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Research article

IMPACT OF ADAPTED YOGA WITH RECREATIONAL GAMES PRACTICE ON SELECTED BIOMOTOR VARIABLES OF INTELLECTUALLY CHALLENGED CHILDREN

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Abstract

The purpose of this study was to find out the impact of adapted yoga with recreational games practice on selected bio-motor variables of intellectually challenged children. For this study, 20 male intellectually challenged children were selected from Faculty of Disability Management and Special Education unit and TAT Kalanilayam Middle School, Coimbatore. The selected subjects were considered as two groups,10subjects in each group. TAT Kalanilayam Middle School boys were treated as experimental group. These 10 subjects hadunder gone adapted yoga with recreational games training designed by the researcher, five days a week for eight weeks. Faculty of Disability Management and Special Education unit boys were treated as control group. The control group did not participate in any specific training programme. The following variables were selected for the study such as biomotor variables namely flexibility and agility.All subjects were tested prior to training and after completion of eight weeks of training on the selected variables. To analyze the collected data investigator used dependent 't' ratio to find out the significant difference between the mean of pre and posttest . Analysis of covariance (ANCOVA) was applied to determine the significance of mean difference between the two groups. The experimental group showed significant difference than the control group after eight weeks ofadapted yoga with recreational games training in all the selected variables.

Key words: *Adapted yoga, recreational games, flexibility, agility and intellectually challenged children.*

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INTRODUCTION

Childrenwho havedevelopmental disabilities learnataslower pacethan other children of a similar age do. They may experience delays in mastering language, social skills and behaviors, problem solving skills, self-care skills, and memory skills. Because they have more difficulty in learning, children with developmental challenges may require special education classes, and also we and more repetitive learning process**(Fagel,2012).**

Adapted Yoga is an alignment-based yoga, unifying body, mind, and spirit. It is a modern evolution of the traditional practice, which was always intended to suit the needs of the individual. The system works first with the physical body and its alignment, building an even balance between strength, stability, flexibility, and symmetry between the front and back of the body, left and right, upper and lower halves, linking as much of the body within consciousness as possible. Traditional and esoteric aspects of yoga are introduced throughout the on-going development of the physical practice to honour the yogic tradition. Though much of this process is achieved through yogic postures, many other traditional yogic tools are used whenever they may be to the student's maximum benefit. In Adaptive Yoga, the classical poses are adapted for individuals of all needs and abilities using modifications and sequencing of poses for maximal physical, physiological, organic, mental, and energetic effects **(Lisa C &Kaleay Isley,2014).**

METHODOLOGY

Selection of subjects

For this study 20 mild category intellectually challenged boys with IQ Level50 to 69 were selected by random sampling technique from Faculty of Disability Management and Special Education unit, Ramakrishna Mission Vivekananda University and TAT Kalanilayam Middle School, Coimbatore. The subject's age ranged from 11 to 14 years.

Selection of variables

Independent Variable

Adapted yoga with recreational games practice.

Dependent Variables

Bio-motor Variables

1. Flexibility
2. Agility

Selection of tests

As per the available literature, the following standardized tests were used to collect the relevant data on the selected variables.

Table- I

CRITERION MEASURES

S.No	Bio-motor Variables	Test	Unit of measurement
1.	Flexibility	Sit and Reach Test	Centimeter
2.	Agility	4x10 Shuttle Run	In seconds

EXPERIMENTAL DESIGN

For this study, the selected subjects were considered as two groups, 10subjects in each group.TAT Kalanilayam Middle School boys were treated as experimental group. These 10 subjects were given adapted yoga with recreational games training designed by the researcher, five days a week for eight weeks.Faculty of Disability Management and Special Education unit boys were treated as control group. The control groupdid not participate in any specific training programme. The following criterion variables were selected for the study such as bio-motor variables namely flexibility and agility. The training period was for eight weeks except Saturday and Sunday of every week. All subjects were tested prior to training and after completion of eight weeks of training on the selected variables.

List of asana and pranayama: Padmasana, Vajrasana, Yoga Mudra, Yoga Mudra,Paschimotasana, Matsyasana, Shalabasana, Bhujangasana, Dhanurasana, Halasana, Pathahasthasana, Tadasana, Shashangasana,Kapalbhati,Bhramri Pranayama, Nadisodhana, and Meditation.

List of recreational games: Cat and Rat,King in the circle, Fire on the mountain run run run, Simon says, Running relay, Hopping relay, Kangaroo relay, Ball roll relay, Tunnel ball relay, Knock the Indian club relay, Ball bounces into the bucket off a wall, Knock down Indian clubs.

STATISTICAL TECHNIQUE

The following statistical procedures were employed to estimate the impact of adapted yoga with recreational games practice on selected bio motor variables of intellectually challenged children. Dependent ‘t’ ratio was used to find out the significant difference between the mean of pre and post- test.

Analysis of covariance (ANCOVA) was applied to determine the significance of mean difference between the two groups namely adapted yoga with recreational games practice group and control group. In all cases, the criterion for statistical significance was set at 0.05 level of confident ($P \leq 0.05$).

RESULTS AND DISCUSSION

Computation of‘t’ test

The objective of the paired ‘t’ ratio was to describe the differences between the pre-test and post-test mean of adapted yoga with recreational games practice group and control group on the selected bio-motor variables of intellectually challenged children.

TABLE – II
SIGNIFICANCE OF MEAN GAINS & LOSSES BETWEEN PRE AND POST TEST SCORES ON SELECTED VARIABLES OF ADAPTED YOGA GROUP

S.No	Variables	Pre-Test Mean	Post-Test Mean	Std. Dev (±)	σ DM	r	't' Ratio
1	Flexibility	9.000	12.600	0.5164	0.163	0.873	22.045*
2	Agility	17.100	14.650	0.6819	0.216	0.791	11.362*

(Table value for 0.05 level for df 1, 9 = 2.262)

An examination of table - II indicates that the obtained 't' ratios are 22.045and 11.162 for flexibility andagility respectively. The obtained 't' ratios on all the selected variables are found to be higher than the required table value of 2.262 at 0.05 level of significance for 1, 9 degrees of freedom. So, it is found to be significant. The results show that the adapted yoga with recreational training group is statistically significant.

FIGURE- 1
BAR DIAGRAM SHOWING PRE AND POST TEST MEAN DIFFERENCES OF ADAPTED YOGA WITH RECREAATIONALGAMES PRACTICE GROUP ON SELECTEDBIO-MOTOR VARIABLES

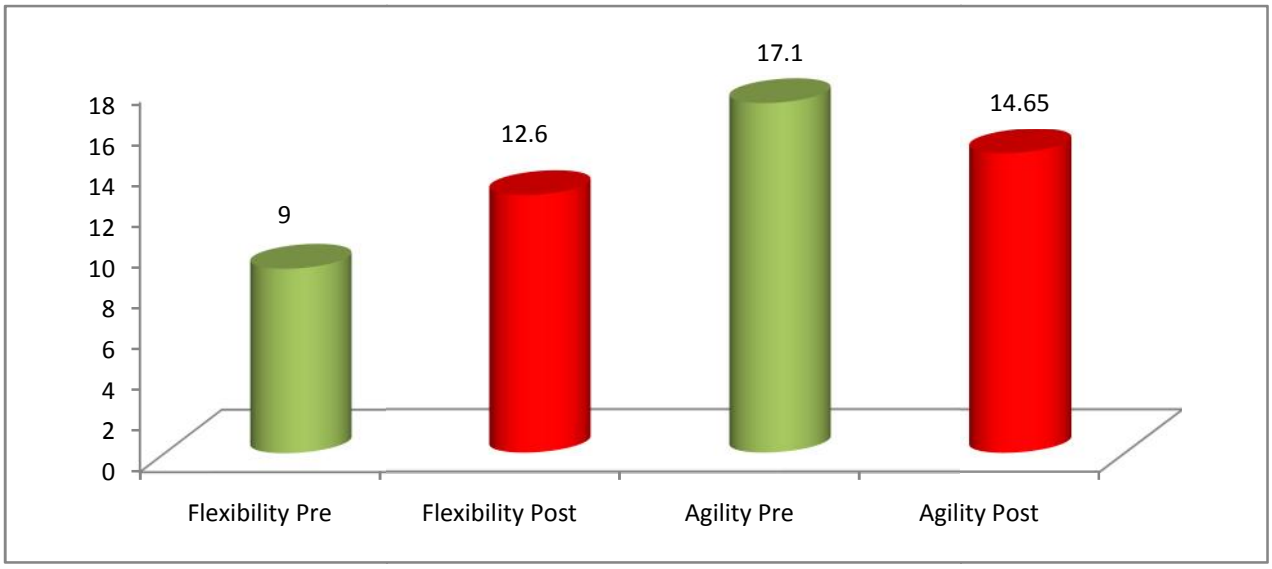


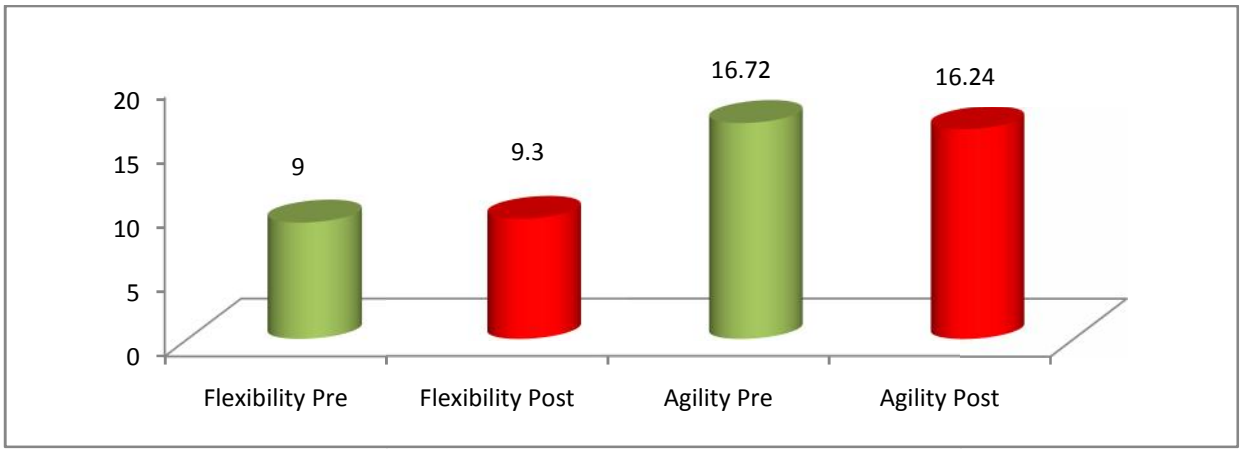
TABLE – III
SIGNIFICANCE OF MEAN GAINS & LOSSES BETWEEN PRE AND POST TEST SCORES ON SELECTED VARIABLES OF CONTROL GROUP

(Table value for 0.05 level for df 1, 9 = 2.262)

S.No	Variables	Pre-Test Mean	Post-Test Mean	Std. Dev (±)	σ DM	r	't' Ratio
1	Flexibility	9.000	9.300	1.059	0.335	0.384	0.896
2	Agility	16.720	16.240	1.214	0.384	0.462	1.251

An examination of Table-III indicates that the obtained 't' ratios are 0.896 and 1.251 for flexibility and agility respectively. The obtained 't' ratios on all the selected variables are found to be lesser than the required table value of 2.262 at 0.05 level of significance for 1, 9 degrees of freedom. So, it is found to be not significant. The results show that the control group is not significant.

FIGURE 2
BAR DIAGRAM SHOWING PRE AND POST-TEST MEAN DIFFERENCES ON SELECTED BIO-MOTOR VARIABLES OF CONTROL GROUP



COMPUTATION OF ANALYSIS OF COVARIANCE

The objective of the ANCOVA was to describe the statistical results of impact of adapted yoga with recreational games practice on selected bio-motor variablesof intellectually challenged children.

TABLE-IV
COMPUTATION OF ANALYSIS OF COVARIANCE OF MEAN OF ADAPTED YOGA AND CONTROL GROUPS ON FLEXIBILITY

Test	Adapted Yoga	Control group	Source of Variance	Sum of Squares	df	Mean Square	'F' ratio
Pre - Test Mean	9.000	9.0000	B	0.000	1	.000	0.001
			W	20.000	18	1.111	
Post - Test Mean	12.600	9.3000	B	54.450	1	54.450	67.593*
			W	14.500	18	.806	
Adjusted Post -Test Mean	12.600	9.300	B	54.450	1	54.450	109.544*
			W	8.450	17	.497	

B- Between Group Means * - Significant
W- Within Group Means (Table Value for 0.05 Level for df 1 & 18 = 4.413)
df- Degrees of Freedom (Table Value for 0.05 Level for df 1 & 17 = 4.415)

RESULTS ON FLEXIBILITY

An examination of table – IV indicates the results of ANCOVA for pre-test scores of the experimental group and control group. The obtained F-ratio for the pre-test is 0.001 (P>0.05) indicating that the random sampling is successful and the required table F-ratio is 4.413. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 18.

The obtained F-ratio for the post-test is 67.593 (P<0.05) and the table required F-ratio is 4.413. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 18.

The adjusted post-test means of experimental and control group are 12.600 and 9.300 respectively. The obtained F-ratio for the adjusted post-test means is 109.54 (P < 0.05) and the required table F-ratio is 4.415. Hence the F ratio for the adjusted post-test means onflexibility is significant at 0.05 level of confidence for the degree of freedom 1 and 17.

Pre-test, post-test and adjusted post-test mean difference of the experimental and control group on flexibility is presented in Figure 3.

FIGURE-3
BAR DIAGRAM SHOWING PRE-TEST, POST-TEST AND ADJUSTED POST-TEST MEAN DIFFERENCES OF ADAPTED YOGA GROUP AND CONTROL GROUP ON FLEXIBILITY

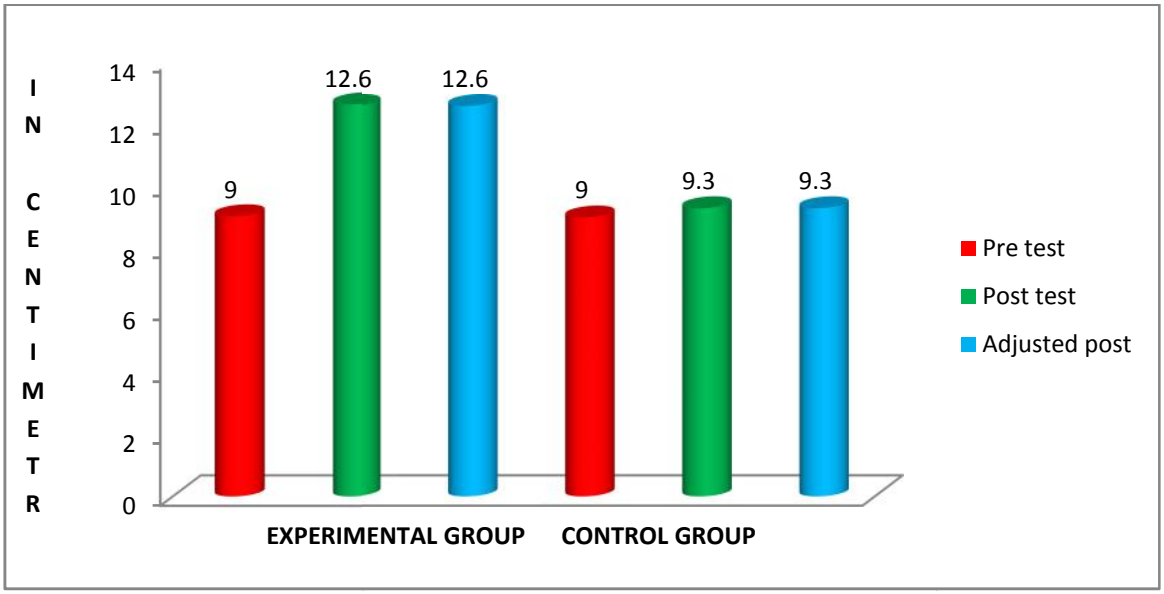


TABLE-V
COMPUTATION OF ANALYSIS OF COVARIANCE OF MEAN OF ADAPTED YOGA AND CONTROL GROUPS ON AGILITY

	Adapted Yoga	Control group	Source of Variance	Sum of Squares	df	Mean Square	'F' ratio
Pre - Test Mean	17.100	16.720	B	0.722	1	0.722	0.655
			W	19.856	18	1.103	
Post - Test Mean	14.650	16.240	B	12.641	1	12.641	9.299*
			W	24.469	18	1.359	
Adjusted Post -Test Mean	14.521	16.369	B	16.463	1	16.463	18.210*
			W	15.369	17	0.904	

B- Between Group Means * - Significant
W- Within Group Means (Table Value for 0.05 Level for df 1 & 18 = 4.413)
df- Degrees of Freedom (Table Value for 0.05 Level for df 1 & 17 = 4.415)

RESULTS ON AGIILITY

An examination of table – V indicates the results of ANCOVA for pre-test scores of the experimental group and control group. The obtained F-ratio for the pre-test is 0.655 (P>0.05) indicating that the random sampling is successful and the required table F-ratio is 4.413. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 18.

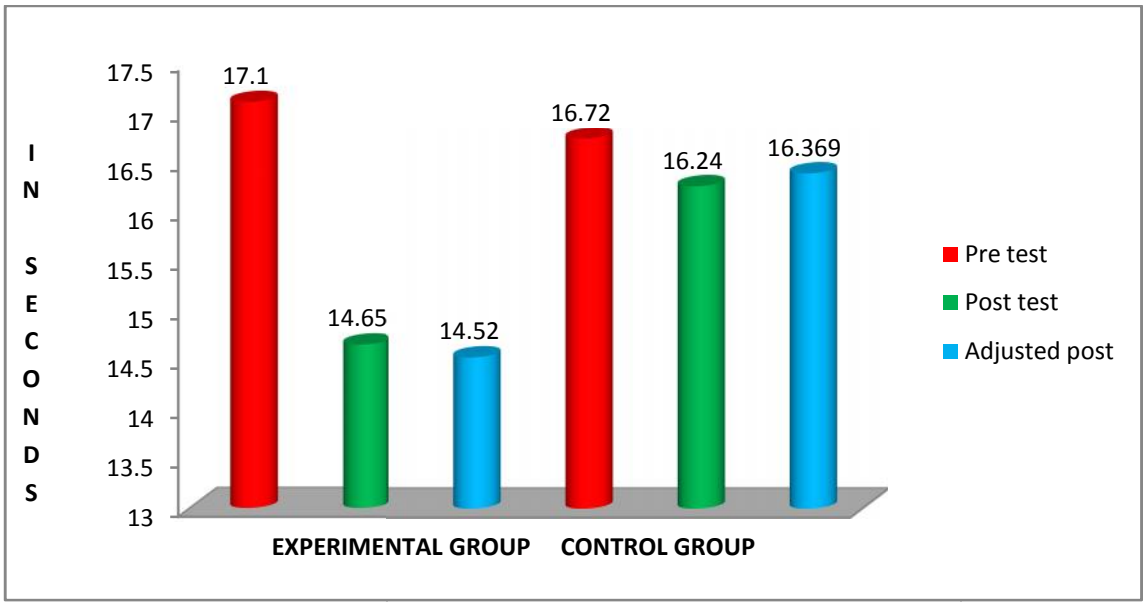
The obtained F-ratio for the post-test is 9.299 (P<0.05) and the required table F-ratio is 4.413. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 18.

The adjusted post-test means of experimental and control group are 14.521 and 16.369 respectively. The obtained F-ratio for the adjusted post-test means is 18.210 (P < 0.05) and the required table F-ratio is 4.415. Hence the F ratio for the adjusted post-test means onagility is significant at 0.05 level of confidence for the degree of freedom 1 and 17.

Pre-test, post-test and adjusted post-test mean difference of the experimental and control group on agility is presented in Figure 4.

FIGURE-4

BAR DIAGRAM SHOWING PRE-TEST, POST-TEST AND ADJUSTED POST-TEST MEAN DIFFERENCES OF ADAPTED YOGA GROUP AND CONTROL GROUP ON AGIILITY



DISCUSSION ON FINDINGS

The ultimate goal of the researcher was to examine the significant differences between the adapted yoga with recreational games practice group and control group on selected bio-motor variables of intellectually challenged children. The theme behind this study was to observe the effects of adapted yoga with recreational games practice group and control group on selected bio-motor variables of intellectually challenged children. To achieve this, two different groups were designed as adapted yoga with recreational games practice group and control group.

The study indicated that the adapted yoga with recreational games practice group significantly shows changes on the selected dependent variables namely flexibility and agility but control group did not show significant changes on all the selected variables. It was found that the adapted yoga with recreational games practice group was significantly greater when compared to control group in the selected dependent variables such as flexibility and agility for a period of eight weeks.

BIOMOTOR VARIABLES

The results on flexibility and agility showed that there were significant effects due to the adapted yoga with recreational games practice. Further it showed that the mean value of adapted yoga with recreational games practice group had better improvement in flexibility and agility than control group. The results of the study are in conformity with the findings the following authors.

Halder et al. (2015) suggested Hatha yoga can improve anthropometric characteristics, muscular strength and flexibility among volunteers of different age group and can also be helpful in preventing and attenuating age related deterioration of these parameters.**Tracy and Hart (2013)** suggested Yoga subjects exhibited increased dead lift strength, substantially increased lower back/hamstring flexibility, increased shoulder flexibility, and modestly decreased body fat compared with control group. **Fan and Chen (2011)** suggested yoga exercise has positive benefits for both the physical and mental health of elders with dementia living in long-term care facilities. It is recommended that yoga be included as one of the routine activities in these long-term care facilities.

CONCLUSIONS

1. Within the limitations and on the basis of the findings of the study, it was very clear that eight weeks of adapted yoga with recreational games practice produced significant changes in the selected bio-motor variables namely flexibility and agility of intellectually challenged children
2. It was also concluded that the control group did not show any significant difference in the selected bio-motor variables namely flexibility and agility of intellectually challenged children.

3. Further, it was inferred that adapted yoga with recreational games practice appears to be a safe and practical intervention tool for improving bio-motor variables of intellectually challenged children.

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