We are IntechOpen, the world's leading publisher of Open Access books
Built by scientists, for scientists

6,900
Open access books available

186,000
International authors and editors

200M
Downloads

154
Countries delivered to

Our authors are among the

TOP 1%
most cited scientists

12.2%
Contributors from top 500 universities

CLARIVATE ANALYTICS
BOOK CITATION INDEX
INDEXED

WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Early Intervention of Autism:
A Case for Floor Time Approach

Rubina Lal and Rakhee Chhabria

Additional information is available at the end of the chapter

1. Introduction

Autism is a developmental disorder that affects a child's perception of the world and how the child learns from his or her experiences. Even among the most complex disabilities, autism remains an enigma. Autism is the frequently occurring form of a group of disorders known as Autism Spectrum Disorders (ASD). The term Autism Spectrum Disorders (ASD) covers diagnostic labels which include Autistic Disorder, High Functioning Autism, Asperger's Syndrome, and Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS).

Autism Society of America [1] defines autism as a complex developmental disability that typically appears during the first three years of life and is the result of a neurological disorder that affects the normal functioning of the brain, impacting development in the areas of social interaction and communication skills. Autism has also been defined as a neurological disorder characterized by qualitative impairment in social interaction and communication as well as the presence of restricted, repetitive, and stereotyped patterns of behaviors, interests and activities [2]. Children with ASD share the social and communicative symptoms which are the core of autism, but they vary in severity of symptoms and in level of functioning.

The first three years of life are critical to a child's development. Parents take their child to the pediatrician, during this period for general health check up, screening and vaccinations. Although child with autism can be screened by 18 months by a pediatrician, parents often are the first ones to suspect behavioral deviations in their child. The mean age for such screening is approximately 15 months and in some cases it can be as early as 11 months [3]. According to the parents, children manifest patterns of extreme reactivity, either by getting upset when new stimulus is shown or by completely ignoring it. The infants often fail to copy verbal behavior of others and do not babble by 12 months.

Research reports a significant difference between age-matched infants with autism and typically developing infants with respect to visual attention to social stimuli, smile frequency, vocalization, object exploration engagement, facial expression, use of conventional gesture, and pointing to indicate interest [4].

Identifying autism in toddlers is a recent practice. A large number of children have been diagnosed reliably at 2 years. Professionals can now predict autism from the behaviors observed in a child younger than 2 years. Providing therapeutic intervention at this age would improve developmental and adaptive outcomes. The global trend in early intervention of autism is to provide training to parents so they can help the children develop in key areas of social responsiveness, attention skills, early communication skills, and interactive behavior.

2. Autism and social behavior

Difficulties in social relationships and interactions have been the defining features of autism. Hence, the need to understand the nature of these difficulties and to find effective treatments for them has been central to autism research and educational practices [5]. Unlike neuro-typical children who learn how to be social and interactive by watching how others talk, play and relate to each other, enjoy the give-and-take of social engagement and initiate, maintain and respond to interactions with others, children with autism often do not show the expected development of early social interaction skills. They are often socially avoidant, socially indifferent and awkward. Autistic children avoid social contact by having a tantrum or running away from people who attempt to interact with them. They seek social contact with people only when they want something. Factors that may affect development of social behavior are described below.

- Theory of Mind: Many children with autism also show profound empathy deficits. They develop a limited appreciation or no appreciation at all, of other people's feelings and ideas. They don't recognize and respond to faces as do normal children, and they thus do not learn that each face belongs to an individual separate person. To the severely autistic child, his/her own feelings and ideas are the only feelings and ideas that appear to exist. Autistic children may have no reaction to another person's crying, for example. They may have no idea that their words and actions affect other people. Many autistic children are completely unaware of their surroundings and other people in their surroundings. It is impossible for some autistic children to take another person's perspective without deliberate training. For individuals with autism, it does not come naturally to consider other people's perspective. This makes it difficult for them to understand how others think and feel [6]. Clinicians and researchers call this inability to consider other's perspective as deficit in *theory of mind.* Theory of mind, the ability to attribute mental states to self and others in order to understand and predict behavior, is an area of weakness among individuals in the autism spectrum. The development of theory of mind begins in infancy, as does the shift from the typical course that is seen in children with autism spectrum disorders. While the peak in theory of mind development occurs in typical children from the

age of 3 to 4, mental state understanding in individuals within the autism spectrum often continues to be conspicuously absent throughout the lifespan and leads to significant social and communicative challenges.

• Play Behavior: Play is considered a key social behavior. Children play, regardless of age, so this is a behavior that is typically found in the behavioral repertoires of all children. To teach play to children with autism is to teach them skills that other typically developing children have and give them a common ground, a common language to engage with others. Play phases occur in developmental stages that typically developing children go through, so play is not only for fun, but for a purpose. Children learn about social interaction and language through play. As children with autism have trouble in symbol use and joint attention, understanding another's perspective, participating in pretend play and using imitative skills are difficult for many of them. They are more self-centered than self-ish. When involved in joint play, there can be a tendency to impose or dictate the activity. Social contact is tolerated as long as other children play their game according to their rules. Children with ASD play in a 'bubble' and can resent other children intruding into their activity. They prefer to be left alone and continue their activity uninterrupted. There is a strong preference to interact with adults who are far more interesting, knowledgeable and more tolerant and accommodating to their lack of social awareness. It is often hard for them to enter into play with other children, maintain that play, and be appropriate. The children do not see themselves as members of a particular group and follow own interest rather than that of other children in the group. In fact, while other children have mastered the rules of simple childhood games, these children may not understand what is expected of them in team sports. They are often not interested in competitive sports or team games. Even understanding basic turn-taking may elude them. Most of them are unable to comprehend how or why one would have a sense of satisfaction in knowing that one's opponents felt inferior.

• Comprehending Emotions: Inability to empathize with people may be misinterpreted as a complete lack of the ability to care for others. It is more often a lack of *understanding of emotions*. The child is either confused by the emotions of others or has difficulty expressing own feelings. The child does not display the anticipated range and depth of facial expression. As interaction continues, one is aware that the child is not recognizing or responding to changes in the other person's facial expression or body language. Hands may be moved to describe graphically what to do with objects or express anger or frustration, but gestures or body language based on an appreciation of another person's thoughts and feelings- e.g. embarrassment, consolation or pride- are conspicuously diminished or absent [7]. Subtle clues may not be recognized by a child with Asperger's Syndrome. The child can then be confused and offended when criticized for not complying with the signals of hidden intention. Not only are there problems with the understanding of the emotional expressions of others, but the child's own expression of emotions are unusual, and tend to lack subtlety and precision. A complete stranger may be given a kiss on the lips, or distress is expressed quite out of proportion to the situation. Sometimes they cannot express their anger appropriately. When they are anxious or

stressed, they may not be able to let others know how they are feeling and may react violently or aggressively. Additionally, appropriate social interaction in autism is hampered by a tendency to become fascinated by special interest that dominates the child's time and conversation, and the imposition of routines that must be completed. The interest is a solitary pursuit and not that evinced by age peers. A lack of completion of the activity in a routine can lead to distress and anxiety. Researches indicate that insistence on completing an activity in a particular way may be the child's attempt to find patterns and look for rules and organization within environment [8]. Once a pattern has emerged it must be maintained. Thus, establishment of a routine ensures that there is no opportunity for change. As social situations are inherently dynamic, this adherence to routine and limited interest deeply impacts the child's ability to be socially active in appropriate manner.

3. Early intervention

Early intervention (EI) is a system of services provided to children who are disabled, have delayed development or are at risk of delayed development, from birth until about five years of age. To help children with autism it is essential to focus on the earliest years of development, since this is a critically important time for early learning which powerfully affects the child's future life course.

Early intervention, also known as early childhood education, provides a support system for children with developmental disabilities and their families. Early intervention may start as soon as it is evident that the child has a developmental disability or is at risk of acquiring it. The early intervention services ensure that infants and pre-school children develop the core skills in physical, cognitive, communication, socio-emotional and self help domains. Early intervention (EI) services are coordinated so that they enable child's growth and development and support families during the critical early years. For the family, such services help in overcoming the feelings of isolation, stress and frustration, and reduce the cost of providing for special education, rehabilitation and health care needs of the child. EI services follow a multidisciplinary approach, with a variety of therapists and teachers working in collaboration to improve the child's prognosis in every area of development.

To help children with autism it is essential to focus on the earliest years of development, since this is a critically important time for early learning which powerfully affects the child's future life course. The children are actively engaged in an instructional program three to five times a week, through the year. It involves planned intervention organized around relatively brief periods of time for the very young children so that they may receive sufficient adult attention. Since children with autism find it difficult to work in large groups, the EI services for them should follow a structured program of one-on-one training or training in small groups to help attain individual goals.

EI is the most dynamic and critical period in the treatment of autism for one very simple reason: the younger they are, the more 'elastic' their brains are [9]. Recognizing and diagnosing autism before pre-school age has been uncommon until the last few years. But increas-

ingly autism is being identified very early in development. It has been shown that diagnosis can be valid and reliable at 2 years of age, and signs can be recognizable and predictive of autism even from early in the second year of life. In future it is likely that autism will be diagnosed for most children in the toddler age period [18 - 30 months). Very early therapeutic intervention is likely to improve developmental and adaptive outcomes. Trials of early intervention need to focus on training parents to work with their very young children in the key areas of social responsiveness, attention skills, early communication skills, and interactive play. The findings of a study by Ivar Lovaas [10] on early behavioral intervention of children with autism in 1987 showed a significant gain in IQ and that 49% of children who received EI were mainstreamed in regular classrooms.

The guidelines for best practice in early intervention for children with autism [11] recommend the following:

- Preparation: All children on entering intervention programs should have had a comprehensive, multidisciplinary diagnostic assessment from an interdisciplinary team of experienced clinicians and based on national and internationally agreed criteria. Diagnostic evaluations should include interviews with parents/care givers to review the child's developmental history, family history, previous assessments and interventions; collection of information from all professionals involved in the care of the child; paediatric, psychological, and speech pathology examinations to assess communication, relevant health conditions including motor skills, vision, and hearing, and any associated problems such as intellectual disability and anxiety. Additionally, direct observation of the child is important in the assessment of cognitive, social, and communicative (verbal & nonverbal) domains, fine and gross motor, and adaptive functioning using both standardised tests and informal procedures.

- Timing: Intervention should begin as early as possible in the child's life. Since a child at risk of autism can be screened by 16 months the intervention may start immediately.

- Process: All children should have an Individual Family Service Plan (IFSP), for their education, designed to best fit their and their family's needs and strengths, developed in consultation with parents, and reviewed and revised regularly in light of the child's progress and ongoing needs.

- Intensity: Ideally the intervention should be provided for 20 hours a week for two years, with continuing support into, and through the school age years.

- Content and Focus: The content should be autism specific and include teaching joint attention skills, play, and imitation skills; building communication through Alternative and Augmentative Communication (AAC) techniques such as pictures, symbols and signs; developing social interaction and daily living skills; and management of sensory issues and challenging behaviors.

- Settings: The intervention should be delivered in various settings, individually and with peers. Implementation should happen both at the centre and at home. Including age peers

with no disability enhances the quality but it should be done so that peer interaction is adequately supported.

- Program Design and Methods: A high degree of structure in the program is essential, i.e. well organized, regular and predictable, focused on specific objectives, and consistently managed. A supportive teaching environment with modeling, prompting, praise, shaping, and generalization strategies will maximize learning.

- Challenging Behaviors: A functional approach to modifying challenging behaviors includes positive behavior support that consists of teaching alternative appropriate behavior and communication skills to replace challenging behaviors.

- Personnel: Teachers and therapists should be adequately trained in working with children with autism and have knowledge and skills required for their special needs.

- Family Collaboration: Parents need information about autism and services, especially at key times like first diagnosis and school entry. Programs should include parent involvement, such as provision of support, counseling, and parent education to help the child with play, social, and communication skills development, and with management of challenging and repetitive behaviors

- Research and Evaluation of Program: Evaluation of treatment outcomes should be built into EI programs using systematic assessment of the child's social, cognitive, and adaptive functioning before, during, and at the end of the program. Regular and systematic documentation of program process and outcome helps in evaluation.

Collaboration with family or parents is a component of best EI practices. Parents of children who have autism play an important role; they are critical components of the intervention process, without whom gains are unlikely to be maintained. The involvement of parents in implementing intervention strategies designed to help their autistic children has a history stretching back at least three decades [12]. Parental involvement is an integral part of the success of early intervention programs for children with autism. The collaboration between the parent and the professional working with the child in the program is critical to the effectiveness of programs.

Traditionally, the EI for autism has been premised on the use of applied behavioral methods such as discrete trials. However, at times parents find the structure, organization and protocol of behavioral intervention difficult to implement and maintain. Consequently, the program receives inadequate follow up in the child's home. There is a need for interventions that do not require a rigid structure and ensure parental involvement. Hence, in the recent years, EI practices for autism have seen a shift from behavioral methods to developmental approaches.

4. Developmental approach

In a developmental approach, development of a child with autism is compared with the developmental sequence seen in non-disabled children. Early childhood assessment tools are

used to determine the patterns of typical development. The skills that the child demonstrates are indicative of his or developmental level. The intervention goals are set for the skills the child failed or partially accomplished during assessment. A developmental approach to intervention is also referred to as child centered approach in which the adult follows the child's lead. It uses materials and activities that suit the child's level in a given area of development. The materials are provided to the child, and the adult facilitates the child' interaction with them so that the child moves towards achieving the pre-set developmental goal. But it is the child's initiative with the material or activities that serves as guideline for the adult's interaction. For example, if a child picks up a toy, the adult may show what can be done with it by demonstration and prompts. Child's preferences decide what should be selected as material, and the adult plays a supportive role to encourage the child's interaction with the material. Unlike the behavioral methods, developmental approach does not require the child to interact with material or carry out an activity in a pre-specified structured manner. The consequences of such interactive behaviors are reinforcements that occur naturally in child's environment. The reinforcements may be internal, such as, happiness at being able to complete a task successfully.

5. The DIR model and floor time

The Developmental, Individual, Relationship-based (DIR) Model, designed by Stanley Greenspan in 1989, provides a framework to understand the functional emotional development and unique profile of every child, and a guide to create emotionally meaningful learning interactions that promote critical functional emotional developmental capacities. The objectives of the DIR Model are to build healthy foundations for social, emotional, and intellectual capacities rather than focusing on skills and isolated behaviors [13]. The DIR describes six milestones as crucial to a child's development. Parents and professionals involved with the child must comprehend how the milestones affect a child's emotional and intellectual growth. The six milestones, namely, Self regulation and interest, Intimacy, Two-way communication, Complex communication, Emotional ideas, and Emotional thinking, are explained below. Individual difference is the unique biologically-based ways each child takes in, regulates, responds to, and comprehends sensations such as sound, touch, and the planning and sequencing of actions and ideas. While children may be very hyper sensitive to touch and sound, others may be hypo sensitive, and still others seek out these sensations. Relationship is described as the learning relationships with caregivers, educators, therapists, peers, and others who tailor their affect based interactions to the child's individual differences and developmental capacities to enable progress in mastering the essential foundations.

Floor time, is central to the DIR model of early intervention. It enables professionals and parents to assess and implement intervention programs that address the unique developmental needs of children with autism. The major element of this approach entails that (a) professionals do floor time with the child (b) parents observe floor time being done with their child, and (c) parents change their style of relating to the child with regard to a given milestone. Floor time is a systematic way of working with a child with autism to help him or

her climb the developmental ladder. Floor time intervention aims at taking the child back to the first milestones that the child may have missed in the process of development. With the help of the therapists and parents the child works towards achieving the milestones. This is done through intensive one to one sessions for which parents share equal responsibility with the therapists. According to the DIR/Floor time framework, due to individual processing differences, children with autism do not master the early developmental milestones that are the foundations of learning. Floor time [14] describes six core developmental stages that children with autism have often missed or not mastered:

- Regulation and interest in the world: Infants try and process what they see, hear, and feel. They respond to pleasant face and soothing voice. They learn to enjoy, understand and, use the pleasant feelings and sensations to calm themselves. This helps them learn to take in and respond appropriately to the world around them. This ultimately develops the ability to self regulate.

- Engagement and relationship: Babies learn to bond with their parents very soon. They recognize the parents' face and voice, and want to touch them or be close to them. They enjoy being cuddled and loved by their parents. This process of bonding also builds a relationship of trust between babies and their parents. This trusting relationship enables the child to become a well-adjusted adult later in his or her life. It also forms a stable base for all future relationships. The baby learns that relationships with people can be joyful.

- Two-way communication: Once relationship with parents is developed, the baby realizes that he or she can have an impact on parents. The baby's smile can produce a smile from the parents. If the baby reaches out to mother, she picks him or her up. The baby learns that adults can understand and respond to its communication intents and feelings. A dyad of communication starts slowly. When the baby looks at the mother and reaches out to her – the mother responds by giving eye contact and a hug. In turn the baby may smile, vocalize or touch the mother. Thus a non-verbal dialogue or a two-way communication process may be completed. The baby soon transfers this new ability to other things in the environment. He bangs a toy, it makes a noise, and if he drops his bottle, it breaks. His actions can have an impact not only on his parents but others too. Hence, two-way communication helps babies to learn about them and about the world.

- Complex communication: The non-verbal two way communication slowly becomes complex in nature. While earlier the baby was initiating or responding to a communication by a simple gesture of reaching out or smiling, now he may run towards the mother, and squeal with pleasure. Anger and displeasure may be expressed by pulling, kicking and grabbing or throwing things. Similarly, hugs and kisses are used to express affection. Since, the baby is ambulatory by now, he may take the parent by hand and show them what he wants. Complex communication ability also aid development of creativity. The toddler adds his own ideas to the games that parents play with him. This leads to the emergence of the child's own personality.

- Emotional ideas: Play is a fertile ground for ideas. Using toys and playthings, a child creates a world where toys play roles. So, a teddy is a friend, a doll is a baby and a shoe box

is a car garage. This idea-filled play provides a strong basis for language development. Besides learning to label things, the child now uses dialogue during play with help of the parents. Eventually, he is able to manipulate the ideas to meet his needs. When hungry, he can ask for food; if he needs help he can call his mother instead of crying. He learns about object permanence - that although not visible to him, object do not disappear. Hence, he can feel secure thinking about his parents even when they are not with him. With this ability to use symbols, the child moves on to a higher level of communication and awareness.

- Emotional thinking: When he reaches this stage, a child is ready to connect various ideas into a logical sequence. While in the previous stage he was able to carry out symbolic activities, such as dressing a doll, and banging a toy car into another to simulate a crash, the child is now able to think emotionally. He may dress up the doll for a car ride. At this stage, the child is able to express a wide range of emotions, and through this learns to recognize self. The child now comprehends concept of space and time at a personal level. For example, the child understands that grandmother's house is different from his own, or that if he grabs another child's toys, his own favorite car may later be taken away by that child. The child, by this time, is fully verbal and can use words to express ideas and feelings.

5.1. Floor time method

A typical floor time session is conducted in a child's naturalistic environment and requires the therapist or parent to sit on the floor and work with the child. The purpose is to help the child achieve the stages of development, by taking him back to the milestones that he may have missed. During a session, the parent or therapist follows the child's lead. This helps in establishing relationship between the child and the adult. It is this relationship that slowly enables the child to develop the basic social, emotional and communication abilities. During a floor time session the child learns to engage with others, initiate actions, make own wishes and desires known and the realization that his actions can elicit responses from others. Floor time creates opportunities for children to have dialogues, which are called circles of communication, first without words and later with them, and eventually to imagine and think. Since floor time sessions are child-centered, the activities are motivating to the child as it is he who has chosen them. Additionally, the selecting the child's natural environment for the session also contributes to calming him and improving his comfort level. A floor time session follows the steps given below.

1. Observation: Before starting a session, the adult observes the child. This requires watching the child while he is in the room, observing what interests him, assessing his level of interaction – is he running around or is he sitting quietly. This observation helps the adult determine the child's current emotional state.

2. Approach: Once the adult understands the child's level of emotional functioning, he or she joins the child in whatever the child is doing. If the child sits and merely twirls a toy, the adult follows this play behavior. However, the adult adds value to it by label-

ing the activity in gestures and words. The adult also uses appropriate facial expression and tone of voice to convey own enjoyment in what the child is doing. Such measures enable the adult to open the circle of communication with the child

3. **Child's Lead:** During a floor time session, the child is the director or leader of activities. The adult's role is to follow the child. The aim here is to support the child's activities and initiatives, and through this to take him to a higher level of emotional functioning.

4. **Expand Ideas:** As the sessions progress, the adult builds on the child's play initiatives. Now the adult associates daily experiences with the experiences during the play activities. For example, the adult may say "give teddy a bath, like mommy gives you". This planned expansion and addition to child's activities help in development of emotional ideas.

5. **Close Circle of Communication:** Once the adult engages the child at a level the child currently enjoys, enters the child's activities, and follows the child's lead, he or she now attempts to move the child from a mutually shared engagement toward more increasingly complex interactions, a process known as "opening and closing circles of communication." In a circle of communication, the adult opens the circle by approaching the child, and the child closes the circle by giving a reaction to the adult's comments and gestures. During session many circles may open and close in quick successions as the adult interacts with the child. The process leads to two-way communication.

6. Research support for floor time

The Floor time approach examines the functional developmental capacities of children in the context of their unique biological profile and their family relationships and interactive patterns. A longitudinal study [15] was conducted to determine if children with ASD could overcome the core deficits in social behavior and become empathetic and reflective with floor time intervention. A follow-up study of 16 children diagnosed with (ASD) revealed that with the DIR/Floor time approach, a subgroup of children with ASD can become empathetic, creative, and reflective, with healthy peer relationships and solid academic skills. This suggests that some children with ASD can master the core deficits and reach levels of development formerly thought unattainable with a family-oriented approach that focuses on the building blocks of relating, communicating, and thinking [16].

In another study undertaken by Greenspan and Weider [15] where the progress of 200 children who had earlier received Floor time sessions, was reviewed showed that majority of the children learned to relate and engage with warmth, trust and intimacy; they were able to interact, read and respond to social signals; a subgroup of children developed the capacity for imaginative play, creative use of language and reflective thinking. This sub group was included in mainstream schools where the children developed meaningful relationships with peers.

Josefi and Ryan [17] conducted a case study on a 6 year old boy with severe autism. Video recordings of 16 sessions of play therapy with the child were analyzed qualitatively and quantitatively. The study concluded that this child was able to enter into a therapeutic relationship and demonstrated attachment behavior towards the therapist. Key areas of improvement were in the child's development of autonomy and pretend play, while ritualistic behaviors showed only mild improvement. Changes were also noted in the boy's behavior at home of increased independence and empathy. One implication of this preliminary research is that non-directive play therapy may enhance and accelerate emotional/social development of children with severe autism.

Children with ASD differ from one another—in the ways they engage, relate, and communicate and in the ways they respond to sensations, and plan and sequence their actions. These differences mean that each child requires an intervention approach tailored to his uniqueness, an intervention that must also consider the home setting. According to Costa and Witten [18] the goals of such a program, regardless of the approach used, must be to strengthen the child's core deficits, namely: building the foundations for relating, communicating and thinking. The DIR/Floor time Model is especially beneficial to children with ASD and other developmental and/or emotional challenges.

Solomon et al [19] published an evaluation of The PLAY Project Home Consultation, a widely disseminated program that trains parents of children with autism spectrum disorders in the DIR/Floor time model. Sixty- eight children, 2 to 6 years old (average 3.7 years) completed an 8–12 month program where parents were encouraged to deliver 15 hours per week of 1:1 interaction. Pre/post ratings of videotapes by blind raters using the Functional Emotional Assessment Scale (FEAS) showed significant increases in child subscale scores. That is, 45.5 percent of children made good to very good functional developmental progress. Overall parents' satisfaction with program was 90 percent.

7. Method

The study was experimental in nature and employed a pre-test post-test control group experimental design. It was conducted on children with ASD residing in Mumbai, India. The objectives were to determine the efficacy of floor time approach for developing social behavior in pre-school children with ASD, and to compare the levels of social skill achievement by children who received floor time intervention with those who did not.

7.1. Subjects

Children with ASD within the age group of 3 to 6 years were randomly selected from five pre-schools and intervention clinics located across the city and suburban areas of Mumbai. A total of 26 children participated in the experiment. After selection the children were randomly assigned to treatment and control groups so that both groups had 13 children each.

7.2. Instruments

The Behavioral Scale for Social Skills (BSFS) and Floor time intervention were the primary instruments used in the study. They were developed for the purpose of the research. A brief description of both is given below.

- Behavioural Scale for Social Skills: The BSFS was used as a measure at both pre and post tests. The instrument measured social behaviour under 4 domains –

a. Turn taking: This is one of the bases for development of social skills and inferring others' intentions correctly [20]. Turn taking includes use of play material with an adult and with peers.

b. Two-way communication: As a child enjoys intimacy in a safe and calm manner, he realizes he can have an impact on others. The child expresses a feeling or intention, and his partner responds. This is the beginning of communication. Two-way communication enables the child to enjoy intimacy and initiate interaction through gestures at first and then with words.

c. Understanding of cause and effect: This is a basis for development of thinking skills. The ability to see the relationship between an event and the factors leading to it helps a child decode the world around him. Understanding of cause and effect relationship improves by providing the child the opportunity to explore the environment.

d. Emotional thinking: According to Greenspan, emotional thinking is the ability to build bridges between ideas to make them reality-based and logical. Ideas are linked together into logical sequences and play, and imagination is also more rational.

The BSFS had a total of 20 items. Each item was measured on a 4-point scale based on the category of response, namely, correct response; response with verbal prompt; response with gestural prompt; and response with physical prompt. Whereas correct responses were scored as 4, responses with physical prompts were scored as 1. The selection of items under each sub head of BSFS was done after detailed discussions with developmental psychologists, pre-school teachers, and many parents. In addition, several observations of pre-school children with and without ASD were also made for selection of items. The instrument was pilot tested on children with ASD belonging to the same age group as the subjects.

- Floor time Intervention: Floor time is a comprehensive program for infants, young children, and families with a variety of developmental challenges including ASD. The program aims at enhancing the functional emotional developmental levels and creating those learning relationships that will help the child move ahead in social skills acquisition. Floor time can be tailored to suit the individual needs of children with ASD. Floor time approach was used for treatment in the study. As stated earlier, Floor time approach helps an infant/young child reach the 6 milestones crucial for development of social behavior, namely, self regulation; intimacy; two way communication; complex communication; emotional ideas,; and emotional thinking. However, in this study, the treatment was directed toward achievement of 4 milestones – Turn taking (a component skill in intimacy), Two way communication, Understanding of cause and effect relationship (an impor-

tant skill for problem solving that enhances complex communication), and Emotional thinking. Various activities were developed for the purpose of enhancing the target skills. Some of the activities are mentioned below.

a. Turn taking: Here the activities selected were done with the authors and then done with peers. Such activities as building block tower, bead stringing, rolling a ball, and throwing ball in a bucket were used for teaching turn taking skills to children.

b. Two-way communication: Training a child to respond to his name, reach out to a plaything, and respond to non-verbal communication such as gestures, facial expressions etc was undertaken to develop the ability for two way communication.

c. Cause and effect: A series of simple activities were done to explain the relationship between an outcome and its cause. Tapping a spoon on a surface, shaking a bell, pressing a toy to produce sound or movement, squeezing a wet sponge, opening a transparent box to obtain a desirable object within, etc. were undertaken to help the children establish the connection between a cause and its effect.

d. Emotional thinking: Pretend play was primarily used for this purpose. Hence, pretend play such as talking on telephone, dressing or feeding the doll (where the authors would at times play out the doll's emotions in the right tone of voice), and playing a shopkeeper etc. were included. The focus was on recognition of emotions. Thus, flash cards of happy and sad faces were used too during the pretend play so that the child was able to understand what did it mean when the 'doll' was 'crying' or the the shopkeeper was 'happy'.

7.3. Procedure

The intervention started after assessing the children's baseline behavior on BSFS. The 26 children were then randomly assigned to experimental and control groups so that both groups had 13 children each. As per the recommended floor time protocol, the researchers observed each child in the experimental group to determine his or her current emotional level, before the commencement of intervention. Each child in the experimental group received 20 sessions of floor time intervention. Each session was of 30 minutes duration. Each session included at least one activity relevant to the pre selected social skills. The sessions started by getting the child's attention by showing a desired object. The researchers used word and simple phrases to describe each activity. The activities were done as given below, and parents were encouraged to observe the sessions.

• Building a block tower began by demonstrating how to make a tower from the four blocks provided on the floor. The child was then asked to lay a block over the one put by the adult. Subsequently, the adult would put another block over it. The adult would then prompt the child to take his or her turn to put a block on top. The activity was repeated with a peer. Now the peer would take the adult's role. The adult would call out each child's name and say ' your turn now ', as they put one block over the other to make a block tower.

- A number of colorful beads were placed on the floor along with a string for the bead stringing activity. The task was first demonstrated, and then used to encourage the child to take turn with an adult and later with a peer in slipping a bead through the string.

- The ' ball rolling ' activity was done by rolling the ball to a child and asking him or her o roll it back to the adult. In case of 5 or 6 year old children, a slight variation was made. The activity was introduced with a peer. Both the child and peer were asked to take turns in throwing the ball to the adult and to each other.

- Throwing the ball in the bucket required that the child identify the bucket first. Subsequently, the task was demonstrated before the child taking turn with the adult and with peer to throw a ball in the bucket.

- Cause and effect activities such as ringing a bell (to produce sound), squeezing a sponge (for water to drip), and opening a box (to get what is inside) were demonstrated and subsequently, taught with prompts and cues. Some fun activities such as blowing soap bubbles were also included as soap bubbles excited the children.

- Calling out the child's name, seeking his attention by showing a preferred object or toy helped in initiating two-way communication. Preferred activities served a dual purpose. They could get the child's attention, but they were also helpful in teaching the child a way to communicate. The adult would have a picture of the preferred activity or toy. The child would be asked to point or pick up the picture in order to get the activity. The adult also used facial expression cards to help the child understand what each expression meant.

- Pretend play was a strong medium for teaching emotional thinking. Pretend play was encouraged using a variety of toys such as dolls, telephone, car, kitchen set, and doctor set etc. The adult would pretend to call the child, and ask the child to pick up the phone and say something. While the child was holding the doll, the adult would prompt him or her to hug and kiss the doll. If the child put the doll away, the adult would convey in appropriate tone and affect how sad the doll was feeling. The child would then be prompted to hold the doll again.

- Taking the lead from the child, the adult would stand at the window if the child was standing there. The adult would then softly describe what they could both see.

- Though all activities were pre-planned, the adult would at times digress to include activities that suited the need of the child on a given day.

While the experimental group children received floor time intervention, the children in the control group received the usual early intervention sessions provided in their educational settings. Post intervention, BSFS was administered again.

Figures 1 to 7 illustrate some of the floor time activities done with the children.

Figure 1. Block tower activity

Figure 2. Picture matching

Figure 3. Getting a child's attention

Figure 4. Pretend play with doll

Figure 5. Teaching facial expression

Figure 6. Choice of play things

Figure 7. Activity with peer

8. Results

The study was conducted to establish the efficacy of floor time for development of social behavior in pre-school children with ASD. The children who received intervention showed a qualitative change in their interactive behavior. A comparison of their composite mean score on BSFS at baseline with that at post intervention showed a significant difference. The data was analyzed using t-test, as the selection of children was random. Table 1 presents the details.

	Mean	N	df	t-value	Significance
Pre test	34.92	13	12	9.56	p< .0001
Post test	48.38	13			

Table 1. Comparison of Composite Mean Scores on BSFS at Pre and Post Tests

The statistical analysis of data indicated the overall effectiveness of floor time. The average score on BSFS at baseline [34.92] increased post intervention [48.38]. This increase was significant as evident from the obtained t-value [9.56, p<.0001]. That the intervention was effective for all children in the group may be seen from Figure 8 which shows the performance of each child at pre and post intervention conditions
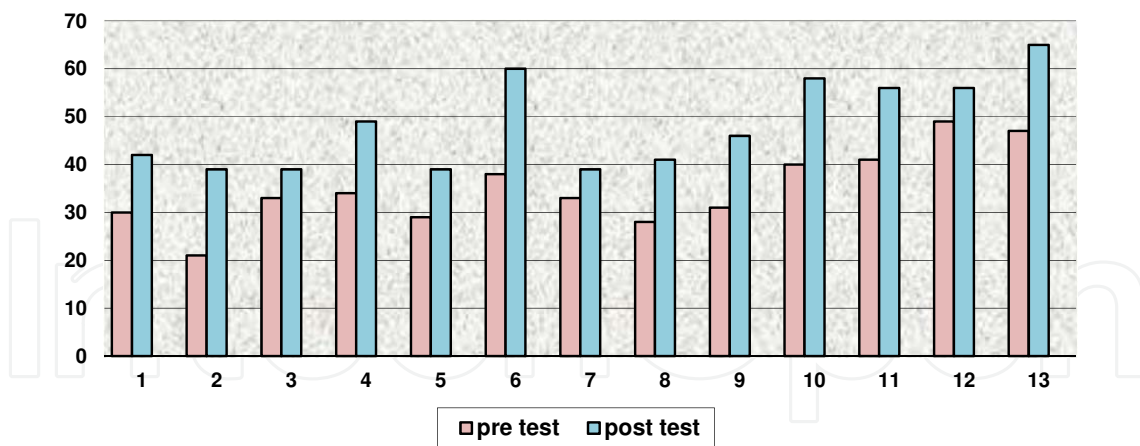
Figure 8. Comparison of individual performance on BSFS

From Figure 8 it is evident that floor time intervention enhanced the social behavior of children, though some gained more from the treatment than others. This variance may be due to initial intra group differences in the children's functioning levels.

Children's scores on selected components of BSFS of turn taking, two way communication, cause and effect and emotional thinking were analyzed individually. On Turn taking skill, the baseline mean [12,38] was significantly lower than the mean score [17.69] post intervention. The derived t-value [5.02] was statistically significant (p<.0002]. An illustration of each child's performance on turn taking skill is provided by Figure 9.

Figure 9. Comparison of individual performance on turn taking

It is evident from Figure 9 that the treatment was effective for all children in the experimental group. All of them gained significantly, except child no. 7 who showed a marginal improvement only. The children's ability to understand the relationship between cause and its

effect also improved. Their mean performance on this sub skill post intervention [13.30] was higher than the baseline [8.61]. The derived t-value was significant [7.17, p<.0001]. Each child's performance on cause and effect is depicted in figure 10. The data indicates the effectiveness of floor time as a method to develop the understanding of cause and effect relationship in children with ASD.
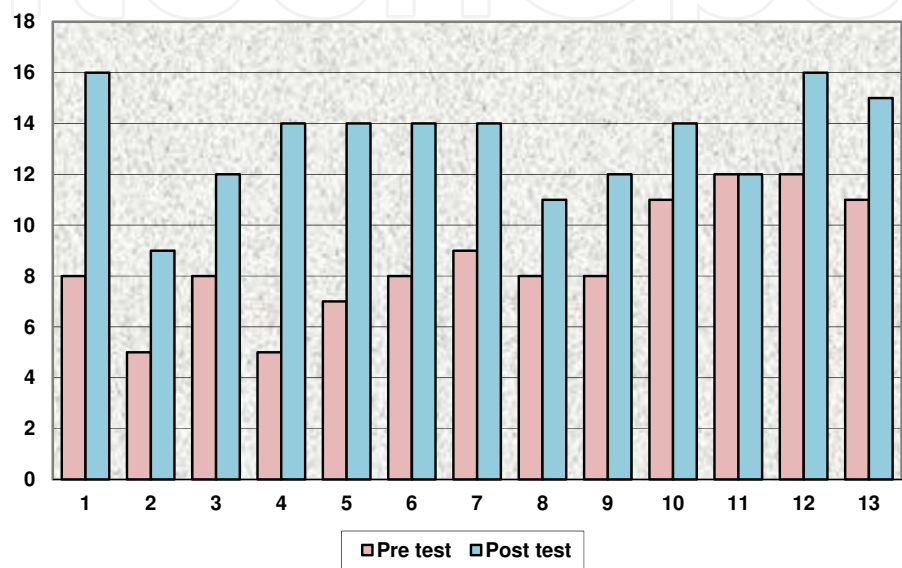

Figure 10. comparioson of individual performance on cause and effect relationship

When performances on two-way communication skills were compared, a similar trend was evident. The mean score at baseline [6.31] was lower than that post intervention [8.69] and the difference was statistically significant (t=5.72, p<.0001]. Individually too, children improved as may be seen from figure 11. All children gained on the ability for two-way communication.

Lastly, when the data from BSFS were analyzed for performance on emotional thinking, a significant gain was seen in this area too. The difference between baseline mean score [7.38] and post intervention mean score [8.84] was significant (t-value=3.5, p<.004). Though this difference was significant when means were compared, individually all children did not gain from the intervention. Whereas most children showed an enhancement in emotional thinking from pre to post intervention, performance of some remained the same as what it was at baseline. Figure 12 presents the data on emotional thinking. Since, emotional thinking is the last and the most complex of the six milestones; it is possible that these children required more time to achieve this skill than what was given during the 20 sessions of intervention. However, these children improved their performance on the earlier sub-skills of turn taking, two-way communication and understanding of cause and effect relationship.
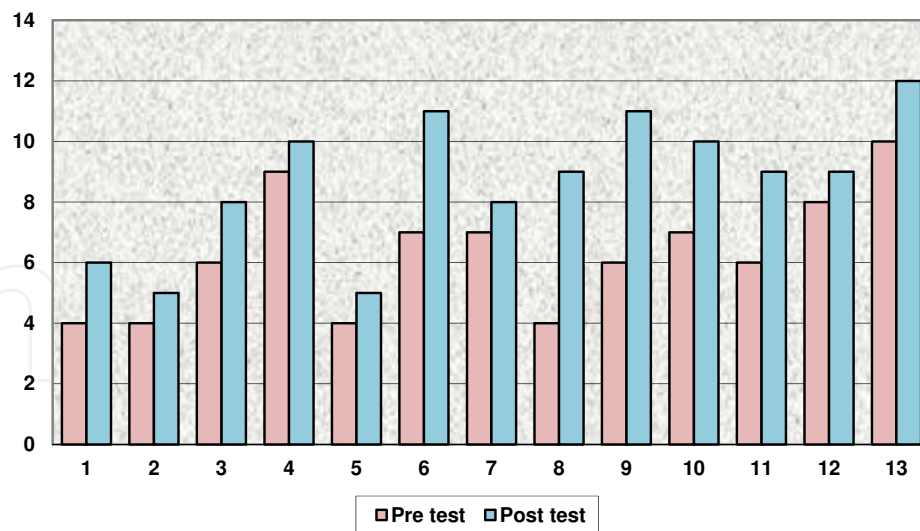
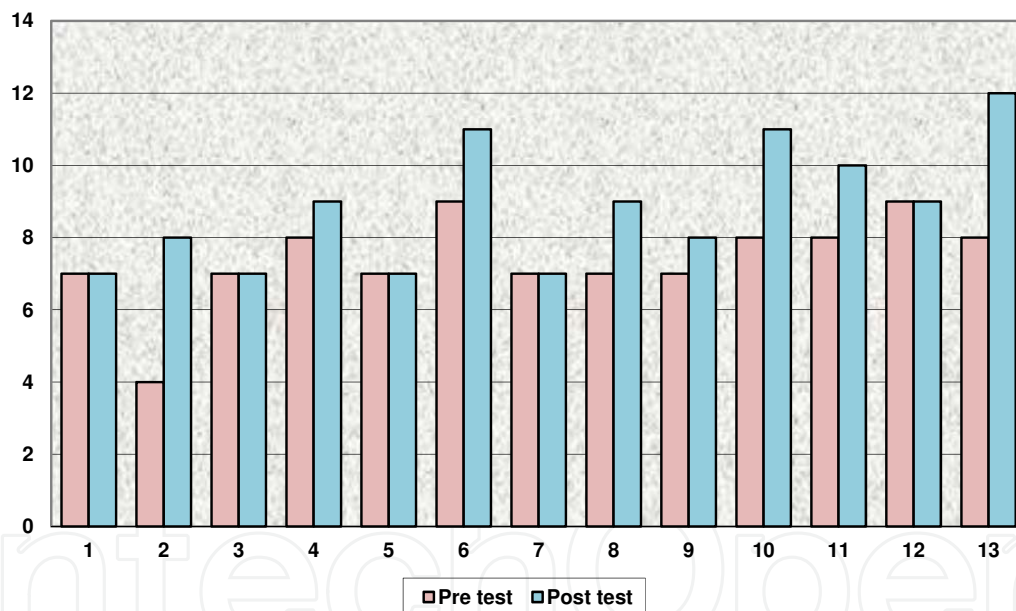**Figure 11.** Comparison of individual performance on two-way communication

Figure 12. Comparison of individual performance on emotional thinking

The second objective of the study was to compare the performance of children in the experimental group with that of those in control group. As mentioned earlier, the participant children were randomly selected from 5 pre-schools and intervention clinics. Hence, when the study commenced all children were on some kind of early intervention program. The study, in effect, determined the efficacy of floor time in comparison with other early intervention strategies. In order to do this, the post intervention performance on BSFS by both groups was analyzed. The mean score of experimental group was compared with that of control group. The data analysis is presented in Table 2.

	Mean	N	df	t-value	Significance
Experimental	48.38	13	24	3.08	p<.0.005
Control	37.46	13			

Table 2. Comparison of Post test performance of experimental and control groups

Comparison of post intervention mean scores of experimental and control groups showed a significant difference between the two, in favour of the experimental group. The resultant t-value [3.08] was statistically significant (p<.005]. This indicated that in comparison to other measures for early intervention, floor time was more effective in development of social behavior of children with ASD. Figure 13 provides a graphic representation of this difference
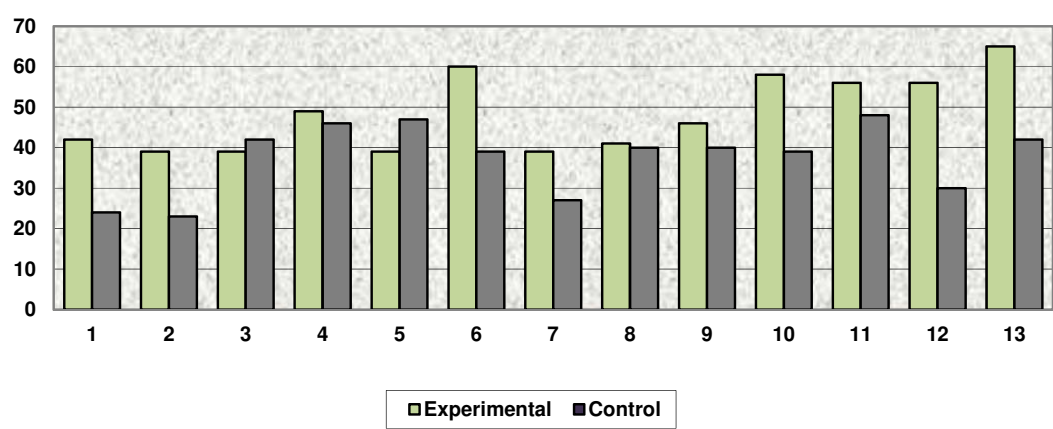

Figure 13. Comparison of post intervention performance of experimental and control groups

It is evident from Figure 13 that except for child no. 3 and child no. 5, all children in experiment group achieved higher scores on BSFS than the control group children. Most children's scored significantly higher than their control group peers. A comparative analysis of both group's mean performance on each sub skill i.e. turn taking (TT), two-way communication (TWC), cause and effect (C&E), and emotional thinking (ET), within BSFS is presented in Figure 14.

The children who received floor time intervention performed better on an average than those who were in the control group. However, the performance gap between the two groups was not uniform across all sub skills. On emotional thinking skill, the average performance of both groups was nearly same with control group's mean less than 2 points below that of experimental group.
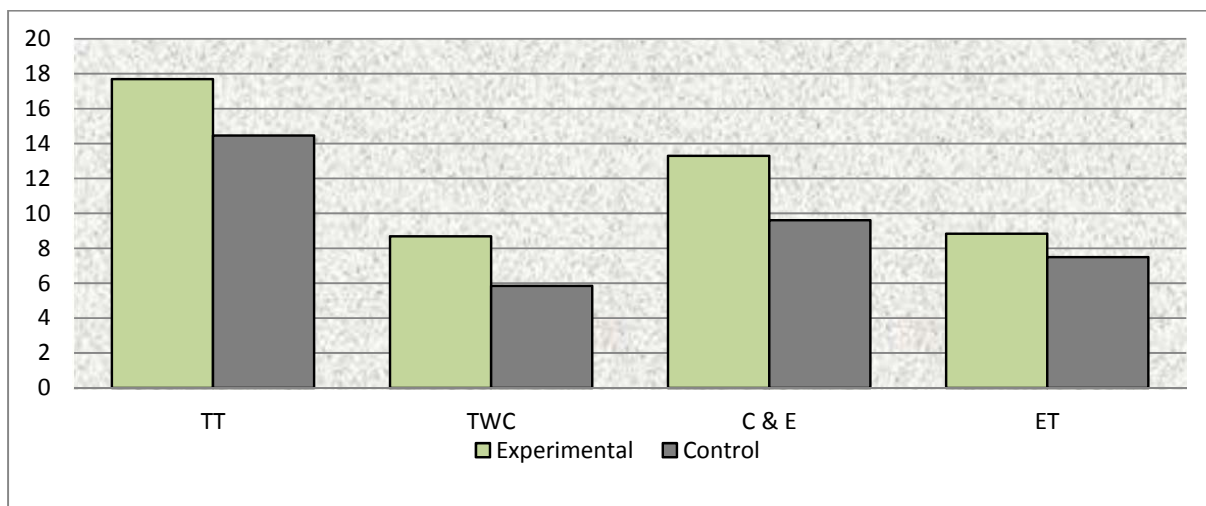
Figure 14. Comparison of experimental and control group on sub skills of BSFS

9. Discussion

Unlike neuro-typical children who learn how to be social and interactive by watching how others talk, play and relate to each other, enjoy the give-and-take of social engagement and initiate, maintain and respond to interactions with others, children with autism often do not show the expected development of early social interaction skills. Promoting the social development of infants and toddlers with ASD is one of the primary goals of early intervention services, as is facilitating the ability of young children with social delays to develop appropriate friendships. With early and intensive intervention, the seemingly pervasive social skill deficits of many children with ASD can be remediated[21]. To successfully target these important skills, intervention efforts, even within early intervention, should include: (a) regular access to typical peers, (b) thoughtful planning of meaningful social situations embedded throughout the day, (c) the use of "social" toys, (d) multiple-setting opportunities (home inclusive, community-based) to practice emerging social skills, and (e) intensive data collection in order to make midcourse corrections to existing intervention plans [22]. Poor social skills are an impediment to child's success in classroom, and can also be the cause of behavioral problem. Accordingly, teaching social skills is a common educational objective for children who have autism [23]. However, while teaching variables such as age, developmental and functional levels and sensory profile of each should be considered. Floor time which is based on the developmental approach takes care of the child's developmental level and emphasizes building the milestones that the child may have missed during his or her period of growth. Rather than focusing on teaching a child to speak a few words to interact, Greenspan suggests that the child's gestural system should be worked upon first for language to flow in naturally rather than by rote, thus focusing on the developmental ladder. As the child climbs the developmental ladder he or she becomes more and more regulated and forms a

sense of self. In the study the authors chose age and functionally appropriate activities for helping a child achieve the given milestones for social behavior. The individual sessions during which the adult followed the child's lead, prompted and encouraged the child effort to participate, and provided the opportunity to practice the skill with a peer contributed to the significant increase in each child's performance from pre to post intervention on BSFS.

According to the Colorado guidelines [24] early intervention strategies must involve building of positive relationships between adults (parents and caregivers) and the infant or toddler. The intent should be to teach the child that parents and caregivers can be relied on as stable, secure, and safe figures that provide nurturance, comfort, pleasure and guidance. Developing attachments is a challenge for a young child with ASD, so special efforts are required, even when signs of a child's interest are not apparent. This might require that a parent or caregiver identify the activities, objects, settings, and interactions that the child finds pleasurable and provide those events and items to the child contingent on a social interaction behavior (rather than non-contingently in a manner meant to keep a child satisfied without social interaction). A tickle game might be initiated with a child and then interrupted by the caregiver with the expectation that the child look at the adult or repeat a gesture to continue. A key objective of efforts to form positive relationships is to ensure that the interactions are pleasurable and that they are associated with the child receiving input that is consistent with needs and interests. Importantly, successful efforts to form strong, positive bonds when a child is very young result in a subsequent relationship in which an adult has considerable influence over a child's behavior and this influence can be essential for the guidance and instruction that the adult (parent or other caregiver) must provide on an ongoing basis. The floor time intervention addressed the issues mentioned above. Activities selected were simple and manageable for the children. Most activities were demonstrated before the child was required to participate. For children with autism, visually organized tasks are easier to learn [25]. During intervention the adult often provided model/picture of a task to be done e.g. block tower, completed puzzle, picture and symbol cards etc. Intervention sessions were built around child's motivation and interests. Most early intervention programs for children with ASD are based on behavioral approach and use discrete trial training. Though evaluations have shown acquisition of learning and behavioral development in several children [26], behavioral approach does not suit all children and families. Strict protocol of timing, intensity, structure, and quality of therapist training influences the success of behavioral interventions. In contrast, floor time encourages naturalistic interactions to develop the core skills. It takes into account the inherent bonding and affection parents have for the child, and guides the parent to modify and channelize their interactions to suit the developmental level of the child. As stated earlier, the children selected for the study attended pre-school and intervention clinics. Thus control group children also received early intervention while floor time intervention was given to the experimental group. However, the experimental group children performed better on selected social skills at the end of the intervention period. The significantly higher achievement of social skills by experimental group children may be attributed to the child-centric naturalistic interactions that occurred during the floor time intervention.

10. Conclusion

Early intervention is very important for enhancing the development of infants and toddlers with disabilities, and they are especially crucial in determining the future language, social and behavioral outcomes of very young children with ASD [27]. A primary consideration of programs for young children with ASD is to provide an environment that is designed to prevent problem behaviors, promote engagement and participation, and facilitate successful interactions with typically developing peers. Getting the child to engage with materials and activities may prevent challenging behavior occurrence and promote appropriate social behavior [28]. Results of this research support the above findings. Floor time principles state that development begins with a shared world between the caregiver and the young child. The goal is to help the child with ASD emerge from its own world and enter this shared world in order to develop his or her functional and emotional capacities. Floor time achieves this by encouraging child to engage in age and level appropriate play activities with adults and later with peers. The outcomes indicate the effectiveness of Floor time as a method for early intervention of children with autism. The findings of the study may be useful for families who are in need of evidence based and suitable early intervention for children with ASD.

Acknowledgements

Author details

Rubina Lal and Rakhee Chhabria

Department of Special Education, SNDT Women's University, Mumbai, India

References

[1] Autism Society of America (2006). *Defining Autism.* Available from http://www.autismsociety.org (accessed May. 8, 2012)

[2] American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorders (4th ed. TR). Washington DC

[3] Young, R. Brewer, N. Pattison, C. (2003). Parental identification of early behavioralabnormalities in children with autistic disorder. Autism, 7, 125-143.

[4] Volkmar, F. Chawarska, K. Klin, A. (2005). Autism in infancy and early childhood. Annual Review of Psychology, 56, 315-36.

[5] Lal, R. and Ganesan, K. (2011) Children with Autism Spectrum Disorders:Social Stories and Self Management of Behaviour British Journal of Educational Research1(1): 36-48, 2011SCIENCEDOMAIN international

[6] Richard, G. J. (2000). The source for treatment methodologies in autism. East Moline, IL: Lingui Systems

[7] Attwood, T. (1988). Asperger's syndrome: A guide for parents and professionals. London. Jessica Kinsley.

[8] Baron-Cohen, S. (2003a). The essential difference: The truth about the male and female brain. New York: Basic Books

[9] Martin, N. (2009) Art as an early intervention tool for children with autism. Jessica Kinsley Publishers, PA.USA

[10] Lovaas OI. Behavioral treatment and normal educational and intellectual functioning in youngautistic children. J Consult Clin Psychol. 1987;55(1):3–9

[11] Prior,M & Robert, J. (2006) Early Intervention for Children with Autism Spectrum Disorders: for Best Practices http://www.health.gov.au/internet/main/publishing.nsf/content/D9F44B55D7698467CA257280007A98BD/$File/autbro.pdf (accessed June 20, 2012)

[12] Diggle, T.T.J, and McConachie, H.H.R. (2009) Parent-mediated early intervention for young children with autism spectrum disorder (Review) http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003496/pdf/standard (accessed on August, 2012)

[13] http://www.icdl.com/DIRFloortime.shtml (accessed on Sept. 1, 2012)

[14] Greenspan, S.I., and Wieder, S. (1998). The child with special needs. Encouraging intellectual and emotional growth. Perseus Publishing, Massachusetts

[15] Wieder, S. and Greenspan, S.I., (2005). Can children with autism master the core deficits and become empathetic,creative, and reflective?:A Ten to Fifteen Year Follow-Up of a Subgroup of Children with Autism Spectrum Disorders (ASD) Who Received a Comprehensive Developmental, Individual-Difference, Relationship-Based (DIR)Approach. Journal of Developmental and Learning Disorders Vol 9: 39-60

[16] Greenspan, S.I., and Wieder, S. (1997b). developmental patters and outcomes in infants and children with disorders in relating and communicating: A chart review of 200 children with autistic spectrum diagnoses. Journal of Developmental and Learning Disorders. 1: 87-141

[17] Josefi, O.,Ryan, V (2004). Non-directive play therapy for young children with autism: A case study Children. Clinical Child Psychology & Psychiatry. Vol 9 (4), 533-51.

[18] Costa G & Witten MR(2009). Pervasive Developmental Disorders. In Mowder, Rubinson & Yasik (Eds), Evidence-Based Practice in Infant and Early Childhood Psychology. Wiley.

[19] Solomon, R., J. Necheles, C. Ferch, and D. Bruckman (2007) Pilot study of a parent training program for young children with autism: The P.L.A.Y. Project Home Consultation program. Autism 11, no. 3 205-224.

[20] Nadel, J.: Early imitation and a sense of agency. In: Proceedings of the 4th international workshop on epigenetic robots (2004) http://tivipe.com/TVPresearch/62430115.pdf (accessed on Sept.19, 2012)

[21] McGee, G., Daly, T. & Jacobs, H.A. (1993). Walden preschool. In S. L. Harris & J.S. Handleman (Eds.), Preschooleducation programs for children with autism. Austin, TX:Pro-Ed.

[22] Strain, P. S., & Danko, C. D. (1995). Caregivers' encouragement of positive interaction between preschoolers with autism and their siblings. Journal of Emotional and Behavioral Disorders, 3, 2–12.

[23] Weiss, M.J., & Harris, S.L. (2001). Teaching social skills to people with autism. Journal of Behavior Modification. 25, 785-802

[24] Early Intervention Colorado Autism Guidelines for Infants and Toddlers (2010). Developed by the Universityof Colorado Denver, PELE Center, under contract with the Colorado Department of Human Services, Division for Developmental Disabilities. www.eicolorado.org (accessed on July 2,2012)

[25] Lal, R. and Shahane, A. (2011). TEACCH Intervention for autism. In T.Williams (Ed.) Autism Spectrum Disorders-From Genes to Environment. In Tech, Croatia

[26] Lal, R and Lobo, S. (2007). Discrete trial training and development of pre learning skills in intellectually impaired children with autism. Journal of Rehabilitation Council of India. 3, 1&2: 15-23

[27] National Resource Council, (2002). Educating Children with Autism. National Academic Press, Washington

[28] Strain, P., & Schwartz, I. (2009). Positive behavior support and early intervention for young children with autism: Case studies on the efficacy of proactive treatment of problem behavior. In W. Sailor, G. Dunlap, G. Sugai, & R.H. Horner (Eds). Handbook of positive behavior support (pp. 107–123). New York