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MANUAL OROFACIAL STIMULATION AND ITS IMPACT ON CHILDREN WITH CEREBRAL PALSY

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Abstract. *Orofacial education of children with cerebral palsy is a long-lasting process that requires perseverance especially from their families. The main methods based on active orofacial exercises and those from speech therapy continue to question the effectiveness of oral motor treatment, leaving a gap in the literature concerning the feeding skills improvements of the children diagnosed with cerebral palsy. Based on this concern, we ask ourselves the question: are there other better methods of oral motor rehabilitation for these children with special needs? In this study we aimed to investigate, within the complex rehabilitation programme for CP, the impact of manual orofacial stimulation in order to reduce sialorrhea and improve mandibular movements, which play an important role in the feeding process. The study included 10 participants (5 girls and 5 boys), aged 8-10 years, diagnosed with cerebral palsy, spastic tetraplegia form with severe orofacial impairment and the intervention protocol consisted of a manual orofacial stimulation programme 4 times a week. Statistical results revealed that the application of the proposed orofacial stimulation programme was highly effective for the 10 research participants, whose scores improved significantly at the final assessment compared to those achieved at the beginning of the study, reaching almost normal values even in the case of mandibular parameters.*

Keywords: *cerebral palsy; sialorrhea; mandibular disorders; manual orofacial stimulation.*

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Introduction

Cerebral palsy (CP) is a motor and postural disorder caused by non-progressive damage to the developing brain (Sadowska et al., 2020). CP can affect oral motor skills, resulting in speech delay, hypersalivation (excessive drooling), as well as difficulties with sucking, chewing and swallowing (Senner et al., 2004). The prevalence of oral motor disorders in children with cerebral palsy is 68-90% (Field et al., 2003). Choking on various foods (56% of cases) while eating, the duration of this process for more than 3 hours a day (28%) and mastication difficulties (26%) are all feeding disorders that are commonly encountered in these children (Lopes et al., 2013).

Feeding problems caused by oral motor dysfunction lead to growth and development retardation, while the presence of hypersalivation has major effects on integration into social life (Sığan et al., 2013). Sialorrhea (hypersalivation) or the involuntary loss of saliva due to difficulty retaining it within the oral cavity is a common disorder in children with CP (Lakraj et al., 2013). The inability to retain saliva within the mouth is caused by poor head and lip control and/or lack of coordination of the tongue with a mouth constantly open, or can also be caused by diminished tactile sensations (Kumar, 2015).

The consequences of salivary control disorders are significant and have a major impact on the quality of life for both the child or young person and their families and caregivers (Van der Burg, 2006). Successful management of drooling can alleviate associated hygiene problems, improve physical appearance, increase self-esteem and significantly reduce stress on children or young people with cerebral palsy, their siblings, parents and/or caregivers, as well as the direct impact on health problems (Alrefai et al., 2009).

Oromotor function is an essential part of feeding, chewing, swallowing and communication (Snider et al., 2011). Its impairment frequently leads to temporomandibular dysfunction caused by the presence of muscle spasticity that restricts movements at this level (Fernandes et al., 2015). Recent studies on oral rehabilitation in dentistry for people with special needs have highlighted the importance of temporomandibular assessment in the masticatory, stomatognathic and respiratory functions, as well as in the dental treatment prognosis (Fernandes et al., 2015).

The serious consequences of oromotor function disorders in children with disabilities require therapeutic intervention focused on orofacial education, which will have the effect of improving this physiological process. The literature releases the theory that the application of an orofacial stimulation programme within the complex rehabilitation treatment for children with cerebral palsy can bring significant benefits to increasing their levels of social independence (Banzato et al., 2022).

Purpose of the study. Our paper aims at investigating, within the complex rehabilitation protocol for children with cerebral palsy, the impact of manual orofacial stimulation in order to reduce sialorrhea and improve mandibular range of motion and mandibular lateral deviation, with an important role in downward and lateral movements of the mandible during the feeding process.

Hypothesis. Manual orofacial stimulation of the peri- and intraoral muscles and structures reduces sialorrhea and improves mandibular range of motion and mandibular lateral deviation in children with cerebral palsy.

Methodology

Participants and Procedure

Our experimental study took place at the Elena Căciulan Fizioclinique Rehabilitation Centre in Bucharest between June 2023 and January 2024. Conducted over a period of 7 month, our rehabilitation protocol focused on the benefits of passive movement as opposed to active exercise and speech therapy exercises which are the most frequently used in oral motor rehabilitation. These orofacial manipulations and techniques produce, in the case of children with CP, kinaesthetic, proprioceptive and emotional sensations, helping them to develop a better awareness of their faces, as they address both peri- and intraoral muscles and structures.

This manual stimulation is also a very effective and easy-to-apply option even in the case of patients with a low cognitive level, because it requires their minimum involvement.

The study included 10 participants (5 girls and 5 boys) aged 8-10 years, diagnosed with cerebral palsy, spastic tetraplegia form with severe orofacial impairment. For each child in the study group, a participation agreement was drawn up and signed by their caregivers.

Inclusion criteria:

- severe orofacial impairment with the presence of sialorrhea, as well as chewing and swallowing problems;
- residence in Bucharest;
- possibility to participate in the physiotherapy programme 4 times a week.

Exclusion criteria:

- mental retardation;
- previous history of seizures;
- associated diseases.

Patients were tested initially, at the beginning of orofacial stimulation, and finally, after 7 months of specific therapy, given that progress is slow for the child with CP throughout the rehabilitation process.

Sialorrhea was assessed using the Thomas-Stonell and Greenberg Scale, and two objective measurements of the mandible were also used, namely mandibular range of motion and mandibular lateral deviation, with an important role in assessing the functional status of the masticatory system (Jalis et al., 2016). The Thomas-Stonell and Greenberg Scale (Thomas-Stonell & Greenberg, 1988) aims to assess the severity of hypersalivation or drooling (which is common in cerebral palsy) on a scale of 1 to 5 as follows:

- 1 - dry (never drools);
- 2 - mild (wet lips only);
- 3 - moderate (wet lips and chin);
- 4 - severe (wet clothes);
- 5 - profuse (wet clothes, hands, trays, objects within reach).

Mandibular range of motion is measured with the ruler, the unit of measurement is the centimetre, and it is performed as follows:

Patient's position:

- lying supine on the treatment table.

Physiotherapist's position:

- standing sideways to the patient;
- the physiotherapist, with a grip on the patient's mandible and a counter-grip on their forehead, will perform passive raising and lowering movements of the mandible to determine its maximum point of descent where the measurement will be made.

Measurement technique

Using the ruler, the distance between the midline of the central incisors in the upper arch and the midline of the central incisors in the lower arch will be measured; the normal value of mandibular range of motion for a child aged 8-10 years is 3-4 cm (Figure 1).

Figure 1. Measurement of mandibular range of motion

Mandibular lateral deviation is also measured with the ruler, and the unit of measurement is the millimetre. The lateral axis of the mandible to the right and to the left is measured as follows:

Patient's position:

- lying supine on the treatment table.

Physiotherapist's position:

- standing sideways to the patient;
- the physiotherapist, with a grip on the patient's mandible and a counter-grip on their forehead, will perform passive lateral movements of the mandible to determine the maximum point of lateral deviation where the measurement will be made.

Working technique:

The distance between the midline of the upper central incisors and the midline of the lower central incisors will be measured with the mandible moved to the right and then to the left; the normal value of mandibular lateral deviation for a child aged 8-10 years is 3-4 mm (Figure 2). The limited lateral movement of the mandible restricts its rotational movement, which is the most important phase of mastication.

Figure 2. Measurement of mandibular lateral deviation

Rehabilitation protocol

Our study highlights a personalized orofacial intervention protocol for children with CP in order to reduce sialorrhea and improve mandibular movements, with an important role in feeding process. The protocol consisted of a manual orofacial stimulation programme using manipulations specific to general massage, passive stretching techniques and passive mobilisations of peri- and intraoral muscles and structures (Table 1).

Effleurage manipulations have a sensory stimulation effect, and those applied to the forehead, from the centre to the periphery, have an effect on the mouth closing and opening movements and on peripheral vision, also activating the rhythm of the sphenoid bone movements. Friction applied to the masseter muscles have the effect of combating muscle hypotonia at this level, and their contraction causes saliva to be removed from the parotid gland. Stimulation of the facial muscles through tapotement movements with the fingertips activates the mandibular nerve and plays a role in the translational movements of the mandible thus preparing mastication, but also has a sensory role.

Passive stretching applied to the masseter muscles helps the mastication process by pulling the mandible upwards and forwards, and when applied to the temporal muscles, it activates them and achieves the mouth closing movement. Temporomandibular stretching (Figure 3) also results in better control of the downward movement of the mandible during mastication. Also, passive downward and lateral mobilisations of the mandible aim to increase range of motion in the temporomandibular joint and to achieve better control of the mouth closing movement, with a role in keeping the food bolus within the mouth.

Figure 3. Temporomandibular passive stretching

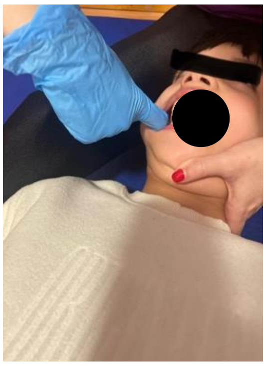

Figure 4. Intraoral stimulation

Intraoral stimulation through effleurage manipulations performed inside the oral cavity on the upper and lower gingival surfaces and also the masseter and pterygoid muscles (Figure 4) produces a raising and lowering movement of the lingual apex, as well as the displacement and orientation of the tongue towards the stimulus, which intensifies its lateral movement and thus increases the muscle tone at this level, a process that prepares the child for handling the food bolus. By stimulating the soft palate, which has a large number of trigeminal nerve endings, information is provided to the postural control centres, with effects on the position of the head, teeth and dental arches.

Table 1. *Peri- and intraoral muscle stimulation*

Massage manipulation/technique	Description	Dosage
1. Effleurage	The physiotherapist applies slowly, with light touches from the chin to the temporal area at the level of the masseter and temporal muscles and to the forehead, from the centre to the periphery.	5/10 repetitions
2. Friction	The physiotherapist applies friction movements to the masseter muscles on the both sizes of the face at the same time.	5/10 repetitions
3. Tapotement (percussion)	The physiotherapist applies tapotements movements with the fingertips, from the earlobe to the lip commissure and then from the chin to the lower lip and from the nasal wings to the upper lip.	5/10 repetitions
4. Masseter muscle passive stretching	The physiotherapist stretches, for 5 seconds, with the fingers of both hands, at the level of the mandible and the zygomatic bone.	2/3/ repetitions
5. Temporal muscle passive stretching	The physiotherapist stretches, for 5 seconds, with the fingers of one hand, on the coronoid process and with the fingers, from the other hand, in adduction (" fan" position), at the level of temporal fossa.	2/3/repetitions
6. Temporomandibular stretching	The physiotherapist stretches, for 5 seconds, with the thumb and the index on one side and on the other of the temporomandibular joint, on the both sides of the face at the same time.	2/3/repetitions
7. Stimulation of the suprahyoid muscles	The physiotherapist catches with the thumbs and the fingers, from both hands, the mandible, on one side and on the other of the chin protuberance and slight pressure is applied, for 5 seconds, on the genioglossus and mylohyoid muscles.	5/10 repetitions
8. Passive downward and lateral mobilisations of the mandible	The physiotherapist catches with the thumb and the index the chin and perform passive movements of raising and lowering the mandible.	5/10 repetitions
9. Intraoral stimulation- 1st Technique	The physiotherapist applies effleurage manipulations (using gloves) with the index finger on the gingival surfaces (upper and lower), from the level of the incisors to the left/right side.	5 repetitions
10. Intraoral stimulation- 2nd Technique	The physiotherapist applies effleurage manipulations with the index finger, on the intraoral wall, right/left, at the level of the masseter and pterygoid muscles.	5 repetitions

11. Intraoral stimulation-3rd Technique	The physiotherapist performs, with the index finger, through effleurage manipulations, stimulation of the palatine veil, from the posterior to the incisors, then from the posterior to the canines (at 45º), to the premolars (65º) and to the molars (at 90º).	5 repetitions

Each physiotherapy session lasted 20 minutes, the order of the manipulations and techniques being respected according to the principle of progression throughout the study; thus we started with simple fingertip movements, consisting of light and fine pressure applied to the perioral muscles, we continued with the stretching techniques and at the end we performed passive mobilisations of the mandible, which generally presents a higher degree of discomfort because of the lack of mobility at the level of the temporomandibular joint. Perioral applied orofacial therapy will always precede intraoral stimulation since the oral cavity is an intimate and sensitive area and children need time to get used to the therapy.

As for the number of repetitions, it was set according to the severity of orofacial disorders established at the initial assessment.

Of the 10 study participants diagnosed with CP, two showed a lower level of orofacial disorders, therefore, in the first 10 sessions, we started with 5 repetitions of facial massage manipulations, 2 repetitions for each stretching technique and 5 repetitions of passive mobilisations of the mandible. In the following sessions, the number increased to 10 repetitions of facial massage manipulations, 3 repetitions for each stretching technique and 10 repetitions of passive mobilisations of the mandible; this dosage was maintained until the end of the study, with intraoral massage being also introduced.

The other eight participants in the study showed an increased level of orofacial disorders, therefore, in the first 10 sessions, we started with 3 repetitions of facial massage manipulations, 1 repetition for each stretching technique and 3 repetitions of passive mobilisations of the mandible, continuing then, in the following 5 sessions, with 5 repetitions of facial massage manipulations, 2 repetitions for each stretching technique and 5 repetitions of passive mobilisations of the mandible.

After the first 15 sessions, the number increased to 10 repetitions of facial massage manipulations, 3 repetitions for each stretching technique and 10 repetitions of passive mobilisations of the mandible; this dosage was maintained until the end of the study, with intraoral massage being also introduced. Every day, study participants performed at home manual facial massage procedures and passive stretching techniques recommended by the physiotherapist. Throughout our experimental study, ethical research principles were respected, anonymity was ensured, and research data were analysed and kept confidential.

Results

Preliminary data analysis highlighted that no outliers (extreme values) were identified for the scores achieved by the study participants on the Thomas-Stonell and Greenberg Scale applied to determine the degree of sialorrhea severity. The main descriptive statistics indicators were calculated for the initial and final scores obtained by the group of participants (N = 10) on this rating scale.

We present below the initial and final values of the main statistical indicators, namely: mean (m), median (the middle point in a dataset), mode, standard deviation (SD), coefficient of variance (Cv), skewness (a measure of asymmetry) and kurtosis (a measure of flatness), for the experimental group of 10 participants (N = 10) in order to analyse their scores and thus establish the degree of sialorrhea severity.

Descriptive statistics indicators – Initial and final testing – 4 rating scales

Table 3. *Descriptive statistics indicators – Thomas-Stonell and Greenberg Scale – Subjective assessment*

Statistical indicators	Degree of sialorrhea severity (Thomas-Stonell and Greenberg Scale)
Initial assessment	
N	10
Mean	4.20
Median	4.00
Mode	4.00
Standard deviation	0.42
Coefficient of variation	0.10
Skewness	1.779
Kurtosis	1.406
Final assessment	
N	10
Mean	3.00
Median	3.00
Mode	3.00
Standard deviation	0.82
Coefficient of variation	0.27
Skewness	0.000
Kurtosis	-1.393

Table 3 shows the initial and final values of the main descriptive statistics indicators obtained for sialorrhea severity (Thomas-Stonell and Greenberg Scale).

At the initial assessment, statistical indicators highlighted that:

- On the Thomas-Stonell and Greenberg Scale (sialorrhea severity), the group achieved the following scores: mean = 4.20, median = 4.00, mode = 4.00, SD = 0.42, coefficient of variation = 0.10, indicating that the group was homogeneous; skewness (-1.779) and kurtosis (1.406) fell within the range ± 1.96, showing that the normality of the data distribution was ensured (Hahs-Vaughn & Lomax, 2020).

At the final assessment, statistical indicators revealed that:

- On the Thomas-Stonell and Greenberg Scale (sialorrhea severity), the group achieved the following scores: mean = 3.00, median = 3.00, mode = 3.00, SD = 0.82, coefficient of variation = 0.27; skewness (0.000) and kurtosis (-1.393) fell within the range ± 1.96, showing that the normality of the data distribution was ensured.

Elements of inferential statistics

Using the non-parametric Wilcoxon test for two dependent samples (Labăr, 2022), we investigated the existence of statistically significant differences between the results recorded on this rating scale at the initial and final testing. Thus, the scores obtained were compared in order to determine the degree of sialorrhea severity (Thomas-Stonell and Greenberg Scale).
Significant differences ($p < 0.05$) were found between participants' scores achieved at the initial testing (median = 4.00) and final testing (median = 3.00) in terms of sialorrhea severity.

The effect size is r = 0.70 (Ellis, 2010) for sialorrhea severity, indicating a very strong treatment effect on participants' scores, which significantly improved from severe to moderate sialorrhea.

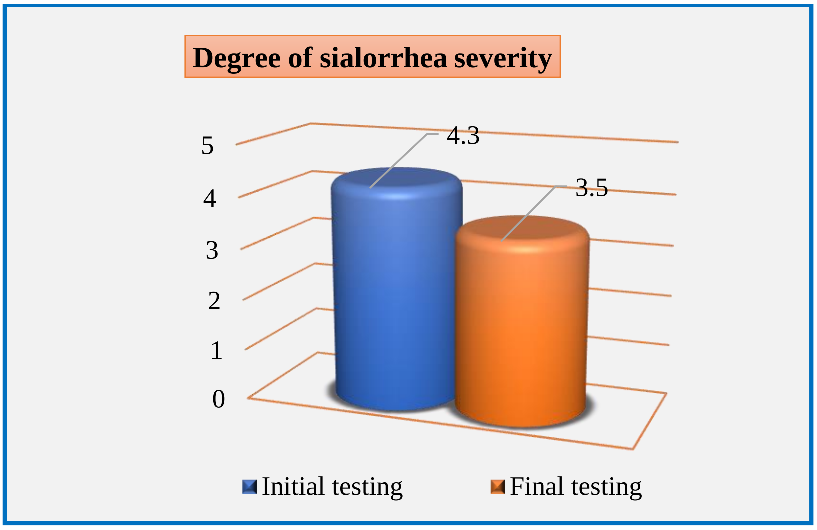

Figure 5. Comparison of initial and final testing results for sialorrhea severity

Figure 5 shows the comparison of mean scores obtained by the research participants at the initial and final testing for the degree of sialorrhea severity, which significantly improved ($p < 0.05$), with a 18, 6% progress rate, after applying the rehabilitation protocol.

Measurement results for mandibular range of motion and mandibular lateral deviation

Preliminary data analysis highlighted that no outliers (extreme values) were identified in the scores achieved by the study participants when measuring their mandibular range of motion and mandibular lateral deviation. The main descriptive statistics indicators were calculated for the group of participants, considering the results obtained from the initial and final measurements.

We present below the values of the main statistical indicators: mean (m), median, mode, standard deviation (SD), coefficient of variation (Cv), asymmetry index (skewness) and flatness index (kurtosis) for the 10 research participants (N = 10), in the case of measurements performed during the initial testing.

Table 4. *Descriptive statistics – measurement results for mandibular range of motion and mandibular lateral deviation – initial testing*

Statistical indicators	Initial testing results	
	Measurement of mandibular range of motion (cm)	Measurement of mandibular lateral deviation (mm)
N	10	10
Mean	2.69	1.90
Median	2.00	1.00
Mode	2.00	1.00
SD	1.31	1.37
Cv	0.48	0.26
Skewness	1.45	2.62
Kurtosis	0.09	8.02

Table 4 shows the values of the main descriptive statistics indicators resulting from the initial assessment of mandibular range of motion and mandibular lateral deviation:

- Regarding the measurement of mandibular range of motion, the group achieved the following scores: mean = 2.69 (cm), median = 2.00, mode = 2.00, SD = 0.48, coefficient of variation = 0.48, indicating that the results were heterogeneous and the group was not homogeneous; skewness = 1.45 and kurtosis = 0.09, so the normality of the data distribution was ensured;
- Regarding the measurement of mandibular lateral deviation, the group achieved the following scores: mean = 1.90 (cm), mode = 1.00, median = 1.00, SD = 1.37, coefficient of variation = 0.26, indicating that homogeneity was ensured; skewness = 2.62 and kurtosis = 8.02, showing that the distribution was asymmetric, leptokurtic (positive kurtosis).

Table 5. *Descriptive statistics – measurement results for mandibular range of motion and mandibular lateral deviation – final testing*

Statistical indicators	Final testing results	
	Measurement of mandibular range of motion (cm)	Measurement of mandibular lateral deviation (mm)
N	10	10
Mean	3.41	2.41
Median	3.00	1.5
Mode	2;5	5
SD	1.41	2.26
Cv	0.41	0.93
Skewness	0.20	0.29
Kurtosis	-1.63	1.64

Table 5 shows the values of the main descriptive statistics indicators resulting from the final assessment of mandibular range of motion and mandibular lateral deviation. Thus, we can highlight the following relevant aspects:

- Regarding the measurement of mandibular range of motion, the group achieved the following scores: mean = 3.41 (cm), median = 3.00, the data distribution was bimodal because there were two values that appeared with the highest frequency: 2.00 and 5.00, SD = 1.41, coefficient of variation = 0.26, indicating that the results were heterogeneous and the group was not homogeneous; skewness = 0.20 and kurtosis = -1.63, so the normality of the data distribution was ensured;

- Regarding the measurement of mandibular lateral deviation, the group achieved the following scores: mean = 2.41 (cm), median = 1.00, mode = 5.00, SD = 2.26, coefficient of variation = 0.93, indicating that the homogeneity of the results was not ensured; skewness = 0.29 and kurtosis = 1.64, so the data were normally distributed.

Using the non-parametric Wilcoxon test for two dependent samples (Labăr, 2022), we investigated the existence of statistically significant differences between the results recorded on this rating scale at the initial and final testing.

Application of this statistical procedure was aimed at comparing the results obtained by the experimental group in the two assessments focused on measuring mandibular range of motion and mandibular lateral deviation at the two testing times, namely before and after the experimental intervention (kinetic treatment applied to the research participants).

Table 6. *Results for the two measurements – scores achieved at the initial vs. final testing*

Wilcoxon test	Initial testing vs. final testing	
	MAM	MDLM
Wilcoxon	0	3.5
Z	-2.803	-1.467
p	0.00	0.00
r	0.88	0.46

Note: MAM = measurement of mandibular range of motion; MDLM = measurement of mandibular lateral deviation.

Statistical data analysis shown in Table 6 compares the results recorded at the initial testing with the results recorded at the final testing for both measurements applied to the research participants (N = 10), highlighting that:

There are statistically significant differences ($p < .01$) between initial testing results (median = 2.00) and final testing results (median = 3.00) for the measurement of mandibular range of motion.

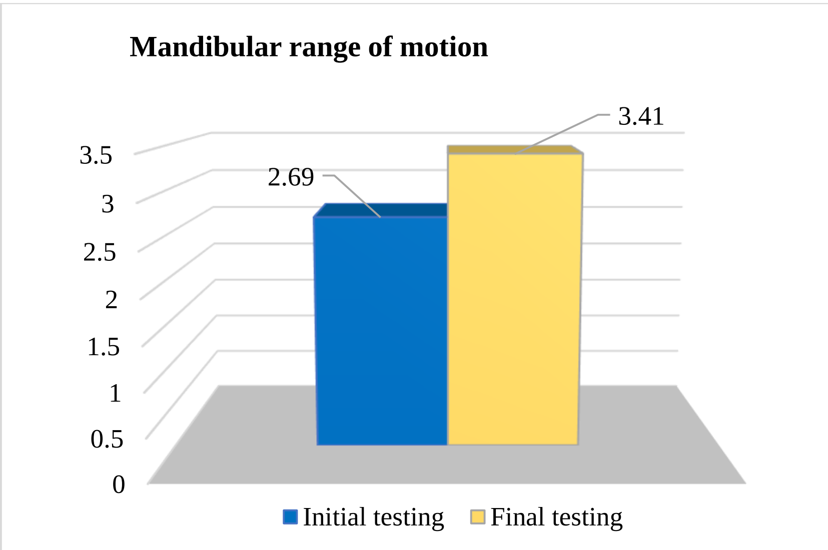

Figure 6. Comparison of initial and final testing results for mandibular range of motion

The effect size indicator is r = 0.88 (Ellis, 2010), which highlights a very strong effect of the intervention (kinetic programme applied to participants) on the study results for mandibular range of motion.

Figure 6 shows the difference between participants' results obtained at the initial assessment, where their mean score for mandibular range of motion was 2.69 (cm), and participants' results obtained at the final assessment, where their mean score was 3.41 (cm) after the experimental intervention, with a 26,7% progress rate, the final score being close to the value considered normal for the age of the children included in the research.

There are also statistically significant differences ($p < .01$) between initial testing results (median = 1.00) and final testing results (median = 1.5) for the measurement of mandibular lateral deviation.

The effect size is r = 0.46, which indicates a strong effect of the experimental intervention on the results obtained for mandibular lateral deviation.

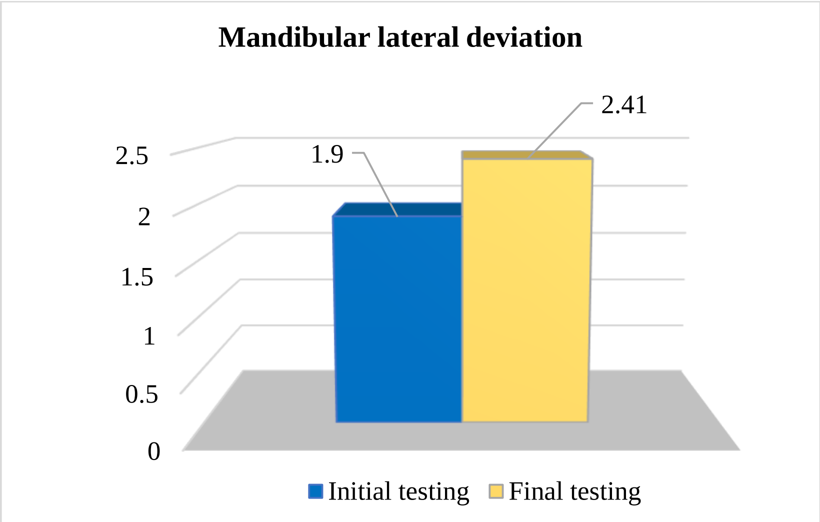

Figure 7. Comparison of initial and final testing results for mandibular lateral deviation

Figure 7 graphically illustrates the existence of significant differences in mandibular lateral deviation between the two testing times (initial and final ones), as a result of comparing the arithmetic means. Before the experimental intervention, the research participants had a mean score of 1.90 (mm), while at the final assessment, their mean score was 2.41 (mm), indicating a significant improvement ($p < .01$) in their results, with a 26,8% progress rate.

Discussion

The present study aimed to investigate the impact of manual kinetic stimulation of peri- and intraoral muscles and structures on the reduction of sialorrhea and the improvement of mandibular movements in children with cerebral palsy.

As regards orofacial education, studies have highlighted the positive impact of peri- and intraoral muscle stimulation through passive stretching techniques on improving tongue, lip and mandible control, with a significant correlation being observed particularly between good tongue function and speech improvement in children with cerebral palsy (Ray, 2001).

The study conducted by Min et al. (2022) also showed a significant improvement in oral motor function and feeding skills, including mouth closure, lip closure on the feeding utensil, lip closure during deglutition, food control during swallowing and mastication, straw suction and fluid control during deglutition after a 16-week period of using orofacial stimulation techniques. Mouth closure was the most effective and mastication was the least effective item following the use of these techniques.

A systematic literature review study (El Nagar et al., 2021) demonstrated the effects of sensory stimulation through facial massage procedures associated with passive and active orofacial exercises on reducing sialorrhea and improving mastication in children with CP. Another study based on a review of the literature from 2000 to 2016 (McAllister et al., 2018) highlighted the importance of intraoral sensorimotor stimulation for children with orofacial, deglutition and saliva control impairments through techniques aimed at increasing intraoral muscle tone, coordination and movements of the tongue, lips and mandible, in combination with passive muscle stretching and sensory stimulation techniques aimed at influencing the physiology of oropharyngeal mechanisms. Following the intervention, mastication and swallowing were improved during spoon-feeding and liquid ingestion.

As regards the importance of mandibular movements during feeding, in the sense of reducing possible pain at this level and achieving better control during mastication, Malawade et al. (2023) noted the effectiveness of temporomandibular mobilisations and posture education to improve mandibular movements during mastication in children with neurological impairments and severe feeding disorders.

The study results obtained after applying the proposed rehabilitation protocol emphasised the benefits of manual orofacial stimulation through specific massage manipulations, passive facial stretching techniques and passive mobilisations, with a strong impact on reducing sialorrhea and increasing mandibular range of motion and mandibular lateral deviation, which play an extremely important role in the feeding process of children with cerebral palsy.

Although the literature highlights various orofacial approaches, the present study comes as a complement to it, and we believe that the integration of peri- and intraoral manual stimulation techniques in the complex rehabilitation programme of children with neurological disorders can bring additional benefits to improving the feeding process of them.

We also highlight the impact of our study on these children and their families, both medically and socially, through a faster rehabilitation, after 7 month of orofacial intervention the sialorrhea significantly improved, with a 18,6% progress rate, the mandibular range of motion and lateral deviation with a 26,7% and 26,8% progress rate, reached almost normal scores even, all these aspects translate into possibilities of faster adaptation to social life and different feeding possibilities and care assistance from the family, as well as therapeutically, providing support to specialists in the field, in order to find the most effective methods for the oral motor rehabilitation of cerebral palsy.

Conclusion

For children with cerebral palsy and their families, feeding is a big challenge, especially when these children present severe orofacial disorders, therefore creating personalized orofacial programme according to the particularities of every child as an integral part of the complex treatment for cerebral palsy is imperative.

Orofacial education of children with cerebral palsy is a long-lasting process that requires perseverance and determination especially from their families, for whom it often seems unattainable, but also from the physiotherapist and the entire multidisciplinary team. Consistent application of an individualised orofacial rehabilitation protocol will have notable benefits in terms of reducing sialorrhea and increasing mandibular range of motion and mandibular lateral deviation, which play a very important role in the feeding process of children with cerebral palsy.

Statistical results showed that the proposed intervention programme had a strong impact on the 10 research participants, given that their final scores improved significantly compared to those achieved at the beginning of the study, thus a literature gap concerning the detection of the most effective oral motor rehabilitation methods for these children is filled. As our investigation was conducted on a small sample, the research results should be interpreted with caution, and their generalizability is therefore limited.

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Institutional Review Board Statement: The research was conducted according to the principles stated in the Declaration of Helsinki. The study was approved by the Ethics Committee of the National University of Physical Education and Sport in Bucharest (ID: 52/1701).

Informed Consent Statement: The written informed consent for the participants to take part in the study was obtained.

Data Availability Statement: Data can be made available upon request to the contact author.

Conflicts of Interest: The authors declare no conflicts of interest.

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