# Epidemiology of Disability in Children with Cerebral Palsy in Eastern Uttar Pradesh: A Descriptive Study Using the ICF Framework

**Dr. Vijay Kumar Gupta, Ph.D.**

**Lecturer in Physiotherapy, Composite Regional Centre (CRC), Gorakhpur, Uttar Pradesh, under the National Institute for Empowerment of Persons with Visual Disabilities (NIEPVD), Department of Empowerment of Persons with Disabilities (DEPwD), Ministry of Social Justice and Empowerment, Government of India.**

**DOI: https://doi.org/10.51244/IJRSI.2026.1310000034**

**Received: 11 October 2026; Accepted: 16 October 2026; Published: 29 October 2026**

## ABSTRACT

Background: Cerebral palsy (CP) is a major cause of childhood-onset disability and may be associated with difficulties in communication, cognition, feeding, sensation, and participation. Regional evidence on the functional profiles and service needs of children with CP in low- and middle-income settings remains limited. Objective: To describe disability among children with CP in Eastern Uttar Pradesh using the International Classification of Functioning, Disability and Health (ICF) framework. Methods: This descriptive epidemiological survey included 2,139 children diagnosed with CP who were identified through hospitals, rehabilitation centres, physiotherapy colleges, non-governmental organisations, paediatric clinics, and community referrals. Assessments included the Gross Motor Function Measure (GMFM-88), Gross Motor Function Classification System–Expanded and Revised (GMFCS-E&R), Manual Ability Classification System (MACS), Communication Function Classification System (CFCS), Eating and Drinking Ability Classification System (EDACS), the Ten Questions screening tool, and structured questionnaires covering self-care, participation, demographic characteristics, comorbidities, and rehabilitation use. Results: Spastic quadriplegia was reported as the predominant motor subtype, and many children were classified at GMFCS Levels IV and V. Educational participation was limited. Epilepsy, intellectual disability, visual impairment, and hearing impairment were reported as common comorbidities. Fewer than half of the children reportedly received regular physiotherapy; use of occupational therapy, speech therapy, and assistive devices was also described as low. Hearing impairment was reported to be associated with greater motor severity. Conclusion: The findings suggest substantial functional and participation challenges among the children included in this study, alongside gaps in rehabilitation and educational access. Early identification, decentralised rehabilitation, caregiver support, and inclusive education warrant attention. Numerical estimates, full statistical results, and key methodological details must be verified and added before submission.

**Keywords:** Cerebral palsy, disability, ICF, functional classification, Eastern Uttar Pradesh

## INTRODUCTION

Cerebral palsy (CP) comprises a group of permanent disorders of movement and posture attributed to non-progressive disturbances in the developing fetal or infant brain. Although the underlying brain disturbance is non-progressive, the functional consequences may change over time. CP may coexist with impairments in sensation, cognition, communication, behaviour, feeding, and musculoskeletal function, contributing to activity limitations and restrictions in participation.

The epidemiology and functional profile of CP vary across settings in relation to perinatal and neonatal care, survival, socioeconomic conditions, and access to health and rehabilitation services. Although evidence from high-income countries is substantial, regional data from low- and middle-income countries remain

uneven. Within India, differences in health infrastructure, geography, and social conditions make locally relevant evidence important for service planning.

Eastern Uttar Pradesh includes large rural populations and communities that may face geographical and financial barriers to specialist care. However, comprehensive regional descriptions of functional disability, participation, comorbidities, and rehabilitation-service use among children with CP are limited. Such information can inform rehabilitation planning, inclusive education, and support for families.

The International Classification of Functioning, Disability and Health (ICF) provides a framework for understanding disability through the interaction of health conditions with body functions and structures, activities, participation, and contextual factors. This study aimed to describe disability among children with CP in Eastern Uttar Pradesh using an ICF-informed approach, with attention to functional classification, participation, comorbidities, and rehabilitation-service utilisation.

# METHODOLOGY

### Study design and setting

A descriptive epidemiological survey with an exploratory approach was conducted among children with CP in Eastern Uttar Pradesh. The study period was [insert start and end dates], and the districts covered were [insert complete list of districts]. These details should be reported to define the study setting clearly.

### Study population

The study included 2,139 children diagnosed with CP and residing in Eastern Uttar Pradesh. The participants' age range was [insert range]. The inclusion and exclusion criteria were [specify criteria], and CP diagnosis was confirmed using [specify diagnostic criteria and assessor/source]. The number of children screened, excluded, and included should be reported to establish the recruitment denominator.

### Case identification and recruitment

Cases were identified through institutional records at government and private hospitals, rehabilitation centres, physiotherapy colleges, non-governmental organisations, and paediatric clinics. Community referrals were obtained through interviews with parents and community leaders, followed by home verification.

The sampling method, recruitment period, numbers recruited from each source, and procedures used to avoid duplicate records should be specified. Unless a population-based sampling frame is documented, the sample should not be described as representative of all children with CP in the region.

### Assessment instruments and data collection

Functional assessment included the Gross Motor Function Measure (GMFM-88), Gross Motor Function Classification System–Expanded and Revised (GMFCS-E&R), Manual Ability Classification System (MACS), Communication Function Classification System (CFCS), and Eating and Drinking Ability Classification System (EDACS).

The Ten Questions (TQ) screening tool and structured self-care and participation questionnaires were also used. A structured bilingual (Hindi and English) interview schedule was administered to parents to collect demographic, socioeconomic, health, rehabilitation, and participation information.

### Data analysis

Data were summarised descriptively across the ICF domains of body functions and structures, activities, participation, and contextual factors. Cross-tabulations and chi-square tests were reportedly used to examine associations involving functional classifications. GMFCS Levels I–III were grouped as ambulatory and

Levels IV–V as non-ambulatory. The statistical software and version, significance threshold, handling of missing data, and complete test results (test statistics, degrees of freedom, p-values, and effect estimates where appropriate) should be added from the original analysis.

### Ethical considerations

Ethics approval was [insert committee name, approval/reference number, and date, if applicable]. Informed consent was obtained from [specify parent/guardian procedures], and child assent was obtained where appropriate and applicable. Describe confidentiality safeguards and institutional permissions. These details must be confirmed from the study records and must not be inferred or fabricated.

## RESULTS

### Demographic characteristics

Participants' demographic characteristics should be presented using counts and percentages. The available summary indicates that most participants were younger than 15 years, males outnumbered females, and most children lived in rural areas; Gorakhpur district accounted for more than half of the cases. Insert the verified age-group distribution, sex distribution, rural/urban distribution, and district-wise counts and percentages in a table. Report denominators for each variable and explain any missing data.

### Motor subtype and functional classification

Spastic quadriplegia was reported as the most common motor subtype, and a large proportion of children were classified at GMFCS Levels IV and V, suggesting substantial gross-motor limitations in this sample. Limitations in manual ability, communication, and eating and drinking were also described. Insert the verified counts and percentages for each motor subtype and each level of GMFCS, MACS, CFCS, and EDACS. Ensure that the denominators and any missing or unclassified observations are clearly stated.

### Participation and educational access

Educational participation was reported to be limited, with most children described as not enrolled in formal or informal educational settings. Insert the number and percentage of children in each education category and define the categories used, including how formal education, informal education, and non-enrolment were classified.

### Comorbidities

Epilepsy, intellectual disability, visual impairment, and hearing impairment were reported as common comorbidities. Hearing impairment was reported to be significantly associated with greater motor severity. Insert the number and percentage of children with each comorbidity, the denominator used, and the complete statistical results for the reported association, including the test used, test statistic, degrees of freedom, exact p-value where available, and an effect estimate. Do not describe an association as statistically significant unless supported by the original analysis.

### Rehabilitation-service utilisation

Fewer than half of the children were reported to receive regular physiotherapy, while use of occupational therapy, speech therapy, and assistive devices was described as low. Service utilisation was also reported to vary by socioeconomic status, maternal education, and geographical location.

Insert verified counts, denominators, and percentages for each service and the statistical results supporting any reported associations. Define "regular physiotherapy" and clarify the reference period for service use.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue X October 2026

# DISCUSSION

This study describes disability among 2,139 children with CP identified through institutional sources and community referrals in Eastern Uttar Pradesh. The supplied findings point to a substantial burden of gross-motor limitation, restricted educational participation, coexisting impairments, and gaps in rehabilitation-service use. The multi-domain approach is consistent with the ICF perspective, in which disability is understood not solely as a diagnosis or impairment but also in relation to activity, participation, and contextual barriers.

This study describes disability among 2,139 children with CP identified through institutional sources and community referrals in Eastern Uttar Pradesh. The findings suggest substantial gross-motor limitations, restricted educational participation, coexisting impairments, and gaps in rehabilitation-service use. The use of multiple functional measures within an ICF-informed framework is a strength because it considers disability in relation to body functions, activities, participation, and contextual factors. The interpretation of these findings should remain cautious until the numerical estimates and full statistical outputs are reported.

The reported predominance of spastic quadriplegia and GMFCS Levels IV and V suggests that many children in this sample had substantial support needs. However, recruitment through institutions and referrals may have increased the likelihood of identifying children with more severe disability or greater contact with services. Accordingly, these distributions should not be generalised to all children with CP in Eastern Uttar Pradesh unless the sampling frame supports such an inference.

Limited educational participation is an important finding. School access may be affected by mobility, communication, feeding and self-care needs, transport, family resources, physical accessibility, and the availability of inclusive support. The present summary does not quantify the contribution of these factors; therefore, they should be discussed as plausible considerations rather than established explanations. Educational participation should be reported using clearly defined categories and verified numerical estimates.

The reported comorbidities reinforce the importance of multidisciplinary assessment rather than relying on gross-motor classification alone. The reported association between hearing impairment and greater motor severity should be interpreted cautiously until the statistical test, effect estimate, and p-value are provided. A non-significant result for another comorbidity, if observed, would not by itself establish the absence of an association.

The reported low use of rehabilitation services highlights the importance of accessible, family-centred, and community-linked care. Decentralised services, caregiver education, clear referral pathways, assistive technology, and coordination with schools may be relevant priorities. However, the descriptive design cannot establish that socioeconomic circumstances, maternal education, or geographical location caused differences in service utilisation.

A strength of the study is the inclusion of a large regional cohort and the use of several functional classification and assessment systems across motor, manual, communication, and eating/drinking domains. Important limitations include the unclear sampling frame and recruitment denominator, absence of study dates and detailed eligibility criteria in the supplied summary, and lack of numerical estimates and full statistical outputs in the text provided. The available information also does not establish population prevalence. These limitations should be reviewed against the original protocol and dataset. Strengths include the large sample and the use of several functional classification and assessment systems covering motor function, manual ability, communication, and eating and drinking. Limitations include the incompletely described sampling frame and recruitment denominator, missing study dates and eligibility criteria, and the absence of complete numerical estimates and statistical outputs in the current draft. The available information does not establish population prevalence. These points should be checked against the original protocol and dataset, and the manuscript should report ethics approval and consent procedures transparently.

The supplied findings indicate that children with CP identified in Eastern Uttar Pradesh experience substantial functional limitations and participation restrictions, alongside limited access to rehabilitation and education. An ICF-informed, region-specific response should combine early identification, multidisciplinary assessment, decentralised rehabilitation, caregiver support, assistive technology, and inclusive education. Further reporting of exact estimates and transparent sampling and ethics procedures is necessary to support interpretation and replication.

Among the children included in this study, the findings suggest substantial functional limitations and participation restrictions, alongside limited access to rehabilitation and education. An ICF-informed, regionally responsive approach may prioritise early identification, multidisciplinary assessment, decentralised rehabilitation, caregiver support, assistive technology, and inclusive education. Complete numerical reporting, transparent sampling procedures, and verified ethics information are needed to support interpretation, reproducibility, and publication.

## REFERENCES

1. Darrah J, Law M, Pollock N, Wilson B, Russell DJ, Walter SD, et al. Context therapy: a new intervention approach for children with cerebral palsy. Child Care Health Dev. 2002;28:409–417. [Verify title, authorship, and page details against the original source before submission.
2. Darrah J, Law M, Pollock N, Wilson B, Russell DJ, Walter SD, et al. Context therapy: a new intervention approach for children with cerebral palsy. Child Care Health Dev. 2002;28:409–417. Verify the article title, authorship, volume, issue, and page details against the original publication before submission.
3. Hidecker MJC, Paneth N, Rosenbaum PL, Kent RD, Lillie J, Eulenberg JB, et al. Developing and validating the Communication Function Classification System for individuals with cerebral palsy. Dev Med Child Neurol. 2011;53:704–710.
4. Maulik PK, Darmstadt GL. Childhood disability in low- and middle-income countries: overview of screening, prevention, services, legislation, and epidemiology. Pediatrics. 2007;120(Suppl 1):S1–S55. [Verify the exact citation and pagination before submission.]
5. Maulik PK, Darmstadt GL. Childhood disability in low- and middle-income countries: overview of screening, prevention, services, legislation, and epidemiology. Pediatrics. 2007;120(Suppl 1):S1–S55. Verify the exact title and bibliographic details against the original publication before submission.
6. Palisano RJ, Rosenbaum P, Bartlett D, Livingston MH. Content validity of the expanded and revised Gross Motor Function Classification System. Dev Med Child Neurol. 2008;50:744–750.
7. Sankar C, Mundkur N. Cerebral palsy—definition, classification, etiology and early diagnosis. Indian J Pediatr. 2005;72:865–868.
8. Sellers D, Mandy A, Pennington L, Hankins M, Morris C. Development and reliability of the Eating and Drinking Ability Classification System (EDACS) for individuals with cerebral palsy. Dev Med Child Neurol. 2014;56:245–251.
9. World Health Organization. International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization; 2001.