



Education content in teachers' vocal health promotion: an integrated review

Conteúdos didáticos nas intervenções de saúde vocal do professor: uma revisão integrativa

Contenidos didáticos en las intervenciones de salud vocal del profesor: una revisión integrativa

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Abstract

OBJECTIVE: It is an integrated review aiming at knowing the educational content of collective and preventive actions on Teacher's vocal health. **METHOD:** To perform this study, authors followed suggested criteria from Cochrane Handbook, which starts with the definition of research question, following search and selection of papers, and critical analysis of each paper. This process ends with analysis, interpretation and explanation of the findings about the research question. Through the search engine of Biblioteca Virtual em Saúde (BVS) portal, the Bireme, Pubmed, SciELO, Cochrane, Scopus

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and Web Of Science platforms / databases were consulted using the descriptors “voice and teacher”, “voice and professor”, in English, Portuguese and Spanish. The study reveals that there are a big variety of methods and educational contents used in actions on teacher's vocal health. **LITERATURE REVIEW:** The first electronic search recorded 530 scientific papers, of which 510 were excluded and 20 elected because they are preventive collective practices focused on teachers' vocal health, which described the educational content applied. **CONCLUSION:** The studies showed that there is great variability in the methodology and in the discussed educational content. In theoretical content, almost all interventions addressed the vocal hygiene issue. In the practical content, applied topics were heterogeneous

Keywords: Voice; Health promotion; Teachers.

Resumo

OBJETIVO: Fazer uma revisão integrativa dos conteúdos didáticos abordados nas intervenções preventivas coletivas dentro da área de saúde vocal do professor. **MÉTODO:** Para a realização do estudo, os autores seguiram os critérios sugeridos pela Cochrane Handbook. O passo inicial foi a formulação de uma pergunta, seguida da localização e seleção criteriosa dos artigos. Em seguida, ocorreu a avaliação crítica de cada estudo, finalizando com a análise, interpretação e apresentação dos achados encontrados. No portal da Biblioteca Virtual em Saúde (BVS) foram consultadas as plataformas/bases de dados Bireme, Pubmed, SciELO, Cochrane, Scopus e Web Of Science, com a utilização dos descritores “voz e professor” e “voz e educador”, em inglês, português e espanhol. **REVISÃO DE LITERATURA:** A primeira busca eletrônica contabilizou 530 trabalhos científicos, dos quais 20 foram eleitos por se tratar de práticas coletivas preventivas voltadas à saúde vocal do professor, as quais descreviam os conteúdos didáticos aplicados. **CONCLUSÃO:** A análise dos estudos demonstrou que existe grande variabilidade na metodologia e nos conteúdos didáticos abordados. Nos conteúdos teóricos, quase a totalidade das intervenções aborda o tema da higiene vocal. Nos conteúdos práticos, os temas aplicados foram heterogêneos.

Palavras-chave: Voz; Promoção da Saúde; Docentes.

Resumen

OBJETIVO: Hacer una revisión integrativa de los contenidos didácticos abordados en las intervenciones preventivas colectivas dentro del área de la salud vocal del profesor. **MÉTODO:** Para la realización del estudio, los autores siguieron los criterios sugeridos por la Cochrane Handbook. El paso inicial fue la formulación de una pregunta, seguida de la localización y selección criteriosa de los artículos. En seguida, se produjo la evaluación crítica de cada estudio, finalizando con el análisis, interpretación y presentación de los hallazgos encontrados. En el portal de la Biblioteca Virtual en Salud (BVS) fueron consultadas las plataformas/bases de datos Bireme, Pubmed, SciELO, Cochrane, Scopus y Web Of Science, utilizando los descriptores “voz y profesor” y “voz y educador”, en inglés, portugués y español. **REVISIÓN DE LITERATURA:** La primera búsqueda electrónica contabilizó 530 trabajos científicos, de los cuales 20 fueron elegidos por tratarse de prácticas colectivas preventivas dirigidas a la salud vocal del profesor, las cuales describían los contenidos didácticos aplicados. **CONCLUSIÓN:** El análisis de los estudios demostró que existe una gran variabilidad en la metodología y en los contenidos didácticos abordados. En los contenidos teóricos, casi la totalidad de las intervenciones trata del tema de la higiene vocal. En los contenidos prácticos los temas aplicados han sido heterogéneos.

Palabras claves: Voz; Promoción de la Salud; Docentes.

Introduction

The performance of Speech-Language Therapy in the vocal field comprises prevention, diagnosis, treatment and development of vocal patterns.

In that context, teachers' vocal health is a widely studied theme, as teachers' vocal demand is significant in their daily practice and most national and international studies, which investigate teachers' voice, find high rate of vocal disorders. Their causes are multiple and interdependent.

Therefore, it is necessary to make efforts in order to promote vocal health among those professionals, prevent future disorders, detect them early and treat already existing disorders. That fact justifies the need of intervention within vocal health promotion.

In a review¹ of the scientific productions in the area from 1994 to 2008, 500 Brazilian publications were recorded. By analyzing the study trends, it was observed that 86% of the papers could be included in assessment categories, and only 6.2% reported intervention descriptions.

Some authors² point to the need of practices with detailed and accurate methodological approach in order to become measurable interventions, thus validating the procedures of vocal health promotion.

A possible analogy on intervention issues of teachers' vocal health³ points to the fact that such practices can be seen as a "medication", which mostly has its effect evaluated, being necessary to describe its composition.

Therefore, this study aims to carry out an integrated review of the educational contents applied to preventive, collective interventions on teachers' vocal health promotion. From the knowledge of contents reported by the literature, it will be possible to develop a specific performance protocol in order to measure professional practice, thus contributing to this field of knowledge.

Method

This research is an integrated review, understood as an instrument for the Evidence-Based Practice, which enables the knowledge synthesis of a given subject.^{4,5}

In order to carry it out, the guidelines established by the Cochrane Handbook⁶ were followed.

Initially, the following question to be investigated was structured: what are the educational contents applied to interventions on teachers' vocal health promotion? The following methodological steps involved search, selection, critical assessment of the studies and presentation of the knowledge synthesis.

Literature search was held online by means of virtual health library (BVS, in Portuguese) between May and June of 2016. Initially, several descriptors were tested, such as "vocal health", "vocal health program", "speech-language science", "health promotion", "worker's health", "education", "prevention", and "educational contents". However, the best data cross-checking was obtained with the following descriptors: "voice and teacher", "voice and professor".

By means of the descriptors, a total of 530 national and international manuscripts were surveyed. There was no restriction on the publication year. The first filter used was full texts, excluding articles which only showed the abstracts. These texts should be written in English, Portuguese and Spanish. In that initial selection, the manuscripts were reduced to 340.

Subsequently, the reading of the manuscript titles was held, theme reference to "teacher's voice" was the inclusion criterion. In this step, 193 articles were selected. It was followed by the step of reading the abstracts, then 40 studies were included, using the criterion of being related to the theme intervention.

Concluding the selection, the full reading of all studies was held. In this step, the exclusion criteria were: review manuscripts on teacher's voice; manuscripts which did not have straight intervention on the theme; and studies which did not describe the performed interventions.

Under those criteria, 20 articles were excluded, being eight literature reviews on the theme, but they did not report practical intervention; six were repeated; two of them described methods acting upon the voice, but no intervention; one intervention was not specifically on the theme of teacher's voice, but on speech-language therapy intervention in general; a study reviewed reports on the subject. A study was excluded, as there was no detailed description of the addressed contents/themes, its objective was to assess the difference from vocal signs and symptoms among the participant subjects of two distinct ways of teacher's voice-related in-

tervention (preventive, and preventive-therapeutic). Another article was excluded as the intervention with teachers occurred by means of a video that they watched on the theme, different methodology from the other selected studies in the current review.

Under the elucidated criteria above, 20 articles were selected to comprise the current review.

The selection of the manuscripts was carried out individually by two reviewers, who followed the same criteria of inclusion and exclusion previously established. At the end of each step, discrepancies were analyzed and jointly excluded

by the reviewers. In case of doubts, the opinion of a third reviewer was requested in order to make a decision on the inclusion or exclusion of a certain manuscript.

Literature review

Using the inclusion and exclusion criteria formerly described, the flowchart in Figure 1 shows the number of selected articles in each step of the selection process for the current review.

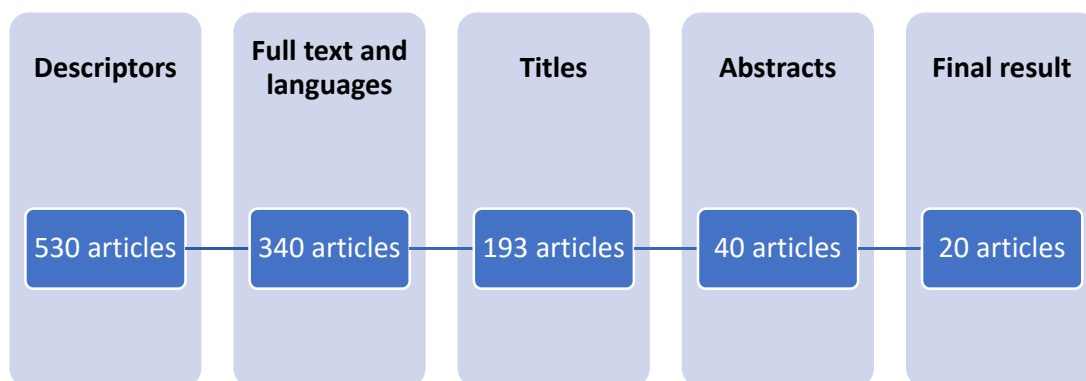


Figure 1. Flowchart with amount of articles in the steps of the integrated review

In order to show the selected articles in the current review, they were initially presented in Figure 2, which outlines each one of the selected 20 studies, within general categories of identification

(authors, year and country where it was published), followed by manuscript title, researched subjects, instruments used for data collection, a brief description of the intervention, and major results.

Authors, year and country	Title	Subjects	Objective	Instruments	Intervention	Results
1) BOVO, <i>et al.</i> (2007) EUA ⁷	Vocal Problems Among Teachers: Evaluation of a Preventive Voice Program	264 kindergarten teachers.	To assess the efficiency of a vocal preventive program for teachers.	Two questionnaires: one on the intervention and the VHI (Voice Handicap Index).	Two groups: one did not participate in the intervention, and the other participated with two theoretical hours and three practical hours.	The participant group in the intervention improved several aspects, such as the dysphonia degree. The positive effects remained after a year.
2) PENTEADO (2007) Brasil ⁸	Relations between health and teaching job: teachers' perceptions on vocal health	12 teachers from the interior of São Paulo State.	To apprehend teachers' perception on the health-vocal disease process.	Focus group.	Subjects' thoughts and perception on voice and vocal health.	Need to expand actions on teachers' vocal health and theme inclusion: work organization, subjectivity and quality of life.
3) SILVÉRIO, <i>et al.</i> (2008) Brasil ⁹	Actions on vocal health: proposal to improve teachers' vocal profile	42 teachers from a public school.	To analyze complaints, symptoms, habits and kind of voice, before and after the participation in a group of vocal experience.	Interviews, vocal registers, laryngological exam and groups of vocal experience.	Three steps: The first with interviews, perceptive auditory analysis and laryngological assessment. The second with groups of vocal experience. The third with vocal analysis after the intervention.	A significant number of voice disorders was found in the investigated population. By participating in the vocal experience group, teachers reduced vocal tension and understood the causes of such tensions.
4) SIMÕES-ZENARI, LATORRE (2008) Brasil ¹⁰	Changes in behaviors related to vocal use after speech-language intervention among day-care educators	26 educators from two day-care centers in São Paulo State, Brazil	To assess changes in harmful vocal habits during a vocal health program for educators.	Application of a protocol comprising questions on negative behaviors for vocal use.	Theoretical-practical program with an initial meeting of four hours, followed by four meetings of two hours each (totaling 12 hours).	After intervention, the researched subjects reduced behaviors, such as: vocal use out of their professional activities, use of very high-pitched or very low-pitched voice.
5) LEPPÄ-NEN, <i>et al.</i> (2009) Finlândia ¹¹	A Comparison of the Effects of Voice Massage TM and Voice Hygiene Lecture on Self-Reported Vocal Well-Being and Acoustic and Perceptual Speech Parameters in Female Teachers	60 elementary school teachers divided in two groups, similar in number, having different interventions.	To compare the effects on the voice between a Finnish massage technique and a lecture on vocal hygiene.	Questionnaires on vocal quality and vocal acoustic analysis in daily speech.	A group participated in a lecture on vocal hygiene for three hours. Another group underwent five sessions of Finnish massage technique (VM) working on the vocal production-related muscles.	By comparing both groups, the authors concluded that the massage evidenced more positive effects, suggesting that this technique may help vocal maintenance during classes.
6) LAUKKA-NEN, LEPPÄ-NEN e ILO-MAKI (2009) Finlândia ¹²	Self-Evaluation of Voice as a Treatment Outcome Measure	90 elementary school teachers.	To compare voice effects of three different approaches: lecture, training and vocal massage.	Questionnaire of subjects' self-assessment.	All of them participated in a lecture on vocal hygiene. One group only attended the lecture, the other attended the lecture and a vocal training, and the third group attended the lecture and the application of the vocal massage technique (VM).	Both groups receiving practical interventions such as vocal training or vocal massage had better result than the first one, with only a single lecture on vocal hygiene.
7) LUGHESEI, <i>et al.</i> (2010) Brasil ¹³	Actions for teachers' vocal health promotion and prevention: an issue of collective health	26 teachers from a state school in São Paulo State, Brazil.	To analyze the vocal, preventive and occupational aspects of actions towards teachers' vocal health promotion.	Laryngological assessment, questionnaire, and preventive-therapeutic intervention.	Twelve meetings (an hour and a half), with theoretical and practical contents related to teachers' vocal health.	Authors point to the need to attribute high prevalence of vocal disorders among teachers to environmental and organizational aspects of that professional job.
8) FERREIRA <i>et al.</i> (2010) Brasil ¹⁴	Teacher's voice: group management	10, 3 e 5 thousand in each program, all teachers from São Paulo City, Brazil.	To describe three programs on teachers' vocal health.	Description of the objective, call, development, strategies, number of participants, positive and negative aspects of each program.	The three programs comprised preventive, collective activities on the theme.	A positive aspect was that teachers' felt valued while participating in such actions, and the negative one was the difficulty in adherence.

Authors, year and country	Title	Subjects	Objective	Instruments	Intervention	Results
9) TIMMER-MANS <i>et al.</i> (2010) Belgica ¹⁵	The Effect of a Short Voice Training Program in Future Teachers	66 Education undergraduates	To investigate a module on vocal training for future teachers	Tests with subjective questions and objective measures applied before and after the intervention.	Two groups, one group attended a 6-hour vocal training, the other group didn't.	In the subjective questions, no differences were observed between the groups, but in the objective ones, they were positive for those who attended the training.
10) TIMMER-MANS <i>et al.</i> (2010) Belgica ¹⁶	Voice training in teacher education: the effect of adding an individualized microteaching session of 30 minutes to the regular 6- hour voice training	81 university students	To investigate vocal effects when one module of vocal training is added of 30 minute-individual counselling.	Several tests with subjective questions and objective measures applied before intervention and after four months.	Two groups: one group attended vocal training (6h30'). The other group attended the training and 30 adding minutes of individual counselling.	In the subjective questions, results were similar between the groups. In the objective measures, improvement was evidenced in the trained group. The impact of the counselling session was small, being more significant to women.
11) KASAMA, MARTINEZ E NAVARRO (2011) ¹⁷ Brasil	Proposal of vocal well-being program for teachers: case study	22 teachers from a Waldorf education school.	To analyze the effects of a program on vocal health.	Assessment questionnaire before and after intervention.	Twelve meetings of one hour each with guidance and vocal exercises.	This proposal expanded participants' perception and awareness on the beneficial and harmful factors to vocal health.
12) DRAGO-NE (2011) Brasil ¹⁸	Vocal health program for educators:	387 educators from a municipal educational network.	To describe a vocal health program for teachers.	Vocal screening and description of basic and advanced groups' activities.	Basic group: six hours of vocal theory and practice. Advanced group: 10 hours of in-depth theory and practice.	There was a high number of teachers with vocal disorders, and the major result was the significant reduction in the vocal symptoms.
13) LUCHELI, MOURAO E KITAMURA (2012) Brasil ¹⁹	Effectiveness of a vocal improvement program for teachers	13 teachers from a state school in the interior of São Paulo State, Brazil.	To analyze teachers' phonarticulatory parameters pre and post-participation in a vocal improvement program.	Laryngological assessment, vocal evaluation (acoustic and auditory perceptible) before and after the intervention.	The proposed vocal improvement program held twelve weekly meetings, 1h30' each.	The program may contribute to better vocal use, for example, the expansion of the frequency range. No changes were observed in pitch, modulation and articulation.
14) MASSON <i>et al.</i> (2013) Brasil ²⁰	Vocal warm-up and cool-down in Teaching Students	14 Teaching undergraduates from a public university in the interior of São Paulo State, Brazil.	To investigate the effects of a vocal warm-up and cool-down program.	Self-assessment protocol of body and voice-related aspects.	Three-hour mini-course: one hour of lecture and two hours of practical vocal warm-up and cool-down activities.	In the subjects' perception, there were positive effects related to vocal warm-up and cool-down, such as the reduction of vocal discomfort.
15) PIZOLA-TO <i>et al.</i> (2013) Brasil ²¹	Evaluation of the Effectiveness of a Voice Training Program for teachers	102 teachers divided in two groups (experimental and control group).	To investigate the vocal effects of two approaches of a vocal educational program for teachers.	Acoustic vocal analysis before and after the vocal function exercises.	Control group: two sessions of vocal hygiene. Experimental group: a session of vocal hygiene and four vocal exercises.	There were not statistically significant differences between the groups. The vocal exercises had immediate positive impact on teachers' vocal quality, but that was not kept longitudinally.
16) PIZOLA-TO <i>et al.</i> (2013) Brasil ²²	Impact on quality of life in teachers after educational actions for prevention of voice disorders: a longitudinal study	70 randomly selected teachers from public schools.	To investigate the impact on the quality of life and voice by means of two different vocal health interventions for teachers.	VRQL Questionnaire before and after intervention.	Two groups: one attended a lecture on vocal hygiene and carried out vocal exercises, and the other group only attended the lecture.	In both groups, teachers showed self-assurance to answer the questionnaire, although there was no significant difference between the groups.

Authors, year and country	Title	Subjects	Objective	Instruments	Intervention	Results
17) SERVI-LHA e ARBACH (2013) Brasil ²³	Assessment of the vocal-advisory effect in university teachers	8 teachers from the health area at a private educational institution.	To assess the effects of a speech-language therapeutic guidance for teachers.	VHI Protocol (Voice Handicap Index) on the first and last days of the intervention.	Seven meetings, hour long each, addressing teachers' theoretical and practical vocal health aspects.	The intervention was evidenced positive to the extent that all the subscales of the research instrument used were reduced, specially the emotional vocal aspect.
18) XAVIER, SANTOS e SILVA (2013) Brasil ²⁴	Teachers' vocal health: speech-language therapeutic intervention in the primary health care	27 teachers from municipal schools in Recife, Pernambuco State, Brazil.	To present an intervention for teachers' vocal health promotion.	Two questionnaires: one on vocal history, and the other to assess the intervention.	Six voice workshops every fifteen days aiming at promoting teachers' vocal health.	Subjects reported their participation as positive to; become aware of the vocal importance; to motivate for vocal care, and improve vocal and professional performance.
19) TRIGUEI-RO, et al. (2015) Brasil ²⁵	The teacher's voice: an instrument that needs care	Teachers from the urban area of Paraíba State, Brazil.	To describe participants' experience in an intervention to preserve teachers' voice.	Case study, describing the steps to carry out an intervention.	Weekly workshops with lectures on vocal health preservation and vocal exercises.	To the authors, the intervention favored learning and improvement in quality of life, being a way to act upon teachers' vocal health.
20) PEREIRA, MASSON e CARVALHO (2015) Brasil ²⁶	Vocal warm-up and breathing training in teachers: randomized clinical trial	31 teachers from state schools in Salvador, Bahia State, Brazil.	To compare the effectiveness of two speech-language therapeutic interventions on teachers' vocal quality.	VHI 10 Protocol (Vocal Handicap Index) and computerized acoustic voice analysis.	Two groups with different practices: one group with vocal warm-up, and the other with breathing training.	The author considered the practices effective, with similar results on vocal quality. Subjects from the warm up group reported better vocal benefits.

Figure 2. Sample profile (n=20)

The sample of studies was diversified, and the researched subjects were all teachers from different education levels. The number of subjects in each intervention was also varied, with a maximum of 10 thousand and a minimum of 8, according to each study.

As for the research objectives, studies can be divided in two groups (with similar occurrence): in one group, the intervention report or description is the main focus on the article⁷; and in the other group, emphasis lies on some kind of intervention assessment², occurring in different categories, such as effects, efficiency and the changes occurred, comparing distinct moments (before and after the intervention), as well as the approaches and procedures that were carried out.

Regarding the applied research instruments, there were questionnaire reports, focus group, interviews, voice recordings, laryngological exam, vocal assessment (acoustic or auditory-perceptive analysis), protocols, such as VQL (Voice Quality of Life), VDI (Vocal Disadvantage Index) and VHI (Voice Handicap Index), objective and subjective tests, vocal screening test and activity description.

All the studies have group intervention in common.

As for intervention results, all studies pointed to the improvement in aspects related to teachers' vocal health promotion, such as: improvement in the degree of dysphonia; elaboration of coping strategies; reduction of the vocal tension; reduction in the voice use out of professional activities; suggested use of the vocal massage technique; teachers being valued; expansion in subjects' perception; reduction in vocal symptoms; contribution for better vocal use; vocal importance; improvement in quality of life and vocal benefits.

Returning to the initial question of the current review (what are the educational contents addressed in preventive collective actions in teachers' vocal health area?), the answer is found in Figure 3 where the studies are described, reporting the addressed teaching contents for each selected intervention.

The contents were divided in two large groups: theoretical contents and practical contents. The items from each group were taken by the authors from the citations found in the reviewed articles.

Thus, eight items, which comprise the theoretical contents are as follows: vocal hygiene (vocal habits and care); vocal production (anatomy and physiology of the vocal apparatus); vocal

perception (involving concepts such as "normal voice" or "adapted voice", as well as subjects' self-assessment on their vocal quality); vocal disorders (laryngeal pathologies, dysphonia concept, elucidation of the commonest signs and symptoms in the process for the development of dysphonia); teachers' vocal demand (characteristics of the vocal use in teaching career, rate of vocal disorders in that population); relation between voice and physical environment (classroom acoustics, presence of noise and systems of voice amplification); relation between voice and organization of the teaching job (work hours; number of students in the classroom; stress, violence, quality of life).

In the category "others", very specific reports were grouped, as they were different from the ones formerly cited. They are as follows: ways to cope with the condition, relation between voice and teaching aspects, process of human communication, hearing, concept of vocal well-being and vocal psychodynamics.

One of the inclusion criteria in this review was the intervention studies on the theme, and all studies addressed practical contents.

The first category of analysis within the theoretical content group entails the guidance on vocal care, also known as "vocal hygiene".

That item addresses the influence of habits, such as: speaking loudly, smoking, speaking surrounded by other sounds, smoking, constantly clearing the throat or coughing, drinking water, diet habits, among others. The management of such habits objectifies the maintenance of teachers' vocal health.

At this point, we also find the issue of voice-related health conditions, such as allergic, respiratory, gastric, emotional (depression) disorders, medication, etc.

Almost all reviewed articles (95%) address the issue of vocal health guidance. Thus, that seems to be an almost unanimous teaching content in the area interventions.

The second category of analysis within the group of theoretical contents refers to vocal production, that is, explanations on the anatomy and physiology of the vocal apparatus, pointing out the organic structures of the vocal apparatus, as well as its functioning. That content was also greatly recurrent in the interventions, mentioned in 55% of the studies analyzed in this review.

Authors, year and country	Theoretical							Practical
	Vocal hygiene (habits)	Vocal production	Vocal Perception	Vocal disorders	Vocal demand	Voice and environment	Voice and work	
1) BOVO, <i>et al.</i> (2007) EUA ⁷	X	X		X	X	X	X	Diaphragmatic breathing, full body and laryngeal relaxation, healthy vocal pattern (with reduction of vocal attacks), resonance and articulation.
2) PENTEADO (2007) Brasil ⁸	X		X	X	X	X	X	Reflections on vocal exercises (vibration)
3) SILVÉRIO, <i>et al.</i> (2008) Brasil ⁹	X	X	X			X	X	Warm-up and cool-down exercise
4) SIMÕES-ZENARI, LATORRE (2008) Brasil ¹⁰	X	X	X		X	X		Vocal projection, resonance, breathing, articulation, vocal resistance, vocal fold vibration, cervical stretching
5) LEPPÄNEN, <i>et al.</i> (2009) Finlândia ¹¹	X							Voice massage (specific registered technique)
6) LAUKKANEN, LEPPÄNEN e ILOMAKI (2009) Finlândia ¹²	X							Vocal massage (specific registered technique) and vocal training
7) LUCHESI, <i>et al.</i> (2010) Brasil ¹³	X	X						Breathing, pneumophonoarticulatory coordination, phonatory tension, articulation, speech speed and modulation, resonance, vocal projection, verbal and non-verbal expressiveness, vocal warm up and cool down
8) FERREIRA <i>et al.</i> (2010) Brasil ¹⁴	X	X		X	X	X	X	Vocal production, relaxation, breathing, resonance, articulation, communication, expressiveness, stretching, vocal warm up and cool down
9) TIMMERMANS <i>et al.</i> (2010) Bélgica ¹⁵	X	X						Exercise for the components of voice production (healthy posture, breathing, optimal fundamental frequency, vocal projection, resonance and articulation)
10) TIMMERMANS <i>et al.</i> (2011) Bélgica ¹⁶	X	X						Voice production (healthy posture, breathing support, optimal fundamental frequency, vocal projection, resonance and articulation), and thirty minutes of individual speech-language therapeutic intervention
11) KASAMA, MARTINEZ e NAVARRO (2011) Brasi ¹⁷	X	X			X		X	Warm up and cool down, breathing, articulation and resonance
12) DRAGONE (2011) Brasil ¹⁸	X				X	X	X	Basic group (phonatory activities to increase vocal resistance and reduce tension), and Advanced Group for vocal comfort (breathing coordination with phonation and resonance)
13) LUCHESI, MOURÃO e KITAMURA (2012) Brasil ¹⁹	X	X						Breathing, pneumophonoarticulatory coordination, phonatory tension, articulation, speech speed and modulation, resonance, vocal projection, verbal and non-verbal expressiveness, vocal warm up and cool down
14) MASSON <i>et al.</i> (2013) Brasil ²⁰								Vocal warm up and cool down
15) PIZOLATO <i>et al.</i> (2013) Brasil ²¹	X	X		X				Exercises on body posture and relaxation; phonation, frequency and intensity; breathing; resonance and articulation
16) PIZOLATO <i>et al.</i> (2013) Brasil ²²	X	X		X				Exercises on body posture and relaxation; phonation, frequency and intensity; breathing; resonance and articulation
17) SERVILHA e ARBACH (2013) Brasil ²	X	X			X	X	X	Techniques for healthy voice use: projection, vocal modulation, articulation and body posture
18) XAVIER, SANTOS e SILVA (2013) Brasil ²⁴	X	X	X					Techniques on relaxation and vocal exercises of lip and tongue vibration, fricative phonemes, gargle-like sound and humming
19) TRIGUEIRO, <i>et al.</i> (2015) Brasil ²⁵	X							Exercises on relaxation, breathing, articulation, vocal warm up and cool down
20) PEREIRA, MASSON e CARVALHO (2015) Brasil ²⁶								Breathing training and body stretching, fricative phonemes, vibrant sounds and nasal sounds.

Figure 3. Presentation of the addressed teaching contents (n=20)

There were four citations for the content regarding vocal perception. This item comprises two factors: the concept of normal or adapted voice and vocal self-assessment. Conceptualizing voice is something complex, it is not coherent for an author²⁷ to adopt the phrase normal voice, thus, she proposes the use of “adapted voice” when the “vocal production has socially acceptable quality, does not interfere with speech clarity, enables individuals’ professional development and transmits the emotional message of the speech”.

Vocal self-assessment or self-perception²⁸ refers to the subjects’ own rating of their vocal quality. It is considered a subjective parameter and its practice is largely used in Speech-Language studies. For example, a former study¹ reviewed 500 publications addressing teachers’ vocal health, and 52.5% carried out the assessment in teachers’ own perceptions. Approaches on vocal quality and adapted voice²⁷ are considered significant for vocal health promotion.²⁸ In that aspect, encouraging teachers to self-assess their own voice may contribute for them to increase their vocal perception.

Vocal disorders were reported in 20% of the answers. In that aspect, laryngeal pathologies are addressed, the concept and classification of dysphonia, as well as their reported signs and symptoms. Many research studies warn about the high rate of dysphonia among teachers.²⁹ Thus, loss or change in the voice pattern commonly occur among teachers. However, as a possible measure for promoting vocal health, it is important for them to know that dysphonia should not be considered something natural within their job, and they should know the possibilities for prevention, diagnosis and treatment of vocal disorders.

The correlation between voice and environmental aspects, such as acoustics in the classroom, presence of noise and voice amplification systems was reported in 35% of the interventions – this knowledge influences in the occurrence and worsening of dysphonia among teachers.^{29,30} Many authors have analyzed these issues³¹ correlating voice production and work settings, and highlight the influence of factors, such as: noise within school settings, thermal shock, adequacy or not of the environmental air ventilation, superior airways exposure to irritative products, presence of dust in the workplace, among others. For example, a study³² evidenced a correlation between high

levels of classroom noise and vocal intensity used by teachers.

Seven interventions studied here (35%) applied contents related to the vocal demand, searching strategies to reduce it in the classroom. Literature³⁰ shows several examples on that.

Six analyzed studies (30%) reported the relation between voice and organization of the teaching job, addressing work hours, number of students in the classroom, stress, violence and quality of life. Several scientific studies^{14,19} argue about the influence of those factors related to work processes as predisposing or aggravating the development of dysphonia. Studies in the area³¹ report factors such as heavy workload, high vocal demand, overcharge of function and activities, no breaks during work hours, and lack of autonomy to carry out the job. There are also a lot of research studies^{3,9} evidencing high rates of dysphonia among teachers, pointing to the need of actions for vocal health promotion.

In a detailed descriptive analysis of 63 Brazilian publications³³ addressing collective interventions of vocal health among teachers, the following themes and/or contents were reported: vocal habits and behaviors (71%) – comparing to the scoring in this review (95%), that content can be considered remarkable for interventions in the area. As for the theme of anatomy and physiology of vocal production, the study³¹ showed a frequency of 44%, and in the current study, that scoring was a little higher (55%). Regarding the issue of the work environment, it was evidenced 22%, and in the current study, this content was found in 35% of the citations.

In the category “others” was grouped contents reported once or twice, maximum, and point to the following subjects: ways to cope with the problem, voice relation to teaching aspects, process of human communication, hearing, concept of vocal well-being and vocal psychodynamics.

Regarding the clustered contents in relation to practical interventions, answers differ among the studies. Sometimes, the exercises are not described, or they were reported as vocal warm up or cool down, comprising a series of exercises. In a review of published articles in the area of teachers’ voice, researchers¹ find it important to measure the interventions and validate instruments within vocal health promotion.

The following practical contents were reported: global relaxation, laryngeal relaxation,

proper posture, massage (studies by Leppanen¹¹ and Laukkanen¹² report specific technique of voice massage), phonation (fricative phonemes, vibrant sounds, nasal sounds, healthy vocal pattern, reduction of vocal attacks, adequate pitch and intensity of vocal production), diaphragmatic breathing, pneumophonoarticulatory coordination, speech speed, speech modulation, verbal and non-verbal expressiveness, vocal resistance, resonance and projection.

In general, all selected studies addressed theoretical and practical contents on teachers' vocal health, systematic review on vocal interventions in the aforementioned population. Authors³⁴ aimed to compare the efficiency in the prevention of vocal disorders with direct approach (exercises) and indirect one (guidance), concluding that intervention combined with guidance and exercises evidences significant improvement in the parameters of vocal quality and voice self-assessment, even when applied for a short period of time.

Study limitation lies in the number of selected articles, as the adopted criteria may have excluded significant articles, mainly because it is a highly productive area on scientific studies, that is, the theme on teachers' voice.

The article contribution is that the findings in this current review may point out trends occurring in other research studies in the area.

Studying the educational contents addressed in those interventions can be justified by speech-language therapists' need to understand vocal health interventions as an educational practice³¹.

Conclusion

From the analysis of the selected studies, it could be observed that there is a methodological and thematic diversity in the teaching contents addressed in the preventive collective interventions in the area of teachers' vocal health.

Regarding the theoretical contents, almost all interventions addressed the issue of vocal hygiene. Thus, vocal care seems to be the most frequently approached aspect.

In relation to the practical contents, applied categories were heterogeneous, and sometimes the specific techniques used were not detailed.

From the obtained results, it is possible to highlight the need of structuring interventions on

teachers' vocal health that can be measured, aiming at strengthening evidence-based practice.

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