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The Effect of Brain Gym Exercises on Self- Esteem and Sensory Processing Speed on High School Hearing Impaired Students

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ABSTRACT

Sensory integration is one of the most important types of sensory processing which requires left and right hemispheric coordination. It is a challenge especially in the case of differently-abled children. One way to help differently-abled students achieve academic success is to have positive self-esteem. The present research paper has tried to use Brain Gym exercises on hearing impaired children. The results of the educational kinesiology exercises have been ascertained using Stroop test and self-esteem questionnaire. The subjects who are selected for the study were hearing impaired students (N=30) between the age group of 15-20 who were given practices on 10 different types of Educational Kinesiology exercises for 45 days continuously. The results of the pre and post intervention were assessed using paired sample t-test and significant difference in terms of improvements were found in the hearing impaired students on both the sensory processing speed and self-esteem.

Keywords: *Brain Gym, Self-Esteem, Hearing Impaired Students, Stroop Test, Color Word Interference*

Auditory, vestibular and visual systems work together to build our ability to learn, pay attention, process information, and move our bodies smoothly. Our ears collect the sounds which provide critically important stimulation for the development of the brain. Our ears and eyes are integrated and work together as a team. In the case of Hearing Impaired children we can see that they have impairment in one of the sense and that is the hearing.

One way to help students achieve academic success and also to improve their self-esteem is by incorporating the Brain Gym exercises into the academic curriculum and also by making it as an vital part of the ever developing world. Any experience of information entering the brain including movement, results in neural activity. This study aims at increasing the whole-brain

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functioning of the Hearing Impaired students by incorporating the Brain Gym exercises on their regular academic curriculum. According to Dennison (1994), and Brain Gym consultants worldwide, Brain Gym is holistic and improves the quality of the learning process by addressing learning difficulties irrespective of culture, age and background. Based on the research study formulated, the Stroop color word test is used to find the effect of the Brain Gym exercises discussed above.

Another dependent variable that is used for the study is the Self-esteem Questionnaire. One way to help students achieve academic success is to have positive self-esteem. One would assume that Hearing-Impaired (HI) individuals encounter more difficulties regarding their self-esteem because they often face multiple challenges, such as speech and language delays, communication problems, and less or no access to the sound-dominated world. These problems could potentially harm HI children's level of self-esteem, resulting in for example less stable friendships and more bullying.

Readying the body to learn in the movement system is called Educational Kinesiology (Edu-K). Dennison developed a set of 26 specific movements, called Brain Gym, to promote integrated visual, auditory and kinesthetic functioning. The more the experience is repeated, the more neural connections are generated and the stronger those connections become. (Hannaford, 2005). Brain Gym stimulates the nervous system equally in all brain parts, minimizes one-sided, negative brain reactions, builds new pathways to both hemispheres, and eliminates stress. Cecilia Freeman (2000)., Brain Gym Consultant and Instructor, uses Edu-K and Brain Gym to benefit those challenged with autism, cerebral palsy, ADD, ADHD, PDD-NOS, Angelman's Syndrome, Speech Impairment, Blindness and Deafness. Based on Freeman's and Dennison's view on the benefit of Brain Gym on deaf and Hearing Impaired students, this study was incorporated on a positive note.

The Present Study

The present study is aimed at evaluating the efficacy of brain gym on self- esteem and Stroop effect which in turn create an effect on sensory processing speed. This is a pre experimental study among hearing impaired students. The study can help in improvement of the sensory processing speed and self-esteem of the hearing impaired students. The Brain Gym exercises were incorporated in order to promote the whole brain learning of the Hearing Impaired students. The variables observed by the investigator for the present study are, Independent variable is Brain Gym programme and Dependent variable is Sensory Processing Speed and self-esteem.

Need For the Study

The present study is conducted to find the effect of the Brain gym exercises on the Hearing Impaired individuals. Since the Brain Gym exercises has been proved to have a positive effect on

the sensory processing speed, color-word interference effect and self-esteem, based on the theoretical knowledge and review of literature, the tests such as Stroop Color-Word test and the Coppersmith Self-esteem Questionnaire is selected for this present study.

REVIEW OF LITERATURE

Kariuki and Kent (2014) had done an investigation on The Effects of Brain Gym Activities and Traditional Teaching Strategies on Students Performance in Comprehension in a 4th Grade classroom. The purpose that this study was done was to examine the difference between students scores in comprehension (English Language Arts) tests when they are led in Brain Gym activities before class instruction and when they are taught using traditional teaching strategies. The sample used for the study consisted of 11 males and 9 females. Data was collected using Pearson Reading Comprehension Tests. The students of the study were tested after five days of receiving traditional teaching strategies and again after five days of participating in Brain Gym activities before class instruction began. Data was analyzed using paired t-test. The overall result indicated a significant difference in student's comprehension test scores when taught using Brain Gym activities over the student's comprehension test scores who were taught using only traditional teaching strategies. However, there was no significant difference between genders on performance.

METHODOLOGY

This chapter deals with the research design, the tools used for data collection, the locale of the study and sampling technique used for the investigation as well as analysis of the data.

Purpose of the Study

The purpose of this study was to see whether high school Hearing Impaired children engaging in brain gym exercises on a regular basis has enhanced their self-esteem and their sensory processing speed or the Stroop effect. The sensory processing speed was measured using the Stroop Test.

Statement of the Problem

The problem of the study is to find out whether there is improvement in the Hearing Impaired students in terms of the sensory processing speed and self-esteem after the implementation of the Brain Gym exercises.

Objectives of the Study

The main objectives of the study are to study the effect of Brain Gym on sensory processing speed of the Stroop test in hearing impaired students and to study the effect of Brain Gym on Self-esteem in hearing impaired students.

Hypotheses

H1: There would be significant differences in the sensory processing speed among Hearing Impaired students before and after Brain Gym exercise intervention. Based on this six sub hypothesis were framed.

H2: There would be significant differences in Self Esteem among Hearing Impaired students before and after Brain Gym exercise intervention. Based on this four sub hypothesis are framed.

Selection of Sample

Purposive sampling method involves deliberate selection of particular units of the universe for constituting a sample, which represents the universal Kothari (2000). A total sample of 30 children with Hearing Impairment where chosen for the study. It included equal number of boys and girls (Males N=15 and Females N=15) within the age range of 15 to 20 years.

Selection of Methodology

In order to achieve the objectives of the study the investigator selected experimental design. A descriptive study determines and reports the way things are. The study was done on 30 high school hearing impaired students who were given practices on 10 different types of Educational Kinesiology exercises.

Research Design

The research design used to carry out the present study is single before and after without control group experimental design.

Tools

The tools used for the present study includes; Stroop color word test and Coppersmith Self-esteem Questionnaire.

Procedure

The participants of the study included 30 high school hearing impaired students who were selected based on purposive sampling. Before administering the tests, clear instructions were provided to the students. During the pre-training session the students were instructed to give relevant answers to the data of Self-esteem and Stroop test. They were given proper instructions of how to go with the questionnaire of self-esteem and the Stroop test. During this session the students were initially modeled by the supervisor and made to follow all the 10 Brain Gym exercises. In the post-training session again the same instruction that was given in the pre-training session was given.

Statistical Analysis

Paired t- test was used to analyze the data obtained from Stroop Color and Word Test and Self-esteem Questionnaire.

RESULTS AND DISCUSSION

To determine the effectiveness of Brain Gym on the sensory processing speed of the Hearing Impaired students, a pre-test of the Stroop color-word test was administered to all the participants at the beginning of the study. This test also served as the post-test given at the end of the study after the implication of the Brain Gym exercises.

	M	***SD***	***t***	***df***	***sig***
Pre- post test comparison of Time word effect	5.46	4.85	6.16	29	.00
Pre – post test comparison of time color effect	4.90	2.72	9.86	29	.00
Pre- post test comparison of Time colour- word effect	6.03	5.09	6.48	29	.00

There was significant difference in the scores for sensory processing speed and time word, color and color word effect in pre test and post test conditions. P value is < 0.01 level.

	M	***SD***	***t***	***df***	***Sig***
Pre- post test comparison of error word effect	.13	.43	1.68	29	.10
Pre- post test comparison of error colour effect	1.06	1.01	5.75	29	.00
Pre- post test comparison of error colour- word effect	1.56	1.35	6.32	29	.00

There was no significant difference in the scores for sensory processing speed and error word effect in pre-test (M=.13, SD=.43) and in post test (M=.00, SD=.00) conditions; t (29), = 1.68, P value is not significant.

There was significant difference in the scores for sensory processing speed and error color effect and error color- word effect in pre and post conditions. P value is < 0.01 level.

	M	***SD***	***t***	***df***	***sig***
Pre- post test comparison of General self-scale	2.86	1.46	10.59	29	.00
Pre- post test comparison of Social self-scale	.93	.73	6.91	29	.00
Pre- post test comparison of Home parent self- esteem	.10	.48	1.14	29	.26
Pre- post test comparison of School academic self- esteem	.80	.96	4.55	29	.00

The overall hypothesis H2 which states that there would be significant differences in Self Esteem among hearing impaired students before and after Brain Gym exercise intervention was said to be partially accepted. This is because of the no significant improvement in the sub hypothesis H2.3. Since this sub hypothesis is not accepted the overall hypothesis that is state on the basis of Self-esteem on Hearing Impaired students is also partially accepted.

SUMMARY

The aim of this study was to see whether high school hearing impaired children engaging in brain gym exercises on a regular basis has enhanced their self-esteem and their sensory processing speed or the Stroop effect. The main objectives of the study are, to study the effect of Brain Gym on sensory processing speed and color word interference of the Stroop test in hearing impaired students and also to study the effect of Brain Gym on Self-esteem in hearing impaired students.

The research design used to carry out the present study is single before and after without control group experimental design. The tools used for the present study includes Stroop color word test and Coppersmith Self-esteem Questionnaire. The intervention used is 10 brain gym exercises. Paired t- test was used to analyze the data obtained from Stroop test and Self-esteem questionnaire.

CONCLUSION

The results of the pre and post intervention were assessed using paired sample t-test and significant improvements were found in the hearing impaired students in terms of self-esteem and sensory processing speed and Stroop effect.

The hypothesis H1 and its subscales states that there would be significant differences in the sensory processing speed among hearing impaired students before and after Brain Gym exercise intervention and this is noted by using the Stroop test. The only sub scale where there is no significant difference is in the H1.4 hypothesis. Due to the non-significance in that sub scale the overall H1 hypothesis is said to be partially accepted.

From the results, H2, which states that there would be significant differences in the self-esteem among the hearing impaired students before and after Brain Gym exercise intervention, we can infer that there is partial acceptance of this hypothesis. The sub hypotheses of H2 hypothesis are all noted to have significant improvement except for the parent home self-scale. In this dimension there is no significant improvement in the results even after the incorporation of the Brain Gym exercises. Form this discussion we can conclude that the hypothesis H2 is partially accepted.

The hypothesis that did not show much significant improvement can be due to the limited intervention period. . Due to limited intervention time period the Brain Gym exercises would have been ineffective in these dimensions of the Stroop color-word test and the Coppersmith self-esteem questionnaire. The insignificance of the home parent scale of the self-esteem questionnaire may be due to the long term effect that the parents have on the children from their childhood. Based on the results of this study, the researcher intends to use Brain Gym exercises

in instruction in the future to improve student participation and concentration. Teachers should include the brain gym exercises as part of the curriculum, in order to energize the children and stimulate their brains.

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Conflict of Interests: The author declared no conflict of interests.

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