

Influence of Recreational Games on Selected Fitness Components, Cognitive Skills and Psychomotor Abilities among Mild Intellectually Challenged Children

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Abstract: Most children have the option to participate in recreation, after school activities, weekend team sports, and summer camps. At school, they have a chance to exercise in physical education classes and in the playground at recess. However, these are limited for children with disabilities. Children with disabilities want to have friends, enjoy activities, and be included like everyone else. Like other children their interests range from swimming and sports, to visiting parks and playgrounds and attending summer camps with friends. The purpose of this study was to find out Influence of Recreational games on selected fitness components, cognitive skills and psychomotor abilities among mild intellectually challenged children from age group of 10 to 15 years both boys and girls and forty five students who were study in Coimbatore District, . The subjects were divided in to three groups, each group consisting of 15 each. Experimental group I participated in unified play activities with partner who is normal for a period of 12 weeks training. Experimental group II participated in unified play activities among themselves for a period of 12 weeks training. Control group did not participate in unified play activities. The subjects were tested on selected criterion variables physical fitness variables as flexibility, leg explosive power and balance, Cognitive skills span of memory and span of attention and psychomotor ability reaction time, finger – eye coordination and hand – eye coordination before the training and after 12 weeks of training. The analysis of covariance was applied to find out the significant difference among the 10 -14 years of all groups in the selected variables. The “t” ratio was applied to find out significant improvement in the selected variables in each groups.

Key Words: Recreational games, intellectually challenged children and disability.

Introduction

Play is important to the social and physical development of all children, when children with and without disabilities play together they learn to appreciate each other’s abilities and similarities and just think about the impact on our world when these kids are the grown – ups in charge of life. How different our schools, neighborhoods, workplaces, and communities will be when each person is viewed as a unique individual and valued for what they can do. [1-2] Inclusion in play activities. Intellectual disability is a broad concept encompassing various intellectual deficits, including mental retardation (MR), deficits too mild to properly qualify as MR, various specific conditions (such as specific learning

disability), and problems acquired later in life through acquired brain injuries or neurodegenerative diseases like dementia. Intellectual disabilities may appear at any age. [3] In young children, play is frequently associated with cognitive development and socialization [4]. Play that promotes learning and recreation often incorporates toys, props, tools or other playmates [5-10]. Play can consist of an amusing, pretend or imaginary activity alone or with another. Some forms of play are rehearsals or trials for later life events, such as "play fighting", pretend social encounters (such as parties with dolls), or flirting. Modern findings in neuroscience suggest that play promotes flexibility of mind, including adaptive practices such as discovering multiple ways to achieve

Table 1 Analysis of covariance among recreational games training experimental group I, experimental group II and control group on flexibility

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	7.66	7.6	7.62	Between	0.04	2	0.02	0.003
				Within	292.53	42	6.96	
Post test mean	10.6	9.8	7.36	Between	74.97	2	37.48	5.51*
				Within	285.33	42	6.79	
Adjusted post mean	10.6	9.82	7.62	Between	72.64	2	36.32	31.30*
				Within	47.56	41	1.16	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

a desired result, or creative ways to improve or reorganize a given situation [11 -16].

METHODOLOGY

The method adopted, description of the tools, the sample selected, data collection procedures and the outline of the experiment done and procedure are presented below

The Methodology for the present investigation is on the influence of Recreational games on selected physical fitness components, cognitive skills and psycho motor variables among mild Intellectually challenged children which is discussed under the following headings. Selection of Subjects Experimental design, Variables, test, Tester reliability, Orientation of Subjects, Collection of data, Test Administration, Training method, Statistical Technique.

RESULTS OF ANALYSIS OF COVARIANCE

The analysis of covariance was applied to find out the significant mean difference experimental group I (with normal partner), experimental group II (with partner from same group) and control group in the selected variables. The results were presented in the following tables. Table 1 shows the obtained 'F' values on pre test, post test and adjusted post test means on flexibility of Recreational games training groups and control group. The pre test means on flexibility were 7.66, 7.6 and 7.62 respectively. The 'F' value observed for the pre – test on flexibility was 0.003. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence.

Based on the results it was confirmed that the mean differences among the groups of Recreational games training groups and control group on flexibility before the start of the respective treatments were found to be insignificant.

The post means on flexibility of Recreational games groups and control group were 10.6, 9.87 and 7.36 respectively. The 'F' value observed for the post test on flexibility was 5.51. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training groups and control group on flexibility was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on flexibility produced significant improvements among the experimental groups.

The adjusted post test means on flexibility of Recreational games training groups and control group were 10.6, 9.82 and 7.6 respectively. The 'F' value observed for the post test on flexibility was 31.30. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on adjusted post test means among the groups namely Recreational games training group and control group on flexibility was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on flexibility produced significant difference among the experimental groups.

Table 2. Analysis of covariance among recreational games training experimental group i, experimental group ii and control group on explosive power

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	107.26	105.2	103.2	Between	124.04	2	62.022	0.38
				Within	6801.73	42	161.94	
Post test mean	121.86	111.06	104.13	Between	12395.91	2	1197.95	6.87*
				Within	7320.4	42	174.29	
Adjusted post mean	119.85	111.08	106.12	Between	14256.0	2	713.0	38.86*
				Within	752.2	41	18.34	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

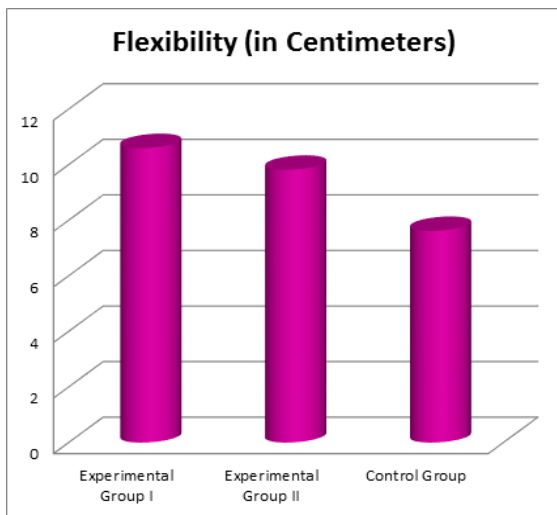


Fig 1. Adjusted mean values of flexibility of experimental group I, experimental group II and control group

Table 2 shows the obtained ‘F’ values on pre test, post test and adjusted post test means on explosive power of Recreational games training experimental group I, Recreational games training experimental group II, and control group.

The pre test means on explosive power were 107.26, 105.2 and 103.2 respectively. The ‘F’ value observed for the pre – test on explosive power was 0.38. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and

control group on explosive power before the start of the respective treatments were found to be insignificant.

The post test means on explosive power of Recreational games training experimental group I, experimental group II and control group were 121.86, 111.06 and 104.13 respectively. The ‘F’ value observed for the post test on Explosive power was 6.87. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training group experimental group I, experimental group II and control group on explosive power was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on explosive power produced significant improvements among the experimental groups.

The adjusted post test means on explosive power of Recreational games training group experimental group I, experimental group II and control group were 119.85, 111.08 and 106.12 respectively. The ‘F’ value observed for the post test on explosive power was 38.86. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on adjusted post test means among the groups namely Recreational games training group experimental group I, experimental group II and control group on explosive power was highly significant as the value was higher than required

table value of 3.21. Thus the results obtained proved that the training on explosive power produced significant improvements among the experimental groups.

Table 3. Analysis of covariance among recreational games training experimental group I, experimental group II and control group on balance

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	11.93	11.00	11.26	Between	6.93	2	3.46	0.16
				Within	879.986	42	2.94	
Post test mean	17.33	15.2	19.93	Between	271.9	2	110.95	4.41*
				Within	1054.66	42	25.11	
Adjusted post mean	16.81	15.58	12.06	Between	182.24	2	91.12	16.77*
				Within	222.66	41	50.4	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

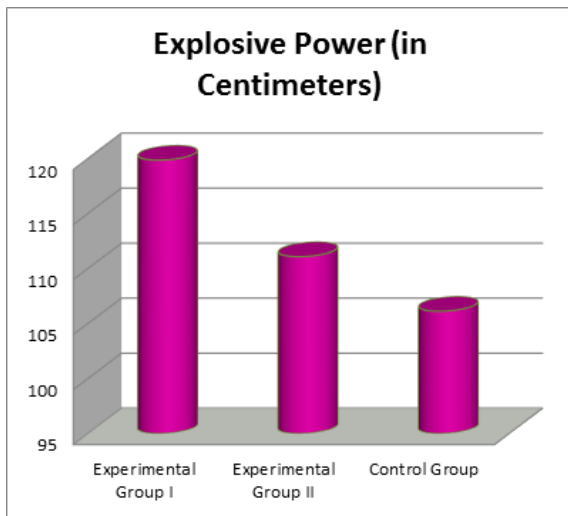


Fig 2. Adjusted mean values of explosive power of experimental group I, experimental group II and control group

Table 3 shows the obtained ‘F’ values on pre test, post test and adjusted post – test means on balance of Recreational games training experimental group I, experimental group II and control group.

The pre test means on balance were 11.93, 11.00 and 11.26 respectively. The ‘F’ value observed for the pre – test on balance was 0.16. It fails to reach the table value of 3.21 for degree of freedom 2,

43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and control group on balance before the start of the respective treatments were found to be insignificant.

The post test means on balance of Recreational games training experimental group I, experimental group II and control group were 17.33, 15.2 and 19.93 respectively. The ‘F’ value observed for the post test on balance was 4.41. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on balance was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on balance produced significant improvements among the experimental groups.

The adjusted post test means on balance of Recreational games training experimental group I, experimental group II and control group were 16.81, 15.58 and 12.06 respectively. The ‘F’ value observed for the post test on balance was 16.77. It was greater than the table value of 3.16 for degree of freedom 2,

43 at 0.05 level of confidence. Since the observed F-value on adjusted post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on balance was highly significant as the value was

higher than required table value of 3.21. Thus the results obtained proved that the training on balance produced significant improvements among the experimental groups.

Table 4. Analysis of covariance among recreational games training experimental group I, experimental group II and control group on span of memory

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	2.93	2.86	2.86	Between	0.04	2	0.02	0.03
				Within	26.4	42	0.62	
Post test mean	3.26	3.06	2.8	Between	1.64	2	0.82	1.7
				Within	20.26	42	8.48	
Adjusted post mean	3.23	3.08	2.81	Between	1.33	2	0.66	5.33*
				Within	5.11	41	0.124	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

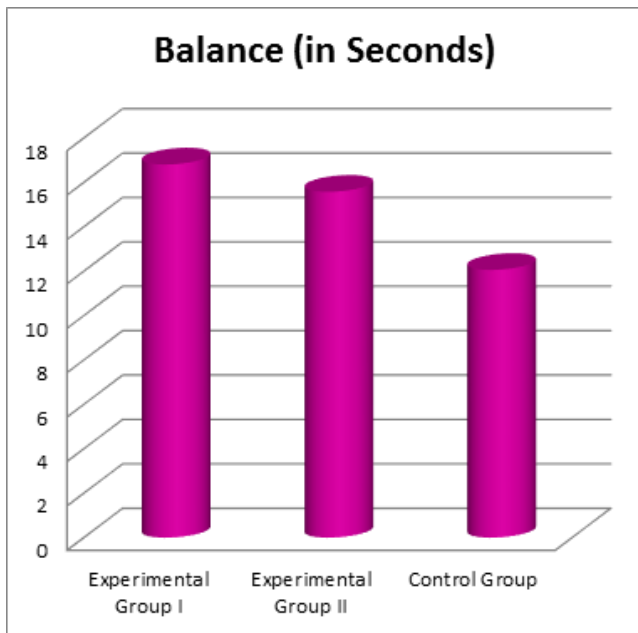


Fig 3. Adjusted mean values of balance of experimental group I, experimental group II and control group

Table 4 shows the obtained ‘F’ values on pre test, post test and adjusted post test means on span of

memory of Recreational games training experimental group I, experimental group II and control group.

The pre test means on span of memory were 2.93, 2.86 and 2.86 respectively. The ‘F’ value observed for the pre – test on span of memory was 0.03. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and control group on memory before the start of the respective treatments were found to be insignificant.

The post test means on span of memory of Recreational games Experimental group I, experimental group II and control group were 3.26, 3.06 and 2.8 respectively. The ‘F’ value observed for the post – test on memory was 1.7. It was lesser than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on memory was not significant as the value was lesser than required table value of 3.21. Thus the results obtained proved that the training on memory

produced no significant improvements among the experimental groups.

The adjusted post test means on memory of Recreational games training group and control group were 3.23, 3.08 and 2.81 respectively.

The 'F' value observed for the adjusted post test on memory was 5.33. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on

adjusted post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on memory was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on memory produced significant improvements among the experimental groups.

Table 5. Analysis of covariance among recreational games training experimental group I, experimental group II and control group on span of attention

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	2.53	2.46	2.8	Between	0.04	2	0.02	0.06
				Within	15.2	42	0.36	
Post test mean	2.86	2.66	2.46	Between	1.2	2	0.6	1.70
				Within	14.8	42	0.35	
Adjusted post mean	2.83	2.68	2.48	Between	0.92	2	0.46	2.86
				Within	6.64	41	0.16	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

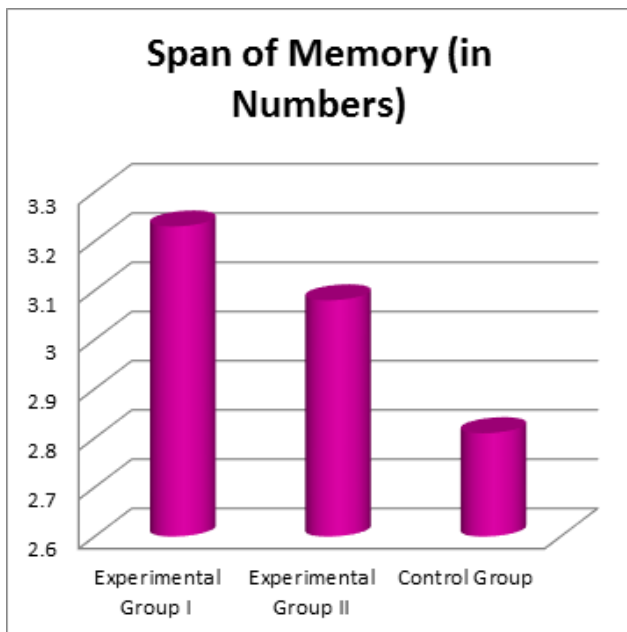


Fig 4. Adjusted mean values of span of memory of experimental group I, experimental group II and control group

Table 5 shows the obtained 'F' values on pre test, post test and adjusted post test means on span of attention of Recreational games training

experimental group I, experimental group II and control group.

The pre test means on span of attention were 2.53, 2.46 and 2.8 respectively. The 'F' value observed for the pre test on span of attention was 0.06. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training group and control group on attention before the start of the respective treatments were found to be insignificant.

The post test means on attention of Recreational games groups and control group were 2.86, 2.66 and 2.46 respectively. The 'F' value observed for the post test on attention was 1.70. It was lesser than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on span of attention was not significant as the value was lesser than required table value of 3.21.

Thus the results obtained proved that the training on span of attention produced insignificant improvements among the experimental groups.

The adjusted post test means on balance of Recreational games training group and control group were 2.83, 2.68 and 2.48 respectively. The 'F' value observed for the post – test on attention was 2.86. It was lesser than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the

observed F- value on adjusted post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on attention was not significant as the value was lesser than required table value of 3.21. Thus the results obtained proved that the training on attention produced insignificant improvements among the experimental groups.

Table 6.Analysis of covariance among recreational games training experimental group I, experimental group II and control group on reaction time

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F – value
Pre test mean	0.42	0.41	0.40	Between	0.0019	2	0.00096	0.03
				Within	1.02	42	0.24	
Post test mean	0.38	.37	0.40	Between	0.008	2	0.004	0.18
				Within	0.99	42	0.02	
Adjusted post mean	0.37	0.37	0.41	Between	0.015	2	0.007	13.46*
				Within	0.023	41	0.0005	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

Table 6 shows the obtained 'F' values on pre test, post test and adjusted post test means on reaction time of Recreational games training experimental group I, experimental group II and control group.

The pre test means on reaction time were 0.42, 0.41 and 0.40 respectively. The 'F' value observed for the pre – test on reaction time was 0.03. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and control group on reaction time before the start of the respective treatments were found to be insignificant.

The post test means on reaction time of Recreational games training experimental group I, experimental group II and control group were 0.38, 0.37 and 0.40 respectively. The 'F' value observed for the post test on reaction time was 0.18. It was lesser than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely

Recreational games training group and control group on reaction time was not significant as the value was lesser than required table value of 3.21. Thus the results obtained proved that the training on reaction time produced no significant improvements among the experimental groups.

The adjusted post test means on reaction time of Recreational games training experimental group I, experimental group II and control group were 0.37, 0.37 and 0.41 respectively. The 'F' value observed for the adjusted post test on reaction time was 13.46. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on reaction time was highly significant as the value was higher than required table value of 3.21.

Thus the results obtained proved that the training on reaction time produced significant improvements among the experimental groups.

Table 7. Analysis of covariance among recreational games training experimental group I, experimental group II and control group on finger eye coordination.

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F value
Pre test mean	17.66	17.53	17.46	Between	0.31	2	0.15	0.01
				Within	598.8	42	14.25	
Post test mean	20.13	19.6	17.26	Between	69.33	2	34.86	3.22
				Within	688.26	42	16.38	
Adjusted post mean	20.01	19.62	17.35	Between	61.67	2	30.83	39.83*
				Within	31.73	41	0.77	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

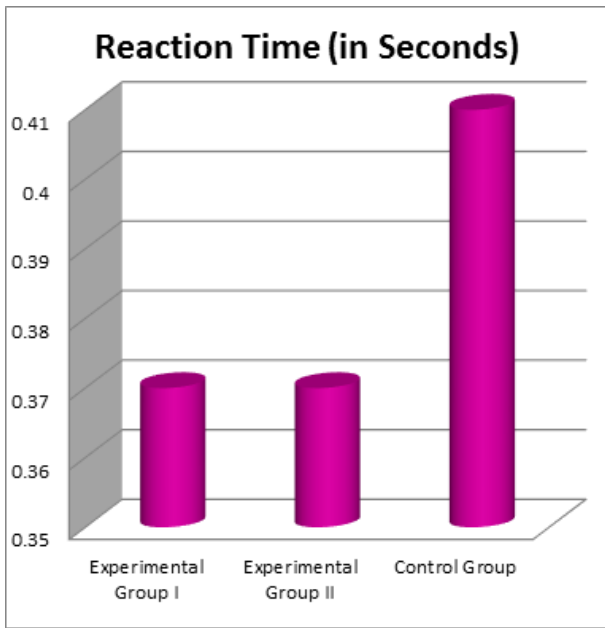


Fig 5. Adjusted mean values of reaction time of experimental group I, experimental group II and control group

Table 7 shows the obtained ‘F’ values on pre test, post test and adjusted post test means on finger eye coordination of Recreational games training experimental group I, experimental group II and control group. The pre test means on finger eye coordination of these were 17.66, 17.53 and 17.46 respectively. The ‘F’ value observed for the pre test on finger eye coordination was 0.01. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at

0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and control group on finger eye coordination before the start of the respective treatments were found to be insignificant.

The post means on finger eye coordination of Recreational games groups and control group were 20.13, 19.6 and 17.26 respectively. The ‘F’ value observed for the post test on finger eye coordination was 2.12. It was lesser than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on finger eye coordination was not significant as the value was lesser than required table value of 3.21. Thus the results obtained proved that the training on finger eye coordination produced no significant improvements among the experimental groups.

The adjusted post test means on finger eye coordination of Recreational games training experimental group I, experimental group II and control group were 20.01, 19.62 and 17.35 respectively. The ‘F’ value observed for the adjusted post – test on finger eye coordination was 39.83. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the

groups namely Recreational games training experimental group I, experimental group II and control group on finger eye coordination was highly significant as the value was higher than required table value of 3.21.

Since significant differences were recorded, the scores were further subjected to statistical treatment using scheffe's post hoc test and the results were presented in the table

Thus the results obtained proved that the training on finger eye coordination produced significant improvements among the experimental groups.

Table 8. Analysis of covariance among recreational games training experimental group I, experimental group II and control group on hand eye coordination

	Recreational games group I	Recreational games group II	Control group	Source of variance	Sum of square	Df	Mean square	F - value
Pre test mean	1.8	1.73	1.66	Between	0.13	2	0.06	0.22
				Within	12.66	42	0.30	
Post test mean	1.73	2.66	2.33	Between	3.33	2	1.66	4.77*
				Within	14.66	42	0.34	
Adjusted post mean	2.62	2.33	2.03	Between	2.57	2	1.28	5.07*
				Within	10.42	41	0.25	

*Significant at 0.05 level of confidence

Required table value at 0.05 level of significant with df 2 and 42 is 3.21 and df 2 and 41 is 3.22.

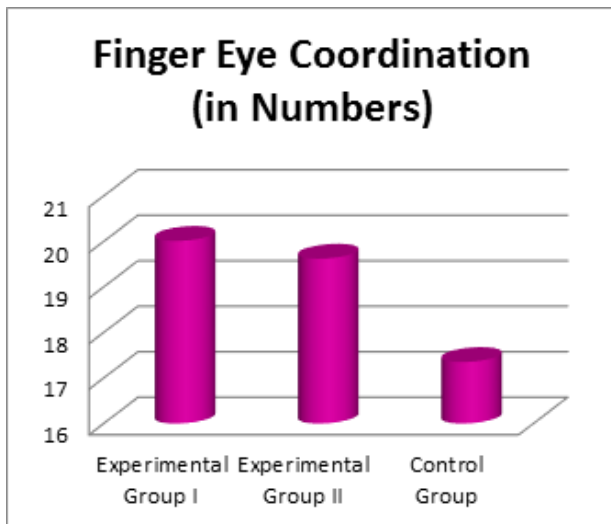


Fig 6. Adjusted mean values of finger eye coordination of experimental group I, experimental group II and Control group

Table 8 shows the obtained 'F' values on pre test, post test and adjusted post test means on hand eye coordination of Recreational games training

experimental group I, experimental group II and control group.

The pre test means on hand eye coordination were 1.8, 1.73 and 1.66 respectively. The 'F' value observed for the pre test on hand eye coordination was 0.22. It fails to reach the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of Recreational games training experimental group I, experimental group II and control group on hand eye coordination before the start of the respective treatments were found to be insignificant.

The post means on hand eye coordination of Recreational games groups and control group were 1.73, 2.66 and 2.33 respectively. The 'F' value observed for the post - test on hand eye coordination was 4.77. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training experimental group I, experimental group II and control group on hand eye coordination was highly significant as the value was higher than

required table value of 3.21. Thus the results obtained proved that the training on hand eye coordination produced significant improvements among the experimental groups.

The adjusted post test means on balance of Recreational games training group and control group were 2.62, 2.33 and 2.03 respectively. The 'F' value observed for the adjusted post – test on hand eye coordination was 5.07. It was greater than the table value of 3.21 for degree of freedom 2, 43 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely Recreational games training group and control group on hand eye coordination was highly significant as the value was higher than required table value of 3.21. Thus the results obtained proved that the training on hand eye coordination produced significant improvements among the experimental groups.

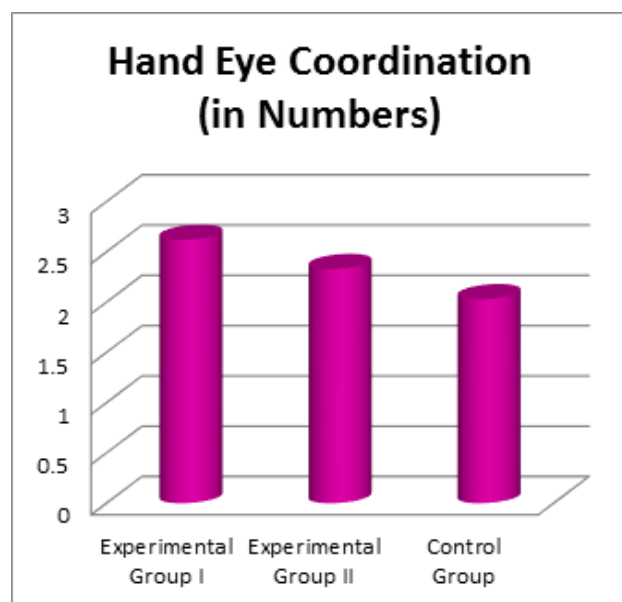


Fig 7. Adjusted mean values of hand eye coordination of experimental group I, experimental group II and control group

Discussion and findings

The results of the present study indicate that all the recreational game training had influenced changes in the selected variables of flexibility, leg explosive power, balance, span of memory, span of attention, reaction time, finger eye coordination and hand eye coordination due to 12 weeks of training.

Conclusions

It was concluded that recreational game programme with normal partner significantly improved the selected fitness variables: flexibility,

explosive power jump and balance cognitive skills: span of memory and span of attention psychomotor abilities: hand eye co-ordination, finger eye co-ordination and reaction time among the experimental group I.

It was concluded that experimental group II had significantly improved in selected fitness variables: flexibility, leg explosive power and balance Psychomotor skills: hand eye coordination, finger eye coordination and reaction time.

It was concluded that recreational game training experimental group I showed significant improvement better than Recreational game training experimental group II in variables leg explosive power.

It was concluded that there was no significant difference between recreational game training experimental group I and recreational game training experimental group II in flexibility, balance cognitive skills: span of memory and span of attention Psychomotor skills: hand eye coordination, finger eye coordination and reaction time.

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