

Effect of Adaptive Yoga Therapy in Increasing Hand Steadiness among Children with Intellectual Disability

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ABSTRACT

Yoga is an ancient Indian tradition which has diverse effect through physical and mental practices. Several studies showed the effect of yoga in the various health aspects of human body. It improves the general health, neurological functioning and physical activity. Researches also showed a great literature on the effect of yoga on the attention, concentration and problem solving of the students. Present research was intended to see the effect of yoga on the hand steadiness of children with ID. To conduct the experiment researcher had selected 20 children with ID with predetermined inclusionary criteria from GRIID and randomly assigned to the two groups (Experimental/Control). Intervention was given to the experimental group, regularly for 5 days week, daily one hour up to 3 months and no any treatment given to the control group. They have attended their routine classes. In results it is found that students who got the intervention, showed a significant effect on decrease in the errors on hand steadiness test in comparison to the control group with t value 3.84 and 6.43 respectively.

Keywords: *Yoga Therapy, Steadiness, Children, Intellectual Disability*

Intellectual impairment means significantly sub-average general intellectual functioning, which exists concurrently with depicts in adaptive behavior and manifested during the developmental period that adversely affects a student's educational performance. It affects a child's ability to reason and understand, to acquire skills and master developmental milestones within "typical" age range, to solve problem and adapt to new situations, and to learn and remember as easily as others.

Children who are intellectually impaired function at an intellectual level that is below average and have difficulties with learning and daily living skills. Conceptual skills like language, social skills like interaction with others and practical skills like self-care are lacking in children with

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intellectual impairment. Children labeled as such need special care to overcome social, intellectual and physical disabilities. Children with intellectual impairment generally lack fine motor coordination abilities (Panda, 1997).

There are so many techniques and methods to develop fine motor co-ordination abilities like rolling play dough into tiny balls (Peas) using only the finger tips, using pegs or toothpicks to make designs in play dough, tearing newspaper into strips and then crumpling them into balls, scrunching up one sheet of newspaper in one hand, using small sized screwdrivers like those found in an erector set. All these methods are merely based on training. They generally take longer duration to develop fine motor co-ordination abilities. Moreover, they require special educator and adopted materials. Special educator follows all the techniques and adapted material to train the children with impairment following the proper teaching strategies so as to train them effectively.

Yoga is one of the important methods to improve the fine motor coordination ability among children. The great Indian philosopher Patanjali Maharshi describes Yoga in his Yoga Sutra as “chittavrittinirodha” i.e. cessation of the fluctuation of mind. According to him, Yama (abstention), Niyama (observance), Asana (posture) Pranayama (life force control), Pratyahara (abstraction), Dharana (concentration), Dhyana (meditation) and Samadhi (liberation) are the eight stages or limbs of yoga. Pranayama “prana” + “yama” is the fourth limb of yoga which balances nervous system and improves mental clarity and physical coordination (Chanchani & Chanchani, 2006)

Yoga is an ancient Indian tradition which through diverse physical and mental practices the practitioner strives to achieve a state of all around health. 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.

The practice of yoga has already been shown to be of therapeutic benefit in cases with psychosomatic ailments such as bronchial asthma (Nagarathna & Nagendra, 1985; Nagendra &

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Nagarathna, 1986). After 9 months of yogic practice, mentally retarded children also showed improvement in general mental ability, psychomotor coordination, and intelligent and social behaviour (Uma, Nagarathna, Nagendra, Vaidehi, & Seethalakshmi, 1989).

Yoga has shown beneficial results in various physical and mental disorders (M. Javnbakht and R. Hejazi Kenari 2009). Yoga may also improve rehabilitation of people with intellectual disability. However, every person with intellectual disability (ID) is unique and the limitation to learn varies from mild to profound.

A milestone study on steadiness and psychomotor co-ordination was conducted by Kocher, H.C. (1974) with a view to evaluate the effect of yoga exercises on steadiness as claimed as well as to examine the influence of these practices on psycho-motor co-ordination, and the relationship between steadiness and co-ordination. Another study which was conducted by Pratap, V. (1968) also supports the view that yoga practices increase steadiness in normals.

Kocher, H.C. (1972) measured steadiness by Mirror Tracing Test on 36 subjects (21 for experimental group and 15 for control group). After pre testing the experimental group was given yoga practices for 8 months. After this experimental period, both the groups were again tested. The result revealed that, there was significant improvement in hand steadiness among yoga practitioners as compared with control group in terms of errors on Mirror Tracing Test. According to Kocher, H.C. and Pratap, V. (1972) yoga practices are supposed to reduce the high activation level. The condition of high activation seems to increase the disorganization of motor responses. These practices are intended to stabilize the psycho-physiological mechanism so that there is less and less tendency towards an imbalance in face of external and internal stimuli.

Sahu, R.J. and Gharote, M.L. (1984) conducted the experiment of psychomotor performance on 17 males and 11 females undergoing training course in yoga. Test was administered before and after yoga training programme. The subjects were required to place 100 pins one after another in 100 holes. It was clear from the t-test value that there was improvement in dexterity of both male and female. According to Sahu, R.J. and Bhole, M.V. (1983) various yoga training programmes are intended to release psycho physiological tensions and develop a state of relaxed behavior in the individual, with this background; an individual can have better performance involving speed and accuracy. Paranjape, S.D. and Bhole, M.V. (1979) conducted a study to examine the effect of yogic training on resting neuro-muscular activity. Gore, M.M. (1987) also supported the same findings when he conducted a study to examine the effect of yogic training on neuro-muscular efficiency in normal and stressful conditions. Sahu, R.J. and Gharote, M.L. (1985) observed that yogic training for short duration brings about significant improvement on the perception of depth and distance.

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METHODOLOGY

Present study is a pretest posttest control group design intended to see the effect of yoga therapy on increasing hand steadiness among children with intellectual disability. Present study was conducted in the Government Rehabilitation Institute for Intellectual Disabilities (GRIID), sector – 31, Chandigarh with the prior permission of the administrator and the informed consent of the parents and students on prescribed performa. Researcher had selected the samples from the school of GRIID with formal consent of administrator. Students attending GRIID with condition of ID duly certified by the authorities were selected for the present study. Researcher had selected the 40 students initially for the present study with the age range from 12 to 18 years having fine motor deficits and assessed on the hand steadiness test. On the bases of average means scores of errors (+/- 10 to average mean scores) of students, 20 students were selected for the present study. Although comorbid condition of epilepsy and ASD was excluded from the present study. Then researcher assigned the 10 equal students randomly through lottery system to both the groups.

Tool:

Hand steadiness was tested using the simple apparatus conventionally employed (Hunt, 1936; Munn, 1946), which was fabricated by Anand Agencies, Pune, India. This apparatus consists of a metal plate in which are nine holes of graded diameters (the largest diameter being 12.5 mm and the smallest 2 mm). A metal stylus is connected to the plate in series, with a counter which is activated whenever the stylus makes contact with the metal plate. The subject is instructed to insert about 2 cm of the metal stylus in each hole, keeping his arm extended without support, and then maintain the stylus in the hole for 15 sec. without allowing the stylus to make contact with the side of the hole. Then the stylus is withdrawn also without making contact with the sides. Subjects began the testing procedure with the largest hole first and then proceeded to the smallest one. The numbers of accidental contacts which the metal stylus made with the metal plate were registered on the electronic counter as the number of errors.

Procedure:

In the present study researcher will select 20 students with ID from Regional Institute for Mentally Handicapped with informed consent of administrator and parents and randomly assign them to the both groups equally. Researcher will make arrangements to conduct the experiment in the yoga room and arrange necessary requirements for the experiment. Then researcher conducted the pretest on both the groups and start experiment on the experimental group. No treatment will be given to the control group. Researcher will give treatment to experimental group for 45 minutes daily, five days in a week regularly for three months and posttest will be conducted. Then researcher will enter the score of both groups in tabular form for the further analysis to make inferences from the data by using appropriate statistical package.

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RESULTS

Table 1: Comparisons of Pre and Post Scores on Performance Hand Steady Test of the Subjects of Control Group – Results of Paired T-Test (Within Group):

Control Group		N	Mean	Std. Deviation	t-value, df & p-value
Within Group	Pre test 12.5	10	92.40	10.87	't'=.591, df=9, p<0.01
	Post test 12.5	10	92.90	10.74	
	Pre test 8.00	10	111.20	4.89	t'=7.42, df=9, p<0.01
	Post test 8.00	10	106.50	4.85	

Table 1 depict that pretest and posttest errors mean scores on hand steadiness test of the control group in 12.5 mm hole are 92.40 and 92.90 respectively and pretest and posttest mean scores of the control group in 8.0 mm hole are 111.20 and 106.50 respectively. It shows that there is very low difference in reductions in the errors on hand steadiness test. It also indicate that $p > .05$ in means scores of errors on hand steadiness test in 12.5 mm hole which shows that there is no significant difference in the pre and post test scores in 12.5mm hole, but in the 8.0 mm hole, $p < .05$ hence it indicate that there is a significant difference in the mean scores of errors in the 8.0 mm hole.

Table 2: Comparisons of Pre and Post Scores on Performance Hand Steady Test of the Subjects of Experimental Group – Results of Paired T-Test (Within Group):

Experimental Group		N	Mean	Std. Deviation	t-value, df& p-value
Within Group	Pre test 12.5	10	92.20	2.48	't'=11.782, df=9, p<0.01
	Post test 12.5	10	78.10	3.24	
	Pre test 8.00	10	111.00	3.77	t'=10.547, df=9, p<0.01
	Post test 8.00	10	88.00	7.61	

Table 2 depict that pretest and posttest errors mean scores of the experimental group on hand steadiness test in 12.5 mm hole are 92.20 and 78.10 respectively and pretest and posttest mean scores of the experimental group in 8.0 mm hole 111.00 and 88.00 respectively. It shows that there is difference in reductions in the errors on hand steadiness test. It also indicate that $p < .05$ in mean scores of errors on hand steadiness test in 12.5 mm hole which shows that there is significant difference in the pre and post test scores in 12.5mm hole and in the 8.0 mm hole, $p < .05$ hence it indicate that there is also significant difference in the mean scores of errors in the 8.0 mm hole.

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Table 3: Comparisons of Post mean Scores on Performance Hand Steady Test of the Subjects of Control Group V/s Experimental Group – Results of Paired T-Test (Between Group):

Control Group v/s Experimental Group	N	Mean	Std. Deviation	t-value, df & p-value	
Between Group	Post test (C) 12.5	10	92.90	10.74	't'=3.845, df=9, p<0.01
	Post test (E) 12.5	10	78.10	3.24	
	Post test (C) 8.00	10	106.50	4.85	t' = 6.432, df=9, p<0.01
	Post test (E) 8.00	10	88.00	7.61	

Table 3 depict that pretest and posttest errors mean scores on hand steadiness test of between the groups in 12.5 mm hole are 92.90 and 78.10 respectively and pretest and posttest mean scores of both the groups in 8.0 mm hole are 106.50 and 88.00 respectively. It shows that there is high difference in reductions in the errors of experimental group and control group on hand steadiness test. It also indicate that $p < .05$ in 12.5 mm hole which shows that there is significant difference in the pre and post test scores in 12.5mm hole, but in the 8 mm hole, $p < .05$ hence it indicate that there is a significant difference in the mean scores of errors in the 8 mm hole.

DISCUSSION

In the present study researcher given the adaptive yoga therapy to samples of experimental group regularly for three months and results recorded and analyzed. Researcher found that study showed a positive effect on the hand steadiness of children with intellectual disability. In the analysis of objectives researchers found that children commit less errors on hand steadiness test at 12.5 mm and 8.00 mm hole, which are exposed to the yogic intervention in comparison to the control group with t value 10.547 and 11.782 respectively. Although control group does not show any effect on the scores of errors on the hand steadiness test. In this regard a milestone study on steadiness and psychomotor co-ordination was conducted by Kocher, H.C. (1974) with a view to evaluate the effect of yoga exercises on steadiness as claimed as well as to examine the influence of these practices on psycho-motor co-ordination, and the relationship between steadiness and co-ordination. Another study which was conducted by Pratap, V. (1968) also supports the view that yoga practices increase steadiness in children. Paranjape, S.D. and Bhole, M.V. (1979) conducted a study to examine the effect of yogic training on resting neuro-muscular activity. Gore, M.M. (1987) also supported the same findings when he conducted a study to examine the effect of yogic training on neuro-muscular efficiency in normal and stressful conditions. Although sample size in the study was small so there is a limitation of the generalization. But in future it can be replicate on more samples for its generalization.

IMPLICATIONS

The present study is very useful for the professionals and parents working for the rehabilitation and physical growth and stability of the body of their children. It is also support the existing knowledge of the field related to effect of yoga on motor function of human body. This study

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explains the importance of adaptive yoga for the development of hand steadiness among children with intellectual disabilities. In the light of existing literature and present study it is concluded that adaptive yoga therapy is very useful for the physical-motor development among persons with intellectual disability as well as physical disability.

Acknowledgments

The author appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interests

The author declared no conflict of interests.

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How to cite this article: Sharma M, Kumar S, Chavan B (2016), Effect of Adaptive Yoga Therapy in Increasing Hand Steadiness among Children with Intellectual Disability, *International Journal of Indian Psychology*, Volume 4, Issue 1, No. 83, ISSN:2348-5396 (e), ISSN:2349-3429 (p), DIP:18.01.162/20160401, ISBN:978-1-365-64761-1