CHANGES IN BEHAVIOUR, SOCIALIZATION, AND COMMUNICATION AFTER APPLYING EARLY INTERVENTION THERAPY IN CHILDREN WITH AUTISM AT CHILD DEVELOPMENT CENTER OF CHATTOGRAM MEDICAL COLLEGE HOSPITAL

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Roll No: 0119/03

Registration No: 730

Session: 2019-2020

A thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health

One Health Institute

Chattogram Veterinary and Animal Sciences University

Chattogram-4225, Bangladesh

December 2021

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This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects and that all revisions required by the thesis examination committee have been made

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List of symbols and abbreviations

ABA	: Applied Behavior Analysis
ASD	: Autism Spectrum Disorders
ADOS-G	: Autism Diagnosis Observation Schedule Generic
BDT	: Bangladeshi Taka
CMCH	: Chittagong medical college hospital
DSM	: The Diagnostic and Statistical Manual of Mental Disorders
DLP	: Digital language processor
Fig	: Figure
Min	: Minutes
ml	: Milliliter
N	: Total number of samples
^{o}C	: Degree Celsius
SD	: Standard Deviation
Sec	: Seconds
SPSS	: Statistical packages for social sciences
viz	: Namely
wt.	: Weight

Abstract

Autism Spectrum Disorders (ASD) are becoming a global problem, as they are frequently reported among non-communicable diseases. The main problems of this disease are a lack of socialization, communication skills, and behavioral abnormalities. Starting the therapy at an early age can lead to better results within a short time. Determining the correct age for children for giving therapy would represent a valuable step to enhancing better functioning for children with autism. In this work, we have compared the effectiveness of early intervention therapy within different age groups of children and shown the benefit of early intervention therapy. Screening of ASD was carried out by psychological tools like M-Chat, how and why communication assessment checklist, Bayley scales of infant and toddler development, and neurodevelopmental assessment form. This observational study was conducted between January 2020 to December 2020 in Chittagong Medical College Hospital. The diagnosis was confirmed by a team consisting of child health physicians, child psychologists, and developmental therapists with the help of M-Chat, neurodevelopmental assessment, how and why communication checklist, and Bayley's scales of infant and toddler development. The intervention was provided on a 1:1 basis which was adapted from various evidence-based practices including the 'More Than Words. Interventions were given for six subsequent sessions in the two months interval. Levels of communication were measured after intervention and compared with two age groups of children. In this study, a total of 150 samples were taken from two different age groups of 1 year 6 months to below 3 years (75 samples) and above 3 to 5 years (75 samples). Among the young age group of children, 90.70 % were male and only 9.30 % were female. On the other hand, 84 % of children in the elderly age group were male and 16 % were female. Our study summarizes the results of improvements in children having autism disorder after completing the early interventional therapy for younger and older age groups. After completing early intervention therapy, the younger age group showed a remarkable improvement where there were no children in their own agenda stage. Moreover, 46.70 % child were in the early communication stage, 41.00 % were in the requester stage and 12.00% were in the partner stage. On the other hand, almost half (49.30 %) of the older age group children were in their own agenda stage. In this age group, only 9.30% of children were in the

early communicator stage, 37.30 % were in the requester stage and 4.00 % were in the partner stage. The age of children starting the early interventional therapy has a significant effect ($P<0.001$) on the early improvements of ASD. These results suggested that significant improvements had been observed in the overall level of communication, socialization, and behavior in the young age group of children. Hence, to facilitate the early diagnosis of children with ASD an awareness program should be implemented targeting the parents and speed up the development of children by confirming early interventional therapy.

Keywords: Autism spectrum disorder, children, early intervention therapy, age factor, Bangladesh.

1. Introduction

Autism spectrum disorders (ASD) are a diverse group of conditions. They are characterized by some degree of difficulty with social interaction and communication (WHO). ASD include autistic disorder (also known as "classic autism," early infantile autism, childhood autism, or Kanner's autism), pervasive developmental disorder-not otherwise specified (PDD-NOS), childhood disintegrative disorder. Because people with ASD can exhibit a wide range of symptoms, it is referred to as a "spectrum" disorder. People with ASD may have difficulty communicating with you or may not look you in the eyes when you speak to them. They may also have limited interests and engage in repetitive behaviors. They may spend a long-time arranging thing, or they may repeat the same sentence over and over.

ASD prevalence has increased over the last 15-20 years, from five cases per 10,000 to one in 50 now. According to the Centers for Disease Control and Prevention (CDC), approximately one in every 68 children has ASD across all ethnic, racial, and socioeconomic groups. ASD has been identified in studies in Europe, Asia, and North America with an average prevalence of about 1%. A South Korean study found a higher prevalence of 2.6 percent (CDC, 2014). Parents who have a child with ASD have a 2 percent -18 percent chance of having another child with ASD. ASD is more common in people who have specific genetic or chromosomal circumstances. Around 10% of children with ASD also have Down syndrome, tuberous sclerosis, fragile X syndrome, or other genetic and chromosomal disorders (CDC, 2014).

There is no standard treatment strategy for ASD at the moment. There are numerous methods for improving a child's ability to grow and learn new skills. Treatments include behavior and communication therapies, skill training, and symptom-controlling medications. Several interventions for children with autism spectrum disorder have been developed. These interventions may have empirical support; however, others have not been thoroughly evaluated to determine their efficacy.

Effective care for the autistic child can be achieved by demonstrating specific behavioral interventions that can be demonstrated to all children but are especially important with the ASD population. Behavioral interventions include, as previously

discussed, imitation/role-modeling paired with reinforcement, rewards, shaping high-probability requests/low probability requests, differential reinforcement choices, visuals, and distraction techniques (Souders et al., 2002). Maintain consistency in caregiver assignment to anticipate and fulfill the child's needs until communication can be established, seek clarification and validation, and give positive reinforcement when eye contact is used to convey nonverbal expressions (Townsend, 2014). Make sure to convey warmth, acceptance, and availability; give the child familiar objects, such as toys or a blanket. Encourage your child's attempts to interact with others. Use something acceptable to the child as positive reinforcement for eye contact (e.g., food, familiar object). Replace gradually with social reinforcement (e.g., touch, smiling, and hugging).

We compared the effectiveness of early intervention therapy across different age groups of children in this study and demonstrated the benefit of early intervention therapy. Screening of ASD was carried out by a team consisting of child health physicians, child psychologists, and developmental therapists with the help of M-Chat, neurodevelopmental assessment, how and why communication checklist, and Bayley's scales of infant and toddler development. psychological tools like M-Chat, how and why communication assessment checklist, Bayley scales of infant and toddler development, and neurodevelopmental assessment form. In this study we have compare the effectiveness of early intervention therapy within different age groups for children with ASD.

Justification:

Professionals diagnosis ASD on the basis of difficulties in two areas – 'social-communication' and restrictive repetitive and/or sensory behavior or interest (DSM-5, 2021). It was the study to compare the effectiveness of early intervention therapy within different age group for children with ASD. We can use the outcome of the study at different child development center across the country so that parents and caregivers are aware enough to come early to nearest child development center. An implementation of a proper awareness program at national level can make people more aware about the situation so that the rate of ASD will be lower in near future.

Research question:

What are the changes in behavior, socialization, and communication after applying early intervention therapy in children with autism at child development center of Chattogram Medical College Hospital?

Objectives:

General:

- To compare the effectiveness of early intervention therapy within different age groups of children and show the benefit of early intervention therapy.

Specific:

- To understand the right age groups for children for getting better responses from intervention therapy.
- To explore the effect of demographic variables on the outcome of intervention therapy for ASD.

Variables:

ASD, own agenda, early communicator, requester, partner, socialization, communication, behavior, age, sex, urban, rural, income and early intervention therapy.

Operational definition:

ASD- Autism spectrum disorders (ASD) are a diverse group of conditions. They are characterized by some degree of difficulty with social interaction and communication (WHO).

Own agenda- it is a stage of ASD in which child has less eye contact, less response to name, less attention, less interaction to other people.

Requester- A child at the **Requester Stage** is just beginning to realize that her actions can have an effect on you. By pulling or leading you, she is able to ask you for.

Early communicator- the child will request or respond by repeating what you say and make requests for more motivating things. He or she begins to protest or refuse. Occasionally he/she will use body movements, gestures, sounds, or words to get your attention.

Partner- where a child is using fewer than 3 words or phrases (which may be spoken, signed, involves pictures, written words or other symbolic system) referentially, regularly and with communicative intent.

Socialization- the activity of mixing socially with others.

Communication- a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior the function of pheromones in insect communication also: exchange of information.

Behavior- the way in which one acts or conducts oneself, especially towards others.

Early intervention therapy- Is the term used to describe the services and supports that are available to babies and young children with developmental delays and disabilities and their families. May include speech therapy, physical therapy, and other types of services based on the needs of the child and family.

2. Review of Literatures

2.1 Overview

ASD is a pervasive developmental disorder in which the core impairments influence on children's development. A relative or total absence of reciprocal social interactive skills is the primary symptom seen in children with autism spectrum disorder. These children make less frequent eye contact and direct fewer facial expressions toward their parents (Cassidy, 2013). An important problem in communication is another essential symptom in children with ASD. Preschoolers diagnosed with autism may demonstrate deviation in spoken language or may be completely nonverbal. They may simply echo "repeat" what is said to them without importance. Some children may be able to speak, but demonstrate a lack of pragmatic communication skills (Klin et al., 2005). They also added, in contrast to these negative symptoms, the other symptom of autistic spectrum disorders involves behavioral excess. Children with autism may engage in repetitive mannerisms, such as flapping their hands, flicking their fingers in front of their eyes, pacing back and forth, running on tiptoe, and so on. Objects may be used in unusual ways, such as spinning or tapping them or repeatedly flicking a doll's eyes open and shut.

Some children demonstrate an excessive interest in unusual topics. Children diagnosed with autism also may be rigid, insisting on following specific rituals, demanding to perform activities in an exact order, or following the same route to a destination. Repetitive actions sometimes evolve into self- injurious behaviors, such as head-banging, hand-biting, or face-slapping (Turkington & Anan, 2007).

2.2 Background

Leo Kanner was the person who got the gift of being able to step back and see the whole picture when he published his initial paper in 1943. At this time, children with psychiatric illness have been diagnosed with childhood onset schizophrenia. Kanner recognized several differential characteristics of some children that made them different from those with schizophrenia. He identified the disorder of this group of children as "autistic disturbances" and proposed a new diagnostic category. From the nearly 70 years since Kanner's first description of autistic disorder (autism), we have seen this diagnosis evolve considerably (Sadock et al., 2015).

In 1935, Leo Kanner wrote the first textbook of child psychiatry. He mentioned about different characteristics of child psychiatry ranging from learning to folklore; nevertheless, when Kanner passed away in 1981, Dr. Kanner was best one known for his writing on constructing the autism diagnostic criteria (Tarbox et al., 2014). Before 1943 when Kanner wrote his paper, "*Autistic Disturbance of Affective Contact*", no one differentiates among what scientist and psychiatrist Kanner named “Infantile Autism” also "childhood early onset schizophrenia". The word autism was one of the “4A’s” originally used by Swiss psychiatrist Eugene Bleuler, who used it to refer to another term he also used schizophrenia. Bleuler borrowed the term from the Greek “auto” meaning “self” to describe a focus on the self, which he observed in the individuals with schizophrenia. Schizophrenic patients withdraw from the outside world and engage in another world directed by cognition and perception of them. Kanner also borrowed the term from Bleuler in order to describe children who appeared to have a similar self-turned focus (Gallo, 2010; Matson & Glidden, 2007). The German pediatrician, Hans Asperger, wrote a paper in 1944 that echoed many of Kanner's descriptions. Asperger also used the term "autistic” to refer to his patients. He also emphasized that impairment in social integration was primary to the disorder which affecting the child's relations to his or her whole environment. Like Kanner, Asperger emphasized that this difference was present from early in life, and not a progressive event as seen in schizophrenia. Unlike Kanner, Asperger also described an abnormal relation to objects, involving abnormal fixations, collections, and lengthy monologs about these special interests (Tasman et al., 2015).

Previously, symptoms of autism were diagnosed as early childhood schizophrenia. Individuals with autism differ from those with schizophrenia, in those children with ASD have a disturbance in their development prior to the onset of symptoms, this observation is the reason that autism is categorized as a pervasive *developmental* disorder. Symptoms of autism are present throughout early development and diagnosis is typically made in early childhood. In addition, hallucinations and delusions, which are the hallmark symptoms of schizophrenia, are often not appreciably in individuals with autism (Gallo, 2010).

Sir Michael Rutter noted that, although genetic factors were prominent in both disorders, parents of children with autism were often highly functional, intelligent, and of higher social class. Regarding cognitive functioning individuals with autism

are much more likely to suffer from intellectual disability than individuals with schizophrenia who are more likely to suffer from a cognitive decline over the course of their lifetime. Individuals with autism are more likely to have epilepsy.

2.3 Prevalence

In a study by Autism and Developmental Disabilities Monitoring (ADDM) indicated an overall prevalence of 9 per 1000 at age eight years for 2006 and 11 per 1000 at age eight years in 2008 (approximately 1 in 54 boys and 1 in 252 girls). The prevalence estimates varied widely by site, sex, and racial/ethnic group. Studies in Europe, Asia, and the United States indicate that the prevalence of ASD ranges from 2 to 20 per 1000, or approximately 1 in 50 to 1 in 500. Prevalence increased in the past 15–20 years from 5 cases per 10,000 to current estimates of 1 in 50 for autism spectrum disorders (Centers for Disease Control and Prevention, 2012). ASD have been increasingly diagnosed over the last two decades. By definition, the onset of ASD is in the early developmental period; however, some cases are not recognized until the child is much older. Because of this delay between onset and diagnosis, the prevalence rates increase with age in young children. It is not clear how the updated diagnostic criteria for ASD in the DSM-5 will affect the prevalence of ASD (Sadock et al., 2015).

2.4 Risk factors

The rate in siblings, the prevalence of ASD without associated medical conditions in siblings of children with ASD has been estimated to range from 3 to 10 percent based on studies with methodological limitations (small sample size, ascertainment bias, etc.) (Lauritsen, Pedersen, & Mortensen, 2005). However, the risks for ASD in siblings of children with ASD without an identifiable etiology: 7 percent if the affected child is female, 4 percent if the affected child is male and >30 percent if there are two or more affected children (Gronborg et al., 2013; Ozonoff et al., 2011).

2.5 Sex distribution:

ASD is almost 5 times more common among boys. Every 42 boy about one child is affected by ASD and every 189 girl there is a girl affected by ASD (CDC, 2014). ASD is diagnosed four times more often in boys than in girls. In clinical samples (Sadock et al., 2015). Girls with ASD more often exhibit intellectual disability than

boys. One potential explanation for this is that girls with ASD without intellectual disability may be less likely to be identified, referred clinically, and diagnosed (Sadock et al., 2015).

2.6 Etiology

The etiology of ASD is incompletely unknown. Autistic Theories of behavior may be categorized into two large categories: psychological and biomedical perspective. The psychological theories attribute the disorder to parenting behaviors, inherent socio-emotional limitations, cognitive deficits, and learning in the early years of growth and development The biomedical theories attribute the disorder to genetic factors, neurological impairment, structured brain abnormalities, neurochemical influences, or neurodevelopmental pathological processes (Schumann et al., 2014).

a) Genetic factors

The consensus is that ASD is a genetic disorder that affects brain development. Evidence for the strong genetic contribution is derived from the following observations: 1- Unequal sex distribution, with 4:1 male predominance. 2- Increased prevalence in siblings of patients with ASD compared with the general population. 3- High concordance rate among monozygotic twins (36: 96%). 4- Co-occurrence of ASD and single gene disorders (e.g., tuberous sclerosis) has also been observed (Augustyn, 2009). No identified genetic alterations may lead to autism has been recognized, numerous types of genetics are susceptible to be elaborated in the autism. 5 of this genetics are *EN2* ("Engrailed 2 gene"), that is involved in cerebellum development, *OXTR* "oxytocin receptor genes", that is involved in the response to stress and in community skill such as understanding, *"SLC6A4*"; a serotonin transporter gene that could account for phenotypic expression of happiness, *RELN* (Reelin gene), that is involved in neurological immigration in the development of brains, *"GABR* gamma amino butyric acid receptor genes", which regulate brain cell movement, difference, and synapse construction. Specific genes mutations have been identified on chromosomes 2, 3, 15, 16, 17, and 22 (Johnson et al., 2013).

b) Neurobiological factors

Neuroimaging researches in individuals with autism propose that brains abnormalities play a vital role. Current abnormalities include diffuse differences in total and

regional gray and white matter volumes, brain lateralization, brain chemical concentrations, neural networks, "sulcal and gyral anatomy" and intellectual processing in comparison to individuals without autism (Chen et al., 2011). About twenty to twenty-five percentage show ventricular enlargement on computed tomography (CT) images. Electroencephalography (EEG) irregularities and seizure disorders occur with larger than the predictable rate in persons with ASD. Four percent to thirty-two percent of individual with ASD have "grand mal seizures" at approximately time (Sadock et al., 2015)

c) Environmental, perinatal and Parental factors

Environmental issues, such as toxins acquaintances, perinatal insults, teratogens, and mother and father infections, the explanation for little cases (Gardener et al., 2011). The most significant prenatal factors associated with ASD is advanced motherly and fatherly age, gestational diabetes, maternal gestational bleeding, and first order delivery baby. Perinatal risk influences for ASD contain umbilical cord obstacles, fetal distress, birth trauma, small for gestational age, the low weight of birth, lower 5-minute Apgar score, congenital deformities, or Rh feature mismatching or hyperbilirubinemia. A lot of the maternal difficulties include hypoxia, which may be an underlying risk factor influence itself (Sadock et al., 2015).

2.7 Diagnosis techniques

DSM-5 establishes a single ASD diagnosis, which replaces the PDD subtypes. ASD diagnosis requires the presence of past or current deficits in social-emotional reciprocity, nonverbal communicative behaviors for social interaction. Individuals must also exhibit at least two of four symptoms from the domain of restricted behavior, interests, and activities. These include stereotyped or repetitive movements, use of objects, or patterns of speech; insistence on sameness, inflexible adherence to routines, or ritualized patterns of behavior and unusual interest in sensory aspects of the environment (APA, 2013). To provide further descriptive information, DSM-5 contains several specifiers for an ASD diagnosis. These include “with or without accompanying intellectual impairment, "with or without accompanying language impairment,” “with catatonia,” “associated with a known medical or genetic condition or environmental factor,” and “associated with another neurodevelopmental, mental, or behavioral disorder” (Flamez & Sheperis, 2015). Incorporating a dimensional

component, DSM-5 has introduced rating scales to assess the severity of current symptoms. Accompanied by descriptive text, these range from level 1, "requiring support," to level 2, "requiring substantial support," to level 3, requiring very substantial support." Individual ratings are assigned for the domains of social communication and restricted and repetitive behaviors (Morrison, 2014).

2.8. Clinical Features

Parents notice developmental problems, before children first birthday. Concerns about vision and hearing were more often reported in the first year and differences in social, communication, and fine motor skills were evident from 6 months of age. Research has shown that a diagnosis of autism at age 2 can be reliable, valid, and stable (CDC, 2014). Indicators of autism most commonly recognized in the second year of life (Landa et al., 2013).

a) Communication: It is a broad word that refers to the giving and receiving of information through spoken language and sounds, written language, gestures, sign language, and body language. Impairment in communication can range from total lack of language, or an absence of an obvious desire to communicate, to excessive or formal speech with poor reciprocal conversation abilities

Communication impairment include the following: (1) delay in, or whole minimizing of, the development of articulated language; (2) in individuals with suitable talk, marked deficiency in the ability to initiate or sustain a verbal or idiosyncratic linguistic; and (4) lack of varied, spontaneous make it believe play or social imitative play suitable to current developmental stage (Nugent, 2011; Volkmar, Paul, Rogers, & Pelphrey, 2014).

b) Restrictive interests and repetitive or stereotypic behaviors: It includes (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in its intensity or focus; (b) show inflexibility to specific, nonfunctional routines or rituals; (c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements); (d) persistent preoccupation with parts of objects (Tarbox et al., 2014).

Mannerisms, Stereotypies, and facial twisting are most common when a kid is left with himself individually and may a reduction in organized situations. Self-injurious

behaviors are more common among ASD patients with cognitive disability and include head-hitting, face or body slapping, self-biting, or self-pinching. The triggers for these behaviors may be predictable (frustration, anxiety, excitement) or seemingly random (Minshawi et al., 2014)

c) Insistence on sameness: Persons with autism have significant difficulty with changeovers and may need the same monotonous identically days. Apparently, fixed adherence to nonfunctional, specified routines and rituals is the character of autism. These may apparent during several facets of daily life, such as eating particular foods or to follow the same route from one place to another without deviation. The insistence on sameness may manifest with distress at small changes in routines and difficulty with transitions (APA, 2013).

d) Response to Sensory stimuli: Autistic children have been observed to over respond to some stimuli and under responding to other sensory stimuli (e.g., to sound and pain). It is not uncommon for a child with autism to appear deaf, at times showing little response to a normal speaking voice; on the other hand, the same child may show intent interest in the sound of a wrist watch. Some autistic children have a high pain threshold or an altered response to pain. Many autistic children reported enjoying music. They frequently hum a tune or sing a song or commercial promo before saying words (Sadock & Sadock, 2011).

2.9. Comorbid Features:

ASD symptoms overlaps with that of a range of disorders, including intellectual disability (ID), attention deficit hyperactivity disorder (ADHD), and language disorders and are frequently comorbid with these conditions as well as with psychiatric disorders such as oppositional defiant disorder (ODD), obsessive-compulsive disorder (OCD), anxiety, depression, and schizophrenia (Belardinelli et al., 2007).

2.9.1 Language disorders

The level of language impairment varies widely in ASD, from an estimated 20–50% with no functional speech to those with Asperger's disorder, who have regular to more than average structural language functioning but impaired pragmatic language abilities. Less than one-half fail to use speech as the primary mode of communication

(Lord & Corsello, 2005). In language disorders, there could be impairment in structural language functioning, such as grammar (syntax, morphology) and phonology, and impairment in functional language functioning, such as semantics (the meaning of language) and pragmatics (the conversational use of language). In high-functioning ASD, there are language deficits that are more likely to not be present or to resolve, including deficits in phonetics, morphology, syntax, and concrete vocabulary. Semantic and pragmatic abilities are more persistent, and by definition, people with ASD have pragmatic language deficits (Tyson et al., 2014).

Various methods are available for assessing children's communication skills including direct assessment (e.g., Mullen Scales of Early Learning; Mullen, 1995), language sampling and analysis, and parent and teacher report (e.g., Vineland Adaptive Behavior Scales - 3rd Edition; Sparrow, Cicchetti, & Saulnier, 2016). For longitudinal research, the options are constrained by resources (e.g., cost of administering assessments and skilled assessors at multiple time points or cost of transcribing and analyzing spontaneous language samples); minimum time intervals between standardized assessments; sensitivity of measures to possible change in short periods of time; and the burden on children, families, and staff. There have been multiple calls for improved methods for assessing change amongst children receiving early intervention (Kasari, Brady, Lord, & Tager-Flusberg, 2013; McConachie et al., 2015; Trembath et al., 2016). In order to understand trajectories, it is important to employ a regular, systematic, and ecologically valid way of measuring children's communication. One option is the Language Environment Analysis (LENA®) system, which involves the use of small wearable digital recorders that measure the quantity of vocalizations produced by children and adults in the environment.

2.9.2 Macrocephaly: nearly one-fourths of kids with autism have a circumference greater than the normal. An increased rate of head growth is found in up to 70% of children with ASD during the first year of life, but not all of these children become macro-cephalic. In the term of motor deficits, Children with ASD may have motor deficits including abnormal gait, clumsiness, toe walking, or other abnormal motor signs, such as hypotonia (APA, 2013).

2.9.3 Seizures: While epilepsy has long been associated with autism spectrum disorders, the proportion of patients reported to demonstrate comorbid seizure

disorder varies from 5% to 44%. A follow-up study carried out in 135 patients with idiopathic autism. Of these, 33 (25%) exhibited epileptic seizures. Two types of seizures were observed: partial seizures with secondary generalization (in 61%) and generalized seizures. While 18% of the non-epileptic group show epileptic discharges on EEG (Frye et al., 2016; Hara, 2007).

2.9.4 Anxiety: In the description of Kanner (1943) about autism, he distinguished unusual terror or anxiety in numerous of this young children. One child, Herbert, was "tremendously frightened by running water, gas burners, and many other things." He became troubled by any change of an accustomed form. "If he notices the change, he is very fussy and cries." Another child did a "good deal of worrying.

2.9.5 Gastrointestinal Disorders: Autistic Children have a greater rate of gastrointestinal (GI) difficulties than normally developing children or children with developmental delays. Autistic persons appear overwhelmed to GIT illnesses because of behaviors leading to constipation and other feeding food issues selectivity (Ibrahim, Voigt, Katusic, Weaver, & Barbaresi, 2009

2.9.6. Autoimmune Disorders: Some patients with ASD exhibit irregularities and/or insufficiencies of immune systems function prominently to unsuitable or ineffective immune reaction to pathogenesis challenges.

2.9.7 Irritability: Broadly well defined, irritability includes "aggression, self-injurious behaviors, and severe temper tantrums". These marvels are usually come across in kids and adolescents with ASD. Severe temper tantrums could be hard to control, and self-injurious behaviors are often problematic to control. In children with ASD who are less in functioning and have intellectual deficits, aggression may emerge unexpectedly without an obvious purpose or trigger, and injurious of self-behaviors such as skin picking, head banging, and biting oneself may also be noted (Kim & Lord, 2013).

2.9.8 Insomnia: Insomnia considered as a common sleep problem within children and adolescents with ASD, valued to occur in 44: 83% of school-aged children. Behavioral and pharmacological both interventions have been applied as interventions. Behavioral interventions comprise modification of parental behavior

before and at a time for bed, and given that routines that remove reinforcers for remaining awake (Johnson et al., 2013; Malow et al., 2014).

2.10. The Need for Early Intervention

Research has shown that early intervention is necessary for individuals who have ASD and the leading treatment for ASD is early intensive behavior intervention (EIBI) based on the principles of ABA. Numerous studies have provided empirical evidence for the effectiveness of this approach for children with ASD, documenting substantial gains in functioning

Assessment

The first step for designing a curriculum for a child with ASD is to conduct a comprehensive assessment to identify skills the child has already mastered and skills the child still needs to learn. It is imperative that the curriculum is tailored to the child's specific needs; failing to do so, could potentially result in various adverse side effects (Tarbox et al., 2014)

The documentation of skill insufficiencies and strong point across every part of individual growth permits one to the enterprise a well-balanced program that reflects requirements from each capacity. Eight key areas of human adequate functioning have been recognized including: (1) social, (2) motor, (3) adaptive, (4) language, (5) executive functions, (6) play, (7) cognition, and (8) skills academic (Granpeesheh, Tarbox, Najdowski, & Kornack, 2014).

2.11. Comprehensive therapies

The first aim of communication teaching is to give the autistic child a functional way to express his or her needs. Teaching mands is the most important of the verbal operants, as it benefits the speaker directly. It is usually one of the first to emerge developmentally, and can often lead to the acquisition of further language as well as immediate decreases in interfering behaviors. Mands should be prioritized, emphasized, and taught early (LaFrance & Miguel, 2014).

3. Materials and Methods

3.1. Study Design

This observational study was aimed for comparing the effectiveness of intervention therapy in two different age groups of children with ASD. The age of one group of participants was from 1 year 6 months to below 3 years and another one was above 3 to 5 years old. Children were selected after evaluating on CDC and taking verbal consent from their guardian. At least 6 regular intervention sessions were given during the one-year study period and a psychological tool M chat, neurodevelopmental assessment form, how and why communication checklist, bayley's scale of infant and toddlers developmemt used for the assessment. The extent of improvement in communication, socialization, and behavior skills of the subjects was considered as the outcome measure of this study. After the therapy different levels of improvements in communication like Own Agenda, Requester, Early Communicator, and the Partner stage were assessed by the child psychologist and developmental therapist.

Stage 1: The own agenda stage: The person appears uninterested in others and tends to play or do activities alone. Their communication will be mainly pre-intentional. The majority of children are at this stage when first diagnosed as autistic.
Stage 2: The requester stage: The person has begun to realize that their actions have an effect on others. They are likely to communicate their wants and what they enjoy by pulling you towards objects, areas or games.
Stage 3: The early communicator stage: Interactions will begin to increase in length and become more intentional. The person may begin to echo some of the things that they hear to communicate their needs. Gradually, they will begin to point to things that they want to show and begin to shift their gaze, beginning to engage in a two-way interaction.
Stage 4: The partner stage: The person has become a more effective communicator. They will be using speech and will be able to carry out a simple conversation.

3.2. Data collection:

The study was conducted in Shishu Bikash Kendro (Child development center) at Chittagong medical college hospital (CMCH) which is a tertiary care hospital located in

Chattogram city, Bangladesh. Each participant had a unique ID and follow-up all data were collected from selected children having ASD and talking early intervention therapy at that center. The pre stage conditions of all children were recorded by the child health physician before providing the therapy. After the completion of the therapy children were further screened in two months interval by the developmental therapist the improvements of each child were recorded for comparing with pre stage data.

The duration of the study was 1 year, between January 2020 to December 2020 and samples was taken by convenient sampling in which 75 samples were taken from each age group.

3.3. Screening of ASD

Screening of ASD was carried out by the trained investigator using the psychological tools:

- M Chat
- Gross developmental assessment, how and why communication assessment checklist
- Neurodevelopmental assessment form and
- Psychological screening performed by BSID (Bayley Scales of Infant and Toddler Development)

Level of communications were measured after intervention and compared with pre intervention level.

3.4. Intervention therapy

Intervention was provided on a 1:1 basis which was adopted from various evidence-based practices including the ‘More Than Words’. Interventions were given for six subsequent sessions in two months interval. It is a holistic intervention programme adopted from several standard evidence-based practices such as, ‘More Than Words’ which is commonly used by the developed countries for the ASD children and have demonstrated positive outcomes (Carter, 2011; Sussman, 2012; Islam et al, 2012). Materials needed food, bubbles, balloon, choice of toys in a container, color picture of the specific materials. The developmental 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 (Islam et al, 2012). 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 to 1.5 hours. Finally, after receiving intervention session subjects were assessed in terms of socialization and communication skill and were compared with pre intervention level.

3.5. Data Analysis

All data regarding two groups of children stored in Microsoft excel sheet. After coding the final dataset was transferred into the SPSS software (Statistical packages for social sciences). All analyses were conducted by SPSS. Firstly, frequencies were calculated for categorical variables. Finally, Chi square test was done for measuring the differences of the outcomes of therapy between two age groups of children and the effect of children age on the improvement of disorder.

4. Results

Table 1 presents the comparison of different demographic variables- gender, location, and monthly family income between two groups of children- young age group and old age group. Among the young age group of children, 90.7% were male and only 9.3% were female. They were mostly from the urban areas (84%) and 21.3 % were belongs to the poor income family possessing below 15 thousand Bangladeshi Taka (BDT) per month.

Table 1: Demographic characteristics of two groups of children

	Young age group (%)	**Old age group (%)**	**Total (%)**
Gender			
Male	68 (90.7)	63 (84)	131 (87.33)
Female	7 (9.30)	12 (16)	19 (12.66)
Location			
Urban	63 (84)	57 (76)	120 (80)
Rural	12 (16)	18 (24)	30 (20)
Monthly family income			
Below 15,000 Taka	16 (21.3)	23 (30.7)	39 (26)
16,000-30,000 Taka	23 (30.7)	30 (40)	53 (35.33)
31,000-45,000 Taka	19 (25.3)	3 (4)	22 (14.66)
46,000-60,000 Taka	10 (13.3)	12 (16)	22 (14.66)
Over 60,000 Taka	7 (9.3)	7 (9.3)	14 (9.33)

Moreover, highest number of young aged children (30.7%) was from the family having 16 to 30 thousand BDT monthly incomes whereas, 25.3% of other had 31 to 45 thousand monthly incomes. Besides, a considerable number of families (13.3%) had income range from 46 to 60 thousand BDT. On the other hand, 84% of children in the elderly age group were male and 16 percent were female. Most of them (40%) were coming from the families with monthly income range of 16 to 30 thousand BDT followed by 30.7% from

below 15 thousand monthly incomes. 16% of families had high income from 46 to 60 thousand per month. Alike younger age group, the higher number of elder group children (76%) were lived in city.

Table 2 depicts the differences of change in communication, sociability, and behavioral activities between the groups of children after providing intervention therapy. Analysis revealed significant differences among the changes (P<0.001) between young and old age groups.

Table 2: Compare the improvement in communication, socialization, and behavior between the two groups of children after completing the early intervention therapy

	Young	**Old**	**P value**
Changes in Communication			
Good	9 (12)	3 (4)	
Moderate	35 (46.7)	7 (9.3)	0.001
Mild	31 (41.3)	28 (37.3)	
Poor	0	37 (49.3)	
Changes in Socialization			
Good	9 (12)	3 (4)	
Moderate	34 (45.3)	7 (9.3)	0.001
Mild	32 (42.7)	28 (37.3)	
Poor	0	37 (49.3)	
Changes in Behaviors			
Good	9 (12)	3 (4)	
Moderate	34 (45.3)	7 (9.3)	
Mild	32 (42.7)	28 (37.3)	0.001
Poor	0	37 (49.3)	

It has observed that in terms of communication in younger children everyone improved, with 12% having good outcomes and 46.7% moderate and 41.3% slight improvements. Only 4% of older children, on the other hand, had good results and most of them had poor outcomes (49.3%). Again, the largest percentage of younger children (45.3 %)

reported moderate improvements in sociability, with everyone improving, but the majority of older children (49.3 %) had poor outcomes. Behavioral changes were also observed in both younger and older children, in addition to communication and socializing. The progress type of younger children was mostly found having moderate improvement (45.3) whereas most of the older children showed poor improvement (49.3%) such as the socialization criteria.

Table-3 summarizes the results of improvements of children having autism disorder after completing therapy for younger and older group. All the children from younger age group considered for this research showed improvement as early communicator (46.7%), requester (41.3%), and partner (12%). On the other hand, almost half of the older age group children (49.3%) had showed no or little progress. The age of children during starting therapy has significant effect ($P<0.001$) on the early improvements of ASD.

Table 3: Comparison of improvements between two different age groups of children after completing early intervention therapy in both group.

	Stages of improvement after therapy				
Children groups	Own agenda (%)	Early communicator (%)	Requester (%)	Partner (%)	0.001*
Young age group (1 year 6 months to 3 years)	0	35 (46.70)	31 (41.30)	9 (12.00)	
Old age group (3 to 5 years)	37 (49.30)	7 (9.30)	28 (37.30)	3 (4.00)	
*Significant at 1% level					

Table 4 shows the improvements among young and older children based on the demographic factors. Gender, locality, and monthly income are among the participant's parameters, considered in this table. Here, 25.2% of the male participants didn’t show any improvements at all, 26.7% were early communicator, 39.7% were the requester and

8.4% of them had the most improvements; whereas 21.1% of the female participants didn't show any response to the treatment, 36.8% were early communicators, another 36.8% were requester and 5.3% improved more than others. However, among the 22.5 % from urban regions, 30.8 % were early communicators, 36.7 % were requesters, and 10% were partners, whereas among the 33.3 % from rural areas, the majority were requesters with no one in the partners group. Again, the majority of them were from the lowest family income category (46.2%), with 15.4 % as early communicators, 30.8 % as requesters, and 7.7 % from the partner category. The P-value for the category of monthly family income ($P<0.007$) was determined to be significant compared to all the other factors evaluated in this table (Table-4).

Table 4: Effect of demographic variables on the outcome after early intervention therapy for ASD.

Variables with categories	**Own agenda**	**Early communicator**	**Requester**	**Partner**	**P value**
Gender					
Male	33 (25.2)	35 (26.7)	52 (39.7)	11(8.4)	0.81
Female	4 (21.1)	7 (36.8)	7 (36.8)	1 (5.3)	
Location					
Urban	27 (22.5)	37 (30.8)	44 (36.7)	12 (10)	0.074
Rural	10 (33.3)	5 (16.7)	15 (50)	0	
Monthly family income					
Below 15,000 Taka	18 (46.2)	6 (15.4)	12 (30.8)	3 (7.7)	
16,000-30,000 Taka	8 (15.1)	14 (26.4)	26 (49.1)	5 (9.4)	0.007*
31,000-45,000 Taka	1 (4.5)	9 (40.9)	8 (36.4)	4 (18.2)	
46,000-60,000 Taka	7 (31.8)	9 (40.9)	6 (27.3)	0	
Over 60,000 Taka	3 (21.4)	4 (28.6)	7 (50)	0	

5. Discussions

This research was carried out in a Child Development Center, under a tertiary care hospital (CMCH) in Bangladesh. The study's purpose was to compare the improvements in behavior, socialization, and communication among children with autism who had received early interventional therapy. The children in this study were separated into two age groups: younger (1 year 6 months to below 3 years) and older (3 to 5 years). The responses of children were recorded and demonstrated that it provided a comprehensive solution of social communication development for them as well as enhancing the abilities and knowledge of the parents in managing these children (Woods et al., 2003). For children with ASD, early social communication skills are essential precursor to expressive language. Initiating shared attention, behavior control, and social engagement all need social communication (Fuller et al., 2020). This study revealed that early intervention treatment significantly improved their communication skills, which eventually resulted in improved behavior and sociability.

Among the participant the number of male children were much higher than the female which could be due to fact that male children are more likely to be affected by ASD. According to the researchers from University of California, ASD affects one female out of every four males (Werling et al., 2013). Further study done by the same researchers reports that autism spectrum disorders (ASDs) have long been known to afflict much more men than women, and sex-specific variables have been proposed to enhance males' risk of ASDs or to protect females against them. Moreover, no conclusive component in ASD etiology that may explain for its male-biased prevalence has been identified, and it is unclear whether the primary determinants of sex-differential susceptibility function as male-specific risk factors or female-specific protective factors (Werling et al., 2013). Another study demonstrated that males are more likely to have autism impairments because they require fewer family risk factors on average to achieve an equal impairment threshold (Robinsona et al., 2013).

Table 3 outlines after completing early intervention therapy, the younger age group(1 and ½ year to below 3) showed a remarkable improvement where there were no children in their own agenda stage. Moreover, 46.70 % children were in the early communication

stage, 41.00 % were in the requester stage and 12.00% were in the partner stage. On the other hand, almost half (49.30 %) of the older age group (3 year to 5) children were in their own agenda stage. In this age group, only 9.30% of children were in the early communicator stage, 37.30 % were in the requester stage and 4.00 % were in the partner stage. The age of children starting the early interventional therapy has a significant effect ($P<0.001$) on the early improvements of ASD. These results suggested that significant improvements had been observed in the overall level of communication, socialization, and behavior in the young age group of children.

The results show that improvement of children from own agenda to partner following intervention therapy were associated with the age of children at the start of therapy. Significant improvement found in young age group (1 year 6 months to 3 years) which was concordant with a previous study in the area that also found significant differences in a number of social communication skills (Tanzida Zaman et al., 2017).

Other studies conducted by Sallows & Graupner (2005); Cohen & Smith (2006); Eldevik, Hastings, Jahr, & Hughes (2012) found a significant adaptive behavior modification in areas of communication, socialization, daily living activities and total adaptive score. Earlier studies also demonstrated that children who start intervention prior to or at age three have significantly better outcomes compared to older children.1,2,3 (Harris SL et al, 2000; National Research Council 2001). Literature also evident that at least 85 to 90% of children with autism can learn to use functional speech if intervention begins in the preschool years. (McGee GG et al, 1994; Koegel LK 2000). These studies suggest that an earlier age at the beginning of intervention may be predictors of better outcomes.26,2 (Gabriel RL et al, 2001; Harris SL et al, 2000)

Table 1 also outlines the location that may influence ASD in children of various ages and genders. Location is considered as one of the most important factors for early diagnosis and taking proper steps for early intervention therapy of ASD. The majority of the participants in this study (84% of the young age group and 76% of the elderly age group) were from urban areas, indicating a lack of adequate understanding and care by family members of ASD children in rural areas. According to prior studies, families with children having ASD in rural areas face a variety of problems, (Ws et al., 2015).

According to the Centers for Disease Control, the tremendous financial hardship connected with the diagnosis is exacerbated by the fact that autistic children's families earn 28 percent less than non-autistic children's households (Cidav et al., 2012). As a result, parents struggle to strike a balance between their children's needs for care and their job obligations and many families with disabled children fail to obtain to accessible, affordable, and high-quality child care. The majority of the participants in this study are from 16,000 – 30,000 TK income group (49.10%), implying that their treatment may be uncertain in the long term.

Early intervention therapy used to improve speech, sociability, and behavioral activities. Table 2 shows significant differences in Changes in socialization, behaviour, and communication between the two groups of participants ($P<0.001$). Functional communication and social interaction should be emphasized in early intervention programs for children with ASD, according to various guidelines, including the NRC (National Research Council) in the United States. Most of the children from young age group of this study, showed moderated improvement (46.7%) in terms of communication whereas majority of the children in the old age group (49.3%) were poorly improved.

In case of sociability, which showed improvements in all the young children, with most of the improvements being moderate (45.3%). According to the researcher Ingersoll and his team, after six months of intervention, the child's (all the children in the study were between the ages of between 1 year 6 months and 5 years) degree of peer social avoidance was found to be a strong predictor of intervention result in terms of language usage and peer avoidance (Ingersoll et al., 2001). Again, we can observe that most of the old age group children has the poor improvement in terms of socialization (49.3%). According to Giacomo Vivanti, a scientist and Associate Professor in the A.J. Drexel Autism Institute's Early Detection and Intervention research program, the more time passes, the more difficult it will be to correct brain circuitry and behavioral expression in order to achieve more optimal behavioral patterns (Vivanti et al., 2014). Therefore, it is reasonable to conclude that the rate of socialization improvement by early intervention in ASD is mostly determined by age.

Behavioral alteration in ASD individuals is another determinant considered in Table-2. Based on this criterion, we can see that most older children had poor improvements compared to most younger children who showed moderate improvements in this table. According to the researchers from University from Washington, USA; they divided the ASD participants into two groups- ESDM (Early Start Denver Model) and Community Intervention groups. Both ASD groups (ESDM and Community Intervention) demonstrated a normal pattern of early-stage processing of facial information after early detection and access to two years of intervention. This demonstrates that the most crucial step to take in modifying behavioral difficulties in ASD children is early intervention.

Several recent study findings emphasize the necessity of initiating communication intervention as soon as possible. Researcher Lord and his team from National Academy of Sciences claimed that pre linguistic and early language intervention for children with ASD has been proven to make a significant improvement, at least in terms of brief outcomes (Lord et al., 2001).

Analysis shows the average monthly family income of children had significant effect on the outcome of intervention therapy of ASD. It may be due to fact that care givers of children from low-education families are less able to properly follow instructions. The finding was supported by literature which stated that families with poor income and low education posed significant problem and highly varied the duration of time to complete the treatment Another previous study also reported the effect of household income on the diagnosis of ASD and early intervention services (Relationships Between Household Income and Functional Independent Behavior for Children with Autism).

The nationwide ASD prevalence survey in Bangladesh has indicated that the children who are emerging with behavioral problems of any kind mostly came from the higher wealth quintiles of the society (Khan et al, 2012). It may be due to the higher cost of ASD services which limits poorer families from obtaining care. Moreover, low income and low education families are underrepresented in intervention research.

6. Limitations

- Assessment of the stages of communication development of the child depended mostly on the clinicians' clinical judgment and assessment.
- Identifying other factors for positive and negative aspects that interfere with the intervention
- There was no control group in the study with whom the results could be compared. Therefore, it cannot definitely be determined from this study that the intervention itself was responsible for improvements of the functional status of the children.

7. Conclusion

The rising prevalence of ASD in children is a serious social and economic issue. As a result, there is an urgent need to implement intervention programs for children at a young age in order to achieve better outcomes and reduce the risks of ASD and create awareness among the general population to lower the risk ASD. The average monthly family income of children with ASD had a significant effect on intervention therapy response. Low-income families had a significant negative impact on the early intervention program's effectiveness. However, the effectiveness of EIT may be dependent on a number of factors, including the intensity of the intervention, the children's socio demographic, developmental, and clinical factors.

8. Recommendation

Based on the findings of the current study, it is recommended to apply intervention therapy at early age preferably before 3 years to enhance the children functioning by improving communication and socialization. The implementation of a proper awareness program for community in order to confirm the early diagnosis of ASD and starting therapy at the very young age of children. Extend this study with a large number of samples from different child development center of the country to cover up all ASD children across Bangladesh. To provide an evidence-based program, a randomized controlled study with strong control and a subset receiving home-based intervention is required.

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Annex 1

এম চাট

আপনার সন্তান সাধারণত কেমন তা নিম্নলিখিত শুন্যস্থান পূরণ করে জানান। অনুগ্রহ করে প্রত্যেকটি প্রশ্নের উত্তর দিতে চেষ্টা করুন। যদি কোন আচরণ খুবই কম দেখা যায় (জীবনে দুই একবার দেখেছেন) তবে শিশুটি তা স্বাভাবিকভাবে করেন ধরে উত্তর দিবেন।

১. আপনার শিশুকে শূন্যে তুলে বা হাঁটুর উপর দোলালে কি আনন্দ পায় ? ☐ হ্যাঁ ☐ না

২. আপনার শিশু কি অন্য শিশুরা কি করছে সেদিকে খেয়াল করে ? ☐ হ্যাঁ ☐ না

৩. আপনার শিশু কি কোন কিছুর উপর উঠতে পছন্দ করে (যেমন, আসবাবপত্র, সিঁড়ি) ? ☐ হ্যাঁ ☐ না

৪. আপনার শিশু কি উঁকি-টুকি/লুকোচুড়ি খেলতে আনন্দ পায় ? ☐ হ্যাঁ ☐ না

৫. আপনার শিশু কখনও ভান করে কিনা (যেমন, মিছিমিছি ফোনে কথা বলা, পুতুলের যত্ন করা বা অন্য কিছু ভান করা) ? ☐ হ্যাঁ ☐ না

৬. আপনার শিশুটি কি কখনও কিছু চাওয়ার জন্য আঙ্গুল নির্দেশ করে দেখিয়ে দেয় ? ☐ হ্যাঁ ☐ না

৭. আপনার শিশুটি কি কখনও নিজের উৎসাহের প্রতি আঙ্গুল নির্দেশ করে দেখায় ? ☐ হ্যাঁ ☐ না

৮. আপনার শিশুটি ছোট ছোট খেলনা (গাড়ী, গুঁটি) মুখে না দিয়ে, না চিবিয়ে বা না ফেলে যথাযথভাবে খেলে কিনা ? ☐ হ্যাঁ ☐ না

৯. আপনার শিশুটি কি কখনও কোন জিনিস আপনার কাছে এনে দেখায় ? ☐ হ্যাঁ ☐ না

১০. আপনার শিশুটি কি আপনার চোখের দিকে দু'এক সেকেন্ডের বেশী সময় ধ'রে তাকায় ? ☐ হ্যাঁ ☐ না

১১. আপনার কি মনে হয় আপনার শিশু শব্দের প্রতি অতি প্রতিক্রিয়াশীল (যেমন, কোন শব্দ শুনলে কানে হাত দেয়) ? ☐ হ্যাঁ ☐ না

১২. আপনার শিশুটি কি আপনাকে দেখে বা আপনার হাসির উত্তরে হাসে ? ☐ হ্যাঁ ☐ না

১৩. আপনার শিশুটি কি আপনকে অনুকরণ করে (যেমন, আপনার মুখভঙ্গী বা অন্যকোন ভঙ্গীর অনুকরণ) ? ☐ হ্যাঁ ☐ না

১৪. আপনার শিশু কি তার নাম ধরে ডাকলে সাড়া দেয় ? ☐ হ্যাঁ ☐ না

১৫. ঘরের অন্য প্রান্তে কোন খেলনার দিকে আঙ্গুল দিয়ে নির্দেশ করলে আপনার শিশু কি সেদিকে তাকায় ? ☐ হ্যাঁ ☐ না

১৬. আপনার শিশু কি হাঁটে ? ☐ হ্যাঁ ☐ না

১৭. আপনি কোন জিনিসের দিকে তাকালে, আপনার শিশু কি সেদিকে তাকায় ? ☐ হ্যাঁ ☐ না

১৮. আপনার শিশুটি কি ওর মুখের সামনে আঙ্গুলগুলি অস্বাভাবিকভাবে নাড়াচাড়া করে ? ☐ হ্যাঁ ☐ না

১৯. আপনার শিশুটি তার কোন কার্যকলাপের প্রতি আপনার মনোযোগ আকর্ষন করে ? ☐ হ্যাঁ ☐ না

২০. আপনার কি কখনও মনে হয়েছে যে আপনার শিশুটি কানে শোনে না ? ☐ হ্যাঁ ☐ না

২১. অন্য লোকেরা যা বলে, আপনার শিশু কি তা বুঝতে পারে ? ☐ হ্যাঁ ☐ না

২২. আপনার শিশু কি এমনভাবে তাকায় যেন সে কিছুই দেখছে না বা উদ্দেশ্যহীন ঘুরতে থাকে ? ☐ হ্যাঁ ☐ না

২৩. অপরিচিত কিছু দেখে আপনার শিশুটি কি আপনার প্রতিক্রিয়া দেখার জন্য আপনার মুখের দিকে তাকায় ? ☐ হ্যাঁ ☐ না

M-CHAT research is ongoing at the University of Connecticut and Georgia State University. The follow-up study of the initial sample is expected to be published in the near future. This research is supported by funding from the National Institute of Child Health and Development, the Maternal and Child Health Bureau, and the National Alliance for Autism Research. For more information, please contact Diana Robins at drobins@g...edu or Deborah Fein at Deborah Fein@uconn edu

M-CHAT Scoring Instructions

A child fails the checklist when 2 or more critical items are failed OR when any three items are failed. Yes/No answer convert to pass/fail response. Below are listed the failed responses for each item on the M-CHAT. Bold capitalized items are CRITICAL items.

Not all children who fail the checklist will meet criteria for a diagnosis on the autism spectrum. However, children who fail the checklist should be evaluated in more depth by the physician or referred for a development evaluation with a specialist.

1. No	6. No	11. Yes	16. No	21. No
2. No	**7. No**	12. No	17. No	22. Yes
3. No	8. No	13. No	18. **Yes**	23. No
4. No	9. No	14. No	19. No	
5. No	10. No	15. No	20. Yes	

SHISHU BIKASH KENDRO

Neurodevelopmental Assessment Form (abridged), March 2013 version

Master ID #: **Sex:** **Date of birth:**
Name: **Sibs:**
Age: **Consanguinity:**
Date of Registration: **SES :**
Address:

Chief Complaints:

H/O Present Illness:

Birth history:

- Antenatal:

- Natal:

- Neonatal:

Drug history: **Immunization:**

Milestones of Development:

Past history/illnesses:

Family history:

Feeding history:

On observation:

General Examination (if relevant)

Weight: **Height:** **OFC:**

Cognition: **Speech:**

Behavior: **Hearing:**

Vision: **Premitive reflex:**

Motor Function: **G.M:** **Oromotor function**

F.M: **Tone:**

Seizures: **Reflexes:**

Socialization :

Eye contact -

Responsive social smile -

Facial expression –

Body posture & gesture –

Peer relationship –

Response to other peoples emotion –

Sharing of own enjoyment –

Joint attention –

Communication :

Pointing –

Showing –

Giving –

Asking –

Requesting –

Use of others body to communication –

Conversation –

Behaviour :

Pattern of play –

Stereotyped behavior –

Hand/body mannerism –

Restricted interest –

Sensory interest –

Consensus between Physician and Psychologist –

Diagnosis:

Plan of Management:

Physician Psychologist Therapist

THE HOW AND WHY COMMUNICATION ASSESSMENT CHEKLIST

NAME: DATE: CHILD ID: ASSESSOR:

WHY the child communicate	open hand reach	movement	Sound	use adult's hand	point	eye contact	word approximation	gesture	Picture	Sound + Picture	words
get food											
request bubbles											
request balloon											
continue people game (eg. action song, swing)											
make a choice											
request help											

Adapted from 'MORE THAN WORDS' Henen Center, Canada.
Materials needed 'food, bubbles, balloon, choice of toys toy in container, colour picture of the specific materials.
This checklist designed.

Bayley

Scales of Infant and Toddler Development™

THIRD EDITION

Record Form

PA. No. _____

Child's name: _____

Sex: ☐M ☐F ID #: _____

Examiner's name: _____

School/Child care program: _____

Reason for referral: _____

_____

Subtest Summary Scores

Subtest	Total Raw Score	Scaled Score	Composite Score	Percentile Rank	Conf. Interval (____%)
Cognitive (Cog)					
			Use Table A.5		
Language (Lang)					
Receptive Communication (RC)					
Expressive Communication (EC)					
Sum					
			Use Table A.4		
Motor (Mot)					
Fine Motor (FM)					
Gross Motor (GM)					
Sum					
			Use Table A.4		
Social-Emotional (SE)					
			Use Table A.5		
Adaptive Behavior					
*Communication (Com)					
Community Use (CU)					
Functional Pre-Academics (FA)					
Home Living (HL)					
*Health and Safety (HS)					
*Leisure (LS)					
*Self-Care (SC)					
*Self-Direction (SD)					
*Social (Soc)					
*Motor (MO)			(GAC)		
Sum					
			Use Table A.6		

*For children younger than one year, the GAC is calculated using only those skill areas indicated by an asterisk.

Calculate Age and Start Point

	Years	Months	Days
Date Tested			
Date of Birth			
Age			
Age in Months and Days	Years X 12 + months		
Adjustment for Prematurity	Adjust through 24 months		
Adjusted Age			
Start Point	Calculate start point according to chart below		

Age	Start Point
16 days- 1 month 15 days	A
1 month 16 days- 2 months 15 days	B
2 months 16 days- 3 months 15 days	C
3 months 16 days- 4 months 15 days	D
4 months 16 days- 5 months 15 days	E
5 months 16 days- 6 months 15 days	F
6 months 16 days- 8 months 30 days	G
9 months 0 days- 10 months 30 days	H
11 months 0 days- 13 months 15 days	I
13 months 16 days- 16 months 15 days	J
16 months 16 days- 19 months 15 days	K
19 months 16 days- 22 months 15 days	L
22 months 16 days- 25 months 15 days	M
25 months 16 days- 28 months 15 days	N
28 months 16 days- 32 months 30 days	O
33 months 0 days- 38 months 30 days	P
39 months 0 days- 42 months 15 days	Q

PEARSON

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PsychCorp

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Case Record Form

Date:

OPD No:	SBK No:	
Name:	Age:	Sex:
	Weight:	Height:
Location:	Urban	Rural
Education of Parents	Father:	Mother:
Occupation of Parents	Father:	Mother:

Birth History-

Family History-

Co-morbidity (if Present)

CC- Restlessness
Less attention
Less eye contacts
Less response to name
Probable Diagnosis

Diagnosis confirmed by

1. M Chat Scoring				
2. Bayley's scale of infant and toddler development				
3. Neurodevelopment Assessment	Socialization	Mild	Moderate	Severe
	Behavior	Mild	Moderate	Severe
	Communication	Mild	Moderate	Severe
4. How and why communication assessment checklist	Own agenda			
	Requester			
	Early communication			
	Partner			

Confirmed diagnosis:

Signature of CHP Signature of DT Signature of CP

Brief bio-data of the author

Dr. Promugdha Hafiz passed the Secondary School Certificate Examination in 2006 followed by Higher Secondary Certificate Examination in 2008. She obtained her MBBS Degree in 2015 from Chattogram Medical College, Bangladesh. Now, she is a Candidate for the degree of Masters in Public Health (One Health) under the One Health Institute, CVASU. She published two scientific articles in international peer- reviewed journals. She has immense interest to continue research on AMR, child health, and infectious disease epidemiology through One Health approach.