CITATION
Stefani CM, de Almeida de Lima A, Stefani FM, Kung JY, Flores-Mir C, Compton SM. Effectiveness of orofacial myofunctional therapy in improving orofacial function and oral habits: a scoping review. *Can J Dent Hyg*. 2025;59(1):59–72.

Supplementary Tables with the Descriptive Characteristics of Included Studies

Supplementary Table S1. Descriptive characteristics of studies on the effectiveness of OMT for treating ankyloglossia-associated OMDs (n = 8)

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Carminatti et al. 2022(1) Brazil	RCT (proper randomization, no allocation concealment, blinded outcome assessor)	To evaluate the effectiveness of frenectomy with or without OMT on tongue general and functional aspects.	Children from six to 12 years with altered lingual frenulum	OMT group: frenectomy followed by OMT (isotonic tongue exercises). 3 times a day for 15 days (starting 15 days after the surgery) (n= 20)	Control group: frenectomy only (n = 20)	Tongue lift, mobility, position at rest, and speech sounds change. Evaluation times: before, 15 days after, and 30 days after the surgery (end of OMT).	Both groups improved after the surgery. Tongue lift, mobility, and speech sound production improved between 15 and 30 days for OMT group ($p < 0.001$). Tongue lift and mobility significantly improved in the OMT group compared to the control group after 30 days ($p < 0.05$).
Saccomanno et al. 2019(2) Italy	RCT (pilot study) (no randomization description, no allocation concealment, no blinding)	To test an OMT protocol for patients with altered lingual frenulum	Children between 4.5 and 11.7 years old with altered lingual frenulum	OMT group: tongue exercises aiming to 1) establish tongue rest posture; 2) increase mouth opening and tongue lift; 3) tone up tongue and mouth floor muscles; 4) improve tongue and soft palate mobility. 15 times each exercise, 3 times daily (min. 30 minutes), for 3 weeks. Home exercises and Office appointments for monitoring. Therapy diary for monitoring. (n = 2)	Home exercises group: same home exercises, same frequency and duration, no office appointments for monitoring and supervising. (n = 2) Untreated control group (n = 2)	Clinical evaluation of tongue and lips strength and endurance, swallowing, and nasal permeability. Evaluation times: baseline and after 3 weeks (end of OMT).	After 3 weeks - Untreated and Home exercises group: no difference from baseline. - OMT group: improvement in tongue position at rest, awareness of the oral cavity, maximum interincisal opening and maximum interincisal opening with the tongue tip in the maxillary incisive papillae, tongue strength and endurance, and breathing function.
Lalakea and Messner 2003(3) USA	Before-and-after (with a control group with no ankyloglossia)	To evaluate the efficacy of frenuloplasty in adolescents and adults	Patients aged 13 or older with ankyloglossia	Frenuloplasty followed by tongue exercises to improve tongue mobility (unsupervised) five times a day for a month after the surgery. (n = 6)	Non-ankyloglossia control group (n = 20)	Tongue elevation: interincisal distance with the mouth maximally open (tongue tip in contact with upper dentition).	After 1 month: - all patients reported gains in at least 3 of 6 categories of tongue function (eg, ability to lick lips).

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
						Tongue protrusion: maximum protrusion of the tongue tip past the lower teeth. Patients self-reported complaints (questionnaire) Evaluation times: baseline, 1 week, 1 month (end of OMT), and 3 months postoperatively	- tongue mobility significantly improved for both protrusion ($p< 0.05$) and elevation ($p<0.001$) compared with baseline. Reduced compared with normal controls (no statistical significance). After 3 months: stable or improved subjective tongue function, protrusion, and elevation.
Messner and Lalakea 2002(4) USA	Before-and-after	To evaluate the efficacy of frenuloplasty in children	Children aged 2 to 12 years with ankyloglossia	Frenuloplasty followed by tongue exercises to improve tongue mobility (unsupervised) five times a day for a month after the surgery. (n = 20)	NA	Tongue elevation: interincisal distance with the mouth maximally open (tongue tip in contact with upper dentition). Tongue protrusion: maximum protrusion of the tongue tip past the lower teeth. Speech sounds production. Evaluation times: baseline, 1 week, 1 month (end of OMT), and 3 months postoperatively	After 3 months: - Improvement in tongue elevation and protrusion ($p<0.01$). Both measurements improved from T1 to T3 (after OMT) - no statistical analysis. - 9 in 11 (82%) of showed speech improvement.
Scarano et al. 2023(5) Italy	Retrospective cohort	To evaluate the effectiveness of atmospheric plasma (voltaic arc dermabrasion) for the frenectomy of a short lingual frenulum.	Children aged 6 to 11 years (mean age 8.8 years) with ankyloglossia classified as class III or IV (Kotlow's classification).	Frenectomy followed by OMT tongue exercises: one sequence, 15 times daily to improve tongue mobility. Starting one week before the surgery and continuing for 45 days after the surgery (one, two, or three sequences – depending on the post-surgical moment, 15 times a day). (n = 30)	NA	- maximal interincisal mouth opening (MIO) - interincisal mouth opening with tongue tip to maxillary incisive papillae (MOTTIP) - Kotlow's free-tongue measurement (length from base of tongue insertion of the lingual frenulum to the tip) - Measured with the Quick Tongue Tie Assessment Tool® (QTT) Evaluation times: before and after the surgery, one week, one and two months after.	All outcomes (Kotlow's free-tongue measurement, MOTTIP, and MIO) were statistically different from the baseline after one week, one month, or two months. No significant differences were detected between one week, one month, or two months.
REVIEWS							

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Gonzalez-Garrido et al. 2022(6) Spain	Systematic review	To provide an updated perspective on OMT research in ankyloglossia and to analyze its efficacy - as an adjunct or not to frenectomy - in improving patients with ankyloglossia.	Individuals of any age with ankyloglossia	OMT as an adjunct to frenectomy or as a single treatment	- no treatment - surgery alone - other therapies	Any physical variable susceptible to improvement after OMT	- 11 studies included - Only one has not performed frenectomy - Almost half have not specified the protocol used for OMT. - Treatment lasted about 4 weeks in most of the studies Conclusion: - Surgery was more effective than OMT - better results when combined. - OMT improved tongue mobility, strength, and endurance; sleep apnea; mouth breathing and snoring; quality of life; clenching teeth; myofascial tension; pain after surgery; and speech sound production
Inostroza-Allende et al. 2021(7) Chile	Integrative review	To present the speech therapy intervention strategies used after lingual frenulum surgery in children, adolescents, and adults.	Children over three years old, adolescents, and adults undergoing lingual frenulum surgery.	Speech therapy or OMT	NI	- Exercises / therapeutic protocol description - effectiveness (tongue position at rest/tongue mobility/speech / other)	- 10 included studies - all with positive results. - 4 used OMT exercises focused on lingual mobility. - 5 used a combination of OMT and speech therapy - 1 used exercises for other functions. - 3 started exercises before the surgery. - Postoperative rest time: 1 started OMT immediately / other between 1 to 7 days. Exercise frequency: between 3 and 20 repetitions / 2 to 5 daily / for 1 to 2 months Conclusions: The importance of speech therapy in the multidisciplinary approach to the lingual frenulum is concluded.

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Miranda et al. 2016(8) Brazil	Systematic review	To conduct a systematic review of the evidence on the types of interventions used in the lingual frenum alteration and its evolution.	NI	Surgery/speech therapy or both	NI	NI	Of 26 included studies, only 4 combined OMT with surgery: - all subjects underwent tongue exercises after surgery. - One study added the articulation of consonants to the list of exercises. - One study mentioned that some individuals developed speech normally while others needed speech therapy. Conclusion: Surgery is the most effective approach for improving symptoms due to ankyloglossia. However, the speech does not always fit the expected pattern, which justifies working with a speech therapist for better results.

Notes: OMT (orofacial myofunctional therapy), OMDs (orofacial myofunctional disorders), RCT (randomized controlled trial), NA (not applicable), NI (not informed)

Supplementary Table S2. Descriptive characteristics of studies on the effectiveness of OMT in the treatment of atypical swallowing (n = 9)

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Begnoni et al. 2020(9) Italy	Before-and-after	To analyze the effects of OMT on muscular function and behavior in a group of patients with atypical swallowing and second dentition completed.	adolescents (mean age 14.75±1.60 years) and young adults (mean age 23.66±4.80 years) with atypical swallowing	- according to Garliner method (Garliner,1974(10)) - 10 weekly sessions of 45 min - daily exercises at home (n = 15)	NA	- EMG (masseter / anterior temporalis and submental muscles) during swallowing. - Clinical evaluation (OMES analysis – appearance, position, mobility, functions, mastication) Evaluation times: baseline and 10 weeks (end of OMT)	Clinical results: - All participants showed complete clinical recovery - Total OMES showed a statistical difference between the intervention's beginning and end ($p < 0.01$). - Appearance and posture, mobility, and function OMES subscales showed statistical differences - mastication did not. ssEMG results: decreased duration of activation, increased

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
							activity of SM (general redistribution of the muscular activity toward the “healthy model”).
Cayley et al. 2000(11) Australia	Before-and-after	To assess (with electropalatography and cephalometry) the effectiveness of OMT in producing soft and hard tissue changes in a group of patients with anterior open bite.	boys with 9.93 +- 1.02 years	Tongue re-education therapy (Zante, 1994(12)): - 20-minute fortnightly sessions (maximum 4 sessions) - First stage: development of new muscle patterns for correct lip and tongue postures and swallow - Second stage: instruction and practice in normal swallowing using liquid and semi-solid materials (n = 8)	NA	- Electropalatography - Cephalometry (open bite) - Clinical evaluation (for success: child able to use old and new swallowing patterns on command, and new was generalized) Evaluation times: baseline and at 30 days (end of OMT)	Clinical evaluation: 5 in 7 children - successful swallowing reeducation. - Cephalometry: tendency of open bite reduction with further eruption of upper and lower incisor teeth (no statistical difference) - Electropalatography: small differences for swallowing (no statistical difference) / more anterior pattern of palatal contact / more consistent and definite contact pattern for water and saliva swallows after therapy.
Christensen and Hanson 1981(13) USA	RCT (no randomization description, no allocation concealment, blinded outcome assessors)	To investigate the assumption that oral myofunctional services might facilitate the remediation of articulation disorders. To answer the questions: 1) Can therapy successfully correct tongue thrust? 2) Will therapy for tongue thrust - emphasizing proper lingual resting postures - facilitate correction of an /s/ defect? "	Public school children who completed kindergarten and would be entering first grade at the end of summer with ages ranging from 5y 8m to 6y 9m (mean age 6y 2m)	OMT + Speech Therapy (ST) Group: - 22 individual half-hour sessions once a week for six weeks and twice a week for eight weeks (14 weeks) - Tongue thrust and articulation services: tongue-thrust services (according to Barrett and Hanson, 1978(14) and Falk, 1977(15)) for 6 weeks / alternating sessions of tongue-thrust and articulation services for eight weeks - Home assignments - Parental supervision (n = 5)	ST group: - 22 individual half-hour sessions once a week for six weeks and twice a week for eight weeks (14 weeks) - Articulation service (the same for both groups / thoroughly described in article) - Home assignments - Parental supervision (n = 5)	a) Tongue-tip placement - word repetition test to evaluate tongue-tip placement in production of /t/ /d/ /l/ /n/ /s/ and/z/. b) Clinician-designed picture articulation test: spontaneous production of 24 s-words and 8 z-words c) the Goldman-Fristoe Test of Articulation d) a tongue-thrust assessment of tongue position and movement during swallows of liquids/solids and saliva(14) Evaluation times: baseline and 14 weeks – end of therapy	- Intragroup comparisons: except for Group ST tongue-thrust, both groups significantly improved after treatment (tongue tip placement, /s/ and /z/ articulation, Goldman-Fristoe articulation test). - Intergroup comparisons: No difference between groups for tongue-tip placement, /s/ and /z/ articulation, Goldman-Fristoe test of articulation). Tongue-thrusting differed between groups (p < 0.05): 4 in 5 children in OMT + ST group showed normal swallowing pattern versus none in the ST group after 14 weeks.
Farret et al. 1997(16) Brazil	Non-RCT	To evaluate the recurrence rate of atypical swallowing 03	Children aged 8 to 11 years (mean age of 9.5	OMT + MT (Mechanical therapy) group:	MT group (as previously described) (n = 10)	Treatment relapse (clinical evaluation of	At the end of the therapy (5 months): 60% of OMT +MT

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
		years after a differentiated treatment to which 18 children with atypical swallowing were subjected.	years) with atypical swallowing	OMT - three phases: 1) raising the awareness of the need to correct the problem; 2) correction phase of the atypical function; and 3) automation phase (according to Segóvia 1988(17); Ferraz 1984(18)). (no information on session number, frequency, and duration) MT: re-educating removable device during the day/crib device at night (according to Farret et al. 1996(19)). (n = 10)		swallowing pattern - no further description) Evaluation times: Baseline, 5 months (end of therapy) and 3 years after therapy)	group with normal swallowing pattern and 40% in automation phase. In MT group 20% with normal swallowing pattern, 80% no improvement. - 3 years after therapy): 10/10 children in OMT + MT group with normal swallowing pattern. MT-only group 88% (7 in 8) with normal swallowing pattern - 1 child showed no improvement / 2 lost in follow-up.
Giuca et al. 2008(20) Italy	Before-and-after	To verify the effects of a myofunctional protocol - composed of a series of exercises to correct the anomalous function and position of the tongue.	children aged 5 to 13 years, non-orthodontic patients with atypical swallowing	Adapted from Garliner(10) (1974) and Levrini (1977): - 8 sessions - exercises 4 or 5 times a day - identification exercises: tongue brushing (both sides from base to tip) - lateral pressure on the tongue edges - different types of pressure: dorsal/inferior - cooling: wet cotton stick on the incisive papilla Tongue posture: with orthodontic rubber bands on the tip of the tongue / put in the incisive papilla - swallowing as spontaneous act: autosuggestion and memoranda - 14% with severe Class II treated with Bionator appliance. (n = 57)	NA	Clinical evaluations: (1) First session: - type of swallowing - labial and lingual posture - presence of hypertrophic adenoids and/or tonsils - dentomaxillofacial dysmorphisms - lingual frenulum - bad habits - sensibility and mobility of the tongue - dyslalia (2) follow-up sessions - changes in: - labial and lingual posture - breathing - tongue mobility and sensibility - swallowing pattern - perioral contraction Evaluation times: baseline, 1, 4, and 8 weeks	Comparison before and after therapy: - low tongue posture: 65% before, of which 54% were corrected. - reduced tongue movements: 49% before, of which 74% were corrected - reduced tongue sensibility: 49% before, of which 89% improved - lip incompetence (specific exercises for the lips): 62% before, of which 38% improved - 47% of the children obtained a physiologic swallowing - 62% of the patients treated with bionator and OMT obtained a correct swallowing

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Heinzelmann et al. 2009(21) Germany	Case-control (non-paired)	To determine which of the suspected factors (assumed by Kittel, 2004(22)) have an influence and to what extent they affect the outcome (physiological swallowing pattern).	Children treated according to Kittel's(22) concept for atypical swallowing	Group achieving success after OMT: - food or drink / saliva swallowing 80% correct (n = 35)	Group not achieving success after OMT (incorrect food or drink/saliva swallowing) (N = 14)	Factors explored: - restoring the normal orofacial muscle tone - patients' participation frequency - therapy setting - muscular requirements - Motivation of the patient - Parental cooperation with the success of treatment. Evaluation times: not specified. After the OMT intensive phase.	Success was more frequent among girls (77%) than boys (55%). Children in the success group were older (mean age 12.8 vs 9.6 years). 62% of the success group were in group therapy vs 42% in unsuccessful group. Orthodontic treatment was more frequent, and oral habits more infrequent in success group. OMT success was associated with: - Sex (girls over boys) - type of therapy (group over individual) - Parental participation (positively associated with motivation).
Mozzanica et al. 2021(23) Italy	Before-and-after (with two subgroups divided according to the dentition – mixed versus complete)	To provide additional information regarding the efficacy of OMT in patients with tongue thrust. In particular: - to analyze the modifications of oral and facial motricity and tongue strength following OMT using validated instruments. - to analyze the correlations between oral and facial motricity and tongue strength. - To evaluate the effect of dentition on the results obtained with OMT.	Children (mixed or complete dentition) referred to the Department of Phoniatrics and Speech and Language Pathology because of tongue thrust or myofunctional disorders by the Dental Department.	Intermediate dentition group (permanent incisors and fully erupted first molars with deciduous teeth in the buccal region). OMT according to the Garliner method(10): - 10 weekly sessions of 45 min each in office and daily exercises at home; - OMT consisted of isometric and isotonic exercises involving the tongue, soft palate, and lateral pharyngeal wall; - designed to improve suction, swallowing, chewing, breathing, and speech functions; - home exercises: at least thrice daily with 10–20 repetitions each time. (n = 10)	Complete dentition group (only permanent teeth present): submitted to the same OMT protocol. (n = 12)	1) Orofacial Myofunctional Evaluation with Scores (OMES) (maximum total score of 104 - indicating the best possible condition): • Appearance and posture: face, lips, jaw, cheeks, and tongue. • Mobility: lips, tongue, jaw, and cheeks. • Functions: breathing and swallowing. • Mastication: biting, chewing pattern, and dysfunctional behavior during mastication. 2) Tongue strength: Iowa Oral Performance Instrument (IOPI) - to measure the peak pressure (in kPa) exerted by the tongue. Evaluation times: baseline and at the end of OMT (10 weeks).	Significant improvement in the OMES total and subscale scores after OMT. The median OMES total score before the OMT: 84.5 / after 96.5 - when considering all the patients ($p = 0.001$). No differences between groups -mixed or complete dentition. Tongue strength: significant increase in the peak isometric tongue pressure in both the anterior and posterior parts of the tongue after OMT in both groups (no differences between groups).

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
Overstake 1976(24) USA	Quasi-randomized controlled trial (pseudo-randomization process, no blinding)	To investigate the possible relationship within a triad of problems: (l) deviant swallowing, classified as tongue thrusting, (2) orthodontic problems of an open bite and overjet variety, and (3) interdental /s/ speech defects. The efficacy of a treatment program was determined for a group of children exhibiting this combination of problems.	Orthodontic population of children (7 to 12 years old) referred to the investigator by orthodontists in private practice.	Swallow therapy group: therapeutic sessions scheduled at 2, 3, 4, 5, 6, 8, and 10-week intervals for nine months. Treatment in swallowing formulated on kinesiologic principles and by positioning the tongue and mandible in their proper postures just before initiating reflex swallowing behavior. - 15-minute in-office sessions conducted by the investigator. - Home exercises under parental supervision: five minutes before each meal with half a glass of liquid, progressing to semi-solids, then hard, chewy, difficult-to-swallow food. (n = 28)	Swallowing and speech-therapy group: - swallow therapy identical to swallow therapy group. - Speech therapy with acoustic and phonetic placement approach (instructions, e.g., where the tongue was to be placed to produce a normal /s/ sound). - Homework speech practice: 15 minutes before the child went to bed. Practice materials, word lists, phrases, and sentences were suggested. - Combined sessions no longer than 15 minutes. - Same schedule, same period (n = 20)	1. Visual examination for open bite and/or overjet. 2. Normal or deviant tongue-thrust swallowing. 3. Presence of interdental /s/ speech sound defects. 4. Swallow pattern (visual evaluation): - smoothness and flexibility of the swallow, - maintaining the tongue tip on the posterior portion of the gingiva, - correct contraction of temporalis and masseter muscles. Evaluation times: baseline and at the end of OMT (9 months)	1. Swallowing pattern: 41 in 48 (85%) developed normal swallow patterns after therapy (86% in swallow therapy and 85% in swallow and speech therapy groups) - significant difference in intragroup comparison between groups not shown. 2. /s/ sound: 85% (24 in 28 children) of swallow training and 75 % (15 in 20) of the swallow and speech training group developed normal /s/ speech sound. Statistical difference intragroup, difference between groups not shown.
Toronto 1975(25) USA	Retrospective cohort	To present an objective long-term follow-up evaluation of the permanency of corrected swallowing patterns as preconized by Barret and Hanson (1974)(26). To assess some factors which may influence the relapse of tongue thrust after treatment.	Patients who successfully completed tongue thrust therapy with Dr. Barret (9 to 15 years old at the beginning of therapy), with at least 5 years since the end of the therapy.	OMT (according to Barret and Hanson, 1974)(26) (no description). (n = 50)	NA	1) Tongue thrust: - clinical evaluation: tongue pushing against or through the teeth. Other signs: mentalis muscle contraction, pursuing the lips, relaxed masseters. - assessed during swallow: solid food, liquid, saliva -Skirt-gun test: count backward from 100 with the mouth wide open, water skirted into mouth, swallow, continue counting. 2) Factors associated with relapse: interview (habits, breathing type, speech problems, dental trauma, tonsils, orthodontic treatment. Evaluation times: before treatment, 5	- 36 of 50 (72%) retained the correct swallowing pattern. Of whom 20 used braces – one presented orthodontic relapse (but no tongue thrust relapse). - 12 (24%) presented mild thrust. Of whom 8 used braces - one presented orthodontic relapse. - 2 (4%) presented severe thrust - both presenting open bite relapse after orthodontic treatment. - No patient returned to orthodontic therapy after finishing OMT. - Mouth breathing (positively) and respiratory allergies (negatively) were

Study	Design	Objective	Population	Intervention (n)	Comparison (n)	Outcomes and follow-up	Results
						years after treatment ends.	associated with tongue thrust relapse.

Notes: OMT (orofacial myofunctional therapy), RCT (randomized controlled trial), EMG (electromyography), NA (not applicable), NI (not informed)

Supplementary Table S3. Descriptive characteristics of studies on the effectiveness of OMT in the treatment of lip incompetence (n = 13)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
Barber and Bonus 1975(27) USA	Non-RCT (with a non-tongue thrust patients control group)	- To measure the effectiveness of a circumoral myofunctional exercise when applied to a group of children who evidence a tongue-thrust pattern; - To measure the changes in incisor tooth relationships of tongue-thrusting children after periods of circumoral myofunctional exercise.	Children between 7.4 and 19.4 years old with tongue-thrust swallowing pattern	Group 1: circumoral exercises for 6 months. - lip button attached to a spring scale: inserted between the lips and pulled while tensing the lips to resist the loss of the button. - 15 minutes twice daily. - Highest pulling force at the beginning and end of each exercise period (measured by the attached spring scale) recorded by each child in a log - Recall every three or four weeks for clinical evaluation and log collection (n= 7)	Group 2: circumoral exercises for 3 months - same procedures described for group 1. (n= 13) Group 3: untreated group (children with tongue-thrust) (n= 12) Group 4: untreated group (non-tongue thrust group: children with normal swallowing pattern, similar in sex, age, and ethnicity) (n= 9)	- Lip strength measured in ounces by a spring scale. - Cephalometric evaluation of soft tissues outlines, dental and bony profile. - Dental casts evaluation Evaluation times: Group 1 – baseline, 3, 6 and 24 months Group 2 – baseline and 3 months Group 3 – baseline, 3 and 6 months Group 4 – baseline, 3and 6 months	Lip strength after 3 months: Group 1 - 366% increase. Group 2 - 320% increase. Groups 3 and 4 - no changes After 6 months: Group 1 - 579% increase. Groups 3 and 4 - no changes 18 months after exercise cessation: Group 1 – little loss of strength. No differences in cephalometric and dental cast evaluations. Tongue-thrusting habit ceased in some patients after treatment (not the objective of the OMT).
Das and Beena 2009(28) India	Non-RCT	- To establish the degree of improvement in lip seal clinically and ultrasonographically in adenotonsillectomized experimental group children after prescribed 6 months of lip seal therapy and exercises with the oral screen.	Children between 7 and 12 years with enlarged adenoids and tonsils submitted to adenotonsillectomy in a tertiary care facility	Lip seal therapy and exercises with an oral screen Exercises: - Lip pulls - Lip puffer - Blowing balloons - Hold water in the mouth - Button and string therapy - Exercises with an oral screen (Dentaurum) 15–20 repetitions / 4 times a day for 6 months	Control group (same condition, no exercises) (n= 15)	Lip thickness: measured ultrasonographically. Evaluation times: baseline and six months (end of the therapy)	Lip thickness: No significant difference between exercise and control groups in baseline (P >0.05); significant difference after 6 months (P <0.001) - for lower lip in contracted and relaxed positions; for upper lip in the relaxed and contracted positions. Intragroup results: all measures improved in exercise group between pre and post-treatment

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				Parental supervision and log recording (n= 15)			measures. None in control group. (no available results for other outcomes)
Garcia-Gonzalez et al. 2009(29) Cuba	Before-and-after	To determine variations in labial force values and open bite after OMT	Children between 9 and 12 years from public schools with lip incompetence, open bite, and atypical swallowing	OMT group: 1- Extension of the upper lip (pressing the lips together). 2- Pull the upper lip outward and downward with the fingers. 3- Swallow with the tip of the tongue behind the upper incisors. 4- Click the tongue. - At school and home for 15 minutes - alternating one and the other / three times a day / supervised by an adult. Record sheet: to monitor. Exercises were supposedly done for one year (not clear) (n = 52)	NA	- Lip force assessed in grams with a modified dynamometer - Open bite assessed in mm with a millimeter ruler. Evaluation times: baseline, 8 and 12 months.	Lip strength at 12 months: - boys with permanent dentition: 48.5 grams increase ($p < 0.001$). - girls with permanent dentition: 41.7 grams ($p < 0.001$). Lip seal: 90.3% of children (boys 95.6%, girls 86.2%) Open bite (in mm) reduced significantly after 12 months (mean reduction 2.1 mm, $p < 0.001$).
Ingervall and Eliasson 1982(30) Switzerland	Non-RCT	To evaluate: - The possible influence of lip training on the morphology of the dentition and lips; - The effect of lip training on lip function.	Children with permanent incisors fully erupted, and incompetent lips	Lip training group Lip exercises: - stretch the upper lip downward and press it against the upper incisors - stretch the lower lip upward and fold it over the upper lip from the outside 10 minutes, 3 times a day, for 12 months Regular appointments for motivation and follow-up. 7 to 17 follow-up visits (according to individual demand) (n = 15)	Control group (no exercises) (n = 10)	- Morphology of the dentition and lips: casts evaluation (overjet, overbite, dental arches length and width) and cephalometry - Lip function: EMG (rest mandible posture, swallowing water and saliva, chewing apples and peanuts).	EMG: - Rest: no difference between groups both before and after OMT - Swallowing: no difference between before and after OMT in training group; increased in control group - Chewing: no difference between before and after OMT in training group; increased in control group. Bite and facial morphology: - groups differed before OMT (facial height, lip separation, and upper lip thickness greater in training group) - In training group: overbite, lower arch

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
							length, and lips height increased; upper lip thickness and interlabial gap decreased after OMT. - In control group, the interlabial gap and the upper lip thickness increased. - After OMT: lower and upper lips heights significantly higher in training group.
Jardini 1999(31) Brazil	Before-and-after	To present a preliminary study of the results and effectiveness obtained with the use of the "lip exerciser" device - designed as a complement to perioral OMT.	Pediatric patients (6 to 16 years) with shortened upper lip, hypotonic and hypofunctional lips from a private speech-therapy practice	"Lip exerciser" use instructions: the two acrylic bases must be supported in the center of the lips. The folds should go in the vestibule. The rods and the spring must be kept outside the mouth. User must force the closure with the lips; the opening is passive. Exercises: 1) open and close the mouth slowly till "lip exerciser" closure 2) open and close the mouth, keeping the lips firmly sealed with occluded teeth for 30 seconds - training in the office and home execution - 2 to 4 series, 10 to 20 times daily for 3 months and 3 times a week for 3 months after that. (n = 10)	NA	Upper lip length: - measured with a digital caliper (height from the nasal spine to the lower end of the marginal orbicularis muscle in mm) Clinical evaluation: - Lip volume - Lip tone - Lips position at rest - Lips sealing during chewing - Hyperfunction during swallowing Evaluation times: baseline, 3 and 6 months (end of the therapy)	- Upper lip length: 8 in 10 patients showed improvement of 3mm or higher ($p < 0.05$) after 3 months - effect present after 6 months - Clinically: increased lip tone, decreased lip volume, lack of exposure of the inner mucosa, enhanced traction resistance and rigidity on palpation.
Ohtsuka et al. 2015(32) Japan	Before-and-after	To determine whether specific training to increase the endurance of the orbicularis oris muscle in subjects with lip incompetence effectively improves lip competence.	Volunteers from undergraduate or graduate students who were physically healthy but had lip incompetence. Mean age 25 +- 2.5 years.	Lip endurance training regime: - With the same traction plates used for measurements - plate inserted into the upper and lower oral vestibules and connected to a weight by strings.	NA	Sealed lip ratio: - lip-contact sensor and recording device - lower lip in contact with the upper lip. - two conditions: relaxation and concentration. - sealed lip ratio formula = (lip-sealing time / total recorded time) X 100	Oo strength: no difference between T1 and the other time points. Oo endurance: - there was no difference between T1 and T2 (control period). - T3 and T4 (training period) were

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				- The subject stood and tipped their head forward. - The weight hung for 5 s supported only by their lips / then supported in the hand for 5 s. - 20 repetitions for 4 weeks (n = 18)		Orbicularis oris strength: - traction plates connected to a universal testing machine - maximum tensile strength - force required for the plates to escape the oral vestibule Endurance of the orbicularis oris: - traction plates held in place with lips - pulled in a horizontal direction with a weight - Time till plates escaping the mouth Evaluation times: - baseline (T1) and after 4 weeks (T2). - 2 (T3) and 4 weeks (T4) after the start of training. - 4 (T5) and 8 weeks (T6) after lip-training.	significantly ($p < 0.003$) higher than T2. - T4 was higher than T3 (not significant) - Post-training endurance at T5 and T6 were smaller than at T4 (not significant) Sealed Lip Ratio: - no difference between T1 and T2 in relaxation or concentration. - During training, relaxation/concentration increased significantly ($p < 0.003$) at T3 compared with T2. - values at T4 were significantly ($p < 0.003$) higher than T3 in both conditions. - Post-training: lower at T5 and T6 than at T4 (not significant).
Owman-Moll and Ingervall 1984(33) Switzerland	RCT (no randomization process description, no allocation concealment, no blinding)	To evaluate the effect of treatment with an oral screen on lip morphology and function in patients with incompetent lips. The effect of the treatment on the dentition was studied at the same time.	Children (6.9 to 13.5 years) with incompetent lips (no habitual lip seal), short upper lip, and proclined maxillary incisors with increased overjet.	Oral screen group: - custom-made acrylic screen, extending to first permanent molars, filling upper and lower buccal folds, in contact with the maxillary central incisors, 1 to 2 mm gap with other teeth and alveolar process, central metal loop between the lips, bite in a slightly open position (1 to 2 mm in the molar area), used nightly. - lip-training exercises: pulling forward on the loop while trying to resist the force by tightening the lips. 10 minutes twice a day. Return visits once a month: motivation and oral screen adjusts. (n = 16)	Control group: no treatment. (n= 16)	1) Biometry: Overjet and overbite measured on dental casts. 2) Facial morphology: analyzed on profile radiographs. 3) Lip function: EMG at rest, chewing, swallowing - duration and cycle number during chewing. 4) Lip strength: with a dynamometer - maximum lip force that the subject can exert to prevent the mouthpiece from being pulled loose from the grip between the lips. Evaluation times: baseline, 12 months	1) - Overjet: decreased in both groups, greater in oral screen group. - Diastema: reduced in both groups, more marked in oral screen group. - Change in molar relation and the increase in arch width: similar in both groups. 2) - Lips height: increased in oral screen group; control group only lower lip. - Lips thickness: upper lip decreased and maxillary incisors coverage improved in both groups; lower lip and curvature differed between groups; interlabial gap reduced in both groups - more in oral screen group.

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
							3) EMG activity of lips in rest, chewing and swallowing: no changes in oral screen group; one variable changed in control group. 4) Lip strength: increased significantly in oral screen group.
Saccuci et al. 2011(34) Italy	Before-and-after (with a control group with no lip incompetence)	To assess by surface electromyography (EMG) the changes in upper and lower orbicular oris (OO) muscles produced by a preformed functional device in subjects with Class II, division 1 malocclusion, deep bite, and labial incompetence.	Treatment group: Caucasian patients with Class II malocclusion, deep bite, overbite greater than 4 mm, and labial incompetence. Mean age 9.0 ± 1.5 years. Control group: children with normal occlusion (Class I occlusion without crowding, with good relationship between the upper and the lower dental arches). Mean age 9.5 ± 0.8 years.	Preformed Orthodontic/functional device (Occlus-o-Guide™). The patients were instructed to wear the device during sleep. During daytime: wear the device for 2h, moderate pressure with the lips for 1–2 min, relax for 10–20 s without opening the mouth, and start again. (n = 13)	Control group (no malocclusion, no lip incompetence) (n= 15)	EMG of orbicularis oris (OO) - Rest position; - Swallowing (evaluate the existence of the labial seal associated with the activation of the OO muscle); - Kissing (study the electric potentials of the OO muscle during activity); - Opening the mouth, clenching teeth, and protrusion of mandible (evaluate the OO muscle tone during movements that are not expected to involve the OO muscle). Evaluation times: baseline (T0), 3 (T1) and 6 (T2) months	- Treated group: significant increase in muscle tone at rest for the lower OO muscle from T0 to T1. Upper OO muscle: significant increase during mandible protrusion from T1 to T2. All the other movements: upper and lower OO muscles showed increased muscle tone (not statistically significant) from T0 to T2. The upper OO muscle during swallowing exhibited decreased muscle tone from T0 to T2 (no statistical significance). - Treated group X control: lower values in muscle tone of lower OO muscle - rest and during protrusion of the mandible (statistically significant). Treated group reached same muscular contraction activity as the control group - no difference between groups at T2.
Satomi et al. 2001(35) Japan	Non-RCT (with a control group with no lip incompetence)	To explore the relationship between lip sealing and lip power and the effect of button pull exercise on lip posture and lip power.	Children (mean age 11.2 years) seeking orthodontic treatment with no lip sealing.	Button-Pull Group (BPG): A 7/8-inch button with a kite string was used for the button-pull exercises: 1. With occluded molars, put the button in the oral vestibule, closing the lips.	No lip seal control group (regular OMT – no description, no button-pull exercises) (n = 35) Normal lip seal group (no exercises) (n = 100)	- Lip power: measured using a tension gauge. - Relationship between lip power and lip sealing (not specified).	BPG: lip strength highest value 6.5 months after the beginning of the therapy. Decreased after this, even with continued therapy. BPG: 23 in 91 (25%) achieved a habitual closed lip posture. The

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				2. Tighten the lip sealing and pull the string forward while counting three seconds. 3. Rest. Once a day, every day, for at least 9 months. (n= 91)			lip strength in this subgroup was not different from other children in BPG. No significant difference between BPG and OMT: similar level of lip seal and strength. Despite increasing lip strength, 3/4 of BPG did not achieve lip sealing.
Soto-Cantero et al. 2003(36) Cuba	Before-and-after (with a control group with no lip incompetence)	To design a device that could measure upper lip force, determining its value in girls with competent bilabial closure and the variations experienced by this force in girls with incompetent bilabial closure undergoing treatment with myotherapy.	- girls from 5 to 12 years old - either with competent or incompetent lips - primary to permanent dentition.	Group with incompetent lips (OMT): 2 exercises - Extension of the upper lip by putting the red of the lip under the edge of the upper incisors and pressing it with the lower lip. - Massage and extend the upper lip with both hands' thumb and index fingers. - repeated 30 times, 3 times a day for 12 months. (n = 45)	Control group with competent lips (n= 45)	Upper lip strength: measured with a sphere dynamometer to which a stainless steel plate was adapted to bite, with an interchangeable mouthpiece for each patient. Evaluation times: baseline and 12 months.	- Upper lip strength control group (competent lips): 140 +- 23.8g in primary dentition / 211 +- 33.3g in mixed dentition / 275 +- 26.7g in permanent dentition. - Upper lip strength in OMT group (incompetent lips): 1) Before OMT: 168 +- 35.5g in primary dentition / 182 +- 46.3 g in mixed dentition / 212 +- 43.8g in permanent dentition. 2) After OMT: 205+- 55.1g in primary dentition / 234+- 39.9g in mixed dentition / 272 +- 35.9g in permanent dentition.
Thuer and Ingervall 1990(37) Switzerland	Before-and-after	To investigate whether the increase in lip strength attainable with an oral screen also affects the pressure from the lips on the teeth.	Children - mean age 9y and 3 m (range 6y 8m to 11y 2m), with incompetent lips, short upper lip and proclined maxillary incisors.	Oral screen: - custom-made acrylic, both arches till first permanent molars, filling upper and lower buccal folds contact with maxillary incisors and inferior molars only, a metal loop between the lips in the midline - Use during the night and for 10 minutes during the day - Lip training exercises: pull forwards on the loop while trying to resist the force by tightening the lips 3	NA	1) Face morphology: - Cephalometry - Dental casts 2) Lip strength: maximum force (in grams) the lips exert before the mouthpiece is pulled loose, with a dynamometer. 3)Lip function: EMG of muscle activity and pressure from lips on incisors. Simultaneous recordings of upper and lower lip pressure and OO muscle activity: - in rest position	1) Face morphology: - overjet and upper arch length decreased from baseline to 9m and increased from 9 to 14m. The overbite increased from baseline to 9m, not 9 to 14m. - No cephalometric variable related to lips changed during the period. Incisors inclination did not change significantly. 2) Lip strength: increased during treatment, decreased after treatment.

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				times a day for 8 to 10 months. - Check-ups once a month. (n = 16)		- chewing and swallowing. Evaluation times: baseline, 9 months (end of therapy), and 14 months (after the therapy)	3) Lip function: no significant changes in resting lip pressure, pressure during swallowing, or pressure from upper lip during chewing. The pressure from lower lip during chewing increased during the treatment but decreased after 14m.
Yang et al. 2022(38) (published article) Yang et al. 2022(39) (article preprint) China	Non-RCT	To evaluate the effect of OMT on correcting middle-mixed dentition malocclusions.	Children (mean age 8.1 years) with lip incompetence and mixed dentition treated at tertiary facility	Training group: Lip muscle training: 1. Lip closure and competency exercise: tightly close the lips with a plastic sheet for 1 hour daily. 2. "Lip kisses" 100 times a day. Tongue muscle training: 1. place chewing gum on the tip of the tongue / place the tip of the tongue against the palate right behind the upper front teeth and press down on the gum while swallowing with the teeth closed for 10 min a day. Preformed appliance (MRC): during the sleeping time at night (>= 8h) and 2 hours during the day. Monthly visits (appliance replacement) - until anterior teeth alignment. Mean treatment duration: 354 days. (n = 56)	Control group: it was provided the same training instruction, but without persistently doing it (information available in the article preprint). Conventional orthodontic treatment (removable expansion devices and "2*4" local fixed appliances) until anterior teeth alignment. Mean treatment duration: 322 days. (n = 53)	- internal and external photos - dental casts - lateral cephalograms - orthopantomogram (OPG) - lip strength evaluation Evaluation times: baseline (pre-treatment - T0) and final (post-treatment, ~12 months - T1):	T0: no statistically significant difference in lip strength between the two groups T0 x T1 Intervention group: cephalometric measurements - significant forward movement of the mandible ($p < 0.01$) / significant proclination of the lower incisors ($p < 0.01$) / Forward and downward movement of hyoid bone ($P < 0.01$). Intergroups comparison at T1: - Lip strength: increased in intervention group ($P < 0.05$). - Cephalometric measurements: forward movement of mandible improved in Intervention group ($p < 0.05$). No difference in the position of hyoid bone.
Yoshizawa et al. 2016(40) Japan	Before-and-after	To determine the effectiveness of hypoxic orbicularis oris muscle training for improving lip incompetence.	Healthy Japanese volunteers (10 males and 10 females, mean age 23.6 +- 2.3 years), undergraduate or graduate students, with lip incompetence.	Hypoxic lip training: - Traction plate inserted into the upper and lower oral vestibules and connected to a weight by strings; stand and tip the head forward, occlude molars	NA	Sealed lip ratio: - Lip seal detection sensor: attached to lips, with a recording device - Sealed lip ratio formula = (lip sealing time/total recorded time) X 100	Orbicularis oris strength: gradually increased during training and decreased slightly post-training. Higher value at T2 than T0(p< 0.016). Slightly lower values at T3 and

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				and do not suck the plate, hang the weight for 5 s supported only by the lips and then supported in the hands for 5 s / 5 times daily for 4 weeks. - Increased weight 2 weeks after the start of training. - Checklist to subjects: training registry and motivation. (n = 20)		- 2 situations: relaxation and concentration - 5 minutes each. Orbicularis oris strength: - Traction plate inserted in oral vestibules, pulled by a testing machine - the force required for the plate to come out. Orbicularis oris endurance: - traction plate inserted into oral vestibules, pulled horizontally by a weight - time in seconds until the plate comes out.	T4 than T2 (not significant). Orbicularis oris endurance: gradually increased during training and decreased post-training. Endurance at T2 higher than T0 ($p< 0.003$) and T1 ($p < 0.016$). Lower values at T3 and T4 than at T2 (not significant). Sealed lip ratio: increased during training and decreased post-training. In relaxation and concentration: higher values at T1 and T2 than at T0 ($p < 0.003$). Higher values at T2 than at T1 ($p < 0.003$). Lower ratios at T3 and T4 than at T2 (not significant).

Notes: OMT (orofacial myofunctional therapy), RCT (randomized controlled trial), NA (not applicable), NI (not informed), EMG (electromyography), OO (orbicularis oris muscle)

Supplementary Table S4. Descriptive characteristics of studies on the effectiveness of OMT in the treatment of mouth breathing (n = 10)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
Campanha et al. 2010(41) Brazil	RCT (no randomization process description, no allocation concealment, blinded outcome accessor)	To determine the impact of speech therapy on asthma and allergic rhinitis control in mouth-breathing children and adolescents.	Children and adolescents (6 to 15 years) with asthma and clinical mouth breathing, monitored at a specialized service.	OMT + beclomethasone dipropionate (BD) by nasal inhalation (500 mcg/day) OMT started one month after medication - comprised three stages: 1) awareness and proprioception of respiratory mode and type 2) respiratory function training: muscle exercises – isometric exercises to strengthen lips, tongue, cheeks, and adaptation to the	Beclomethasone dipropionate (BD) by nasal inhalation (500 mcg/day) (n = 12)	1) Asthma clinical score 2) Allergic rhinitis clinical score 3) Oral breathing evaluation: based on the orofacial myofunctional assessment protocol adapted by the authors – respiratory mode, period of oral breathing and habitual positioning of lips, according to the parents (after guidance from researchers), and clinical confirmation of breathing mode and habitual lip position.	1) Asthma: - No difference between groups in T0. The groups differed in T4 ($p = 0.046$). 2) Rhinitis: - No differences between groups in T0. Patients presented moderate persistent allergic rhinitis in T0 that progressed to mild at T1 and remained until the study's end. 3) Oral breathing: - Lips rest position (parents) differed between groups in T1

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				usual position – lips seal and tongue. 3) breathing exercises to stimulate nasal breathing and abdominal costo-diaphragmatic breathing Other: chewing and swallowing function improvement. Individual 40-minute sessions twice a week for 8 weeks (16 sessions). (n = 10)		Evaluation times: baseline (T0 - use of BD by oral inhalation) / T1 (one month BD by nasal inhalation) / T2 (after 8 OMT sessions) / T3 (after 16 OMT sessions - end) / T4 (30 days after OMT end / 4 months BD by nasal inhalation)	(p = 0.010), T3 (p = 0.027), and T4 (p = 0.030). - Lip rest position (clinically) differed between groups in T2 (p = 0.000), T3 (p = 0.000), and T4 (p = 0.000). - Breathing mode: differed between groups in T2 (p = 0.002), T3 (p = 0.000), T4 (p = 0.000). All favoring OMT + BD group.
Gallo and Campiotto 2009(42) Brazil	Before-and-after	To describe the evolution of children aged five to 11 years, mouth breathers, submitted to OMT with emphasis on strengthening the muscles of the phonoarticulatory organs and training of the nasal breathing.	Children aged 5 to 11 years old, with mouth or oronasal breathing, from the waiting list for speech-language therapy in a specialized service.	Speech Therapy: isometric and isotonic exercises such as working on lip and cheek strength, stretching the upper lip philtrum, relaxing the mentalis muscle, and nasal breathing training, among others (adjusted for the patient's age). 10 weekly 30-minute individual OMT sessions (n = 6)	NA	Clinical evaluation: - Structures of the oral sensorimotor system (facial type, position of lips and tongue at rest, characteristics of the upper and lower lips, labial and lingual frenulum, tone and mobility of lips and tongue, occlusion) - Oral functions (chewing, swallowing, breathing, speaking). - Nasal function - with a Glatzel's Mirror. Evaluation times: baseline and 2.5 months after	Before therapy, 100% (n = 6) had at least one altered pattern (lip sealing, muscles of the phonoarticulatory organs strength, and nasal breathing). After OMT 2 in 6 (33.3%) showed no satisfactory progress - justified by dentofacial deformities and failure to undergo orthodontic treatment. 4 in 6 (66.7%) showed improvement in lip sealing pattern and possibility of nasal breathing most of the time.
Habumugisha et al. 2022(43) China	Non-RCT (with a non-mouth breathing control group)	To examine the clinical effects of OMT on children with functional mouth breathing by cephalometric radiographs and study models.	Children aged 5 to 10 years, functional mouth breathers, attending the orthodontic clinic of a tertiary health care facility.	OMT group: - lip sealing training with a lip trainer (tension 250g) - 10 minutes - 3 times/day - tongue flipping training (tip of the tongue strongly bouncing at the palate) - 100 times/day - chewing gum training (spreading out chewing gum at the palate) -15 times/day - swallowing training (pushing water on the tip of the tongue up	Control MB group (functional mouth breathers that refused treatment) (n = 68) Control NB (children with nasal breathing) (n = 70)	Study models and cephalometric radiographs (orthodontic measurements). Evaluation times: baseline (T0) and after treatment conclusion (T1) (~12 months)	After myofunctional treatment, mouth-breathing children showed better dentofacial growth. The excessive increase of the lower facial height was controlled, and the transverse restriction of the maxillary arch was relieved. Simultaneously, the myofunctional treatment resulted in the

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				against the hard palate and swallowing with lips closed) - 15 times/day. - Registered in logs (under parental supervision). - Myobrace appliance - 2h during daytime and the whole night. Follow-up visits after 2 weeks, then every 4 weeks Treatment length: 1 to 1.5 years. (n = 66)			retraction of upper incisors.
Kumar and Kuriakose 2004(44) India	Non-RCT	- To compare the thickness in circumoral musculature of the experimental group (lip seal therapy and exercises with oral screen for 6 months) with the control group (no exercises). - To clinically determine the improvement in lip seal in experimental group. - To clinically determine the reduction of overjet in experimental group.	Children aged between 5 and 10 years with adenoid and tonsil enlargement who were submitted to adenotonsillectomy.	OMT (experimental) group: exercises with an oral screen (no description) and lip seal therapy (for lip strengthening / lengthening / lip mobility / improving the lip line and lip closure): • Blowing balloons • Lip pulls • Lip puffer • Holding water in the mouth • Button and string therapy Beginning 2 weeks after surgery / 10 to 20 repetitions, 3 times/day for 6 months Parental supervision and log recording. (n = 14)	Control group (no treatment) (n = 14)	- Clinical evaluation: nasal obstruction, snoring, sleep apnea, mouth breathing, and proclination of teeth. - Ultrasonographic evaluation of lip thickness - overjet: measured in casts Evaluation times: T0 – 2 weeks after surgery and T1 – 6 months (OMT end).	- Nasal obstruction, snoring, and sleep apnea improved in both groups after surgery - Teeth proclinations and mouth breathing: remained the same in control group, improved in all patients in OMT group. - lip incompetence, perioral tonicity, and mentalis muscle activity: significant changes in OMT group, no modification in control group - for both contracted and relaxed states. - Upper and lower lip thickness increased after OMT, significantly different from the control group ($p < 0.05$) Overjet: reduced in OMT group ($p < 0.001$).
Lembrechts et al. 1999(45) Belgium	RCT (no randomization process description, no allocation concealment mentioned, blinded outcome assessor)	To investigate the effect of adenoidectomy and adenoidectomy in combination with a logopedic instruction program on habitual open mouth posture (OMP). The aim was to obtain habitual lip closure with nasal breathing at rest.	Children aged 2–10 years undergoing adenoidectomy based on the usual indications	Training program: 13 exercises for identification, lip strengthening, nose breathing, lip closure, and habituation. Systematically intensified. Based on the available literature.	Control group (no exercises) (n = 87 / 51 after 12 months)	Lip distance (middle, 3-point schedule) Duration of the OMP during the examination (4-point schedule) Duration of lip closure after instruction (5-point schedule). The best sum score was 3 (three times rating 1), and the worst was 12.	At T1: significant difference between groups ($p = 0.001$) in OMP and lip closure. At T2: no significant difference was found ($p = 0.526$) With the training, 37% of the children had lip closure at rest in T1 and 38% in T2, while

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				Three individual sessions of 30 min each.: 1. instruction of daily home exercises (parents and children). 2. sensitization - make children and parents conscious of OMP. 3. verbal motivation of parents and children to work on lip closure and nasal breathing. 4. register home exercises in a diary (for compliance check). 5. Small skin plasters used during the night to improve passive lip closure and nasal breathing. (n = 72 / 42 after 12 months)		Evaluation times: T0 - before surgery / T1 - 2 months after surgery, 1 after training / T2 - 12 months after surgery	controls had 13 and 25%, respectively.
Marson et al. 2012(46) Brazil	Before-and-after	- To check the effect of speech and language therapy on a group of mouth breathers - To propose a minimum therapy for mouth-breathing treatment	Pediatric patients aged 5 to 12 years (mean age 9.8 years), with ENT diagnosis of mouth breathing after surgical intervention and/or medication, in a specialized service in a tertiary healthcare facility.	Rehabilitation protocol: a) Nasal breathing awareness training (orientation, hygiene, reading, blowing a straw in a bottle with water, blowing a balloon, playing). Use of passive orofacial maneuvers according to cited literature. b) OMT exercises (according to patient's necessity). c) Breathing mode training. d) Breathing-type training OMT exercises: orbicularis oris (closed beak, open beak, lip pull, click, vibration); tongue muscles (tongue movements, click, vibration); cheeks (inflate both, inflate one, balloon blowing). One weekly session for 24 weeks.	NA	Nasal breathing: - Glatzel's mirror - clinical observation - Parents and patients reports. Posture and morphology of lips and cheeks: - lips (opened, parted, sealed, pressed) and cheeks (symmetric, asymmetric) Lips, tongue, and cheeks strength: manual muscle palpation, tongue depressor. Assessment of praxis: a) lips: closed beak, closed smile, left beak, right beak, click and vibration. b) tongue: vibration, click, lateralization, protrusion, and retraction. c) cheeks: inflate simultaneously, inflate right, and inflate left.	At 24 weeks: - Breathing type: 86% presented nasal breathing and 14% mixed. - Lips: 97% proper strength, 55% sealed lips at rest. - Tongue: 97% proper strength - Cheeks: 97% symmetric, 94% proper strength Statistically significant results for compared to baseline: - Nasal breathing - lips, tongue, and cheeks strength - praxis: right beak, left beak, lips click and vibration, tongue click and vibration, cheeks inflation (both, right, left) Most results were observed after 12 weeks. Most results were not different

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				(n = 36)		Evaluation times: baseline, 12 and 24 weeks (end of OMT).	between 12 and 24 weeks.
Schievano et al. 1999(47) Brazil	Before-and-after	To analyze the influence of OMT on the orbicularis oris superior and inferior (OOS and OOI) and mentalis muscles in mouth-breathing patients in rest and closed lip positions through clinical and electromyographic (EMG) evaluations.	Children aged 5 to 10 years with open-mouth posture habit and probable use of oral airway to supply respiration needs	OMT sessions: - in groups of 3 or 4, 30 min, weekly for 9 months - Purpose: to improve the adequacy of both the musculature and functions of the stomatognathic system. - Exercises: awareness and training of the functions of lips, tongue, chin region, and chewing muscles - Procedures: isometric procedures, facial massage in the chin region, feeding re-education. - Parental supervision: exercises and functions. (n = 13)	NA	EMG activities: - OOS and OOI, and mentalis (MT) muscles - jaw rest position (relaxed musculature) and requested joint lip Clinical evaluation: - Morphological analysis: muscle posture and function of the upper and lower lip, tongue, cheeks, and chin region. - Functional evaluation: mobility of the lips, tongue, cheeks, and soft palate. - Functions: respiration, suction, chewing, swallowing, speech, and voice.	Clinical evaluations: - before and after OMT: lower lip and chin region improved significantly ($p<0·05$) even without form correction. All the functions analyzed (respiration, chewing, and swallowing) improved significantly ($p<0·01$). The difference between resting and closed lips before and after OMT was statistically significant for the OOI and MT muscles but not for OOS. The muscular activity requested to hold lips together decreased after OMT.
Silva 2017(48) Brazil	Non-RCT	To verify the effectiveness of an OMT program for the treatment of habitual mouth breathing in adults with malocclusion.	Young adults with Class II malocclusion and habitual mouth breathing undergoing orthodontic treatment at a specialized service.	OMT group: - Objectives: 1) Reorganize global body posture; 2) raise awareness about respiratory function; 3) clean the nose; 4) promote the use of the nasal airway; 5) strengthen the perioral and tongue muscles; 6) establish nasal airway at rest; 7) promote the lower middle respiratory type; 8) promote the pneumophonoarticulatory coordination; 9) promote nasal breathing during chewing; 10) promote coordination between breathing and swallowing functions (detailed description of exercises in article).	Control group (no OMT) (n = 4)	Clinical breathing assessment (MBGR Orofacial Motricity Protocol, Genaro et al., 2009). - Breathing type - Breathing mode - Nasal breathing possibility: water in the mouth for 2 minutes. - Expiratory airflow area: Altman's millimeter nasal mirror. - Peak inspiration flow (with In-Check Nasal equipment). - Maximum phonation time: time of the emission of hissing sound /s/. - Oral Health-Related Quality of Life: Simplified Oral Health Impact Profile (OHIP-14).	- Oral Health-Related Quality of Life (OHIP-14): no differences between T0 and T2 for both groups. - Respiratory symptoms questionnaire: no difference between groups in T0. Improvement in OMT group in T2 ($p < 0.001$). - Protocol MBGR overall score: improved in OMT group ($p<0.001$). - Expiratory airflow: no patient in OMT showed reduced airflow in T2 vs 3 in T0 (no difference). - Nasal breathing possibility: all 9 OMT patients retained water in mouth for 2 minutes or more in T2.

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				- 45 minutes, 12 sessions, twice a week. - Home exercises (n = 9)		- Respiratory symptoms questionnaire (Caouette-Laberge et al., (1992) adapted by Yamashita (2003). Evaluation times: baseline (T0), after the last OMT session (45 days) (T1), and 3 months after OMT (T2).	- Maximum phonation time: increased in OMT group in T2 (p = 0.002). - Peak inspiration flow: increased in OMT group in T2 (p = 0.002). - Expiratory airflow area: no difference in T2. - Comparison between groups: T0 similar in all outcomes; T2: significant differences for respiratory symptoms; total respiratory function score (MBGR protocol); maximum phonation time; nasal inspiratory peak.
REVIEWS							
Araújo et al. 2019(49) Brazil	Systematic review	To verify if receiving orofacial myofunctional therapy concomitant to drug treatment for asthma and rhinitis is effective to achieve clinical control of the diseases.	Patients with asthma and rhinitis, regardless of age and gender	Orofacial myofunctional therapy to improve chewing, swallowing, and breathing (n = 10)	Control group without orofacial myofunctional therapy (n = 12)	Improvement of orofacial functions and nasal breathing	Only one study met the eligibility criteria(41) – already included in this scoping review), considered to present low-quality evidence, reduced sample size, and only OMT combined with pharmacological treatment. CONCLUSION: This systematic review showed no scientific evidence about the efficacy of OMT in improving clinical control, orofacial functions, and nasal breathing in children and adolescents with asthma and rhinitis.
Batista and Bagnarollo 2020(50) Brazil	Integrative review	To review, in an integrative manner, studies using surface electromyography in the orofacial and cervical musculature in mouth-breathing children aged from	Children with mouth breathing	- Intervention was not a mandatory characteristic for inclusion - Studies with speech therapy and physical therapy were found (n = 46)	No comparison was considered	Surface electromyography (EMG) in orofacial and cervical musculature	Of 14 included studies, only one evaluated the effect of myofunctional therapy or physical therapy on the orofacial musculature(47) – already included in this scoping review).

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
		three to 11 years and 11 months old.					CONCLUSION: Specifically in the field of speech-language pathology, only one study focused on using sEMG in orofacial muscles to demonstrate the therapeutic efficacy […], suggesting that the main purpose of the instrument would be the initial assessment of myofunctional and postural changes caused by mouth breathing and not as a therapeutic biofeedback.

Notes: OMT (orofacial myofunctional therapy), RCT (randomized controlled trial), NA (not applicable), NI (not informed), EMG (electromyography), OOS and OOI (orbicularis oris muscle, superior and interior) ENT (ear, nose, throat service)

Supplementary Table S5. Descriptive characteristics of studies on the effectiveness of OMT for treating non-nutritive sucking habit (n = 7)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
Bourne 2005(51) Trinidad and Tobago	RCT (no randomization process description, no allocation concealment, no blinding)	To compare the effectiveness of the crib and positive reinforcement in treating anterior open bites and increased overjet due to digit-sucking.	Digit-sucking patients (between 7 and 8 years old) of the Child Dental Health Clinic in the School of Dentistry of a University.	Positive reinforcement group: three in-office visits around two, eight, and sixteen weeks after the initial visit. During the first visit for treatment, progress charts were provided for the parent/guardian to record the number of hours per day that digit-sucking is seen and/or reported to occur. A reward system was agreed on with the child and parent on this day. (n = 6)	Crib group: upper transpalatal arch with a crib (fixed appliance). One review visit. (n = 5) Control group (no treatment) (n = 3)	Overjet (OJ) and anterior open bite (OB) in mm recorded with an overjet ruler. (no information on habit cessation). Evaluation times: Baseline (T0) and after 16 weeks (end of treatment - T1).	After 16 weeks, OJ reduced 1.67 ± 1.78 mm in crib group and 0.3 ± 0.67 mm in reinforcement group (p = 0.141). OB decreased 2.5 ± 0.97 mm in crib group and 1.4 ± 1.82 mm in reinforcement group (p = 0.185). Control group showed no differences in OB or OJ.
Green 2010(52) USA	Retrospective cohort	To confirm results provided by Van Norman of 723 subjects in 1997.	People from 3.5 to 16 years enrolled in an orofacial myofunctional program emphasizing a positive behavior modification approach over 10 years from 1999 to 2010 (in a	Positive behavior modification (Van Norman, 1997): - oral habit elimination: positive reinforcement, rewards, and distraction strategies (engage in alternate activities, indoor	NA	Clinical evaluation of orofacial features and functions (baseline). Elimination of the sucking habit (assessed through parents' answers to a survey).	Initial observations (clinical evaluation and parents survey): - 100% with digit sucking habit - 99% tongue low rest posture or tongue

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
			private practice) who had either a digit habit, a pacifier habit, or a habit that included both.	manipulatives for distraction, or other strategies to keep their digits and minds occupied) - Parental instruction on when and how to positively reinforce the desired behavior using praise, tokens, or rewards and encouraging the child's feeling of accomplishment and positive self-control. - contact with the family for the first 60 days - 3 in-person sessions in the first month and one in the second. (n = 441)		Evaluation times: not specified (baseline and 60 days?)	thrust (clinical evaluation) - 41% speech concerns (parental perception) - 16 % /s/ or /sh/ sound distortion (parental perception) After intervention: - 88% discontinued the habit within the first 24h - 98% in the first week - 99.8% after two weeks - 100% after three weeks - 82.5% reported no emotional issues after habit cessation (older and younger patients were more affected) - sleep difficulties: mentioned by 1.7%.
Huang et al. 2015(53) Australia	Retrospective cohort	To conduct a retrospective case-control investigation to assess behavioral and occlusal outcomes of Non-Orthodontic Intervention (NOI) in a sample group of children in Australia to establish clinical relevance.	Children between 4 and 12 years with the habit of digit sucking.	Non-Orthodontic intervention (NOI): 1) Guidance of tongue position: stomahesive wafer (5 mm diameter) attached to the incisive papilla - 3 times/day with parental supervision. Children instructed to touch the wafer with the tongue tip (to elevate the tongue for ~ 2 hours - correct rest position and encourage lip seal). 2) Behavior-shaping program: positive behavior registered on reward charts and regular calls from patients and parents to the orofacial myologist. For 4 months. (n = 77)	Control group (same clinical condition, no treatment) (n = 14)	Clinical evaluation: 1) overjet (measured in mm) 2) presence of anterior open bite (yes/no) 3) presence of digit-sucking behavior (yes/no)." Evaluation times: baseline (T0), and after 4 months (T1 – end of therapy)	- 89.6% NOI group ceased digit sucking habit vs 14% in control group ($p < 0.001$). - 83% NOI group presented without open bite vs 14% in control group ($p < 0.001$). - Mean overjet decreased from 4.2 ± 2.4 mm to 3.1 ± 1.9 mm ($p < 0.001$). - Children in NOI group: more likely to cease their digit-sucking habit ($p < 0.001$, OR = 51.8, 95% CI: 9.8–273.9); also more likely to present without an anterior open bite ($p < 0.001$, OR = 30.0, 95% CI: 5.9–151.6)
Larsson 1988(54) Sweden	Non-RCT	Not informed by the author. Inferred: to evaluate different methods for finger-	Nine-year-old children with finger-sucking habits. Those with the most intensive sucking	Positive reinforcement group (POS group): the object of the treatment was to reinforce the child's	Crib group: a palatal crib with spurs was welded to bands	Sucking habit cessation Psychological evaluation Evaluation times: T0 – baseline, T1 - after	At T1 (10 weeks): Only one child in the control group stopped the habit compared to 5 to

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
		sucking habit cessation.	habit, according to the parents.	non-sucking behavior through different forms of encouragement. This was given by the mother after special instructions and by a psychologist. (n = 19) Negative reinforcement group (NEG group): children and their parents were informed about the consequences of prolonged finger-sucking, and the risk of lasting malocclusion was emphasized. (n = 19)	cemented to the upper first molars. (n = 19) Control group: the children in this group were examined, recorded, and tested like the children in the other groups. No treatment was given. (n = 19)	treatment - 10 weeks, T2 - 12 months after treatment	10 in the other groups. No significant differences were observed between the treatment groups. Cessation rate: 26% in POS group, 53% in NEG group, 42% in Crib group, 5% in control group. At T2 (12 months): the same tendency was observed - 58% in POS group, 74% in NEG group, 61% in Crib group and 11% in control group (2 patients). None resumed the habit after 1 year. Psychologic evaluation found no mental disturbances in children who ceased the habit.
Puig-Ravinal et al. 2002(55) Cuba	RCT (no randomization process description, no allocation concealment, no blinding)	To use myotherapy individually and through group dynamics to suppress the habit of digital sucking; To compare the effectiveness of both methods; To contribute to the restoration of the affected perioral muscles in school children between six and nine years of age of both sexes.	Children from six to nine years of age of both sexes with digit-sucking habit, who made up the first to fourth-grade enrollment in a semi-boarding school, selected at random during 1997-1998 school year.	OMT in group dynamics: - 10 OMT sessions for the orbicularis oris and both buccinators for 30 minutes (no exercises description), two weekly sessions. - Collectively exchanged experiences to achieve greater cooperation and stimulate habit cessation. (n = 15)	Individual OMT: The same exercises, with the same duration and frequency, done individually at home under parental supervision. Dates and duration of the exercises registered on a card. (n = 15)	Habit cessation. Evaluation times: baseline (T0), 6 months (T1), and 12 months (T2) after OMT.	OMT in group dynamics (study group): only 3 children could not stop digital sucking. The other 12 eliminated the habit: 8 after 6 months and 4 one year after therapy. Control group (individual OMT): 8 children ceased the habit: 3 after 6 months and 5 after one year. In this group, seven children were unable to suppress the habit. The results were statistically significant.
Van Norman 1997(56) USA	Retrospective cohort	To share information about the digit (thumb-finger) sucking behavior, including how it begins; biological, psychological, and physiological connections; how it	People from 4,74 to 34 years old with digit-sucking habit	Motivational program: Weekly visits for 3 weeks, six-week visits, and six-month visits. - dental models, photographs, compassion, and	NA	Habit cessation (by parental information) Evaluation times: baseline, 3 and 6 months.	From 723 patients: - 83% sucked the thumb - 17% sucked one or more fingers - 243 (34%) initiated the habit with a pacifier - 94% with malocclusion (open

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
		perpetuates; sucking-related problems; guidelines for referral; considerations on patient selection to enhance therapy success.		- personal persuasion that one could overcome the habit. - Progress charts, prizes, puppet sock for bedtime, band-aids for daytime. - Autonomy and the option of retreating without dishonor. - No parental supervision, only availability for emotional support (empathetic and positive support). (n = 723)			bite 88%, overjet 85%, posterior crossbite 24%, Class II 34%) - 98% tongue-thrust - 38% /s/ sound distortion (lisp) - 28% fingernail biting Digit-sucking habit cessation: - 79% stopped after one visit, another 8% after 2 weeks (total 87%) - Most children missed the 6-month visit - parents understood the problem was solved.
REVIEWS							
Borrie et al. 2015(57) UK	Cochrane systematic review	The primary objective of the review was to evaluate the effects of different interventions for the cessation of non-nutritive sucking habits in children. The secondary objectives were to determine which interventions work most quickly and are the most effective in terms of child and parent- or carer-centered outcomes of least discomfort and psychological distress from the intervention, as well as the dental measures of malocclusion (reduction in anterior open bite, overjet and correction of posterior crossbite) and cost-effectiveness.	Children (up to age 18 years of age) who have a digit-sucking habit or any other NNSH, including a pacifier habit (dummy).	• orthodontic appliances; • barrier techniques - gloves/plasters etc.; • chemical techniques - topical substances applied to pacifier or digit; • behavior modification techniques; • non-treated control; and • any combination of the above.	Any intervention combination or pacifier withdrawal.	Cessation of the habit. 1. Time taken for intervention to be effective. 2. Child and parent- or carer-centered outcomes of discomfort from the intervention, psychological effects of teasing associated with the intervention, and distress caused by removal of the comfort/habit. 3. Reduction in malocclusion as measured by: • reduction in anterior open bite (mm); • reduction in overjet (mm); • correction of posterior crossbite. 4. Costs of interventions.	- 6 included studies: 4 on the cessation of NNSH, 2 on the behavior of child and parent- or carer-centered measures. - All with high risk of bias - Orthodontics appliance (with or without psychological intervention) vs no treatment: 2 trials – probability of habit cessation - short term (<12 months) (RR 6.53, 95% CI 1.67 to 25.53), long term (RR 5.81, 95% CI 1.49 to 22.66), with psychological intervention (RR 6.36, 95% CI 0.97 to 41.96). - Psychological intervention vs no treatment: 2 trials - more effective in short term (RR 6.16, 95% CI 1.18 to 32.10) and long term (RR 6.25, 95% CI 1.65 to 23.65). CONCLUSION: This review found low-quality evidence that

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
							orthodontic appliances (palatal arch and palatal crib) and psychological interventions (positive and negative reinforcement) are effective at improving sucking cessation in children.

Notes: OMT (orofacial myofunctional therapy), OMDs (orofacial myofunctional disorders), RCT (randomized controlled trial), NA (not applicable), NI (not informed), EMG (electromyography), NNSH (non-nutritive sucking habit)

Supplementary Table S6. Descriptive characteristics of studies on the effectiveness of OMT for treating low tongue position at rest (n = 2)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
Lim et al. 2022 South Korea	Retrospective cohort	To introduce Bio-Exercise as a newly structured OMT protocol and to determine the cephalometric and dimensional effects of this method, using lateral cephalometric analysis on malocclusion with low tongue posture in young patients.	Patients (mean age of 8.41±1.45-year-old) with malocclusion and low tongue position at rest, treated with BioEx therapy using tongue elevators.	BioEX: exercises (20 minutes daily) and orthodontic appliance (tongue elevator). Exercises (with tongue elevator): 1) Lip seal: 10 times/day. 2) lip seal with cotton roll in the lower vestibule once daily. 3) Upper lip stretching: 5 times/day 4) I and U exercise: long “I” and “U” sounds ten times/day Tongue training (with tongue elevator): 1) Empty swallowing: 10 times/day 2) Water swallowing: 10 times/day 3) Tongue-palate seal breaker: click the tongue. 30 times/day 4) Reading aloud: 10 min./week with a bite stick on the molars. Orthodontic appliances: - Tongue elevator (most used); or BEX (Bio-Exercise Xenium) (when necessary)	NA	Tongue position at rest before and after BioEx - Evaluated through cephalometric analysis: tongue length (TGL) / tongue height (TGH) / dorsum of the tongue perpendicular to the palatal plane (Td-PP) and the tip of the tongue perpendicular to the pterygomaxillary vertical line (TT-PMV). Evaluation times: baseline (T0) and at the end of treatment (mean 18 months, range: 6 to 37 months) (T1)	The cephalometric analysis between T0 and T1 showed a statistically significant increase in TGL (5.24 ± 5.43 mm) and TGH (2.29 ± 3.12 mm) and a decrease in Td-PP (-1.96 ± 2.54 mm). TT-PMV also increased (1.69 ± 5.36 mm) - not statistically significant. These results indicate that BioEx can be an effective OMT modality in increasing the tonicity of the tongue muscles to establish more normalized tongue position at rest. The tongue was retained much closer to the palatal arch at rest following BioEx treatment.

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				Progress in a report card (assessed monthly) (n = 28)			
Zhang et al. 2016 China	Before-and-after (with a normal occlusion control group)	To evaluate changes following myofunctional exercise in craniofacial morphology and the tongue position for subjects with class III.	Children around 5 years old with class III in the primary dentition and crossbite of anterior teeth.	OMT group: Patients used a device designed to uniform the tongue muscle's motion during the myofunctional exercise (no device description nor picture available). Tongue myofunctional exercise: - using the device four times a day, five minutes per session during one year - lift the tip of the tongue and make the bead roll forward and upward by pushing it - Press the bead to swallow. The children were awarded toys after performing the exercise successfully for a month. (n = 25)	Normal occlusion control group (n = 25)	Cephalometric evaluation (with contrast for the tongue position at rest) Tongue position landmarks: H: The anterior point on the hyoid bone Tu: The top point on the dorsum of the tongue Ti: The most anterior point on the tip of the tongue. Evaluation times: Baseline (T0) and 12 months (T1)	Baseline: OMT compared with control group: S-Ti length, facial angle, and S-Tu length significantly increased ($p< 0.05$). SNA angle, ANB angle, Y-axis angle, convexity angle, NSTu angle, NSTi angle, and S-Go length significantly decreased ($p< 0.05$). After 1 year: OMT post-treatment compared to baseline: Mandibular plane angle and inferior face length, S-Tu length, and the S-Ti length decreased ($p< 0.05$). S-Go length, NSTu angle, and NSTi angle significantly increased ($p< 0.05$). The tongue position was lifted, as demonstrated by the NSTi, and the NSTu angle significantly increased, while S-Ti and the S-Tu length significantly decreased. OMT changed not only the tongue position but also craniofacial morphology.

Notes: OMT (orofacial myofunctional therapy), OMDs (orofacial myofunctional disorders), RCT (randomized controlled trial), NA (not applicable), NI (not informed), EMG (electromyography).

Supplementary Table S7. Descriptive characteristics of studies on the effectiveness of OMT in the treatment of multiple OMDs (n = 9)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
Areias et al. 1996(58) Brazil	Before-and-after	To evaluate the efficacy of an Orofacial Postural Corrective Plate associated with myofunctional therapy	Children from 5 years to 9 months to 6 years and 11 months with position or tonus alteration of	Conventional OMT in the office (no description). Use of Orofacial Postural Corrective Plate 3x /day for 10 minutes (at home).	NA	Clinical evaluation (no blinded assessor): 1) Lip position at rest: parted or closed	- Lips sealed at rest 43.3% at T1 vs 0% at T0. - Correct lips position during solid chewing

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
		to correct the posture of the tongue and lips.	tongue or lips and mild to moderate malocclusion.	Characteristics of the plate: rectangular base with rounded edges, dimensions 4 cm x 1.5 cm and 2 mm thick - to be kept between the sealed lips; curved rod from the center of the plate towards the interior of the mouth - contouring the incisive papilla / rough surface to educate the position of the tongue during rest. (n = 30)		2) Tongue position at rest: between the teeth, in incisive papilla, touching maxillary incisors, touching mandibular incisors. 3) Lips and tongue in function: evaluated during suction, chewing, and deglutition (no description). 4) Speech sounds production Evaluation times: baseline (T0) and 6 months (T1)	63.3% at T1 vs 0% at T0. - Correct lip position during swallowing 100% children at T1 vs 13.3% at T0. - Correct tongue position at rest 33.3% at T1 vs 0% at T0. - Correct tongue position during liquid suction: 100% at T1 vs 53% at T0. - Correct tongue position during solid chewing 96.7% at T1 vs 0% at T0. - Correct tongue position during swallowing 33.3% at T1 vs 0% at T0. All comparisons between T0 and T1 statistically significant ($p < 0.05$).
Bacha and Rispoli 1999(59) Brazil	Non-RCT	To address speech-language therapy in orofacial myology using a Brief Intervention. The objective of the Brief Intervention was to systematize therapeutic form and minimize the time necessary to obtain satisfactory results concerning breathing, feeding, oral-facial habits, buccal hygiene, and corporal posture, physical activity.	Children between 8 and 15 years old with normal occlusion.	OMT brief intervention (BI group) (2 months after orthodontic treatment begins): - Lecture for parents (consciousness) - 8 weekly group sessions - Feeding (guidance): food consistency, mastication - registered in a food diary. - Breathing: nasal hygiene, nasal breathing exercises (at home) 5 min., 3 to 5 times/day - Orofacial habits: consciousness and motivation (post-it) - Oral hygiene: Motivation - Body posture and physical activity: consciousness and motivation. (n = 33)	Control group - no treatment (those patients who were absent in the first session) (n = 21)	Clinical evaluation, photos, video recording (no blinded assessor): breathing, chewing, swallowing, lips and tongue position at rest, habit changes Evaluation times: Baseline and after 11 months	After intervention 3 % of OMT group needed complementary interventions against 57% of control. The OMT brief intervention: - increased vegetable ingestion by 40% - reduced exclusive mouth breathing by 80% (against 40% in control group) / increased exclusive nasal breathing by 20% - improved lip posture (closed at rest) - Reduced bite nails by 94% / bite objects by 93% and other habits as a whole (54% of patients without oral habits ate the end of the intervention against 3% at the beginning) - The brief intervention also improved buccal

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
							hygiene and physical activities but not corporal posture.
Bellingen 2017(60) Germany	Non-RCT	To evaluate the effectiveness of the Padovan Method by answering the following questions: - Does the lip strength increase? - Does the tongue pressure increase? - Does the suction power increase? - Does the lip coordination improve? - Does the tongue coordination improve? - Does the mouth closure improve? - Does the swallowing pattern change (? - Do gross and fine motor skills improve? - Does the sound of the /s/ consonant improve?	Children from 7 to 15 years with OMDs from a private speech therapy practice specialized in the Padovan Method.	OMT-group 11-week therapy after initial evaluation According to Padovan Method (a selection of exercises from the entire program due to limited time) Twice a week for 45 minutes (18 sessions) No home exercises. (n = 8)	Control group (no OMT) (n = 4)	- Lip power (MFT lip balance* - 3 times each) - Superior tongue pressures (IOPI device* kPa - 3 times with 30s rest) - Suction power (time for sucking 20 ml water) - Lips coordination activities - scale rating I to III - Tongue coordination activities - scale rating I to III - Mouth closure (observation - 2 times 1 min) - Swallow pattern (observation - number of gulp types, different consistencies) - Gross and fine motor skills (BOT -2* short version) - Sound /s/ (Ravensburger screening) * No information, no cited reference. Evaluation times: baseline and 11 weeks	Compared to non-treated controls, OMT showed no statistical differences for: - Tongue pressure - Lip strength - Suction power - Gross and fine motor skills And differences for: - Pattern of liquid swallowing ($p < 0.001$) - Position of tongue tip ($p = 0.006$) and edges ($p < 0.001$) - Lip activities ($p < 0.01$) - Tongue activities ($p < 0.001$) - /s/ sound articulation ($p < 0.05$)
Bigenzahn et al. 1992(61) Austria	Before-and-after	To investigate the extent to which OMT for myofunctional disorders is effective in correcting speech defects.	Patients aged 3 to 30 years (mean age 11 +- 4) with OMDs affecting the speech	OMT, according to Garliner Method(10), combined with articulation training one weekly session, 3 to 4 months home-based exercises. (n = 45)	NA	Clinical assessment (no blinded assessor): - head and neck position while seated - breathing - facial expression - lip appearance and closure - tongue - rest position, tonicity, motility - Tongue thrust: chewing, swallowing, speech Palatography - Payne Technic* Lip Strength - Force Scale*	- Improvements in head and neck position while seated ($p < 0.01$) - swallowing pattern and facial expression ($p < 0.01$) - lip appearance ($p < 0.001$), lip closure ($p < 0.001$) - tongue position ($p < 0.001$), tonicity ($p < 0.001$), and motility ($p < 0.001$) - normal breathing in almost all patients ($p < 0.001$)

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
						Articulation disorders (vowels and consonant sounds) * Garliner(10) is on the reference list. Evaluation times: baseline and end of OMT (3 to 4 months)	- 32% achieved orofacial muscle balance ($p < 0.01$) - 91% showed improved rest tongue position - 66% achieved normal sound articulation
Cassir 2016(62) Canada	RCT (no randomization process description, no allocation concealment, no blinded assessor)	To compare and evaluate the efficiency of both basic and complete orofacial myofunctional therapies on the correction of atypical swallowing, orofacial muscle tone, and mode of breathing.	Children and adolescents (6 to 14 years) screened and recruited during the selection for patients in need of orthodontic care at the orthodontic clinic of a university.	Complete OMT: - 7 individual sessions to correct atypical swallowing, tongue position, and lip closure at rest. 1st month: weekly 2nd month: bi-weekly 3rd month: one visit Myofunctional exercises: resonance and articulation exercises, lingual and labial muscle tone and posture, swallowing and body posture exercises. Log journal for compliance. (n = 20)	Simplified OMT: - modifying the tongue posture - 3 individual monthly sessions Verbal instructions and at-home exercises (correct tongue position and lip closure at rest - without addressing atypical swallowing pattern) Log journal for compliance (n = 17)	Clinical evaluation: - Swallowing pattern (while eating a cookie) - Tongue position - Lip closure at rest - Nasal permeability (with a mirror) Clinical evaluation and parental reporting: - breathing mode (nasal/oral) Sound production: - recorded as the patient spoke various tongue-tied sentences Evaluation times: baseline (T0), 3 months - end of OMT (T1), 12 months (T2)	For both groups, between T0 and T2: - nasal breathing improved ($p < 0.001$) - tongue posture at rest improved ($p < 0.001$) - - atypical swallowing pattern decreased ($p < 0.001$) - tongue and apex muscle tone increased ($p = 0.035$) - more with complete OMT ($p = 0.022$) - No differences in cheek and lip muscle tone and bodily posture either between groups or between times
Degan and Puppin-Rontani 2004(63), 2005(64), 2007(65) Brazil	RCT (no randomization process description, no allocation concealment, blinded outcome assessor)	To evaluate the effects of the association between removing sucking habits and Orofacial Myofunctional Therapy in: - Orofacial musculature normalization(63) - Swallowing pattern and tongue rest position(64) - Nasal aeration(65)	Children (4 years to 4 years and 8 months) with sucking habits on pacifiers (using them freely both during the day and at night) and using feeding bottles on average twice a day, recruited from public daycare facilities.	OMT group: Removal of habits with Modified Clarification Method(66) + OMT. OMT protocol: - 30 minutes, 8 weekly sessions - Home exercises 1 time/day - Parental supervision - Muscle strength: upper and lower OO, buccinators, and lingual muscles - isometric exercises with a tongue depressor. - Functions: swallowing and breathing -swallowing preparatory exercises (tongue click, liquid and solid swallowing). - Position at rest: lip sealing and tongue positioning (in the retro-incisal papilla region).	Removal of habits (Modified Clarification Method(66)) and no OMT (n = 10)	1) Oral structures(63) (clinical evaluation): - lips resistance - cheeks resistance - Tongue resistance 2) Tongue position at rest and swallowing pattern(64) (clinical evaluation): - Tongue position at rest - Swallowing pattern (water and food) 3) Breathing type(65) (Altmann millimeter nasal mirror). Evaluation times: baseline (T0 – after habit removal, 2 months (T1 – OMT end) 6 months (T2)	1) Oral structures resistance(63) at T2: - Lips resistance: 70% normal in OMT group vs 30% in control. - Cheek resistance: 100% normal in OMT group vs 20% in control. - Tongue resistance: 40% normal in both groups. 2) Tongue position at rest and swallowing pattern(64) at T2: - Tongue position at rest: 60% normal in OMT group vs 0% in control. - Swallowing pattern: 80% normal in OMT group vs 50% control. 3) Nasal aeration(65) after treatments was significantly greater in

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
				- Personalized. (n = 10)			OMT group at T1 and T2. All with statistical significance ($p < 0.05$)."
Korbmacher et al. 2004(67) Germany	RCT (no randomization process description, no allocation concealment, blinded outcome assessor)	To evaluate any changes in the orofacial system during OMT. In particular, a newly developed appliance-based therapy concept - Face Former Therapy (FFT) was to be compared with conventional OMT as performed by speech-language pathologists with a supplementary qualification.	Children referred to the Department of Orthodontics of a university (mean age 8 years) with multiple untreated OMDs.	Intervention group: Face Former (FF) - flexible silicone appliance inserted in oral vestibules. - Before Face-Former exercises: tongue exercises - when necessary - Face Former basic exercise: compression of the lip wedge with the lips for 6 seconds / 6 seconds relaxation. 20 repetitions 3 times/day. - Other exercises: draw lip wedge upwards / forwards or downwards during lip compression. - After 3-week training period - overnight use. - Recall sessions (control and motivation) - 6-week intervals (n = 17)	Conventional OMT: Delivered at practices run by speech-language pathologists in the region. Individually applied therapy concepts according to the therapist's decision, based on Kittel(22), Grums (no reference cited), and Garliner(10) approaches. (n = 13)	1) extraoral and intraoral findings (clinical photos at rest and in function) 2) diagnosis by the speech pathologist (standardized diagnostic sheet for patients with OMDs(68)) - breathing: clinical observation and parental report -swallowing pattern: clinical observation and palatography -lip strength: digital precision pressure gauge with a relative-pressure sensor (Myo-Bar-Meter®) - /s/ sound production. Evaluation times: baseline (T0), 3 months (T1) and 6 months (T2)	Mouth breathing: 91% pre-interventions. T2: habit persistence in 69% OMT children vs 23.5% of FF ($p < 0.05$). Lip strength: both groups improved. No differences between groups. Swallowing pattern: both groups improved over time (100% pre-therapy). Atypical swallowing pattern at T2 35% in FF group vs 76% in OMT group ($p < 0.05$). Sound /s/: neither group improved in a statistically significant way.
REVIEWS							
Colas 2021(69) Portugal	Narrative review with systematized search (dissertation)	To evaluate the effectiveness of OMT in correcting masticatory and perioral muscle disorders in pediatric patients with malocclusion and OMDs. To answer the question: Is there evidence of the OMT effectiveness for the tongue, lips, and perioral musculature function correction in children?	Pediatric dental patients with OMDs	- OMT (not specified) - Preformed orthodontic appliances with associated exercises	No treatment	Tongue, lips, perioral musculature disorders correction	- 6 included studies (1 RCT, 2 controlled trials / 1 NRCT, 1 prospective study and 1 case report) - 2 studies with MCR, 1 with T4K, 1 with froggy mouth, 2 with myofunctional removable orthodontic devices. Only one study with associated OMT(70) (already included in this systematic review). Number of patients ranging from 20 to 68 (and one case report). All showing positive results. CONCLUSION: The treatment with OMT

Study	Design	Objective	Population	Intervention	Comparison	Outcomes and follow-up	Results
							positively affects chewing and perioral muscles, especially in skeletal Class II malocclusion and tongue position rehabilitation during swallowing and phonation.
Shortland et al. 2021(71) Australia	Systematic review (based on the method described by Pickering and Byrne(72))	To examine the research evidence supporting the use of OMT and/or myofunctional devices (MD) in speech-language pathology treatment (SLP). Specifically: • to identify and critique the level and quality of evidence for OMT and/or MD in SLP treatment • to describe the use and effectiveness of OMT and/or MD in SLP treatment • to identify gaps in the literature and consider areas for future research for OMT and MD in SLP treatment.	Unspecified	Interventions that included OMT or the use of MD carried out by an SLP or included an SLP as part of the therapy team.	NI	Unspecified	- 28 included studies (5 already included in this review(13, 47, 59, 61, 70), the other not fulfilling the eligibility criteria) - 50% included studies rated as Level 3 evidence (case reports) - All studies used OMT. Only 1 with MD - 28 (100%) reported improvements in breathing, swallowing, chewing, oral behaviors, oral hygiene, and/or posture using OMT and/or MDs - only 50% with a significant difference in swallowing, chewing, breathing, and oral behaviors. - One found partial improvement in speech and another none. CONCLUSION: There has been an increase in literature over the last decade in SLPs' use of OMT; however, there are only a small number of studies to date that explore the use of MDs.

Notes: OMT (orofacial myofunctional therapy), OMDs (orofacial myofunctional disorders), RCT (randomized controlled trial), NA (not applicable), NI (not informed), EMG (electromyography), OO and OOI (orbicularis oris muscle), ENT (ear, nose, throat service)

REFERENCES

1. Carminatti M, Nicoloso GF, Miranda PP, Gomes E, de Araujo FB. The Effectiveness of Lingual Frenectomy and Myofunctional Therapy for Children: A Randomized Controlled Clinical Trial. Journal of dentistry for children (Chicago, Ill). 2022;89(1):3-10.
2. Saccomanno S, Di Tullio A, D'Alatri L, Grippaudo C. Proposal for a myofunctional therapy protocol in case of altered lingual frenulum. A pilot study. European journal of paediatric dentistry. 2019;20(1):67-72.
3. Lalakea ML, Messner AH. Ankyloglossia: the adolescent and adult perspective. Otolaryngol Head Neck Surg. 2003;128(5):746-52.
4. Messner AH, Lalakea ML. The effect of ankyloglossia on speech in children. Otolaryngol Head Neck Surg. 2002;127(6):539-45.
5. Scarano A, Di Giulio R, Gehrke SA, Tagariello G, Romano F, Lorusso F. Atmospheric Plasma Lingual Frenectomy Followed by Post Operative Tongue Exercises: A Case Series. Children (Basel, Switzerland). 2023;10(1).
6. Gonzalez Garrido MDP, Garcia-Munoz C, Rodriguez-Huguet M, Martin-Vega FJ, Gonzalez-Medina G, Vinolo-Gil MJ. Effectiveness of Myofunctional Therapy in Ankyloglossia: A Systematic Review. International journal of environmental research and public health. 2022;19(19).
7. Inostroza-Allende F, Ulloa CC, Jara MG, Palomares-Aguilera M. Postoperative speech therapy intervention of the lingual frenulum in children, adolescents and adults. Integrative literature review. Revista de Investigacion en Logopedia. 2022;12(1).
8. Miranda PP, Cardoso CL, Gomes E. Interventions in the Alteration on Lingual Frenum: Systematic Review. Int arch otorhinolaryngol (Impr). 2016;20(3):275-80.
9. Begnoni G, Dellavia C, Pellegrini G, Scarponi L, Schindler A, Pizzorni N. The efficacy of myofunctional therapy in patients with atypical swallowing. European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery. 2020;277(9):2501-11.
10. Garliner D. Myofunctional Therapy in Dental Practice: Abnormal Swallowing Habits: Diagnosis, Treatment. A Course of Study for the Dental Practitioner and Speech Pathologist: Bartel Dental Book Company; 1974.
11. Cayley AS, Tindall AP, Sampson WJ, Butcher AR. Electropalatographic and cephalometric assessment of myofunctional therapy in open-bite subjects. Australian orthodontic journal. 2000;16(1):23-33.
12. Zante SM. Treatment and compliance methods. In: Ferketic MMG, K., editor. Orofacial-myology: beyond tongue thrust: American Speech-Language-Hearing Association; 1994. p. 41-4.
13. Christensen M, Hanson M. An investigation of the efficacy of oral myofunctional therapy as a precursor to articulation therapy for pre-first grade children. The Journal of speech and hearing disorders. 1981;46(2):160-5.
14. Barrett RHH, M. L. Oral myofunctional disorders. 2nd. ed. St. Louis: C. V. Mosby; 1978.
15. Falk ML. Treatment of deviant swallow patterns with neuromuscular facilitation. Int J Oral Myol. 1977;3(1):27-9.
16. Farret MMB, Jurach EM, Tomé MC. Análise do comportamento da deglutiçäo em crianças submetidas a tratamento mioterápico associado ao uso de placas reeducadoras e impedidoras. Rev dent press ortodon ortop maxilar. 1997;2(5):91-5.
17. Segóvia ML. Interrelaciones entre la odontoestomatologia y la fonoaudiologia: la deglución atípica. 2nd ed. Buenos Aires: Panamericana; 1988. 237 p.
18. Ferraz MCA. Manual prático de deglutição atípica e problemas correlatos : terapia miofuncional nos tratamentos orofaciais. 2nd ed. Rio de Janeiro1984.
19. Farret MMBT, Marileda Cattelan; Jurach, Estela Maris; Marchiori, Susana Cardoso. Proposta de um tratamento para reposicionamento lingual em pacientes portadores de deglutinação atípica. Ortodontia. 1996;29(1):43-7.

20. Giuca MR, Pasini M, Pagano A, Mummolo S, Vanni A. Longitudinal study on a rehabilitative model for correction of atypical swallowing. European journal of paediatric dentistry. 2008;9(4):170-4.
21. Heinzelmann B, Bilda K, Kittel AM. Myofunctional therapy: Which influencing factors have an impact on the outcome - A retrospective study. Forum Logop. 2009;23(6):6-11.
22. Kittel AM. Myofunktionelle Therapie. Idstein: Schulz-Kirchner.; 2004.
23. Mozzanica F, Pizzorni N, Scarponi L, Crimi G, Schindler A. Impact of Oral Myofunctional Therapy on Orofacial Myofunctional Status and Tongue Strength in Patients with Tongue Thrust. Folia phoniatrica et logopaedica : official organ of the International Association of Logopedics and Phoniatrics (IALP). 2021;73(5):413-21.
24. Overstake CP. Investigation of the efficacy of a treatment program for deviant swallowing and allied problems. II. Int J Oral Myol. 1976;2(1):1-6.
25. Toronto AS. Long-term effectiveness of oral myotherapy. The International journal of oral myology. 1975;1(4):132-6.
26. Barret RHH, M. L. Oral Myofunctional Disorders. 1st. ed. St. Louis: Mosby Company; 1974.
27. Barber TK, Bonus HW. Dental relationships in tongue-thrusting children as affected by circumoral myofunctional exercise. Journal of the American Dental Association (1939). 1975;90(5):979-88.
28. Das UM, Beena JP. Effectiveness of circumoral muscle exercises in the developing dentofacial morphology in adenotonsillectomized children: an ultrasonographic evaluation. Journal of the Indian Society of Pedodontics and Preventive Dentistry. 2009;27(2):94-103.
29. García González B, Moh A, Anabtawi A, Soto Cantero L, Vistorte Pupo AR. Variaciones de la adaquia y fuerza labial superior en niños, tratados con mioterapia: Policlínico Tomás Romay: Habana Vieja. Rev habanera cienc méd. 2009;8(4).
30. Ingervall B, Eliasson GB. Effect of lip training in children with short upper lip. The Angle orthodontist. 1982;52(3):222-33.
31. Jardini RSR. Uso do exercitador labial: estudo preliminar para alongar e tonificar os músculos orbiculares orais. Pró-fono. 1999;11(1):8-12.
32. Ohtsuka M, Kaneko T, Iida J. Effectiveness of training methods to improve orbicularis oris muscle endurance in patients with incompetent lips. Orthod Waves. 2015;74(4):99-104.
33. Owman-Moll P, Ingervall B. Effect of oral screen treatment on dentition, lip morphology, and function in children with incompetent lips. Am J Orthod. 1984;85(1):37-46.
34. Saccucci M, Tecco S, Ierardoa G, Luzzi V, Festa F, Polimeni A. Effects of interceptive orthodontics on orbicular muscle activity: A surface electromyographic study in children. J Electromyogr Kinesiology. 2011;21(4):665-71.
35. Satomi M. The relationship of lip strength and lip sealing in MFT. The International journal of orofacial myology : official publication of the International Association of Orofacial Myology. 2001;27(gsi, 8207532):18-23.
36. Soto Cantero L, García González B, González Fernández M. La fuerza labial superior y sus variaciones con la mioterapia. Rev cuba estomatol. 2003;40(3).
37. Thuer U, Ingervall B. Effect of muscle exercise with an oral screen on lip function. European journal of orthodontics. 1990;12(2):198-208.
38. Yang X, Lai G, Wang J. Effect of orofacial myofunctional therapy along with preformed appliances on patients with mixed dentition and lip incompetence. BMC oral health. 2022;22(1):586.

39. Yang X, Lai G, Wang J. Effect of orofacial myofunctional therapy on the middle-mixed dentition patients with incompetent lips. 2022(Query date: 2023-05-16 15:13:58).
40. Yoshizawa S, Ohtsuka M, Kaneko T, Iida J. Study of training for improving lip incompetence. Orthod Waves. 2016;75(3):47-53.
41. Campanha SMA, Fontes MJF, Camargos PAM, Freire LMS. The impact of speech therapy on asthma and allergic rhinitis control in mouth breathing children and adolescents. Jornal de pediatria. 2010;86(3):202-8.
42. Gallo J, Campiotto AR. Terapia miofuncional orofacial em crianças respiradoras orais. Rev CEFAC. 2009;11(supl.3):305-10.
43. Habumugisha J, Cheng B, Ma S-Y, Zhao M-Y, Bu W-Q, Wang G-L, et al. A non-randomized concurrent controlled trial of myofunctional treatment in the mixed dentition children with functional mouth breathing assessed by cephalometric radiographs and study models. BMC pediatrics. 2022;22(1):506.
44. Kumar TVA, Kuriakose S. Ultrasonographic evaluation of effectiveness of circumoral muscle exercises in adenotonsillectomized children. The Journal of clinical pediatric dentistry. 2004;29(1):49-55.
45. Lembrechts D, Verschueren D, Heulens H, Valkenburg HA, Feenstra L. Effect of a logopedic instruction program after adenoidectomy on open mouth posture: a single-blind study. Folia Phoniatr Logop. 1999;51(3):117-23.
46. Marson A, Tessitore A, Sakano E, Nemr K. Efetividade da fonoterapia e proposta de intervenção breve em respiradores orais. Rev CEFAC. 2012;14(6):1153-66.
47. Schievano D, Rontani RM, Berzin F. Influence of myofunctional therapy on the perioral muscles. Clinical and electromyographic evaluations. Journal of oral rehabilitation. 1999;26(7):564-9.
48. Silva LKd. Efetividade de um programa de terapia miofuncional no tratamento da respiração oral em indivíduos com má oclusão dentária: ensaio clínico. 2017. p. 93-.
49. Araújo BCL, Simões SdM, Moreira MGS, Mendes ALF, Martins-Filho PRS. Evidence of orofacial myofunctional therapy patients with asthma and rhinitis: a systematic review. CoDAS. 2019;31(4):e20190009-e.
50. Batista DPF, Bagarollo MF. Surface electromyography in orofacial and cervical musculature in mouth breathing children: an integrative literature review. Rev CEFAC. 2020;22(1):e19318-e.
51. Bourne CO. The comparative effectiveness of two digit-sucking deterrent methods. West Indian Med J. 2005;54(4):257-60.
52. Green SE. Confirmational study: a positive-based thumb and finger sucking elimination program. The International journal of orofacial myology : official publication of the International Association of Orofacial Myology. 2010;36(gsi, 8207532):44-59.
53. Huang B, Lejarraga C, Franco CS, Kang Y, Lee A, Abbott J, et al. Influence of non-orthodontic intervention on digit sucking and consequent anterior open bite: a preliminary study. International Dental Journal. 2015;65(5):235-41.
54. Larsson E. Treatment of children with a prolonged dummy or finger-sucking habit. Eur J Orthod. 1988;10(3):244-8.
55. Puig Ravinal L, Martín Zaldívar L, Hidalgo Pacheco A, Altunaga Carbonell A. Comparación de métodos mioterapéuticos para eliminar el hábito de succión digital. Arch méd Camaguey. 2002;6(supl.1):681-7.
56. Van Norman RA. Digit-sucking: a review of the literature, clinical observations and treatment recommendations. The International journal of orofacial myology : official publication of the International Association of Orofacial Myology. 1997;23(gsi, 8207532):14-34.
57. Borrie FRP, Bearn DR, Innes NPT, Iheozor-Ejiofor Z. Interventions for the cessation of non-nutritive sucking habits in children. Cochrane Database of Systematic Reviews. 2015(3).

58. Areias RLFC, Vieira MM, Vieira RM. Placa corretiva postural orofacial: uma proposta de terapia funcional dos órgäos fonoarticulatórios. Pró-fono. 1996;8(1):51-6.
59. Bacha SM, Rispoli CF. Myofunctional therapy: brief intervention. The International journal of orofacial myology : official publication of the International Association of Orofacial Myology. 1999;25(gsi, 8207532):37-47.
60. Bellingen V. On the effectiveness of the Padovan-Method® Neurofunctional Reorganization of myofunctional disorders. Forum Logop. 2017;31(2):16-21.
61. Bigenzahn W, Fischman L, Mayrhofer-Krammel U. Myofunctional therapy in patients with orofacial dysfunctions affecting speech. Folia phoniatrica. 1992;44(5):238-44.
62. Cassir N. Efficacy and stability of orofacial myofunctional therapy on restoring mature pattern of swallowing and nasal breathing in children before orthodontic treatment: papyrus.bib.umontreal.ca; 2016.
63. Degan VV P-RR. Terapia miofuncional e hábitos orais infantis. Rev CEFAC. 2004;6(4):396-404.
64. Degan VV, Puppin-Rontani RM. Remoção de hábitos e terapia miofuncional: restabelecimento da deglutição e repouso lingual. Pró-fono. 2005;17(3):375-82.
65. Degan VV, Puppin-Rontani RM. Aumento da aeração nasal após remoção de hábitos de sucção e terapia miofuncional. Rev CEFAC. 2007;9(1):55-60.
66. Boni RCA, R. C.; Degan, V. V. Utilização do método de esclarecimento para remoção do hábito de sucção de chupeta e/ou mamadeira. J Orthop-Orthod Pediatr Dent. 2001;2(11).
67. Korbmacher HM, Schwan M, Berndsen S, Bull J, Kahl-Nieke B. Evaluation of a new concept of myofunctional therapy in children. The International journal of orofacial myology : official publication of the International Association of Orofacial Myology. 2004;30(gsi, 8207532):39-52.
68. Korbmacher H, Kahl-Nieke B. Optimizing interdisciplinary cooperation for patients with orofacial dysfunctions. Presentation of an interdisciplinary diagnostic referral sheet. J Orofac Orthop. 2001;62(3):246-50.
69. Colas LEK. Terapia Miofuncional Em Pacientes Odontopediátricos: uma Revisão Narrativa. Portugal: Universidade Fernando Pessoa (Portugal); 2021.
70. Van Dyck C, Dekeyser A, Vantricht E, Manders E, Goeleven A, Fieuws S, et al. The effect of orofacial myofunctional treatment in children with anterior open bite and tongue dysfunction: a pilot study. European journal of orthodontics. 2016;38(3):227-34.
71. Shortland H-AL, Hewat S, Vertigan A, Webb G. Orofacial Myofunctional Therapy and Myofunctional Devices Used in Speech Pathology Treatment: A Systematic Quantitative Review of the Literature. American journal of speech-language pathology. 2021;30(1):301-17.
72. Pickering C, Byrne J. The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early-career researchers. Higher Education Research & Development. 2014;33(3):534-48.

CITATION
Stefani CM, de Almeida de Lima A, Stefani FM, Kung JY, Flores-Mir C, Compton SM. Effectiveness of orofacial myofunctional therapy in improving orofacial function and oral habits: a scoping review. *Can J Dent Hyg*. 2025;59(1):59–72.