



Impact of swallowing patterns on orofacial motor speech production in children

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ABSTRACT

Introduction: The relationship between swallowing patterns and orofacial motor speech production has been described in the literature; however, it remains insufficiently integrated into clinical practice and training in speech-language pathology.

Objective: To explore speech therapists' perceptions of the association between atypical swallowing patterns and speech production in children, and to describe self-reported clinical knowledge and practices among Portuguese and French professionals.

Methods: A mixed-methods design was employed, combining a literature review with a cross-sectional online survey of 53 speech therapists (40 French, 13 Portuguese). The questionnaire assessed professional background, knowledge of swallowing-speech relationships, intervention practices, and training adequacy. Data were analyzed using descriptive statistics and thematic content analysis.

Results: Most participants (92.3% Portuguese; 57.5% French) reported that atypical swallowing influences speech production, mainly through altered lingual positioning affecting alveolar (/t/, /d/, /n/) and fricative (/s/, /z/, /ʃ/, /ʒ/) sounds. French clinicians predominantly worked in private practice, while Portuguese clinicians were mainly in institutional settings. University training was widely considered insufficient, leading to high demand for continuing education. Multidisciplinary collaboration, particularly with orthodontists, was limited but recognized as important.

Conclusion: The findings suggest that speech therapists perceive atypical swallowing as potentially associated with pediatric speech production difficulties, particularly through altered lingual positioning and articulation patterns. As an exploratory survey based on self-reported practices, this study highlights perceived training gaps and the need for further research on interdisciplinary assessment and intervention in the swallowing-speech relationship.

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RESUMO

Introdução: A relação entre os padrões de deglutição e a produção motora da fala orofacial tem sido descrita na literatura, mas continua pouco integrada na prática clínica e na formação em terapia da fala.

Objetivo: Explorar as percepções dos terapeutas da fala sobre a associação entre padrões de deglutição atípicos e a produção da fala em crianças, bem como descrever o conhecimento e as práticas clínicas autorreportadas por profissionais portugueses e franceses.

Metodologia: Foi utilizada uma abordagem de métodos mistos, combinando revisão da literatura com um estudo transversal através de questionário online aplicado a 53 terapeutas da fala (40 franceses e 13 portugueses). O instrumento avaliou o perfil profissional, o conhecimento sobre a relação deglutição–fala, as práticas de intervenção e a adequação da formação académica. Os dados foram analisados por estatística descritiva e análise temática.

Resultados: A maioria dos participantes (92,3% dos portugueses; 57,5% dos franceses) considerou que a deglutição atípica influencia a produção da fala, sobretudo através de alterações no posicionamento lingual que afetam sons alveolares (/t/, /d/, /n/) e fricativos (/s/, /z/, /ʃ/, /ʒ/). Os terapeutas franceses trabalham maioritariamente em prática privada, enquanto os portugueses atuam sobretudo em contextos institucionais. A formação universitária foi considerada insuficiente, verificando-se elevada procura por formação contínua. A colaboração multidisciplinar, nomeadamente com ortodontistas, é limitada, mas reconhecida como relevante.

Conclusão: Os resultados sugerem que os terapeutas da fala percebem a deglutição atípica como potencialmente associada a dificuldades na produção da fala em idade pediátrica, particularmente através de alterações no posicionamento lingual e nos padrões articulatórios. Sendo este um estudo exploratório baseado em práticas autorreportadas, os dados evidenciam lacunas percebidas na formação e a necessidade de investigação futura sobre avaliação e intervenção interdisciplinar na relação deglutição–fala.

Introduction

The intricate relationship between swallowing mechanics and orofacial motor speech production represents a cornerstone of pediatric speech-language pathology, particularly within the domain of orofacial motricity. Swallowing and speech share overlapping anatomical structures - including the tongue, lips, velum, and pharyngeal musculature - and neuromuscular control systems, where disruptions in one may influence the other.^{1,2} This study builds on foundational observations from clinical practice and theoretical frameworks, highlighting how atypical swallowing patterns persist beyond infancy, potentially affecting lingual positioning, muscle tone, and articulation precision in children aged 3-10 years.^{3,4}

Traditional perspectives emphasize the transition from infantile to mature swallowing patterns around age 6, where improper lingual propulsion during the oral phase can lead to persistent anterior tongue thrust, open bite malocclusions, and compensatory speech distortions such as interdental lisps (/s/, /z/) and alveolar substitutions (/t/, /d/, /n/)². These patterns may compromise nutritional

intake and respiratory protection and have been associated with speech intelligibility difficulties, as evidenced by electromyographic studies showing delayed submental and orbicularis oris activation in affected children.⁵ Recent biophysiological models further elucidate this nexus, integrating sensory feedback loops and phenotypic factors (e.g., hypotonia in Down syndrome) that may contribute to oromyofunctional imbalances, with potential implications for phoneme production and early literacy development through impaired somatosensory calibration.^{1,5,6}

Despite growing recognition, cross-cultural variations in clinical assessment and intervention persist. In Portugal and France - key regions for this analysis - speech therapists report university training deficiencies in integrating swallowing-speech protocols, with only 57-100% deeming it adequate, prompting reliance on workshops and multidisciplinary referrals to orthodontists. Recent literature suggests that myofunctional therapy may be associated with improvements in articulation accuracy; however, variability in study designs and outcome measures limits the strength of these conclusions, and implementation gaps remain due to limited standardized tools. This highlights the

need for further development of curricula and evidence-based clinical approaches to mitigate long-term impacts on verbal-oral production.⁷

The present investigation addresses these gaps by synthesizing theoretical underpinnings with empirical survey data from 53 Franco-Portuguese clinicians, reporting a high level of clinical agreement regarding a perceived association between atypical deglutition and speech production (92% consensus). By updating prior methodologies with contemporary PubMed-sourced references, we aim to contribute to a better understanding of clinician perspectives on the swallowing-speech relationship in orofacial motricity.^{5,6}

Methodology

Study design

This investigation employed a mixed-methods approach combining a comprehensive theoretical literature review with an empirical cross-sectional survey of speech-language pathology professionals. The theoretical component synthesized anatomical, physiological, and developmental literature on pediatric swallowing and speech production, focusing on orofacial motricity mechanisms. The survey component utilized a descriptive, quantitative-dominant design with qualitative elements to capture clinical knowledge and practices across Portugal and France.

Objectives and research questions

Primary objective: To explore speech therapists' perceptions regarding the relationship between atypical swallowing patterns and orofacial motor speech production in children, and to describe self-reported clinical practices among Portuguese and French participants.

Research questions:

1. How do speech therapists perceive the relationship between atypical swallowing and speech production in children?
2. What clinical practices are self-reported by Portuguese and French participants regarding assessment and intervention in swallowing-speech difficulties?
3. What training gaps are perceived by participants in relation to orofunctional assessment and intervention?

Participants

The target population comprised practicing speech therapists and postgraduate students in speech-language pathology from Portugal (n=13) and France (n=40), totaling 53 respondents. Inclusion criteria: licensed clinicians or final-year students with clinical exposure to pediatric cases; working in educational, hospital, or private settings.

Exclusion: incomplete responses. Participants were recruited via professional networks, university faculty email lists, and social media groups (Portuguese Speech Therapy Association, French Orthophonie Federation). Response rate: 78% (53/68 distributed).

Data collection instrument

A custom-designed questionnaire was developed by the primary investigator, available in Portuguese and French versions. The 28-item instrument included:

- Section 1: Professional Profile (demographics, practice setting, years of experience)
- Section 2: Knowledge Assessment (5-point Likert scale: 1=No knowledge, 5=Expert, e.g., "Does atypical swallowing influence speech production?")
- Section 3: Intervention Practices (multiple-choice + open-ended: techniques, age ranges, multidisciplinary referrals)
- Section 4: Training Evaluation (university coursework adequacy, continuing education needs)

The full questionnaire, including both language versions, is provided as supplementary material. Content validity was established through expert review (n=3 speech therapists) yielding 92% inter-rater agreement. The instrument demonstrated good internal consistency (Cronbach's $\alpha=0.84$).

Procedure

Data collection occurred for three months. Following ethical approval from Fernando Pessoa University Ethics Committee:

1. Informed consent was obtained electronically (100% acceptance rate).
2. Questionnaires were distributed via Google Forms (anonymous, 15-minute completion time).
3. Two reminders sent at 1- and 2-week intervals.
4. Data exported to Excel for cleaning (3.8% missing data, handled via listwise deletion).

Data analysis

Quantitative analysis: Descriptive statistics (frequencies, percentages, means \pm SD) computed using SPSS v.23. Inferential analyses included chi-square tests and Fisher's exact test for group comparisons, depending on expected cell counts. Effect sizes were considered to support interpretation of the findings. Given the small subgroup sizes, inferential findings should be interpreted with caution. Spearman's rho was used for correlation analyses.

Qualitative analysis: Thematic content analysis of open-ended responses following Braun et al⁸ framework: (1) data familiarization, (2) initial coding, (3) theme generation, (4) review, (5) definition. Two independent coders achieved 89% inter-rater reliability (Cohen's κ).

Quality assurance: Anonymity preserved; no identifying data collected. Results triangulated across quantitative/qualitative strands and theoretical literature.

This rigorous methodology ensures robust, replicable findings on the swallowing-speech nexus in pediatric orofacial motricity, addressing identified clinical knowledge gaps.

Results

Sample characteristics

Of 53 respondents, 75.5% (n=40) were French and 24.5% (n=13) Portuguese speech therapists and postgraduate students. The sample included both licensed clinicians and postgraduate students; these groups may differ in clinical experience and were considered when interpreting the findings. French clinicians predominantly worked in private practice (92.5%), while Portuguese favored institutional settings (76.9%). Mean experience: 6.8±4.2 years. Primary pediatric caseload focused ages 3-10 years (68.2% both countries). Table 1 summarizes professional profiles.

Table 1. Participant characteristics by country.

Characteristic	Portugal (n=13)	France (n=40)	Total (n=53)
Practice Setting			
Private	23.1%	92.5%	75.5%
Institutional	76.9%	5.0%	22.6%
Other	0%	2.5%	1.9%
Years Experience Mean ± SD	5.3±3.1	7.4±4.5	6.8±4.2
Primary Age Group			
3-6 years	38.5%	35.0%	35.8%
7-10 years	15.4%	17.5%	16.9%
Mixed	46.2%	47.5%	47.2%

Knowledge of swallowing-speech relationship

92.3% Portuguese and 57.5% French clinicians reported that atypical swallowing influences speech production (Fisher's exact test, p=0.004), suggesting a small effect size, which should be interpreted with caution. Consensus emerged on lingual positioning as primary mechanism (85.2% alveolar sounds /t,d,n/; 79.6% fricatives /s,z,ʃ/). University training adequacy rated insufficient: 100% Portuguese, 57.5% French for speech; 92.3% vs 82.5% for swallowing. Table 2 details knowledge gaps.

Table 2. Training adequacy ratings (1=No knowledge, 5=Expert).

	Domain	Portugal Mean±SD	France Mean±SD	p-value
Knowledge	Swallowing	2.8±0.9	3.1±1.0	0.312
	Speech	2.5±0.8	2.7±0.9	0.478
Training Adequacy	Swallowing	2.2±0.7	2.4±0.8	0.421
	Speech	1.8±0.6	2.1±0.7	0.187

Intervention practices

Myofunctional exercises constituted core interventions (94.3% usage), targeting lingual repositioning (89.6%), velar elevation (76.4%), and labial sealing (68.2%). Portuguese clinicians-initiated therapy earlier (mean age 4.2±1.1 years) vs French (5.6±1.4 years; p=0.023). Multidisciplinary collaboration limited: 46.2% Portuguese referred to orthodontists vs 22.5% French (Fisher's exact test, p=0.042), suggesting a small-to-moderate effect size. Table 3 compares techniques.

Table 3. Primary intervention techniques (% usage).

Technique	Portugal (n=13)	France (n=40)	p-value
Lingual exercises	100%	92.5%	0.312
Velar elevation	84.6%	75.0%	0.412
Labial sealing	76.9%	65.0%	0.387
Mandibular stability	61.5%	47.5%	0.298
Orthodontic referral	46.2%	22.5%	0.042*

*p<0.05

Continuing education needs

92-100% across countries sought advanced training. Portuguese prioritized myofunctional protocols (100%); French emphasized instrumental assessment (85.0%). Correlation found between experience and workshop attendance (r_s=0.67, p<0.001).

Qualitative themes

Thematic analysis (κ=0.89) identified three themes from open responses:

1. Mechanistic Understanding (43.4%): "Anterior tongue thrust pushes against incisors, causing /s/ lisps and open bites" (Portuguese clinician).
2. Training Deficits (32.1%): "University covers anatomy but not clinical integration" (French clinician).
3. Practice Barriers (24.5%): "Lack of standardized protocols hinders referrals" (both countries).

These results confirm strong clinical consensus on swallowing-speech linkage while revealing cross-cultural practice variations and systemic training gaps.

Given the small subgroup sizes, these inferential results should be interpreted with caution.

Discussion

Clinical consensus validates oromyofunctional pathophysiology

The striking cross-national consensus - 92.3% of Portuguese and 57.5% of French clinicians affirming atypical swallowing's impact on speech production - provides

insight into clinicians' perspectives regarding the oromyofunctional hypothesis central to this investigation. This agreement across countries suggests that clinicians commonly identify anterior tongue thrust as a relevant mechanism potentially affecting alveolar ridge contact involved in the production of /t/, /d/, /n/ (85.2% identification) and sibilant precision (/s/, /ʃ/, /z/; 79.6%). Such specificity is consistent with findings from kinematic studies reporting reduced lingual-palatal pressure during /s/ production in children with persistent deglutition tongue thrust.⁹

These clinical observations are consistent with neuromuscular evidence: surface electromyography reveals 20-35% delayed submental and 28% prolonged orbicularis oris activation in affected children, which may affect the spatiotemporal coordination involved in phonemic accuracy⁵. The higher French disagreement rate (42.5%) may be related to differences in practice among French participants, particularly a greater emphasis on symptomatic articulation therapy over etiological assessment - a systemic divergence confirmed across 12 European nations¹⁰. Collectively, these findings suggest that oromyofunctional imbalance may represent a relevant factor in pediatric articulation difficulties, warranting further investigation.⁵

Training-practice disconnect: a curricular crisis

Universal condemnation of university training (100% Portuguese, 57.5% French deeming speech integration inadequate) highlights perceived gaps in academic training. Despite solid anatomical foundations, a gap between theoretical knowledge (mean 2.8-3.1/5) and perceived clinical preparedness (1.8-2.2/5) mirrors European Speech-Language Pathology Association findings: only 43% of 27 nations' programs mandate swallowing-speech coursework exceeding 15 hours.¹⁰

Portuguese clinicians' earlier intervention threshold (4.2 vs. 5.6 years; $p=0.023$) traces directly to institutional ecosystems fostering otorhinolaryngology/orthodontic co-location, contrasting French private practice isolation - a disparity quantified in national audits showing 3.2-fold higher multidisciplinary exposure in hospital vs. solo settings.¹¹ Previous literature has suggested that earlier intervention may be associated with improved outcomes; however, this was not directly assessed in the present study.¹²

Myofunctional therapy efficacy meets referral bottlenecks

The high reported use of myofunctional therapy (94.3%) suggests its widespread adoption in clinical practice, with lingual repositioning (89.6%), velar elevation (76.4%), and labial sealing (68.2%) aiming to address underlying oromyofunctional patterns. Evidence from systematic reviews

supports these approaches: lingual propulsion training has been associated with improvements in articulation outcomes in some studies, although variability in methodologies and outcome measures limits comparability.⁷

A relevant finding is the relatively low rate of orthodontic referrals (46.2% Portugal vs. 22.5% France; $p=0.042$), although interdisciplinary approaches combining speech therapy and orthodontics have been discussed in the literature through synergistic myofunctional-orthopedic stabilization.¹³ Three-dimensional lingual kinematic analyses reveal untreated tongue thrust may be associated with dental and functional changes over time, potentially affecting articulation outcomes.¹⁴ This referral reticence - most acute in isolated private practice - may represent an area for further clinical attention and research.

Clinical implications

The findings of this study highlight the importance of considering swallowing patterns in the assessment of pediatric speech production. Participants reported frequent use of myofunctional approaches and recognized the relevance of interdisciplinary collaboration, particularly with orthodontics.

However, given the exploratory nature of this study and its reliance on self-reported practices, no specific clinical protocols or intervention timelines can be recommended. Further research is needed to establish evidence-based guidelines for assessment and intervention in this domain.^{13,15-18}

Instrumental outcome verification

Instrumental assessment methods may contribute to the evaluation of swallowing and orofacial function. Fiberoptic Endoscopic Evaluation of Swallowing (FEES) is primarily used to assess pharyngeal and laryngeal aspects of swallowing.

For the evaluation of oral-phase function and articulatory mechanisms, other tools such as tongue pressure measurements, electropalatography, palatography, or surface electromyography may be considered, depending on the clinical objective.¹⁹

Educational & policy transformation

The results suggest a perceived need for strengthening training in the integration of swallowing and speech within speech-language pathology curricula.

Methodological limitations & mitigation strategies

1. Selection Bias (experienced clinicians overrepresented): Future studies employ stratified quota sampling across experience bands.

2. Self-Report Inflation: Prospective validation via 20% therapy session audits + blinded GFTA-3 scoring.
3. Temporal Confounds: Cross-sectional design precludes causality; 3-year longitudinal cohorts needed.
4. Geographic Scope and Sample Imbalance: This study is limited to Franco-Portuguese participants, and the imbalance between Portuguese and French respondents may limit the robustness of cross-country comparisons. Future research should include broader and more balanced samples across countries.

Transformative research agenda

1. Definitive RCT: Myofunctional therapy + orthodontics vs. orthodontics alone (n=240, ages 4-7); primary endpoint: Percent consonants correct (GFTA-3).
2. Critical Window Mapping: 5-year prospective cohort tracking swallowing-speech evolution ages 2-12.
3. Instrument Psychometrics: OMES-E vs. 3D transillumination kinematic gold standard ($r > 0.85$ target).
4. Global Validation: 10-nation consortium testing universality across linguistic families.

Overall, the findings of this study suggest that clinicians perceive a relationship between atypical swallowing and speech production, while also identifying relevant gaps in training and interdisciplinary practice.

These results should be interpreted with caution given the study design, and further research is needed to better understand the mechanisms underlying this relationship and to inform evidence-based clinical practice.¹²

Conclusion

This study explored the perceived relationship between atypical swallowing patterns and orofacial motor speech production in children, as reported by 92.3% of Portuguese and 57.5% of French speech therapists. Anterior tongue positioning was frequently identified by participants as a relevant factor potentially affecting alveolar (/t/, /d/, /n/) and sibilant (/s/, /ʃ/) phonemes, with 94.3% clinical adoption of myofunctional exercises indicating consistency in reported clinical practices.

The findings highlight key areas of reflection in speech-language pathology. The results suggest that clinicians consider lingual positioning an important aspect to include in assessment during initial pediatric evaluations, with lingual repositioning exercises frequently reported as part of clinical practice. Portuguese clinicians' earlier therapy initiation (age 4.2 vs. 5.6 years) may reflect differences in access to multidisciplinary contexts in institutional settings - a pattern that warrants further investigation in different contexts.

Training was identified by participants as an area requiring further development: 100% Portuguese and 57.5% French clinicians condemned university curricula, suggesting the importance of strengthening the integration of swallowing and speech content in academic programs. The orthodontic referral disparity (46.2% Portugal vs. 22.5% France) highlights the relevance of interdisciplinary collaboration, particularly with orthodontics.

Overall, this study highlights clinicians' perceptions of the relationship between swallowing and speech, as well as reported gaps in training and interdisciplinary collaboration.

These findings should be interpreted with caution given the exploratory design and reliance on self-reported data. Further research is needed to better understand the mechanisms underlying this relationship and to support the development of evidence-based clinical approaches.

The data supporting the results can be found or stating that it will be provided on request

References

1. McFarland DH, Smith A. Mastication, deglutition, and speech. In: Titze IR, ed. *Principles of Voice Production*. Prentice Hall; 2009:45-67.
2. Ferraz M da C. *Sistema Estomatognático: Uma Visão Global Para o Clínico*. Lovise; 2001.
3. Senez V. *La Déglutition Chez l'enfant*. Orthophonie France; 2015.
4. Marchesan IQ, Junqueira P. *Deglutição: De Fetal a Adulta*. Manole; 2008.
5. Hahn Arkenberg RE, Brown B, Mitchell S, Craig B, Goffman L, Malandraki GA. Shared and Separate Neuromuscular Underpinnings of Swallowing and Motor Speech Development in the School-Age Years. *J Speech Lang Hear Res*. 2023;66(9):3260-3275. doi:10.1044/2023_JSLHR-23-00059
6. Madhavan A, Lam L, Etter NM, Wilkinson KM. A biophysiological framework exploring factors affecting speech and swallowing in clinical populations: focus on individuals with Down syndrome. *Front Psychol*. 2023;14:1085779. doi:10.3389/fpsyg.2023.1085779
7. ASHA. ASHA. https://www.asha.org/practice-portal/clinical-topics/orofacial-myofunctional-disorders/?srsltid=AfmBOor-njmzwGxzYYP8J9fdHrwukzYtaKjjZHCgT7Tg_7O8AwB-3SG5. 2024.
8. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp0630a
9. Matsuo K, Palmer JB. Kinematic linkage of the tongue, jaw, and hyoid during eating and speech. *Arch Oral Biol*. 2010;55(4):325-331. doi:10.1016/j.archoralbio.2010.02.008
10. Home - ESLA Europe. Accessed February 15, 2026. <https://eslaeurope.eu/>
11. Fédération Nationale des Orthophonistes. Accessed February 15, 2026. <https://fno.fr/>

12. Pediatric Feeding and Swallowing. Accessed February 15, 2026. <https://apps.asha.org/EvidenceMaps/Maps/LandingPage/62c566b9-7b2e-4e8a-b52a-7e5d316e80f5>
13. Proffit WR, Fields H, Larson B, Sarver DM. *Contemporary Orthodontics*. 6th Edition. Elsevier; 2018.
14. Perry BJ, Martino R, Yunusova Y, Plowman EK, Green JR. Lingual and Jaw Kinematic Abnormalities Precede Speech and Swallowing Impairments in ALS. *Dysphagia*. 2018;33(6):840. doi:10.1007/s00455-018-9909-4
15. Felício CM. *Motricidade Orofacial: Teoria, Avaliação e Estratégias Terapêuticas*. Edusp – Editora da Universidade de São Paulo; 2020.
16. Marchesan IQ. *Fundamentos Em Fonoaudiologia: Aspectos Clínicos Da Motricidade Oral*. 2.ª. Guanabara koogan; 2005.
17. Marchesan IQ. Distúrbios da Motricidade Oral. In: Russo IP, ed. *Intervenção Fonoaudiológica Na Terceira Idade*. Editora Revinter; 2004:83-100.
18. Felício CM de, Folha GA, Ferreira CLP, Medeiros APM. Expanded protocol of orofacial myofunctional evaluation with scores: Validity and reliability. *Int J Pediatr Otorhinolaryngol*. 2010;74(11):1230-1239. doi:10.1016/j.ijporl.2010.07.021
19. Arvedson JC, Lefton-Greif MA. Instrumental Assessment of Pediatric Dysphagia. *Semin Speech Lang*. 2017;38(2):135-146. doi:10.1055/s-0037-1599111