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Effect of 12 weeks physical exercise training program on speed and agility of deaf and dumb children: A randomized controlled trail

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Abstract

This study aimed to examine the effects of 12-weeks physical exercise training program on speed and agility of deaf and dumb children. Sixty deaf and dumb children were randomly selected from the Sri Sachha muk and the Bhadir educational institute Bahadurgarh Haryana. Students ranged in age from 11 to 18 years. The children were randomly selected into two groups: experimental group (N = 30) and control group (N = 30). The experimental group was selected for the Physical Exercise Training Program for twelve weeks for five day a week and the control group continued their regular school activity. To compare the difference between the pre and posttest of deaf and dumb students on speed and agility 't' test was used and the significance level was set at 0.05. A significant difference was found between pre and post test results on speed and agility motor fitness factor variables. The results of the present study supported the fact that 12 weeks physical exercise training program brings significant improvements in various speed and agility of deaf and dumb children. In the control group no significant difference between the pre-and post-test on speed and agility was observed. The present study will be useful for children with special abilities to develop their overall personality.

Keywords: Speed, agility, deaf and dumb children

Introduction

Children with disabilities are deprived from the participation in physical activities, which further affects their educational, physical and mental development. In the present times, attention has been paid to people with disabilities, recognizing that physical education can make a major contribution to this special population. Physical activity has a unique contribution to children for their physical, mental, emotional and social development. Curricular activities such as sports and games, and other leisure activities are extremely important for the holistic development of children. In the present scenario persistent educational development with systematic physical activities for disabled people are essential requirements for their development (Kane, 1972) [2].

For instance, the suffering of disable children especially deaf and dumb are very vulnerable, they are continuously facing physical, emotional and psychological challenges from themselves as well as from the society. Various means and methods are being adopted in the society to minimize their sufferings. The field of Adapted Physical Education is continuously striving hard to minimize the sufferings of deaf and dumb through motor educability program. People having problem of hearing can be categorized like, Person with hard hearing: Is one who, generally with the use of a hearing aid, becomes enabled to successfully process the linguistic information through an audition. (Report of the Ad Hoc Committee to Define Deaf and Hard of Hearing, 1975). The cases included in this category are those who have hearing loss of more than two decibels in the better ear (profound) or loss of hearing in both ears.

Children born deaf or who became deaf before the ages of two: It is the most affected population of deaf. Due to lack of timely treatment and experts help, these children later on become dumb. More than 5% of the world's population means approximately 466 million people are affected with hearing loss (432 million adults and 34 million children). It is estimated by 2050 more than 900 million people or one in every ten people will have hearing loss. Most people with hearing loss disabilities live in low and middle income group countries

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(WHO, 2020).

The National Education and Disability Act (1995) strongly recommended the provision of equal opportunities for children with special needs. Education also means equal access to physical education, sport, and leisure activities. It is a general feeling that these children are unable to participate in all these activities to the extent that normal norms require. So they are mainly deprived of these activities. These children are children first and then disabled. They have all the enthusiasm for participating in educational activities inside and outside the classroom. ‘Sound Mind in Sound Body’ (Plato). A healthy body has a healthy soul and should, therefore, provide physical activity and health education as well as sports and leisure facilities to every child irrespective of his/her physical and mental level for their growth and development (NEDA, 1995).

The physical education program under adapted physical

education is very specific and varied. In the present study, we investigated the effect 12 weeks Physical Exercise Training Program for the development of speed and agility among deaf and dumb children.

Methods and Procedures

Sixty male subjects between the age group of 11-18 years were randomly selected as subjects from Shri Sachcha Muk and Badhir Educational Institute, Bahadurgarh (Haryana) residential school. After that, the selected subjects were divided into two equal groups of 30 subjects each i.e. control group and experimental group as shown in figure 3.1. The experimental group was treated with Physical Exercise Training Program for twelve weeks for five days in a week and the control group continued their regular school activity and they were not involve in any type of physical exercise activities.

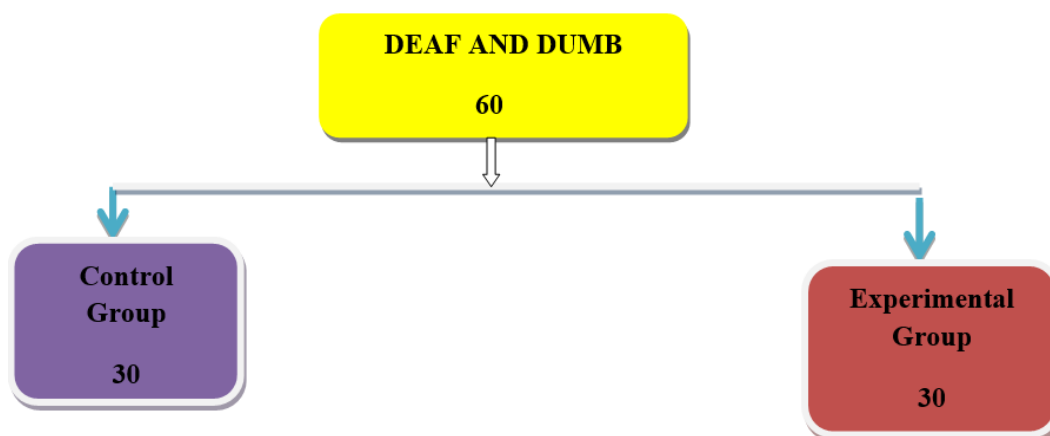


Fig 1: Flow chart of the study participants.

Variables

Independent variable

12 Week Physical Exercise Training Program

Dependent Variable

- Speed
- Agility

Selection of tests and criterion measures

The table 1 shows tests used for measuring the speed and agility of deaf and dumb students.

Table 1: Tests used for measuring speed and agility

Variables	Test/tools administrated	Unit of measurement
Speed	50 meters Dash	Seconds
Agility	Shuttle run	Seconds

Table-2 shows the 12 Weeks Physical Exercise Training Program used on the experimental group. Principle of overload applied as per the individual differences whereas intensity, volume, type, and execution of practice were at the discretion of the students. The scholar provided a proper demonstration of practice. Appropriate rest given after each exercise, and the repeated workload increased after every two weeks. The warm-up exercise was conducted for the first ten minutes before the Physical Exercise Program of 45 minutes given to subjects and cooling-down exercise for the at least ten minutes was also given. The Physical Exercise Training Program was held 6:30 to 7:15 and in the morning session at Shri Saccha Mukh and Bhadir Educational Institute, Bahadurgarh under the supervision of the researcher and specialized mentors.

Table 2: Structural Description of 12 Weeks Physical Exercise Training Program

Week 1&2					
Physical exercise	Intensity	Set	Repetition Times	Rest in between repetition	Rest In between set
60-meter dash run	55%	3	2	60 sec	90 sec
Standing broad jump	55%	3	2	60 sec	90 sec
Alternating toe touch	55%	3	2	60 sec	90 sec
Knee-high	55%	3	2	60 sec	90 sec
Stair runs	55%	3	2	60 sec	90 sec
Jumping jacks	55%	3	2	60 sec	90 sec
Squat jump	55%	3	2	60 sec	90 sec
Forward bending	55%	3	2	60 sec	90 sec
Bent knee sit-ups	55%	3	2	60 sec	90 sec
Shuttle run	55%	3	2	60 sec	90 sec

Zigzag run	55%	3	2	60 sec	90 sec
Week 3&4					
Physical exercise	Intensity	Set	Repetition	Rest In between Repetition	Rest In between set
60-meter dash run	60%	2	3	60 sec	90 sec
Standing broad jump	60%	2	3	60 sec	90 sec
Alternating toe touch	60%	2	3	60 sec	90 sec
Knee-high	60%	2	3	60 sec	90 sec
Stair runs	60%	2	3	60 sec	90 sec
Jumping jacks	60%	2	3	60 sec	90 sec
Squat jump	60%	2	3	60 sec	90 sec
Forward bending	60%	2	3	60 sec	90 sec
Bent knee sit-ups	60%	2	3	60 sec	90 sec
Shuttle run	60%	2	3	60 sec	90 sec
Zigzag run	60%	2	3	60 sec	90 sec

Week 7&8					
Physical exercise	Intensity	Set	Repetition	Rest in between Repetition	Rest in between set
60-meter dash run	70%	4	5	60 sec	110 sec.
Standing broad jump	70%	4	5	60 sec	110 sec.
Alternating toe touch	70%	4	5	60 sec	110 sec.
Knee-high	70%	4	5	60 sec	110 sec.
Stair runs	70%	4	5	60 sec	110 sec.
Jumping jacks	70%	4	5	60 sec	110 sec.
Squat jump	70%	4	5	60 sec	110 sec.
Forward bending	70%	4	5	60 sec	110 sec.
Bent knee sit-ups	70%	4	5	60 sec	110 sec.
Shuttle run	70%	4	5	60 sec	110 sec.
Zigzag run	70%	4	5	60 sec	110 sec.

Week 9&10					
Physical exercise	Intensity	Set	Repetition	Rest in between repetition	Rest In between set
60-meter dash run	75%	3	6	60 sec	90 sec.
Standing broad jump	75%	3	6	60 sec	90 sec.
Alternating toe touch	75%	3	6	60 sec	90 sec.
Knee-high	75%	3	6	60 sec	90 sec.
Stair runs	75%	3	6	60 sec	90 sec.
Jumping jacks	75%	3	6	60 sec	90 sec.
Squat jump	75%	3	6	60 sec	90 sec.
Forward bending	75%	3	6	60 sec	90 sec.
Bent knee sit-ups	75%	3	6	60 sec	90 sec.
Shuttle run	75%	3	6	60 sec	90 sec.
Zigzag run	75%	3	6	60 sec	90 sec.

Week 11&12					
Physical exercise	Intensity	Set	Repetition	Rest in between repetition	Rest In between set
60-meter dash run	80%	3	2	60 sec	100 sec.
Standing broad jump	80%	3	2	60 sec	100 sec.
Alternating toe touch	80%	3	2	60 sec	100 sec.
Knee-high	80%	3	2	60 sec	100 sec.
Stair runs	80%	3	2	60 sec	100 sec.
Jumping jacks	80%	3	2	60 sec	100 sec.
Squat jump	80%	3	2	60 sec	100 sec.
Forward bending	80%	3	2	60 sec	100 sec.
Bent knee sit-ups	80%	3	2	60 sec	100 sec.
Shuttle run	80%	3	2	60 sec	100 sec.
Zigzag run	80%	3	2	60 sec	100 sec.

Statistical Analysis

For the analysis of the collected data, paired t test was used to check the significance of difference in mean scores on speed and agility after post 12 weeks physical exercise training program intervention. The data was statistically treated through student "t" test to find out the pre and posttest mean difference among controlled and experimental groups. The level of significance was set at 0.05.

Results

The baseline characteristics of the deaf and dumb subjects

were shown on Table 3. The result shown in Table 4 shows that in the control group, no significant changes were found on speed and agility of deaf and dumb student's motor ability variables namely speed and agility, with p-value 0.722 and 0.621 respectively. On the other hand, experimental group shows significant improvements in their speed and agility i.e. speed (p=0.0001) and agility (p=0.010) after 12 weeks of physical exercise training program as shown in table 6.

The results of the present study show that after 12 weeks physical exercise training program the significant improvements found on speed and agility of deaf and dumb children.

Table 3: Baseline characteristics of the study participants

Characteristics	Experimental Group N=30 Mean \pm SD	Control group N=30 Mean \pm SD
Speed	9.153 \pm 1.474	8.770 \pm 1.315
Agility	12.739 \pm 1.202	12.599 \pm 1.183

Table 4: Pre and Posttest comparison on speed and agility of control group (Deaf and Dumb children)

Variables	Particulars	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t-value	p-value
Speed	Pre	30	8.770	1.315	0.240	0.007	.360	.722
	Post	30	8.777	1.310	0.239			
Agility	Pre	30	12.599	1.183	0.216	0.008	.499	0.621
	Post	30	12.607	1.191	0.218			

Table 5: Pre and posttest comparison on Speed and Agility of experimental group (Deaf and Dumb children)

Variables	Particulars	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t-value	p-value
Speed	Pre	30	9.153	1.474	0.269	.490	7.184	.0001
	Post	30	8.663	1.639	0.299			
Agility	Pre	30	12.739	1.202	0.219	.392	2.753	.010
	Post	30	12.347	1.121	0.205			

Discussion

The result presented in table- 4 shows that deaf and dumb children in control group shows no significant mean difference between pre and post test results on speed and agility. The possible reason behind the non-significant results in the control group due to the absence of Physical exercise training in the control group and they followed their daily routine. Numerous studies also show the consistent result with our study where no significant changes were found in the control group due to lack of any training program. (Kim and Park, 2006; Krishnan, 1991; Ghosh, S.S. 2014 and Colak.T.*et al.*, 2004) [8, 7].

Interestingly the result presented in table -5 related to experimental group shows the significant improvement on speed and agility after 12 weeks of physical exercise training program in deaf and dumb children. The results of the present study demonstrated that the physical exercises training program contributes to the improvement of speed and agility of an individual. Significant improvement in deaf and dumb children of experimental group in their speed ability was due to conditioning of their muscles and improvement in the Neuro-muscular coordination which ultimately helps in improving reaction time, decrease reflex action time, improvement in the movement speed and acceleration ability. Consistent results were also seen on the speed improvement in the study carried out by Leshkevitch. *et al.* (1989) and Reethammal (1994).

Moreover, in case of deaf and dumb there is a chance of less kinesthetic sense as compare to normal children. However, continuous exposure to physical exercise training, deaf and dumb children able to improve their speed, agility as well as neuromuscular coordination with improvement in their kinesthetic sense. The present study also shows significant improvements in agility and it is well documented in the previous published literature (Ghosh, S.S., 2014; Milne, 1971) [7, 10], (Dhadwal and Singh, 2015 and Dinucci *et al.*, 1977) [6].

Conclusion

The results of the present study supported the fact that 12 weeks physical exercise training programme brings significant improvements on speed and agility of deaf and dumb children. The positive impact of physical exercise training programme also helps in bringing overall development in the deaf and dumb children. Moreover, the present study will be useful for children with special abilities

to develop their overall personality.

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