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Referral and Diagnostic Trends in Children Attending the Child Psychology Clinic in a Tertiary Neurology Hospital in Bangladesh

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Abstract

Background: Increasing numbers of parents are seeking services for concerns about their child's neurodevelopment due to better survival of high-risk newborns, rising literacy, and declining fertility rates. **Objective:** This study was aimed to investigate the referral and diagnostic pattern in children attending the child psychology clinic. **Methodology:** This retrospective study was carried out in the child psychology clinic of the National Institute of Neurosciences and Hospital, Dhaka, Bangladesh from July 2019 to June 2021. Children up to 16 years of age attending the clinic during that study period were included. Data were retrieved from the clinic database and a semi-structured questionnaire was used to obtain sociodemographic, clinical information, causes of referral, the type of psychometric tests administered, and their interpretations. **Results:** Although a total of 1860 (4.16%) children were referred to the child psychology clinic from the outpatient department, 1460 (3.26%) children enrolled themselves in the clinic for evaluation. Their mean age was 6.24±2.56 years and the male to female ratio was 2.3:1. The majority (44.52%) of children were in the 0-5 year age group. Children having the features of Intellectual disability (24.66%), ASD (19.31%), ADHD (14.45%), and cerebral palsy (11.71%) were the most frequent causes of referral for psychological assessment. Epilepsy (6.23%), behavioral and emotional abnormality (4.38%), and speech delay (6.23%) also formed a major bulk. WISC-IV (30.04%), Conner's Rating Scale (22.31%), and DSM-V (15.45%) were the most frequent psychometric test applied in these groups of children. The most frequent diagnosis after the psychological assessment was cognitive delay followed by ADHD, ASD, and behavioral abnormality. **Conclusion:** A significant number of children is found to have disorders that has demanded psychological assessment and intervention. *[Journal of National Institute of Neurosciences Bangladesh, January 2022;8(1):3-8]*

Keywords: Child psychology clinic; neurodevelopmental disorder; ASD; ADHD; intellectual disability

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Introduction

Bangladesh has achieved a steady decline in under-five child mortality rates over the last 2 decades, from 150 per 1,000 live births in 1990 to 41 in 2013[1]. Conversely,

rates of childhood neurodevelopmental disorders (NDDs) have risen from 68 per 1,000 in 1988 to 185 in 2013[2-3]. Eventually, there have an increased incidence of children with developmental difficulties in learning, behavior, and emotional functioning. These may be due to better diagnostic sensitivity to neurodevelopmental problems and residual central nervous system problems that result from success in life-saving treatments in infancy and childhood.

Neurodevelopmental disorders comprise children with a range of impairments and disabilities related to a range of functions with or without underlying disease pathology or disorders. Psychological assessment is often helpful in understanding the strengths and challenges of a child as cognitive, behavioral, and emotional functioning relate to the overall development. The psychological assessment process allows for diagnostic clarity and individualized recommendations. Often, children who are struggling with academic work, social interactions, and emotion regulation have atypical neurological development that can be identified through psychological assessment[4]. This allows for parents, teachers, and therapists to provide intervention and accommodations needed to allow each child to reach their potential.

Psychological assessment is more than the administration of psychometric tests. It is a process of testing that uses a combination of techniques to help arrive at some hypotheses about a person and their behavior, skills, capabilities, and personality. Psychological assessment is frequently used to determine if a child meets diagnostic criteria for a disorder as defined by the DSM-5, neurodevelopmental disorders such as Intellectual Disability, ADHD, and Specific Learning Disorder, depressive disorders, anxiety disorders, and other conditions of childhood. National Institute of Neurosciences and Hospital (NINS&H) is the center of excellence and one of the highest centers of referral for any neurodevelopmental and neurological disorders have started psychological assessment of children since July 2019. This study focused on the proportion of the children attending the Psychology clinic, their age variation, referral indications, the type of psychometric tests applied, its interpretations, and diagnosis.

Methodology

This retrospective study was conducted in the Department of Paediatric Neurology at National Institute of Neurosceicnes & Hospital, Dhaka, Bangladesh from July 2019 to June 2021. In this study, the data of children were retrospectively reviewed who were attended in the child psychology clinic at National Institute of Neurosciences and Hospital, Dhaka, Bangladesh since its establishment to June 2021. The clinic is running under the department of Paediatric Neurology and children up to 16 years of age were referred here for psychological assessment with or without counseling. These children were attained the pediatric neurology outdoor first and attending consultant referred the child to the psychology clinic according to the need basis. Here psychological assessments were done by a highly trained child psychologist who was a specialist in these fields who evaluated the child's strengths and

Table 1: Name of the Psychological assessment scales administered in the child psychology clinic, their age range of application, and indication

Name of the Tests	Age Range	When applied
Wechsler preschool and primary scale of intelligence (WPPSI-lll) (junior)[5]	2 years 6 months to 3 years 11 months.	Intellectual disability (ID), Learning difficulties, Epilepsy
Wechsler preschool and primary scale of intelligence (WPPSI-lll) (Senior)[5]	4 years to 7 years 3 months	ID, Learning difficulties, Epilepsy
Wechsler Intelligence Scale for Children (WISC-lV)[6]	6 years to 16 years 11 months 29 days	ID, Learning difficulties, Epilepsy
The Bayley Scales of Infant Development (Bayley -lll)[7]	16 days to 42 months	Developmental delay, Motor delay, Cognitive delay.
Reynell-Zinkin scales (RZS)[8]	0 to 5 years	Children with visual impairment
Conner's Rating Scale[9]	3 to 17 years	Behavioral problem, Attention deficit
DSM-V for Autism[10]	2 years onwards	hyperactivity disorder (ADHD) Autistic spectrum disorder (ASD)
Modified Checklist for Autism (M-CHAT)[11]	16 to 30 months	Screening of autism
Strengths and Difficulties Questionnaire (SDQ)[12]	4 to 16 years	Behavioral Abnormality
Autism Diagnostic Observation Schedule (ADOS-2)[13]	31 months onwards	ASD
Stanford–Binet Intelligence Scale (SBIS)[14]	2 to 9 years	Children with no speech
Independent Behaviour Assessment Scale (IBAS)[15]	2 to 9 years	To assess the adaptive behavior

weaknesses and subsequently worked with parents, other family members as well as teachers to come up with an approach that would help the child progress. Children who needed psychiatric assessment were further re-evaluated by a psychiatrist of the same institute. Psychological testing wasn't a quick evaluation and it involved the administration, scoring, and interpretation of tests. In this study, psychologist sorted out which psychometric tests should be applied to a child with a particular problem. Sometimes, the physicians also recommended the specific tests required. The assessment often took several hours to complete and likely would involve more than one session. Child psychologist had to know all the details about a child. During a psychological assessment, the child psychologist talked with (interview) the child and their parents and observed the child during the evaluation as well as completed a standardized test by the child. Furthermore, medical records, school records, or interviews or tests the child's parents or teachers were also evaluated to learn more about the child. The results of this type of evaluation revealed which areas the child was doing well in and which were the ones he or she might need to address. The psychologist prepared a written report and met with the parents to review the results.

In this study, the socio-demographic profile and causes of referral among children were reviewedattending this clinic. We also tried to review the psychological tests applied and the results of the tests when available. Data were analyzed using SPSS version 20. Continuous data were presented as means and standard deviations, whereas categorical data were presented as proportions. The study was approved by the Ethical Review Committee (ERC) of the institute.

Results

Total 44726 children attended the Pediatric Neurology outdoor during the study period from July 2019 to June 2021. Among them, 1860 (4.16%) children were referred to the child psychology clinic and 1460 (3.26%) children had attended the clinic. Finally, analysis was done among 1460 children. Their mean age of presentation was 6.24±2.56 years. Among the studied population, 44.52% and 38.42% of cases were in the age group of 0 to 5 years and 6 to 10 years respectively. Most of the children were male (73.97%) and the male to female ratio was 2.3:1. Most of the children (57.12%) resided in an urban area and belonged to middle socioeconomic status (46.51%) (Table 2).

Table 2: Socio-Demographic Profile of the Studied Population (n=1460)

Variables	Frequency	Percent
Mean age	6.24 ±2.56 years	
Age range	0-16 years	
Age Groups		
• 0 to 5 years	650	44.52
• 6 to 10 years	561	38.42
• 11 to 16 years	249	17.05
Gender		
• Male	1018	73.97
• Female	442	30.27
Residence		
• Rural	626	42.88
• Urban	834	57.12
Socio-economic status		
• Lower	413	28.29
• Middle	679	46.51
• Higher	368	25.20

Intellectual disability (24.66%), ASD (19.31%), and ADHD (14.45%) were the most frequent causes of referral for psychological assessment. Children having Cerebral palsy (11.71%), neurodegenerative disorder (1.44%), and Epilepsy (6.23%) were also referred here especially for assessment of cognitive function.

Table 3: Causes of referral to the Psychology clinic

Disease	Frequency	Percent
Intellectual disability (ID)	360	24.66
ASD	282	19.31
ADHD	211	14.45
Cerebral Palsy	171	11.71
Cognitive delay/ regression, behavioral abnormality associated with Epilepsy	91	6.23
Speech delay	91	6.23
Behavioral and emotional problem	64	4.38
Following CNS infection	47	3.22
Developmental delay	42	2.88
Neurodegenerative disorder	21	1.44
Syndromic child	13	0.89
Tic disorder	7	0.48
Sleep problem	3	0.21
Conversion disorder	2	0.14
Headache	2	0.14
Hearing problem	1	0.07
Diagnosis not specified	29	1.99
Counseling	23	1.58

Children with speech delay (6.23%), developmental delay (2.88%), behavioral and emotional problems (4.38%) were also visited the clinic for evaluation. A significant number of children came here without any specific diagnosis (1.99%) whereas a small fraction of children attended the clinic only for counseling (Table 3).

A total of 1618 psychometric tests were applied among 1460 children. Usually one but occasionally two or more tests were applied in a single child for proper evaluation. WISC-IV (30.04%) was the most frequent psychometric test applied in children aged 6 to16 years 11 months 29 days having intellectual and/or learning difficulties. WPPSI-III and Bayley-III were applied in 9.52% and 2.78% of cases respectively (Table 4).

Table 4: Psychological assessment scales administered in the clinic among the studied population (n=1618)

Name of the test	Frequency	Percent
WISC -IV	486	30.04
Conner's Rating Scale	361	22.31
DSM - V	250	15.45
WPPSI - III	154	9.52
RZS	145	8.96
IBAS	108	6.67
Bayley - III	45	2.78
SDQ	30	1.85
ADOS - II	20	1.24
SBIS	12	0.74
M - CHAT	7	0.43

Conner's Rating Scale (22.31%) was administered in a significant number of children having the features of behavioral abnormality, hyperactivity, and/or inattention where the ADHD index was markedly atypical in 59.28% of cases. DSM-V was applied in 15.45% of cases and most of the results (98%) were positive for autism. ADOS-II (1.24%) was used for the diagnosis and classification of ASD, whereas M-CHAT (0.43%) was used for screening. RZS (8.96%), a developmental scale, was applied in children under five years of age with visual impairment and found severely low IQ in 64.14% of cases. IBAS was administered in 6.67% of children to document the adaptive behavior (Table 5).

A significant number of children were found to have extremely low IQ (82.21%) when assessed by WISC-IV, WPPSI-III, Bayley- III, and SBIS (Table 6).

Table 5: Psychological assessment scales administered in the clinic among the studied population (n=1618)

Name of the Tests Applied	Frequency	Percent
Conner's Rating Scale (361)		
Average	1	0.28
Slightly atypical	1	0.27
Mildly atypical	28	7.8
Moderate atypical	117	32.4
Markedly atypical	214	59.3
ADOS- II (20)		
High	8	40.0
Low	4	20.0
Moderate	8	40.0
DSM-V for Autism (250)		
Negative	5	2.0
Positive	245	98.0
M-CHAT (07)		
Negative	3	42.86
Positive	4	57.14
SDQ (30)		
Normal	0	0.0
Abnormal	30	100.0
IBAS (108)		I
Normal	4	3.70
Mild	33	30.56
Moderate	30	27.78
Severe	41	37.96

Table 6: Level of intelligence quotient (IQ) assessed by the different scales

Name of the scale	Score	Frequency	Percent
(Level of IQ)			
WISC-IV, WPPSI-III, Bayley- III, SBIS (n=697)			
Extremely low	<69	573	82.21
Borderline	70-79	76	10.90
Low average	80-89	39	5.60
Average	90-109	09	1.29
RZS (n=145)			
Severe	20-34	93	64.14
Moderate	35-49	33	22.76
Mild	50-69	14	9.65
Normal	≥70	05	3.45

Discussion

Bangladesh has improved child survival rates but has been interposed with a trend towards increasing rates of non-communicable conditions such as childhood disabilities. Developmental, behavioral, and mental health problems are emerging issues in children worldwide. Current global epidemiological data consistently reports that up to 20.0% of children and

adolescents suffer from a disabling mental illness[16]. The prevalence of mental disorders, mental retardation, and epilepsy was found as 18.4% cases, 3.2% cases, and 2.0% cases respectively in a national survey conducted in 2009 among children of Bangladesh[17]. In another study, it was shown that the prevalence of child behavior problems reported by the parents in rural Bangladesh was 14.6% cases[18]. All grades of disability in children in Bangladesh are increasing with improvements in health facilities[19]. As a result, emotional, behavioral, and mental health problems have become one of the commonest presentations to the Child neurology outpatient department and the psychological testing of children has become an increasingly essential component of pediatric care.

Children are referred to the psychology clinic for a variety of reasons. Among other things, they may be depressed or anxious, have problems in attention, behavior, socialization, or communication at home or school, be subjected to bullying, or have a learning disorder. Often when kids are struggling in school or seem to be behind their peers developmentally, a counselor or teacher may suggest the child undergo a psychological assessment. Children having developmental difficulties in various domains due to static or progressive disorders of the brain are also referred for psychological assessment. In this study, 4.16% of children were referred to the psychology clinic for assessment and/or counseling among all attending the pediatric neurology outdoor. Data from OPD of the Institute of Mental Health and Research obtained in 1990 have stated that 9.0% children had mental disorders[20]. Another study described that mental health problems comprised almost one-fifth (18.2%) of children presenting to the Shishu Bikash Kendro (SBK) of Dhaka Shishu Hospital[21].

Our study observed that majority of the children (73.97%) were boys and below 5 years of age. This is encouraging, as early recognition of prodromes of neurodevelopmental impairments is an emerging issue for clinicians, epidemiologists, and educationists worldwide[22]. Urban and rural ratio was 1.33:1 which indicated an increased level of awareness among parents residing in urban areas. A large proportion of children (46.51%) came from middle socio-economic backgrounds. These findings are consistent with a previous study[23]. Largest number of referrals were due to intellectual disability (24.66%) where their IQ level was assessed by psychometric tests. A survey of autism and NDDs in Bangladesh found cognitive impairment (46/1000) as the highest prevalent NDDs among all[3]. ASD (19.31%) was the second common cause of referral in this study. About 14.45% of children having features of ADHD were sent for assessment. These findings coincide with a study done in SBK of a tertiary hospital[21]. A significant number of children with cerebral palsy are also addressed here to assess the level of cognitive and motor function.

A network of child development centers has been created across Bangladesh since 1992[24]. In the first decade, most children attending presented with serious physical, sensory, and intellectual disabilities. Now behavior problems form an increasing proportion of the presenting complaints. In this study, 4.38% children attended the clinic only for behavioral and emotional abnormalities. Disruptive behaviors were also observed in a significant proportion of children with epilepsy. A study conducted in pediatric OPD of tertiary hospitals of Dhaka found a behavioral abnormality in 9.0% cases[23]. Khan et al[18] in a survey mentioned that behavior impairment is more likely found in children with cognitive, motor, or seizure disabilities.

In the child psychology clinic, WISC-IV, Conner's Rating Scale, and DSM-V were the most common tools applied since the common causes of referral were ID, ADHD, and ASD. Conner's Rating Scale revealed moderate to markedly atypical ADHD index in most of the cases. ASD was diagnosed by DSM-V in 98% of cases. ADOS was used as a special play-based assessment which was specifically used for the diagnosis of children with ASD and found moderate to high autism in 80% of cases. SDQ detected a behavioral abnormality in 100% of cases. The cognitive level of every child was routinely determined by standardized diagnostic tools such as the WISC-IV, WPPSI-III, Bayley- III, SBIS and the IBAS and found below normal in most of the cases. By putting all the information together, the child psychologist and the physician came to an understanding of where a child needed assistance and could develop strategies to help the child reach their full potential. Intervention strategies include behavioral modification therapy, dietary intervention, improving socialization-communication, cognitive stimulation, sensory integration therapy, and medication. Counseling was also done by the consultant and psychologists for any prevailing psychosocial adverse condition, parental stress relief, and positive parenting practices.

Conclusion

This study indicates that a significant number of children attending the pediatric neurology OPD of a tertiary hospital need psychological evaluation and

intervention. Intellectual disability, ADHD, ASD, and behavioral and emotional abnormality are the most frequent cause of referral. The commonest findings after the psychological assessment was low IQ followed by ADHD, ASD, and behavioral abnormality. Children aged 4 to 16 years with behavioral abnormality have been assessed by SDQ and have found an abnormality in all cases. These results suggest the need for an ideal multidisciplinary team that includes child neurologists, developmental pediatricians, child psychiatrists, a child psychologist, developmental therapist, counselor, and a social worker to improve hospital-based management. It will help to integrate the services to deal with such patients more effectively.

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