dynamic balance among cerebral palsy children than control group .

Comparing the experimental groups, it was found that Vinyasa Yoga with mantra chanting (Experimental Group I) was better than Vinyasa Yoga without mantra chanting (Experimental Group II) in improvement of dynamic balance.

These findings of the study is in agreement with the finding of the researcher **Deutsch J. Et al. (2017)**

#### **4.13 RESULTS ON GAIT**

The psychomotor variable gait was measured by using heel to toe walking gait analysis test. The mean score of pre test and post tests taken in to consideration for the statistical analysis. The results of efficacy of Vinyasa Yoga with and without Mantra chanting on muscle coordination among children with cerebral palsy is presented in the **Table – XXVI**.

**Table XXVI**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF TWO EXPERIMENTAL**  
**AND CONTROL GROUP ON GAIT**  
**(Scores in Counts)**

Test	Mean			SV	Sum of Squares	df	Mean Sum of Squares	F-ratio
	Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)					
Pre test	7.87	7.73	7.60	B	0.53	2	0.27	2.7
				W	30.27	42	0.72	
Post test	10.93	9.93	7.80	B	76.84	2	38.42	42.17*
				W	38.27	42	0.91	
Adjusted post test	10.87	9.93	7.80	B	70.22	2	35.11	44.52*
				W	32.33	41	0.79	
Mean gain	4.06	2.2	0.2					

\*Significant at 0.05 level of significance.

The table value for df 2 and 42 was 3.22, and table value for df 2 and 41 was 3.23

Table XXVI shows that the pre test mean scores of psychomotor variable gait of experimental group I vinyasa yoga with mantra chanting was 7.87, experimental group II without mantra chanting was 7.73 and control group was 7.60. The post test means showed differences due to 22 weeks of training of Vinyasa Yoga with and without Mantra chanting and control group mean values recorded were 10.93, 9.93 and 7.80 respectively.

The obtained F – value on pre test scores 2.7 was lesser than the required F – value of 3.22 to be significant at 0.05 level. This proved that there was no significant difference between 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 of 42.17 was greater than the required

F – value of 3.22. This proved that the differences between the post test mean of the subjects were significant.

Taking in to 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 44.52 was greater than the required F – value of 3.22. This proved that there was significant differences among the means due to 22 weeks of training of vinyasa yoga with and without mantra chanting on the psychomotor variable gait.

Since significant improvement were recorded, the results were subjected to Post hoc analysis using Scheffe’s confidence interval test. The results were presented in the following table XXVII.

**Table XXVII**  
**SCHEFEE’S POST-HOC TEST FOR ADJUSTED MEANS OF GAIT**  
**(Scores in Counts)**

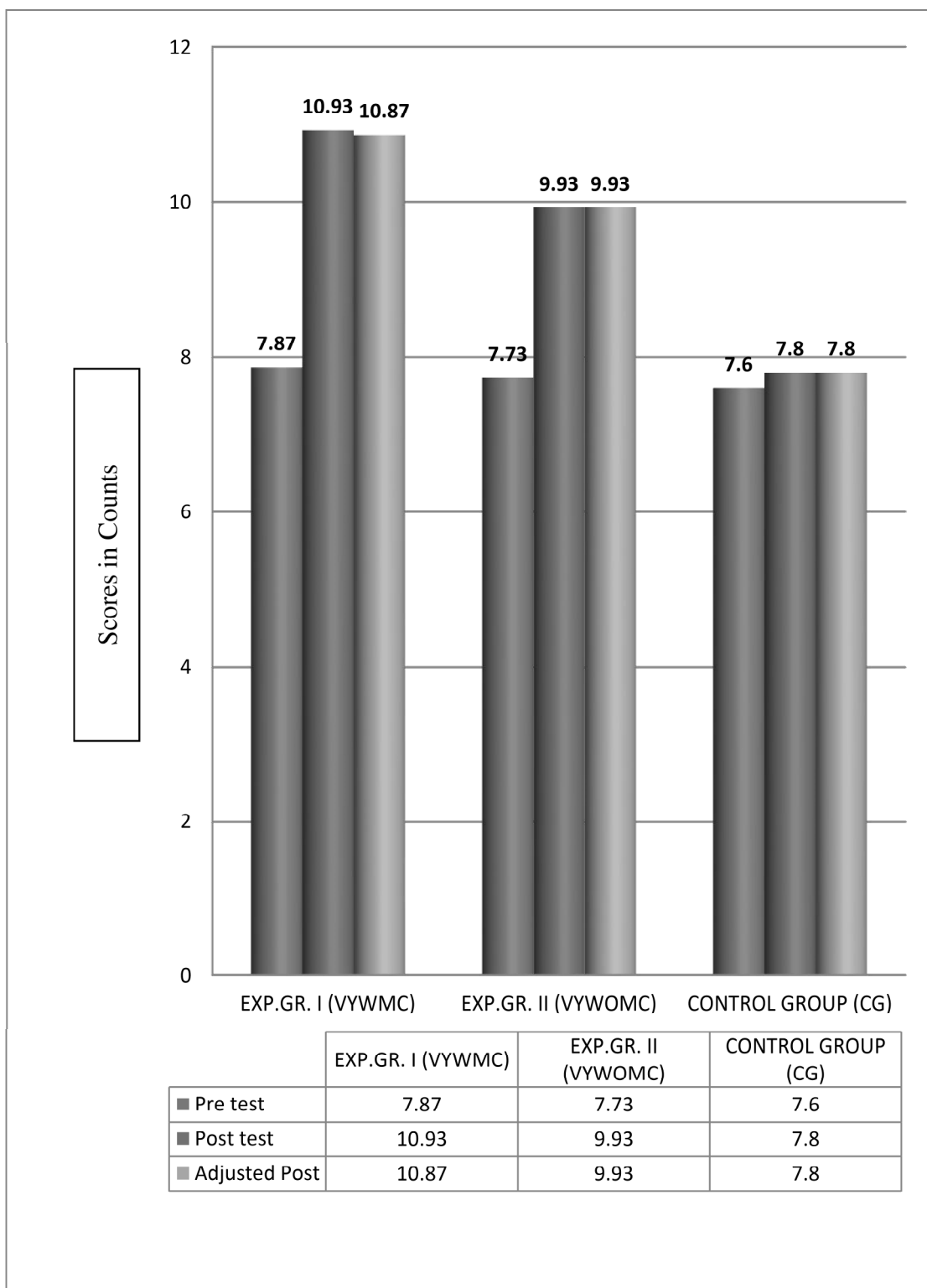
MEANS			Mean difference	Critical Interval
Experimental Group I (VYWMC)	Experimental Group II (VYWOMC)	Control Group (CG)		
10.87	9.93		0.94*	0.82
	9.93	7.80	2.13*	0.82
10.87		7.80	3.07*	0.82

**\*Significant at 0.05 level of confidence**

The multiple mean comparison presented in the above table proved that there was significant differences exist between the adjusted means of gait among the groups. Table XXVII shows that there was significant difference between vinyasa yoga with and without mantra chanting groups than control group. It was also proved that vinyasa yoga with mantra chanting had considerably better significant than vinyasa yoga without mantra chanting on gait among the cerebral palsy children.

The pre, post and ordered adjusted mean values on gait were presented through bar diagram for better understanding of the results of this study in **Figure 33**

**Figure 33**  
**BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF GAIT**  
**(Scores in Counts)**



#### **4.13.1 DISCUSSION ON THE FINDINGS OF GAIT**

The results presented in table XXVI proved that the obtained F – value on the pre test scores was less than the required F – value and the difference were not significant.

The obtained F – value on adjusted mean value was 44.52 which was greater than the required F – value to be significant at 0.05 level. Hence, it was proved that 22 weeks of training of vinyasa yoga with and without mantra chanting significantly altered gait of the cerebral palsy children.

Since there was significant results obtained, post hoc analysis was done and it was found that vinyasa yoga with and without mantra chanting significantly altered gait among cerebral palsy children than control group children.

Comparing the experimental groups, it was found that vinyasa yoga with mantra chanting (Experimental Group I) was better than vinyasa yoga without mantra chanting (Experimental Group II) in improvement of gait.

The above findings can be supported by the research studies conducted by **Deutsch J. Et al. (2017)**

#### **4.14 DISCUSSION ON HYPOTHESES**

The formulated first hypothesis stated that there would be significant difference on selected cerebromuscular variables such as muscle coordination, visual perception, proprioception and cognitive variables such as registration, memory, attention and psychomotor variables such as static balance, dynamic balance and gait due to the influence of vinyasa yoga with and without mantra chanting among children with cerebral palsy than the control group.

The results presented in the ANCOVA Tables X, XII, XIV, XVI, XVIII, XX, XXII, XXIV and XXVI proved that there was a significant differences on selected

cerebromuscular variables such as muscle coordination(reaction time decreased) visual perception(increased) proprioception(reaction time decreased) and cognitive variables such as registration(increased), memory(increased), attention(increased) and psychomotor variables such as static balance(increased) dynamic balance(reaction time decreased) and gait(increased balance) due to the influence of vinyasa yoga with and without mantra chanting among children with cerebral palsy than control group. Hence the formulated first research hypothesis was accepted at 0.05 level of confidence.

The formulated second hypothesis stated that there would be significant differences on selected cerebromuscular variables such as muscle coordination, visual perception, proprioception and cognitive variables such as registration, memory, attention and psychomotor variables such as static balance, dynamic balance and gait due to the influence of vinyasa yoga with mantra chanting than vinyasa yoga without mantra chanting among children with cerebral palsy.

The results presented in the Scheffee's Post Hoc Tables XI, XIII, XV, XVII, XIX, XXI, XXIII, XXV and XXVII proved that there was considerably significant differences on selected cerebromuscular variables such as muscle coordination(reaction time decreased), visual perception(increased), proprioception (reaction time decreased) and cognitive variables such as registration, memory, attention (all increased)and psychomotor variables such as static balance(increased) dynamic balance (reaction time decreased) and gait(increased balance) due to the influence of vinyasa yoga with mantra chanting than vinyasa yoga without mantra chanting among children with cerebral palsy. Hence the formulated second research hypothesis was accepted at 0.05 level of confidence.



## 4.14.1 FIRST HYPOTHESIS TESTING TABLE

TABLE XXVIII

Variables		Research Hypotheses
Cerebro muscular variables	Muscle coordination	Accepted
	Visual perception	Accepted
	Proprioception	Accepted
Cognitive variables	Registration	Accepted
	Memory	Accepted
	Attention	Accepted
Psycho motor variables	Static Balance	Accepted
	Dynamic Balance	Accepted
	Gait	Accepted

## 4.14.2 SECOND HYPOTHESIS TESTING TABLE

TABLE XXIX

Variables		Research Hypotheses
Cerebro muscular variables	Muscle coordination	Accepted
	Visual perception	Accepted
	Proprioception	Accepted
Cognitive variables	Registration	Accepted
	Memory	Accepted
	Attention	Accepted
Psycho motor variables	Static Balance	Accepted
	Dynamic Balance	Accepted
	Gait	Accepted

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.