

**THE NATURE OF SPEECH PROBLEM OF BENGALI
CHILDREN WITH CEREBRAL PALSY AND AUTISM- A
COMPARATIVE STUDY**

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DECLARATION

I hereby humbly declare that this thesis entitled '**The nature of speech problem of Bengali children with cerebral palsy and autism- A comparative study**' is based on work carried out by me and no part of it has been presented previously for any higher degree. The research work was carried out in the Department of linguistics, Dhaka university, Dhaka, Bangladesh, under the guidance of **Prof. Dr. Hakim Arif**, Department of Communication Disorders University of Dhaka.

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CERTIFICATE

Certified that **Dr. Fahmida Ferdous** has completed this thesis entitled '**The nature of speech problem of Bengali children with cerebral palsy and autism- A comparative study**' in partial fulfillment for the degree of master of Philosophy (M.Phil) in linguistics, under the University of Dhaka. Her work is genuine and is up to my full satisfaction.

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TABLE OF CONTENTS

Sl. no.	Title	Page No.
	ABSTRACT	1
Chapter One	INTRODUCTION	4
	1.1 Background	4
	1.2 Rationale of the study	9
	1.3 Research question	10
	1.4 Objectives	10
Chapter Two	REVIEW OF LITERATURE	11
Chapter Three	METHODOLOGY	19
Chapter Four	OBSERVATION AND RESULTS	23
Chapter Five	DISCUSSION	53
Chapter Six	CONCLUSION	66
Chapter Seven	LIMITATIONS OF THE STUDY	67
Chapter Eight	RECOMMENDATION	68
Chapter Nine	REFERENCES	69
	APPENDICES	
	Appendix-I: Data collection sheet	i
	Appendix-II: Informed consent form	xv

LIST OF TABLES

Table no.	Title	Page No.
(Cerebral Palsy)		
Table I	Age distribution of cerebral palsy patients	23
Table II	Sex distribution of cerebral palsy patients	23
Table III	Respondents relation to patient	24
Table IV	Distribution of the study patients by father and mother education	24
Table V	Distribution of the study patients by monthly family income	25
Table VI	Distribution of the study patients by housing type	25
Table VII	Distribution of the study patients by consanguinity	26
Table VIII	Distribution of the study patients by family history of mental illness	26
Table IX	Number of pregnancy of mother	27
Table X	Maternal medical illness during pregnancy	27
Table XI	Any drugs taken	28
Table XII	Natal history of mother	28
Table XIII	Birth history of cerebral palsy children	29
Table XIV	Linguistics out put in children with cerebral palsy	30
(Autism)		
Table XV	Distribution of the study patients by age (Autism)	36
Table XVI	Distribution of the study patients by sex (Autism)	36
Table XVII	Distribution of the study patients by respondents relation to patient	37
Table XVIII	Distribution of the study patients by father and mother education	37
Table XIX	Distribution of the study patients by monthly family	38

	income	
Table XX	Distribution of the study patients by housing type	38
Table XXI	Distribution of the study patients by consanguinity	39
Table XXII	Distribution of the study patients by family history of mental illness	39
Table XXIII	Number of pregnancy of mother	40
Table XXIV	Maternal medical illness during pregnancy	40
Table XXV	Any drugs taken	41
Table XXVI	Natal history of mother	41
Table XXVII	Linguistics out put in children with autism	42

LIST OF ABBREVIATIONS

AAC	Augmentative and alternative communication
ASD	Autism spectrum disorder
CDC	Centers for Disease Control
CP	Cerebral palsy
DQ	Developmental quotient
SLT	Speech and language therapy
TD	Typically developing children

Abstract

Background: The term Cerebral Palsy (CP) was originally coined more than a century ago and loosely translated as "brain paralysis". Regarding autism it has been suggested that peptides from gluten and casein may have a role in the origins of autism and that the physiology and psychology with language development of autism might be explained by excessive opioid-activity linked to these peptides.

Objective: To observe the nature of speech problem in Bengali children with cerebral palsy and autism.

Methodology: This descriptive observational study was conducted in Bengali children with cerebral palsy and autism attended in the out in diagnostic and intervention centre of cerebral palsy and autism in Tertiary level hospital, during the study period. Children had a medical diagnosis of CP and autism who 1st time came in the tertiary level hospital and had hearing abilities within normal limits as documented by either formal audiological evaluation or distortion product otoacoustic emission screening of included in this study. But those who received intervention was excluded from the study. Statistical analyses of the results were obtained by SPSS-20. The results were presented in table form of frequency and percentage.

Result: Almost three fourth (70.0%) of the CP children were 5-7 years and male to female ratio was 3:2. Most (60.0%) of the fathers and 8(80.0%) mothers were illiterate and majority (80.0%) of the patients came from <20000 taka monthly family income in cerebral palsy. Eighty percent CP children were in first children. Regarding linguistic output in children with cerebral palsy 9(90%) children can understand simple two words meaningful sentence. 8(80%) children did not want to play or make friendship with other children. All children (100%) performed phoneme omission, and substitution occurs when their children articulate words with vowels and consonants in different positions. Almost two third (60.0%) of the Autism children belonged to age 5-7 years and male to female ratio was 9:1. Most (90.0%) of the fathers and mothers 9(90.0%) were illiterate and majority (60.0%) of the patients came from 20000-50000 taka monthly family income in Autism. Lower uterine section was found 7(70.0%). Regarding linguistic output in children with autism, all (100.0%) parents were wondered that their children were not deaf, 7(70.0%) children did not respond to his/her name. Eighty percent (80.0%) children could not identify 4/5 body parts. All children (100.0%) had speech developmental delay. Sixty percent (60.0%) children could not use/her index finger to point, to indicate interest in sometimes, (90.0%) children did not ever use his/her index finger to point, to ask for sometimes, 9(90.0%) children did not have any fluency disorder

and 8(80.0%) children could not say name of known objects. Ninety percent 9(90.0%) children could not use pronouns, 9(90.0%) children repeatedly utter words and 70.0% children used idiosyncratic words/neologism. Sixty percent 6(60.0%) children did not try to attract your/other attention his/her activity. All children (100%) did not participate in rhymes/song with other children, 9(90.0%) children did not ever play with symbol and 9(90.0%) children did not take part in conversation. All children could not make eye contact and facial expressions, 100.0% children could not point or look at things with other jointly, and did not smile in response to any activity which he/she likes.

TITLE

**THE NATURE OF SPEECH PROBLEM IN BENGALI
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Chapter -One

Introduction

1.1 Background

A disability in humans may be physical, cognitive, sensory, emotional and developmental or some combination of it. A disability is an umbrella term, covering impairments, activity limitations and participation restrictions. Impairment is a problem in body function or structure which is an activity limitation or a difficulty encountered by an individual in executing a task or action (World Health Organization 2010).

Children with cerebral palsy (CP) frequently demonstrate difficulties in communication as a result of impaired language skills, which are often influenced by motor speech disorders (Straub & Obrzut 2009). The etiology of CP most likely is multifactorial, arising directly from the motor impairment and linked to the cognitive and /or sensory processing deficits associated with CP (Pennington et al. 2005). In contrast, several studies have demonstrated average verbal abilities of higher-functioning children with cerebral palsy (CP) (Straub & Obrzut 2009; Pirila et al. 2004; Sigurdardottir et al. 2008) and even children with early left-sided brain damage may exhibit sparing of language skills (Lidzba et al. 2006).

The prevalence of cerebral palsy is approximately 2.5 per 1000 live births in countries with neonatal intensive care facilities (Colver 2000; Yeargin-Allsopp 2008; Himmelmann 2010). Prevalence is higher in children born with very low birth weight. However, a decline in prevalence in this group from 60.6 (99% CI 37.8-91.4) per 1000 live births in

1980 to 39.5 (28.6-53.0) per 1000 in 1996 has recently been observed in Europe (Platt 2007). Communication difficulties can be associated with any type of cerebral palsy and may relate to limitations in the production of movements for speech, gesture and facial expression; receptive or expressive language; hearing; vision; or a combination of limitations in these functions. Speech impairments are estimated to affect approximately 36% of children with cerebral palsy and communication difficulties are observed in around 42% (Parkes et al. 2010). Prevalence of speech, language and communication impairment increases with severity of motor and intellectual impairment (Kennes et al. 2002; Bax 2006; Parkes 2010; Sigurdardottir 2010). Children may experience communication difficulties from early infancy and, as cerebral palsy is a persistent condition, communication impairments are chronic and children may require long term intervention. In a review of speech and language therapy caseloads in the UK, Enderby 1986 estimated that cerebral palsy was the sixth most common medical cause of speech disorder, and the proportion of referrals of children with this diagnosis remains static (Petheram and Enderby 2001).

In Katherine et al. (2014) work, based on detailed speech and language assessment data from a cohort of 4.5-yearold children with CP, 75% of participants had clinical speech and/or language impairments (Hustad et al. 2010). Communication challenges of any kind can lead to educational and social isolation (Ronski & Sevcik 2005) and can have a detrimental impact on nearly all aspects of development (Sevcik et al. 2004; Light et al. 2004; Light et al. 2007). Thus, identifying and treating specific speech and language problems at the earliest possible age is of the utmost importance.

To date, research on speech and language development in children with CP has been limited, in part due to the extreme heterogeneity of this population. The range of possible speech, language, and communication problems is considerable. To reduce this heterogeneity, Katherine et al. (2014) developed a rubric for considering different speech and language impairment profiles in children with CP (Hustad et al. 2010). Katherine et al. (2014) study model separates children into profile groups based on the presence or absence of speech motor involvement, the severity of speech motor involvement, and the presence or absence of language/cognitive involvement. The resultant model comprises 8 (eight) categorical speech and language impairment profiles. Preliminary work has validated this model on children with CP at the age of 4.5 years (Hustad et al. 2010). One key challenge with this model is that it is difficult to apply to very young children (below the age of three years) because of the wide range of variability in speech and language performance that is considered typical in young children. Such variability during the toddler years can make it difficult to definitively identify problems in young children, especially in cases where deficits are more subtle. Over time, however, the range of acceptable variability narrows, making determination of delays or disorders less complex in many cases.

Speech and language therapists (also known as speech therapists, speech-language pathologists) assess, diagnose and treat the communication disorders associated with cerebral palsy. Speech and language therapy may be delivered in a range of settings,

including clients' homes, community clinics, hospitals and schools (Royal College of Speech and Language Therapists 1999).

Autism spectrum disorder (ASD) covers a set of developmental disabilities that can cause significant social, communication, and behavioral challenges. People with ASD process information in their brain differently than other people. ASD affects people in different ways and can range from mild to severe. People with ASD share some symptoms, such as difficulties with social interaction, but there are differences when the symptoms start, how severe they are, how many symptoms there are, and whether other problems are present. The signs of ASD begin before the age of 3, although some children may show hints of future problems within the first year of life. ASD affects people of every race, ethnic group, and socioeconomic background, but it is five times more common among boys than among girls. The Centers for Disease Control and Prevention (CDC 2012) estimates that about 1 out of every 88 children was identified with ASD.

Children with ASD often are self-absorbed and seem to exist in a private world where they are unable to successfully communicate and interact with others. Children with ASD may have difficulty developing language skills and understanding what others say to them. They also may have difficulty communicating nonverbally, such as through hand gestures, eye contact, and facial expressions. Not every child with ASD will have a language problem. A child's ability to communicate will vary, depending upon his or her intellectual and social development. Some children with ASD may be unable to speak. Others may have rich vocabularies and be able to talk about specific subjects in great detail. Most children with ASD have little or no problem pronouncing words. The majority, however, have difficulty using language effectively, especially when they talk to other people. Many have problems with the meaning and rhythm of words and sentences. They also may be unable to understand body language and the nuances of vocal tones.

Individuals with autism put a heavy demand on educational, social, and medical services, and accurate prevalence estimates are needed for the planning of such services. Until the

1990s, the figure of four to five cases of autism per 10 000 people was widely accepted, although as many as 20 per 10 000 children were reported as showing the triad of impairments in social reciprocity, language impairment, and reduced imagination and restricted activities (Wing & Gould 1979). Studies have shown increased prevalence estimates for all ASDs of between 30 and 90 cases per 10 000 (Baird et al. 2000; Bertrand et al. 2001; Chakrabarti & Fombonne 2005; Honda et al. 2005; Yeargin-Allsopp et al. 2003). In addition to a true increase in prevalence, alternative explanations have been proposed, including changing diagnostic criteria, different methods of ascertainment, varying urban, rural, and country location, and population of study, younger age, and inclusion of individuals with average intelligence quotient (IQ) and those with other neuropsychiatric and medical disorders.

Individuals with autism may have problems impeding their development of speech and language that are well outside the scope of traditional speech and language therapy (such as social deficits) or, at the very least, in the very frontiers of clinical knowledge as to appropriate treatment (developmental articulation disorders). Parents and teachers are confronted by a bewildering range of options and apparent philosophies of treatment of these individuals. However, what really matters most is the empathy, energy, and flexibility of the particular therapist or therapists. In many cases, for example, therapists with seemingly very different philosophies will have surprisingly similar treatment plans because of the realities of the particular individual they deal with.

1.2 Rationale of the study

This study sought to characterize speech and language abilities in children with cerebral palsy and autism. The majority of children with cerebral palsy and autism show evidence of speech and language impairments later in the preschool years, we wondered whether we could identify those problems earlier so that we could begin to work toward delivering earlier intervention or even prevention of later problems. Because of the expected range of variability among children and the fact that the presence or absence of speech motor involvement (a fundamental differentiator in classification system for children with cerebral palsy/ autism) may not yet be discernible belonged to 3 – 18 years of age, we used a broader descriptive approach to characterization of early communication abilities. The specific questions were as follows:

- (1) What are the speech and language profiles of children with cerebral palsy/ autism?
- (2) Do children in different profile groups vary with regard to a select set of speech and language measures?

It is usual for speech and language therapists to liaise with families and teaching staff regarding therapy to ensure that intervention goals are incorporated into daily life, where possible (Calculator and Jorgensen 1991). Therapy may be delivered on an individual basis or in groups. Interventions may also vary in duration and intensity.

Once CP/autism is diagnosed, speech therapists assess the best ways to improve communication and enhance a person's quality of life. Throughout therapy, the speech-language pathologist also works closely with the family, school, and other professionals. If someone with CP/autism is nonverbal or has major trouble with speech, the speech therapist may introduce alternatives to speech. Therefore this study is undertaken to assess the nature of speech problem in Bengali children with cerebral palsy and autism.

1.3 Research question

What type of speech problems in Bengali children with cerebral palsy and autism are observed?.

1.4 Objectives

General Objective:

To compare the nature of speech problem in Bengali children with cerebral palsy and autism.

Specific Objectives

1. To describe the socio-demographic characteristics of Bengali children with cerebral palsy and autism having speech problem
2. To find out the factors affecting the nature of speech problem in Bengali children with cerebral palsy and autism
3. To investigate the different types of speech profiles in Bengali children with cerebral palsy and autism
4. To isolate different language and communication problems in Bengali children with cerebral palsy and autism.

Chapter Two

Literature review

Hustad et al. (2014) examined early speech and language development in children who had cerebral palsy. Questions addressed whether children could be classified into early profile groups on the basis of speech and language skills and whether there were differences on selected speech and language measures among groups. Speech and language assessments were completed on 27 children with CP who were between the ages of 24 and 30 months (mean age 27.1 months; SD 1.8). They examined several measures of expressive and receptive language, along with speech intelligibility. Three groups of children identified were those not yet talking (44% of the sample); those whose talking abilities appeared to be emerging (41% of the sample); and those who were established talkers (15% of the sample). Group differences were evident on all variables except receptive language skills. Eighty five percent of 2-year-old children with CP in this study had clinical speech and/or language delays relative to age expectations. Findings suggest that children with CP should receive speech and language assessment and treatment at or before 2 years of age.

Speech acoustic characteristics of children with cerebral palsy (CP) were examined with a multiple speech subsystem approach; speech intelligibility was evaluated using a prediction model in which acoustic measures were selected to represent three speech subsystems observed by Katherine et al. (2014). Nine acoustic variables reflecting different subsystems, and speech intelligibility, were measured in 22 children with CP. These children included 13 with a clinical diagnosis of dysarthria (SMI), and nine judged

to be free of dysarthria (NSMI). Data from children with CP were compared to data from age-matched typically developing children (TD). Multiple acoustic variables reflecting the articulatory subsystem were different in the SMI group, compared to the NSMI and TD groups. A significant speech intelligibility prediction model was obtained with all variables entered into the model (Adjusted R-squared=0.801). The articulatory subsystem showed the most substantial independent contribution (58%) to speech intelligibility. Incremental R-squared analyses revealed that any single variable explained less than 9% of speech intelligibility variability. Children in the SMI group have articulatory subsystem problems as indexed by acoustic measures. As in the adult literature, the articulatory subsystem makes the primary contribution to speech intelligibility variance in dysarthria, with minimal or no contribution from other systems.

Surveillance registers monitor the prevalence of cerebral palsy and the severity of resulting impairments across time and place. The motor disorders of cerebral palsy can affect children's speech production and limit their intelligibility. Pennington et al. (2013) described the development of a scale to classify children's speech performance for use in cerebral palsy surveillance registers, and its reliability across raters and across time. Speech and language therapists, other health care professionals and parents classified the speech of 139 children with cerebral palsy (85boys, 54girls; mean age 6.03 years, SD 1.09) from observation and previous knowledge of the children. Another group of health professionals rated children's speech from information in their medical notes. With the exception of parents, raters reclassified children's speech at least four weeks after their initial classification. Raters were asked to rate how easy the scale was to use and how

well the scaled described the child's speech production using Likert scales. Inter-rater reliability was moderate to substantial ($k > 0.58$ for all comparisons). Test-retest-reliability was substantial to almost perfect for all groups ($k > 0.68$). Over 74% of raters found the scale easy or very easy to use; 66% of parents and over 70% of health care professionals judged the scale to describe children's speech well or very well. They conclude that the Viking Speech Scale is a reliable tool to describe the speech performance of children with cerebral palsy, which can be applied through direct observation of children or through case note review.

Nordberg et al. (2012) described speech ability in a population-based study of children with cerebral palsy (CP), in relation to CP subtype, motor function, cognitive level and neuroimaging findings. A retrospective chart review of 129 children (66 girls, 63 boys) with CP, was carried out. Speech ability and background information, such as type of CP, motor function, cognitive level and neuroimaging data, were collected and analysed. Speech disorders were found in 21% of the children and were present in all types of CP. Forty-one per cent of the children with speech disorders also had mental retardation, and 42% were able to walk independently. A further 32% of the children were nonverbal, and maldevelopment and basal ganglia lesions were most common in this group. The remaining 47% had no speech disorders, and this group was most likely to display white matter lesions of immaturity. More than half of the children in this CP cohort had a speech disorder (21%) or were nonverbal (32%). Speech ability was related to the type of CP, gross motor function, the presence of mental retardation and the localization of brain

maldevelopment and lesions. Neuroimaging results differed between the three speech ability groups.

The production of speech, language and gesture for communication is often affected by cerebral palsy. Communication difficulties associated with cerebral palsy can be multifactorial, arising from motor, intellectual and sensory impairments. Children with this diagnosis can experience mild to severe difficulties in expressing themselves. They are often referred to speech and language therapy (SLT) services to maximise their communication skills and help them to take as independent a role as possible in interaction activities. Therapy can include introducing augmentative and alternative communication (AAC) systems, such as symbol charts or communication aids with synthetic speech, as well as treating children's natural forms of communication. Various strategies have been used to treat the communication disorders associated with cerebral palsy, but evidence of their effectiveness is limited. Pennington et al. (2011) determined the effectiveness of SLT that focuses on the child or their familiar communication partners, as measured by change in interaction patterns. To determine if individual types of SLT intervention are more effective than others in changing interaction patterns. Any experimental study containing an element of a control was included in this review. This includes non-randomised group studies and single case experimental designs in which two interventions were compared or two communication processes were examined. Sixteen studies were included in the review. Nine studies evaluated treatment given directly to children, seven investigated the effects of training for communication partners. Participants in the studies varied widely in age, type and severity of cerebral palsy,

cognitive and linguistic skills. Studies focusing directly on children suggest that this model of therapy delivery has been associated with increases in treated speech and communication skills by individual children. However, methodological flaws and small sample sizes prevent firm conclusions being made about the effectiveness of the therapy. In addition, maintenance of these skills was not investigated thoroughly. The studies targeting communication partners used small exploratory group designs which often contained insufficient detail to allow replication, although more recent studies have improved in this area. Overall, the studies of indirect intervention have very low power and cannot provide evidence of effectiveness of this type of treatment. Firm evidence of the positive effects of SLT for children with cerebral palsy has not been demonstrated by this review. However, positive trends in communication change were shown. No change in practice is recommended from this updated review. Further research is needed to describe this client group, and its possible clinical subgroups, and the methods of treatment currently used in SLT. Research is also needed to investigate the effectiveness of new and established interventions and their acceptability to families. Rigour in research practice needs to be extended to enable firm associations between therapy and the communication change to be made. There are now sufficient data to develop randomised controlled studies of dysarthria interventions and group parent training programmes. Such research is urgently needed to ensure clinically effective provision for this group of children, who are at severe risk of social and educational exclusion.

Sigurdardottir and Vik (2010) described speech, expressive language, and verbal cognition of children with cerebral palsy (CP). A population study included 152 Icelandic

children with congenital CP (74 males, 78 females; mean age 5y 5mo, range 4y–6y 6mo). Children who spoke in sentences, phrases, or one-word utterances were categorized as verbal. Speech was classified as normal, mild dysarthria, or severe dysarthria. Cognition was reported as IQ (Wechsler Preschool and Primary Scale of Intelligence – Revised) or developmental quotient (DQ). Most children (81%) had spastic CP and bilateral symptoms (76%); 74 (49%) were at Gross Motor Function Classification System(GMFCS) level I, 27% at levels II and III, and 24% at levels IV and V ($p<0.05$). One hundred and twenty-eight children (84%) communicated verbally whereas 24 were nonverbal. Nonverbal status and severe dysarthria were associated with greater motor impairment (GMFCS; $p<0.05$). Twenty-five children (16%) had severe dysarthria. Most (88%) of the nonverbal children had multiple disabilities compared with 18% of the verbal group ($p<0.001$). Median (interquartile range) verbal IQ was 93 (73–104) and performance IQ 77 (61–94; $p<0.05$). Sixty-eight children (45%) had normal verbal cognition and almost a quarter of the children with severe dysarthria had a full-scale IQ/DQ of 70. Most children with CP express sentences and almost half of them have normal verbal IQ.

Oliveira et al. (2007) have done a study to estimated the prevalence of autistic spectrum disorder (ASD) and identify its clinical characterization, and medical conditions in a paediatric population in Portugal. A school survey was conducted in elementary schools, targeting 332 808 school-aged children in the mainland and 10 910 in the Azores islands. Referred children were directly assessed using the Diagnostic and Statistical Manual of Mental Disorders (4th edn), the Autism Diagnostic Interview–Revised, and the

Childhood Autism Rating Scale. Clinical history and a laboratory investigation was performed. In parallel, a systematic multi-source search of children known to have autism was carried out in a restricted region. The global prevalence of ASD per 10000 was 9.2 in mainland, and 15.6 in the Azores, with intriguing regional differences. A diversity of associated medical conditions was documented in 20%, with an unexpectedly high rate of mitochondrial respiratory chain disorders.

Recent reports have suggested that the prevalence of autism and related spectrum disorders (ASDs) is substantially higher than previously recognised. Baird et al. (2006) sought to quantify prevalence of ASDs in children in South Thames, UK. Within a total population cohort of 56 946 children aged 9—10 years, we screened all those with a current clinical diagnosis of ASD (n=255) or those judged to be at risk for being an undetected case (n=1515). A stratified sub sample (n=255) received a comprehensive diagnostic assessment, including standardised clinical observation, and parent interview assessments of autistic symptoms, language, and intelligence quotient (IQ). Clinical consensus diagnoses of childhood autism and other ASDs were derived. They used a sample weighting procedure to estimate prevalence. The prevalence of childhood autism was 38.9 per 10 000 (95% CI 29.9—47.8) and that of other ASDs was 77.2 per 10 000 (52.1—102.3), making the total prevalence of all ASDs 116.1 per 10 000 (90.4—141.8). A narrower definition of childhood autism, which combined clinical consensus with instrument criteria for past and current presentation, provided a prevalence of 24.8 per 10 000 (17.6—32.0). The rate of previous local identification was lowest for children of less educated parents. Prevalence of autism and related ASDs is substantially greater than

previously recognised. Whether the increase is due to better ascertainment, broadening diagnostic criteria, or increased incidence is unclear. Services in health, education, and social care were needed to recognise the needs of children with some form of ASD, who constitute 1% of the child population.

Liu (2005) examined the effect of reduced vowel working space on dysarthric talkers' speech intelligibility using both acoustic and perceptual approaches. In experiment 1, the acoustic-perceptual relationship between vowel working space area and speech intelligibility was examined in Mandarin-speaking young adults with cerebral palsy. Subjects read aloud 18 bisyllabic words containing the vowels /i/, /a/, and /u/ using their normal speaking rate. Each talker's words were identified by three normal listeners. Results revealed that talkers with cerebral palsy exhibited smaller vowel working space areas compared to ten age-matched controls. The vowel working space area was significantly correlated with vowel intelligibility ($r=0.632$, $p<0.005$) and with word intelligibility ($r=0.684$, $p<0.005$). Experiment 2 examined whether tokens of expanded vowel working spaces were perceived as better vowel exemplars and represented with greater perceptual spaces than tokens of reduced vowel working spaces. The results of the perceptual experiment support this prediction. The distorted vowels of talkers with cerebral palsy compose a smaller acoustic space that results in shrunken intervowel perceptual distances for listeners.

Chapter Three

Methodology

3.1 Type of study

Descriptive observational analytical study

3.2 Place of study

The study was carried out in diagnostic and intervention centre of cerebral palsy and autism in tertiary level hospital.

3.3 Study population

During the study period Bengali children with autism and CP aged between 3 – 18 years were attend diagnostic and intervention centre in Tertiary level hospital.

3.4 Sampling method Purposive sampling

3.5 Sample size

The current study duration is only 12 months, so the targeted sample size can not be collected during this study duration. Therefore 20 Bengali children with cerebral palsy and autism was selected in this study.

3.6 Inclusion criteria

1. Children have a medical diagnosis of CP and autism who 1st time came in the tertiary level hospital.
2. Children have hearing abilities within normal limits as documented by either formal audiological evaluation or distortion product otoacoustic emission screening.

3.7 Exclusion Criteria

- Who receive Intervention

3.8 Variables

Independent variables

Age, education, socio-economic status

3.9 Exposure variables

Clinical presentations of CP & autism was described as spastic (hemiplegic, diplegia, or quadriplegia), dyskinetic, ataxic, or non-classifiable.

3.10 Outcome variables

Expressive language: Children were classified as either verbal or nonverbal communicators based on their expressive language functioning, which was rated by the speech and language pathologist throughout the study period.

3.11 Confounding variables

Hearing impairment was defined as being in need of a hearing aid or the presence of deafness (hearing threshold at or above 65dB in better ear).

3.12 Screening methods

Diagnosis of CP

- History taking from parents
- Clinical examination
- Investigation CT Scan/ MRI

Diagnosis of Autism

- History taking from parents
- Clinical examination
- ICD - 10, M-CHAT
- DSM- V

3.13 Equipments CT, MRI, EEG

3.14 Procedure of collecting data

After fulfillment of inclusion and exclusion criteria children were enrolled in this study by giving an ID no. The patients him/herself with care giver have been informed the details of the study and informed consent were given. A predesigned questionnaire was used for data collection. Detailed socio-demographic, past history, speech, language and communication problems were recorded in this structured questionnaire.

3.15 Data processing and data analysis

Statistical analyses were carried out by using the Statistical Package for Social Sciences (SPSS Inc., Chicago, Illinois, USA). The quantitative observations were indicated by frequencies and percentages.

3.16 Quality assurance strategy

At every step of data collection, processing and analysis, suggestion from a statistician have been sought and the data collected has been rechecked to avoid entry of wrong data and ensure analysis using appropriate statistics.

Chapter Four

Observation and results

4.1 Observations and result of speech problems and other related factors in children with cerebral palsy.

Table I: Age distribution of cerebral palsy patients (n=10)

Age (years)	Number of patients	Percentage
5-7	7	70.0
>7	3	30.0

Table I shows age distribution of the cerebral palsy patients. It was observed that almost three fourth (70.0%) patients was found 5-7 years and rest 3(30.0%) as found > 7 years.

Within 4-5 years basic language development occur in a normal child. If any children had problem in basic language development after 7-11 years the child usually becomes “mute” or articulation disordered (Arif et al. 2015; আরিফ এবং নাসরীন ২০১৩).

Table II: Sex distribution of cerebral palsy patients (n=10)

Sex	Number of patients	Percentage
Male	6	60.0
Female	4	40.0

Table II shows sex distribution of the cerebral palsy patients. It was observed that male was found 6(60.0%) and female was 4(40.0%).

Table III: Respondents relation to patient (n=10)

Respondents relation to patient	Number of patients	Percentage
Mother	7	70.0
Father	1	10.0
Other	2	20.0

Table III shows respondents relation to patient. It was observed that respondents relation to patients was mother 7(70.0%), father was 1(10.0%) and other was 2(20.0%).

Table IV: Distribution of the study patients by father and mother education (n=10)

Father education	Number of patients	%
Illiterate	6	60.0
Below graduation	4	40.0
Graduation	0	0.0

Mother education	Number of patients	%
Illiterate	8	80.0
Below graduation	2	20.0
Graduation	0	0.0

Regarding father educational status, in cerebral palsy 6(60.0%) father was illiterate.

Regarding mother educational status, in cerebral palsy group majority 8(80.0%) mother was illiterate.

Table V: Distribution of the study patients by monthly family income (n=10)

Monthly family income	Number of patients	Percentage
<20000	8	80.0
20000-50000	2	20.0
>50000	0	0.0

Table V shows monthly family income of the study patients, and it was observed that majority (80.0%) of the patients came from <20000 taka income in cerebral palsy.

Table VI: Distribution of the study patients by housing type (n=10)

Housing type	Number of patients	Percentage
Cacha	5	50.0
Paka	4	40.0
Semi paka	1	10.0

Table VI shows housing type of the patients and it was observed that 5(50.0%) patients came from cacha house, 4(40.0%) came from paka house and 1(10.0%) came from semi paka house.

Table VII: Distribution of the study patients by consanguinity (n=10)

Consanguinity	Number of patients	Percentage
Present	2	20.0
Absent	8	80.0

Table VII shows consanguinity of the patients and it was observed that consanguinity was found in 2(20.0%).

Table VIII: Distribution of the study patients by family history of mental illness (n=10)

Family history of mental illness	Number of patients	Percentage
Present	1	10.0
Absent	9	90.0

Table VIII shows family history of mental illness of the patients and it was observed that family history of mental illness was found 1(10.0%).

Table IX: Number of pregnancy of mother (n=10)

Number of pregnancy	Number of patients	Percentage
1	8	80.0
2	2	20.0

Table IX shows number of pregnancy of mother and it was observed that 8(80.0%) mother were 1st time of pregnancy.

Table X: Maternal medical illness during pregnancy (n=10)

Maternal medical illness	Number of patients	Percentage
Hypertension	2	20.0
NAD	8	80.0

Table X shows maternal medical illness during pregnancy and it was observed that 2(20.0%) mother had hypertension during pregnancy.

Table XI: Any drugs taken (n=10)

Any drugs taken	Number of patients	Percentage
None	6	60.0
Nothing abnormality detected (NAD)	0	0.0
Other	4	40.0

Table XI shows drug history of mother and it was observed that 6(60.0%) did not take any drug.

Table XII: Natal history of mother (n=10)

Natal history of mother	Number of patients	Percentage
Gestational age		
Full term	10	100.0
Pre-term	0	0.0
Post-term	0	0.0
Mode of delivery		
Normal vaginal delivery	10	100.0
Lower uterine section	0	0.0

Table XII shows natal history of mother and it was observe that majority mother had full term gestational age. Normal vaginal delivery was found 10(100.0%).

Table XIII: Birth history of children with cerebral palsy (n=10)

Birth history	Number of patients	Percentage
History of prolonged labour		
Yes	10	100
No	0	0.0
History of preterm delivery		
No	8	80.0
Don't remember	2	20.0
Place of delivery		
Home attained by untrained birth attended	7	70.0
Hospital, normal vaginal delivery	3	30.0
History of delayed crying at birth		
Yes	7	70.0
Don't remember	3	30.0

Table XIII shows birth history of children with cerebral palsy and it was observed that history of prolonged labour was found 10(100.0%), no history of preterm delivery was 8(80.0%) and home attained by untrained birth attended 7(70.0%). History of delayed crying at birth was found 7(70.0%).

4.2 Total 8 questions were developed for find out the linguistics output in children with Cerebral palsy

First, 1 question on receptive language development (1)

Table XIV: Getting the meaning of the type of sentence by children with cerebral palsy (n=10)

1. Does your child understand your all speech? (আপনার সব কথা কি বুঝতে পারে?)	Number of patients	Percentage
Yes	9	90.0
No	1	10.0

On observations and history taking from care giver the linguistic output of children with cerebral palsy were-

90% children can understood simple two words sentence (সরল বাক্য)

Two words sentence (Arif et al. 2015)

Example-আমাকে দাও । চল যাই । নিয়ে আস ।

But the cannot understand complex sentence (জটিল বাক্য বুঝতে পারে না)

Example- "আমরা নানা বাড়িতে গিয়ে এত মজার খেলা খেলেছিলাম যে আমাদের খুব আনন্দ হয়েছিল"

Second, 1 The nature of social communication (2)

2. Does your child wants to play or friendship with other children? (আপনার শিশু কি অন্য শিশুদের সাথে খেলা করতে অথবা বন্ধুত্ব করতে চায়?)	Number of patients	Percentage
Yes	2	20.0
No	8	80.0

80% children did not want to play or make friendship with other children.

Why do not what to play or make friendship with other children? The answer were-
(কেন খেলা করতে অথবা বন্ধুত্ব করতে চায় না?)

(1) Do not understand other speech-4 (40.0%)

(অন্যের কথা বুঝে না)

(2) Do not express his own speech-5(50.0%)

(নিজের কথা অন্যকে বুঝাতে পারে না)

(3) Do not understand & express his own speech-1(10.0%)

(অন্যের কথা বুঝে না এবং নিজের কথা অন্যকে বুঝাতে পারে না)

Third, 6 questions concerning the use of expressive language development (3, 4, 5, 6, 7, 8)

3. Does any letter (phoneme) omission occur when your child articulates any word? (শব্দ উচ্চারণ করলে কোন ধ্বনি বাদ পড়ে?)	Number of patients	Percentage
Yes	10	100.0
No	0	0.0

All parents (100%) said phoneme omission occurs when their children articulate words.

4. Does any speech substitution occur when your child articulates any word? (আপনার কি মনে হয় আপনার শিশু শব্দ উচ্চারণে একটির ক্ষেত্রে আরেকটি উচ্চারণ করেছে?)	Number of patients	Percentage
Yes	10	100.0
No	0	0.0

All parents (100%) said phoneme substitution occurs when their children articulate words.

Example-“উপর” কে কি বলছে? ”ওফর”
 ”করছ” কে কি বলছে? ”কছছ”

Substitutions occur in both initial and middle positions of words.

5. How can your child articulate following words (with vowel)? (স্বরধ্বনি) **Number of patients Percentage**
(আপনার শিশু নিম্নোক্ত শব্দগুলো কিভাবে বলে?)

"ইট" The child articulates ই-ট (Slowly)		
Yes	10	100.0
No	0	0.0
"অনেক" The child articulates অ-এ (Slowly)		
Yes	10	100.0
No	0	0.0
"আলু" The child articulates আ-অ (Slowly)		
Yes	10	100.0
No	0	0.0

Vowel (স্বরধ্বনি)

“ইট” The child articulate-ই-ট (Slowly)

“অনেক” The child articulate-অ-এ (Slowly)

“আলু” The child articulate-আ-এ (Slowly)

On observation, all children (100%) had articulation disorders when they articulate words with vowels. For example, during articulation of words with vowels they not only omit the consonants in between the vowels, but also prolong the respective vowels which turns into a vowel-glide.

	Number of patients	Percentage
6. How can your child articulate following consonants (আপনার শিশু নিম্নোক্ত ব্যঞ্জনধ্বনিগুলো কিভাবে বলে? যেমন: প /P, ব /B, স/S, জ/ Z)		
প /P, ব /B, স/S, জ/ Z Child articulate "অ"	6	60.0
প /P, ব /B, স/S, জ/ Z Child articulate "ছ"	3	30.0
প /P, ব /B, স/S, জ/ Z Child articulate "উ"	1	10.0
On observation, children failed to utter these consonants.		
7. How can your child articulate following words with consonants? (আপনার শিশু 'বেলা', 'খেলা', 'দেখা' শব্দগুলোকে কিভাবে উচ্চারণ করে?)		
" বেলা", The Child articulates " বে-আ",		
Yes	10	100.0
No	0	0.0
" খেলা" The Child articulates " খে-আ",		
Yes	10	100.0
No	0	0.0
" দেখা" The Child articulates " দে-আ",		
Yes	10	100.0
No	0	0.0

On observation, 100% children have problem in articulating consonants. For example, all children omitted the word-final consonants.

8. How can your child articulate following words with

consonants? আপনার শিশু নিম্নোক্ত শব্দগুলো কিভাবে বলে?

Number of patients Percentage

(ব্যঞ্জনধ্বনিসহ)

"পাতা" The Child articulates "পাটা"

Yes	10	100.0
No	0	0.0

On observation, 100% children had articulation disorder, substitution of dental 'ত' by alveolar 'ট'.

"কাক" The Child articulates "আক"

Number of patients Percentage

Yes	10	100.0
No	0	0.0

"জাল" The Child articulates "আল"

Yes	10	100.0
No	0	0.0

On observation, 100% child had articulation disorder, deletion of word-initial consonants.

"দান" The Child articulates "দা"

Number of patients Percentage

Yes	10	100.0
No	0	0.0

"ভালো" The Child articulates "ভা"

Yes	10	100.0
No	0	0.0

"পর" The Child articulates "প"

Yes	10	100.0
No	0	0.0

On observation, 100% children had articulation disorder. They deleted word-final consonants.

4.3 Observations and result of speech problems in children with Autism

Table XV: Distribution of the study patients by age (Autism) (n=10)

Age (years)	Number of patients	Percentage
5-7	6	60.0
>7	4	40.0

Table XV shows age distribution of the patients. It was observed that 6(60.0%) patients belonged to age 5-7 years.

Table XVI: Distribution of the study patients by sex (Autism) (n=10)

Sex	Number of patients	Percentage
Male	9	90.0
Female	1	10.0

Table XVI shows sex distribution of the patients. It was observed that males were 9(90.0%) and females were 1(10.0%).

Table XVII: Distribution of the study patients by respondents relation to patient (n=10)

Respondents relation to patient	Number of patients	Percentage
Mother	8	80.0
Father	2	20.0
Other	0	0.0

Table XVII shows respondents relation to patient. It was observed that respondents relation to patients mothers were 8(80.0%) and fathers were 2(20.0%).

Table XVIII: Distribution of the study patients by father and mother education (n=10)

Father education	Number of patients	Percentage
Illiterate	0	0.0
Below graduation	1	10.0
Graduation	9	90.0

Mother education	Number of patients	Percentage
Illiterate	0	0.0
Below graduation	1	10.0
Graduation	9	90.0

In autism group 9(90.0%) fathers were educated at graduation level and 9(90.0%) mothers were educated at graduation level.

Table XIX: Distribution of the study patients by monthly family income (n=10)

Monthly family income	Number of patients	Percentage
<20000	0	0.0
20000-50000	6	60.0
>50000	4	40.0

6(60.0%) of the patients came from 20,000-50,000 taka income group & 4(40.0%) of the patients came from >50,000 income group.

Table XX: Distribution of the study patients by housing type (n=10)

Housing type	Number of patients	Percentage
Cacha	0	0.0
Paka	10	100.0
Semi paka	0	0.0

In autism group all patients came from paka house.

Table XXI: Distribution of the study patients by consanguinity (n=120)

Consanguinity	Number of patients	Percentage
Present	1	10.0
Absent	9	90.0

Consanguinity was present in 1(10.0%) and absent 9(90.0%).

Table XXII: Distribution of the study patients by family history of mental illness (n=10)

Family history of mental illness	Number of patients	Percentage
Present	6	60.0
Absent	4	40.0

Family history of mental illness was present in 6(60.0%) and absent in 4(40.0%).

Table XXIII: Number of pregnancy of mother (n=10)

Number of pregnancy	Number of patients	Percentage
1	3	30.0
2	7	70.0

Seven 7(70.0%) mothers had 2nd time of pregnancy and 3(30.0%) had 1st time of pregnancy.

Table XXIV: Maternal medical illness during pregnancy (n=10)

Maternal medical illness	Number of pregnancy	Percentage
Hypertension	1	10.0
NAD	9	90.0

One (10.0%) patients had hypertension.

Table XXV: Any drugs taken (n=10)

Any drugs taken	Number of patients	Percentage
None	6	60.0
Nothing abnormality detected	2	20.0
Other	2	20.0

Six (60.0%) patients did not take any drugs.

Table XXVI: Natal history of mother (n=10)

Natal history of mother	Number of patients	Percentage
Gestational age		
Full term	8	80.0
Pre-term	1	10.0
Post-term	1	10.0
Mode of delivery		
Normal vaginal delivery	3	30.0
Lower uterine section	7	70.0

Majority 8(80.0%) mother were full term during delivery and 3(30.0%) mother had normal vaginal delivery, 7(70.0%) had lower uterine section.

4.4 18 questions were developed to find out the linguistic output in children with Autism

4.4.1 Three question on receptive language development (1, 2, 3)

Table XXVII: Linguistic output in children with autism (n=10)

	Number of patients	Percentage
1. Have you ever wondered if your child is deaf?		
(আপনার কি মনে হয় আপনার শিশুটি কানে শুনে না?)		
Yes	0	0.0
No	10	100.0
2. Does your child respond to his/her name? (আপনার শিশু কি তার নাম ধরে ডাকলে তার দিকে ঘাড় ফিরে তাকায়?)		
Yes	3	30.0
No	7	70.0

On observation and history taking from care giver the linguistics output were in children with Autism.

All (100.0%) parents were wondered that their children were not deaf.

70.0% children did not respond to his/her name. On the other hand, within 9-11 months a normal child can response to his/her name (Arif et al. 2015).

3. Can your child identify 4/5 body parts? (আপনার শিশু কি ৪/৫ টি প্রত্যঙ্গকে নির্দেশ করতে পারে?) যেমন: নাক কোথায়?, চোখ কোথায়?	Number of patients	Percentage
Yes	2	20.0
No	8	80.0

On observations, 80.0% children could not identify 4/5 body parts. But, within 9-11 months a normal child can response to his/her name (Arif et al. 2015).

4.4.2 Eight question were expressive language development (4, 5, 6, 7, 8, 9, 10, 11)

4. Have you ever thought that your child has speech developmental delay? (আপনার কি মনে হয় আপনার শিশুটির কথা বলতে দেরী হয়েছিল?)	Number of patients	Percentage
Yes	10	100.0
No	0	0.0

All children (100.0%) had speech developmental delay. But, within 4-5 years a normal child completes his/her basic language development. And within 12-14 months a normal child can utter meaningful single word (Arif et al. 2015).

5. Does your child use his/her index finger to point, to indicate interest in something? (আপনার শিশুটি কি কাজিঁকৃত বস্তুর দিকে অঙ্গুলি নির্দেশ করেছে পারে?)	Number of patients	Percentage
Yes	4	40.0
No	6	60.0

On observations, 60.0% children use/her index finger to point, to indicate interest in something. But, within 12-14 months a normal child can indicate his/her index finger to point to indicate interest in something (Arif et al. 2015).

6. Does your child ever use his/her index finger to point, to ask for something? (আপনার শিশুটি কি কোন পরিচিত বস্তু সম্পর্কে প্রশ্ন করলে তা অঙ্গুলি নির্দেশ করে দেখাতে পারে?) উদাহরণ: খেলনা টা কোথায়?	Number of patients	Percentage
Yes	1	10.0
No	9	90.0

On observations, 90.0% children did not ever use his/her index finger to point, to ask for something. But, within 25 months to 2.5 years a normal child can indicate his/her index finger to point to ask for something (Arif et al. 2015).

7. Does your child have any fluency disorder? (আপনার শিশুটি কি কথা বলার সময় সাবলীলতায় কোন অসুবিধা আছে? উদাহরণঃ Number of patients Percentage আমি)		
Yes	1	10.0
No	9	90.0

8. Does your child can say name of known object? (আপনার শিশুটি কি চারপাশের পরিচিত বস্তুর নাম বলতে পারে?) উদাহরণঃ মা, গাছ, কুকুর, বিড়াল, পাখি ইত্যাদি		
Yes	2	20.0
No	8	80.0

On observations, 90.0% children did not have any fluency disorder. 80.0% children could not say name of known object. But, within 19-24 months a normal child can say name of known object (Arif et al. 2015).

9. Does your child use 'pronoun' - "I" "You" "Mine"?	Number of patients	Percentage
(আপনার শিশুটি কি “আমার” “আমি” শব্দগুলি ব্যবহার করতে পারে? কিভাবে ব্যবহার করে?)		
Yes	1	10.0
No	9	90.0

(90.0%) children could not use pronouns properly.

উদাহরণ:

“তুমি কেমন আছ”? The child answered তুমি ভাল আছ।

“আমি খাব: The autistic child answered “অনিক খাবে”।

“সে যায়নি। The autistic child answered “স্যার যায়নি”।

“আমার দিকে তাকাবেন না। The autistic child answered “অর দিকে চাইবি না”।

But, within 25 months to 2.5 years a normal child can use pronoun (Arif et al. 2015).

10. Does your child repeatedly utter any words or sentences? (আপনার শিশুটি কি কোন শব্দ বা বাক্য বারবার পুনরাবৃত্তি করে?)

	Number of patients	Percentage
Yes	9	90.0
No	1	10.0

(90.0%) children repeatedly utter words which is called 'Echolalia' ((আরিফ ও নাসরীন ২০১৩).

উদাহরণ: তোমার নাম কি? তোমার নাম কি? তোমার নাম কি?

11. Does your child use idiosyncratic words/Neologism? (আপনার শিশুটি কি কোন নতুন শব্দ উচ্চারিত করে যার কোন অর্থ নেই?)

	Number of patients	Percentage
Yes	7	70.0
No	3	30.0

(70.0%) children used idiosyncratic words/Neologism.

Example: অটিস্টিক শিশু যখন “পানি খাবে” তখন পানির কথা না বলে “লিটা এবং কিন” ইত্যাদি পানিসূচক শব্দ ব্যবহার করেছে (আরিফ ও নাসরীন ২০১৩).

4.4.3 Seven question were for social communication (12, 13, 14, 15, 16, 17, 18)

12. Does your child try to attract your/other attention to his/her activity? (আপনার শিশুটি কাউকে টেনে ধরে খাচ্কা দিয়ে কোন কিছুর দিকে মনোযোগ আকর্ষণ করতে পারে?)	Number of patients	Percentage
Yes	4	40.0
No	6	60.0

(60.0%) children did not try to attract your/other attention to his/her activity.

But, within 9-11 months a normal child can try to attract your/other attention to his/her activity (Arif et al. 2015).

13. Does your child take part in rhymes/song with other children? (আপনার শিশুটি অন্য শিশুদের সাথে ছড়া এবং গানে অংশ নিতে পারে?)	Number of patients	Percentage
Yes	0	0.0
No	10	100.0

All children (100%) did not participate in rhymes/song with other children.

But, within 25 months to 2.5 years a normal child can participate in a rhymes/song with other children (Arif et al. 2015).

14. Does your child ever play with symbol? (আপনার শিশুটি কি প্রতীকী খেলা খেলতে পারে?)	Number of patients	Percentage
Yes	1	10.0
No	9	90.0

(90.0%) children did not ever play with symbol.

But, within 19-24 months a normal child can playing with a symbol (Arif et al. 2015).

15. Does your child take part in conversation? (আপনার শিশুটি কি কারো সাথে সংক্ষিপ্ত কথোপকথন চালাতে পারে?) (উদাহরণঃ ভাত খেয়েছে? এই প্রশ্নের উত্তর 'হ্যাঁ' বা 'না' বলে কি না?)	Number of patients	Percentage
Yes	1	10.0
No	9	90.0

(90.0%) children did not take part in conversation,

But, within 3 years to 3.5 years a normal child can take part in conversation (Arif et al. 2015).

16. Does your child can make eye contact and understand other facial expressions? (আপনার শিশুটি কি চোখের দিকে তাকিয়ে বক্তার মনোভাব বুঝতে পারে?)	Number of patients	Percentage
Yes	0	0.0
No	10	100.0

(100.0%) children could not make eye contact and other facial expressions.

But, within 12-14 months a child can make eye contact and understand other facial expressions (Arif et al. 2015).

17. Does your child point or look at things with other jointly? (আপনার শিশুটি কি অন্যজনের সঙ্গে একই সঙ্গে কোন জিনিস নির্দেশ করতে পারে বা দেখাতে পারে?)	Number of patients	Percentage
Yes	0	0.0
No	10	100.0

All children (100%) could not point or look at things with other jointly.

But, within 9-11 months a child can point or look at things with other jointly (Arif et al. 2015).

18. Does your child smile in response to your activity which he/she likes? (আপনার শিশুটি কি পছন্দের কোন কিছু করলে বা দেখালে হাসি বিনিময় করে?)	Number of patients	Percentage
Yes	0	0.0
No	10	100.0

(100.0%) children did not smile in response to any activity which he/she likes.

But, within 15-18 months a child smiles in response to your activity which he/she likes (Arif et al. 2015).

Chapter Five

Discussion

This descriptive observational study was carried out with an aim to describe the socio-demographic characteristics of Bengali children with cerebral palsy and autism having speech problem, find out the factors associated with the nature of speech problem in children with cerebral palsy and autism, assess the different types of speech profiles in children with cerebral palsy and autism, determine the language impairment in children with cerebral palsy and autism, observe the communication problems in children with cerebral palsy and autism, and also classify the speech of children with cerebral palsy and autism

5.1 Linguistic impairments encountered by children with CP

A total of 10 patients with cerebral palsy and 10 patients with autism in paediatrics department of outdoor of tertiary level hospital were included in this study. Children have a medical diagnosis of CP and autism that 1st time came in the study place and they have hearing abilities within normal limits as documented by either formal audiological evaluation or otoacoustic screening enrolled in this study. In the following, the present study findings have been discussed and compared with previously published relevant studies.

In this present study, it was observed that almost three fourth (70.0%) patients were found 5-7 years and rest 3(30.0%) as found > 7 years. Within 4-5 years basic language development occurs in a normal child. If any child had problem in basic language

development after 7-11 years the child becomes “mute” or possesses articulation disorder in language development. Hustad et al. (2014) in a cohort study of 4.5-yearold children with CP, 75% of participants had clinical speech and/or language impairments. The previous work of the investigators on a similar group of children indicates that by 4.5 years of age, 75% of children have evidence of a clinical speech and/or language impairment

In this current study, it was observed that male predominant in cerebral palsy, which was 60.0% male and 40.0% female. Bax et al. (2006) and Sigurdardottir & Vik (2010) showed children with cerebral palsy were male 61.9% and 49.0% respectively, which is similar with the current study.

In this series, it was observed that respondent’s relation to patients was mother 7(70.0%), father was 1(10.0%) and other was 2(20.0%).

Regarding educational status, in cerebral palsy 6(60.0%) fathers were illiterate and majority 8(80.0%) mothers were illiterate. Similarly, Yeargin-Allsopp et al. (2003) documented in their study that mothers with less education (<12 years) were primarily identified at school sources. A maternal education and maternal age increased; there was a greater likelihood that children were identified only at non-school sources. Ronski & Sevcik (2005) mentioned that parent perception about communication and parental stress may play roles in augmented language intervention. In general, today’s parents may not be afraid of the use of technology because of extensive parent education about the importance of getting communication started and the increased use of computers in daily life.

In this present study, it was observed that majority (80.0%) of the patients came from <20000 taka monthly family income in cerebral palsy. Half (50.0%) patients came from Cacha house, 4(40.0%) came from Paka house and 1(10.0%) came from semi Paka house.

In this current study it was observed that consanguinity was found in 2(20.0%). Family history of mental illness was found 1(10.0%).

Regarding pregnancy, in this present study it was observed that 8(80.0%) mother were 1st time of pregnancy and 2(20.0%) mother were 2nd time of pregnancy. Bax et al. (2006) found in their study that 12.0% of Cerebral Palsy was known to be from a multiple pregnancy, with 48 from a twin pregnancy and 3 from a triplet pregnancy. This compares with a population rate of multiple pregnancy of about 1.5% reported by Ingram (1964). In some instances, both twins had CP and were in the study (4 pairs), and in 13 others, their twin had previously died (7 in utero and 6 during or after birth). Among children from multiple pregnancies, 24.0% were from pregnancies after infertility treatment compared with 3.4% of the singleton pregnancies in their study. Himmelmann et al. (2010) observed that cerebral palsy was the first child in 50.%, the 2nd child in 29% and the 3rd child or more in 21.0%, which is comparable with the current study.

In this current study, it was observed that 2(20.0%) mother had hypertension during pregnancy and other drugs taken by 4(40.0%).

In this experiment, it was observed that all mother had full term gestational age. Normal vaginal delivery was found 10(100.0%). Bax et al. (2006) showed more than half of the

children (54.5%) were born at fullterm in cerebral palsy. Emergency cesarean deliveries were performed in 32.3% of births, whereas 44.8% of the children were born by standard vaginal delivery. Of the rest, 7% were delivered by planned cesarean delivery, 4.2% by Ventouse extraction, 6.1% by forceps, and 2.3% were breech. Himmelmann et al. (2010) showed 0 cerebral palsy 7.0% were born extremely preterm, 12.0% very preterm, 28 moderately preterm 16.0% and 65.0% at term.

In this present study, it was observed that history of prolonged labour was found 10(100.0%), no history of preterm delivery was 8(80.0%) and home attained by untrained birth attended 7(70.0%). History of delayed crying at birth was found 7(70.0%).

Children with cerebral palsy (CP) frequently demonstrate difficulties in communication as a result of impaired language skills, which are often influenced by motor speech disorders (Straub & Obrzut 2009). The etiology of CP most likely is multifactorial, arising directly from the motor impairment and linked to the cognitive and/or sensory processing deficits associated with CP (Pennington et al. 2005). In contrast, several studies have demonstrated average verbal abilities of higher-functioning children with cerebral palsy (CP) (Straub & Obrzut 2009; Pirila et al. 2004; Sigurdardottir et al. 2008) and even children with early left-sided brain damage may exhibit sparing of language skills (Lidzba et al. 2006).

The linguistic output of children with CP taken from the observation and history was that 90% children can understand simple two words meaningful sentence (সরল বাক্য). Though they understand two words sentence (দুই শব্দের বাক্য বুঝতে পারে) (Example-আমাকে দাও। চল যাই।

নিয়ে আস), they are unable to get the meaning of complex sentence (জটিল বাক্য বুঝতে পারেনা)
(Example- "আমরা নানা বাড়িতে গিয়ে এত মজার খেলা খেলেছিলাম যে আমাদের খুব আনন্দ হয়েছিল").

In this study it was observed that 80% children did not want to play or friendship with other children. This is because 4 (40.0%) did not understand other speech (অন্যের কথা বুঝে না), 5(50.0%) did not express his/her own speech- (নিজের কথা অন্যকে বুঝতে পারে না), and 1(10.0%) did not understand & express his/her own speech- (অন্যের কথা বুঝে না এবং নিজের কথা অন্যকে বুঝতে পারে না).

All parents (100%) showed phoneme omission and substitution when they articulate words. (Example- 'উপর' > 'ওফর'; 'করছ' > 'কছছ'; 'বেলা' > 'বে-আ'; 'দেখা' > 'দে-আ' ইত্যাদি).

Above examples indicated that Bengali children with cerebral palsy had articulation disorders during articulating words with both vowels and consonants in different positions.

Again on observation, 100% child had articulation disorder, because they substitute dental 'ত' by alveolar 'ট'.

Hustad et al. (2014) study showed a very small proportion of children were established talkers who appeared to be developing speech and language skills that were roughly commensurate with age expectations. Conversely, 85.0% of the children showed clear evidence of a clinical speech and/or language delay at 2 years of age. The investigator worked on a similar group of children indicates that by 4.5 years of age, 75.0% of children have evidence of a speech and/or language impairment. However, it is unclear

whether these children catch up on their own, or whether intervention leads to advances in skill development that bring children in line with developmental expectations. Descriptive examination of information regarding intervention provided by parents of children in their study indicated that 18 of 27 participants (66%) were currently receiving speech and language services through birth-3 programs. Further descriptive analysis of these data by profile group revealed that 10 of 12 children (83%) who were not talking, six of 11 children (55%) who were emerging talkers, and two of four children (50%) who were established talkers were receiving speech and language services. The above data suggested that children with CP are underserved with regard to speech and language intervention, particularly those who are emerging talkers. Nordberg et al. (2012) showed among children with cerebral palsy 21% of them had speech disorders, and a further 32.0% were nonverbal. The remaining 47.0% did not have any speech disorders. Speech disorders were present in all types of CP, and speech ability was significantly associated with different types of CP ($p < 0.001$). Five of eight children (63.0%) affected, and children with bilateral spastic CP (BSCP), with 22.0% affected.

Speech & language therapy typically begins shortly after a child is diagnosed with cerebral palsy (CP). The role of the speech therapy is to help children speak clearly, communicate effectively & control the muscles involved in speaking. The first step of the speech therapist is to conduct a thorough assessment of a child's physical & cognitive function. This assessment will determine the nature of a child's speech and communication abilities identify causative factors and determine the best approach to therapy.

Speech recognition system technology was also designed in the community to help people with musculoskeletal disabilities caused by cerebral palsy or arthritis with a view to achieving maximum productivity on the computers. Speech intelligibility is a main problem for the people who have cerebral palsy. The motor disorder which characterizes cerebral palsy can affect the function of the muscles involved in the production of speech (Marlene et al. 2007). Efforts to provide effective means of communication for these people include the development of augmentative communication devices and more recently ASR systems investigated for use with the disordered speech (Grattan et al. 1991).

5.2 Linguistic deficiencies by Bengali autistic children

In this study it was observed that 6(60.0%) patients belonged to age 5-7 years and rest 4(40.0%) found more than 7 years. Within 4-5 years basic language development occurs in a normal child. If children had a problem in basic language development after 7-11 years they became “mute” or articulation disordered in language development. Bertrand et al. (2001) reported that the prevalence rate of autistic disorder was 4.0 cases per 1000 children aged 3 through 10 years with 95% CI: 2.8– 5.6.

In this present study it was observed that male was 9(90.0%) and female was 1(10.0%). Hustad et al. (2014) showed the sample comprised male to female ratio was 1.1:1 in autism group. Bertrand et al. (2001) also found the male-to-female ratio for children with autistic disorder was 2.2.

In this study it was observed that respondents' relation to patients was mother 8(80.0%). In autism group 9(90.0%) father was educated at graduation level and 9(90.0%) mother

was also educated at graduation level. Yeargin-Allsopp et al. (2003) documented in their study that children mothers with less education (<12 years) were primarily identified at school sources. As maternal education and maternal age increased, there was a greater likelihood that children were identified only at non-school sources. Ronski & Sevcik (2005) mentioned that parent perception about communication and parental stress may play roles in augmented language intervention. In general, today's parents may not be afraid of the use of technology because of extensive parent education about the importance of getting communication started and the increased use of computers in daily life.

In this current study it was observed that 6(60.0%) of the patients came from 20,000-50,000 taka income group & 4(40.0%) of the patients came from >50,000 income group. In autism group all patients came from paka house. Similarly, Rahman et al. (2011) showed majority (62.0%) of the autism patients came from upper income class, 33.0% middle class and 4.0% came from poor family, which is closely consistent with the current study.

In this study it was observed that consanguinity was present in 1(10.0%) and absent 9(90.0%). Family history of mental illness was present in 6(60.0%) and absent in 4(40.0%).

In this present study, it was observed that seven 7(70.0%) mother had 2nd time of pregnancy and 3(30.0%) mother had 1st time of pregnancy. One (10.0%) patients had hypertension. Six (60.0%) patients did not take any drug.

In this study majority 8(80.0%) mother were full term during delivery and 3(30.0%) mother had normal vaginal delivery, 7(70.0%) had lower uterine section.

Autism spectrum disorder (ASD) covers a set of developmental disabilities that can cause significant social, communication, and behavioral challenges. People with ASD process information in their brain differently than other people. Not every child with ASD will have a language problem. A child's ability to communicate will vary, depending upon his or her intellectual and social development. Some children with ASD may be unable to speak. Others may have rich vocabularies and be able to talk about specific subjects in great detail. Most children with ASD have little or no problem pronouncing words. The majority, however, have difficulty using language effectively, especially when they talk to other people. Many have problems with the meaning and rhythm of words and sentences. They also may be unable to understand body language and the nuances of vocal tones.

Often, children with ASD who can speak usually say things that have no meaning or that seem out of context in conversations with others. For example, a child may count from one to five repeatedly. Or a child may repeat words he or she has heard over and over, a condition called echolalia. Immediate echolalia occurs when the child repeats words someone has just said. For example, the child may respond to a question by asking the same question. In delayed echolalia, the child will repeat words heard at an earlier time. The child may say "Do you want something to drink?" whenever he or she asks for a drink. Some children with ASD speak in a high-pitched or singsong voice or use robot-like speech. Other children may use stock phrases to start a conversation. For example, a

child may say “My name is Tom,” even when he talks with friends or family. Still others may repeat what they hear on television programs or commercials.

On observation and history taking from caregivers the linguistic output with speech problems appeared in children with Autism. More specially-

1. All (100.0%) parents were wondered that their children were not deaf.
2. 70.0% children did not respond to his/her name.
3. Eighty percent (80.0%) children could not identify 4/5 body parts.
4. All children (100.0%) had speech developmental delay.
5. Sixty percent (60.0%) children could not use/her index finger to point, to indicate interest in something.
6. Ninety percent (90.0%) children did not ever use his/her index finger to point, to ask for something.
7. Ninety percent (90.0%) children did not have any fluency disorder.
8. Eighty percent (80.0%) children could not say name of known objects.
9. Ninety percent (90.0%) children could not use pronouns properly (উদাহরণ: “তুমি কেমন আছ”? The child answered তুমি ভাল আছ। “আমি খাব”: The autistic child answered “অনিক খাবে”। “সে যায়নি”। The autistic child answered “স্যার যায়নি”। আমার দিকে তাকাবেন না। The autistic child answered “অর দিকে চাইবি না”)।
10. Ninety percent (90.0%) children repeatedly utter words (উদাহরণ: তোমার নাম কি? তোমার নাম কি? তোমার নাম কি?)।

11. Seventy percent (70.0%) children used idiosyncratic words/neologism (Example: অটিস্টিক শিশু যখন “পানি খাবে” তখন পানির কথা না বলে “লিটা” এবং “কিন” ইত্যাদি পানিসূচক শব্দ ব্যবহার করেছে)।
12. Sixty percent (60.0%) children did not try to attract your/other attention to his/her activity.
13. All children (100%) did not take part in rhymes/song with other children.
14. Ninety percent (90.0%) children did not ever play with symbol.
15. Ninety percent (90.0%) children did not take part in conversation.
16. All (100.0%) children could not make eye contact and other facial expression..
17. All children (100%) could not point or look at things with other jointly.
18. All (100.0%) children did not smile in response to any activity which he/she likes.

Anyone who has come into contact with autism will agree that of all children, those with autism are the most difficult to reach and make interaction. Most will also agree that a great majority of children with autism love music, singing and repetitive movement. At The Listening Centre in Toronto, often hears comments such as the one made by this mom: “Music was my child's road to language. For the longest time I had to put everything into a song”. Activities to engage children with autism, are more likely to be successful if they are accompanied by music-whether they be listening to music, moving to its rhythm or singing. This itself is not communication but is a starting point, a hook which can become a first pillar in building bridges toward nonverbal communication,

vocalization, speech and language. In other words, when used appropriately, music, singing and movement can be stepping stones that help children with autism develop the intent and the pre-language needed to communicate-skills which are usually absent.

Language needs to do with meanings, rather than sounds. A language disorder refers to an impaired ability to understand and/or used words in context. A child may have an expressive language disorder (difficulty in expressing ideas or needs), a receptive, language disorder (difficulty in understanding what other are saying) or a mixed language disorder (which involved both).

Delayed speech means the manner or content of language usage which is significantly below the norms of children of that age. There is a one-to-one relationship between articulatory functions and vegetative functions. Thus the prognosis for the vegetative functions depend on the articulatory functions. It can also be noticed here that the tone of the tongue plays little role in determining the vegetative functions. In spite of this, it is rarely seen that patients having normal articulatory functions have disturbed vegetative functions. Some of the contributing factors in such cases may be severe mental retardation, enlarged/septic tonsils and adenoids. This high incidence of mental retardation, as an associated problem in a cerebral palsied child is of great concern to the rehabilitation team. Incidentally, it is to be observed that all the 10% having normal speech and language fall in the average category. Speech and language development evaluation goes hand in hand with intellectual assessment by the psychologist. As the child improves his/her inner language and verbal expressions, his/her intellect also improves. Some authors state that stereotaxic surgery facilitates better relaxation and thus better speech (Kamalashile, 1975).

The improvement of the patients in speech and language varies according to their disability. The level of communication and interest to communicate through speech is good in spastics with their limited vocabulary. These children find it difficult to articulate back vowels and retroflex sounds, but in dystonia slow rate of speech and abnormal intonation is observed, along with facial grimaces. Though little could be done to overcome dystonia of the tongue by stereotaxic procedures and by speech therapy. The treated dystonia patients had better vegetative and articulatory functions and also better speech and language. It is generally observed that the parents take a very keen interest in and a positive attitude towards the rehabilitation programme of the child. If the same attitude were developed in society as a whole still better results could definitely be expected (Kamalashile et al. 1973).

Speech disorders which refers to impairment in the articulation of speech sounds, fluency and voice as well as language disorders which refer to impairments in the use of the spoken (or signed or written) system and may involve the form of language (grammar & phonology), the content of language (semantics) & the function of language (pragmatics). These may also be described more generally as communication disorders which are typically classified by their impact on a child's receptive skills (with the ability to understand what is said or to decode, integrate, and organize what is heard) and expressive skills (with the ability to articulate sounds use appropriate rate & rhythm during speech, exhibit appropriate vocal tone and resonance and use sounds, words and sentences in meaningful contexts).

Chapter Six

Conclusion

This study was undertaken to determine the nature of speech problem in Bengali children with cerebral palsy and autism. Cerebral palsy is more common in male subject within 5 years, poor family and in first child. Most of the children can understand simple two words meaningful sentence and did not want to play or friendship with other children. Phoneme omission and substitution occurs when they articulate any word. All children had articulation disorder when they articulate words with vowels and consonants in different positions.

Autism is also more common in male subject within 5 years but predominant in well educated and high income family. Family history of mental illness, 2nd child and lower uterine section are more frequent in Autism. All parents were wondered that their children were not deaf and most of the children do not respond to his/her name and could not identify 4/5 body parts. All children had speech developmental delay. Most of the children could not use his/her index finger to point, to indicate interest in sometimes and did not ever use his/her index finger to point, to ask for sometimes. Majority of the children did not have any fluency disorder and most of them could not say name of known object, use pronouns. They repeatedly utter words, used idiosyncratic words/neologism and did not try to attract your/other attention to his/her activity. All children did not participate in rhymes/song with other children and most of them did not ever play with symbol and did not take part in conversation. All children could not make eye contact and other facial expression, point or look at things with other jointly and did not smile in response to any activity which he/she likes.

Chapter Seven

Limitations

1. One key limitation of this work is the small sample size ($n=20=10 \times 2$). Although, this study sought to recruit a representative sample of children with CP, it is possible that the sample may reflect biases of which are not explicitly aware. For example, parents who had particular concerns regarding their child's communication development may have been more likely to participate in this study than those who did not have concerns. In addition, children who had a diagnosis of cerebral palsy prior to 4 years of age (as all did in the present study) may represent a segment of the population that has more frank deficits than those who are diagnosed later in the preschool years. Additional research is needed to replicate the findings of this study on a larger sample where population-based demographics are available to ensure a representative sampling of participants.
2. The study population was selected from one hospital in Dhaka city, so the results of the study may not reflect the exact picture of the country.
3. The present study was conducted at a very short period of time.
4. Small sample size was also a limitation of the present study. Therefore, in future further study may be under taken with large sample size.

Chapter Eight

Recommendation

Further studies can be undertaken by including large number of patients.

Chapter Nine

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APPENDIX-I

Data Collection Sheet

Title: The nature of speech problem in Bengali children with cerebral palsy and autism-
A comparative study.

Study place: Sishu Bikash Kendro, Intervention centre of cerebral palsy and autism in
Tertiary level hospital.

Questionnaire

The nature of speech problems in Bengali children with cerebral palsy.

General history / সাধারণ বর্ণনাঃ-

1. Serial number/ক্রমিক: -
2. Date of interview/ সাক্ষাৎকার নেওয়ার তারিখ
3. Name of patient/রোগীর নাম:
4. Age/ বয়স
5. Sex/ লিঙ্গ
Male/পুরুষ-1, Female/ -2
6. Address/ঠিকানা
7. Respondent's name/ উত্তর
8. Respondent's relation to patient/ উত্তর রোগীর সম্পর্ক
Mother/ -1, Father/ -2
Sister/ বোন-3, Brother/ -4
Other/অন্যান্য-5
9. Family history/ বর্ণনা
 - i) Father's education/ শিক্ষাগত যোগ্যতা
 - Illiterate/অশিক্ষিত-1
 - Below primary/প্রাথমিক শিক্ষার নিচে -2

- Primary/প্রাথমিক শিক্ষা-3
- Secondary/মাধ্যমিক শিক্ষা-4
- Higher secondary/উচ্চ মাধ্যমিক শিক্ষা-5
- Graduation/স্নাতক-6
- Others/অন্যান্য-7

ii) Mother's education/ শিক্ষাগত যোগ্যতা

- Illiterate/অশিক্ষিত-1
- Below primary/প্রাথমিক শিক্ষার নিচে -2
- Primary/প্রাথমিক শিক্ষা-3
- Secondary/মাধ্যমিক শিক্ষা-4
- Higher secondary/উচ্চ মাধ্যমিক শিক্ষা-5
- Graduation/স্নাতক-6
- Others/অন্যান্য-7

10. Monthly family income/

11. Housing type/

- Cacha/ -1
- Paka/ -2
- Semi Paka/ -3

12. Consanguinity/রক্তের সম্পর্ক

- Yes
- Present/উপস্থিত-1
- Absent/অনুপস্থিত-2

13. Family history of mental illness/

সমস্যা

- Present/উপস্থিত-1
- Absent/অনুপস্থিত-2

14. Antenatal History/গর্ভকালীন স বর্ণনা

a) Number of Pregnancy/ গর্ভধারণের সংখ্যা

- 1=1
- 2=2
- 3=3
- 4=4
- >4=5

b) Maternal medical illness during pregnancy/গর্ভকালীন স

সমস্যা

- Fever with rash/ঋ -1
- Diabetes/ডায়াবেটিস-2
- Hypertension/উচ্চরক্তচ -3
- Psychiatric illness/ সমস্যা-4

c) Any drugs taken/যেকোন স সেবন

- None/ -1
- Anti-psychotic/ রোগের ঔ সেবন
- Anti convulsant/ রোগের ঔ সেবন
- Others/অন্যান্য

15. Natal history/প্রসবকালীন বর্ণনা

- Gestational age/গর্ভকালীন স
 - Full term/নির্দিষ্ট স - 1
 - Pre-term/নির্দিষ্ট স পূর্বে - 2

- Post-term/নির্দিষ্ট ৩ - 3

- Mode of delivery/সন্তান প্রসব
- NVD (Normal vaginal delivery) - 1
- Lower uterine cesarean section (LUCS)- 2
- Others- 3

16. Birth history/প্রসবকালীন বর্ণনা

i) History of prolonged labour / দীর্ঘায়িত প্রসব

• Yes/হ্যাঁ-1	• No/ -2	• Don't remember/ -3
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ii) History of preterm delivery/নির্দিষ্ট ৩ পূর্বে সন্তান প্রসব

• Yes/হ্যাঁ-1	• No/ -2	• Don't remember/ -3
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iii) Place of delivery/সন্তান প্রসবের স্থান

- Home attained by untrained birth attendant/ অপ্রশিক্ষিত ধাত্রী দি -1
- Hospital, normal vaginal delivery/ সাধারণ যোনীনালী দি প্রসব-2
- Hospital, lower uterine cesarean section (LUCS)/ নিম্নাংশ অ -3

iv) History of delayed crying at birth/ জন্মের দীর্ঘক্ষণ কাদা ব

• Yes/হ্যাঁ-1	• No/ -2	• Don't remember/ -3
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8 questions were developed for find out the linguistics output in children with Cerebral palsy (Arif et al. 2015).

First, 1 question on receptive language development (1)

1. Does your child understand your all speech? (আপনার সব কথা কি বুঝতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

Second, 1 the nature of social communication (2)

2. Does your child wants to play or friendship with other children? (আপনার শিশু কি অন্য শিশুদের সাথে খেলা করতে অথবা বন্ধুত্ব করতে চায়?)

- Yes/হ্যাঁ-1
- No/না-2

Why do not what to play or friendship with other children? (কেন খেলা করতে অথবা বন্ধুত্ব করতে চায় না?)

- (1) Do not understand other speech (অন্যের কথা বুঝে না)
- (2) Do not express his own speech (নিজের কথা অন্যকে বুঝতে পারে না)
- (3) Do not understand & express his own speech (অন্যের কথা বুঝে না এবং নিজের কথা অন্যকে বুঝতে পারে না)

Third, 6 questions concerning of the use expressive language development (3, 4, 5, 6, 7, 8)

3. Does any letter (phoneme) omission occur when your child articulates any words? (শব্দ উচ্চারণ করলে কোন ধ্বনি বাদ পড়ে?)

- Yes/হ্যাঁ-1
- No/না-2

4. Does any speech substitution occur when your child articulates any words? (আপনার কি মনে হয় আপনার শিশু শব্দ উচ্চারণে একটির ক্ষেত্রে আরেকটি উচ্চারণ করেছে?)

- Yes/হ্যাঁ-1
- No/না-2

5. How can your child articulate following words (vowel)? (স্বরধ্বনি)
(আপনার শিশু ইট, অনেক, আলু শব্দগুলো কিভাবে বলে?)

ইট :
অনেক:
আলু :.....

6. How can your child articulate following consonants (আপনার শিশু নিম্নোক্ত ব্যঞ্জনধ্বনিগুলো কিভাবে বলে? যেমন: প /P, ব /B, স/S, জ/ Z)

প /P:
ব /B:
স/S:
জ/ Z:

7. How can your child articulates following words with consonants?

(আপনার শিশু বেলা, খেলা, দেখা শব্দ গুলোকে কিভাবে উচ্চারণ করে?)

বেলা:
খেলা :
দেখা:

8. How your child can articulate following words (আপনার শিশু নিম্নোক্ত শব্দগুলো কিভাবে বলে?
(ব্যঞ্জনধ্বনি?).

পাতা :

কাক :

জাল :

দান:

ভালো:

পর:

Questionnaire

The nature of speech problem in Bengali children with Autism.

General history / সাধারণ বর্ণনা:

1. Serial number/ক্রমিক: -
2. Date of interview/ সাক্ষাৎকার নেয়ার তারিখ
3. Name of patient/রোগীর নাম
4. Age/
5. Sex/ লিঙ্গ
Male/পুরুষ-1, Female/ -2
6. Address/ঠিকানা
7. Respondent's name/ উত্তর দাতার নাম
8. Respondent's relation to patient/ উত্তর রোগীর সম্পর্ক
Mother/ -1, Father/ -2
Sister/ বোন-3, Brother/ -4
Other/অন্যান্য-5
9. Family history/ বর্ণনা
i) Father's education/ শিক্ষাগত যোগ্যতা
 - Illiterate/অশিক্ষিত-1
 - Below primary/প্রাথমিক শিক্ষার নিচে -2
 - Primary/প্রাথমিক শিক্ষা-3
 - Secondary/মাধ্যমিক শিক্ষা-4
 - Higher secondary/উচ্চ মাধ্যমিক শিক্ষা-5
 - Graduation/স্নাতক -6
 - Others/অন্যান্য-7

ii) Mother's education/ শিক্ষাগত যোগ্যতা

- Illiterate/অশিক্ষিত-1
- Below primary/প্রাথমিক শিক্ষার নিচে -2
- Primary/প্রাথমিক শিক্ষা-3
- Secondary/মাধ্যমিক শিক্ষা-4
- Higher secondary/উচ্চ মাধ্যমিক শিক্ষা-5
- Graduation/স্নাতক-6
- Others/অন্যান্য-7

10. Monthly family income/

11. Housing type/

- Cacha/ -1
- Paka/ -2
- Semi Paka/ -3

12. Consanguinity/রক্তের সম্পর্ক

- Yes
- Present/উপস্থিত-1
- Absent/অনুপস্থিত-2

13. Family history of mental illness/ সমস্যা

- Present/উপস্থিত-1
- Absent/অনুপস্থিত-2

14. Antenatal History/গর্ভকালীন স বর্ণনা

a) Number of Pregnancy/ গর্ভধারণের সংখ্যা

1=1

- 2=2
- 3=3
- 4=4
- >4=5

b) Maternal medical illness during pregnancy/গর্ভকালীন স সমস্যা

- Fever with rash/জ্বর-1
- Diabetes/ডায়াবেটিস-2
- Hypertension/উচ্চরক্তচাপ-3
- Psychiatric illness/ সমস্যা-4

c) Any drugs taken/যে কোন সেবন

- None/ -1
- Anti-psychotic/ রোগের ঔ সেবন
- Anti convulsant/ রোগের ঔ সেবন
- Others/অন্যান্য

15. Natal history/প্রসবকালীন বর্ণনা

➤ Gestational age/গর্ভকালীন স

- Full term/নির্দিষ্ট সম - 1
- Pre-term/নির্দিষ্ট সম পূর্বে - 2
- Post-term/নির্দিষ্ট সম - 3

➤ Mode of delivery/সন্তান প্রসব

- Normal vaginal delivery (NVD) - 1
- Lower uterine cesarean section (LUCS)- 2
- Others- 3

18 questions were developed to find out the linguistics output in children with Autism (Arif et al. 2015).

3 question on receptive language development (1, 2, 3)

1. Have you ever wondered if your child is deaf? (আপনার কি মনে হয় আপনার শিশুটি কানে শুনে না?)

- Yes/হ্যাঁ-1
- No/না-2

2. Does your child respond to his/her name? (আপনার শিশু কি তার নাম ধরে ডাকলে তার দিকে ঘাড় ফিরে তাকায়?)

- Yes/হ্যাঁ-1
- No/না-2

3. Does your child identify 4/5 body parts? (আপনার শিশু কি ৪/৫ টি প্রত্যঙ্গকে নির্দেশ করতে পারে?)
যেমন: নাক কোথায়?, চোখ কোথায় ?

- Yes/হ্যাঁ-1
- No/না-2

8 question were expressive language development (4, 5, 6, 7, 8, 9, 10, 11)

4. Have you ever thought that your child has speech developmental delay? (আপনার কি মনে হয় আপনার শিশুটির কথা বলতে দেরী হয়েছিল?)

- Yes/হ্যাঁ-1
- No/না-2

5. Does your child use his/her index finger to point, to indicate interest in something?

(আপনার শিশুটি কি কাঙ্ক্ষিত বস্তুর দিকে অঙ্গুলি নির্দেশ করতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

6. Does your child ever use his/her index finger to point, to ask for something? (আপনার

শিশুটি কি কোন পরিচিত বস্তু সম্পর্কে প্রশ্ন করলে তা অঙ্গুলি নির্দেশ করে দেখাতে পারে?) উদাহরণ: খেলনা টা কোথায়?

- Yes/হ্যাঁ-1
- No/না-2

7. Does your child have any fluency disorder? (আপনার শিশুটি কি কথা বলার সময় সাবলীলতায় কোন

অসুবিধা আছে? উদাহরণঃ আমি)

- Yes/হ্যাঁ-1
- No/না-2

8. Does your child can say name of known object? (আপনার শিশুটি কি চারপাশের পরিচিত বস্তুর নাম

বলতে পারে?) উদাহরণ: মা, গাছ, কুকুর, বিড়াল, পাখি,

- Yes/হ্যাঁ-1
- No/না-2

9. Does your child use 'pronoun' - "I" "You" "Mine"? (আপনার শিশুটি কি “আমার” “আমি” শব্দগুলি

ব্যবহার করতে পারে? কিভাবে ব্যবহার করে?)

উদাহরণ:

তুমি কেমন আছ:

আমি খাব:

সে যায়নি:

আমার দিকে তাকাবেন না:

- Yes/হ্যাঁ-1
- No/না-2

10. Does your child repeatedly utter any words? (আপনার শিশুটি কি কোন শব্দ বার বার পুনরাবৃত্তি করে?)

উদাহরণ: তোমার নাম কি?)

- Yes/হ্যাঁ-1
- No/না-2

11. Does your child use idiosyncratic words/Neologism? (আপনার শিশুটি কি কোন নতুন শব্দ

উচ্চারিত করে যার কোন অর্থ নেই?)

- Yes/হ্যাঁ-1
- No/না-2

Seven questions were for social communication (12, 13, 14, 15, 16, 17, 18)

12. Does your child try to attract your/other attention to his/her activity? (আপনার শিশুটি

কাউকে টেনে ধরে ধাক্কা দিয়ে কোন কিছুর দিকে মনোযোগ আকর্ষণ করতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

13. Does your child take participate in rhymes/song with other children? (আপনার শিশুটি অন্য

শিশুদের সাথে ছড়া এবং গানে অংশ নিতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

14. Does your child ever play with symbol? (আপনার শিশুটি কি প্রতীকী খেলা খেলতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

15. Does your child take part in conversation? (আপনার শিশুটি কি কারো সাথে সংক্ষিপ্ত কথোপকথন চালাতে পারে?) (উদাহরণঃ ভাত খেয়েছে? এই প্রশ্নের উত্তর 'হ্যাঁ' বা 'না' বলে কি না?)

- Yes/হ্যাঁ-1
- No/না-2

16. Does your child can make eye contact and understand other facial expressions?
(আপনার শিশুটি কি চোখের দিকে তাকিয়ে বক্তার মনোভাব বুঝতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

17. Does your child point or look at things with other jointly? (আপনার শিশুটি কি অন্যজনের সঙ্গে একই সঙ্গে কোন জিনিস নির্দেশ করতে পারে বা দেখাতে পারে?)

- Yes/হ্যাঁ-1
- No/না-2

18. Does your child smile in response to your activity which he/she likes? (আপনার শিশুটি কি পছন্দের কোন কিছু করলে বা দেখালে হাসি বিনিময় করে?)

- Yes/হ্যাঁ-1
- No/না-2

APPENDIX-II

Consent form

সম্মতি পত্র

সম্মতিপত্র

অভিভাবকের জন্য :

১। গবেষণার নাম : The nature of speech problem in Bengali Children with cerebral palsy and Autisms.

২। উদ্দেশ্য :- যদি অটিজম এবং সেরিব্রাল পল্‌সি শিশুদের ভাষা বৈকল্যের প্রকৃত ধরন নির্ণয় করা সম্ভব হয় তাহলে তাদের প্রতিরোধ করার উপায় জানা সম্ভব হবে। এবং এই বার্তা সর্বস্তরের মানুষের কাছে পৌঁছে দেয়া সহজ হবে।

৩। যদি আপনি এই গবেষণায় অন্তর্ভুক্ত হতে সম্মতি প্রদান করেন তাহলে কিছু প্রশ্ন করা হবে এবং প্রাপ্ত ফলাফল একটি কাগজে লিপিবদ্ধ করা হবে।

৪। ঝুঁকি : এই গবেষণায় তেমন কোন ঝুঁকি নাই।

৫। তথ্যের গোপনীয়তা : সংগৃহীত তথ্যাদি কেবল গবেষণার কাজে ব্যবহৃত হবে। গ্রহণকারীদের নাম প্রকাশ করা হবে না এবং সকল তথ্য গোপন রাখা হবে।

৬। এই অংশগ্রহণ : এই গবেষণায় অংশগ্রহণ সম্পূর্ণরূপে আপনার ইচ্ছার উপর নির্ভরশীল এতে আপনি অংশ গ্রহণ করতে পারেন অথবা বিরত থাকতে পারেন। আপনি গবেষণায় অন্তর্ভুক্ত হতে চাইলে এই কাগজে নিচের অংশে আপনার স্বাক্ষর বা টিপসই দিন।

ডা: ফাহিমদা ফেরদৌস

এম.ফিল গবেষক ভাষাবিজ্ঞান বিভাগ

নীচের অংশে অভিভাবক স্বাক্ষর করেন।

আমি এই গবেষণার বিষয়ে সম্পূর্ণ অবগত হওয়ার পর এই গবেষণায় নিজেকে অন্তর্ভুক্ত করতে সম্মতি প্রদান করলাম।

শিশুর সাথে সম্পর্ক

অভিভাবকের নামসহ স্বাক্ষর বা টিপসই