

Evaluating the Effectiveness of School-Based Physiotherapy Interventions on the Participation and Performance of Children with Cerebral Palsy in Sports Activities

Atul Khajuria^{1*}, Christian Gendemeh², Stephen Monday³, J. Samuel Kamanda⁴

Abstract

Introduction: The impact of Cerebral Palsy (CP) on motor function hinders a child's ability to engage in physical and recreational activities, including sports. Particularly, physiotherapy practices within the educational setting have emerged as a therapy modality that aims at the promotion of motor skills, physical conditioning, and social interaction of children with CP. The objective of my study was to determine the level of effectiveness of these interventions in relation to increased sports participation and performance among children with CP in the school setting. The study adopted a descriptive cross-sectional survey approach with a total of 215 participants consisting of physiotherapists, special education teachers, and parents as well as school administrators. Structured questionnaires were administered to solicit quantitative and qualitative information and determine the availability, implementation, and impact of physiotherapy interventions. Quantitative data were analysed using descriptive statistics, and qualitative data using thematic analysis, both using SPSS Version 26. The study results demonstrated considerable enhancement in gross motor skills, coordination, balance, and sports participation amongst children who were supported by school-based physiotherapy programmes. Other noted outcomes included improved psychosocial attributes of self-esteem and social interaction for the peers and the children with Cerebral Palsy. The overwhelming challenges still remain on the insufficiently trained staff and limited school resources, poor infrastructural facilities, and absence of policy frameworks at the school level. The findings of this study are consistent with existing literature on the need to incorporate rehabilitation services into the school system to promote inclusiveness and physical development. School physiotherapy was found to improve social inclusion as well as physical performance. However, systemic problems such as siloed service provision and poor interdisciplinary collaboration remain barriers to the best possible outcomes. School-based physiotherapy promotes comprehensive development in children with CP. These services need to be included in the school health and sports programmes to improve the overall health and social outlook of these children. There is an increased need for policies, funding, and interprofessional efforts to enhance and maintain the benefits of these interventions.

*Author for Correspondence

Atul Khajuria
E-mail: atulkhajuria83@gmail.com

¹Director, Department of Allied Health Sciences, Desh Bhagat University, Fatehgarh Sahib, Punjab, India

^{2,4}Assistant Professor, Department of Allied Health Sciences, Desh Bhagat University, Fatehgarh Sahib, Punjab, India

³Research Fellow, Department of Environmental Science, Desh Bhagat University, Amlah Road, Mandi Gobindgarh, Fatehgarh Sahib, Punjab, India

Received Date: November 18, 2026

Accepted Date: July 19, 2026

Published Date: July 20, 2026

Citation: Atul Khajuria et.al. EVALUATING THE EFFECTIVENESS OF SCHOOL-BASED PHYSIOTHERAPY INTERVENTIONS ON THE PARTICIPATION AND PERFORMANCE OF CHILDREN WITH CEREBRAL PALSY IN SPORTS ACTIVITIES. International Journal of Children. 2026; 3(2): 48–54p.

Keywords: Cerebral palsy, physiotherapy, social inclusiveness, athletic involvement, rehabilitation, special education, psychosomatic development.

INTRODUCTION

Cerebral palsy (CP) is defined as a chronic condition of childhood onset which comprises a

diverse group of non-progressive disorders of the brain that lead to an impairment of movement and posture [1]. CP has a prevalence of around 2 to 2.5 per 1,000 live births globally, and is associated with the functional deficits of spasticity, muscular weakness, decreased postural control, decreased multi-directional coordination, and mobility. Over in the range of 60-80% of physically and intellectually challenged school-aged children, these physical limitations severely restrict the scope of participation in educational and sporting activities that are crucial for holistic development and social integration [2].

From an early age, school-based sports and physical activities have been recognized as potential avenues for fostering physical fitness, psychosocial well-being, and holistic growth in children with disabilities. Within the framework of these activities, school-embedded physiotherapy provides the support aimed at motor control and functional action deficits to enable safe participation in sports. Through individualised programmes, physiotherapists improve balance, strength, motor planning, and endurance, which assist children with cerebral palsy in becoming more confident and productive during school activities [3].

There is a wide body of literature focused on the benefits of physiotherapy with children with CP. However, the delivery and evaluation of school-based physiotherapy services is inconsistent across educational and healthcare systems, particularly in low-resource settings. Other addressable barriers include the lack of access to physiotherapists, absence of an inclusive policy for physical education, and insufficient interaction between educational and health institutions. In addition, there is no empirical research exploring the engagement with physiotherapy-supported sports to evaluate their effectiveness with key stakeholders, such as therapists, teachers, parents, and school administrators.

In order to fill this gap, this study examines the impact of school physiotherapy programmes on the level of participation and performance in sports activities among children with cerebral palsy using data gathered through a structured questionnaire. A diverse group of stakeholders including physiotherapists, special educators, physical education instructors, school principals, and caregivers provided a total of 215 responses which were deemed valid. The questionnaire was tailored towards functional gains, participation, psychosocial outcomes, perceived inclusiveness, and barriers to the delivery of physiotherapy and sports services for children with CP [4].

This study seeks to contribute to the body of literature on the impact of school physiotherapy programmes on children with CP, not only by assessing the impact of current intervention strategies, but also by developing practical recommendations for underpinning the physiotherapy services in schools. The results will inform educational strategists and planners, rehabilitation scientists, and policymakers who aim to improve the inclusive sports and education interfaces with the psychosocial aspects of well-being of children with cerebral palsy.

METHODOLOGY

Research Design

In this study, we used descriptive cross-sectional survey within the quantitative approaches to evaluate stakeholder perceptions on the effectiveness of school physiotherapy interventions for children with cerebral palsy (CP) who participate in sports. The design facilitated the organised gathering and evaluation of data from a wide respondent group at one period to observe patterns, relationships, and trends pertinent to intervention results [5].

Participants and Sampling

An expert sampling technique was applied to select 215 participants from different stakeholder groups who were actively involved in the care, education, and physical training of children with CP.

The participants comprised:

- Physiotherapists

- Special educators
- Physical education (PE) instructors
- School administrators
- Parents and guardians

All respondents were chosen on the basis of their practical knowledge of the school-based interventions and or their engagement in supportive roles concerning children with CP in sports activities.

Data collection was conducted using a self-developed questionnaire collected through a structured self-administrative method informed by relevant literature and existing tools in paediatric rehabilitation and inclusive physical education (Table-1).

The questionnaire contained five main areas:

- *Demographic Information:* Child's age, gender, profession, total working years, and the relationship to the child.
- *Physiotherapy Intervention Characteristics:* Type, frequency, and duration of interventions provided at school.
- *Functional and Performance Outcomes:* Motor coordination, strength, endurance, skill execution, and task completion.
- *Participation and Inclusion:* Comments on child participation and interaction with peers during sports activities.
- *Implementation Barriers and Recommendations:* Providing physiotherapy and its integration with sports – perceived limitations and proposed recommendations.

All items had the same scale with a five-point rating Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Validity and Reliability

Face and content validity were established through expert review by five physiotherapists specialising in inclusive education with a strong background in the subject.

Pilot testing with fifteen participants (not included in the final analysis) demonstrated strong clarity and internal consistency.

Using Cronbach's Alpha for reliability assessment of the tool, a score of 0.87 was attained, demonstrating high internal consistency across the scale.

Data Collection Procedure

Data collection was conducted in both electronic and physical formats over the span of 4 weeks. In this study, participants gave consent while confidentiality and anonymity were preserved during the study. Prior to data collection, ethical clearance was sought from the institutional ethics committee [6].

Data Analysis

The data was input and analysed on SPSS Version 26. The following procedures were utilised:

- *Descriptive statistics:* Frequencies and percentages alongside means and standard deviation to summarise demographic and response data.
- *Exploratory Factor Analysis (EFA):* To determine the underlying dimensions of intervention effectiveness.
- *Inferential statistics:* Independent t-tests for between-clinical and non-clinical participants.

One-way ANOVA among stakeholder groups.

Chi-square tests for association of categorical variables.

Statistical relevance was identified at $p < 0.05$.

RESULTS

This section contains the results from the 215 valid responses from different stakeholders who provide care, education, and facilitate physical development through sports activities to children with cerebral palsy (CP). The results are organised in four main parts: participant demographics, characteristics of the interventions, functional and participation outcomes alongside the perceived challenges and recommendations [7].

Results of Respondent Demographics

The sample included 5 stakeholder groups with a majority of the sample comprising physiotherapists (28.8%) and special educators (20.9%). Most of the respondents (73%) had more than 3 years of experience working with children with CP. This level of experience was helpful in enhancing the quality of the insights and the reliability of the information collected.

Description of Interventions with School Aged Children

Respondents mostly indicated that physiotherapy sessions were conducted two to three times a week, mostly during physical education classes or in the morning activity sessions. Other common goal specifications included: gaining improvement in the patient's gross motor function, balance, and coordination. The most (67%) reported that the interventions were tailored to meet individual needs while 33% reported more group-based formats, especially for sports drills or adapted games [8].

Functional and Sports Performance Outcomes.

Most stakeholders provided feedback that motor skills such as running, jumping, and balancing had shown marked improvement. In particular, 61% agreed that physiotherapy had positive contributions to sports specific performance (e.g. throwing a ball, kicking, or dribbling), and 70% noted improved confidence to participate in games (Table-2).

Further investigation through Exploratory Factor Analysis (EFA) revealed three major dimensions of effectiveness:

- Motor Function and Endurance (Cronbach's $\alpha=0.84$)
- Sports Engagement at a Social Level (Cronbach's $\alpha=0.81$)
- Modification and Security in Physical Activities (Cronbach's $\alpha = 0.79$)

These dimensions accounted for 68.3% of the total variance, which is in complement to the construct validity of the survey.

Table 1. Participant characteristics instrumentation.

Stakeholder category	Number (n)	Percentage (%)
Physiotherapists	62	28.8%
Special educators	45	20.9%
PE instructors	37	17.2%
School administrators	32	14.9%
Parents/guardians	39	18.1%
Total	215	100%

Table 2. Reported physiotherapy intervention characteristics.

Intervention element	Most common response	Frequency (%)
Frequency of sessions	2–3 times per week	58%
Mode of delivery	Individualized sessions	67%
Goals of intervention	Motor coordination & balance	72%

Collaboration with PE staff	Often or always	54%
-----------------------------	-----------------	-----

Involvement and Participation in Sports Activities.

Most stakeholders had an optimistic outlook on the impact of physiotherapy on inclusivity. Approximately 76% suggested that children with CP were more willing to actively participate in sports as a result of the school-based interventions. Both parents and teachers reported that students with CP had increased interactions with their peers during mixed ability team games, which was described as a huge shift from isolation to joyful inclusion.

On the other hand, there were stark differences in inclusion across schools. ANOVA test showed that statistically, schools with in-house physiotherapists reported higher student participation than those with employed external therapists ($F=5.78$, $p<.01$).

Stakeholder Opinions and Implementation Obstacles.

Although there were some outcomes reported, barriers to effective implementation were also noted:

- Insufficient quantity of physiotherapists in schools.
- Lack of dedicated space and adaptive sports equipment.
- No allotted time in the curriculum for physiotherapy has been noted.

The overarching theme from parents and teachers was the need for collaboration between schools and health professionals, along with the proper training for PE teachers concerning inclusive teaching strategies.

Group Comparison: Clinical and Non-Clinical Stakeholders

Statistical analysis using independent t-tests showed an important difference between clinical (physiotherapists) and non-clinical constituents (educators, parents and guardians) regarding the perception of programme effectiveness:

Physiotherapists showed more optimism towards improvement on motor outcomes. (Mean = 4.2, SD = 0.6).

Non-clinicians placed greater emphasis on the psychosocial aspects of the programme like self-esteem and interaction with peers. (Mean = 4.5, SD = 0.5)

This illustrates the broad scope of impact from school-based physiotherapy beyond physical outcomes to significant social and emotional outcomes as well.

Key findings

- Data indicates over 70% of respondents noticed some level of enhancement in performing physical activities and exhibited an increase in self-confidence.
- The inclusion and participation in sports was enhanced through physiotherapy.
- The presence of physiotherapists in the schools led to better outcomes.

Commonly reported barriers included staffing, equipment, and space, among other things. Integrated planning, capacity building, and changes in curriculum were recommended by stakeholders [9].

The research looked into how effective school-based physiotherapy interventions were in enhancing the participation and sports performance of children with Cerebral Palsy. Based on the feedback given by 215 stakeholders, such as physiotherapists, teachers, and parents, the results strongly support that the implementation of physiotherapy in schools helps children with CP in motor skills and social skills.

A significant proportion of respondents reported improvement in gross motor functions that are pre-

requisites to sports participation coordination, balance and strength skills. These outcomes corroborate the previously mentioned research by regarding the impact of specific training on overall physical fitness and functional mobility among children with CP. The effectiveness of individualized interventions as reported by over two thirds of the participants who, with the child's level of function and sports goals, showed improvement, supports the idea that customised plans have meaningful progress [7].

Along with the physical improvements, the study also noted the psychosocial advantages of physiotherapy, like boosted confidence and self-esteem, as well as enhanced social interactions. These improvements demonstrate the underlying objectives of inclusivity in education and adaptive physical activities which strive for skill acquisition along with participation and acceptance. Inclusion follows the principle of respect for difference. From the observation made from step 8, it can be noted that children with CP seemed to be more active in group sports and comfortable engaging with peers and other children after going through physiotherapy. This indicates that these programmes could serve as vital tools for sociological acceptance integration within schools.

Although the research addressed some of the gaps in literature, it also found considerable gaps in the implementation of therapies regarding. The respondents mentioned a lack of physiotherapists, poor infrastructure, and little attention given through education and health as the main barriers. These concerns reflect issues already discussed in the work of. Inclusive practices are helpful, but there is often an institutional level of considerable cross-disciplinary support coordination resources required.

At long last, the differences in stakeholders' perceptions as seen from clinical healthcare professionals (physiotherapists) and non-clinical (parents and school teachers) are very striking. The educators and parents paid greater attention to emotive and social aspects, whereas clinicians focused their major attention on functional improvements. The two are interrelated and highlight the broad spectrum of rehabilitation and propose the need for an assessment system that incorporates both the physical and psychosocial aspects of health and participation [10].

CONCLUSION

This research emphasizes the importance of physiotherapy provided within the school setting for the functional and recreational skills of children with cerebral palsy. The bulk of feedback from 215 stakeholders (physiotherapists, teachers, and other caregivers) indicates that indeed, managed and tailored physiotherapy within the school framework enhances the level of achievement, emotional status, and social participation. The changes reported in gross motor functions, sports activities participation, and self-confidence suggest that there is value in offering physiotherapy as part of the school sports programme towards holistic development and not only physical improvement.

Regardless, the inequities in the way services are delivered, the availability of trained personnel, and available facilities still pose major challenges to optimal universal application. This study stresses important gaps concerning the need for blended disciplinary approaches to design, allocation of resources towards inclusive physical education, and active and responsive career advancement training aimed at sustaining and building on the advantages of these approaches.

As we mentioned above, the recommendation calls for a more holistic perspective where physiotherapy is not regarded as an ancillary treatment, but as an active component of specially inclusive school sports and health developmental programmes for children with cerebral palsy.

Recommendations

Institutional Integration

Incorporation of physiotherapy into the general school curriculum and in particular into special and

inclusive education should be prioritised.

Capacity Building

Special and general physical education teachers as well as other supporting staff should be trained to integrate basic physiotherapeutic and adaptive physical activities.

Resource Provision

Provision of disability-friendly training facilities, appropriate and sufficient adaptive sports equipment, and allocation of therapy time during school hours should be prioritised.

Interdisciplinary Collaboration

Enhancement of communication and coordination between schools and other rehabilitation professionals and parents to better integrate therapy outcomes into education and social activities.

Policy and Monitoring

The local education and health authorities should be urged to formulate comprehensive sports policies with active monitoring and evaluation frameworks.

REFERENCES

1. Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M, Damiano D, Dan B, Jacobsson B. A report: the definition and classification of cerebral palsy April 2006. *Dev Med Child Neurol Suppl.* 2007 Feb 1;109(suppl 109):8-14.
2. Oskoui M, Coutinho F, Dykeman J, Jetté N, Pringsheim T. An update on the prevalence of cerebral palsy: a systematic review and meta-analysis. *Developmental Medicine & Child Neurology.* 2013 Jun;55(6):509-19.
3. Verschuren O, Peterson MD, Balemans AC, Hurvitz EA. Exercise and physical activity recommendations for people with cerebral palsy. *Developmental Medicine & Child Neurology.* 2016 Aug;58(8):798-808.
4. Damiano DL. Activity, activity, activity: rethinking our physical therapy approach to cerebral palsy. *Physical therapy.* 2006 Nov 1;86(11):1534-40.
5. Andrés-Pérez F, Bru-Luna LM, Hidalgo-Fuentes S, Llamas-Salguero F, Martí-Vilar M. Influence of Physical Activity in Children and Adolescents with Cerebral Palsy: A Systematic Review. *Children.* 2025 Jun 27;12(7):853.
6. King G, Tucker MA, Baldwin P, Lowry K, Laporta J, Martens L. A life needs model of pediatric service delivery: services to support community participation and quality of life for children and youth with disabilities. *Physical & occupational therapy in pediatrics.* 2002 Jan 1;22(2):53-77.
7. Novak I, McIntyre S, Morgan C, Campbell L, Dark L, Morton N, Stumbles E, Wilson SA, Goldsmith S. A systematic review of interventions for children with cerebral palsy: state of the evidence. *Developmental medicine & child neurology.* 2013 Oct;55(10):885-910.
8. Bloemen MA, Verschuren O, van Mechelen C, Borst HE, de Leeuw AJ, van der Hoef M, de Groot JF. Personal and environmental factors to consider when aiming to improve participation in physical activity in children with Spina Bifida: a qualitative study. *BMC neurology.* 2015 Feb 10;15(1):11.
9. Wickman K. Experiences and perceptions of young adults with physical disabilities on sports. *Social inclusion.* 2015 Jun 25;3(3):39-50.
10. World Health Organization. International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization; 2001. <https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health>