

# Outcomes of An Early Intervention Programme on Children with Autism Spectrum Disorders

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## Abstract

**Background:** Autism Spectrum Disorders (ASD) is becoming global problem as it is being diagnosed very frequently amongst the non communicable diseases. Lack of socialization, communication skill and behavioural abnormality are the main problem belongs to the disease. Cornerstone of the management is based on early intervention program directed to improve the communication and socialization skill. In Bangladesh different early intervention strategies are implicated adopting from evidence based practices in the developed countries. To determine the effect of early intervention program on the improvement of socialization and communication skills of children with ASD who attended an early intervention programme at the Institute of Autism and Child Development, Chattagram Maa Shishu -O-General Hospital. **Methods:** This is a quasi experimental study carried out at Institute of Autism and Child Development, Chattagram Maa Shishu-O-General Hospital from January 2015 to December 2015. Children with ASD (Autism Spectrum Disorder) aged 1-5 years enrolled as study subjects which is fifty in number. Screening of ASD was carried out by psychological tools like M—Chat (1-3yrs) & ASD assessment scale (> 3yrs). Diagnosis was confirmed by ADOS-G (Autism Diagnosis Observation Schedule- Generic). Intervention was provided on a 1:1 basis which was adopted from various evidence based practices including the ‘More Than Words’. Intervention were given for three subsequent session in one month interval. Level of communications were measured after intervention and compared with pre intervention level. **Results:** Significant improvements has been observed in overall level of communication and activities of daily living which included eye contact, attention, joint attention, turn taking, toilet training. **Conclusion:** A well planned early intervention programme for children with ASD can speed up the social communication development in such a way that gives rise to a hope of mainstreaming these children in future.

**Key words:** Autism; Early Intervention; Home-based.

## INTRODUCTION

Early intervention is a system of services that helps babies and toddlers with Autism Spectrum Disorders (ASD). Early intervention focuses on helping eligible babies and toddlers learn the basic and brand-new skills<sup>1</sup>. The preschool years (3-6) are usually considered ‘early’ when early intervention is concerned in terms of treatment for ASD, researchers in developed countries have been widely testing the benefits of such home based early intervention programmes<sup>2</sup>. Effective early intervention programs are an important first step for children on the autism spectrum. Early diagnosis followed by individualised early intervention can provide the best opportunities for achieving their potential. An outcome of an early intervention as a key management strategy for children with autism has been documented by a number of studies worldwide<sup>3</sup>. Best outcome has often been found when the treatment strategies have focused on educating parents by getting hands on training from experts and been actively involved with the child at home on how best they can elicit responses from their children with ASDs<sup>4</sup>.

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Researchers in developed countries have been widely testing the benefits of such home based early intervention programmes, though in a limited and low tech resource country like Bangladesh very few studies had been conducted to find out the result of early intervention<sup>5</sup>. Early intervention has enormous implication in creating alternative routes of learning in the developing brain which has obstructions on its normal pathways. For example, improved communication with children and better parent-child interaction is found when they have utilized the best opportunity to work with their children in their natural environment at home. Establishing therapeutic centre and special school for children with ASD all over the country in Bangladesh at this moment is difficult and cost effective as because Bangladesh has still a limited number of experts in this field and also it is a resource poor country<sup>6</sup>. Instead of making those parents mediated interventions are relatively inexpensive for the families and empowering for the parents.

This study was conducted at Institute of Autism and Child Development in Chattagram Maa Shishu-O-General Hospital, a tertiary level hospital in Bangladesh. Generally a multidisciplinary team of professionals which are a combination of Paediatric Neurologist, Clinical Speech & Language Therapists, Clinical Occupational Therapists, Psychologists and some Developmental Therapists are allowed to applied treatment and necessary therapies to the children with ASD in this hospital. After diagnosed the child with ASD, team of professionals decided to implement Hanen's program ('More Than Words') as an intervention program in this study. Hanen's 'More Than Words' is such an effective home based parent training programme with measurable and easy directions<sup>7</sup>. It teaches practical and specific strategies to parents of young children with autism to use during everyday routines to enhance and facilitate their communication skills, and also aims to improve parent-child interactions. In this study this training program which have primarily focused on developing early communications skills was handed over to the selected group of parents having children with ASD, in an easy delivery format for application at home. The aim of this study was to ascertain the behavioural outcomes of such an early intervention programme on a selected group of children with ASD three months after offering it in a structured way.

#### MATERIALS AND METHODS

This is a quasiexperimental study carried out at the Institute of Autism and Child Development in Chattagram Maa Shishu-O-General Hospital during the period of January 2015 to December 2015 aimed to identify the outcomes of an early intervention programme on children with ASD. The extent of improvement in communication and socialization skills development of the subjects was considered as the outcome measure of this study. Fifty children with ASD, aged 1- 5 years were enrolled in this study. Screening of ASD was carried out by well known psychological tool like M-Chat (1-3 yrs) and ASD assessment scale (> 3yrs), at the same time diagnosis was confirmed by psychological assessment scale ADOS-G

(Autism Diagnosis Observation Schedule –Generic). Level of communication like Own Agenda, the Requester, the Early Communicator and the Partner stage were determined by those above mentioned psychological assessment and at least 3 regular intervention sessions were given during the study period. The Early Intervention programme was mainly focused on the development of communication and socialization skills, toilet training and correction of feeding habit, sensory problems and other maladaptive behaviours of the ASD children<sup>8</sup>. At the beginning of the session, children received a baseline assessment of their existing strengths and difficulties by the physician and the developmental therapists. The intervention sessions were planned according to the individual need of the child considering the parent's options for prioritising their presenting problem. Sessions were always offered on a one on one basis. It is a holistic intervention programme which is a combined approach adopted from several standard evidence based practices such as, 'More Than Words' 'Applied Behaviour Analysis (ABA)', 'Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)' and 'Picture Exchange Communication System (PECS)' which are commonly used by the developed countries for the ASD children and have demonstrated positive outcomes<sup>7-11</sup>. The therapists offered hands on demonstration of the specific techniques to the parents and provide an individual activity plan for every child according to his specific needs, strengths and difficulties<sup>10</sup>. Written instructions are also provided as a reminder note for all the therapies they have received during each session. Children along with their families were offered such intervention sessions at one month interval. The duration of each session varied from 1.5 to 2 hours. Finally after receiving intervention session subjects were assessed in terms of socialization and communication skill and was compared with pre intervention level. Data was analyzed by SPSS.

#### RESULTS

Mean age of children was 2.5 years. Majority (76%) were in the 2- 3 years age group. Both parents were educated with a graduate degree or above 60% & 70% respectively.

**Table 1:** Distribution of study subjects according to the age.

Age in Years	n=50	Percentage (%)
1-2 yrs	4	8
2-3 yrs	38	76
3-5 yrs	8	16
Total	50	100

**Table 2:** Distribution of study subject according to the sex.

Sex	n=50	Percentage (%)
Male	40	80
Female	10	20
Total	50	100

**Table 3:** Educational background of the parents.

Educational Status	n=50	Percentage (%)
Mother's Education		
Primary	5	10
SSC	5	10
HSC	10	20
Graduate	12	24
Masters	18	36
<b>Total</b>	<b>50</b>	<b>100</b>
Father's Education		
primary	3	6
SSC	10	20
HSC	2	4
Graduate	10	20
Masters	25	50
<b>Total</b>	<b>50</b>	<b>100</b>

**Table 4 :** Parents monthly income.

Income	n=50	Percentage (%)
Upper (>20,000 Tk)	26	52
Middle (10,000-20,000TK)	22	44
Low (<10,000TK)	2	4
Total	50	100

**Table 5 :** Level of communication after intervention.

Level of Communication	Pre intervention (n=50)	Percentage (%)	Post intervention (n=50)	Percentage (%)
Own Agenda	15	30	-	-
Own Agenda to Requester	12	24	5	10
Requester to Requester	11	22	15	30
Requester to Early Communicator	3	6	10	20
Early Communicator to Early Communicator	5	10	10	20
Partner to Partner	4	8	5	10
Partner	-	-	5	10

p = 0.0001

Significant improvement ( $p < 0.0001$ ) was observed in the overall level of communication between the first (Pre intervention) and last (Post intervention) session. Stages of communication have gradually showed a progression from a low functioning level (Own Agenda) to more functional levels (Requester to Early Communicator and then to the Partner level)

**Table 6:** Status of nonverbal communication after intervention.

Eye contact	Pre Intervention	Percentage %	Post intervention	Percentage %	p-Value
Always	-	-	8	16	.006
Some	5	10	32	64	
Occasional	20	40	-	-	
None	25	50	10	20	
Attention span					.000
Always	-	-	8	16	
Some	4	8	20	40	
Occasional	26	52	22	44	
None	20	40	-	-	
Response to joint attention					
Good	0	0	10	20	
2 <sup>nd</sup> prompt	4	8	8	16	
3 <sup>rd</sup> prompt	8	16	20	40	.005
Absent	38	76	12	24	
Turn taking					
Always	0	0	8	16	
Very seldom	10	20	20	40	
Occasional	6	12	15	30	.000
None	34	68	7	14	

Marked improvement has been documented in communication skills in terms of eye contact ( $p = 0.006$ ) attention span ( $p = 0.000$ ) joint attention ( $p = 0.005$ ) and turn taking in play ( $p = 0.000$ ).

**Table 7 :** Improvement in toilet training.

Toileting	Pre intervention (n=50)	Percentage (%)	Post intervention (n=50)	Percentage (%)
No-toilet training	22	44	8	16
Indicate	10	20	20	40
Seek help	13	26	15	30
Independently	5	10	7	14

p= 0.016

Activities of daily living was also improved significantly ( $p = 0.016$ ).

## DISCUSSION

The study was conducted in a tertiary level children hospital specifically at Institute of Autism and Child Development, Chattagram Maa Shishu-O-General Hospital, Chittagong in Bangladesh. Aim of the study was to find out the effectiveness of a special intervention programme, Hanen programme, for ASD children. This programme is reasonably flexible and is

building upon itself from the responses and experiences of the service users. Responses of the group of children has recorded and showed that it has also offered a comprehensive package of childrens social communication development and has enriched the skills and knowledge of the parents in managing these children<sup>12</sup>.

In this study, the total number of participants were 50, among them 40 (80%) were male and 10 (20%) were female. Autism occurs about three or four times more frequently in boy than girl. The age range in this study was 1-5 years among them age range was 1-2 years 4 (08%) 2-3 years 38 (76%) 3-5 years 8 (16%). Early intervention really makes difference to a child's life and helps to maximize their skills. Similar finding has been found by the other contemporary researchers and a recent nationwide prevalence survey in Bangladesh.

A previous study in Bangladesh has shown the gradual progression of stages of autism from a less functioning to a more functioning level<sup>13</sup>. This study has tried to look at the progress of children after a similar intervention programme offered to them during a limited period of time, together with improvements in activities of daily living and enrolment into schools. Results have shown significant differences in a number of social communication skills which are consistent with the results of the previous study<sup>13,14</sup>. In addition, this study has shown significant improvement in activities of daily living such as, toilet training which are time consuming activities for mothers adding to their burden of stress and care for these children as shown in a previous study<sup>14</sup>.

The prevalence of male children, higher socio economic condition, educated parents and greater urban representation of the study population reflects similar picture elsewhere in the world<sup>15</sup>. The recent nationwide prevalence survey in Bangladesh has indicated that the children who are emerging with behavioural problems of any kind mostly came from the higher wealth quintiles of the society<sup>16</sup>.

#### **Limitations of the Study**

Assessment of the stages of communication development of the child depended mostly on the clinicians' clinical judgement and assessment. There are lacking of objective assessment tools that would produce definite results, which would include home observations and assessment by parents. There was no control group in the study with whom the results could be compared. Therefore, it cannot definitely be said from this study that the intervention itself was responsible for improvements of the functional status of the children. A randomized controlled study with preferably a sub-set receiving home-based intervention is needed to provide an evidence-base for reaching to all ASD children across Bangladesh.

#### **RECOMMENDATION**

The study was conducted with a small number of samples. It is recommended that this study can be re studied with a large number of samples. For further researches at the same areas of practices, it is recommended using true experimental design with strong control, randomization and manipulation.

#### **CONCLUSION**

Autism is a lifelong developmental disability that affect's a person's communication, social interaction and behaviour. There are different therapeutic approaches to fulfil the child's needs of communication. Early intervention is one of the most effective approach for the pre school age group with ASD. This study has shown an encouraging outcome of an innovative and a culturally adjusted therapeutic intervention programme for young children with ASD. This study was clearly able to measure the difference between the pre & post intervention measures of certain social communication behaviour of these children. This intervention programme also has been able to prove it's effectiveness in the study children by showing a better outcome in the post intervention group.

A well planned early intervention programme for children with ASD can speed up improvements in social communication in such a way that it gives rise to hope of mainstreaming these children in future.

#### **DISCLOSURE**

All the authors declared no competing interest.

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