



ISSN: 2456-4419

Impact Factor: (RJIF): 5.18

Yoga 2019; 4(2): 285-288

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www.theyogicjournal.com

Received: 02-05-2019

Accepted: 06-06-2019

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Twelve weeks physical exercise training program improves explosive strength and flexibility in deaf and dumb children

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Abstract

The purpose of the present study was to investigate the effects of 12-weeks Physical Exercise Training Program on explosive strength and flexibility of the deaf and dumb children. Sixty deaf and dumb students between the age ranges of 11-18 years were selected for the study from the Sri Sachha Muk and Bhadir Educational Institute, Bahadurgarh, Haryana. The chosen subjects were further randomly divided into two equivalent groups i.e. experimental group (N=30) and control group (N=30). Physical Exercise Training Program was administered on experimental group for 12 weeks (five days a week), whereas control group followed their daily school routine activity. To check the difference between the pretest and posttest of deaf and dumb students on explosive strength and flexibility student paired 't' test was used and the significance level was set at ≤ 0.05 . The result of the study revealed that experimental group shows significant improvements on explosive strength and flexibility of the deaf and dumb students after 12 weeks of Physical Exercise Training Program. However, no significant changes were observed in case of control group on explosive strength and flexibility. The result of the present study demonstrated that physical exercise training program have significant potential to develop various motor ability components among deaf and dumb students.

Keywords: Explosive strength, flexibility, deaf and dumb children

Introduction

In the contemporary era, the problem and sufferings of special able children are very prominent. Particularly, deaf and dumb children are persistently confronting various types of challenges such as physical, emotional and psychological from the society as well as from themselves. 'Deaf and dumb' is considered as the most common kind of disability. Deafness is a condition in which the person not able to hear the words or sounds which eventually leads them to the dumbness (Ghosh and Banerjee, 2015) [5]. Often, due to lack of one sense or another, they are cut off from the sounds around them where a feeling of isolation, frustration and depression disturbs them all the time.

In the recent years, several methods and approaches has been used to improve the condition of the special population. Ironically, these efforts will be only successful if they become the important or productive part of the society. Specially able individuals need constant motivation and encouragement from the society to excel in their potentials. Moreover, by continuous efforts and struggle they want to cross the hurdle of disability, to become the role model for society (Henry Webb, 1981) [6]. Furthermore, The National Education and Disability Act (1995) suggested the provision of equivalent opportunities for special children along with equal access to Physical Education, Sport, and Leisure Activities.

Adapted Physical Education (APE), which is a sub discipline of physical education also organize various motor educability programs for the deaf and dumb children. APE provides safe and satisfying environment for various activities for the disable children (Block, 2016) [1]. The Adapted Physical Educationists are constantly working towards the betterment of the special children by providing them different physical education programs or exposure. Sadly, there is lacunae of efforts has been made in our country to combine specially designed

physical education curriculum into the present education system. Therefore, persistent educational developments with systematic physical activities are basic requirement for the development of the individuals with disabilities (Kane, 1972) [7]. In the present study, we investigated the effect of 12 Weeks Physical Exercise Training Program for the development of Explosive Strength and Flexibility among deaf and dumb children.

Method and Procedures

Sixty deaf and dumb male subjects (age range 11-18 years) were randomly selected from Shri Saccha Muk and Badhir Educational Institute, Bahadurgarh (Haryana) residential school. The selected subjects were further equally bifurcated into two groups. control group (N=30) and experimental group (N=30) as shown in figure 1. The assessments for

explosive strength and flexibility were taken at pretest (zero day) and posttest (After just completion of 12 weeks). 12 weeks physical exercise training program (five days per week) was administered on experimental group whereas control group followed their daily school routine activities. The duration of Physical Exercise Training Program was of 45 minutes apart from warming up and cooling down.

Variables

Independent variable

Twelve Weeks Physical Exercise Training Program

Dependent Variable

- Explosive strength
- Flexibility

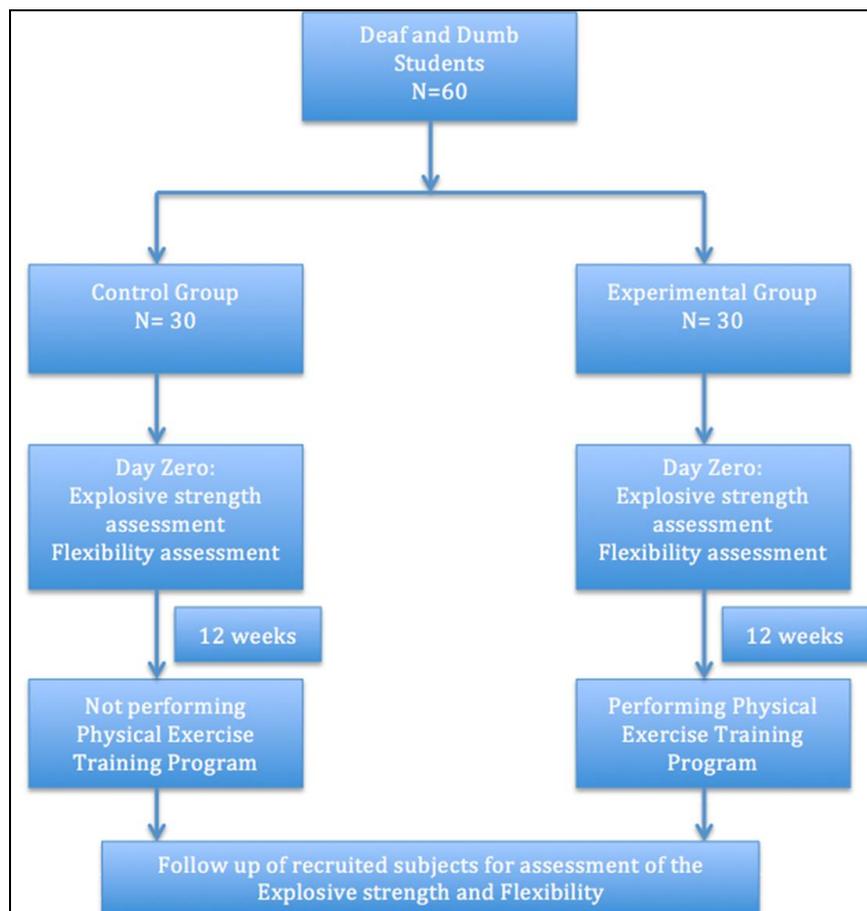


Fig 1: Flow chart of the study participants

Selection of tests and criterion measures

The table 1 shows tests used for measuring the explosive strength and flexibility of deaf and dumb students.

Table 1: Tests used for measuring Explosive Strength and Flexibility.

Variables	Test/tools administrated	Unit of measurement
Explosive strength	Vertical jump	Centimeters
Flexibility	Sit and reach	Centimeters

The twelve weeks Physical Exercise Training Program was implemented on the experimental group. The detailed 12 weeks exercise-training program was published elsewhere (Kumar *et al.* 2019). The principal of overload was administered according to the individual differences. However, intensity and volume of the practice were according

to the preference of the subjects. The workload was gradually increased after every two weeks of the physical exercise training program. The proper rest was also given to the subjects after each exercise. The warm up and cooling down exercises was given for 10 minutes before and after the physical exercise-training program respectively. The Physical Exercise Training Program was administered on experimental group for 45 minutes in the morning (6:30am to 7:15am) at Shri Saccha Muk and Bhadir Educational Institute, Bahadurgarh, Haryana. The Physical Exercise-Training Program was given by the researchers under the supervision of specialized mentors.

Statistical Analysis

The paired student 't' test was used to check the significance of the difference in mean scores of explosive strength and

flexibility of deaf and dumb students at pretest (Zero day) and posttest (Just after completion of twelve weeks) in both the control and experimental group. The level of significance was set at ≤ 0.05 .

Results

Table 2 shows the baseline characteristics of the deaf and dumb subjects. The control group demonstrated no significant changes after 12 weeks on explosive strength ($p=0.54$) and flexibility ($p=0.058$) of the deaf and dumb students as shown in table 3. Interestingly, results presented in table 4

demonstrated that experimental group shows significant changes in explosive strength ($p=0.004$) and flexibility ($p=0.0001$) of the deaf and dumb students after 12 weeks of Physical Exercise-Training Program.

Table 2: Baseline characteristics of the study participants

Characteristics	Experimental group N=30	Control group N=30
	Mean \pm SD	Mean \pm SD
Explosive strength	38.767 \pm 9.630	38.833 \pm 8.591
Flexibility	13.200 \pm 3.408	10.567 \pm 3.401

Table 3: Pre and Posttest comparison on Explosive strength and Flexibility of Control group (Deaf and Dumb children)

Variables	Test Condition	N	Mean	SD	SEM	Mean Difference	t-value	p-value
Explosive strength	Pre	30	38.333	8.591	1.568	0.367	2.009	0.54
	Post	30	38.467	8.472	1.547			
Flexibility	Pre	30	11.333	3.986	0.728	0.267	1.975	0.058
	Post	30	11.067	3.903	0.713			

Data expressed in Mean, SD, and statistical significance; SD-Standard Deviation, SEM-Standard Error Mean; within study groups, Test statistics t-test.

Table 4: Pre and posttest comparison on Explosive strength and Flexibility of Experimental Group (Deaf and Dumb children)

Variables	Test Condition	N	Mean	SD	SEM	Mean Difference	t-value	p-value
Explosive strength	Pre	30	38.767	9.630	1.758	2.267	3.111	0.004
	Post	30	41.033	9.423	1.720			
Flexibility	Pre	30	10.567	3.401	0.621	2.633	7.655	0.0001
	Post	30	13.200	3.408	0.622			

Data expressed in Mean, SD, and statistical significance ($p=0.004^{**}$, $p=0.0001^{***}$) SD-Standard Deviation, SEM-Standard Error Mean; within study groups, Test statistics t-test.

Discussion

The result of the study revealed that, twelve Weeks of Physical Exercise Training Program shows promising results in developing Explosive Strength and Flexibility among deaf and dumb students. The result postulated in table-4 revealed that experimental group shows significant improvements in Explosive Strength and Flexibility after practical exposure/practice with 12 Weeks Physical Exercise-Training Program to the deaf and dumb students. The possible reason behind the obtained results of the present study is may be due to the facts that explosive strength mainly depends upon the muscular power, muscle tone, neuromuscular coordination, conditioning of the fast twitch fibers and intermediate fibers of the individual, which are supposed to improve through specialized explosive physical fitness program. Moreover, the Physical Exercise Training Program comprises of various fundamental motor ability components i.e. speed, explosive strength, dynamic flexibility and agility, which further result into improvements in explosive strength. The result of the present study supported by the various studies also where explosive strength and its associated components improved after administering different types of physical fitness programs on special population (Busko, *et al.* 2020 and Krystyna, *et al.* 2006).

Similarly, experimental group also shows significant increase in the flexibility of the deaf and dumb students after performing/practicing Physical Exercise-Training Program of 12 weeks. Furthermore, Physical exercise Training Program consist of practices like bent knee sit ups, forward and back bending, and alternating toe touch which shows the positive results on the elasticity of muscles, ligaments and tendons and bring the improvement in flexibility. The obtained result of our study was also well documented in the previous researches. (Ghosh, 2014) ^[4] (Kim and Park, 2006) ^[8]. In contrast, control group shows non-significant results on both

the selected motor ability variables i.e. explosive strength and flexibility that is might be due to the fact that control group follow their daily routine activities and they didn't perform the any kind of physical activity.

Conclusion

The result of the present study demonstrated that twelve Weeks Physical Exercise-training Program shows beneficial and significant changes in explosive strength and flexibility of the deaf and dumb students, whereas no changes were observe in case of control group. The favorable impact of physical exercise training program helps in physical, mental, social and emotional development of the deaf and dumb students, which further motivate them to meet the challenges of life in an efficient manner. Moreover, this type of physical fitness program has the potential to boost the level of confidence in deaf and dumb students, which can further elucidate by another study.

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