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Effect of Auditory based Play Therapy on Auditory Avoidance Behavior Among Children with Asd

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KEYWORDS

Auditory based play therapy, auditory avoidance behavior, Short sensory profile (SSP), Autism Spectrum Disorder.

ABSTRACT:

Introduction: Autism is a set of heterogeneous neurodevelopment conditions, characterized by early-onset difficulties in social communication and unusually restricted, repetitive behavior and interests. The worldwide population prevalence is about 1%. Autism affects more male than female individuals, and co-morbidity is common (>70% have concurrent conditions). Individuals with autism have atypical cognitive profiles, such as impaired social cognition and social perception, executive dysfunction, and atypical perceptual and information processing. These profiles are underpinned by atypical neural development at the systems level. Genetics has a key role in the etiology of autism, in conjunction with developmentally early environmental factors. Large-effect is mutations and small-effect common variants contribute to risk (Meng-Chuan Lai et al. Lancet. 2014). Auditory defensiveness is characterized by an extreme sensitivity to sound. The child's nervous system may interpret sounds as too loud, or the pitch may be intolerable. To deal with the discomfort, the child may act out, try and avoid or minimize the auditory input, hyper-focus on something else, or escape.

Objectives:

- To select the children with auditory avoidance behavior among children with ASD with help of short sensory profile. To find out the effect of conventional occupational therapy in control group.
- To find out the effect of auditory based play therapy on auditory avoidance behavior among children with ASD in experimental group.
- To compare the effect between auditory based play therapy and conventional occupational therapy among control group and experimental group.

Methods: 30 ASD children with auditory avoidance behavior were selected for the study based on the assessment. The assessment tool (short sensory profile) was used as pre and post test score. 15 children were given auditory based play therapy that was in experimental group and 15 children were given conventional occupational therapy that was in control group. Post test were taken after 12 weeks of intervention. The results were obtained by comparing the pre test and post test scores.

Results: The results showed that the comparison of pre and post-test mean short sensory profile scores of the experimental group were highly statistically significant, as compared to the control group because of the effect of auditory based play therapy ot reduce auditory avoidance behavior. Since the p value of 0.001 is lesser than 0.05,.The short sensory profile measure scores of the pre and post test of the control group were significantly lower that was that of the experimental group after the implementation of auditory based play therapy on auditory avoidance behavior

Conclusions: The current study concludes that there was a significant improvement in the experimental group than the control group after the auditory based play therapy. Thus, this study proves that auditory based play therapy can be used as an effective intervention to reduce auditory avoidance behavior by using short sensory profile (SSP) for children with ASD.

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1. Introduction

Autism is a set of heterogeneous neurodevelopment conditions, characterized by early-onset difficulties in social communication and unusually restricted, repetitive behavior and interests. The worldwide population prevalence is about 1%. Autism affects more male than female individuals, and co-morbidity is common (>70% have concurrent conditions). Individuals with autism have atypical cognitive profiles, such as impaired social cognition and social perception,exercise dysfunction,and

atypical perceptual and information processing. These profiles are underpinned by atypical neural development at the systems level. Genetics has a key role in the etiology of autism, in conjunction with developmentally early environmental factors. Large-effect is mutations and small-effect common variants contribute to risk (Meng-Chuan Lai et al. Lancet. 2014)

AUDITORY DEFENSIVENESS

Auditory defensiveness is characterized by an extreme sensitivity to sound. The child's nervous system may interpret sounds as too loud, or the pitch may be intolerable. To deal with the discomfort, the child may act out, try and avoid or minimize the auditory input, hyper-focus on something else, or escape. The following behaviors may be observed in children with auditory defensiveness:

- They may show extreme sensitivity to everyday sounds like the vacuum cleaner or hairdryer. Often a child experiencing such sensitivity or defensiveness will cover his/her ears, or appear anxious and tense in a noisy environment.
- They may not like activities or environments usually loved by kids. Birthday parties, kid-centered restaurants, and indoor playgrounds may be too loud and overwhelming for them.
- Leaving the room when they hear a specific sound.
- Having meltdowns when triggered by sound.
- Cover ears or hides in social situations.
- Have strong emotions when noise volume increases.
- Bothered by pitched noises such as whistles, chalk, violins.

ROLE OF OT IN AUDITORY DEFENSIVENESS

- There are several ways that sensory integration therapy can help a child with auditory defensiveness.
- An occupational therapist with advanced practice will be able to assess and treat by improving the ability of the inner ear to do the job of filtering and dampening sound.
- This is done by providing the child with intense movement experiences. Movements affects the workings of the Inner ear, which in addition to filtering sound, is responsible for monitoring where we are in space. As one system improves, so does the other.
- Occupational therapists with additional training can prescribe special filtered music, like the kind used in "The Listening Program" that trains the ear and brain to be less sensitive to sound. This music can be very helpful to children who have trouble attending in noisy environments.
- Sensory integration therapy works on improving the way that the nervous system function registers, integrates and processes sensory input. An occupational therapist trained in sensory processing employs specific techniques that may include integrating primitive reflex patterns that can often support development.
- There are also strategies, that when designed for the individual child and his/her environment, are often referred to as a sensory diet. These strategies may include:
- Modifying the environment (such as in a school) by considering the acoustics in the classroom. Changing the seating arrangements may be beneficial and limiting extraneous noise from the hallway by closing the door or windows is also helpful. It may be necessary to cover the loud speaker with material to tone down the volume.
- Having rugs or carpet on the floor will decrease echo and extraneous noises.
- Whenever possible, children should be given advance notice about bells, announcements, fire drills, etc.

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2. Objectives

- To select the children with auditory avoidance behavior among children with ASD with help of short sensory profile.
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3. Methods

RESEARCH DESIGN:
Quasi experimental type of design was used to determine the effect of auditory based play therapy on auditory avoidance behavior among the children with ASD.

SAMPLE TECHNIQUE
Convenient sampling technique was adopted.

SAMPLE SIZE
30 subjects
15 subjects in control group
15 subjects in experimental group

SAMPLE SETTING
Possible rehab center - mudichur.
Kiddos rehab center - porur.
Shakthi remedial center- seliyur.

VARIBLES
Independent variable
Auditory based play therapy

Dependent variable
Auditory avoidance behavior

SELECTION CRITERIA

Inclusion criteria
Age group – 3 to 10 years.
Participants of gender, both male and female.
Children diagnosed with autism spectrum disorder.
Children with auditory avoidance behavior.

Exclusion criteria
Hearing sensitivity occurs because of a medical condition (example: tinnitus).
Structural problem within the ear itself.
Occur as a side effect of some medications.

INSTRUMENTS USED
Short Sensory Profile (SSP) Purpose of the test:
Short Sensory Profile (SSP) measures the sensory processing abilities. It is a quick, simple, and inexpensive test. It can be used with a wide range of populations.

SCORING METHOD:
Each question should be scored 1 to 5 score.

DURATION
Session's duration : 30 minutes.
Intervention session: 36 sessions
Intervention duration: 12 weeks.

PROCEDURE FOR DATA COLLECTION
The children were selected for the study from the possible rehab center, kiddos rehab center and Shakthi remedial canter. The short sensory profile was assessed for 30 ASD children. The 30 children were divided into two groups: experimental group and control group, 15 in each group. The pretest was assessed from both the groups. The experimental group underwent auditory based play therapy for auditory avoidance behavior. Whereas children in control group received conventional occupational therapy intervention. The intervention was continued for 3 months and a post-test was assessed from both groups.

INTERVENTION PROTOCOL

MUSICAL HIDE AND SEEK – This musical hide and seek is played with objects and is an excellent tool to help the child improve his listening skills.

MUSICAL CHAIR – The kids should walk as long as the music is playing and sit in the closest chair as soon as the music stops.

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MUSICAL STATUES – Play the music and ask the kids to dance. When the music stops, the children should freeze like statues.

DANCE LIKE AN ANIMAL – Want to explain the traits of each animal on the chart before you start the game. You need to tell them how the animal moves, how fast or slow it moves, the sounds it makes and any other unique traits it has.

TISSUE DANCE – Give each child a tissue and ask them to put it on their head. When the music starts they should start dancing and moving on the dance floor, without letting the tissue fall.

DANCE WITH PROPS – Create a dance floor, remove any obstacles and make the place child-friendly. Place all the props on a table, to the side of the room. As soon as you play the music, the kids will have to run to the table and pick up a prop. Then dance anyway they want while using the prop as an accessory. Once the music ends, they put the prop back on the table.

WHAT'S THAT SOUND – Play the sounds of different instruments first. Then play a simple song with distinct sounds of the instruments and ask the children to identify the instruments.

THE PASSING GAME – Wrap the package with as many layers as possible. The more layers, the better it is for the game. Between each layer, place a toffee or a small toy. Make the children sit in a circle. When the music starts, they pass the parcel. And when it stops, they stop. The kid who is holding the parcel when the music stops should unwrap one layer of the parcel to see if he gets a gift.

4. Results

Table No 1: Statistical analysis of pre-test and post-test of control group

TEST	MEAN	SD	N	Z VALUE	p VALUE
Pre – test	13.4667	2.26358	15	-3.433	0.001
Post – test	15.7333	2.52039	15		

*** Significant at 5% alpha level**

Since the p value of 0.001 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference between pre-test and post-test scores in the control group of the SSP. This suggests that the conventional occupational therapy intervention obtained by the control group had mild improvement in the auditory avoidance behavior.

Graph:1 - Comparison of SSP among control group

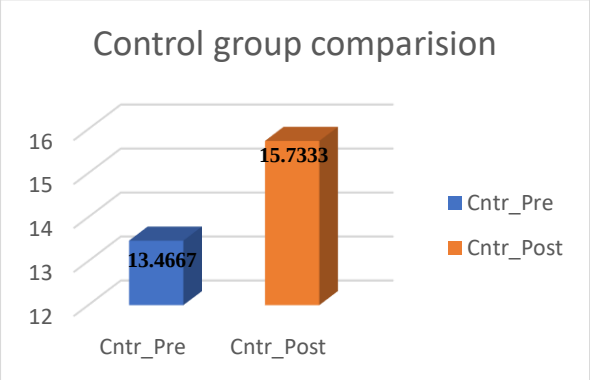

Table No 2: Statistical analysis of pre-test and post-test of the experimental group

TEST	MEAN	SD	N	Z VALUE	p VALUE
Pre - test	13.2667	2.25093	15	-3.434	0.001
Post - test	17.6	1.88225	15		

*** Significant at 5% alpha level**

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In the experimental group, since the p value of 0.001 is less than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in experimental group between pre-test and post-test scores of SSP. This suggests that the Auditory based play therapy obtained by the experimental group had a high improvement in the auditory avoidance behavior.

Graph 2: Comparison of SSP among experimental group

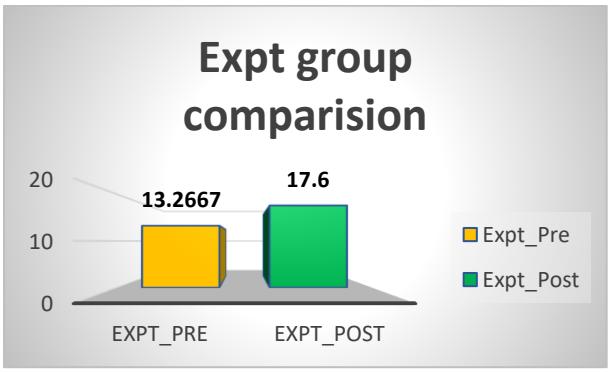


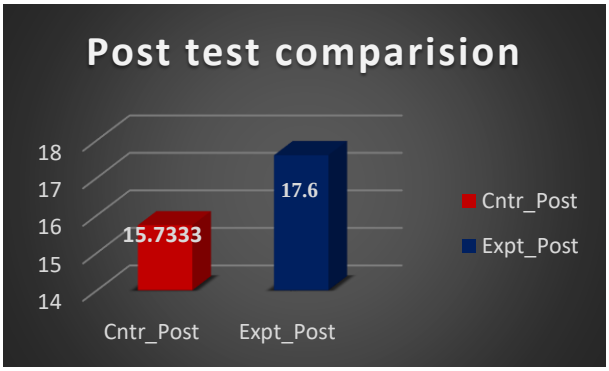
Table No: 3 Comparison of post-test scores of control and experimental group

GROUP	MEAN	SD	N	Z VALUE	p VALUE
Control	15.7333	2.52039	15	-1.99	0.046
Experimental	17.6	1.88225	15		

*** Significant at 5% alpha level**

Since the p value of 0.046 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in post-test scores between experimental and control group of the SSP. This suggests that Auditory based play therapy intervention provided for the experimental group participants were highly effective.

Graph 3: Effect of intervention on SSP



5. Discussion

The study was aimed to determine the effect of decreasing auditory avoidance behavior through auditory based play therapy in children with ASD. The study was conducted for 3 months with ASD children from the possible rehab center, kiddos rehab center and Shakthi remedial center. A total of 30 children were selected and a conventional sample technique adapted to the experimental and control group in every 15 children. Auditory avoidance behavior in both the control and experimental group was assessed by using the Short sensory profile. The experimental group alone underwent auditory based play therapy for three months, whereas control group undergone conventional occupational therapy. After three months of intervention, the post-test evaluation was done for both groups and the scores were calculated and results analyzed.

Table 1 and figure 1 showed that the comparison of auditory avoidance behavior in the control group. The mean value of the pre-test is 13.4667 and the mean value of the post-test is 15.7333 and the p value of 0.001 is less than 0.05, the alternative hypothesis is accepted. Hence, which were statistically significant differences in the control group between pre-test and post-test scores, probably because of conventional occupational therapy intervention like sensory integration therapy, strategies may include: having rugs or carpet on the floor will decrease echo and extraneous noises and wearing headphones or earmuffs that cover the entire ear. This result was supported with article **Nobuhiko Ikuta, Akiko Tokunaga Dec 2016,** which proved the

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effectiveness of earmuffs and noise cancelling headphones to auditory stimuli in children with ASD.

Table 2 and figure 2 showed that the comparison of auditory avoidance behavior in the experimental group. The mean value of the pre-test is 13.2667 and the mean value of the post-test is 17.6 and p value is 0.001 is less than 0.05 which were highly statistically significant, as compared to the control group because of auditory based play therapy. This result is supported with previous article **(R1) Bryan Gee, Kelly Thompson Aug 2013,** which proved the efficacy of sound based intervention with a child with an ASD and auditory sensory over-responsitivity.

Table 3 and figure 3 showed the effect of auditory based play therapy in auditory avoidance behavior. The mean value of the control group is 15.7333 and the mean value of the experimental group is 17.6 and the p value is 0.046 which is less than 0.05 hence alternative hypothesis is accepted. There is statistically significant difference in the post-test of control and experimental group auditory avoidance behavior. This showed that the auditory based play therapy obtained by the experimental group participants were more effective in decreasing auditory avoidance behavior compared to control group participants. The results implicated that auditory based play therapy intervention was very effective in decreasing auditory avoidance behavior among children with ASD. These findings were in accordance with the previous study done by **R4. J Nwora & Bryan M Gee (2009).** The results implicated that auditory based play therapy was very effective in reducing auditory avoidance behavior among children with ASD.

6. Conclusion

The study was conducted over 3 months. Totally 30 children were selected for this study, 15 children were control group, and 15 children were in the experimental group. Pre and post-test were conducted for both groups by using a short sensory profile. The experimental group underwent auditory based play therapy to reduce auditory avoidance behavior.

The results showed that there was a significant improvement in the experimental group than the control group after the specific intervention of auditory based play therapy.

Thus this study proved the effect of auditory based play therapy on auditory avoidance behavior among children with ASD.

LIMITATIONS

- Study was done on small sample size.
- Study was done for a shorter duration of time.
- Study was not compared with gender differences.

RECOMMENDATIONS

- Study can be done with a larger sample size.
- Study can be for a longer duration of time.
- Study can be with gender differences.
- Study can be with different age groups.
- Study can also be enhanced by using other techniques.

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