

## HEALTH DISORDERS AND TEACHERS' VOICES: A WORKERS' HEALTH ISSUE

Liliana Amorim Alves<sup>1</sup>  
Maria Lúcia do Carmo Cruz Robazzi<sup>2</sup>  
Maria Helena Palucci Marziale<sup>2</sup>  
Ana Clara Naufel de Felipe<sup>3</sup>  
Cristiane da Conceição Romano<sup>4</sup>

Alves LA, Robazzi MLCC, Marziale MHP, Felipe ACN, Romano CC. Health disorders and teachers' voices: a workers' health issue. Rev Latino-am Enfermagem 2009 julho-agosto; 17(4):566-72.

*Environmental and/or work risk factors, lack of basic knowledge related to voice, its incorrect use, and a defective vocal model can lead teachers to develop occupational dysphonia. This study aimed to analyze studies focusing on occupational vocal disorders through a literature review. Articles published over a period of 11 years in periodicals indexed in the ScieLO library were searched according to predetermined inclusion and exclusion criteria. Twenty articles related to teachers' vocal occupational disorders were found. We argue that intense vocal use should not harm professionals; the voice has to be pleasant to the speaker and correctly produced. The conclusion is that there is a scarcity of articles available at the studied library relating to teachers' voice disorders. Further studies need to be developed and disseminated so as to increase knowledge in the subject.*

**DESCRIPTORS:** occupational health; voice; voice disorders; faculty

## ALTERACIONES DE LA SALUD Y DE LA VOZ DEL PROFESOR, UN ASUNTO DE SALUD DEL TRABAJADOR

*Factores de riesgos ambientales y/o referentes a la organización laboral, ausencia de nociones básicas sobre la voz, su uso incorrecto y presencia de modelo vocal deficiente pueden llevar al profesor a presentar disfonía relacionada al trabajo. El objetivo de este estudio fue analizar publicaciones sobre alteraciones vocales provenientes del trabajo, a través de revisión de literatura sobre el tema propuesto. Como método, se buscó artículos de periódicos indexados en la biblioteca virtual Scielo, por un período de once años, obedeciendo a criterios de inclusión y exclusión predeterminados. Fueron encontrados 20 artículos que contemplaron alteraciones vocales de los profesores provenientes del trabajo. Se discute, aquí, que el uso vocal intenso no debe propiciar perjuicios a la profesión; la voz debe ser agradable al sujeto y producida correctamente; concluyéndose que hay pocos artículos vehiculados en la biblioteca investigada relacionados a las alteraciones vocales del profesor, provenientes del uso de la voz en el trabajo. Nuevas investigaciones deben ser realizadas y divulgadas para aumentar el conocimiento sobre el tema.*

**DESCRIPTORES:** salud laboral; voz; trastornos de la voz; docentes

## ALTERAÇÕES DA SAÚDE E A VOZ DO PROFESSOR, UMA QUESTÃO DE SAÚDE DO TRABALHADOR

*Fatores de riscos ambientais e/ou referentes à organização laboral, ausência de noções básicas sobre a voz, seu uso incorreto e presença de modelo vocal deficiente podem levar o professor a apresentar disfonía relacionada ao trabalho. O objetivo deste estudo foi analisar publicações sobre alterações vocais decorrentes do trabalho, através de revisão da literatura sobre o tema proposto. Como método, buscou-se artigos de periódicos indexados na biblioteca virtual Scielo, por período de onze anos, obedecendo-se aos critérios de inclusão e exclusão pré-determinados. Foram encontrados 20 artigos que contemplaram alterações vocais dos professores decorrentes do trabalho. Discute-se, aqui, que o uso vocal intenso não deve propiciar prejuízos à profissão; a voz deve ser agradável ao sujeito e produzida corretamente concluindo-se que há poucos artigos veiculados na biblioteca investigada relacionados às alterações vocais do professor, decorrentes do uso da voz no trabalho. Novas pesquisas devem ser realizadas e divulgadas para aumentar o conhecimento sobre o tema.*

**DESCRITORES:** saúde do trabalhador; voz; distúrbios da voz; docentes

Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo, WHO Collaborating Centre for Nursing Research Development, Brazil: <sup>1</sup>Speech Pathology, Doctoral student, e-mail: liliana@eerp.usp.br; <sup>2</sup>RN, Full Professor, e-mail: avrmlccr@eerp.usp.br; marziale@eerp.usp.br; <sup>3</sup>Speech Pathology, Master's student, e-mail: cristianeromano@yahoo.com.br. Universidade de Ribeirão Preto, Brazil: <sup>3</sup>Speech Pathology, Voice specialist, Faculty, e-mail: anafelippe@yahoo.com.br.

## INTRODUCTION

**F**or intensive vocal use not to harm the teaching professional, the voice has to be comfortable for the speaker and correctly produced. Some aspects are noted as determining and aggravating factors that lead to dysphonia such as the environment and work organization (i.e. the need to administer scheduled content and school management), vocal demands and the use of voice in daily contexts, general health, issues related to gender and social roles in society, organization of private life and representations about the health/disease process<sup>(1)</sup>.

Working conditions are environmental aspects that can, in the case they are highly intense and concentrated, interfere with workers' bodies and therefore generate diseases. Work organization includes the division of tasks and people. In the division of people, human relations that involve executing tasks are included. These can be harmful when they alter workers' mental functioning, leading to suffering and mental diseases<sup>(2)</sup>.

Speech-language pathologists should analyze and consider work conditions and organization related to the activities developed by several workers who habitually use their voices, including teachers, because the classroom's physical environment presents risk agents such as noise, dust, chalk dust, and poor illumination, in addition to the relationships among faculty members, students, and the school leadership, which can negatively interfere with workers' voices<sup>(1)</sup>. It is necessary to observe the contexts of real situations of workers' work environment, observe these workers in the classroom and in different pedagogical situations, investigating how they perform their tasks and understand their behavior at work<sup>(2)</sup>.

Teachers are workers who oftentimes are subject to long work hours and have the responsibility to transmit knowledge to students who are not always willing to learn. There might be disagreements among students through the course of the daily routine, which teachers have to deal with and settle, intervals to rest and eat might be short, and generally, salaries are not compatible with the workload. This range of

situations exposes these professionals to disease and accidents.

A study about quality of life related to teachers' voice health problems revealed that the majority of these workers have a good voice (42.2%), and that although they were reasonably satisfied with their voices and quality of life, they presented difficulties in perceiving the health-disease process. It became evident that there are aspects that do not favor quality of life and the existence of health needs that can have implications for teachers' voice and vocal health. In regard to work conditions and organization, 54.7% of the individuals considered the place where they worked unhealthy or only slightly healthy. They mentioned: hot, poorly ventilated, dusty and dirty classrooms, with chalk dust, internal and external noise, work organization problems, stressful social relationships permeated by negative feelings such as aggressiveness, lack of discipline, disrespect and violence. These conditions, adverse to general and vocal health, can predispose individuals to laryngeal irritation, sound competition, and voice abuse or misuse, all of which lead to voice disorders<sup>(3)</sup>. Stressful situations can contribute to voice abuse and misuse, generating extra effort and forcing adaptations in phonetic production, making the professional more vulnerable to the development of dysphonia. Thus, there might exist several situations linked to teachers' stress in an occupational health scenario. Resignation of colleagues, fear of losing their job and lack of economic and professional achievement are some of the factors pointed out as causes of the problem. Additionally, intimidatory harassment also influences cases of occupational stress<sup>(4)</sup>.

Voice disorders caused mainly by issues related to work organization frequently lead to situations of sick leave and incapacity to perform functions yet are not acknowledged by the Brazilian National Institute of Social Security as disease related to work. Voice disorders can have several effects on professionals' voices, which limit vocal and emotional expression, causing stress and anxiety, and posing risks to their performance<sup>(5)</sup>.

A systematic bibliographic review about dysphonia in teachers was performed in several databases and articles published since 1990 were considered. Fifteen out of 3,186 citations met the inclusion criteria to discuss the prevalence of

dysphonia among teachers. Nine articles defined dysphonia based only on the presence of vocal symptoms, with variations in relation to the type, number, frequency and period of reference. Hoarseness and vocal fatigue were mentioned in all studies that evaluated vocal symptoms. Only three analyzed the prevalence of dysphonia based on professional evaluation. Prevalence varied according to period of reference and frequency of studied symptoms<sup>(6)</sup>.

Teachers present aggravating and risk factors in their work process that favor dysphonia. They increase their tone of voice, speak frequently, compete with the environmental noise, present inadequate posture with tension on the cervical musculature, do not have vocal hygiene habits, smoke and face emotionally charging situations, anxiety and stress related to work positions and functions, in addition to double and triple workloads. Vocal self-evaluation indicates satisfaction with voice, most of the time, showing that these professionals have difficulty in identifying such alterations. During their education, teachers are not instructed about voice care, so they end up teaching classes without paying attention to minimum and basic care to prevent dysphonia.

In relation to teachers' practices in terms of planning, execution, evaluation and teaching-learning activities in some Brazilian programs in the health field, a study was carried out with 29 teachers who were attending a graduate course in Didactics. They filled out a questionnaire composed of semi-open questions and their answers emphasized the transmission of information, very heavy workloads, and little integration between courses and lectures<sup>(7)</sup>. None of these studies<sup>(7-8)</sup> investigated teachers' knowledge on healthy vocal preparation, showing a lack of information on the studied topic, related to teachers' occupational voice disorders. Further studies need to be performed and disseminated so as to increase knowledge on the subject.

Investigation of nursing professors' quality of life at work showed the need to implement an institutional policy that introduces basic values and interests and which reflects an investment in improved work conditions<sup>(8)</sup>. The importance of this study's contribution is related to occupational weariness, which can be understood as loss of physical and mental and emotional capacity,

determined by workers' exposure to workload and has the potential to harm workers' health.

Based on the preceding, we argue for the importance of the work of an occupational speech-language pathologist in schools and universities so as to contribute to the discussion of the work of teachers and enable a transformation. Voice disorders can be determined or aggravated by external, organizational, environmental or individuals' behavioral factors and work overload can also be one of these factors<sup>(6)</sup>. Therefore, we can avoid work situations altering the health of these professionals and enable them to better perform, achieving the school's educational goals and the teachers' professional objectives.

This study aimed to analyze published studies that focused on occupational voice disorders through a literature review carried out covering 11 years of literature.

## METHOD

A bibliographic review of articles indexed in the electronic database ScieLO was carried out because this database permits the access to full texts of several scientific articles, in various countries, especially those in Latin America.

The first step was to investigate the terminologies that would be used in the Health Sciences Descriptors (DeCS) by Bireme. The search resulted in the following key words contained in DECS: *saúde do trabalhador* in Portuguese and its version in Spanish (*salud laboral*) and in English (occupational health), associated to descriptors in Portuguese (*voz, distúrbios da voz e docente*), in English (*voice, disorders and faculty*) and in Spanish (*voz, trastornos de la voz e docente*).

The following inclusion criteria were used: articles fully published between 1998 and 2008 with quantitative or qualitative methodologies, those that had at least two of the selected descriptors, those whose abstracts presented the teacher as subject and described this professional's voice disorders, and those available in Portuguese, English and Spanish. The following exclusion criteria were also used: articles written in a language other than English, Portuguese and Spanish, those whose abstracts did not present

teachers as subjects and/or did not describe their voice disorders and which did not have full texts available.

After reading the retrieved abstracts to verify the coherence with the topic under study and following the criteria mentioned above, we found a total of 20 articles indexed in the SciELO library. All articles were fully read and after this stage, we verified that the topics of identification of vocal problems and occupational voice health appeared more frequently in the selected articles.

The study was not sent to the Ethics Research Committee because it did not involve the direct investigation of human subjects.

## RESULTS

The 20 articles, the majority in Portuguese, are distributed in Table 1 according to title, year of publication, language and periodical in which it was published.

Table 1 – Published articles about voice disorders in teachers between 1998 and 2008 (n=20)

Title	Year	Language	Periodical
1. Behavioral changes related to the use of voice after speech-language-hearing intervention with day-care workers	2008	Portuguese	Pró-Fono R. Atual. Cient.
2. Actions in vocal health: proposal to improve teachers' vocal profile	2008	English	Pró-Fono R. Atual. Cient.
3. Factors associated with voice disorders in teachers	2008	Portuguese	Cuadernos de Salud Pública
4. Behavioral changes related to the use of voice after speech-language-hearing intervention with day-care workers	2008	Portuguese	Pró-Fono R. Atual.Cient.
5. Aging, voice and physical activities of teachers and non-teachers	2008	Portuguese	Rev. soc. Bras. Fonoaudiologia
6. Working conditions, quality of life and dysphonia among faculty	2007	Portuguese	Cadernos de Salud Pública
7. Voice disorder: case definition and prevalence in teachers	2007	English	Revista Brasileira de Epidemiologia
8. Conditions of vocal production of teachers of hearing impaired students	2007	Portuguese	Rev. CEFAC
9. Quality of life and vocal health of teachers	2007	Portuguese	Revista de Salud Pública
10. Profile of professional voice users with vocal complaints treated in a tertiary health center	2007	English	Revista Brasileira de Otorrinolaringologia
11. Relations between health and teaching work: perceptions of teachers concerning vocal health	2007	Portuguese	Revista Sociedad Brasileira de Fonoaudiologia
12. Dysphonia in elementary school: Prevalence and Risk factors	2006	Portuguese	Arqui Méd
13. Prevalence of voice disorder in educators and its relation to self-perception	2006	English	Revista de Salud Pública
14. Impact of the voice on quality of life of primary school teachers	2005	Portuguese	Pró-Fono Revista de Atualización Científica
15. Morbidity due to chronic nodular laryngitis in Cuban professional educators	2005	Spanish	Unidad Nacional de Salud Ambiental del Ministerio de Salud Pública
16. Prevalence of dysphonia in teachers in Pampas Tayacaja - Huancavelica	2004	Spanish	Revista Med Hered
17. Proposal for a model of multidisciplinary care for work-related dysphonia: a preliminary study	2004	Portuguese	Revista Brasileira de Otorrinolaringologia
18. Quality of life in nursing teaching	2004	Portuguese	Rev. Latino-Am. Enfermagem
19. Dysphonia in teachers in the city teaching system: prevalence of risk factors	2003	Portuguese	Revista Brasileira de Otorrinolaringologia
20. Laryngeal disorders in workers Education	2000	Spanish	Rev Cubana Hig Epidemiol

In regard to the studies' design, the majority were cross-sectional observational (50%), followed by comparative quantitative (10%), cross-sectional epidemiological (10%), systematic bibliographic review (5%), epidemiological (5%), retrospective observational (5%), retrospective cross-sectional (5%), qualitative with focus groups (5%) and

retrospective analysis of files (5%). Nine (45%) out of the 20 studied articles focused on elementary school teachers (15%) preschool teachers, three (15%) on secondary education, three (15%) on college professors and two (10%) did not specify the studied educators.

Some characteristics of the studied population are presented in Table 2.

Table 2 – Characteristics of teachers with voice disorders in articles published between 1998 and 2008 (n =20)

Number of studied teachers	F	%
12	1	5
15	3	15
26	2	10
42	1	5
47	1	5
74	1	5
75	1	5
80	1	5
93	1	5
120	1	55
163	1	5
238	1	5
451	1	5
747	1	5
841	1	5
922	1	5
2133	1	5
Gender		
Male	1	5
Not specified	3	15
Female	5	25
Both	11	55
Total	20	100

The 20 identified articles showed that individuals' age varied between 19 and 60 years (53.28%), and in some studies the age average was calculated: 35 (5%), 38 (10%) and 39 years (5%).

Existent voice disorders varied and are shown in Table 3.

Table 3 – Voice disorders presented by teachers between 1998 and 2008 (n=20)

Types of occupational voice disorders among teachers	F	%
Glottal closure and mucosal thickening	1	5
Chronic laryngitis, laryngeal infection and functional and organofunctional dysphonia	1	5
Vocal fatigue, temporary loss of voice, hoarseness, vocal weakness after a day of work, vocal fold nodules	1	5
Dryness, itching, burning, tightness sensation or pain in the vocal folds and phlegm	1	5
Vocal fatigue, allergy and infectious process	1	5
Casual and frequent dysphonia, vocal fatigue and concomitant conditions (allergic rhinitis and gastroesophageal reflux)	1	5
Inadequate pneumo-phono-articulatory coordination, difficulty to speak, vocal intensity increased in noisy environments	1	5
Minor structural alterations, Reinke edema and polyp	1	5
Difficulty to speak in noisy environments, hoarseness, vocal fatigue, a variety of frequency, loss of voice, dryness, pain, burning and phlegm in the vocal folds, problems in the upper airways	1	5
Functional dysphonia, chronic laryngitis, leukoplakia, polyps and atrophic laryngitis	1	5
Reinke edema, vocal fold cyst, organofunctional dysphonia (vocal nodules), allergic rhinitis, sinusitis, gastritis, hyperthyroidism, Temporomandibular joint disorder	1	5
Vocal nodules, larynx tumors or cancer and hoarseness	1	5
Dysphonia, vocal fatigue, hoarseness	2	10
Accumulation of phlegm, speech effort due to environmental noise, frequency and intensity oscillation	1	5
Not specified	5	25
Total	20	100

## DISCUSSION

In relation to Table 1, the majority of studies were published between 2007 and 2008. Six are directly related to the speech-language-hearing and otorhinolaryngology fields. The majority of authors are speech-language pathologists, explained by the fact that these are the professionals who deal with human communication. This professional can integrate occupational health programs because they can certainly contribute to improve the population's oral language, fluency and voicen, especially for those people at a higher risk of developing problems, as is the case of teachers.

In five (25%) of the 20 publications presented in Table 3, the studied individuals presented nodules or polyps on the vocal folds, five (25%) had dysphonia, another five (33.33%) had vocal fatigue, four (20%) presented hoarseness, among other disorders. In a study carried out in Porto (Portugal) with elementary school teachers, the prevalence of dysphonia significantly increased with age ( $p=0.004$ ) and the number of years in the profession ( $p=0.002$ ). The most common vocal complaints were changes in the laryngeal sensitivity (laryngeal pain – 62.8%, dryness – 61.9%) and hoarseness (64.3%). All complaints (except pain and burning) were significantly associated with the prevalence of dysphonia ( $p<0.001$ )<sup>(9)</sup>. In another study with 93 teachers the following disorders were found: hoarseness (54.1%), vocal fatigue (51.4%), grave/acute variation (25.7%) and/or voice loss (18.9%). The main negative sensory symptoms were: dry throat (58.1%), phlegm (48.6%), pain while speaking (29.7%), and/or burning (25.7%).

A perceptual-hearing analysis of vocal parameters and time of physical activity was carried out in 47 female and male individuals older than 65 years of age: 23 teachers and 24 non-teachers. The two evaluated groups presented similar vocal parameters. The difference found was related to variables such as: chronological age and how long they practiced physical activity, that is, the older the teachers, the smaller the loudness variation, whereas, the older the non-teachers the smaller the speech speed. Non-teachers' longer time of physical activity was related to vocal quality with fewer deviations<sup>(11)</sup>.

Intensive use of the voice was reported by 91.7% of teachers, and there was temporary voice loss in 25.6%. The most frequently reported symptoms specifically related to the throat were: sensation of

dryness (66.5%), itching (51.5%), phlegm (49.7%), pain (43.6%), burning (39.4%) and feeling of tightness or the sensation of a lump in the throat (30.7%)<sup>(12)</sup>.

Table 3 shows voice disorders found among teachers. The files of patients treated between 1990 and 2003 by the Voice Group at a tertiary health service were analyzed in a retrospective cross-sectional study. A high prevalence of smokers was found, which correlated with Reinke edema, leukoplakia and reflux laryngitis. About 70% of the patients presented vocal symptoms with two years of duration (11% up to 3 months, 16% between 3 and 6 months and 41% between 6 months and 2 years) and had not yet received a precise diagnosis. Many were away from their professional activities or had limited work performance<sup>(9)</sup>.

Teachers become sick due to vocal problems during their work performance because they are not familiar with basic notions of how to appropriately care for their voices. However, having to comply with sick leave policies might be a difficulty for these workers. The decision of temporarily removing these workers from their activities should be based on potential aggravation to vocal folds and risks. Thus, prevention programs are important and should focus on sensitizing professionals to these problems so they can recognize the symptoms early and also educating them about good vocal hygiene.

Teachers know the symptoms and voice disorders but need education regarding the use of their voices in the occupational context. Weariness and loss of vocal quality was also evidenced and actions promoting health in the work environment were suggested<sup>(13)</sup>. The work of vocal health promotion aimed at teachers implies the fact that the majority of vocal health disorders can be minimized through preventive programs. To achieve such a goal, health professionals should be committed to health promotion

for these workers advancing their well-being and pleasure while performing vocal work<sup>(14)</sup>.

## CONCLUSION

This study aimed to analyze studies focusing on occupational voice disorders, which revealed that there are few studies in the studied library. We specifically focused on occupational voice health, considering that the voice is essential for oral communication and interpersonal relationships, is important for health promotion and quality of life, and also that problems related to it can interfere in these matters. We observed in the studied articles that signs and symptoms more easily identified with their potential relationship to vocal health problems are those that cause physical sensations of discomfort such as burning, cough, infections of the larynx, and hoarseness. Thus, teachers are not so sensitive to be able to interpret the indications of the voice's perceptive-hearing characteristics at work, which impedes the prevention of future voice disorders. To minimize such situations, the work of a speech-language pathologist can be offered in workshops and forums on voice use, referrals to specific exams and following up with teachers during their work. Care for the voice requires paying attention to the phonetic production and also observing whether teachers use correct forms of communication while teaching classes or directing students. These professionals can benefit from transformations in dialogical relations and appropriate language production, while the speech-language pathologist is committed to health promotion and improved quality of life for these workers.

## REFERENCES

1. Smith E, Lemke J, Taylor M, Kirchner HL, Hoffman H. Frequency of voice problems among teachers and other occupations. *J Voice*. 1998 Dec; 12(4):480-8.
2. Smith E, Gray SD, Dove H, Kirchner L, Heras H. Frequency and effects of teachers' voice problems. *J Voice*. 1997; 11:81-7.
3. Penteado RZ, Pereira IMTB. Qualidade de vida e saúde vocal de professores. *Rev. Saúde Pública [Internet]*. 2007 Apr. [Acesso 20 ago 2008]; 41(2):236-43. Disponível em: [http://www.scielosp.org/scielo.php?script=sci\\_arttext&pid=S1415-790X2007000400020&lang=pt](http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1415-790X2007000400020&lang=pt)
4. Spoti VS. Riscos psicossociais e assédio moral no contexto acadêmico [dissertação]. [Ribeirão Preto]: Escola de Enfermagem de Ribeirão Preto/USP; 2007.
5. Souza MT. Distúrbio de voz relacionado ao trabalho. 14º Seminário de voz da PUC-SP; 2004 Nov. 05; São Paulo, São Paulo. 21p.
6. Jardim R, Barreto SM, Assunção AA. Voice Disorder: case definition and prevalence in teachers. *Rev. Bras. Epidemiol. [Internet]*. 2007 Dec. [Acesso 10 jul 2008]; 10(4):625-36. Disponível em: [http://www.scielosp.org/scielo.php?script=sci\\_arttext&pid=S1415-790X2007000400020&lang=pt](http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1415-790X2007000400020&lang=pt)

7. Rozendo CA, Casagrande LDR, Schneider JF, Pardini LC. Uma análise das práticas docentes de professores universitários da área de saúde. *Rev Latino-am Enfermagem* [Internet]. 1999 Apr. [Acesso 19 ago 2008];7(2):15-23. Disponível em: [http://www.scielo.org/scielo.php?script=sci\\_arttext&pid=S1415](http://www.scielo.org/scielo.php?script=sci_arttext&pid=S1415)
8. Rocha SSL, Felli Andrés VE. Qualidade de vida no trabalho docente em enfermagem. *Rev. Latino-am. Enfermagem* [Internet]. 2004 janeiro-fevereiro [Acesso em 15 jul 2008];12(1): 28-35. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-11692004000100005&Ing=](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692004000100005&Ing=)
9. Freitas SV. Disfonia em professoras do Primeiro Ciclo do Ensino Básico: prevalência e factores de risco. *Arq Med* [Internet]. set. 2007 [Acesso 22 dezembro 2008];20(5-6):145-52. Disponível em: [http://www.scielo.oces.mctes.pt/scielo.php?script=sci\\_arttext&pid=S0871-34132006000400001&Ing=pt&nrm=iso](http://www.scielo.oces.mctes.pt/scielo.php?script=sci_arttext&pid=S0871-34132006000400001&Ing=pt&nrm=iso)
10. Simões M, Latorre MRDO. Prevalência de alteração vocal em educadoras e sua relação com a auto-percepção. *Rev Saúde Pública* [Internet]. 2006 dec [Acesso 14 dez 2008];40(6):1013-8. Disponível em: [http://www.scielo.org/scielo.php?script=sci\\_arttext&pid=S0034-89102006000700008&Ing=en](http://www.scielo.org/scielo.php?script=sci_arttext&pid=S0034-89102006000700008&Ing=en)
11. Gampel D, Karsch UM, Ferreira LP. Envelhecimento, voz e atividade física de professores e não professores. *Rev Soc Bras F.* [Internet]. 2008 [Acesso 08 abr 2009];13(3):218-25. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1516-80342008000300004&Ing=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1516-80342008000300004&Ing=en)
12. Araújo TM, Reis EJFB, Carvalho FM, Porto LA, Reis IC, Andrade JM. Fatores associados a alterações vocais em professoras. *Cad Saúde Pública* [Internet]. 2008 jun [Acesso 14 dez 2008];24(6):1229-38. Disponível em: [http://www.scielo.org/scielo.php?script=sci\\_arttext&pid=S0102-311X2008000600004&Ing=pt](http://www.scielo.org/scielo.php?script=sci_arttext&pid=S0102-311X2008000600004&Ing=pt)
13. Penteado RZ. Relações entre saúde e trabalho docente: percepções de professores sobre saúde vocal. *Rev Soc Bras F* [Internet]. 2007 Mar [Acesso 14 dez 2008];12(1):18-22. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1516-80342007000100005&Ing=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1516-80342007000100005&Ing=en)
14. Grillo MHMM, Penteado RZ. Impacto da voz na qualidade de vida de professore(a)s do ensino fundamental. *Pró-Fono Rev Atual Cient* [Internet]. 2005 dez [Acesso 12 jan 2009];17(3):311-20. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-56872005000300006&Ing=pt](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-56872005000300006&Ing=pt)