

EVALUATION OF DIFFERENT INTERVENTION STRATEGIES FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

NAZIA QAYYUM, SYEDA SALMA HASAN

G.C University Lahore

CORRESPONDENCE: NAZIA QAYYUM, E-mail: naziaqayyum3@yahoo.com

ABSTRACT

OBJECTIVE

This study was conducted to evaluate the effectiveness of different intervention strategies for children with autism.

DESIGN

Case study along with the pre and post-test method

PLACE AND DURATION OF STUDY

The study was conducted at Rising Sun Institute for special children Lahore, duration of study comprised of two terms in school year that is almost 8½ months.

SUBJECT AND METHODS

A 6 years old boy newly enrolled, diagnosed with autism was selected for study. He was assessed by a team of professionals including psychologist, child specialist, physiotherapist, sensory and occupational therapist, speech and language therapist, self-care trainer and sports trainer. Childhood Autism Rating Scale (CARS) and Portage Guide to Early Education (PGEE) were used for diagnostic and developmental assessment. A multi intervention program was implemented according to a set time table which was followed with regularity. Record of this study was kept through progress reports by therapists, monthly worksheets and test results. Child was reassessed again to measure progress of therapeutic interventions. Wilcoxon test and bar graph were used for pre and post statistical analysis.

RESULTS

Significant differences were observed in patient's ratings on CARS and PGEE. After implementation of therapies, child's scores on CARS, which were previously in the severe category of autism, fell in the mild to moderate category of autism. Pre-test and post test results had mean differences, scores on CARS are 2.6/.63(M/SD) in pre-test and 2.2/.40 (M/SD=) in post-test, while scores on PGEE are 40.0/3.93 (M/SD) in pre-test and 42.4/4.15 (M/SD) in post-test.

CONCLUSION

A multidisciplinary approach must be incorporated in school and home settings as well.

KEY WORDS

Autism, Childhood Autism Rating Scale, Portage Guide to Early Education, Interventions

INTRODUCTION

The present research is focusing on autism, aiming at evaluating different intervention strategies for children with autism. Autism Spectrum Disorder is a neuro developmental disorder which is characterized by impairment in communication and social interaction and repetitive behaviors/interest or activities¹. Onset of autism is usually between 18 months of age². Center for Disease Control and Prevention, suggested that an average of 1 in 68 children are identified with ASD³. Autism affect boys five times more than girls³. An indigenous study determines the prevalence of Autism in the special education schools of Lahore and results reveal that 6.31% of population with special needs meet the criteria for autism⁴. There is no single known cause of autism².

An indigenous research indicates that using a multi-pronged intervention is very helpful for children having autism⁵. Key methods include Son-Rise program, speech and language therapy, behavior therapy, sensory and occupational therapy, art therapy, music therapy, play therapy, self-care training, sports and computer class. The Son Rise Program is essentially home based and relationship-based program with one to one interactive approach. Central principle is conveying an attitude of "total acceptance" of the child including all of his/her conducts and making social interaction pleasurable⁶. Behavioral interventions are used to improve academic performance, socialization, language and communication and daily living skills, it also helps in teaching new skills or tasks, increasing and maintaining behaviors, generalization and transfer of learning to daily life situations and to reduce repetitive and self-injurious behaviors⁷.

Speech and language therapy helps in improving general ability of communication including receptive and expressive aspects, making interaction with others efficient⁷. Sensory integration therapy is comprised of auditory, olfactory, gustatory, vestibular, proprioceptive, and/or tactile stimulation. Children usually have hyposensitivity or hypersensitivity to sensory input and self-stimulation, stereotypic and self-injurious behaviors of children with autism are may be due to sensory dysfunctions. Unusual sensitivities of mild to severe form to different sounds, sights, touch, taste, and smells and different pain threshold are present in autism⁸. A recent study found that children with autism exhibit fewer repetitive behaviors after getting sensory therapy and achieved more goals as compared with those who were not given therapy⁹. Occupational therapists works on improving different skills and tasks such as activities of daily living, fine and gross motor skills and perceptual expertise including discriminating between colors, shapes, and sizes¹⁰.

Music and art therapy helps in improving social interaction and

communication, as they provide means of expression to children; it also increases and helps in their desire to communicate and comprehension¹¹. Music helps in reducing echolalia. Art activities help in managing acting out behaviors and tantrums by providing a safer and socially acceptable way for expression¹². Play therapy is helpful in teaching appropriate behaviors, task completion imagination, turn taking concept, building relationships with peers, imitation of actions of others, use of appropriate language, and tolerance to a variety of ways to play with toys and sharing with other children, reciprocal interaction and most importantly it is a source of fun and enjoyment⁴. Exercises and activities of sports are a way of reducing aggression and repetitive behaviors among individuals with autism¹³. Self-help skills generally focus on necessary skills for an individual to perform independently the routine activities of daily living². Assistive technology especially use of computer helps in improving alertness, matching, communication, identification, recognition and it provides visual stimulation for children with autism¹⁴. An individualized educational plan is a written document/plan which includes special education program and/or services required by a special child according to his needs, strengths and weaknesses⁵.

Research work on evaluating management plans followed in special education schools is scarce in Pakistan. Recent management techniques for autistic children include combination of different interventions offered at a child's IEP (Individual Education Plan). Many educational approaches and programs to help teach students with autism are being used in the classroom settings. The main objective of this study is to evaluate the effectiveness of using multiple intervention strategies for autism relevant to specific goals in special school.

CASE PRESENTATION

Participant of this study was a 6 year old student from Rising Sun Institute for Special children Defence Campus Lahore, single born child to his non-consanguineous parents and has never been in any treatment before. He came for assessment with presenting complaints of restlessness, wiggling, rocking, hand flapping, repetitive behaviors, and echolalia. Both of his parents are above 35, his father is working in a private company and mother is a housewife. His parents are caring, friendly, and cooperative towards him. They are living in nuclear family setup. Child was born full term normal delivery at a hospital, with immediate first cry and pink color. His weight was about 8 pounds. His mother suffered from fibroids during pregnancy for which she took a medicine prescribed by the physician. He achieved his milestones at normal age. He started his schooling at the age of 4 years in playgroup at a private school. He studied till nursery class. His academic assessment was based on oral examination as writing skills were not age appropriate. After that he got admission in Rising Sun Institute for Special Children Lahore. He had poor pencil grip. He could match objects and pictures but he could not match small letters with capital letters. He pointed several body parts on himself and in pictures. He recognized circle and triangle shapes. He could count by rote 1-30. He had no concept of heavy and light, different textures, behind, beside, next to, first, middle and last positions and order sequence. He correctly answered simple questions of general knowledge asked by mother and psychologist such as, "Who created us?", "What is your name?" etc. It was observed that he had rote learning, moreover his concepts were

not generalized. Permission from Parents and Rising Sun Institutes' management was taken for data collection. Child was assessed by using Childhood Autism Rating Scale¹⁵, Portage Guide to Early Education¹⁶, behavioral observation and detailed history taken from parents. Diagnosis was given according to the DSM-V criteria for autism.

PROCEDURE/TREATMENT APPROACH

After detailed assessment by a team of professionals including psychologist, speech and language pathologist, physiotherapist, occupational and sensory therapist, Individualized Educational Plan (IEP) was developed based on the assessment results and child's needs. Intervention plan included, Son-Rise Program, Speech and Language Therapy, Behavior Therapy, Sensory and Occupational Therapy, Art Therapy, Music Therapy, Play Therapy, Self-Care Training, Sports and Computer Class. All therapies were given side by side according to set time table. Monthly work sheets and observation reports were used for record keeping. At the end of each term child was reassessed by the team of therapists. Results of pre and post assessments were then compared for analysis. Data was analyzed by applying Wilcoxon test on pre and post score of CARS and PGEE by using SPSS 16 and using Bar graphs. Reports of therapists at pre and post levels were also used for analysis.

RESULTS

Table 1
Wilcoxon test for Pre and Post Scores of child on Childhood Autism Rating Scale

Variable	Pre	Post	t	p
	M (SD)	M (SD)		
CARS	2.6 (.63)	2.2 (.40)	-2.97	.003

Note: t=Wilcoxon test value. Median = 2.0.

Figure 1: Bar graph showing child's pre and post scores on sub scales of Childhood Autism Rating Scale (CARS).

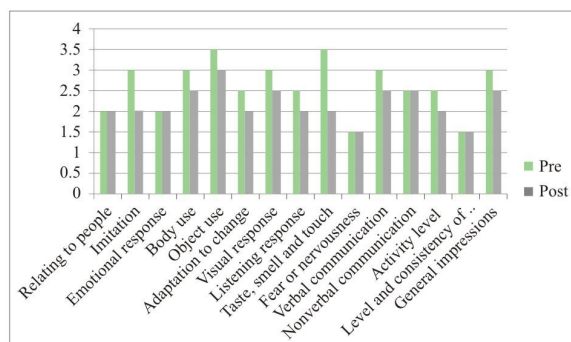
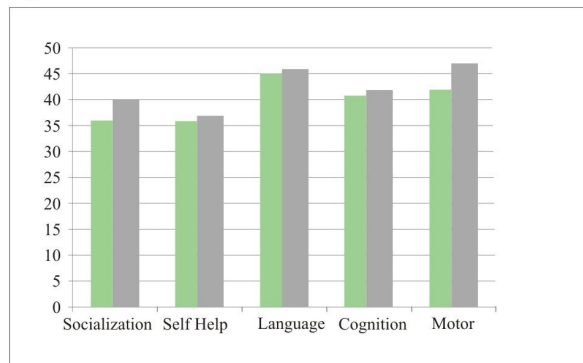


Table 2
Wilcoxon test for Pre and Post Scores of child on PGEE

Variable	Pre	Post	t	p
	M (SD)	M (SD)		
PGEE	40.0(3.93)	42.4 (4.15)	2.06	.039

Note: t=Wilcoxon test value. Median = 41

Figure-2



Pre assessment report of motor skills and sensory and occupational skills

Child was a mobile, independent and compliant boy. His fine motor skills assessment and physical trial of some activities of eye-hand coordination showed that he has good fine motor skills, self-help up-to writing but the quality of these activities was not age appropriate. He had slight sensory issues in following areas:

- Slightly hyposensitive in vestibular processing (movement)
- Poor in proprioceptive processing
- Poor in tactile perception and discrimination

Pre assessment report of speech and language:

Child's speech and language milestones were delayed. His receptive and expressive vocabulary was limited. His listening was very inconsistent and his ability to process auditory information was very limited. He needed repetition of instructions, verbal and physical prompts to keep him focused on activities. He was able to recognize everyday object names, everyday verbs and identify objects by their function. He was able to understand some early concepts like up, down, front, back but not heavy or light. He was able to identify some shapes and colors but showed inconsistency in his ability to identify them. He was able to point to different body parts as well as some clothes but showed inconsistency in his ability to follow instructions with two key elements e.g 'point to the tail of the elephant'. He showed weaknesses in his ability to process information and this often resulted in echolalia, where he would repeat the instructions rather than respond to them. He showed difficulties in naming skills and had a limited vocabulary of fruits, vegetables and animals. While using action picture cards, he was able to create sentences up to 7 words in length. Therapist had to ask different questions about the picture to get the answers. His expressive language showed limitations in his use of verbs, conjunctions e.g 'and, so, because' as well as auxiliary verbs and prepositions. He had significant weaknesses in his expressive language skills in the length of sentence structures that he could produce on a consistent basis, as well as expressive grammar and retrieval and use of vocabulary.

Post Assessment of Sensory Integration processing and Occupational Therapy

Patient started walking on balance beam, and could found sound stimulus direction. His visual tracking was improved and he could

differentiate between soft and hard ball with little help and could discriminate large and small objects. He could identify and distinguish colours and shapes. His eye contact improved to 4-5 minutes. He started taking interest in activities and was able to follow commands. He could complete goal directed activities for 15 minutes. He understood the concept of right and left direction. His bilateral coordination developed. His gripping improved and he was able to do lacing activity.

Post Assessment of Speech and language therapy

He had shown improvement in his listening and attention skills during speech sessions. He had shown slight improvement in his tongue lateralization, elevation and blowing. He also showed improvement in his linguistics concepts with the aid of action pictures cards and sign along signs, e.g., showing him a picture of a boy playing with fire, he was able to identify fire, the danger and also the emotions and describe why he was crying. He showed improvement in grammatical forms such as pronouns and auxiliary verbs and prepositions. During conversation he said pragmatically accurate sentences. He improved in his turn taking and other social activities. His concept of boy, girl, up, down, sit and stand were developed. Irrelevant sentences in speech were 60 % reduced. He could point and name some fruits. He also improved in story and event telling.

DISCUSSION

The use of different intervention strategies in combination proved to be helpful in providing therapeutic treatment for autism in this case. A significant change appeared in the child during the study period, his results on CARS decreased as indicated by figures and tables in the result of therapeutic intervention, scores were previously falling in the severe category at the time of pre assessment but after implementing therapies for the 2 terms (each term consisting of 4½ months) scores fell in the mild to moderate category of autism. Along with this quantitative change there was behavioral improvement observed in the child.

Child showed improvement in imitation skills and in visual response as his eye contact had improved a lot. There was a significant progress in his vocalization and use of sentence relevant to the situation, concentration during activities, on seat behavior in class and self-care skills. He showed good understanding of instructions and compliant behavior during different activities for example, coloring, painting, pasting, play dough activities etc. Intensive therapeutic management plan which includes implementation of different therapies in a structured and consistent environment proved to be very effective for children with autism¹⁷.

He has shown improvement in imitation, he could imitate different gestures but still required verbal prompt in imitation of strokes. He has now stopped smelling different objects and putting things in his mouth which he previously used to do. His attachment with different objects was now minimized as now he knew functional use of different objects. His echolalia and excessive questioning has been reduced to some extent but still teacher and speech therapist are working on it. His use of non-verbal communication has also improved as now he understands non-verbal gestures of adults. In addition his verbal communication also showed improvement in his

vocabulary, pragmatic skills etc. His repetitive behaviors were also minimized to some extent.

Table 3 and figure 2 presented child's score on PGEE which indicates that he has shown improvement in all developmental areas but more in motor, language and socialization areas. Implementation of discrete trail training, prompting, chaining, shaping, task analysis and clear instructions were also helpful in developing and teaching new skills and decreasing the problematic behavior. Prompting helps in improving and developing learning skills, social interaction, and compliant behavior and readiness skills for learning. All therapists ignored unwanted behaviors of the child and kept him busy in different activities which help in decreasing repetitive and restricted behaviors. Child learnt many new tasks from PGEE by using ABA techniques.

Different play activities, group activities, and music and sports activities have proved to be of great help while working with the child. These therapies helped in improving concentration, cognitive development, enhancing social interaction and verbal communication. This is supported by researches as play therapy helps children with autism in learning appropriate behavior, task completion, turn taking, building relationships, imitation, appropriate language, and tolerance to a variety of ways to play with toys, reciprocal interaction¹⁸. Different art activities helped in improving social interaction, enhancing expression, building concentration, cognition and pre writing skills of the child. These results are further supported by previous researches as studies have shown that art therapy helps in enhancing social interaction¹⁹ and facilitated cognitive growth¹¹. Music therapy was used mainly as reinforcement, as it provides a safer mode of expression to the child. He repeated different poems which helps him in developing his vocabulary. Music also helped in improving his social interaction and attention span as he completed different activities with interest and proper attention when music was provided as reinforcement. Results are further supported by research that music therapy is effective in withdrawing children from their inner world²⁰.

Speech and language therapy helped in improving child's receptive and expressive language, such as understanding commands, conveying his needs. These results are in accordance with the researches that speech therapy has the maximum efficacy if started earlier in life. A survey found that only 12% were totally nonverbal by age 5, so with appropriate interventions there is reason to hope that children with autism can learn to talk, at least to some extent²¹. Occupational and sensory integration therapy helped in overcoming children sensory and occupational issues. Child showed considerable improvement in sensory integration processing, in fine and gross motor skills. Child showed good auditory processing, improvement in visual tracking, sustaining focus during activities and recognition of textures. These results are further supported by research studies that children with ASD have higher level of sustained focus during and after the implementation of SIT¹⁰.


CONCLUSION

In nut shell it is concluded that implementing multiple interventions for children with autism spectrum disorder proves to be helpful in improving their socialization skills, language skills and in minimizing restricted and repetitive behaviors. A multidisciplinary approach

must be incorporated in school and home settings as well.

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