ORIGINAL RESEARCH PAPER

Health Science

EFFECTIVENESS OF SENSORY MOTOR ACTIVITIES IN IMPROVING GROSS MOTOR SKILLS OF CHILDREN WITH ATTENTION DEFICIT AND HYPERACTIVITY DISORDER

KEY WORDS: ADHD, Gross motor function, sensory motor activities, Occupational therapy.

T. Jegadeesan
MOT

Gunasekaran.C
BOT

ABSTRACT

AIM : To determine the effectiveness of sensory motor activities in improving gross motor skills of children with ADHD. **OBJECTIVES:** 1.To assess the level of gross motor function in children with ADHD.,2.To evaluate the effectiveness of sensory motor activities in improving gross motor skills of ADHD.
METHODOLOGY: Totally 30 subjects, 15 in experimental group and 15 in control group with age of 4 to 8 years participated in this study. Both control and experimental groups were assessed using Test of Gross Motor Development (TGMD). Experimental group received occupational therapy Treatment along with sensory motor activities, control group received occupational therapy treatment only. RESULT: The scores were tabulated and analysed statistically with 't' test. According to unpaired "t" value of TGMD 3.8037 there is a significant difference in gross motor skills.
CONCLUSION: The conclusion of this study indicates that the sensory motor activates are effective in improving gross motor skills of children with ADHD.

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a developmental disorder inattention, impulsivity, restlessness and directed behavior control which developed naturally and is mainly due to major, sensory, motor or emotional neurological disorders. According to the Diagnostic and Statistical Manual of Mental Disorders criteria published by the American Psychological Association (APA), symptoms must be displayed before the child reaches 7 years and behaviors that are indicator of the disorder must be seen at least through two different fields and destruct considerably social, occupational or educational performance of the patient. The symptom very among patients and include behavior problems such as inattention, hyperactivity, impulsivity, andacademic under achievement. Research has reported ADHD prevalence estimate of approximately 5.9% -7.1% in children and adolescence with a male and female radio of approximately 3:1 in population sample. Barkley analyzed motor activities of children with ADHD and found that 62% of the children suffer from weak skills in coordinating their activities and the inability is completely evident in their gross and fine skills. Test of gross motor development (TGMD) using assess the gross motor skills (ADHD) children. Lower score of gross motor performance in ADHD children Sensory motor activity used to developing the gross motor skills in ADHD child Sensory motor skills involvesthe process of receiving sensory messages (sensory input) and producing a response (motor output). This sensory information then needs to be organized and processed to be able to produce an appropriate motor, or movement response to be successful in daily tasks at home or at school sensory motoractivity used improve the gross motor skills activity such as balance activity, jumping and hopping activity, ball skill activity, core strength activity, motor planning and sensory motor activity. In this study the researcher intend to find out the effectiveness of sensory motor activities in improving gross motor function of ADHD children.

AIM AND OBJECTIVES

AIM

- To determine the effectiveness of sensory motor activities in improving gross motor skills of children with ADHD

OBJECTIVES

- To assess the level of gross motor function in children with ADHD
- To evaluate the effectiveness of sensory Motor activities in improving gross motorskills of ADHD

REVIEW LITERATURE

1. MM.SCHOEMAKER et.al.,(2015)

The conducted study was to appraise the evidence of impaired motor skills and motor control among children with [ADHD].In that study 45 articles were selected from journals, data basis in 45 articles, 30 articles described motor skills of children with ADHD and 15 articles described the influence of medication on motor skills. The result shows the impaired motor skills and aspect of motor control children with ADHD aged between 6 to 16 years.

2.DANIELE MAGISTRO et.al., [2015]

The purpose of the study is to verify whether gross motor skills have positive effects on academic achievement of typically developing children by mediating ADHD related behaviors. Totally 63 children were participated the children's gross motor skills were measured by the test of gross motor development. The result showed that gross motor skills have positive effects on academic achievement because of mediating ADHD related behaviors. These results invite development of intervention program by promoting motor skills and early detection of behavioral problems lead to improvement of all children's school achievement

3. KAMAL E.AL., [2014]

The purpose of the study was to examine the effectiveness of sensory motor [sensory stimulation] on gross motor skills in children aged 5 to 7 years with Down syndrome. 24 children were included in this study. Subjects were divided into two groups [ex-12and control-12] children randomly.16 session were planned with each session last for 35 minutes. Experimental group receive sensory motor intervention. The study concluded that the effectiveness of sensory motor activities was able to improve gross motor skills in children with Down syndrome.

4. SAEED KOSARI et.al.,(2011)

The aim of the study is to examine the effect of the selective physical exercise on gross motor activities of children with ADHD disorder. 20 children with ADHD are selected randomly and based on pre test. The selected motor program was repeated for 18 sessions. The results showed that there is significance in all variables of the study in experimental group. According to the result, the study concluded that, the selected physical education program was able to improve gross motor skills in children with ADHD.

5. CLAUDIA EMCK et.al., (2010)

The purpose of the present study was to determine how different aspects of gross motor performance and physical fitness are affected in three psychiatric sub groups: children with emotional disorders, behavior disorders and pervasive developmental disorder (PDD). 100 samples were included according to the children psychiatry areas. The mean gross motor performance scores of the BD and PDD group were significantly lower than

score of emotional disorders group. Physical fitness was poor in all sub groups.

6. PANCY ET.AL., [2009]
The purpose of this study was to compare the movement skills of the children with autism spectrum disorder [ASD], attention deficit of hyper activity disorder [ADHD] and those without disabilities. 91 children in the age range of 6-10 yrs of average IQ were participated. After controlling for age, both ASD and ADHD groups scored significantly lower than controls on overall gross motor development as well as locomotors and object control sub tests, and the ASD groups performed more poorly then the ADHD groups.

7.WILLIAM J.HARVEY et.al., [1997]
The purpose of this study was to describe the fundamental gross motor skills and fitness conditions of children with [ADHD]. 19 children in the ages 7 to 12 years participated in the study. Gross motor performance was measured by the [TGMD]. The study concluded that the fundamental gross motor performance and physical fitness of children with ADHD are substantially below average.

METHODOLOGY
The purpose of the study is to determine effectiveness of sensory motor activities in improving gross motor skills of ADHD children.

RESEARCH DESIGN:
The present study was two groups, pretest and post test quasi-experimental design.

Control group : pretest + OT intervention +posttest
Experimental group : pre test OT+ sensory motor activity +post test

STUDY SETTING:
Occupational therapy foundation, Thiruchengode

SAMPLING SIZE
30 subjects

STUDY DURATION
Total duration of this study is 6 month

INTERVENSTION PEREIOD
Total period of intervention was 6 weeks; sessions were given one hour per day in alternative day's total of 18 sessions.

SELECTION CRITERIA
INCLUSION CRITERIA:
1)ADHD children with the age range of 4-8
2)Both boys and girls
3)ADHD children attending mainstream education in regular school

EXCLUTION CRITERIA
1)ADHD children with any other associated disorder
2)Children below 4 years and above 8 year
3)Children physical disability
VARIABLE

INDEPENDENT VERIABLE
- Sensory motor activities

DEPENDENT VARIABLE
- Gross motor function of
- ADHD children

MESUREMENT OF TOOL AND METERIALS USED
Test of gross motor development 2

SCALE DISCRIPTION
The Test of Gross Motor Development – 2 (TGMD-2) is a standardized test that measures gross motor abilities that develop early in life.

POPULATION:
The TGMD-2 is designed to assess the gross motor functioning in children aged 3 through 10 years.

TEST MATERIAL:
8"-10" playground ball 4" lightweight ball

basketball tennis ball soccer ball softball 4'-5' square beanbag tape(plastic electrical) 2 traffic cones plastic bat batting tee

TIME TO ADMINISTER:
The test takes 15-20 minutes to administer per child. Set up and clean-up may take an additional 10 minutes.

TEST COMPONENTS:
The TGMD-2 looks at 12 gross motor skills divided into two subtests: 1) Locomotors (run, hop, gallop, leap, horizontal jump, and slide) Object Control (ball skills such as striking a stationary ball, stationary dribble, catch, kick, overhand throw, and underhand roll)

PROCEDURE
Totally 30 subjects who met the selection criteria hare included in this study. They are equally divided into control and experimental group by convenient sampling method. Both control and experimental group was assessed using test of gross motor development (TGMD) scale. After the baseline data (pretest) has obtained the .control group received only regular occupational therapy treatment the experimental group Occupational therapy treatment with sensory motor therapy with 1 hour session in alternative weeks in 6 weeks duration. After the intervention period is get over the post test was taken from both control and experimental group by using the (TGMD) scale the pretest and post test scores were used to find out the result of the study

INTERVENTION
SENSORY MOTOR ACTIVITY
1 TO 6 SESSIONS
Balance Activities, Stand on one leg

Stepping up and down, Walking along different surfaces – eg pillows, foam,, Jumping and Hopping, Jump on spot, Jump over progressively higher stick/bar/obit, Jump sideways – back and forth, forwards and back, Ball Skills/Eye Hand Coordination, Throwing a ball, Kick a ball, Core Strength, Kneeling Standing on one leg, Motor Planning and Sensory Motor, Obstacle courses (motor plan), Bouncing on a trampoline Dancing and actions tomusic (motor plan)

6 TO 12 SESSIONS
Balance activity, Walking along a narrow beam, Ball Skills/Eye Hand Coordination, Throwing a ball, Kick a ball, Hit a ball, Core Strength, half Kneeling, Bridging, Bear walk, General strength, Tug of war games, Wheel barrow, Motor planning, Galloping and skipping, Dancing and action to music

13 TO 18 SESSIONS
Balance Activities, Walking on toes and on heels, Follow a wriggly line – walk on line or feet either side, Jumping and Hopping, Jump down from a progressively higher height, Jump from hoop to hoop, circle to circle, Hop on spot or hop forwards progress to hopping sideways, Ball skills, Games, Such as sevens, tens, handball, t-ball, kanga cricket .Core strength, Bear walk, Crab walk, General strength, Wall squat, Play with heavy ball or fit ball – catch, bounce; push (upper limb and core strength),Motor planning and sensory motor, Visual copy games like follow the leader (motor plan), Verbal copy games such as Simon Says (motor plan)

STATISTICAL ANALYSIS

TABLE:1Comparisonbetween controlgroup andexperi mental group in pre tests.

s. no	pre test	me an	s d	"t"	"p"
1	control group	29.07	9.80	1.15	0.26
2	experimental group	24.73	7.38	79	63

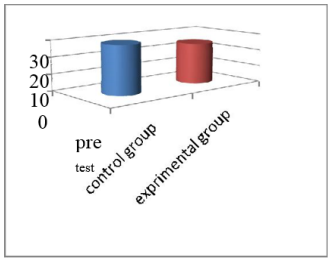

TABLE: 1shows comparison ofcontrol group and experimental group in pre test, mean value of (TGMD) is 29.07:24.73 and "t" value is 1.1579, "p" value is 0.2663, which shows it is not statistically significant.

TABLE 2 Comparisonbetween pre and post testscores of gross motor skills ofcontrol group

s.no	control	Me an	sd	" t"	" p"
1	Pre test	29.07	9.08	0.78	0.44
2	Post test	30.33	10.57	20	72

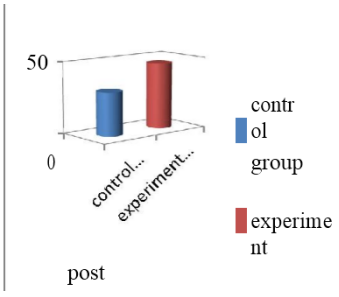

TABLE:2 show that comparison between the controlgroup (TGMD-2) pre test andpost test score mean 29.07:30.33 and "t" value 0.7820 and"p" value is 0.4472..

TABLE: 3 Comparison of pre and post test scores of experimental group

S.NO	EXPERIM ENTAL GROUP	MEAN	SD	"t"	"P"
1	Pre test	24.73	7.38	7.4	0.0
2	Post test	46.27	11.73	770	001

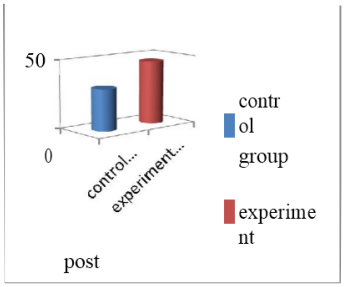

TABLE: 3 show that comparative analysis of experimental group pre-test and post test mean values24.73, 46.27 and "t" value is 7.4770 and "p" value is 0.0001.

TABLE: 4 Comparison of post test scores of gross motor skills between experimental and control group

S.No	POSTTEST	MEAN	SD	"t"	"P"
1	Control group	30.33	10.5	3.80	0.00
2	Experimentalgroup	46.27	11.73	37	19

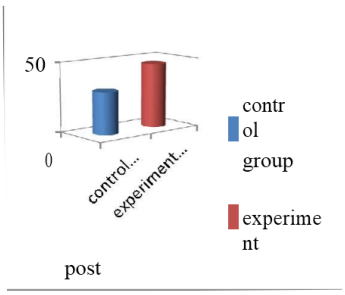

TABLE: 4 shows comparison of control group and experimental group post test value of (TGMD) is 30.33: 46.27 and "t" value is 3.8037, "p" value is 0.0019, which shows it is statistically significant.

DISCUSSION

The purpose of study was to find out the effect of sensory motor activities on improving gross motor skills of ADHD children.

30 samples were selected based on selection criteria. 15 samples were randomly placed in control group as well in experimental group. TGMD test have been used to both the group. Scores were calculated and statistically treated with unpaired't' test.

The pre test value of both control group and experimental group pre test mean value are (TGMD) 29.07: 24.73 and "t" value is 1.1579 , "p" value is 0.2663, which shows it is statistically not significant.

Sensory motor activities were given to experimental group along with regular occupational therapyControl group only regular occupational therapy given. After 6 weeks of intervention post tests have been calculated and scored were tabulated and statistically analyzed.

Paired 't' test have been calculated for the control group (gross motor skills) between the control group (TGMD-2) pre test and post test score mean 29.07 :30.33 and "t " value 0.7820 and "p" value is 0.4472 ,wish shows it is statistically not significant.

Paired "t" test has been calculated for the comparative analysis of experimental group between pre-test and post test mean values are 24.73, 46.27 and "t" value is 7.4770 and "p" value is 0.0001. Whish shows it is statistically significant. The reason for improvement in experimental group can be due to the additional sensory motor

Activitiesalongwithoccupationaltherapyintervention.These findings aresupported bySAEED KOSARI et.al.(2011)In this study they examined the effect of the selective physical exercise on gross motor activities of children with ADHD disorder. 20 children with ADHD were selected randomly and based on pre test. The selected motor program was repeated for 18 sessions. The results showed that there is significance in all variables of the study in experimental group. According to the result, the study concluded that, the selected physical education program was able to improve gross motor skills in children with ADHD.

Unpaired 't' have been calculated between control group and experimental group in post test, mean values are (TGMD) 30.33 : 46.27 and "t" value is 3.8037 , "p" value is 0.0019 , wish shows it is statistically significant .Intervention supported by KAMAL ET. AL., [2014]The study examined the effectiveness of sensory motor stimulation on gross motor skills in children's aged 5 to 7 years with Down syndrome. 24 children were included in this study they were divided into two groups [ex-12and control-12] randomly.16 session were planned with each session last for 35 minutes. Experimental group received sensory motor intervention. The study concluded that the effectiveness of sensory motor activities was able to improve gross motor skills in children with Down syndrome. With this research based supports the researcher accepts the alternative hypothesis and rejecting null hypothesis.

The result of this study reveals that patient in the experimental group showed improved gross motor skills than control group.

CONCLUSION

The conclusion of this study indicates that the sensorymotor activities are effectives inimproving gross motor skills ofchildren with ADHD.

LIMITATION

- Study is done with a limited sample size.
- Study is done for a confined age group.
- Not compared with genders.
- Not compared with other treatment methods.

RECOMMENDATION

- The study can be done on a large sample size.
- Follow up can be recommended.
- Study can be done with extended age limit.
- The study can be repeated with comparison between the genders.

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