#### EFFECT OF ADAPTED GAMES AND ASANA PRACTICES ON SELECTED PSYCHOMOTOR VARIABLES OF PERSONS WITH INTELLECTUAL DISABILITY

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#### Abstract

The purpose of the study was to find out the effect of adapted games and asana practices on selected psychomotor variables of persons with intellectual disability. To achieve the purpose of the study, forty five (45) students were randomly selected from 90, with an age range 12-17 years and their mean age is 14 years, who were from different special schools of Kerala state such as Love Shore Special Schools, Kozikkode and Malappuram, Pratheeksha Special School, Mukkam, Kozhikode and Rahmaniya School for Mentally Handicapped, Kozhikode for acting as subjects for the study. They are intellectually challenged – mild, moderate and trainable- without multiple disabilities. The experimental group 1 had undergone adapted asana practices and experimental group 2 had undergone combined adapted asana and games practices for twelve weeks 5 days per week and 1 hour per day basis. The control group had not undergone any training process. The pre test and post test before and after the twelve week training were conducted in the selected psychomotor variables for the three groups. The collected data were analyzed using t ratio to find out the significant improvement in the selected variables of the subjects. ANCOVA was applied to find out the significant difference between the groups. The statistical analysis showed that the intellectually challenged persons in the experimental groups had significantly improved in all selected psychomotor variables namely Static Balance, Reaction Time and Manual Dexterity. The experimental group 2 (adapted games and asana group) had shown better improvements than the experimental group 1 (adapted asana) in all the selected psychomotor variables. The results also showed that there is no significant difference in the control group in all selected psychomotor variables.

Keyword: Intellectual disability, static balance, reaction time, manual dexterity

### Introduction

Intellectual disability is characterized by significant limitations both in intellectual functioning and adaptive behavior as expressed in conceptual social, and practical adaptive skills which originate before the age of 18 (Schalock et al. 2010 p13). Intellectual disabilities are multidimensional in that, they affect all aspects of a person's life. Many parents face problems in bringing up their children with intellectual disability to the level of normal children in concern of psychomotor fitness and functional ability. Participation in games and sports and yoga asana which are modified for this type of children may influence on their physical, motor, and functional abilities. Adapted physical education and sports is an individualized program including physical and motor fitness, functional motor skills and patterns, skills in aquatics and

dance, and individual and group games and sports designed to meet the unique needs of individuals (Winnick. J.P 2011).

#### Asana

In the Yoga Suthra, Padanjali describes asana as a "steady and confortable posture", referring specially to the seated, meditative posture used for meditation practices. He further suggests that meditation is the path to Samadhi, transpersonal self-realization (S. Prabavanada and C. Isherwood, 1996). Adapted asana are physical postures of yoga practiced by persons with special needs or physically and intellectually challenged people. Adapted asana can be performed as:

- 1. Modified postures: asana may be performed with modified postures instead of their real postures according to the ability of the performer.
- 2. Part to part: an asana can be performed part to part and part to complete suitable to needs of performer.
- 3. Asana with support: adapted asana can be performed with external support of the instructor or trainer to achieve the maximum performance and benefits.

"The right application of yoga techniques for the children with intellectual disability depends largely on individual physical disability", says **S N Saraswathi (1998).** Medical science has achieved a lot and reached a high position to do many things for the benefits of challenged children, especially intellectually challenged children. This should be combined with science of yoga to maximize the benefits on intellectually challenged children.

#### **Psychomotor Ability**

Psychomotor ability refers to a wide range of actions involving physical movements related to the conscious cognitive processing. Psychomotor learning is demonstrated by physical skills such as movement, coordination, manipulation, dexterity, grace, strength, actions which demonstrate the fine motor skills such as use of precision instruments or tools, or action which evidence gross motor skills such as the body in dance. Persons with intellectual disability are very poor in psychomotor ability because of their neurodevelopmental disorder.

There are about eleven components for psychomotor ability and nine of them are in the field of physical proficiency which consistently considered in the common variance of psychomotor tasks. (Fleishman et al. 1960)

**1. Reaction Time:** This is the ability to quickly respond (with hand, finger or foot) to a signal (sound, signal or picture) when it appears. It is noticed and recorded that the measurement of reaction time in persons with intellectual disability is high and they usually take much more time than the normal persons.

**2. Static Balance:** It is the ability of an individual to maintain equilibrium at stationary position. The balance of an object is very high when its surface area which touches is wider. Usually static balance is very low in the people with intellectual disability.

**3. Manual Dexterity:** This is the ability of an individual to move his hands and arms quickly and skillfully in a well-directed and rapid coordination to manipulate or assemble larger objects. To measure this ability Minnesota Rate of Manipulation Test is used.

#### Need of the Study

Children with or without intellectual disability must be brought up to achieve the overall development. In the childhood and adolescent's period a lot of changes take place in the growth and development of an individual, especially physical, mental and psychomotor areas. Suitable training and activities will help them to achieve these developments. Regular practice of adapted or modified games, especially team games and modified or adapted asana can make changes in the functional ability and psychomotor ability in children with intellectual disabilities. (S. Alegesan 2016)

#### Methodology

The study was designed to find out the effect of adapted games and asana practices on selected psychomotor variables and of persons with intellectual disability with an age range 12-17 years and their mean age is 14 years.

To complete the purpose of the study, Forty Five (45) students were randomly selected from 90, who were from different special schools of Kerala state such as Love Shore Special Schools, Kozikkode and Malappuram, Pratheeksha Special School, Mukkam, Kozhikode and Rahmaniya School for Mentally Handicapped, Kozhikode for acting as subjects for the study. They are intellectually challenged – mild, moderate and trainable- without multiple disabilities. These students had not undergone any special training program apart from their regular routine in the school.

The subjects were divided randomly into three groups. One group (Experimental group I N=15) had acted as adapted asana group. Second group (Experimental group II N=15) had acted as adapted games and adapted asana group. Then the third group (Control group (N=15) had acted as control group. The experimental groups had undergone adapted games and adapted asana training for a period of 12 weeks and control group had not undergone any training other than their daily routine at school.

The pre and post test data collected from persons with intellectual disability of special schools of Kozhikode and Malappuram district of Kerala were compared for the effect of adapted games and adapted asana practice for 12 weeks. The difference obtained in the selected criterion variables between initial and final means was tested through statistical treatment using Analysis of Covariance (ANCOVA) for statistical significance. The subjects were compared on selected criterion variables to find out the effect of adapted asana and combined adapted games and asana practices using ANCOVA to find out the significant impact if any, among the groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

#### RESULTS

# TABLE-IANALYSIS OF COVARIANCE FOR PRE AND POST AND ADJUSTED POST TESTSCORES OF STATIC BALANCE FOR CONTROL AND EXPERIMENTAL GROUPS

Test	Exp. 1	Exp. 2	Control	Source	Sum of	df	Mean	Obtained
	Asana	Games&	Group	of	Squares		Square	'F' ratio
		Asana		Variance				

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Pre Test								
Mean	1.76	1.78	1.82	Between	.032	2	.016	.043
SD	.461	.651	.690	Within	15.58	42	.371	
Post Test								
Mean	2.46	2.80	1.81	Between	7.65	2	3.82	11.332*
SD	.490	.530	.701	Within	14.17	42	.337	
Adjusted								
Post Test	2.48	2.80	1.78	Between	8.27	2	4.13	42.560*
Mean				Within	3.98	42	.097	
*	Significa	nt	at.	0.05	level	0	f	confidence

(The table value required for Significance at 0.05 level with df 2 and 42 is 3.22, 2 and 41 is 3.23)

As shown in table I, the obtained f value on the scores of pre-test means of .043 was lesser than the required table value of 3.22, which proved that the random assignment of the subjects was successful and their scores in static balance before the training were equal and there was no significant difference at 0.05 level. The obtained f value on the scores of post-test means of 11.332 was greater than the required table value of 3.22. Hence, there was significant difference between the post-test means at 0.05 level.

Taking into consideration of pre-test and post-test means, the adjusted post-test means were determined and the obtained f value of adjusted post-test means of 42.560 was greater than required table value of 3.23. Hence, there was significant difference between adjusted post-test means at 0.05 level. Since significant improvements were recorded, the results were subjected to analysis by using Scheffe's post-hoc test. The results are presented in table II.

#### TABLE-II THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TESTS PAIRED MEANS ON STATIC BALANCE

Exp.1 Asana	Exp. 2 Games& Asana	Control Group	Mean Difference	Confidence Level Value
2.48	2.80		0.32*	
2.48		1.78	0.70*	0.289
	2.80	1.78	1.02*	

As shown in table 2, the adjusted post-test mean difference of adapted asana, combined adapted asana and adapted games, and control groups are 0.32, 0.70, and 1.02 respectively and they are greater than the required confidence interval value of 0.289 and these comparisons were significant at 0.05 level. The results of the study further have revealed that there is a significant difference in static balance between the adjusted post-test means of adapted asana and combined adapted asana and adapted games, adapted asana and control group and combined adapted asana and adapted games and control group. However, the improvement in static balance was significantly higher for combined adapted asana and adapted games group than other groups. It may be concluded that the combined adapted asana and adapted games group exhibited better than the other groups in improving static balance.

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	Exp.1 Asana	Exp. 2 Games& Asana	Control Group				
Pre Test	1.76	1.78	1.82				
Post Test	2.46	2.8	1.81				
Adjusted Post Test	2.48	2.8	1.78				



#### Figure- 1

#### **TABLE-III**

ANALYSIS OF COVARIANCE FOR PRE AND POST AND ADJUSTED POST TEST SCORES OF REACTION TIME FOR CONTROL AND EXPERIMENTAL GROUPS

Test	Exp. 1	Exp. 2	Control	Source	Sum of	df	Mean	Obtained
	Asana	Games&	Group	of	Squares		Square	'F' ratio
		Asana		Variance				
Pre Test	1.24	1.24	1.25	Between	.158	2	.079	
Mean								.948
SD	.236	.261	.355	Within	3.50	42	.083	
Post Test	.963	.885	1.25	Between	1.13	2	.566	10.387*
Mean								
SD	.185	.079	.351	Within	2.29	42	.055	
Adjusted	1.020	.858	1.225		1.01	2	.506	29.648*
Post Test				Between				
Mean				Within	.699	41	.017	

\* Significant at. 0.05 level of confideence (The table value required for Significance at 0.05 level with df 2 and 42 is 3.22, 2 and 41 is 3.23)

As shown in table III, the obtained f value on the scores of pre-test means of .948 was lesser than the required table value of 3.22, which proved that the random assignment of the subjects was successful and their scores in reaction time before the training were equal and there was no significant difference at 0.05 level. The obtained f value on the scores of post-test means of 10.387 was greater than the required table value of 3.22. Hence, there was significant difference between the post-test means at 0.05 level.

Taking into consideration of pre-test and post-test means, the adjusted post-test means were determined and the obtained f value of adjusted post-test means of 29.648 was greater than required table value of 3.23. Hence, there was significant difference between adjusted post-test means at 0.05 level.

Since significant improvements were recorded, the results were subjected to analysis by using Scheffe's post-hoc test. The results are presented in table IV.

TABLE- IV

## THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TESTS PAIRED MEANS ON REACTION TIME

Exp. 1 Asana	Exp. 2 Games& Asana	Control Group	Mean Difference	Confidence Level Value
1.020	.858		0.162*	0.101
1.020		1.225	0.205*	0.121
	.858	1.225	0.367*	

As shown in table 4.2, the adjusted post-test mean difference of adapted asana, combined adapted asana and adapted games, and control groups are 0.162, 0.205, and 0.367 respectively and they are greater than the required confidence interval value of 0.121 and these comparisons were significant at 0.05 level.

The results of the study further have revealed that there is a significant difference in reaction time between the adjusted post-test means of adapted asana and combined adapted asana and adapted games, adapted asana and control group and combined adapted asana and adapted games and control group.

However, the improvement in reaction time was significantly higher for combined adapted asana and adapted games group than other groups.

It may be concluded that the combined adapted asana and adapted games group exhibited better than the other groups in improving reaction time.



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Test	Exp. 1	Exp. 2	Control	Source	Sum of	df	Mean	Obtained
	Asana	Games&	Group	of	Squares		Square	'F' ratio
		Asana		Variance				
Pre Test	132.27	136.33	147.00	Between	1736.93	2	868.46	2.021
Mean								
SD	15.60	24.70	20.87	Within	18044.27	42	429.62	
Post	126.40	116.27	146.87	Between	7289.64	2	3644.82	11.719*
Test								
Mean								
SD	16.13	15.06	21.12	Within	13062.27	42	311.00	
Adjusted	131.11	117.92	140.51		3729.08	2	1864.54	26.465*
Post				Between				
Test				Within	2888.55	41	70.453	
Mean								

#### \* Significant at. 0.05 level of confidence (The table value required for Significance at 0.05 level with df 2 and 42 is 3.22, 2 and 41 is 3.23)

As shown in table V, the obtained f value on the scores of pre-test means of 2.021was lesser than the required table value of 3.22, which proved that the random assignment of the subjects was successful and their scores in manual dexterity before the training were equal and there was no significant difference at 0.05 level. The obtained f value on the scores of post-test means of 11.719 was greater than the required table value of 3.22. Hence, there was significant difference between the post-test means at 0.05 level.

Taking into consideration of pre-test and post-test means, the adjusted post-test means were determined and the obtained f value of adjusted post-test means of 26.465 was greater than required table value of 3.23. Hence, there was significant difference between adjusted post-test means at 0.05 level.

Since significant improvements were recorded, the results were subjected to analysis by using Scheffe's post-hoc test. The results are presented in table VI TABLE- VI

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FESTS PAIRED MEANS ON MANUAL DEXTERITY							
THE SCHEI	FFE'	S TEST FOR	THE DIFFERENCES	<b>BETWEEN THE</b>	E ADJUSTEI	) POST	

Exp. 1	L	Exp. 2	Control Group	Mean	<b>Confidence</b> Level
Asana		Games & Asana		Difference	Value
131.11		117.92		13.19*	
131.11			140.51	9.4*	7.789
		117.92	140.51	22.59*	

As shown in table 7.2, the adjusted post-test mean difference of adapted asana, combined adapted asana and adapted games, and control groups are 13.19, 9.4, and 22.59 respectively and

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they are greater than the required confidence interval value of 7.789 and these comparisons were significant at 0.05 level.

The results of the study further have revealed that there is a significant difference in manual dexterity between the adjusted post-test means of adapted asana and combined adapted asana and adapted games, adapted asana and control group and combined adapted asana and adapted games and control group.

However, the improvement in manual dexterity was significantly higher for combined adapted asana and adapted games group than other groups.

It may be concluded that the combined adapted asana and adapted games group exhibited better than the other groups in improving manual dexterity.

	Figure-3						
	Exp.1 Asana	Exp. 2 Games& Asana	Control Group				
Pre Test	132.27	136.33	147				
Post Test	126.4	116.27	146.87				
Adjusted Post Test	131.11	117.92	140.51				



#### DISCUSSION ON FINDINGS OF STATIC BALANCE

• The result of the study had revealed that there is significant improvement in static balance of the experimental groups of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is no significant improvement in static balance of the control group of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is better significant improvement in static balance of the experimental group 2 (combined adapted games and asana) than the experimental group 1 (adapted asana) of intellectually challenged persons from pre test to post test.

DISCUSSION ON FINDINGS OF REACTION TIME

• The result of the study had revealed that there is significant improvement in reaction time of the experimental groups of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is no significant improvement in reaction time of the control group of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is better significant improvement in reaction time of the experimental group 2 (combined adapted games and asana) than the experimental group 1 (adapted asana) of intellectually challenged persons from pre test to post test.

#### DISCUSSION ON FINDINGS OF MANUAL DEXTERITY

• The result of the study had revealed that there is significant improvement in manual dexterity of the experimental groups of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is no significant improvement in manual dexterity of the control group of intellectually challenged persons from pre test to post test.

• The result of the study had revealed that there is better significant improvement in manual dexterity of the experimental group 2 (combined adapted games and asana) than the experimental group 1 (adapted asana) of intellectually challenged persons from pre test to post test.

#### CONCLUSIONS

The following conclusions were drawn from the results of the study.

1. It was concluded that the 12 week adapted asana practices improved static balance, reaction time and manual dexterity of persons with intellectual disability.

2. It was concluded that the 12 week combined adapted games and adapted asana practices improved static balance, reaction time and manual dexterity of persons with intellectual disability.

3. It was concluded that the 12 week combined adapted games and adapted asana practices had shown better improvement in static balance, reaction time and manual dexterity of experimental group 2 than experimental group 1 of persons with intellectual disability.

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