

Risk Factors Associated with Functional Disabilities among Children in Uttar Pradesh India Using the Washington Group Child Functioning Module

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Abstract

Background:

Childhood disability in low-resource settings is primarily identified through impairment-based clinical certification, which may not adequately capture functional limitations. Evidence comparing functional assessment tools with certification-based identification in community settings in India remains limited.

Methods:

A nested case–control study was conducted in three blocks of Chitrakoot district, Uttar Pradesh. A total of 2,295 children aged 2–17 years were included, comprising 605 clinically certified cases and 1,690 controls. Functional difficulties were assessed using the Washington Group/UNICEF Child Functioning Module (WG-CFM). Descriptive statistics, chi-square tests, and age- and sex-adjusted logistic regression analyses were performed.

Results:

Among children aged 5–17 years ($n = 2,060$), 92.6% of clinically certified children reported ≥ 1 functional difficulty compared with 52.8% of controls ($p < 0.0001$; AOR 9.79, 95% CI: 7.04–13.63). Cognitive and psychosocial difficulties were most common among cases, including learning (77.5%), remembering (77.2%), concentration (75.9%), and behaviour (75.3%). Daily anxiety and depressive symptoms were reported in 34.8% of cases versus $\sim 2.8\%$ of controls (AOR ~ 19). Sensory difficulties were lower but significant (hearing: 12.8% vs 3.9%; seeing: 8.3% vs 3.4%). In children aged 2–4 years ($n = 235$), functional difficulty was higher among cases (77.8% vs 64.9%) but not statistically significant; only seeing and hearing showed significant associations.

Conclusion:

Functional difficulties were substantially higher among clinically certified children, particularly in cognitive and psychosocial domains. The WG-CFM captured a broader spectrum of functional limitations beyond sensory impairments, indicating its value as a complementary tool to clinical certification for identifying childhood disability in community settings.

Introduction

Disability in children is a serious public health and social concern, yet it often receives limited attention. According to the WHO and UNICEF report, over 240 million children worldwide live with some form of disability.^{1,2} Many of these children are unable to attend school regularly, do not get proper healthcare, or miss out on basic rehabilitation support. The true extent of the problem remains uncertain, especially in low- and middle-income countries (LMICs), where data systems are weak, and measurement tools often focus narrowly on impairments rather than on functioning and participation.³

India has the largest number of children in the world and has tried different policies to support children with disabilities. However, there are significant discrepancies in the available estimates of childhood disability. The 2011 Census reported about 1.24 million children (0–19 years) with disability, while surveys like the National Sample Survey (76th Round) and NFHS-5 gave different figures.⁴ These newer surveys also showed that disability is more common in rural areas, poorer households, and states such as Uttar Pradesh.^{5,6}

How disability is defined has a significant impact on estimates. The medical model sees it as the result of a disease or condition, so the focus is on diagnosis, treatment, and possible cure.⁷ The functional model takes another view. It looks at the difficulties children face in everyday life and how well they can move around, learn, communicate, and join in with others.⁸

In India, children must get a clinical disability certificate to be officially recognized and to access most services or benefits.⁹ Although this certificate is treated as the standard proof of disability, it has its own limitations. This certification process mainly follows an impairment-based model. It emphasizes diagnosis and percentage of disability rather than the real-life functioning of the child. Such an approach overlooks environmental and social barriers that influence participation and inclusion, which are central to the International Classification of Functioning, Disability and Health (ICF) framework. As a result, many children with functional difficulties, especially in learning, behavior, or communication, may remain unrecognized and excluded from support, limiting efforts to measure and improve their actual functioning and quality of life.⁹

Globally, disability is measured in three main ways. One is direct questioning, but people often underreport because of stigma. Another is activity-based assessment, which looks at limitations in areas like vision or hearing. The third uses standardized instruments.¹⁰ Among these, the Washington Group/UNICEF Child Functioning Module (CFM) is commonly used. It collects information from caregivers about the child's functional difficulties and does not require a medical diagnosis. Studies in different countries show that the CFM is simple, affordable, and capable of identifying many problems that medical certification fails to detect.^{11,12}

In India, some field studies have found that certification identifies children with clear medical conditions, whereas the CFM captures a broader set of functional difficulties.¹³ However, there is still not enough evidence on how these two approaches compare when used together in community settings.

Aims & Objectives

We used the Washington Group Child Functioning Module in Chitrakoot district, Uttar Pradesh, and compared the results with data from children with clinical certification. The purpose was to see the pattern of functional difficulties, alignment with certified disability, and to examine the feasibility of using trained community-based rehabilitation (CBR) workers to collect reliable disability data in low-resource settings. Such information is important in LMIC settings, where certification is not easily available but reliable and inclusive data are needed for planning programs and policies.¹⁴

The main objective of the study was to compare the pattern of functional difficulties identified through the WGCFM with the officially certified (clinical) disability status of children.

Primary Hypothesis

WGCFM is a useful tool to understand the extent of functional problems that children with medically certified disabilities face.

Methodology

This nested case-control study was carried out in three blocks of Chitrakoot district: Karwi, Pahadi, and Manikpur. These areas were chosen because earlier programs led by Perkins India had already built trust in the community and established systems for mobilization. We used a case-control study design. Cases and controls were drawn from the same villages and were matched by age to allow meaningful comparison. All participating children were earlier clinically examined for any disabilities, and later all these children were screened for functional limitations using the Washington Group/UNICEF Child Functioning Module (WG-CFM).¹⁵ In addition, we included a set of socio-contextual variables that were modified to suit the local environment. This design allowed us to directly compare how functional challenges were reported among children with and without disabilities.

Variable Definitions and Subjects

- **Cases:** 605 Children classified as cases were those who had a clinically certified disability and who also did not 'pass' the functional difficulty module. These children had previously been identified through the Perkins project, where field staff conducted disability assessments and facilitated access to support. The same staff carried out the data collection for the present study, ensuring continuity in assessment and classification. The cases were divided into two age categories, as the mode of assessment of functional disability varies between the two age groups.
- **Controls:** 1690 controls (approximately 3 controls per case) were children who did not have a medically certified disability. These children were also identified during the Perkins project's community survey, when field staff screened children, but these children were not found to have any medically certifiable disability. For the current study, these children were systematically included as the control group. The controls were also categorized into two age slabs to be comparable to the cases.
- **Functional Difficulty:** Children who reported no difficulty across all domains were classified as having no functional difficulty, whereas children who reported any level of difficulty in at least one domain were classified as having functional difficulty.
- **Clinical Disability:** Children with a medical certificate of disability were classified as children with clinically certified disability.
- **Parental Education:** Parental education was defined as the highest level of education attained by either the father or the mother.

Survey Instruments and Tool Adaptation

The Washington Group Child Functioning Module, which was developed jointly by UNICEF and the Washington Group on Disability Statistics, served as the main tool for assessment.¹⁵ We used the Hindi version, which had been translated through a forward-backward process and then reviewed with local experts and field workers to check whether the wording made sense in the local context.

The tool covers 13 key functional areas such as seeing, hearing, walking, self-care, learning, memory, social interaction, and emotional aspects like worry and sadness. Each question allows the caregiver or child to respond on a four-point scale, ranging from "no difficulty" to "cannot do at all." This helped us capture not just the presence of a problem but also how severe it was. To understand background factors, we also added questions on family income and parental education,

Sample Design and Size

A nested case-control design was applied with the aim of comparing functional limitations between children with and without clinically certified disabilities. The study sample was built on a previously identified group of children with clinically certified disabilities, who had been screened earlier through Perkins-supported community-based assessments.

In total, 605 children with medically certified disabilities were included. For each of these children, we attempted to recruit around two children without disabilities from the same community as controls. However, due to refusals, unavailability, and practical issues in the field, the number of controls was slightly lower. Eventually, 1690 controls were enrolled, making the final study sample children.

Training of Enumerators

The survey was conducted by trained community-based rehabilitation (CBR) workers and special educators. Training and skilling included both classroom teaching and practical exercises. The classroom part covered disability concepts, the International Classification of Functioning for Children and Youth (ICF-

CY), and the principles behind the WG-CFM tool. The practice sessions included role plays and a pilot. Ethical points such as consent, confidentiality, and respectful questioning were also emphasized.

Data Collection Protocol

Data Collection Protocol

Survey data were collected using paper forms, which contained the WG-CFM along with additional sociodemographic questions adapted from earlier Perkins studies. Paper-based tools were preferred because digital infrastructure in these rural areas was limited. Completed forms were later digitized manually. To safeguard confidentiality, no personal identifiers were kept in the digital database, which was encrypted and stored on secure, password-protected systems.

For younger children (aged 2–10 years), parents or caregivers answered the questions on their behalf. Adolescents (aged 11–17 years) were encouraged to respond directly, provided they could understand the questions or their mothers could respond to the interview. The interviews were mostly conducted in Hindi. On average, one interview lasted about 20–30 minutes. To ensure quality, completed forms were checked daily by supervisors. A pilot test with about 50 families in a nearby block was done first to test and refine the process.

Ethical Considerations

The study was approved by the Institutional Review Board (IRB) of Shri Sadguru Seva Sangh Trust, Chitrakoot, India (Ethics Approval No.: SNC/IEC/2026-06/03/02). Written informed consent was obtained from the parents or legal guardians of all participating children, and assent was obtained from children aged 13 years and above. Participants and their families were informed that participation was voluntary and that they could withdraw from the study at any time without any consequences. Children identified during the survey as requiring medical or social intervention were referred to the local Community-Based Rehabilitation (CBR) programme or appropriate government health services.

All procedures involving human participants were conducted in accordance with the ethical standards of the Institutional Review Board of Shri Sadguru Seva Sangh Trust and the principles of the Declaration of Helsinki and its later amendments or comparable ethical standards.

Data Analysis

The data were analyzed using Stata version 19 to check for associations and frequencies. Descriptive statistics were used. Associations between variables were tested using chi-square tests and logistic regression models to identify factors linked with functional limitations. The Adjusted Odds Ratio was calculated after adjusting for age and gender.

Results

235 children between the ages of two and four constituted the younger age sample, which consisted of 208 uncertified controls and 27 certified cases. The older age children sample consisted of 2060 children between the ages of 5 and 17, including 578 cases and 1482 controls.

The mean age ($\pm$ SD) of all children in the 2–4-year group was 3.18 ± 0.83 years. On average, clinically certified children were 3.37 ± 0.79 years older than controls (3.15 ± 0.84). All children in the 5–17 age group had a mean age ($\pm$ SD) of 10.15 ± 3.14 years, with cases having a higher mean age (11.2 ± 3.0) than controls (9.47 ± 3.09).

There were some variations in caste distribution according to the certification status. General/Underserved children made up 5.96% of all 2–4-year-olds, but this was higher in cases (14.81%) than in controls (4.81%). The remaining children were mostly categorized as Other (2.98% overall, 3.70% among cases compared to 2.88% among controls) castes. General/Underserved caste children made up 6.75% of all children aged 5 to 17, with a somewhat greater percentage among cases (8.65%) compared to controls (6.01%). Additionally, the majority of children in this age group were categorized as other castes (91.35% among cases vs. 93.99% among controls, 93.25% overall).

About 94.04% mothers in the 2–4-year age group had no formal education, with a smaller percentage among cases (85.19%) than controls (95.19%). 22.2% mothers had primary education among cases than 17.31% in controls. Secondary education was 37.04% in cases than 5.77% in controls. Maternal education was recorded as not known for 3.70% of cases and 7.69% of controls.

In the 5–17 year group, 48.16% of mothers had no formal schooling, again lower among cases (39.97%) than controls (51.35%). 39.79% Mothers with primary education were in cases compared to controls (28.48%), and mothers who had completed secondary education were also somewhat higher among cases (17.99%) than controls (13.97%). Maternal education was not known for 2.25% of cases and 6.21% of controls in this age group, respectively.

The functional difficulties (WGCFM domains) of clinically certified and control children aged 2–4 years are compared in Table 2. Although the overall difference was not statistically significant, 77.8% of children who were clinically certified reported having any degree of functional impairment, compared to 64.9% of children who were not clinically certified.

Children with clinical certification demonstrated noticeably greater challenges in the sensory areas. 14.8% of clinically certified individuals reported having any visual impairment, compared to 2.4% of controls ($p < 0.05$). In a similar vein, 2.9% of children who did not have a clinically certified disability reported having any hearing difficulties, compared to 14.8% of clinically certified children ($p < 0.05$).

The proportion of clinically certified children reporting any difficulty was generally higher for the remaining domains of walking, fine motor, communication, learning, playing, and behaviour, but these differences were not statistically significant.

Table 3 compares WGCFM functional difficulties among children aged 5–17 years by clinical certification status. Among those who were clinically certified (cases), an overwhelming majority reported any functional difficulty (92.6%), compared with 52.8% among control children ($p < 0.0001$). Across nearly all domains, clinically certified children consistently reported greater functional difficulty compared to controls (all $p < 0.0001$).

The highest levels of difficulty were found in cognition/learning and psychosocial functioning within the clinically certified group. About 77.5% of clinically certified children reported difficulties with learning, remembering in about 77.2%, concentration among 76.0%, accepting change among 75.6% children, and behaviour difficulties among 75.3% children. Social participation challenges were seen: 72.8% of clinically certified children reported difficulty with making friends, and daily anxiety symptoms were reported by 34.8% and daily depressive symptoms by 34.8%, compared to very few proportions among controls.

Certified children also reported substantial difficulty in core functioning areas, including walking (57.1%) and self-care (54.5%), and communication difficulties (40.5%). Sensory difficulties were less common than cognitive/psychosocial limitations, but remained significantly higher among clinically certified children: 12.8% reported hearing difficulty and 8.3% reported seeing difficulty. Overall, these findings suggest that among clinically certified children aged 5–17 years, WGCFM captures a comprehensive and more severe profile of functional difficulty, with the greatest burden in learning, memory/concentration, behavioural regulation, peer interaction, and emotional well-being.

Seeing difficulties were reported by 14.8% of clinically certified children, compared with 2.4% of controls, and clinically certified children had over six times higher odds of seeing difficulty (AOR 6.47, 95% CI 1.60–26.12; $p < 0.05$). Similarly, hearing difficulties were reported by 14.8% of clinically certified children versus 2.9% of controls, with clinically certified children having nearly sixfold higher odds of hearing difficulties (AOR 5.99, 95% CI 1.55–23.13; $p < 0.05$).

Functional impairments were significantly higher consistently across all WGCFM, even after controlling for age and sex dimensions among clinically certified children aged 5–17 (Table 5). In total, 52.8% of controls (783/1482) and 92.6% of certified children (535/578) had at least one functional difficulty. The adjusted odds of having any functional difficulties were almost ten times greater for clinically certified children (AOR 9.79, 95% CI 7.04–13.63; $p < 0.0001$).

About 77.5% of clinically certified children reported difficulties with learning, remembering in about 77.2%, concentration among 76.0%, accepting change among 75.6%, and behaviour difficulties among 75.3%, each of which was associated with approximately three times higher adjusted odds compared to controls (all $p < 0.0001$). Difficulties with making friends were also highly prevalent, affecting 72.8% of certified children (AOR 3.14, 95% CI 2.54–3.90).

Over one-third of clinically certified children (34.8%) exhibited daily anxiety symptoms, compared with 2.8% of controls, corresponding to nineteen times higher odds (AOR 19.18, 95% CI 13.34–27.58), and for daily depressive symptoms similarly. (34.8% vs 2.8%; AOR 19.53, 95% CI 13.55–28.16).

The analysis was divided into two age groups, 5–9 years and 10–17 years, because symptoms of anxiety and depression are often less common in early childhood than in adulthood.

The adjusted odds of daily depressive symptoms (AOR 22.3, 95% CI 13.06–38.07) and daily anxiety symptoms (AOR 20.46, 95% CI 12.15–34.45) were twenty times higher among children aged 5–9 who were clinically certified. Both associations were highly statistically significant ($p < 0.0001$).

Children in this age group, 10–17, who were clinically certified had adjusted odds of daily depression that were nearly nineteen times higher (AOR 18.9, 95% CI 11.28–31.65) and daily anxiety that were nearly twenty times higher (AOR 19.95, 95% CI 11.77–33.8), compared with the control ($p < 0.0001$ for both).

The functional difficulty status of children who have been medically and clinically certified is summarized in Table 7. Of the 27 clinically certified children between the ages of 2 and 4, 21 (77.78%) had functional difficulties, and 6 (22.22%) did not. Of the 578 clinically certified children between the ages of 5 and 17, 535 (92.56%) reported having functional difficulties, while only 43 (7.44%) did not.

Discussion

This study suggests that the Washington Group Child Functioning Module is effective in quantifying functional difficulty among clinically certified children, and that functional difficulty identified through WGCFM is strongly associated with clinical certification status, while also revealing important domain-specific limitations not captured by certification alone, thereby supporting the primary hypothesis. Across both age groups, the majority of clinically certified children experienced one or more functional difficulties, with a clear age gradient. Functional difficulties were reported by 77.8% of children with clinical certification between the ages of 2 and 4 and 92.6% of certified children between the ages of 5 and 17. This suggests that functional limits become more apparent with age. Clinically certified children are more than controls in both age groups (mean age 3.37 vs. 3.15 years in ages 2–4, and 11.2 vs. 9.47 years in ages 5–17). This pattern is further supported by mean age differences, which indicate that both the recognition and reporting of functional difficulty increase as children get older.

Gender differences were also evident. Among clinically certified children aged 5–17 years, boys constituted a higher proportion (65.7%) compared to girls (34.3%), whereas gender distribution was nearly equal among certified children aged 2–4 years. This suggests that functional difficulties severe enough to result in clinical certification may be more frequently identified or persist more prominently among boys as age increases. In addition, maternal education showed a consistent and notable association with clinical certification and reported functional difficulty. In both age groups, clinically certified children were more likely to have mothers with primary or secondary education, particularly striking in the 2–4 year group, where 37.0% of certified children had mothers who had completed secondary education compared to 5.8% among controls. A similar pattern was observed among children aged 5–17 years, with secondary education more common among mothers of certified children (18.0% vs 14.0%). This gradient suggests that higher maternal education may be

associated with greater awareness, recognition, and reporting of functional difficulties, facilitating both certification and identification of limitations through WGCFM.

We also observed that a third of children with clinically certified disabilities did not report major functional difficulties.^{16–18} This discrepancy emphasizes the need for using a uniform definition of disability that incorporates functional dimensions in addition to clinical certification. Clinical Certification is important because it opens the door to government support, educational accommodations, and other health benefits.¹⁶ Therefore, there is an urgent need to think of integrating functional limitation in disability certification in addition to the clinical diagnosis. This will ensure that children with functional limitations are also able to access disability concessions and social benefits. Local field staff already engaged in community-based rehabilitation (CBR) and outreach could be effectively trained to use a structured, validated tool such as the Washington Group Child Functioning Module (WGCFM).^{11,19–21} This approach would enhance the early detection and ensure that a more comprehensive definition of disability is adopted in India.

Placing these findings within a broader policy context, the study stresses the importance of a dual-track disability monitoring approach that links impairment-based certification with functional assessment data. Such integration can promote more inclusive service delivery and align with the principles of India's Rights of Persons with Disabilities (RPwD) Act, 2016.¹⁶ as well as the Sustainable Development Goals' (SDG) commitment to "leave no one behind."²²

Limitations

This study has certain limitations. Functional assessments were based on caregiver reports, which may be affected by response bias or differences in understanding of questions. Additionally, coverage was restricted to three blocks, which limits generalizability. The study also observed that to establish disability status, both the clinical certification and functional domains should be assessed. One limitation of the study was that we could not observe the children who did not have a clinical certification and who could have been designated as 'cases' based on their functional limitations. This would have provided an estimate of what proportion of children with a functional difficulty do not have a clinically certifiable disability. Nevertheless, the community-based approach using the WGCFM displayed key practical advantages, low cost, short training time, and easy adaptation to local languages. These strengths make it a sustainable model for community-driven disability monitoring. Future programs can be built upon this experience by embedding periodic screening into regular health and education systems to promote early identification and intervention.

Declarations

Ethical Considerations: The study was approved by the Institutional Review Board (IRB) of Shri Sadguru Seva Sangh Trust, Chitrakoot, India (Ethics Approval No.: SNC/IEC/2026-06/03/02). Written informed consent was obtained from the parents or legal guardians of all participating children, and assent was obtained from children aged 13 years and above. Participants and their families were informed that participation was voluntary and that they could withdraw from the study at any time without any consequences. Children identified during the survey as requiring medical or social intervention were referred to the local Community-Based Rehabilitation (CBR) programme or appropriate government health services.

All procedures involving human participants were conducted in accordance with the ethical standards of the Institutional Review Board of Shri Sadguru Seva Sangh Trust and the principles of the Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent for Publication:

Not Applicable

Competing interests:

The authors declare that they have no competing interests related to the research, authorship, or publication of this manuscript on children with functional difficulties.

Clinical trial number

Not applicable.

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Author Contribution

S.T.: Methodology, Resources, Investigation, Data Collection, Writing – Review & Editing. S.J.: Data Analysis, Resources, Visualization, Methodology, Writing – Original Draft. S.M.: Project Administration, Resources, Validation, Writing – Review & Editing. S.K.: Conceptualization, Funding Acquisition, Methodology, Supervision, Writing – Review & Editing. K.P.: Data Analysis, Resources, Visualization. E.J.: Conceptualization, Writing – Review & Editing. G.V.S.M.: Conceptualization, Supervision, Validation, Writing – Review & Editing. All authors read and approved the final manuscript.

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Data Availability

Due to the sensitive nature of this study involving data of children with disabilities, raw data will not be made publicly available to protect participant confidentiality and uphold ethical commitments. However, de-identified data summaries and frequencies may be shared with qualified researchers upon reasonable request.

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Tables

Table 1: Socio-demographic characteristics of respondent children by certification status among 2-4 and 5-17 years							
		Age 2-4			Age 5-17		
Characteristics		All (n=235)	Case (n=27)	Controls (n=208)	All (n=2060)	Case (n=578)	Controls (n=1482)
Gender	Male	120 (51.06)	14 (51.85)	106 (50.96)	1160 (56.31)	380 (65.74)	780 (52.63)
	Female	115 (48.94)	13 (48.15)	102 (49.04)	900 (43.69)	198 (34.26)	702 (47.37)
Age (Mean±SD)		3.18±0.83	3.37±0.79	3.15±0.84	10.15±3.14	11.2±3	9.47±3.09
Caste	General/Underserved	14 (5.96)	4 (14.81)	10 (4.81)	139 (6.75)	50 (8.65)	89 (6.01)
	Other	7 (2.98)	1 (3.7)	6 (2.88)	1921 (93.25)	528 (91.35)	1393 (93.99)
Mothers' education	Mother None	221 (94.04)	23 (85.19)	198 (95.19)	992 (48.16)	231 (39.97)	761 (51.35)
	Primary education	42 (17.87)	6 (22.22)	36 (17.31)	652 (31.65)	230 (39.79)	422 (28.48)
	Secondary education completed	22 (9.369)	10 (37.04)	12 (5.77)	311 (15.1)	104 (17.99)	207 (13.97)
	Not known	17 (7.23)	1 (3.7)	16 (7.69)	105 (5.100)	13 (2.25)	92 (6.21)

Table 2: Comparison of disability types between cases and controls for age 2 - 4 years					
Disability type		All (n=235)	Case (n=27)	Controls (n=208)	p-value
Functional disability	No Difficulty	79 (33.62)	6 (22.22)	73 (35.1)	0.183
	Any Difficulty	156 (66.38)	21 (77.78)	135 (64.90)	
Seeing	No Difficulty	226 (96.17)	23 (85.19)	203 (97.60)	<0.05
	Any Difficulty	9 (3.83)	4 (14.81)	5 (2.4)	
Hearing	No Difficulty	225 (95.74)	23 (85.19)	202 (97.12)	<0.05
	Any Difficulty	10 (4.26)	4 (14.81)	6 (2.88)	
Walking	No Difficulty	102 (43.4)	13 (48.15)	89 (42.79)	0.597
	Any Difficulty	133 (56.6)	14 (51.85)	119 (57.21)	
Fine motor	No Difficulty	92 (39.15)	9 (33.33)	83 (39.9)	0.510
	Any Difficulty	143 (60.85)	18 (66.67)	125 (60.1)	
Communication	No Difficulty	92 (39.15)	8 (29.63)	84 (40.38)	0.281
	Any Difficulty	143 (60.85)	19 (70.37)	124 (59.62)	
Learning	No Difficulty	84 (35.74)	8 (29.63)	76 (36.54)	0.481
	Any Difficulty	151 (64.26)	19 (70.37)	132 (63.46)	
Playing	No Difficulty	86 (36.6)	7 (25.93)	79 (37.98)	0.221
	Any Difficulty	149 (63.4)	20 (74.07)	129 (62.02)	
Behaviour	No Difficulty	90 (38.3)	9 (33.33)	81 (38.94)	0.573
	Any Difficulty	145 (61.7)	18 (66.67)	127 (61.06)	

Table 3: Chi-square comparison of disability types between cases and controls for age 5 - 17 years					
Disability type		All (n=2060)	Case (n=578)	Controls (n=1482)	p-value
Functional disability	No Difficulty	742 (36.02)	43 (7.44)	699 (47.17)	<0.0001
	Any Difficulty	1318 (63.98)	535 (92.56)	783 (52.83)	
Seeing	No Difficulty	1961 (95.19)	530 (91.7)	1431 (96.56)	<0.0001
	Any Difficulty	99 (4.81)	48 (8.300)	51 (3.44)	
Hearing	No Difficulty	1929 (93.64)	504 (87.2)	1425 (96.15)	<0.0001
	Any Difficulty	131 (6.36)	74 (12.8)	57 (3.85)	
Walking	No Difficulty	1067 (51.8)	248 (42.91)	819 (55.26)	<0.0001
	Any Difficulty	993 (48.2)	330 (57.09)	663 (44.74)	
Self-care	No Difficulty	1166 (56.6)	263 (45.5)	903 (60.93)	<0.0001
	Any Difficulty	894 (43.4)	315 (54.5)	579 (39.07)	
Communication	No Difficulty	1438 (69.81)	344 (59.52)	1094 (73.82)	<0.0001
	Any Difficulty	622 (30.19)	234 (40.48)	388 (26.18)	
Learning	No Difficulty	902 (43.79)	130 (22.49)	772 (52.09)	<0.0001
	Any Difficulty	1158 (56.21)	448 (77.51)	710 (47.91)	
Remembering	No Difficulty	882 (42.82)	132 (22.84)	750 (50.61)	<0.0001
	Any Difficulty	1178 (57.18)	446 (77.16)	732 (49.39)	
Concentration	No Difficulty	905 (43.96)	139 (24.05)	766 (51.72)	<0.0001
	Any Difficulty	1154 (56.05)	439 (75.95)	715 (48.28)	
Accepting change	No Difficulty	902 (43.79)	141 (24.39)	761 (51.35)	<0.0001
	Any Difficulty	1158 (56.21)	437 (75.61)	721 (48.65)	
Behaviour	No Difficulty	920 (44.66)	143 (24.74)	777 (52.43)	<0.0001
	Any Difficulty	1140 (55.34)	435 (75.26)	705 (47.57)	
Making friends.	No Difficulty	979 (47.52)	157 (27.16)	822 (55.47)	<0.0001
	Any Difficulty	1081 (52.48)	421 (72.84)	660 (44.53)	
Anxiety	Not Exhibited Daily	1747 (84.81)	315 (54.5)	1432 (96.63)	<0.0001
	Exhibited Daily	243 (11.8)	201 (34.78)	42 (2.83)	
Depression	Not Exhibited Daily	1745 (84.71)	314 (54.33)	1431 (96.56)	<0.0001
	Exhibited Daily	242 (11.75)	201 (34.78)	41 (2.77)	

Table 4: Age and sex adjusted odds ratio for Age 2-4					
Disability type		Case (n=27)	Controls (n=208)	AOR	p-value
Functional disability	No Difficulty	6 (22.22)	73 (35.1)		
	Any Difficulty	21 (77.78)	135 (64.90)	1.92 [0.74, 4.99]	0.180
Seeing	No Difficulty	23 (85.19)	203 (97.60)		
	Any Difficulty	4 (14.81)	5 (2.4)	6.47 [1.60, 26.12]	<0.05
Hearing	No Difficulty	23 (85.19)	202 (97.12)		
	Any Difficulty	4 (14.81)	6 (2.88)	5.99 [1.55, 23.13]	<0.05
Walking	No Difficulty	13 (48.15)	89 (42.79)		
	Any Difficulty	14 (51.85)	119 (57.21)	0.83 [0.37, 1.86]	0.647
Fine motor	No Difficulty	9 (33.33)	83 (39.9)		
	Any Difficulty	18 (66.67)	125 (60.1)	1.30 [0.56, 3.05]	0.542
Communication	No Difficulty	8 (29.63)	84 (40.38)		
	Any Difficulty	19 (70.37)	124 (59.62)	1.63 [0.68, 3.91]	0.275
Learning	No Difficulty	8 (29.63)	76 (36.54)		
	Any Difficulty	19 (70.37)	132 (63.46)	1.38 [0.57, 3.32]	0.472
Playing	No Difficulty	7 (25.93)	79 (37.98)		
	Any Difficulty	20 (74.07)	129 (62.02)	1.78 [0.72, 4.41]	0.216
Behaviour	No Difficulty	9 (33.33)	81 (38.94)		
	Any Difficulty	18 (66.67)	127 (61.06)	1.28 [0.55, 3.01]	0.565

Table 5: Age and sex adjusted odds ratio for Age 5-17					
Disability type		Case (n=578)	Controls (n=1482)	AOR	p-value
Functional disability	No Difficulty	43 (7.44)	699 (47.17)		
	Any Difficulty	535 (92.56)	783 (52.83)	9.79 [7.04, 13.63]	<0.0001
Seeing	No Difficulty	530 (91.7)	1431 (96.56)		
	Any Difficulty	48 (8.300)	51 (3.44)	2.34 [1.54, 3.57]	<0.0001
Hearing	No Difficulty	504 (87.2)	1425 (96.15)		
	Any Difficulty	74 (12.8)	57 (3.85)	3.08 [2.12, 4.46]	<0.0001
Walking	No Difficulty	248 (42.91)	819 (55.26)		
	Any Difficulty	330 (57.09)	663 (44.74)	1.53 [1.25, 1.86]	<0.0001
Self-care	No Difficulty	263 (45.5)	903 (60.93)		
	Any Difficulty	315 (54.5)	579 (39.07)	1.85 [1.51, 2.26]	<0.0001
Communication	No Difficulty	344 (59.52)	1094 (73.82)		
	Any Difficulty	234 (40.48)	388 (26.18)	1.88 [1.53, 2.31]	<0.0001
Learning	No Difficulty	130 (22.49)	772 (52.09)		
	Any Difficulty	448 (77.51)	710 (47.91)	3.39 [2.71, 4.25]	<0.0001
Remembering	No Difficulty	132 (22.84)	750 (50.61)		
	Any Difficulty	446 (77.16)	732 (49.39)	3.07 [2.45, 3.84]	<0.0001
Concentration	No Difficulty	139 (24.05)	766 (51.72)		
	Any Difficulty	439 (75.95)	715 (48.28)	3.00 [2.41, 3.74]	<0.0001
Accepting change	No Difficulty	141 (24.39)	761 (51.35)		
	Any Difficulty	437 (75.61)	721 (48.65)	2.89 [2.32, 3.60]	<0.0001
Behaviour	No Difficulty	143 (24.74)	777 (52.43)		
	Any Difficulty	435 (75.26)	705 (47.57)	3.05 [2.45, 3.80]	<0.0001
Making friends.	No Difficulty	157 (27.16)	822 (55.47)		
	Any Difficulty	421 (72.84)	660 (44.53)	3.14 [2.54, 3.90]	<0.0001
Anxiety	Not Exhibited Daily	315 (54.5)	1432 (96.63)		
	Exhibited Daily	201 (34.78)	42 (2.83)	19.18 [13.34, 27.58]	<0.0001
Depression	Not Exhibited Daily	314 (54.33)	1431 (96.56)		
	Exhibited Daily	201 (34.78)	41 (2.77)	19.53 [13.55, 28.16]	<0.0001

Table 6: Adjusted odds ratios (AORs) for depression and anxiety among children aged 5–9 and 10–17 years					
		Age 5-9		Age 10-17	
		AOR 95%CI	p-value	AOR 95%CI	p-value
Depression	Not Exhibited Daily				
	Exhibited Daily	22.3 [13.06, 38.07]	<0.0001	18.9 [11.28, 31.65]	<0.0001
Anxiety	Not Exhibited Daily				
	Exhibited Daily	20.46 [12.15, 34.45]	<0.0001	19.95 [11.77, 33.8]	<0.0001

Table 7: Functional difficulty status among medically certified children aged 2–4 and 5–17 years		
	Age 2-4	Age 5-17
	Medically certified (n=27)	Medically certified (n=578)
No functional difficulty	6 (22.22)	43 (7.44)
Functional difficulty	21 (77.78)	535 (92.56)