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Effect of Yoga Practice on Motor Function among Children with Hearing Impairment

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ARTICLE DETAILS

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ABSTRACT

Children with disabilities like hearing impairment often show disorders at motor development as well as coordination. In view of this, the present investigation was carried out to determine whether yoga practices can be a potentially helpful tool to improve motor abilities of disabled children. For this study, a total of fifty physically disabled children were divided into two groups first being the control group and the other being experimental group. Children belonging to both experimental and control group were assessed at the start of the study i.e. on the first day and after 12 weeks of the yoga intervention. The yoga practices focussed on the reaction ability, agility and balance related asanas. Only the children belonging to experimental group were subjected to training of yoga practices, for 1 hr each day for a total period of 12 weeks. The within group comparison results showed that there is statistically significant ($p<0.05$) improvement in neuromuscular coordination, eye hand coordination, agility, and balance in subjects of experimental or yoga group however no such change was observed in control group. Hence, it is clear from the study that regular yoga practice can be used as an effective method for improving motor abilities of physically disabled children.

1. Introduction

It is widely known and accepted the world over that the practice of yoga is beneficial for improving general health of an individual. However, largely, the knowledge is of qualitative type and to become a regular physical fitness improvement, one needs a more in-depth understanding of such effects. The practice of yoga has its origins in ancient Indian philosophy, however, presently, there are many modern schools of yoga (i.e., Iyengar, Viniyoga, Sivananda, etc.), each having its own distinct emphasis regarding the relative content of physical postures and exercises (asanas), breathing techniques (pranayama), deep relaxation, and meditation practices that cultivate awareness and ultimately more profound states of consciousness.

Moreover, the application of yoga as a means of therapeutic intervention has also been tried in India as well as abroad. Yoga has been beneficial to the people without disabilities; however, there is very little knowledge about its utility in the physically challenged people. The various yogasanas may increase the practicer's physical flexibility, coordination, and strength, while the breathing practices and meditation may calm and focus the mind to develop greater awareness and decrease anxiety, and thereby resulting in better quality of life. In spite of a growing body of clinical research studies on the therapeutic effects of yoga, there is still a lack of concrete evidence regarding its relevance for improving the physical fitness of the physically challenged children like those with hearing impairment. In this study, we summarize the results of a focussed investigation on the effects of yoga practice on various components of motor development in the physically challenged children.

2. Research Methodology

2.1 Selection of the Subjects

The subjects selected in this study were children attending school for physically disabled individuals situated in Nagpur, Maharashtra. The subjects were selected with respect to their disability type i.e. only the children with hearing impairment were selected. Subject's age varied from 12 to 15 years.

2.2 Research design

In this study, quasi experimental pre-post design was used for conducting this research study.

2.3 Sample size and Sample selection

For this study a sample size of 50 was considered appropriate as this is an experimental study. The purposive sample was randomly assigned into experimental group (n=25) and control (n=25) group by lottery method for random selection.

2.4 Experimental procedures

Subjects belonging to both experimental and control groups were assessed on the first day and after 12 weeks of the yoga practice. The subjects of experimental group then subjected to a training of yoga practices, under the supervision of a yoga expert. Each day the subjects were engaged in practicing yoga asanas for 1 hr in the evening for a total period of 12 weeks. The control group did not undergo any yoga training during this period. The yoga training consisted of Asana, Pranayama, and Meditation. All practices were introduced in a slow and progressive manner. The experimental group practiced Yoga asanas (postures) and Pranayama (breathing techniques). Standing asana included Ardha Chakrasana, Padahastasana, Trikonasana and Tadasana. The sitting position asana were Vajrasana, Janu Shirasana, Ushtrasana and Vakrasana. The breathing exercises for experimental group participants were Bhastrika, dirgha swasana, and Bhramari pranayama.

2.5 Methods used for assessment

The neuromuscular co-ordination was assessed using wave pass test, in which handball and goalpost was needed.

Three players were required for this test. The performer of the test would stand between two players. The performer passed the ball towards the player in right and then again he collected the ball from him and passed to the player at his left, this action continued for 30sec. During this period the researcher counted the number of accurate passes only, which formed the score of the subject. To measure the hand reaction time of the subjects, ruler drop test was used. The subjects were asked to undergo shuttle run test so that their agility could be determined. Modified Bass Test of Dynamic Balance was used to determine the dynamic balance of the subjects.

2.6 Statistical analysis

Standard methods were followed for the data extraction for each of the variables. Data analysis was done using SPSS ver. 18.0 (SPSS Inc., Chicago, IL, USA). Data was analyzed using paired *t*-tests, independent *t*-test and descriptive statistical method. The significance level was chosen to be 0.05.

3. Results and Discussion

The purpose of this study was to determine the impact of yoga practices on the physical fitness of the physically challenged children, hence, only the data pertaining to experimental group has been presented as the control group students did not show any substantial change in their physical fitness and coordination.

3.1 Neuromuscular Coordination

Table No. 1: Neuromuscular Coordination of children having hearing impairment

Group of subjects	Mean	±SD	Min.	Max.	M.D.	't'	P
Before yogic training	4	±2	2	7	4	3.394	<0.05
After yogic training	8	±2	5	10			

SD: Standard Deviation; **MD:** Mean Difference

Table 1 shows results of comparative assessment of neuromuscular coordination of children of the study area having hearing impairment. Results indicated that before yoga training children have average pass accuracy of 4±2 passes whereas after getting yoga training there average pass accuracy improved to 8±2 passes.

3.2 Hand Reaction Time

Table No. 2: Hand Reaction Time of children having hearing impairment

Group of subjects	Mean	±SD	Min.	Max.	M.D.	't'	P
Before yogic training	3.4	±1.3	2.9	4.4	1.9	3.227	<0.05
After yogic training	1.5	±0.5	1.1	3.2			

SD: Standard Deviation; **MD:** Mean Difference

Table 2 shows results of comparative assessment of hand reaction time of children of the study area having hearing impairment. Results indicated that before yoga training children have average hand reaction time 3.4±1.3 sec, whereas after getting yoga training there average hand reaction time was 15.3±2.5 sec.

3.3 Agility

Group of subjects	Mean	±SD	Min.	Max.	M.D.	't'	P
Before yogic training	8.2	±1.3	6.9	9.4	1.1	2.954	<0.05
After yogic training	7.1	±1.8	6.1	8.3			

SD: Standard Deviation; **MD:** Mean Difference

Table 3 shows results of comparative assessment of agility of children of the study area having hearing impairment. Results indicated that before yoga training children needed average 8.2±1.3 sec, whereas after getting yoga training there average time needed to complete the test was 7.1±1.8 sec.

3.4 Balance ability

Group of subjects	Mean	±SD	Min.	Max.	M.D.	't'	P
Before yogic training	4.2	±1.5	3.1	6.3	4.2	2.879	<0.05
After yogic training	8.4	±1.2	6.8	10.2			

SD: Standard Deviation; **MD:** Mean Difference

Table 4 shows results of comparative assessment of balance ability of children of the study area having hearing impairment. Results indicated that before yoga training children indicated successful performance by holding a static position on each tape mark for less than five seconds to be specific 4.2±1.5 sec without exposing the tape mark. However, after getting yoga training could remain static for more than 5 sec to be specific 8.4±1.2 sec thereby indicating improved balance.

4. Conclusions

4.1 Neuromuscular Coordination

- From the statistical analysis of the data it is concluded that there is positive impact of yoga training on neuromuscular coordination of the children having hearing impairment.

4.2 Hand Reaction Time

- From the statistical analysis of the data it is concluded that there is positive impact of yoga training on hand reaction time of the children having hearing impairment.

4.3 Shuttle Run

- From the statistical analysis of the data it is concluded that there is positive impact of yoga training on agility of the children having hearing impairment.

4.4 Balance Ability

- From the statistical analysis of the data it is concluded that there is positive impact of yoga training on balance ability of the children having hearing impairment.

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