

## PUBLISHED ABSTRACT

# Non-Surgical Nutritional Interventions in Children with Cerebral Palsy – Developing a Targeted Interdisciplinary Approach in a Low-Cost Setting

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### Background

The feeding difficulties surrounding children with cerebral palsy are a well-documented occurrence. As advancements continue into perinatal and neonatal care, the prevalence of premature and low birth weight infants have increased over recent years. This trend is reflected in the current number of children who develop cerebral palsy in later years. In addition, the growing frustration surrounding mealtimes in both the child and caregiver is a significant factor which compounds each interaction. These difficulties frequently result in failure to thrive which complicates the global development of this population even further and often necessitates a surgical intervention.

### Methods

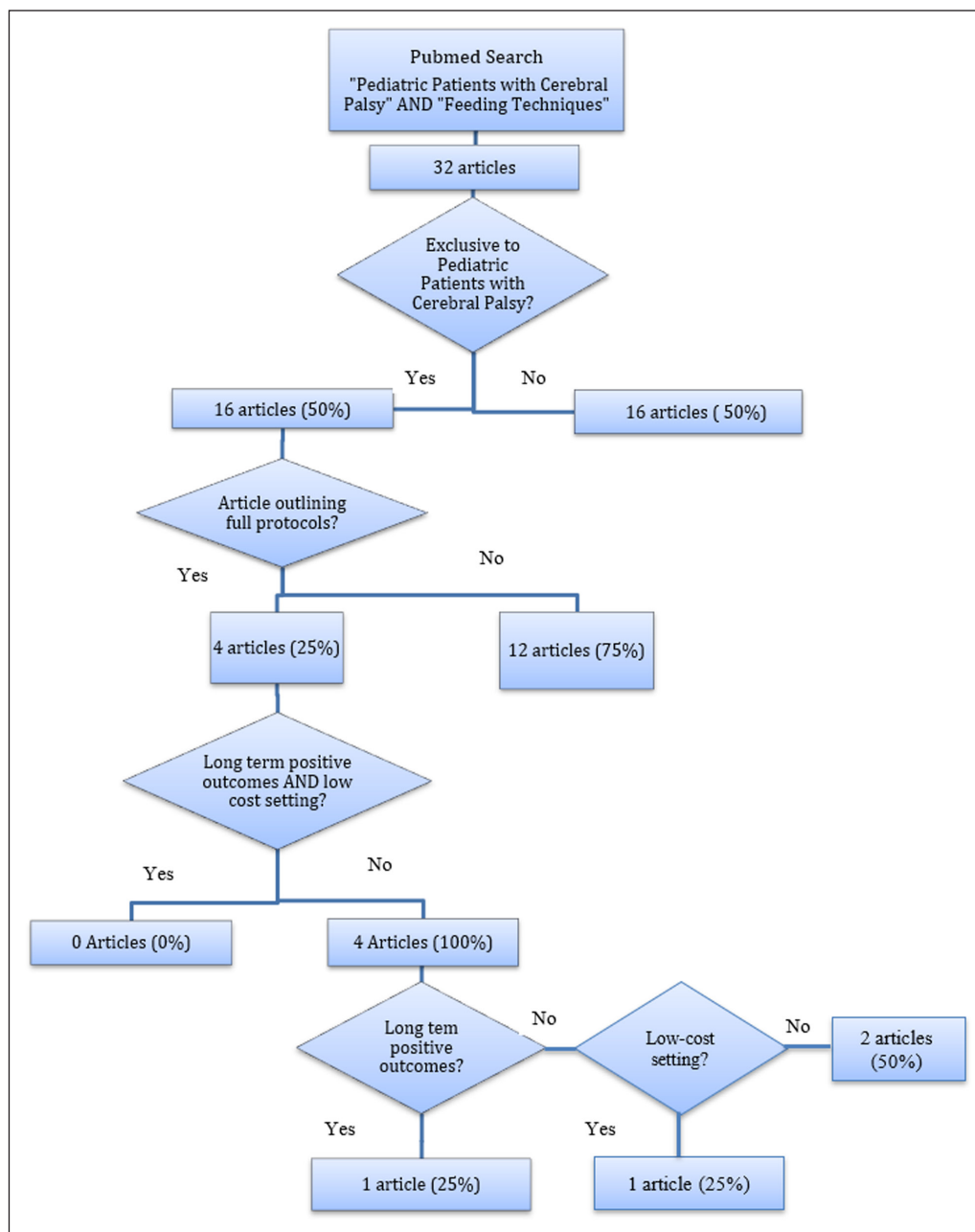
A review of recent existing literature between 2005 and 2020 was conducted utilizing the PubMed database using the search terms “Pediatric patients with Cerebral Palsy” linked with the Boolean operator AND to the term “Feeding Techniques” (**Figure 1**). Results were then analyzed to determine the baseline clinical status of patients, the type of feeding intervention used, inpatient versus outpatient intervention and the response to treatment. For implementation purposes, the two key selection criteria were the ability to maintain long term positive outcomes and the generalizability of the intervention to regular clinical practice in low-cost settings.

### Results

The initial search resulted in thirty-two articles. Sixteen articles [1–16] were selected which focused exclusively on patients with cerebral palsy and their nutrition after the removal of any duplicated articles. Of this number, only four articles described protocols in their entirety which could be directly applicable [1, 6, 10, 11]. Three articles focused on children with varying severities of cerebral palsy [1, 6, 11] while one article focused specifically on children with spastic diplegic cerebral palsy [10]. One article focused solely on a behavioral therapeutic approach [10], however all four of the protocols included behavioral training. All four protocols included the modification of feeds through increasing the caloric intake and thickening consistency of the feeds. Appropriate feeding utensils and positioning were utilized in all protocols. Two of the reviewed articles clearly outlined an outpatient treatment plan [1, 10] with one article using a daily outpatient protocol [10] while another used a fortnightly protocol [1]. In reference to the key implementation criteria, one article utilized a protocol which focused on a low socioeconomic status intervention with broad generalizability into clinical practice [1] while another used an interdisciplinary approach with multiple specialized therapists [10]. Of these, one article was able to demonstrate the ability to maintain and develop long-term positive outcomes demonstrated by continued patient weight gain through the use of their protocol [10]. It is of importance that none of the articles reviewed were able to achieve a long-term positive outcome through a low-cost protocol as outlined in the flow diagram (**Figure 1**).

### Conclusions

A heightened awareness of the wide range of therapeutic interventions and the ability to achieve positive outcomes through appropriate patient-specific interventions is essential when treating patients with cerebral palsy. An analysis of previous literature elicits pervasive challenges in formulating treatment plans which are both cost effective and produce consistent positive outcomes. By combining the pertinent aspects of the two protocols from the literature review which were able to meet the criteria of either low cost or long-term weight gain we can translate the result into a practical setting. In developed countries with resource-limited environments, a targeted interdisciplinary team including the



**Figure 1:** Flow Diagram Outlining the Process of Article Selection and Review.

physician, social worker, nutritionist, physical therapist along with a speech and swallow therapist may be beneficial to long-term gains in patient care. The provision of appropriate social counselling for families utilizing a patient-centered partnership can assist in allaying fears and feelings of inadequacy amongst caregivers.

**References**

1. **Adams MS, Khan NZ, Begum SA, Wirz SL, Hesketh, T, Pring TR.** Feeding difficulties in children with cerebral palsy: low-cost caregiver training in Dhaka, Bangladesh. *Child: Care, Health and Development.* 2011; 38(6): 878–888. DOI: <https://doi.org/10.1111/j.1365-2214.2011.01327.x>
2. **Andrew MJ, Parr JR, Sullivan PB.** Feeding difficulties in children with cerebral palsy. *Archives of Disease in Childhood – Education & Practice Edition.* 2012; 97(6): 222–229. DOI: <https://doi.org/10.1136/archdischild-2011-300914>
3. **Arvedson JC.** Feeding children with cerebral palsy and swallowing difficulties. *European Journal of Clinical Nutrition.* 2013; 67(S2). DOI: <https://doi.org/10.1038/ejcn.2013.224>
4. **Asgarshirazi M, Farokhzadeh-Soltani M, Keihanidost Z, Shariat M.** Evaluation of Feeding Disorders Including Gastro-Esophageal Reflux and Oropharyngeal Dysfunction in Children With Cerebral Palsy. *Journal of Family & Reproductive Health.* 2017; 11(4): 197–201.
5. **Brooks J, Day S, Shavelle R, Strauss D.** Low Weight, Morbidity, and Mortality in Children With Cerebral Palsy: New Clinical Growth Charts. *Pediatrics.* 2011; 128(2). DOI: <https://doi.org/10.1542/peds.2010-2801>

6. **Campanozzi A, Capano G, Miele E, Romano A, Scuccimarra G, Giudice ED, Staiano A**, et al. Impact of malnutrition on gastrointestinal disorders and gross motor abilities in children with cerebral palsy. *Brain and Development*. 2007; 29(1): 25–29. DOI: <https://doi.org/10.1016/j.braindev.2006.05.008>
7. **Cardona-Soria S, Cahuana-Cárdenas A, Rivera-Baró A, Miranda-Rius J, Carpi JMD, Brunet-Llobet L**. Oral health status in pediatric patients with cerebral palsy fed by oral versus enteral route. *Special Care in Dentistry*. 2019; 40(1): 35–40. DOI: <https://doi.org/10.1111/scd.12429>
8. **Caselli TB, Lomazi EA, Montenegro MAS, Bellomo-Brandão MA**. Comparative study on gastrostomy and orally nutrition of children and adolescents with tetraparesis cerebral palsy. *Arquivos De Gastroenterologia*. 2017; 54(4): 292–296. DOI: <https://doi.org/10.1590/s0004-2803.201700000-48>
9. **Caselli TB, Lomazi EA, Montenegro MAS, Bellomo-Brandão MA**. Assessment Of Nutritional Status Of Children And Adolescents With Spastic Quadriplegic Cerebral Palsy. *Arquivos De Gastroenterologia*. 2017; 54(3): 201–205. DOI: <https://doi.org/10.1590/s0004-2803.201700000-32>
10. **Clawson EP, Kuchinski KS, Bach R**. Use of behavioral interventions and parent education to address feeding difficulties in young children with spastic diplegic cerebral palsy. *NeuroRehabilitation*. 2007; 22(5): 397–406. DOI: <https://doi.org/10.3233/NRE-2007-22506>
11. **Ekici B, Çaliskan M, Sigan S, Uzunhan T, Aydinli N, Eraslan, E**. Effects of oral motor therapy in children with cerebral palsy. *Annals of Indian Academy of Neurology*, 2013; 16(3): 342. DOI: <https://doi.org/10.4103/0972-2327.116923>
12. **Figueiredo AA, Lomazi EA, Montenegro MA, Bellomo-Brandão MA**. Quality Of Life In Caregivers Of Pediatric Patients With Cerebral Palsy And Gastrostomy Tube Feeding. *Arquivos De Gastroenterologia*. 2020; 57(1): 3–7. DOI: <https://doi.org/10.1590/s0004-2803.202000000-02>
13. **Melunovic M, Hadzagiccatibusic F, Bilalovic V, Rahmanovic S, Dizdar, S**. Anthropometric Parameters of Nutritional Status in Children with Cerebral Palsy. *Materia Socio Medica*. 2017; 29(1): 68. DOI: <https://doi.org/10.5455/msm.2017.29.68-72>
14. **Smith SW, Camfield C, Camfield P**. Living with cerebral palsy and tube feeding: A population-based follow-up study. *The Journal of Pediatrics*. 1999; 135(3): 307–310. DOI: [https://doi.org/10.1016/S0022-3476\(99\)70125-3](https://doi.org/10.1016/S0022-3476(99)70125-3)
15. **Snik D, Jongerius P, Roos ND, Verschuren, O**. Nutritional care: The 'poor child' of clinical care in children with cerebral palsy. *Journal of Pediatric Rehabilitation Medicine*. 2019; 12(2): 133–138. DOI: <https://doi.org/10.3233/PRM-180537>
16. **Tessier DW, Hefner JL, Newmeyer, A**. Factors Related to Psychosocial Quality of Life for Children with Cerebral Palsy. *International Journal of Pediatrics*. 2014; 2014: 1–6. DOI: <https://doi.org/10.1155/2014/204386>

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