



Role of sensory intervention through a need based specific aquatic program on sensory profile of children with autism

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Abstract

The purpose of present study is to find out the role of sensory intervention through a need based specific aquatics program based on sensory profile of children with Autism. Ten boys with Autism were selected as participants for the study. They were selected on the basis of their sensory profile. Sensory profile of each participant was assessed through a Sensory profile caregiver questionnaire by Winnie Dunn. All the participants have undergone a specific swimming program as per their needs and ability for 40 minutes to one hour for a period of 12 week. The pre-test and post-test were conducted in two parameters of sensory profile. The collected data were statistically analyzed using t- test. The significant level was fixed at 0.05. It was concluded from the result of the study that the specific need-based swimming program had significant effect in improving the sensory profile of children with Autism.

Keywords: autism, sensory processing problems, sensory intervention, sensory integration

Introduction

Training improves everyone's quality of life. Children are very susceptible to positive changes due to their unreserved nature and involvement in any physical activity. But when we talk about children with Autism, they are very pure to responses due to any reflexes given to them. These people have a non – manipulative approach in their life so they are simple but very sensitive in nature. Training them needs a very meticulous and need based plan. They enjoy a lot with water as every child does. Aquatic training has a positive effect in improving the physical ability of the growing child (Yeung-Courchesne, R. & amp, 1997) ^[30].

Water has a quality of making active involvement of an individual when emerged into it. The tactile sense of water, buoyancy, gravity (citation), pressure etc. involves an individual actively and even passively in exercise mode or recreational mode. The water also creates a relief sensation due to change in temperature by providing addition sense of involvement into the activities done in it. Aquatic movements like kicking, splashing, balancing, walking, making bubbles, assisted floating and combination of discrete movements along with experiencing the depth through support of floating tube or without it bring the spatial awareness. These are the experiences of taking a participant from unknown to known, where a participant starts understanding of buoyancy leading to learning of various motor skills to manipulate. Water. Acts of turning your head, turning of torso, bring opportunity feel the transaction of balance and motor coupling. Acts of balancing, raising the head or keeping the head down, non-contact of foot from the floor influences the vestibular process of any individual. A bout of activity inside water by continuously working against gravity, managing buoyancy improves the endurance, it creates an opportunity for participants to develop muscular strength due to continuous

pushing and pulling act under water to keep themselves floating. The influencing factor like vestibular, endurance, strength is integral component of sensory profiling and a water-based activity that provide this sensory diet can be useful for fulfilling the need of sensory deficiencies. The most required people in need for sensory diet are people with autism and if exercises and programs performed under water can supplement the sensory diet for the autistic, aquatic programs can become a specialized part of intervention programs with long term benefits.

Individual with Autism often lack motivation to engage in sustained physical activity. Self-reinforcement and Self-monitoring for PE performance is very much required to see the effect of exercise on sensory profile. Achieving small objective through structure schedule helped to create interest and self- reinforcement. This is promoting sustained participation and leading to adaptation of particular exercise, skill or movement. Research shows positive effect of sustained exercise on reduction of BMI, Disruptive and stereotypic behavior (Citation). Children with autism spectrum disorder may be at risk for being physically inactive because characteristics of the disability interfere with successful participation in traditional forms of physical activity. Children without disabilities acquire a majority of their physical activity during transportation, informal play (unstructured) and formal play (structured). Children with ASD demonstrate (a) restricted, repetitive and stereotyped pattern of behavior, interests, and activities; (b) qualitative impairments in social interaction; and (c) qualitative impairments in communication. These impairments may interfere with a variety of physical activity opportunities. It is expected that children with ASD would be less active than children without disabilities

This aquatic program was based on individual needs as all the participants has different needs and abilities. This program

was designed as water activity is active as well passive therapy also where a participant act against the gravity, enjoy the buoyancy force. A structured training session for body perception, motor planning and endurance through fun activity, basis movement in water to improve endurance and coordination were plan in this individual based aquatic program. This aquatic program is based on a sensory intervention theory originally developed by Ayres (1 (AJ, 1991)) [1]. *SI-based treatment* is defined as “a program of intervention involving meaningful therapeutic activities characterized by enhanced sensation, especially tactile, vestibular, and proprioceptive, active participation, and adaptive interaction” Research says most of the children with Autism has sensory processing disorder where the brain receives information through the sense organs like eyes (sight), nose (smell) and ears (sound). It then processes the information received to make sense of the world around us. Billions of neurons of the brain are involved in processing input from the environment and helping an individual to respond and behave in an appropriate manner. This is termed sensory processing, sometimes also referred to as sensory integration. When the brain has difficulty in receiving information and responding suitably, it leads to sensory processing disorder or sensory integration dysfunction. The brain is unable to efficiently process and integrate the inputs received from the environment through the senses causing a person to behave in an “irrational” manner. This becomes evident in the way the person responds to certain sensory stimuli. It affects all aspects of a person’s life – cognitive, social and emotional.

Methodology

Ten boys aged 5–10 years, participated in the specific aquatic program. All the participants were with moderate to profound disabilities and had a primary diagnosis of autism. They were

Tools and technique

Table 1: Variables and Test for Sensory Profile Questionnaire

Variables	Name of the test	Unit of measurement
Vestibular processing	Sensory profile caregiver questionnaire by W.dunn	Points
Sensory processing related to endurance and tone	Sensory profile caregiver questionnaire by W.dunn	Points

Training Program

These participants practiced training in different body movement through aquatic program. The following movement walking, bubbling, floating, kicking, free style hands movement, deep water experience, fun games in water were involved in the movement-oriented program using different resources. Subjects underwent individual as well as group activities in the evening. Aquatic program was design on the basis of individual threshold and level of sensory process. Pre and post-test were conducted prior to and after the

Result and Discussions

Table 2: Descriptive Statistics of sensory intervention through movement-oriented program on the endurance and tone of sensory profile

		N	Mean	Std. Deviation	Std. Error Mean	Correlation	Sig.
Pair 1	Endurance- Pre	10	33.600	3.470	1.097	.798	.006
	Endurance- Post	10	38.900	4.357	1.378		

nonverbal and verbal. The participants were recommended for the study by the Occupational therapist and classroom teachers on the basis of their sensory needs. All the participants were selected on the basis of their sensory score after assessing their sensory profile through sensory profile questionnaire. Need based training program was developed to test the effectiveness of program for minimizing the sensory related difficulties for modulation related to endurance and process related to vestibular among children with Autism. For testing the effectiveness of the program data was collected through pre- test and post training test. To see the effect of training T test was applied on the data.

Selection of variables

Independent variable

- Need based aquatic program

Dependent variable

- Vestibular processing
- Sensory processing related to endurance and tone

Experimental Design

For this study, 10 school boys with autism were selected as subjects from Noida, Uttar Pradesh, by applying purposive sampling method. The age of subjects ranged from 8 to 10 years. The subjects were selected on the basis of their sensory profile. Their sensory profile was assessed through a Sensory profile caregiver questionnaire by Winnie dunn. The selected subjects were considered as one group. The following criterion variables were selected for the study from sensory profile questionnaire. These variables are Vestibular processing, Sensory processing related to endurance and tone. The training period was for 12 weeks except Saturday and Sunday of every week.

intervention. The pre and post- test were conducted before and after 12 weeks intervention using Sensory profile Winnie Dunn, caregiver questionnaire.

Statistical Technique

The following statistical procedure was employed to find out the effect of sensory intervention through movement-oriented Program on the selected variable of sensory profile. T test was calculated to find out the significant difference between the mean of pre and post-tests of the group.

Table 2 shows that the mean score of the sensory intervention through movement-oriented program on the endurance and tone of sensory profile were 33.600 ± 3.470 and 38.900 ± 4.357

respectively. The result shows clearly that mean is increased due to the effect of training.

Table 3: Independent T- Test of sensory intervention through movement-oriented program on the endurance and tone of sensory profile

		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2 tailed)
Pair 1	Endurance- Pre	-5.300	2.626	.830	-6.380	9	.000
	Endurance- Post						

*Significant at 0.05 level of significance

Table 3 reveals that the sensory intervention through movement-oriented program on the endurance and tone of sensory profile has significantly higher in Endurance- Post as

compared to the Endurance- Pre, as the calculated ‘t’ value obtained were -6.380 with $P < 0.005$.

Table 4: Descriptive Statistics of sensory intervention through movement-oriented program on the Vestibular Processing of sensory profile

		N	Mean	Std. Deviation	Std. Error Mean	Correlation	Sig.
Pair 1	Vestibular- Pre	10	43.500	5.835	1.845	.941	.000
	Vestibular- Post	10	46.800	6.088	1.925		

Table 4 reveals that the sensory intervention through movement-oriented program on the Vestibular processing of sensory profile were 43.500 ± 5.835 and 46.800 ± 6.088

respectively. The result shows clearly that mean is increased due to the effect of training.

Table 5: Independent T- Test of sensory intervention through movement-oriented program on the Vestibular Processing of sensory profile

		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2 tailed)
Pair 1	Vestibular- Pre	-3.300	2.057	.650	-5.072	9	.001
	Vestibular- Post						

*Significant at 0.05 level of significance

Table 5 reveals that the sensory intervention through movement-oriented program on the Vestibular processing of sensory profile has significantly higher in Vestibular- Post as compared to the Vestibular- Pre, as the calculated ‘t’ value obtained were -5.072 with $P < 0.005$.

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Conclusion

On the basis of results the following conclusions are drawn:

1. There were significantly differences in sensory intervention through movement-oriented program on the endurance and tone of sensory profile of the participants were with moderate to profound disabilities and had a primary diagnosis of autism.
2. There were significantly differences in sensory intervention through movement-oriented program on the Vestibular processing of sensory profile of the participants were with moderate to profound disabilities and had a primary diagnosis of autism.

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