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Mother's functional difficulty is affecting the child functioning: Findings from a nationally representative MICS 2019 cross-sectional survey in Bangladesh

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Abstract

Background: Functional difficulties in children can be transmitted from mother to child, which is a major concern. We sought to determine whether there was a correlation between a mother's functional difficulty and functional difficulty in kids between the ages of 2–4 and 5–17. We also want to evaluate other fundamental aspects that influence on child's functionality.

Methods: We used Multiple Indicator Cluster Survey (MICS) data sets. For two different age groups, the children's difficulty status was evaluated. The socio-demographic factors served as explanatory variables in this study. We used χ^2 tests and survey logistic regression models to analyze the data.

Results: Functional difficulties were less common in children aged 2–4 years (2.78%) but 8.27% in those aged 5–17 years. The study specifies that the mother's functional difficulty (odds ratio [OR]: 2.66, confidence interval [CI]: 1.35–5.24 for children aged 2–4 years and OR: 3.36, CI: 2.80–4.03 for children aged 5–17 years) were significantly associated with the functional difficulty of both age groups' children. Not attending early childhood education programs (OR: 1.89, CI: 1.16–3.10 for children aged 2–4 years and OR: 2.66, CI: 2.19–3.22 for children aged 5–17 years) and divisions were also significantly affecting the functional difficulty of both age groups' children. Moreover, area of residence and gender were significant factors for the older age group.

Conclusions: The prevalence of difficulty among children in Bangladesh is high. Children's functional difficulty, regardless of age, is greatly influenced by the functional difficulty of their mothers, their absence from early childhood education programs, and divisions. Reducing the prevalence of child functioning difficulties will

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be more successful if the government and NGOs consider these factors while developing appropriate intervention programs.

KEYWORDS

Bangladesh, child functional difficulty, early childhood education program, mother's functional difficulty, Multiple Indicator Cluster Survey (MICS)

1 | INTRODUCTION

The number of children with functional difficulties as reported by their parents is steadily increasing.[1] Functional difficulty is a medical condition where the disabled person may face discomfort or difficulty in social life and mental activities and may start from birth or at any point in life. Broadly saying it includes all types of disorders, that is, cognitive, sensory, physical, mental, intellectual, development, or the difficulty may combine multiple factors.[2] The starting point of difficulty is uncertain. Therefore, children evaluated with any impairment, like hearing, language, seeing, emotional, or mental retardation, are considered disabled children or children with difficulty. Child functional difficulty is an alarming problem nowadays. Families with functionally challenged children face a good number of problems that one might not even think about. In most cases, the parents are stressed, and out-of-pocket medical costs for treatment are enormous.[2] Child functional difficulty is also a significant cause of divorce or separation.[3–6] In the 21st century, when working women is a general term, mothers of disabled children are more often unable to work, as they have to pay more attention to their children than normal ones.[7] Not only mothers but also fathers have been found to spend fewer hours in the office in most cases.[8] As parents alone are unable to tackle the abnormal behavior, they need help from assistants in many cases.[9] All these circumstances are negatively affecting the overall income, making it a more troublesome situation for the parents and other family members. As the functional difficulty influences the children's participation and functioning in the environment and society, understanding the type of difficulty and the factors associated with it is, therefore, paramount.[10]

According to Olusanya et al., worldwide, more than 290 million children and adolescents face functional difficulties, that is, more than 1 in every 10 children and adolescents have cognitive difficulties, epilepsy, hearing or vision loss. Furthermore, 94.5% (275.2 million) of the disabled children examined belonged to low- and middle-income countries.[11] The child functional difficulty prevalence in Bangladesh among 2–9 years children was estimated at 70 out of 1000 while considering the severity of all grades. However, when only severe functional difficulty was taken into consideration, the estimate was reduced to 22 out of 1000 children.[12] According to another study, Bangladesh had 1.3 million developmentally disabled children under the age of 5 in 2016.[13]

Over and above, the sphere of functional difficulty has developed gradually over the past several decades—from defining functional difficulty as a solely medical circumstance to factors related to the environment in which the individuals live along with health conditions, making functional difficulty a complex term to assess.[14,15] Besides, tools developed in high-income countries may not be appropriate for lower-income countries because of differences in the context by which functional difficulty is assessed.[16] Several well-known mechanisms have been used to assess functional difficulty among children, most of which measure motor, cognitive, language, and social functioning in children. However, it is ironic that most of the lower-income countries are unable to conduct the second stage of the test, which is clinical assessment, because of the limited resources available to them, resulting in failing to capture mild to moderate functional difficulty. Hence, to balance at national and international levels, standardized measures are badly needed. Over the past several decades, vigorous attempts have been taken to initiate meaningful functional difficulty data across various countries, which will result in a better understanding of the orbit of functional difficulty across the globe; however, these attempts need to be more consistent to ensure the availability of valid and comparable functional difficulty data across the countries.

To clear it up, United Nations Children's Emergency Fund (UNICEF) administered the Multiple Indicator Cluster Survey (MICS), introduced a disability module for children in 2000, and collected data from various lower-income countries.[17] Standard estimates on socioeconomic and health-related variables are assessed by MICS. With this target, MICS, since then, has already published 240 surveys and has collected data from low-income countries (as defined by per capita gross national income). The number of countries has already exceeded 100. There was no data available on child disability at that period, nor in MICS' first-round surveys. However, MICS, in their following survey, which was the second round conducted by them and got released in 2000, collected data on child disability. However, in 2019 they modified the module and renamed it functional difficulties.

In their second round, there were more than 50 surveys. Hence, MICS became the most significant source of child disability data for low-income countries globally comparable.[18]

To make it more polished, in 2011, it was combined with the Washington Group on Disability Statistics. Since then, it has been the best tool ever evolved to assess child functioning.[16] The module divided the children into two groups; one covers children aged 2–4 years, and the latter covers children aged 5–17 years. Because the two groups might have different types of disabilities that cannot be identified together. Children below two years were not included because the scenario of late development is quite common in

lower-income countries. The World Health Organization's (WHO) international classification of functioning, disability, and health was taken as the basis for selecting questions for this module and was modified according to the questions used by the Washington Group of Disability Statistics to assess disabilities in adults in their former studies.[17]

Child functional difficulty was previously studied for Ghana using MICS-17 survey data, and it was estimated that 20.67% of Ghanaian children have functional difficulties. The mother's functional difficulty was also a contributing factor,[19] which is because if the parents have any hearing, vision, learning, or other functional difficulties, it may be transmitted to the child. Even if the mother is malnourished during pregnancy, the child may be born with disabilities. Mental illnesses can be passed down to a child during or after pregnancy too.[20] Dey et al.[19] also found that age, gender, education level, health insurance status, mother's educational qualification, wealth index, and area of residence were significant factors behind difficulties. A study in Cameroon and India[21] found that 10.5% of children in Cameroon and 12.2% in India face functional difficulties. However, the number of studies assessing the association between child and mother functional difficulty in Bangladesh is scarce in the literature. A recent study on Bangladesh MICS showed that 0.8% of under-5 children have multiple disabilities, while 2.0% have at least one functional difficulty.[22] They found that a mother's functional difficulty is a significant factor in 2–4-year-old children's functional difficulties. However, the authors did not investigate the functional difficulty of children aged 5–17 years. Since children of different ages experience different difficulties, noncore domains should be considered for children 5–17 years old children. Therefore, we aimed to determine the association between a mother's functional difficulty and functional difficulty in children aged 2–4 and 5–17 years. We also intended to identify the significant factors underlying 2–4 and 5–17 years of child functional difficulty and assess any differences between the two sets of significant factors.

2 | METHODS

2.1 | Data source

We used data from the MICS 2019 to conduct this study. Bangladesh Bureau of Statistics (BBS) carried out MICS in 2019 in collaboration with UNICEF, Bangladesh, as a part of the global MICS program. UNICEF, mainly working with children and women, designed such a sample for MICS that could provide estimates for almost all indicators about their situation in urban and rural areas.

2.2 | Outcome variable

The outcome variable was the functional difficulty of a child. As the younger children cannot respond correctly; therefore, the mother or caretaker of those children answers the questions for them. They were asked questions about core domains. Core domains, for example, seeing, walking, hearing, communication, learning, playing, behavior, and picking up small objects, could be visually assessed, whereas a child having difficulty with noncore domains, such as depression, stress, anxiety, might not be assessed if he/she does not let others know. The questionnaire includes categorical responses, namely "no difficulty," "some difficulty," "a lot of difficulties," and "cannot do it at all" for core domains and noncore domains' response categories were "daily," "weekly," "monthly," "a few times in a year," never," and "no response." If the child has difficulty in any of the domains mentioned above, then the child has been considered to have functional difficulty. The outcome variable has two categories, "Yes" and "No." "Yes" indicates that the child has functional difficulty, and "No" indicates that the child does not have any functional difficulty. In the beginning, the children were divided into two age categories, namely 2–4 and 5–17 years, as at different ages, children may suffer from different types of difficulties.

2.3 | Exposure variable

The exposure variable was the "mother's functional difficulties." The mother's functional difficulties were assessed using questions from six domains (seeing, hearing, walking, cognition, self-care, and communication). The questionnaire includes categorical responses, such as "no difficulty," "some difficulty," "a lot of difficulties," and "cannot do it at all." If the mother has difficulty in any of the above-mentioned domains, she is considered to have functional difficulty. Thus, the exposure variable (i.e., mother's functional difficulties) in the MICS survey data sets is divided into two categories: "Yes" and "No." The answer "Yes" implies that the mother has functional difficulties, whereas the answer "No" shows that the mother does not have any functional difficulties.

2.4 | Potential factors

MICS has a wide range of factors. Among those, factors such as gender, area, division, wealth index, mother's education level, ethnicity of household head, sex of household head, and education level of household head were included as the independent variables for analysis.[19] Male and female were the two categories for sex and sex of the household head variable. The area was categorized as urban and rural.[23] This study included all eight geographical divisions of Bangladesh, that is, Barisal, Chittagong, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet. The wealth index was categorized into three categories, that is, poor, middle, and rich. The mother's education level and the education level of the household head were categorized as "up to primary," "secondary," and "higher secondary and above." Up next, mothers' functional difficulty was a binary variable with two categories, "yes" and "no." The ethnicity of the household head also included only two categories, that is, "Bengali" and "others."

2.5 | Statistical analysis

The statistical analysis for the two age groups (2–4 and 5–17 years old) was conducted separately to identify the factors associated with a child's functional difficulty. A descriptive analysis was undertaken to check the background characteristics of the participants. Then the univariate analysis between difficulty status and the possible factors associated with the difficulty status was done. Following the instruction found from Hosmer and Lemeshow,[24,25] we chose factors for the multiple binary logistic regression (say initial model) that had a *p*-value of less than 0.25 in the univariate analysis. The variance inflation factor (VIF) was then used to verify multicollinearity. Any factor with a VIF > 5 (the rule of thumb value for multicollinearity) was removed from the model.[26,27] After removing the factors with high VIF, we run the final logistic regression model. Calculated *p*-values were based on the Wald test. To assess how much the chance of suffering from any difficulty varies among categories compared to the reference category, odds ratio (OR) and 95% confidence interval (CI) were calculated. As MICS uses a complex survey design,[18] two major issues must be considered in assessing data from the MICS survey: (1) homogeneity or nonindependence, which is produced by the nonrandom sample, and (2) disproportionate sampling, which results in unequal unit selection probabilities, such as oversampling or noncompliance adjustment.[28] Therefore, we applied a weighting component to each respondent record to account for nonresponse and change in the selection probability. In addition, we used the clustering and stratification variables to cope with the multistage cluster sampling design in the MICS database. We computed the area under the curve (AUC) to assess the models' performance using receiver operating characteristic curve (ROC) analysis. The AUC shows how accurate the model is. The AUC value ranges from 0 to 1, with 0 signifying an entirely incorrect classifier, 1 signifying a perfectly accurate classifier, and an AUC of 0.5 signifying no discernible discriminatory model ability.[29] Supporting Information: File 2 contains the codes used for the analysis. The STROBE guideline was followed, and STATA version 14 was used for all statistical analyses.

2.6 | Ethical statement

The Bangladesh Government's technical committee, led by the Bangladesh Bureau of Statistics (BBS), authorized the survey procedure. In addition, each participant verbally consented. In the instance of 15–17-year-old individually questioned minors; adult consent was obtained before the child's approval. The surveyors informed that participating in the survey was completely voluntary and that the data would be kept private and confidential. Participants might also refuse to answer any or all questions and end the interview at any time.[18] We carried out all methods in accordance with relevant guidelines and regulations.

3 | RESULTS

3.1 | Prevalence and epidemiology of child functioning

Table 1 presented the prevalence of functional difficulty among Bangladeshi 2–4- and 5–17-year children according to the selected factors. The child functioning prevalence was different in these two groups. There was a higher prevalence among children aged 5–17 years. Only 2.78% of children (373) aged 2–4 years were not functioning appropriately, whereas 8.27% of children (3020) aged 5–17 years experienced difficulties.

Children with functionally challenged mothers were also found to face functional difficulties. 10.4% of children aged 2–4 who had functional difficulties came from mothers who had some form of functional difficulty. However, the percentage increased to 24.6% for those aged 5–17. This study showed that male children were more prone to functional difficulties for both groups under consideration. While looking for children aged 2–4 years, 3.2%, of disabled male children were found, whereas the number of female disabled children was only 2.3%. Looking forward to children aged 5–17, the percentage of disabled male children had increased to 8.8%, and for female children, the percentage was 7.7%. When considering the mother's education level and the education level of the household head, both age groups showed a similar pattern. Increasing the level of the mother's and household head's education, we found that the percentage of functionally disabled decreased.

Moreover, gender, wealth index, division, mother's functional difficulty, ethnicity of household head, education of household head, and never attended early childhood programs were significantly associated with functional difficulties of both age groups under consideration. In contrast, the area shows significant relation for children aged 5–17, and the mother's education level also affects significantly children aged 2–4 years.

Additionally, functional difficulties were reported by 3.3% and 1.61% of the mothers with children aged 2–4 and 5–17, respectively. Children's functional difficulty in the individual domain and the distribution of the mother's functional difficulty are presented in Supporting Information: Figures 1–3.

3.2 | Logistic regressions

The logistic regressions' results were shown in Table 2. The educational qualification of the household head was removed in the final model for 2–4- and 5–17-year-old children as it has a VIF > 5. Similarly, ethnicity was also removed in the final model for 5–17 years old children. However, the odds of facing functional difficulty decreased with the increased education levels for both age groups. For example, when the educational qualification of the household head was up to the primary, the OR was 1.41 (0.77–2.57) for children aged 2–4 years and 1.05 (0.87–1.17) for children aged 5–17 years compared to the household heads with education

TABLE 1 Comparison of the prevalence of functional difficulty among Bangladeshi 2–4- and 5–17-year children using the MICS 2019 database

	2–4 years			5–17 years		
	Functional difficulty					
Covariates	No Unweighted frequency (weighted percent)	Yes Unweighted frequency (weighted percent)	*p* Value	No Unweighted frequency (weighted percent)	Yes Unweighted frequency (weighted percent)	*p* Value
Gender			0.005			<0.001
Male	7073 (96.7)	224 (3.2)		18,647 (91.1)	1693 (8.8)	
Female	6607 (97.7)	149 (2.3)		17,815 (92.3)	1327 (7.7)	
Wealth index			0.010			<0.001
Poor	6358 (96.7)	207 (3.3)		16,537 (90.4)	1582 (9.6)	
Middle	2550 (97.9)	54 (2.1)		7493 (91.7)	597 (8.2)	
Rich	4771 (97.4)	112 (2.5)		12,324 (93.2)	828 (6.8)	
Area			0.978			0.002
Urban	2514 (96.7)	70 (3.3)		6921 (93.3)	494 (6.7)	
Rural	11,166 (97.3)	303 (2.7)		29,541 (91.3)	2526 (8.7)	
Division			<0.001			<0.001
Barisal	1150 (91.5)	102 (8.5)		3028 (79)	667 (2.1)	
Chattogram	2904 (98.7)	36 (1.3)		6678 (89.8)	548 (10.1)	
Dhaka	2657 (95.9)	97 (4.1)		7408 (94.7)	432 (5.3)	
Khulna	1901 (98.4)	32 (1.5)		5733 (95.5)	309 (4.4)	
Mymensingh	788 (94.2)	42 (5.8)		1915 (82.3)	369 (17.5)	
Rajshahi	1463 (98.5)	21 (1.5)		4173 (88.3)	478 (11.6)	
Rangpur	1638 (98.3)	26 (1.7)		4794 (97.2)	156 (2.7)	
Sylhet	1179 (98.6)	17 (1.3)		2733 (97.8)	61 (2.2)	
Mother's education level			0.008			0.355
Up to primary	5043 (96.7)	168 (3.3)		19597 (91.4)	1663 (8.5)	
Secondary	6663 (97.4)	167 (2.6)		14024 (91.9)	1136 (8.1)	
Higher secondary and above	1974 (97.9)	38 (2.1)		2841 (92.7)	221 (7.3)	
Mother's functional difficulty			<0.001			<0.001
Has functional difficulty	204 (89.6)	21 (10.4)		859 (75.3)	301 (24.6)	
Has no functional difficulty	13,213 (97.3)	339 (2.6)		30,845 (92.2)	2345 (7.7)	
Ethnicity of household head			0.008			<0.001
Bengali	13,340 (97.1)	373 (2.8)		35,533 (91.6)	3010 (8.4)	
Other	340 (100)	0 (0)		929 (98.6)	10 (1.2)	
Sex of household head			0.724			0.322
Male	12,496 (97.2)	343 (2.8)		32,602 (91.7)	2674 (8.2)	
Female	1184 (97.4)	30 (2.6)		3860 (91.3)	346 (8.6)	

(Continues)

TABLE 1 (Continued)

Covariates	2–4 years			5–17 years		
	Functional difficulty					
	No Unweighted frequency (weighted percent)	Yes Unweighted frequency (weighted percent)	*p* Value	No Unweighted frequency (weighted percent)	Yes Unweighted frequency (weighted percent)	*p* Value
Education of household head			0.024			<0.001
Up to primary	8180 (96.9)	248 (3.1)		22,900 (91.2)	2026 (8.7)	
Secondary	3801 (97.4)	93 (2.6)		9565 (92.3)	710 (7.6)	
Higher secondary and above	1688 (98.1)	30 (1.8)		3978 (92.9)	281 (7.1)	
Ever attended early school program			0.003			<0.001
Yes	1757 (98.3)	25 (1.7)		35,200 (92.2)	2702 (7.8)	
No	7459 (97.1)	213 (2.9)		1262 (81.4)	318 (18.6)	

Abbreviation: MICS, Multiple Indicator Cluster Survey.

qualification of higher secondary and above. Similarly, compared to the children with mothers whose education qualification was higher secondary or above, children from mothers with secondary or up to primary education had higher odds of facing difficulties.

According to the final model, most of the factors were almost a similar pattern, except gender and area. The mother's functional difficulty also showed an almost similar OR with a slight difference compared to the initial model. The mother's functional difficulty was highly significant for both age groups under consideration. Children with disabled mothers were at higher risk than children with mothers who did not have any difficulty. The OR was 2.66 (1.35–5.24) for children aged 2–4 years and 3.36 (2.80–4.03) for children aged 5–17 years with a $p < 0.01$. Though gender was significantly associated with difficulty in functioning among the children aged 5–17 (OR: 1.14, CI: 1.03–1.27), it was not significant for difficulty in children aged 2–4 years. The residence area was also significant for children aged 5–17 with OR 1.23 (1.06–1.43). The division was highly significant ($p < 0.001$) for both age groups. The odds of having any functional difficulty were the highest in the children from Barisal (OR 6.88 [3.38–14.00] for children aged 2–4 years and OR 11.36 [8.42–15.34] for children aged 5–17 years) followed by Mymensingh division (OR 5.05 [2.36–10.82] for children aged 2–4 years and OR 8.99 [6.40–12.62] for children aged 5–17 years).

Another important point is, never attending early childhood programs was also significant for both age groups. Children who never attended the program showed higher OR for children aged 2–4 years 1.89 (1.16–3.10), and 2.66 (2.19–3.22) for children aged 5–17 years compared to children who never attended. In the models for the children in the two age groups, the wealth index and the mother's educational level were not significant.

If we look for factors for male and female children separately (Supporting Information: Tables S1–S4), we found that mothers' functional difficulty, division, not attending early childhood program, and ethnicity of household head was common for both age groups. In contrast, the wealth index was also a significant factor for female children. Figure 1 shows the ROC curves for both 2–4- and 5–17-year-old children. The model performed slightly better in differentiating between disabled and nondisabled groups for 2–4 years old (AUC = 0.718 vs. AUC = 0.705). In addition, all factors had VIFs of less than 5, and the mean VIFs for the final models for children aged 2–4 and 5–17 were 2.4 and 2.03, respectively.

4 | DISCUSSION

The burden of childhood functional difficulty is rising rather than decreasing.[1] Additionally, children in developing countries have suboptimal general health, which is related to childhood disabilities.[30] In this article, we used broad, nationally representative survey data to evaluate variables related to children's functional problems in Bangladesh. We applied logistic regression analysis to assess the factors associated with functional difficulty in at least one domain. Though the factors for the two different age groups were almost similar, the prevalence differed a lot (nearly three times higher in the older age group) which was consistent with the findings from other cross-sectional studies.[22,31] Furthermore, in line with previous studies,[19,22] we found that the mother's functional difficulties were significantly associated with both age groups, implying that if a mother has any functional difficulties, it is usually passed on to the child. Not going to an early childhood program and the geographical division also significantly impacted the functional difficulties of both groups of children. In addition, functional difficulties for 5–7 years of children varied significantly across gender and areas of residence.

A healthy mother brings a healthy child. A mother's functional difficulty in any domain may be transmitted to children. From many genetic studies,[32,33] it is commonly recognized that each parent

TABLE 2 Factors associated with functional difficulty among Bangladeshi 2–4- and 5–17-year children using MICS 2019 database by multiple logistic regression analysis (initial model and final model)

	Initial model				Final model			
	2–4 years		5–17 years		2–4 years		5–17 years	
Covariates	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value
Gender		0.312		0.015		0.323		0.015
Female	1		1		1		1	
Male	1.16 (0.87–1.56)		1.14 (1.03–1.27)		1.16 (0.86–1.56)		1.14 (1.03–1.27)	
Wealth index		0.175		0.5481		0.225		0.626
Poor	1.34 (0.85–2.09)		1.08 (0.94–1.25)		1.37 (0.87–2.14)		1.07 (0.92–1.24)	
Middle	1		1		1		1	
Rich	1.57 (0.98– 2.50)		1.03 (0.88–1.20)		1.51 (0.94–2.42)		1.02 (0.87–1.18)	
Area				0.008				0.007
Urban			1				1	
Rural			1.23 (1.05–1.43)				1.23 (1.06–1.43)	
Division		<0.001		<0.001		<0.001		<0.001
Sylhet	1		1		1		1	
Barisal	6.93 (3.40–14.14)		11.42 (8.45–15.44)		6.88 (3.38–14.00)		11.36 (8.42–15.34)	
Dhaka	3.85 (1.97–7.52)		2.52 (1.82–3.49)		3.81 (1.95–7.44)		2.52 (1.82–3.48)	
Khulna	1.36 (0.62–3.01)		2.07 (1.50–2.84)		1.35 (0.61–2.99)		2.05 (1.49–2.81)	
Mymensingh	5.14 (2.39–11.03)		9.02 (6.42–12.68)		5.05 (2.36–10.82)		8.99 (6.40–12.62)	
Rajshahi	1.16 (0.46–2.92)		6.24 (4.59–8.46)		1.14 (0.45–2.87)		6.22 (4.59–8.43)	
Rangpur	1.94 (0.84–4.44)		1.35 (0.95–1.90)		1.89 (0.82–4.35)		1.34 (0.95–1.89)	
Chittagong	1.14 (0.53–2.46)		5.41 (3.99–7.34)		1.14 (0.53–2.45)		5.13 (3.79–6.95)	
Education of household head		0.488		0.407				
Higher secondary or above	1		1					
Secondary	1.26 (0.68–2.33)		0.96 (0.79–1.17)					
Up to primary	1.41 (0.77–2.57)		1.05 (0.87–1.17)					
Ever attended an early childhood program		0.012		<0.001		0.011		<0.001
Yes	1		1		1		1	
No	1.88 (1.15–3.08)		2.65 (2.19–3.22)		1.89 (1.16–3.10)		2.66 (2.19–3.22)	
Mother's functional difficulty		0.004		<0.001		0.005		<0.001
Has functional difficulty	2.30 (1.37–5.30)		3.34 (2.70–4.01)		2.66 (1.35– 5.24)		3.36 (2.80–4.03)	
Has no functional difficulty	1		1		1		1	
Mother's education level		0.567				0.245		
Higher secondary	1				1			
Secondary	1.38 (0.76–2.51)				1.56 (0.91–2.66)			
Up to primary	1.32 (0.70–2.48)				1.56 (0.91–2.68)			

(Continues)

TABLE 2 (Continued)

	Initial model				Final model			
	2–4 years		5–17 years		2–4 years		5–17 years	
Covariates	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value	Odds ratio (95% CI)	*p* Value
Ethnicity				<0.001				
Others			1					
Bengali			7.49 (3.45–16.25)					

Abbreviations: CI, confidence interval; MICS, Multiple Indicator Cluster Survey.

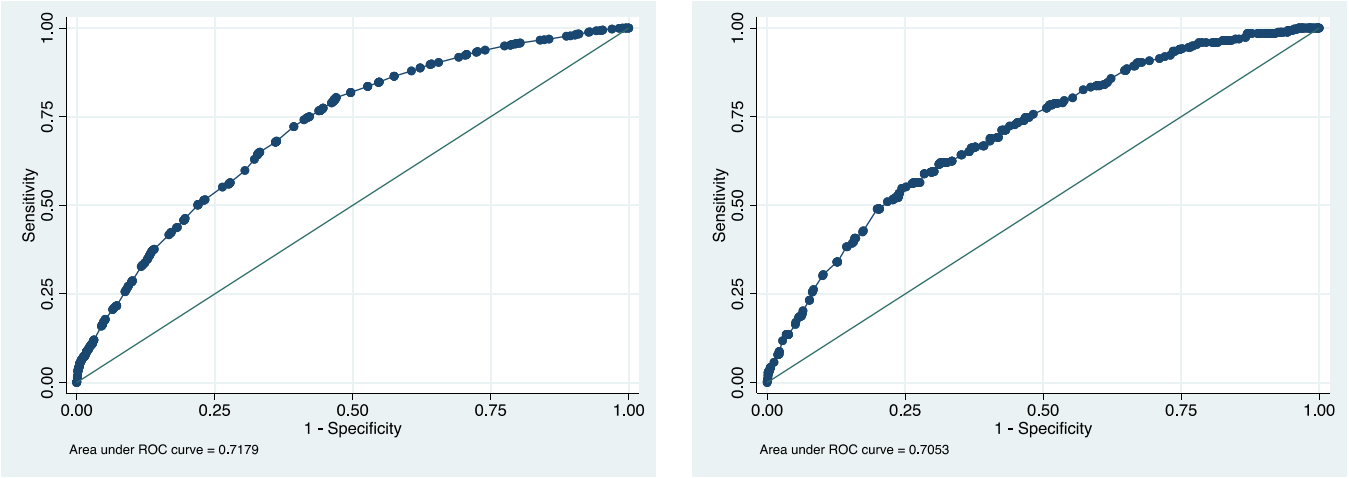

FIGURE 1 Receiver operating characteristic (ROC) curves for screening children with functional difficulties for both age groups

transfers down some genetic information as well as flawed information to their children. According to studies by Blackburn et al.,[20] the parental functional difficulty is usually transmitted to children. Engle et al.[34] and Purdue[35] also found that intellectual difficulty can be transmitted genetically. These studies validate our result that if a mother has a functional difficulty, a child is at an elevated risk (nearly two to three times for our study) of developing a functional difficulty as well. Nonetheless, it is highly likely that children of mothers with functional difficulties face some early ignorance due to their mothers' inabilities, setting the social environment for the emergence of a functional difficulty.[19] We have also found that an older child was at increased risk given that the mothers had functional difficulties. The reason might be the number of difficulties taken under consideration. For children aged 2–4 years, the functional difficulties taken under consideration were less in number compared to children aged 5–17 years. Therefore, while the number of difficulties increased, the odds increased automatically.[32,33,36]

In line with the previous study,[22] we found that gender was not significantly associated with the functional difficulties of under-5 children. Several studies on adult functional difficulties, however, have identified gender as a potential cause of adult functional difficulty.[37–39] We also found that gender was significantly associated with the 5–17 years of children's functional difficulties. Compared to 5–17 years female children, male children were more in the number facing difficulty according to our findings. In 2010, Scott and Collings[40] found that males with an anxiety disorder reported more numbers compared to females, which supports our findings. However, those previously mentioned studies[37–39] indicated that women reported having more difficulties than men. It is possible that inadequate care for expectant and new mothers is to blame for the greater likelihood of difficulty among women. These mothers often have long-term health issues while carrying out their reproductive functions that, for social reasons, are kept private and cause them to get sick regularly. The proportion of females participating in reproductive activities was negligible when we considered children aged 5–17 years. Perhaps, as a result, we observed that female children are less prone than their male counterparts to experience difficulties. Similarly, the sensitivity analysis conducted by Tareque et al.[39] revealed that women are less likely than men to suffer from difficulties.

We also found that 5–17 years of children from rural areas were at greater risk than children from urban areas, which is consistent with the findings of other previous studies.[23,37–39] However, the factor, area of residence, was not significant for 2–4 years old children. Saha and Khan[22] found a similar result. This indicates that while growing up, the environment around the children matters a lot. The literacy rate, which is lower in rural areas than in urban areas in Bangladesh,[41] might play an important role. In rural areas, importance

is not imposed on education. The level of the mother's education and the household head's education also plays an important role in children's functional difficulty. As rural mothers are not educated adequately, their children are more prone to face difficulty. Moreover, in most Bangladeshi rural families, fathers are the head of the family and are responsible for making each decision. Therefore, the household head's education level cannot be ignored. On the other hand, urban parents are more educated and aware than parents from rural areas. As a result of a better knowledge of the first features of developmental impairment, there has been a greater emphasis on infant diagnosis and early intervention programs.[42] Because those parents from urban areas try to take proper care of their children, a smaller number of children suffer from functional difficulties. Moreover, in Bangladesh's rural areas, infectious diseases are frequently one of the main reasons for difficulties.[43] Poverty is another important issue that increases the likelihood of functional difficulty.[30] Since most rural residents in Bangladesh are below the poverty line, they cannot appropriately treat the functional difficulties in the early stages.

One notable finding is that all divisions showed that difficulty increased with chronological age except Dhaka and Rangpur, where fewer children suffered from difficulty from the 5–17 age group than children who belonged to the 2–4 group. Moreover, consistent with the previous study,[39] the risk of having functional difficulty was highest in the children from Barisal, followed by the Mymensingh division. The possible reason might again be poverty. Of all the divisions in Bangladesh, Barisal has the highest poverty rate (0.5), followed by Mymensingh (0.49).[44] On that note, we also found that 5–17 years female children from a family with poor economic conditions were at greater risk of experiencing functional difficulties than their counterparts.

Consistent with the findings of Saha and Khan,[22] we found that compared to children who enroll in early education programs, children who do not are more likely to have difficulties. Attending an early education program makes the children more confident, skilled learners, and communicators, as well as mentally and physically healthier.[34,35] Benjamin et al.[45] showed that children with disabilities can be intervened in their early childhood period, and discrepancies in school participation are also found, which indicates that communicating with other children who are not disabled may help them improve. Despite these facts, children who have some sort of functional difficulties are more often unable to attend the early childhood program. In the context of Bangladesh, there are not sufficient early childhood programs for adequately functioning children, let alone children with functional difficulties, which hinders the probability of improvement in these children.

4.1 | Strengths and limitations

This study detected the prevalence and factors associated with children's functional difficulty for two different age groups in Bangladesh. Additionally, we tried to find any difference among the factors for male and female children separately. Though there exists a study that assessed the factors for children aged 2–4 years old, there is no published study that assessed the factors for both 2–4 and 5–17 years. The next noteworthy strength is that the data set used in this study was a nationally representative, large data set.

However, the study was conducted on the secondary data set; the factors were confined, which is a major limitation. For example, we use the mother's functional difficulties as the "exposure" variable, which is specified by a dichotomous response, that is, "yes"/"no" in the data set. The dichotomous response does not address the difficulty level, and it is difficult to evaluate the risk of the mother reporting incorrectly outside of its context. Moreover, due to the secondary nature of the data, many confounding factors could not be controlled. For example, this study could not assess all the possible causes (e.g., environmental causes and physical access to healthcare) of parent/caregiver and child functional difficulties that are not related to "passing it on to the child." Second, not everyone's perception is the same, so there remain differences in measuring or assessing the difficulties faced by children. As for children aged 2–4 years old, the respondent is a different individual other than the children themselves, so there might remain a gap.[46] In addition to that, since data were collected through the interview method on a stigmatized topic, there might be reporting bias.

More studies are needed to assess the factors associated with child disabilities fully.

4.2 | Recommendations

To mitigate the impact of functional difficulty, a stronger emphasis should be placed on education, as the mother's and household head's levels of education impact the functional difficulty of the children. Moreover, since children who have previously attended early childhood programs are less likely to experience difficulties, extra efforts should be made to enroll children in such programs. Furthermore, more focus should be given to boys in legislation and strategic planning, as they are more prone to face difficulties than girls. Additionally, the newborn of a woman experiencing difficulties should be closely monitored to avoid as much difficulty as possible.

5 | CONCLUSIONS

In Bangladesh, the prevalence of children with difficulty is significantly high, which is alarming. Evidence has been found supporting that a mother's functional difficulty significantly affects children's functional difficulty. To reduce the transmission, would-be mothers need more attention to mental and physical health. Children's functional difficulty, regardless of age, is also greatly influenced by their absence from early childhood education programs, and divisions. Reducing the prevalence of child functioning difficulties will be more effective if the government and NGOs consider these factors while developing appropriate intervention programs and implementing the intervention programs properly.

AUTHOR CONTRIBUTIONS

Aniqua Anjum: Data curation; formal analysis; writing – original draft; writing – review & editing. **Tanvir Ahammed**: Data curation; formal analysis; resources; visualization; writing – original draft; writing – review & editing. **Md. Mahedi Hasan**: Writing – original draft; writing – review & editing. **Muhammad Abdul Baker Chowdhury**: Data curation; resources; supervision; writing – review & editing. **Md. Jamal Uddin**: Conceptualization; supervision; writing – review & editing.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

All data presented here in the manuscript are freely available at https://mics.unicef.org/surveys.

TRANSPARENCY STATEMENT

The lead author Md. Jamal Uddin affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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