

Absenteeism due to voice disorders in teachers: literature review, 2005-2015

Absenteísmo por distúrbios da voz em professores: revisão da literatura, 2005-2015

El absentismo por trastornos de la voz en los docentes: una revisión de la literatura, 2005-2015

*Luciana Daniella Lages Moselli**

*Ada Ávila Assunção**

*Adriane Mesquita de Medeiros**

Abstract

Objective: To identify results in the literature concerning absences practiced by teachers which were assigned to voice disorders and associated factors. **Methods:** Literature review of scientific articles in Portuguese, English and Spanish (2005-2015). **Results:** 15 cross-sectional and quantitative articles were found which were carried out in Latin America, Europe, Asia and North America who used as main data collection instrument the self-filling questionnaire. In addition to absences from work the authors examined the prevalence of voice disorders among teachers and their relation with social, economic and health aspects. The frequency of work-related absences for voice disorders ranged from 3.5% to 63%. The factors associated with these faults were: female gender, vocal complaint during professional training, having witnessed episodes of classroom violence, depression or anxiety, respiratory problems, impact

* Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil.

Authors' contributions:

LDLM took part in the conception and design of the study, data analysis and interpretation, writing (with relevant intellectual contribution), and also in the approval of the final version for publishing.

AAA participated in the conception and design of the study, writing (with relevant intellectual contribution) and in the approval of the final version for publishing.

LDLM was involved in the conception and design of the study, data analysis and interpretation, writing (with important intellectual contribution), and in the approval of the final version for publishing.

Correspondence address: Luciana Daniella Lages Moselli - lucianamozelli@gmail.com

Received: 05/12/2016

Accepted: 11/04/2017

and severity of voice disorders in teacher quality of life. **Conclusion:** There is a considerable increase in scientific publications on the subject, but there are still gaps in prevalence and associated factors. The large variation in the frequency of work-related absences due to voice disorders found in the studies may be related to the methodology used (reference period) to investigate it. Searching for consensus on the research protocol will allow the comparison of the results. Socio-demographic, health and work-related factors associated with lack of work due to voice show the complexity of the event studied and allow the identification of elements for the elaboration of preventive actions aimed at the health of teachers.

Keywords: Absenteeism; Voice disorders; Faculty.

Resumo

Objetivo: Revisar a literatura especializada sobre frequência de faltas ao trabalho por distúrbios de voz em professores e fatores associados a essas. **Métodos:** Revisão bibliográfica de artigos científicos em português, espanhol e inglês (2005-2015). **Resultados:** Foram encontrados 15 artigos de estudos transversais e quantitativos realizados na América Latina, Europa, Ásia e América do Norte que utilizaram como principal instrumento de coleta de dados o questionário autopreenchível. Além das faltas ao trabalho, os autores examinaram a prevalência de distúrbios de voz entre professores e sua relação com aspectos sociais, econômicos e de saúde. A frequência de faltas ao trabalho por distúrbios de voz variou entre 3,5 % e 63%. Os fatores associados a essas faltas foram: sexo feminino, queixa vocal durante a formação profissional, ter presenciado episódios de violência em sala de aula, depressão ou ansiedade, problemas respiratórios, impacto e gravidade dos distúrbios da voz na qualidade de vida do professor. **Conclusão:** Há considerável aumento de publicações científicas sobre o tema, mas ainda existem lacunas sobre a prevalência e fatores associados. A grande variação na frequência de faltas ao trabalho por distúrbios de voz encontrada nos estudos pode estar relacionada à metodologia utilizada (período de referência) para investigá-la. Buscar por consenso quanto ao protocolo de investigação viabilizará a comparação dos resultados. Fatores sociodemográficos, de saúde e relacionados ao ambiente de trabalho associados à falta ao trabalho por causa da voz mostram a complexidade do evento estudado e permitem identificar elementos para a elaboração de ações preventivas voltadas para a saúde dos professores.

Palavras-chave: Absenteísmo; Distúrbios da voz; Docentes.

Resumen

Objetivo: Revisar la literatura especializada sobre frecuencia de faltas al trabajo por trastornos de la voz en maestros y factores a ello asociados. **Métodos:** Revisión bibliográfica de artículos científicos en portugués, español e inglés (2005-2015). **Resultados:** Se encontraron 15 artículos de estudios transversales y cuantitativos realizados en América Latina, Europa, Asia y América del Norte que utiliza como principal instrumento la recopilación de datos el cuestionario de auto-realización. Además del ausentismo, los autores examinaron la prevalencia de los trastornos de la voz en los docentes y su relación con aspectos sociales, económicos y de salud. La frecuencia de las ausencias al trabajo por trastornos de la voz osciló entre el 3,5% y el 63%. Los factores asociados a estos fallos fueron: sexo femenino, queja vocal durante la formación profesional, haber sido testigos de episodios de violencia en las aulas, depresión o ansiedad, problemas respiratorios, impacto y gravedad de los trastornos de la voz en la calidad de vida del maestro. **Conclusión:** Existe un considerable aumento de las publicaciones científicas sobre el tema, pero todavía hay lagunas sobre la prevalencia y los factores asociados. La amplia variación en la frecuencia de las ausencias al trabajo por trastornos de la voz que se encuentra en los estudios puede estar relacionada con la metodología empleada (período de referencia) para investigarlo. Búsqueda de consenso sobre el protocolo de investigación permitirá la comparación de los resultados. Factores sociodemográficos de salud y relacionados con el ambiente de trabajo, asociados con la falta al trabajo a causa de la voz, muestran la complejidad del evento estudiado y permiten identificar elementos para la elaboración de acciones preventivas para la salud de los maestros.

Palabras clave: Absentismo; Trastornos de la voz; Profesores.

Introduction

Absenteeism from work practiced by teachers is a worldwide recognized problem^{1,2}. Work absence related to a disease process is called illness-absenteeism and indicates a worse health condition³. Absenteeism costs bring about considerable expenditures to institutions, companies and to the society.

Voice disorders, also known as dysphonia, refer to any difficulty or alteration in vocal emission that prevents the natural production of the voice⁵. These problems interfere in the personal and professional life of teachers, due to incapacity processes.

In Brazil, a study found the prevalence of 11,6% of voice disorders among teachers and 7,5% in other categories². In Finland, 12% of teachers presented voice disorders in 1998, and it increased to 29% in 2001⁷. In Holland, 58,6% of teachers have reported voice disorders at least once during their career⁸. In Belgium, a case-control study showed the prevalence of 51,2% and 27,4% of voice disorders among teachers and controls, respectively¹. It must be pointed out that the presence of voice disorders does not have a direct relationship with the need of being absent from work.

The specialized literature reports the magnitude of voice disorders in the teachers' category. However, little attention has been given to absenteeism as a consequence of those problems^{1,9}.

In spite of its unquestionable relevance to the school system, this phenomenon has been seen much more as a disciplinary matter than as a public health one¹⁰. However, absenteeism is a worldwide subject that has its multidimensional character recognized.

This study aimed to make a review on the specialized literature concerning teachers' absences which were assigned to voice disorders and associated factors.

Method

This bibliographic study examined scientific publications from 2005 to 2015. The question that

guided this revision was: how often are teachers absent from work because of voice disorders and associated factors?

The literature revision consisted of the following steps: creation of the question, 2) identification of publications in the select bases, 3) definition of both criteria: inclusion and exclusion, 4) definition of information to be taken from the select studies, 5) evaluation of the included studies, 6) analysis of results, 7) presentation of the revision/summary of knowledge.

The search has prioritized the PUBMED Portal and the Health Virtual Library, besides the references found in the MEDLINE, LILACS, IBICS e BDNF – Nursing databases. The Portuguese, English and Spanish descriptors were “AND” combined through the Boolean operator “OR”. Three key-blocks were used for the searches: *Licença médica, ausência por enfermidade, sick leave, absenteísmo, absentismo e absenteeism; *Voz, voice, qualidade da voz, calidad de la voz, voice quality, distúrbios da voz, trastornos de la voz, voice disorders, afonia, afonia, aphonia, disfonía, disfonía, dysphonia, rouquidão, ronquera e hoarseness; *Docentes, docents, faculty, professor, teacher, professores e teachers. The searches were taken by combining the blocks with the Boolean operator “AND”.

Portuguese, Spanish and English articles concerning work absences due to vocal disorders in teachers during 2005 to 2015 were included. The excluding criteria were: dissertations, theses and qualitative studies articles. In this step, 25 documents were found in BVS (15 MEDLINE, 6 LILACS, 3IBCS e 1 BDNF-Nursing) and 10 in PUBMED (MEDLINE).

In the first step, the selected articles were read. In this step, 22/35 articles were included and 13/35 were excluded: 10 were repeated, one was a dissertation, one a qualitative study and one which the complete text was not available. An additional search was made considering the references from the selected articles, resulting in the inclusion of another article. After reading the complete texts, 15 articles were taken for analysis. (Figure 1).

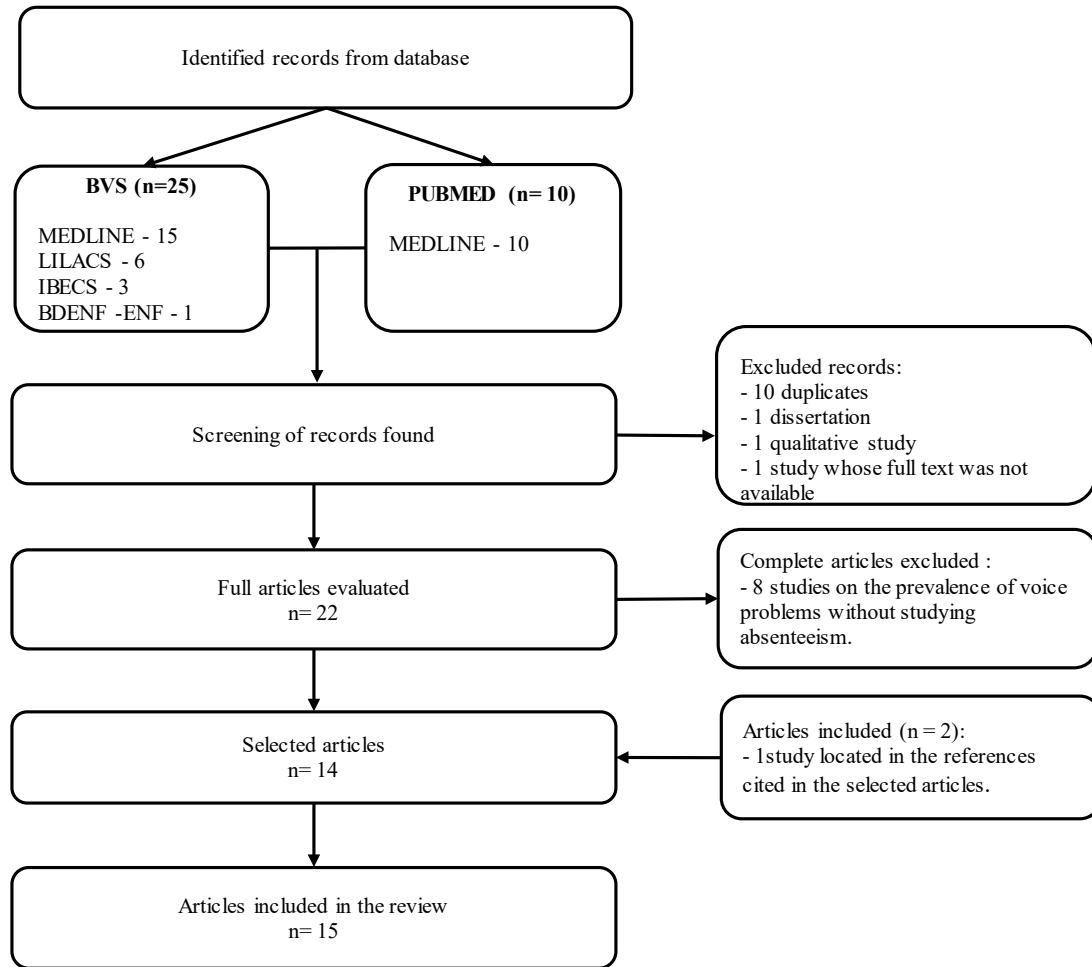


Figure 1. Process of article selection

The collected information was organized according to the following criteria: author and year, local, participants, event measurement, frequency and associated factors to absences from work because of voice disturbances.

Results

In this research all selected articles consisted of cross-sectional studies. There were 5/15 publications from Latin America, 6/15 from Europe, followed by 1/15 from Asia and 1/15 from North America. The big majority of articles did not compare teachers with other categories. The samples were mostly from the female gender (Chart 1).

Chart 1. Population, measurement form, and frequency of work absences due to voice disorders, by country and year.

Author/ year	Continent/ country		Population			Absences due to voice disorders %	Cross-sectional study	
			N	Women	Men		Tool	Reference period
Pereira et al 2015 ²⁰	South America	Brazil	P = 90	85	5	23,0	Self-filling questionnaire	Not given
			NP = 90	85	5	0		
Da Rocha et al 2013 ¹⁸		Brazil	P = 575	525	50	15,0	Self-filling questionnaire	Not given
Medeiros et al 2012 ⁹		Brazil	P = 1980	1980	–	3,5 (15 days) 30,0 (career)	Self-filling questionnaire	15 days prior to the survey and throughout the career
Behlau et al 2012 ²		Brazil	P = 1651	1308	343	22,5	Self-filling questionnaire	12 months prior to the survey
			NP = 1614	1101	513	5,9		
Cantor Cutiva & Burdof 2015 ⁴		Colombia	P = 438	332	106	7,0	Self-filling questionnaire	30 days prior to the survey
Cantor Cutiva & Burdof 2014 ²¹		Colombia	P = 438	332	106	7,0	Self-filling questionnaire	30 days prior to the survey
Alvarado Diaz et al 2013 ¹²		Colombia	P = 262	229	33	63,0	Medical record	Not given
Da Costa et al 2012 ¹⁹		North America	The United States	P = 237	182	55	23,0	Self-filling questionnaire
Houtte et al 2011 ¹	Europe	Belgium	P = 994	670	324	19,2	Self-filling questionnaire	Throughout the career
			NP = 290	–	–	7,6		
Åhlander et al 2011 ¹⁴		Sweden	P = 467	336	131	35,0	Self-filling questionnaire	Not given
Nerrière et al 2009 ¹⁷		France	P = 3646	2382	1264	46,6	Self-filling questionnaire	12 months prior to the survey
Angelillo et al 2009 ¹³		Italy	P = 504	322	182	23,0	Self-filling questionnaire	12 months prior to the survey
			NP = 402	244	158	5,4		
Kooijman et al 2007 ⁸		Holland	P = 1775	910	865	19,0 to 45,0	Self-filling questionnaire	Throughout the career
De Jong et al 2006 ¹⁶		Holland	P = 1878	987	891	16,8	Self-filling questionnaire	Throughout the career
			NP = 239	157	82	12,4		
Moy et al 2015 ¹⁵		Asia	Malaysia	P = 6039	5066	973	18,2	Self-filling questionnaire

T = teachers NT = not teachers

Concerning data collection instruments, the questionnaires which were filled in by the participants themselves were the most used. Just one study took data from medical records¹². Besides the absence from work due to voice disorders among teachers (15/15), the authors examined the preva-

lence of the disturbances in the very professional category (4/15)^{13, 14, 2, 15}. The studies have also investigated the correlation of these problems with teacher training (1/15)¹⁶, common mental disorders (2/14)^{17, 18}, kind of voice care and possible access barriers to health services (2/15)^{1,}

19, otorhinolaryngological diagnosis (2/15)^{12, 20}, impacts of absenteeism because of voice disorders in life quality of teachers (1/15)¹⁹ and its direct and indirect costs (1/15)⁴.

Six articles did not inform the time criterion used to determine the frequency of absences from work due to vocal disorders. Among those (9) there was no consensus about that mentioned criterion. There was preponderance of articles which asked about work absences having as reference: the career (4) or 12 months prior to the survey (3). Two

articles considered as reference the last 30 days prior to the survey, and one, 15 days

The frequency of work absences due to voice disorders ranged from 3.5% to 63% (Table 1). Researches who investigated the event considering the last 15 and 30 days prior to the survey have found the lowest rates: 3.5% for 15 days⁹ and 7% for 30 days^{20,21}. The largest prevalence (63%) of absences was associated to the presence of vocal nodules.

In four studies the authors described associated factor to work absences due to voice disorders^{12, 17, 19, 23} (Chart 2).

Chart 2. Associated factors to work absences due to vocal disorders

Author	Associated factors
De Jong et al 2006 ¹⁶	Female gender ($p < 0,001$; OR = 1,84).
	Vocal complaint during professional training ($p < 0,001$, OR: 2,07).
Medeiros et al 2012 ⁹	Witness of violence from students or parents one or more times (OR = 2,10; CI 95% = 1,14-3,90).
	Presence of depression or anxiety (OR = 2,03; 95% CI = 1,09-3,78).
	Upper respiratory tract during the 2 previous weeks (OR = 2,85; 95% CI = 1,53-5,29).
	Absenteeism due to voice disorders during the last 6 months (OR = 15,79; 95% CI = 8,18-30,45).
Da Rocha et al 2013 ¹⁸	Higher functional, physical and emotional impact due to voice disorders ($p = 0,008$ CI 95% 0,035-0,231).
Cantor Cutiva & Burdof 2015 ⁴	Severity of voice disorders (OR 7,99 CI 95% 2,81-22,79).

OR Odds ration
IC Confidence Interval

Discussion

The present review showed the authors' concern about work absences due to voice disorders among teachers, and the largest production was found in the last five years. From the selected articles, there were 11 published in that period^{1, 2, 4, 8, 19, 12, 13, 18, 19, 20, 21}.

The women were predominant in the studied samples, what was already expected considering the faculty workforce²². All discussed results from the 15 articles were based on cross-sectional studies. This design is very appropriate in spite of not allowing causal inference on the prevalence of illnesses and associated factors^{13, 15}. Results from cross-sectional studies are valuable by suggesting associations, in which plausible hypothesis can be exploited through deepening investigations.

The most used tool in the researches was the self-filling questionnaire (14/15). There was only one publication in which the researchers took data

from medical reports of teachers attended in an Occupational Health Service, in order to study the prevalence of vocal nodules associated to dysphonia¹². By using this strategy, the researches have less expenses, get a higher number of respondents, and are more embracing at territorial level when compared to those that use face-to-face interviews⁸. Self-filling questionnaires produce greater volume of information and make feasible studies with populations or samples more expressive. However, differences related to the format and content of the answers are taken into account, as well as memory failures from the respondents⁸.

By comparing the teachers with controls (5/15)^{1, 2, 13, 16, 20}, the first have presented higher risk of work absence because of voice disorders. Teachers miss work because of voice impairments much more than workers in other occupations.

After comparing absenteeism due to voice disorders among teachers and non-teachers, the results were similar in Italy (23,0% vs 5,4%)¹²,

Belgium (19,2% vs 7,6%)¹ and in two studies carried out in Brazil (22,5% vs 5,9%)² and (23% vs 0%)²⁰. Holland presented the lowest frequency of work absences due to vocal disorders (16,8%)¹⁶. The prevalence in the other professions was 12,4%.

The reference period for the question that generates the outcome variable must be highlighted. The lack of consensus on this essential criterion for both the question (inquiry) itself and for embracing the possible clinical evolution, makes the comparison of results more difficult and, consequently, brings losses in knowing this subject. Concerning the quality of the inquiry, the time criterion influences on results because the recent memory is more faithful than the memory of events happened in the remote past⁷. Longitudinal studies with representative samples of different occupational groups have taken 12 months as the reference period for researching absenteeism²³. Even so, there were diverged results about absences due to vocal disorders during the 12-month period: 46,6%¹⁷, 23%¹³ and 22,5%². This divergence could be explained by the distinct methodological approach and by the presence of other factors that lead the teacher to be absent or not to work because of vocal disorders, besides the morbidity.

Other studies with similar design methods may help to know about the prevalence and factors that can contribute to the decision of being absent from work due to voice disorders.

At Speech, Language and Audiology clinics, the period of 21 days is considered the mark for differing acute dysphonia from the chronic one. Acute clinical conditions triggered by laryngitis, influenza and cold may be present in vocal symptoms that will hardly exceed a two-week period, but these processes may become chronic⁵. Considering that clinic characteristic, inquiries that depend on recalls (such as in cross-sectional studies) use a time parameter when they ask about the symptoms.

It is worth to establish a consensus, since voice disorders triggered by the rise of voice usage can also be called functional dysphonia, in the early stage.

Over the time, functional dysphonia can evolve into distinct and progressive phases which can worsen or not. It begins with predominance of sensory symptoms, such as vocal fatigue, phonatory exertion, burning and / or pain in the throat, and possibly the intermittent hoarseness⁵. Symptoms may evolve and be manifested by increased hoarse-

ness, clearing, coughing, difficulty in maintaining the voice, variations in fundamental frequency, changes in vocal projection, loss of vocal efficiency, and decrease of vocal resistance⁵. At this stage, depending on the case, secondary lesions can appear in the vocal folds. From then on, the symptoms become more constant, with emphasis on auditory-visual signs accompanied by evident effort and vocal discomfort. The secondary organic lesions, possible in the more advanced clinical phases, explain the clinic condition of chronic dysphonia and even aphonia. Alvarado et al., in 2013¹² have identified a higher prevalence (63%) of absences associated with the presence of vocal nodules compared to other authors.

It is possible to think that, throughout the professional career and based on their experience, the teachers use strategies to minimize vocal overloading and to deal with vocal disorders²⁴. This fact might explain the decrease of work absences for this reason, from 30 years on⁸. Probably, these results refer to “The effect of Healthy Worker”, that is, only the healthier workers are able to keep working. Maybe these teachers have succeeded in creating strategies or had personal resources to cope with those difficulties, to become less vulnerable to the environment conditions²⁴.

However, not all teachers are absent from work when they are sick. Even though they were orientated by the audiologist to stay home, teachers’ efforts for not missing work were observed, with a clear intention of fulfilling their professional and social responsibilities⁶. Probably, different kinds of motivation, ethical aspects for example, could influence on the act of attending work, even under unfavorable physical conditions, but it is not possible to deepen in these hypotheses because the selected studies did not mention this aspect on work absences due to vocal disturbances.

It attracts attention the lack of results about associated factors to teachers’ absences due to vocal disorders^(4/15). Even so, an association with the female gender was identified¹⁶. Besides the differences in the biological predisposition, perception of the state of health and the way of coping with the disease, the distinct roles given to men and women related to the housework are suggested to explain the results in which the women are shown to be in disadvantage when health events²⁶ are studied²⁶.

Vocal disturbances which are identified during teacher training¹⁶ must be faced as associated fac-

tor of work absences, once they are predictors of future aggravation²⁷.

These findings highlight the importance of investigating vocal disturbances in the beginning of teachers' training and also to give adequate guidance to prevent and reduce the impacts during their career.

It was found an association between absences from work due to vocal disorders with violence episodes⁹. Possibly the emotions arisen from those episodes function as a trigger for worsening symptoms and causing incapacity. Besides that, it is possible to consider another way of thinking: individuals more susceptible to vocal overloading are also more sensitive to vicissitudes in psychosocial environment. Therefore, to miss work would be a result of a global effect which would articulate both reactions: vocal and emotional overload.

Elements for developing this hypothesis were not found, opening opportunities for future investigations. Absence recurrence (1/15)⁹ can be also related to environmental stresses or lack of social support. Medeiros et al. in 2012⁹ have already registered this association with breathing problems. In the presence of upper airways symptoms, it is expected an increase of vocal exhaustion and limitation in the performance of tasks considering the lower vocal projection which follows respiratory problems²⁸.

The combination of vocal fatigue and respiratory problems may lead to vocal declining and can influence on the teacher's decision to miss work.

Work absences due to vocal disorders have been associated with worse life quality related to the voice¹⁸. Vocal problems can cause a vocal problem in a can cause several effects

Several impacts on the teacher's quality life are related to vocal problems and are caused by vocal fatigue, worsening of vocal quality, withdrawal from professional career, bad relationship with students and restrictions on creativity and autonomy²⁹.

The severity of voice disorders was also identified by one of the authors⁴, not being unexpected the absence from work, once this disability limits routine activities, including pedagogical tasks.

Conclusion

There is a considerable rising on the number of scientific publications about absences from work

due to vocal disorders, but there still are gaps about their prevalence and associated factors.

The great variation on work absences due to voice disorders seen in the studies can be related to the methodology (reference period) used for investigation. This methodological problem brings difficulties in comparing the results. The search for a consensus on the investigation protocol could benefit the state of arts.

The lack of results about absences associated factors shows that there is a wide field for investigations on the identification and understanding about motives that can influence the teacher's decision to be absent from work due to vocal disorders. The factors identified in the studies (feminine gender, voice complaint during professional training, have witnessed episodes of violence, depression and anxiety, breathing problems, impact and severity of voice disorders on teacher's quality of life) show the complexity of the analyzed event.

Knowing the prevalence of absences from work caused by voice disorders and their associated factors makes possible to identify elements to create prevention actions concerning voice disorders among teachers.

References

1. Houtte E, Claeys S, Wuyts F, Van Lierde K. The impact of voice disorders among teachers: vocal complaints, treatment-seeking behavior, knowledge of vocal care, and voice-related absenteeism. *J Voice*. 2011; 25(5): 570-5.
2. Behlau M, Zambon F, Guerrieri AC, Roy N. Epidemiology of voice disorders in teachers and nonteachers in Brazil: prevalence and adverse effects. *J Voice*. 2012; 26(5): 665.e9-18.
3. Eriksson HG, von Celsing AS, Wahlström R, Janson L, Zander V, Wallman T. Sickness absence and self-reported health a population-based study of 43,600 individuals in central Sweden. *BMC Public Health*. 2008; 8:426.
4. Cantor Cutiva LC, Burdorf A. Medical costs and productivity costs related to voice symptoms in Colombian teachers. *J Voice*. 2015; 29(6): 776.e15-22.
5. Schwartz SR, Cohen SM, Dailey SH, et al. Clinical practice guideline: hoarseness (dysphonia). *Otolaryngol Head Neck Surg*. 2009;141:1-31.
6. Bassi I B. et al. Quality of life, self-perceived dysphonia and diagnosed dysphonia through clinical tests in teachers. *J Voice*. 2011; 25(2):192-201.
7. Simberg S, Sala E, Vehmas K, Laine A. Changes in the prevalence of vocal symptoms among teachers during a twelve-year period. *J Voice*. 2005; 19(1): 95-102.



8. Kooijman PG, Thomas G, Graamans K, de Jong FI. Psychosocial impact of the teacher's voice throughout the career. See comment in PubMed Commons below *J Voice*. 2007 May; 21(3): 316-24.
9. Medeiros AM, Assunção AA, Barreto SM. Absenteeism due to voice disorders in female teachers: a public health problem. *Int Arch Occup Environ Health*. 2012;85(8):853-64.
10. Bowers T. Teacher absenteeism and ill health retirement: a review. *Cambridge Journal of Education*. 2001; 31(2): 135-57.
11. Mendes KDD, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. *Texto Contexto Enferm*. 2008; 17(4): 758-64.
12. Alvarado Diaz AF, Pinzon CE, Tovar Cuevas JR, Fajardo Hoyos A. Vocal nodules in a colombian teachers group with dysphonia. *Med Segur Trab (Madrid)*. 2013; 59(233):375-82.
13. Angelillo M, Di Maio G, Costa G, Angelillo N, Barillari U. Prevalence of occupational voice disorders in teachers. *J Prev Med Hyg*. 2009; 50(1): 26-32.
14. Åhlander VL, Rydell R, Löfqvist A. Speaker's comfort in teaching environments: voice problems in Swedish teaching staff. *J Voice*. 2011; 25(4): 430-40.
15. Moy FM, Hoe VC, Hairi NN, Chu AH, Bulgiba A, Koh D. Determinants and effects of voice disorders among secondary school teachers in Peninsular Malaysia using a Validated Malay Version of VHI-10. *PLoS One*. 2015; 10(11):e0141963.
16. De Jong FI, Kooijman PG, Thomas G, Huinck WJ, Graamans K, Schutte HK. Epidemiology of voice problems in Dutch teachers. *Folia Phoniatri Logop*. 2006; 58(3): 186-98.
17. Nerrière E, Vercambre MN, Gilbert F, Kovess-Masféty V. Voice disorders and mental health in teachers: a cross-sectional nationwide study. *BMC Public Health*. 2009; 9: 370.
18. Da Rocha LM, de Mattos Souza LD. Voice Handicap Index associated with common mental disorders in elementary school teachers. *J Voice*. 2013; 27(5): 595-602.
19. Da Costa V, Prada E, Roberts A, Cohen S. Voice disorders in primary school teachers and barriers to care. *J Voice*. 2012; 26(1): 69-76.
20. Pereira ER, Tavares EL, Martins RH. Voice disorders in teachers: clinical, videolaryngoscopic, and vocal aspects. *J Voice*. 2015; 29(5): 564-71.
21. Cantor Cutiva LC, Burdorf A. Factors associated with voice-related quality of life among teachers with voice complaints. *J Commun Disord*. 2014; 52: 134-42.
22. Araújo TM, Carvalho FM. Condições de trabalho docente e saúde na Bahia: estudos epidemiológicos. *Educ Soc*. 2009; 30(107): 427-49.
23. Parent-Thirion A, Fernández Macías E, Hurley J, Vermeylen G. Working conditions: quality of working life. In: Fourth European Working Conditions Survey. Dublin, Ireland: European Foundation for the Improvement of Living and Working Conditions, 2007.
24. Vianello, Luciana, Ada A. Assunção, and Ana CC Gama. Estratégias implementadas para enfrentar as exigências vocais da sala de aula: o caso das professoras readaptadas por disfonia. *Distúrbios da Comunicação*. 2008; 20(2): 163-70
25. Naimi AI, Richardson DB, Cole SR. Causal inference in occupational epidemiology: accounting for the healthy worker effect by using structural nested models. *Am J Epidemiol*. 2013; 178(12): 1681-6.
26. Bekker MH, Rutte CG, van Rijswijk K. Sickness absence: a gender-focused review. *Psychol Health Med*. 2009; 14(4): 405-18.
27. Ohlsson AC, Andersson EM, Södersten M, Simberg S, Barregård L. Prevalence of voice symptoms and risk factors in teacher students. *J Voice*. 2012; 26(5): 629-34.
28. Romero Sánchez E, Martín Mateos AJ, Mier Morales M. Disfonia. *FMC - Formación Médica Continuada en Atención Primaria*. 2008; 15(2): 62-9.
29. Jardim R, Barreto SM, Assunção AA. Voice disorder: case definition and prevalence in teachers. *Rev Bras Epidemiol*. 2007; 10(4): 625-36.