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Pattern of Disabilities among Differently Abled Children Attending a Special Education Institute in Rajshahi, Bangladesh: A Cross-Sectional Study

Dr. Abdullah Al Kafi[1]*, Belona Nasrin Shoshi[2]

[1]Associate Professor, Department of Medicine, Islami Bank Medical College, Rajshahi, Bangladesh
[2]Master of Public Health (MPH), Department of Public Health, Varendra University, Rajshahi, Bangladesh

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***Corresponding author:** Dr. Abdullah Al Kafi
Associate Professor, Department of Medicine, Islami Bank Medical College, Rajshahi, Bangladesh

Abstract

Introduction: Childhood disability represents a significant public health challenge in low-resource settings, yet detailed epidemiological profiles of children attending special education institutes in Bangladesh remain scarce. This study aimed to identify the pattern of disabilities and associated socio-demographic, perinatal, and familial characteristics among differently abled children attending Islami Bank Medical College and Hospital in Rajshahi, Bangladesh. ***Methods:*** A cross-sectional study was conducted among 120 children attending Islami Bank Medical College and Hospital in Rajshahi, Bangladesh. Data were collected via face-to-face interviews with mothers or guardians using a pre-tested, partially structured questionnaire. Disability types, birth history, maternal health, and familial factors were analyzed using descriptive statistics and chi-square tests in SPSS version 22. ***Result:*** The mean age of children was 8.85 (±4.25) years; 66.7% were male. Autism spectrum disorder was the most common disability (44.2%), followed by cerebral palsy (15.8%), Down syndrome (15.0%), and multiple disorders (13.3%). Half (50.8%) exhibited multiple co-occurring disability characteristics. Significant associations were found between disability type and sex ($p<0.05$), prematurity/low birth weight ($p<0.001$), birth trauma ($p<0.001$), and maternal age at conception ($p<0.001$). Despite 90.8% antenatal care coverage, 92.5% of mothers did not take folic acid during the first trimester, and 95.0% were unaware of micronutrient deficiencies. ***Conclusion:*** Autism is the predominant disability among children in this setting, with notable links to perinatal factors and maternal age. Critical gaps persist in maternal nutrition awareness and perinatal care. Findings underscore the need for targeted autism services, strengthened perinatal interventions, and integrated maternal health education to mitigate disability risks and improve outcomes for differently abled children in Bangladesh.

Keywords: Childhood disability, Autism spectrum disorder, Special education, Perinatal factors, Maternal health.

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INTRODUCTION

Disability in childhood is a universal challenge to global public health, with millions of affected children and families across the world. Disabilities or handicaps have been estimated to occur in about 5% of the world's children, including a wide range of physical, sensory, cognitive, developmental and behavioural disorders [1]. The understanding of disability has shifted from the exclusive focus on health conditions as the cause of disability to consideration of how health and contextual factors interact, which is reflected in the International Classification of Functioning, Disability and Health (ICF) and its child and youth counterpart (ICF-CY) [2,3]. It is this framework that highlights the fact, as indicated above, that disability is not only a health issue - it is a multi-sectoral phenomenon that describes both the individual and their environment. Bangladesh, like many low-middle income countries (LMICs), children with disability confront formidable barriers to health-care, and education and social inclusion. High quality national prevalence data is scarce but existing studies indicate that children with disabilities are of major concern, due to numerous socioeconomic, genetic and environmental causes underlying childhood disability [4-6]. This is particularly intricate in low-resource settings where diagnostic services, specialist care, and rehabilitation are not sufficient or only available to a minority of people [7]. Children with disabilities are a diverse group, from those with mild learning difficulties to severe developmental disorders. Common disabilities in the paediatric population include intellectual disability,

autism spectrum disorder, cerebral palsy, Down syndrome and multiple genetic syndromes [8,9]. A large majority of children also have comorbidities, making their treatment and management more challenging. The aetiology of these disabilities is multifactorial, reflecting intricate genetic predisposition, antenatal determinants, perinatal events and postnatal factors [10]. There seems to be a growing realization in several parts of the world for the reported prevalence rate of childhood disabilities, most especially disorders such as autism spectrum disorder (ASD) [11]. This perceived increase may be explained by a variety of factors, such as better survival of severely disabled children (in part owing to advances in medical care), greater recognition and diagnosis by healthcare professionals and the general public, and increasing diagnoses through information technology [12]. But it also reflects an increasing urgency for the right services and supports for children with disabilities, and the families who love them. In the Bangladeshi setting, special Hospitals are important for service provision to children with disabilities. Rajshahi Islami Bank Medical College and Hospital is an example of such a hospital where disabled children are facilitated. But little is known about the pattern of disabilities in children seen in this hospital, their demographics and associated factors. Knowledge of these patterns is crucial for planning targeted preventive efforts, resource distribution and future needs. Though it is difficult to assess and categorize childhood disabilities, there are many instruments, and methods applied in several contexts. The ICF-CY covers a holistic approach to disability, regard body functions and structures, activities and participation and contextual factors [13,14]. It is used as both a research instrument and a clinical tool to evaluate disability nationally and internationally, especially in the child and youth population [15]. Previous studies on childhood disabilities in Bangladesh have been few, and primarily concerned with general prevalence rather than detailed description of specific impairments under institution held settings. There are few studies focusing on the association between types of disabilities and socio-demographic, socio-economic and health characteristics in a population-based study in Bangladesh. The objective of this study was, therefore, to fill this gap and examine the patterns of disabilities in children living in Rajshahi. Specifically, the study aimed to determine: common types of disabilities; socio-demographic profile of the children and their families; relationships between types of disability and selected associated factors. In conclusion, knowledge gained from this study is intended to improve understanding of childhood disability in this situation and guide the development of appropriate interventions and support services

METHODS

This was a descriptive cross-sectional study carried out in the Department of Medicine, Islami Medical College and Hospital, Rajshahi, Bangladesh. The length of the study was 1 year, between July 2024 and June 2025. The study group comprised the disabled children visiting the hospital, who were under observation at that period. A purposive sample of 120 children was included. The sample size was determined by applying the formula $n = (z^2pq)/d^2$, resulting 323 subjects. But, as there were no eligible participants to enroll in the study at that time, 120 children have been enrolled in this study as a result. A pre-tested, semi-structured questionnaire was used for face-to-face interviews by the principal investigator for data collection. Mothers/guardians of the children were interviewed. Best effort was placed to collect accurate and non-discriminative data. All disabled children enrolled with the institute during the study period were included. Refusal to participate was the sole exclusion criterion. The study was approved by the Ethical Review Committee. Written informed consent was given by all participants in response to the explanation of aim and methods for the study. The identity of those filling the survey is always respectfully thoughtful and all data was anonymous. Data entry and analysis were done by using (SPSS) software version 22. Data were analyzed with descriptive statistics and $p < 0.05$, $p < 0.01$ levels of statistical significance respectively.

RESULTS

Table 1: Age Distribution of Children (N=120)

Age Group	Respondents	
	n	%
<5 years	14	11.7
5–9 years	61	50.8
10+ years	45	37.5
<5 years	120	100.0
Total	**120**	**100.0**

Mean ± SD = 8.85 ± 4.25 years

This table presents the age distribution of the study participants. The mean age of the children was 8.85 (±4.25) years. The majority (50.8%) were aged between 5–9 years, followed by 37.5% aged 10 years or above, and 11.7% under 5 years old (Table no 1).

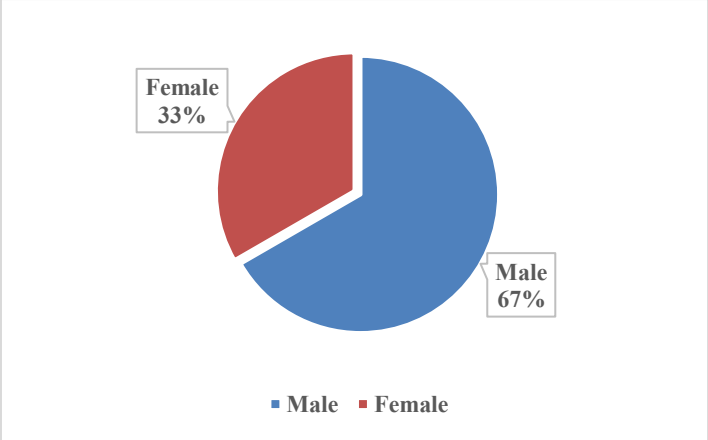

Figure 1: Distribution of the respondents by sex It was found that majority (66.67%) the respondents were male and (33.33%) were female (Fig. no. 01)

Table 2: Weight of Child at Birth (N=120)

Weight Category	Respondents	
	n	%
<2.00 kg	14	11.7
2.00–2.49 kg	14	11.7
2.50–3.50 kg	71	59.2
>3.50 kg	21	17.5
Total	**120**	**100.0**

Mean ± SD = 2.92 ± 0.81 kg

This table outlines the birth weight profile of the participants. The mean birth weight was 2.92 (±0.81) kg. The majority (59.2%) had a birth weight within the normal range of 2.50–3.50 kg, while 11.7% were low birth weight (<2.50 kg) and 17.5% weighed over 3.50 kg.

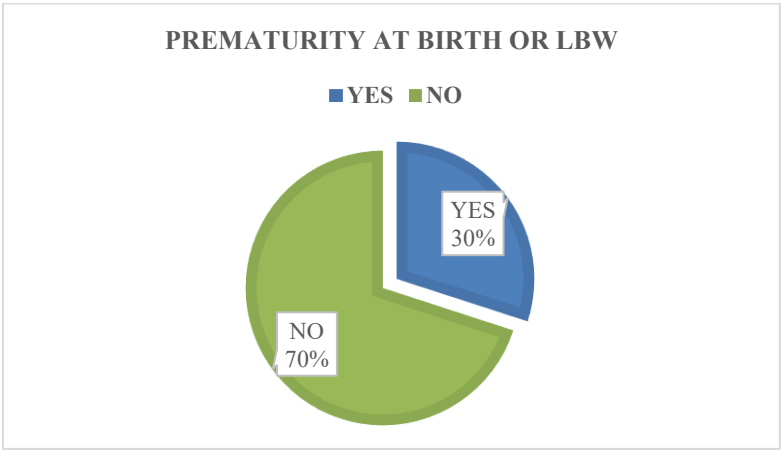

Figure 2: Distribution of the respondents by prematurity It was found that majorities (70.0%) of the respondents did not have prematurity or LBW babies at birth and 30.0% had this condition (Fig. no. 02)

Table 3: Type of Disability among Children (N=120)

Type of Disability	Respondents	
	n	**%**
Autism	53	44.2
Down Syndrome	18	15.0
Cerebral Palsy	19	15.8
Mental Disorder	12	10.0
Multiple Disorder	16	13.3
Others	2	1.7
Total	**120**	**100.0**

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This table displays the distribution of primary disability types among the study population. Autism spectrum disorder was the most common (44.2%), followed by cerebral palsy (15.8%), Down syndrome (15.0%), multiple disorders (13.3%), mental disorders (10.0%), and other disabilities (1.7%).

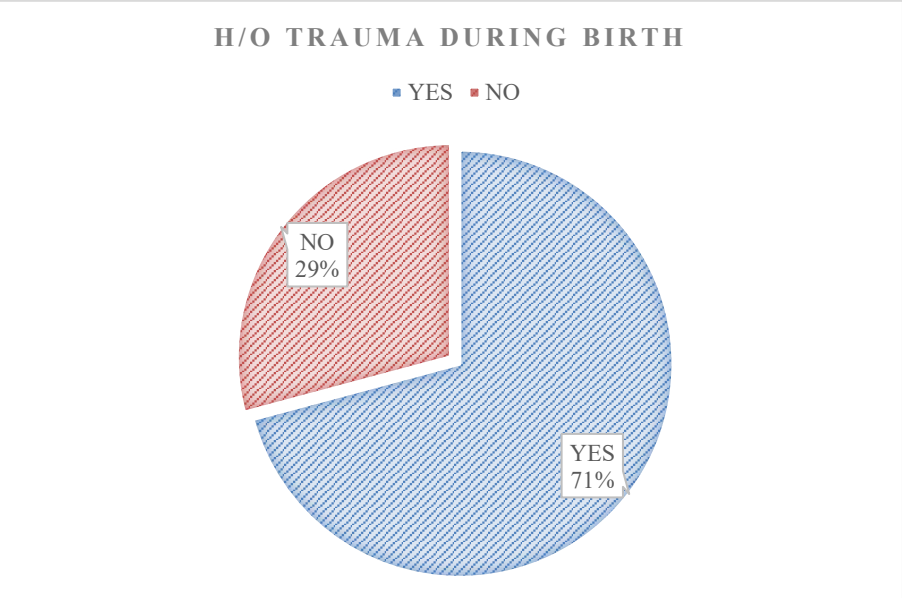

Figure 3: Distribution of the respondents by trauma during birth It was found that 70.83% of the respondents' child did not have trauma during birth and 29.17% had this condition (Fig. no. 03).

Table 4: Characteristics of Disability (N=120)

Characteristic	Respondents	
	n	%
Speechless	31	25.8
Restlessness	16	13.3
Attention Disorder	8	6.7
Inadequate Response	1	0.8
Multiple	**61**	**50.8**
Others	3	2.5
Total	**120**	**100.0**

This table describes the presenting characteristics of disabilities among children. The majority (50.8%) exhibited multiple co-occurring characteristics. Speechlessness was observed in 25.8% of children, while restlessness, attention disorders, and inadequate response were reported in 13.3%, 6.7%, and 0.8% of cases, respectively.

Table 5: Health History of Children (N=120)

Variable	Respondents	
	Yes (n, %)	No (n, %)
Infectious disease within 3 months of birth	90 (75.0)	29 (24.2)
Any adverse incidence after birth	86 (71.7)	34 (28.3)
Did not cry at birth	67 (55.8)	52 (43.3)
Pathological jaundice after birth	18 (15.0)	102 (85.0)
Prematurity / Low Birth Weight	36 (30.0)	84 (70.0)
Trauma during birth	35 (29.2)	85 (70.8)

This table summarizes key health and birth-related indicators. A high proportion of children (75.0%) experienced infectious diseases within the first three months of life, and 71.7% had adverse incidents after birth. More than half (55.8%) did not cry at birth, while pathological jaundice was uncommon (15.0%). Prematurity or low birth weight was present in 30.0% of cases, and birth trauma was reported in 29.2%.

Table 6: Socio-Demographic Profile of Families (N=120)

Variable	Category	Respondents	
		n	%
Mother's Occupation	Housewife	100	83.3
	Service	19	15.8
	Business	1	0.8
Father's Education	Illiterate	6	5.0
	Class I–V	15	12.5
	Class VI–XII	18	15.0
	Graduate	24	20.0
	Post-graduate	57	47.5
Monthly Family Income (Tk)	≤15,000	25	20.8
	15,001–30,000	29	24.2
	30,001–60,000	42	35.0
	>60,000	24	20.0
Consanguineous Marriage	Yes	14	11.7
	No	106	88.3

This table provides an overview of family socio-demographic profiles. The majority of mothers were housewives (83.3%), and nearly half of fathers (47.5%) had post-graduate education. The most common monthly family income bracket was Tk 30,001–60,000 (35.0%). Consanguineous marriage was reported in 11.7% of families.

DISCUSSION

The objectives of this study were to determine the prevalence and common disabilities among children with some sort of disability who attended Islami Bank Medical College Hospital, Rajshahi in Bangladesh and explore related socio-demographic and birth-related factors. The results show a number of important patterns, some in line and others in contrast with national and international evidence on childhood disabilities. Autism spectrum disorder (44.2%) was the most frequent disability reported in this study, followed by cerebral palsy (15.8%), Down syndrome (15%), and other multiple diagnosis category of disabilities (13.3%). This very high level for autism is worth noting, and could be due to the enhanced diagnostic knowledge as well as possibly regional or institutional conditions. The estimated prevalence of autism around the world is about 4 per 1,000 children but there are those who believe numbers have started to rise as a result of better identification and diagnosis [7]. The proportion observed in the present study is much higher and that could be due to selective referral pattern to the institute or it represent an emerging public health problem in the (region). One half of children (50.8%) had multiple features of disability, suggesting an aspect to complex overlapping nature of developmental disorders. This is in accordance with findings from around the world, where children with disabilities frequently have comorbid disorders of speech, cognition and behaviour [8]. Most of the children (75.0%) had a history of infectious disease in the first three months of age. This corresponds with those of low-resource countries, where infectious diseases continue to be a major cause of developmental morbidity such as Pakistan [16, 11]. Infections during early life, including meningitis and measles are well recognized risk factors for childhood hearing loss, cerebral palsy and intellectual impairment [4,17]. In addition, 55.8% of children didn't cry at birth possibly suggesting perinatal asphyxia or neurological insult at delivery. Birth asphyxia is a recognized cause of cerebral palsy and learning disability [18]. Meanwhile, 30.0% of them were born preterm or had a LBW and 29.2% suffered birth trauma. Both of these conditions are closely related to neurodevelopmental disabilities such as cerebral palsy and learning disabilities [18,10]. The strong statistical correlation between prematurity/LBW and type of disability ($p<0.001$) confirms this association. Maternal age at conception was significantly associated with type of disability ($p<0.001$). It is important to note that 91.7% (11/12) of children who born from mothers aged more than 35 years had Down syndrome, which is in accordance with the known biological risk of chromosomal abnormalities related to advanced maternal age [19]. On the other hand, autism was significant in children of younger (26–30 years) mothers. Although the vast majority of mothers (90.8%) had received antenatal care, during their first trimester 92.5% did not take folic acid, and 95.0% did not know to a lack of iodine, iron or calcium ingestion. It is well-established that nutritional deficiencies during pregnancy are risk factors for neural tube defects and cognitive impairment [19,20]. This lack of maternal nutrition knowledge is an important gap that can be targeted for public health action. Most fathers (47.5%) had post-graduate educations, and the majority of families were middle-income families. This could be a consequence of better access to diagnostic and supportive services in the more educated families and not necessarily indicative that these disorders are less common in the lower education group. Notably, 50.0% of fathers had criminal behaviour or history of smoking / alcohol / drug use -57which may be associated with poor pregnancy outcomes and possible genetic environmental risk for disability [19]. In 11.7% of

families, the parents were consanguineous. Consanguinity is a major risk factor for autosomal recessive disorders and congenital anomalies, predominantly in South Asia and the Middle East [21, 22]. Not all guys, but still a thing here. This research offers important, original data on childhood disabilities in a country context specific to Bangladesh. The use of well-structured questionnaire, and face-to-face interviews guaranteed detailed data gathering. Nevertheless, several caveats should be noted. The limited sample size (120) was due to resource constraints; non-random sampling technique (purposive sampling) also meant generalization was limited. The cross-sectional nature of the study precludes drawing causal inferences. Also, Remembrance bias could influence the mothers to report the perinatal events. These find support in international frameworks such as WHO's International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY), which advocate a broad perspective on disability [9,23]. Conclusion: This study found autism to be the most frequent disability among children at Islami Bank Medical College and Hospital, associated with perinatal events, maternal age and familial factors. The findings highlight the complex nature of childhood disability and the importance of comprehensive health, education and social support. This can be explored in future large population-based longitudinal studies to better understand causal pathways and intervention effects.

Limitations of the Study

The study was conducted at a single hospital with a small sample size. Additionally, data were collected from only one special education institute in Rajshahi, which may not represent the diversity of disability patterns across different regions of Bangladesh.

CONCLUSION

This cross-sectional study identified autism spectrum disorder (44.2%) as the most prevalent disability among children attending Islami Bank Medical College and Hospital in Rajshahi, Bangladesh, followed by cerebral palsy (15.8%), Down syndrome (15.0%), and multiple disorders (13.3%). Significant associations were found between disability type and several factors: male sex was linked with autism ($p<0.05$), while advanced maternal age (≥35 years) was strongly associated with Down syndrome ($p<0.001$). Prematurity/low birth weight and birth trauma were significantly correlated with cerebral palsy and multiple disorders ($p<0.001$). Despite high antenatal care uptake (90.8%), critical gaps in maternal nutrition awareness were evident, with 92.5% not taking first-trimester folic acid and 95.0% unaware of micronutrient deficiencies.

RECOMMENDATION

Based on these findings, several actionable recommendations are proposed. At the clinical and service level, targeted autism intervention programs should be developed within special education institutes, perinatal care strengthened to reduce birth trauma and prematurity, and first-trimester folic acid supplementation integrated into routine antenatal care. Community and policy initiatives should include public awareness campaigns focusing on early disability recognition and stigma reduction, promotion of inclusive education through teacher training and infrastructure adaptation, and expansion of community-based rehabilitation services. For research and monitoring, establishing a disability surveillance system within special education institutes and conducting multicentre studies across Bangladesh are recommended to validate findings and enable longitudinal tracking of disability trends and outcomes.

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