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Bridging Global Advances and Lived Realities of Cerebral Palsy in Cameroon

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Abstract

Background: Advances in the diagnosis and management of cerebral palsy (CP) have improved outcomes in many high-income countries through earlier identification, evidence-based interventions, and coordinated rehabilitation pathways. However, the applicability of these advances in low-resource settings remains uncertain. In Cameroon, CP is shaped not only by neurological impairment but also by sociocultural beliefs, health system limitations, poverty, and restricted access to rehabilitation services.

Discussion: This commentary examines the gap between global progress in CP care and the lived realities of children and families in Cameroon. We argue that CP should be understood as a biosocial condition, influenced by the interaction of biomedical, social, cultural, and structural factors. While international guidelines promote early diagnosis and intervention, implementation is constrained by shortages of trained personnel, fragmented referral systems, sociocultural beliefs, and limited developmental surveillance. Preventable perinatal and neonatal complications continue to contribute substantially to CP burden, reflecting broader inequities in maternal and child health services. Rehabilitation remains largely family-led, with caregivers often prioritizing participation, inclusion, communication, and quality of life over impairment-focused outcomes. Stigma, social exclusion, caregiver psychological distress, and inadequate support services further compound the challenges experienced by affected families. Additionally, the absence of a lifespan perspective leaves adolescents and adults with CP underserved within existing policies and programmes.

Conclusion: Improving CP outcomes in Cameroon requires contextually grounded approaches that integrate biomedical care with community-based rehabilitation, caregiver support, inclusive education, and disability-inclusive policies. Bridging global evidence with local realities offers an opportunity to advance equitable rehabilitation systems while contributing valuable insights to global disability and rehabilitation practice.

Keywords: Cerebral palsy; Cameroon; Rehabilitation; Disability; Early intervention; Community-based rehabilitation; Health equity

Abbreviations: CP: Cerebral Palsy; HINE: Hammersmith Infant Neurological Examination; GMA: General Movements Assessment; HICs: High-Income Countries; LMICs: Low and Middle-Income Countries; CBR: Community-Based Rehabilitation

Background

Over the past decade, advances in the diagnosis and management of cerebral palsy (CP) have transformed paediatric rehabilitation globally. Improved neonatal care, neuroprotective strategies, early intervention, and standardized diagnostic pathways have contributed to declining prevalence and improved functional outcomes in many high-income countries (HICs). International clinical guidelines now support diagnosis within the first months of life using evidence-based tools such as the General Movements Assessment (GMA) and the Hammersmith Infant Neurological Examination (HINE), enabling intervention during critical periods of neuroplasticity [1,2].

However, these advances remain unevenly distributed. In many low- and middle-income countries (LMICs), including Cameroon, the realities of CP differ substantially from those described in global clinical frameworks. CP in these settings is not only a biomedical condition but also a biosocial phenomenon

shaped by structural inequities, sociocultural beliefs, poverty, limited rehabilitation systems, and unequal access to maternal and child healthcare [3-5]. Consequently, approaches developed in HICs cannot simply be transferred into low-resource settings without critical contextual adaptation. This commentary argues that although global advances in CP care offer important opportunities for improving outcomes, their implementation in Cameroon requires culturally responsive, community-based, and systems-oriented approaches that reflect local realities.

Bridging this gap demands moving beyond narrow biomedical models toward integrated frameworks that recognize the social, cultural, and structural dimensions of disability. Reframing cerebral palsy beyond biomedical models. CP is commonly defined as a group of permanent disorders affecting movement and posture caused by non-progressive disturbances in the developing brain [6,7]. While this definition underpins international clinical practice, qualitative and community-based research in Cameroon demonstrates that disability is often understood through pluralistic explanatory models that extend beyond biomedical interpretations. Families may interpret CP through spiritual, moral, relational, and cultural frameworks, including beliefs associated with ancestral anger, witchcraft, curses, or maternal wrongdoing during pregnancy.

These interpretations are not peripheral to care; they fundamentally shape health-seeking behaviour and rehabilitation experiences. Families frequently navigate multiple healing systems simultaneously, including biomedical care, traditional healing, sociocultural rituals, and faith-based interventions. Such pluralistic pathways reflect both deeply rooted cultural understandings of illness and limited trust in formal healthcare systems. They also highlight the limitations of applying purely biomedical frameworks to contexts where disability is socially and spiritually interpreted. Importantly, these sociocultural realities influence the timing of diagnosis and intervention.

Global recommendations advocating diagnosis between 3 and 6 months of age assume the availability of specialized services, developmental surveillance systems, and accessible referral pathways. In Cameroon, however, these assumptions rarely hold. Delayed diagnosis is shaped not only by resource constraints but also by the interaction between cultural beliefs, stigma, caregiver experiences, and weak health systems [8,9]. Recognizing CP as a biosocial condition has important implications for rehabilitation policy and practice. It challenges deficit-oriented approaches and emphasizes the need for culturally responsive and family-centred models of care that engage communities rather than positioning them as barriers to biomedical intervention.

Early Diagnosis: Feasibility Versus Reality

Evidence from HICs demonstrates that early diagnosis and intervention improve developmental and caregiver outcomes by capitalizing on early neuroplasticity [1,2]. In these settings, structured diagnostic pathways have reduced the average age of diagnosis substantially, enabling earlier rehabilitation and family support. In Cameroon, however, the feasibility of implementing these pathways remains constrained by systemic limitations. Specialist services are scarce and concentrated in urban centres, while referral systems remain fragmented and poorly coordinated. Many primary healthcare facilities lack personnel trained in developmental assessment or rehabilitation, limiting opportunities for early identification within routine child health services [9]. Community-based evidence further suggests that caregivers often recognize developmental concerns early but have trouble obtaining timely responses within formal healthcare systems [10].

This disconnect exposes the limitations of specialist-driven diagnostic models in contexts where rehabilitation systems and developmental services remain under-resourced. It also demonstrates that caregivers possess important experiential knowledge that is frequently overlooked within conventional diagnostic frameworks. These realities suggest that early diagnosis in Cameroon cannot rely solely on highly specialized models imported from HICs. Instead, contextual appropriate strategies are needed, including integration of developmental surveillance into primary healthcare, training of community health workers, and incorporation of caregiver observations into early identification pathways [5,11]. Such approaches may offer more equitable and feasible alternatives for strengthening early detection in low-resource settings.

Epidemiological Inequities and Preventable Pathways

Although global prevalence of CP has declined in many HICs because of advances in obstetric and neonatal care, emerging evidence suggests that the burden remains substantially higher in many LMICs [1,12]. In Cameroon, wide variation in prevalence estimates reflects weak surveillance systems, underdiagnosis, inconsistent diagnostic pathways, and limited epidemiological data [8,13,14,15]. Importantly, CP in Cameroon remains strongly associated with preventable perinatal and neonatal complications. Birth asphyxia, neonatal infections, severe jaundice, poorly managed seizures, prematurity without adequate neonatal support, and infectious diseases continue to contribute significantly to childhood neurodisability [13].

These patterns reveal broader inequities within maternal and child health systems and highlight the preventable nature of many CP-related brain injuries in low-resource settings. The persistence of these risk factors underscores the importance of prevention as a central component of CP policy and practice. Strengthening antenatal care, improving skilled birth attendance, expanding neonatal resuscitation training, and increasing access to emergency obstetric and newborn care are critical priorities. Equally important are public health interventions that improve maternal education, reduce poverty, and strengthen community awareness regarding maternal and newborn health. CP in this

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context therefore reflects not only individual neurological injury but also structural inequalities embedded within health systems and broader social conditions.

From Intervention to Participation: Adapting Rehabilitation to Context

A growing body of evidence supports early, intensive, task-specific interventions for improving functional outcomes among children with CP. However, translating these intervention models into the Cameroonian context presents substantial challenges. Rehabilitation services remain limited, urban-centred, and inaccessible for many families. As a result, caregivers frequently become the primary providers of therapy within home and community settings, often without formal training or adequate support [9,11]. This reliance on families reflects both the resilience of caregivers and the absence of sufficiently resourced rehabilitation systems. Importantly, rehabilitation priorities within these contexts often differ from those emphasized in specialist clinical models. Families frequently prioritize participation, communication, inclusion, mobility within daily environments, and quality of life over narrow impairment reduction.

Community-based rehabilitation (CBR) initiatives similarly demonstrate that meaningful intervention extends beyond clinical therapy to include social participation, caregiver empowerment, and environmental adaptation.

These findings challenge assumptions that rehabilitation models developed in HICs can be transferred unchanged into low-resource settings. Effective intervention in Cameroon requires culturally responsive, family-centred, and contextually embedded approaches that integrate therapy into daily routines and community life [16]. Strengthening caregiver capacity, reducing stigma, and supporting participation within schools and communities may be as important as formal therapeutic interventions themselves. Task-sharing approaches involving community health workers, peer support networks, and locally adapted rehabilitation programmes may provide more sustainable pathways for expanding access to care while addressing workforce shortages and geographical inequities.

The Hidden Burden: Comorbidities, Stigma, And Caregiver Mental Health

Globally, most individuals with CP experience multiple comorbidities, including epilepsy, pain, communication difficulties, feeding problems, visual and hearing impairments, and intellectual disabilities. In Cameroon, the burden associated with these conditions is intensified by limited access to specialist care, assistive technologies, pain management, nutritional support, and inclusive education services. Beyond clinical impairments, stigma remains a pervasive and often underrecognized dimension of CP. Children with disabilities may experience exclusion from education, social activities, and community participation, while caregivers, particularly mothers, frequently encounter blame, social isolation, and psychological distress [8,13].

In some communities, disability continues to be associated with shame, supernatural beliefs, or perceived family wrongdoing, reinforcing discrimination and limiting help-seeking behaviours (Lonn et al., under review for publication). The emotional and economic burden on caregivers is substantial. Families often face chronic financial strain associated with transportation, therapy costs, medications, and long-term caregiving demands [8]. Caregiving responsibilities may also disrupt employment, family relationships, and social participation. Despite increasing global recognition of caregiver wellbeing as a critical component of CP management, psychosocial support services remain largely unavailable in many parts of Cameroon. Addressing CP outcomes therefore requires a broader understanding of disability that includes caregiver wellbeing, mental health, social inclusion, and economic protection as essential components of care rather than secondary concerns.

A Missing Lifespan Perspective

Although global frameworks increasingly emphasize lifelong approaches to CP management, services in Cameroon remain heavily focused on childhood where services exist though insufficient. Adolescents and adults with CP are largely absent from rehabilitation planning, policy development, and disability programming.

This absence has important long-term implications. Adults with CP often experience chronic pain, progressive musculoskeletal complications, fatigue, declining mobility, unemployment, and social exclusion, yet access to rehabilitation and social protection remains extremely limited. Transition pathways between paediatric and adult services are poorly developed, and few systems exist to support long-term participation in education, employment, or independent living. The neglect of adulthood within CP services reflects broader gaps in disability-inclusive social policy and rehabilitation planning. Developing a lifespan approach is therefore essential for ensuring continuity of care and promoting long-term wellbeing, participation, and dignity for individuals living with CP.

Towards Contextually Grounded Innovation

Bridging the gap between global evidence and local realities requires contextually grounded innovation rather than direct transplantation of HIC rehabilitation models. Sustainable progress depends on adapting evidence-based approaches to local health systems, cultural realities, and resource constraints. Promising strategies may include community-based early identification programmes, task-sharing with community health workers, caregiver-led rehabilitation support, peer mentoring initiatives, and development of low-cost assistive technologies. Integrating cultural beliefs and community perspectives into rehabilitation frameworks may further strengthen trust, improve engagement,

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and reduce stigma.

Importantly, innovation in low-resource settings should not be viewed merely as compensating for scarcity. Community-based and family-centred approaches emerging from Cameroon and similar settings may offer important lessons for global rehabilitation practice by emphasizing participation, relational care, resilience, and contextual adaptation. Ultimately, improving CP outcomes in Cameroon requires investment not only in specialist services but also in equitable rehabilitation systems, inclusive education, caregiver support, disability-inclusive policy implementation, and broader social protection mechanisms.

Conclusion

Advances in CP diagnosis and management have transformed outcomes for many children globally, yet these gains remain unevenly distributed. In Cameroon, CP continues to reflect broader inequities in maternal and child healthcare, rehabilitation access, disability inclusion, and social protection. Bridging global evidence with local realities therefore requires more than transferring biomedical models from high-income settings. It demands culturally responsive, community-based, and system-oriented approaches that recognize the lived experiences of children with CP and their families. Strengthening early identification, rehabilitation systems, inclusive education, caregiver support, and disability-inclusive policies will be essential for reducing inequities and improving long-term outcomes. Contextually grounded innovation offers an important opportunity not only to improve CP care in Cameroon but also to expand global understanding of rehabilitation in low-resource settings. Sustainable progress will depend on ensuring that children and families are not excluded from care because of geography, poverty, stigma, or structural neglect.

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