Efficacy of Selected Yogic Practice on Flexibility and Balance among Adolescents with Intellectual Disability and Down syndrome

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Abstract

The purpose of the study was to find the effectiveness of selected yogic practice on flexibility and balance among adolescents with Intellectual Disability and Down syndrome. To achieve the purpose of the study, thirty adolescents with intellectual disability and Down syndrome were selected from Love Shore Institute for Mentally Challenged, Calicut. The selected subjects in to two groups; Group I consisted of 20 subjects, Group II consisted of 10 subjects who acted as controls. Group I underwent selected yogic practice thrice a week for eight weeks. Group II did not participate in any special training apart from the regular curricular activities. The selected variables flexibility and balance were measured by using Sit and Reach and Standing Stork Tests respectively. Groups were tested on selected variables prior to and immediately after the training program. ANCOVA was applied to find out the effect of training. The results of the study showed that significant difference in balance was observed between the groups after training and no significant differences were found in flexibility.

KEYWORDS: Yogic Practice, Intellectual Disability, Down syndrome, Flexibility and Balance

1. Introduction.

Yoga is an ancient Indian practice which involves movements of body to allow the mind to concentrate and achieve balance and well-being thereby building a bridge between the mind and body of a human being. According to Heriza (2004), N “the purpose of traditional yoga is for each individual to be healthy, both physically and mentally, and able to reach his or her highest potential as a person”. Hatha yoga aims to prepare the body for meditation in the course of breathing and physical exercises. Hatha yoga emphasizes body-mind wellness through postures or asanas which tone and strengthen muscles and increase flexibility.

Children with Intellectual Disability encompass a heterogeneous group of people with varying needs. The learning ability of these groups is slower than normal children of the same age groups. They exhibit delay in developing their activities like late to smile, move, sit, walk and show interest in things. In general they use to have deficits in one or more areas like self care, home living, communication & social skills, social & emotional developments and also to their approach to the community resources. They also indicate

difficulties in Intellectual functioning and performance of day to day activities expected of a person of similar age group.

Down syndrome is the most common form of Intellectual Disability in the world. It occurs in approximately 1 out of every 1000 babies born alive, and is caused by a genetic abnormality that affects the chromosome (Rozen NJ and Patterson D, 2003). Behavioral and psychological problems are more frequent and they are less active than their nondisabled counterparts (Croce & Horvatt, 1992; Dyer, 1994; Moon & Renzaglia, 1982). Researchers have found that, persons with disabilities have higher morbidity and mortality rates than normal people as they are less active. (Beange, McElduff, & Baker, 1995; Rimmer, 1994). The common disorders among Down syndrome include attention deficit hyperactivity disorder, oppositional disorder, and aggressive disorder. People with disabilities with Down syndrome have a higher percentage of body fat than other individuals with mental retardation, and that they have a depressed rate of resting metabolism (Chad, Jobling, & Frail, 1990).

Flexibility is a major functional ability to perform various tasks in day today life such as lifting, sweeping and playing games etc. It is pertinent to mention that, when people become aged, flexibility also gets deteriorated which may results in falls and injuries. On assessing the frequent injuries of such people, experts suggest inclusion of flexibility training on the daily fitness routine to reduce injuries.

Balance is a vital element for body movements such as moving and standing for human as well as animals. The body balance is a coordination of number of other body system working together. The individuals those who have lesser balance may cause unexpected fall resulting in injuries. People with ID or Down syndrome generally show lesser body balance comparatively than normal people. Motor development particularly standing positions and walking ability is generally delayed in children with Down syndrome. Balance and motor functions are correlated with each other, therefore the physical exercises has to be imparted focusing on both the elements. (Roksana Malak , 2015)

2. Methodology.

Thirty adolescents with Intellectual Disability and Down syndrome were selected from Love shore Institute for mentally challenged, Calicut. The selected subjects were assigned into two groups. Group I consisted of 20 Intellectually disabled and Down syndrome subjects and Group II consisted of 10 subjects acted as the control group. Group I underwent selected yogic practice thrice a week for eight weeks. Group II did not participate in any special training apart from the regular curricular activities. The selected variables flexibility and balance were measured by sit and reach test and stork stand test respectively. The duration of training session was eight weeks. The training session ranged from 30 to 60 minutes approximately, including warming up and cooling down.

The training programme was based on the results of the pilot study. The training programme carried out for a period of eight weeks is presented in Table 1.

TABLE –I
Training Schedule

Yogic practice	1-2week	3-4week	5-6week	7-8 week
Tadasana	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Padahasthasana	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Ardhachakrasana	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Veerabadrasan	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Sugsana	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Pachimothasana	&1@5#30	&2@10#30	&3@15#30	&4@20#30
Badhakonasana	&1@5#30	&2@10#30	&3@15#30	&4@20#30

&=repetition,@=holding in seconds, #=rest between asanas in seconds

Statistical Technique

Analysis of covariance was used to determine significant differences for dependent variables within two groups. When significant difference was observed, a pair wise comparison was done by post hoc test. The level of significance was set at 0.05 level of confidence. Findings of the statistical analysis are presented in table 2

Table 2
Mean and standard deviation of different groups on flexibility measured in post-testing

Treatment Groups	Mean	Std. Deviation	N
Experimental	15.0400	8.36899	20
Control	10.1460	4.73073	10
Total	13.4087	7.63805	30

Table 2 shows that experimental group post test mean was 15.0400 with standard deviation of 8.369 and control group mean was10.146 with standard deviation of 4.731.

Post test Means & Standard Deviation on Flexibility of experimental and control groups

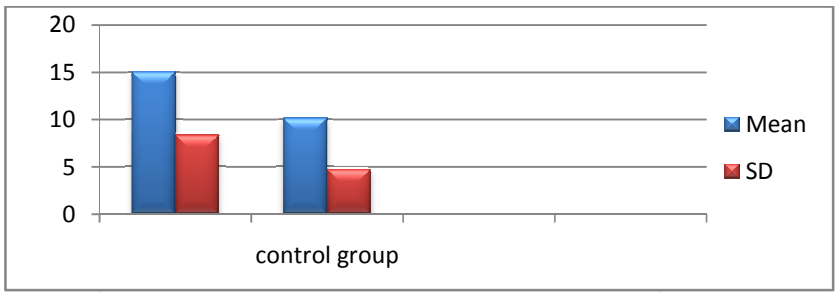


Table 3
Adjusted mean and standard error of different groups in post -testing

Treatment Groups	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental	13.922[a]	.684	12.519	15.325
Control	12.383[a]	.976	10.379	14.386
a. Covariates appearing in the model are evaluated at the following values: Pre-flex = 11.8777.				

Further, adjusted means and standard deviation for the flexibility of different groups during post testing are shown in Table 3. It shows that after adjusting the post test means of experimental group was 13.922 with standard error of 0.684 and for control group the post test mean was 12.383 with standard error 0.976.

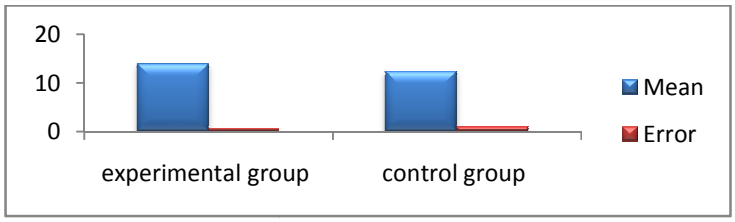
Table 4
Analysis of Covariance on Flexibility of Experimental and Control group

Table 4 shows that the F-value on the adjusted means of two treatment groups

	Type I Sum of Squares	Df	Mean Square	F	Sig. (*p*-value)
Pre-flexibility	1429.223	1	1429.223	155.784	.000
Treatment Groups	14.921	1	14.921	1.626	4.21
Error	247.708	27	9.174		
Total	7085.623	30			
Corrected Total	1691.852	29			
a. R Squared = .854 (Adjusted R Squared = .843)					

(experimental and control) during the post-testing. The obtained F ratio value of 1.626 is less than the required table value f 4.21. Hence, it is inferred from the results of the study that eight weeks of training could not produce any significant changes on the flexibility of the experimental group.

Adjusted post test mean and standard error on Flexibility of different groups



The analysis on Balance is presented in tables 5

Table 5
Post test Mean and standard deviation on Balance of different groups

Treatment Groups	Mean	Std. Deviation	N
Experimental	3.192	1.836	20
Control	2.839	2.528	10
Total	3.074	2.054	30

Table 5 shows that the experimental groups post test mean was 3.192 with standard deviation of 1.836 and control group mean was 2.839 with standard deviation of 2.528.

Post test Means & Standard Deviation on Balance of experimental and control groups

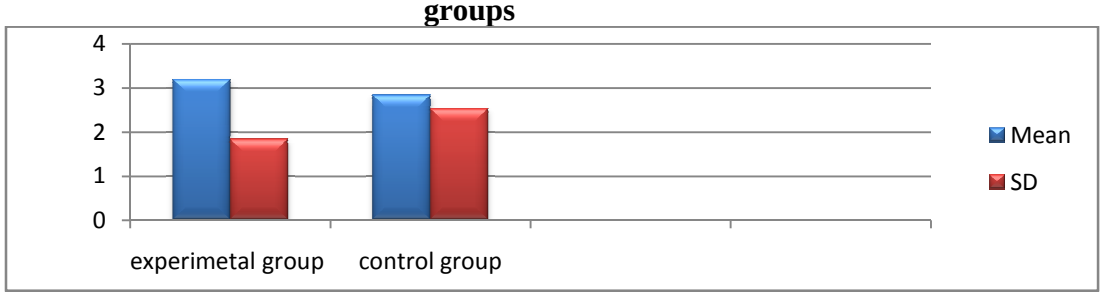


Table 6
Adjusted Post test mean and standard error on Balance of different groups

Treatment Groups	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental	3.286[a]	.121	3.037	3.535
Control	2.650[a]	.172	2.298	3.002

a. Covariates appearing in the model are evaluated at the following values: Pre-balance = 2.6063.

Further, adjusted means and standard deviation on balance of different groups during post test are shown in Table 6. It shows that after adjusting, the post test means of experimental group was 3.286 with standard error of 0.121 and for control group the mean was 2.650 with standard error 0.172.

Adjusted post test mean and standard error of different groups

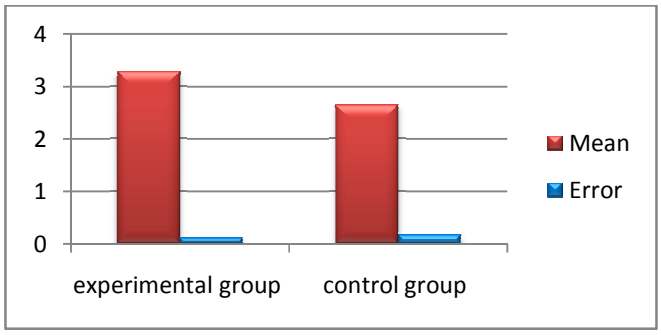


Table 7

ANCOVA on the post-test data on Balance

Source	Type I Sum of Squares	df	Mean Square	F	Sig. (*p*-value)
Pre Balance	111.825	1	111.825	380.559	.000
Treatment Groups	2.682	1	2.682	9.128	.005
Error	7.934	27	.294		
Total	405.925	30			
Corrected Total	122.441	29			
a. R Squared = .935 (Adjusted R Squared = .930)					

Table 7 shows that the F-value for comparing the adjusted means of two treatment groups (experimental and control) during the post-test. Since the obtained F ratio value of 9.128 is higher than the p-value of 0.005, it is clear that there existed significant difference occurred as a result of training. In order to understand which of the paired means were significant, post hoc comparisons have been made for the adjusted means of the two treatment groups which shown in Table 8

Table 8

Pair-wise comparison of post test adjusted means of Balance of different treatment groups

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.[b] (*p* – value)	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Experimental	Control	.636*	.210	.005	.204	1.068
Control	Experimental	-.636*	.210	.005	-1.068	-.204

Based on estimated marginal means*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

It may be noted that p-value for the mean difference between experimental and control is 0.005 and the obtained value is higher than 0.05, it is significant at 5% level.

Discussion

The analysis revealed that there was no significant difference in flexibility. However there was a significant difference in balance due to eight weeks of training. Hopkins and Hopkins (1976) suggested that a yoga programme could benefit children, especially those with psychomotor deficits; they reported that yoga postures promote body awareness, balance and laterality. There are three primary components of physical fitness: cardiovascular endurance, muscular strength endurance and flexibility (Rimmer, 2009). Nonetheless balance is a core functional component to perform task. People with Intellectual disabilities and Down syndrome can increase their physical fitness levels by participating in physical activity programs which address their specific needs. Yoga practice may enhance functional ability that encompasses all areas of life which helps to survive from their disabilities and they can lead life. The duration of the present study was very short and studies of longer duration may conducted in these lines .

Conclusion

1. It is concluded that the yogic practice programme for eight weeks could not significantly improve the flexibility of adolescents with Intellectual disability and Down syndrome. .

2. It is concluded that the yogic practice programme for eight weeks is effective in improving the balance of adolescents with Intellectual disability and Down syndrome.

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