

Original articles

Voice impact in the social communication and emotion of teachers before and after speech therapy

Impacto da voz na comunicação social e emoção de professoras antes e após fonoterapia

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Source of help: support from the Dean of the Federal University of Minas Gerais (PRPQ) and National Council for Scientific and Technological Development (CNPq).

Conflict of interest: non-existent

ABSTRACT

Purpose: to compare the impact of voice on the quality of teachers' life before the speech therapy and follow-up after high therapy and identify associated factors.

Methods: observational study, based on information collected in two stages: secondary data from medical records and questionnaires on line, after rising speech. The participants were 54 teachers, sent by the municipal occupational service with the diagnosis of dysphonia, for the Speech Therapy Clinic of a Teaching hospital. Speech therapy occurred from January 2012 to December 2013. The information of interest were responses to the Voice Activity and Participation Profile, number of vocal symptoms, issues relating to working conditions and living habits. A descriptive and inferential analysis using a statistical program.

Results: there was a decrease in reported symptoms when comparing the before and post speech therapy. As for the medians of the parameters of the above-mentioned protocol on both occasions, the groups differed in of social communication and in emotion. For these parameters were no statistical differences between the groups regarding the absence of noise generated in the classroom. The other independent variables did not differ between groups.

Conclusion: speech therapy brings positive impact on the voice of teachers in relation to behavioral and occupational factors. The improvement is evidenced by the reduction in the number of reported vocal symptoms after high speech. After speech therapy, there is lower limit of dysphonia vocal activities related to social communication and emotion, especially in the absence of noise in the classroom.

Keywords: Voice; Faculty; Speech Therapy; Quality of Life; Speech, Language and Hearing Sciences

RESUMO

Objetivo: comparar o impacto da voz na qualidade de vida de professoras no momento inicial e após alta fonoterápica e identificar os fatores associados.

Métodos: estudo observacional prospectivo, por meio de informações coletadas em dois momentos: dados secundários dos prontuários e questionários online, após alta fonoaudiológica. Participaram da pesquisa 54 professoras, encaminhadas pelo serviço ocupacional municipal com o diagnóstico de disfonía, para o Ambulatório de Fonoaudiologia de um Hospital de ensino. A fonoterapia ocorreu entre janeiro de 2012 e dezembro de 2013. As informações de interesse foram: respostas ao Protocolo do Perfil de Participação e Atividades Vocais, número de sintomas vocais, questões relativas às condições de trabalho e hábitos de vida. Realizou-se análise descritiva e inferencial por meio de um programa estatístico.

Resultados: houve redução no relato de sintomas ao comparar os momentos pré e pós-fonoterapia. Quanto às medianas dos parâmetros do protocolo supracitado nos dois momentos, observou-se que os grupos se diferenciaram em comunicação social e em emoção. Para estes parâmetros houve diferença estatística entre os grupos em relação à ausência de ruído gerado em sala de aula. As demais variáveis independentes não se diferenciaram entre os grupos.

Conclusão: a intervenção fonoaudiológica traz impacto positivo sobre a voz de professoras em relação aos fatores comportamentais e ocupacionais. A melhora é evidenciada pela redução do número de sintomas vocais relatados após alta fonoaudiológica. Após fonoterapia, há menor limitação da disfonía nas atividades vocais relacionadas à comunicação social e emoção, principalmente diante da ausência de ruído em sala de aula.

Descritores: Voz; Docentes; Fonoterapia; Qualidade de Vida; Fonoaudiologia

Received on: July 12, 2015

Accepted on: January 05, 2016

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INTRODUCTION

The voice problems that affect teachers, experienced in daily speech therapy services, are revealed in significant numbers of prevalent and incident cases that require vocal assistance ¹.

Teachers have shown a higher occurrence of multiple signals and vocal symptoms when compared to other occupational groups, and their problems are related to the use of voice at work ^{2,3}. Most of them report that they have had limitations on voice functionality, with adverse and negative repercussions on the effectiveness of communication by vocal deviation ⁴.

A case-control study found an association between work stress and loss of functional ability early, by teacher's vocal illness from the municipal education of São Paulo. Health-related aspects showed that they are crucial to the ability in their work and, in this case, the vocal symptom had a preponderant role ⁵.

To the World Health Organization (WHO), a healthy work environment is determined by a process of continuous improvement of the protection and promotion of safety, health and well-being of all workers and the sustainability of the work environment, with collaboration of workers and managers ⁶.

Thus, the concern for the quality of teacher's life is growing, according to the occupational challenges that they are submitted to an effective performance in their working day, such as the use of their voices for long periods without adequate rest, loud noise in the school environment and in the classroom, and the maintenance of healthy habits such as proper hydration and nutrition, among others ⁷.

Due to susceptibility of numerous interferences in the teacher's voice, the speech therapy is of great importance for maintenance of a good vocal health, which reflect in a better quality of life ⁸.

The objective of this study was to compare the impact of voice on quality of teachers' life, in the beginning and after speech therapy discharge and to identify associated factors.

METHODS

This work is part of a research project approved by the Research Ethics Committee (COEP) of the Federal University of Minas Gerais with the ETIC 482/08 number. The original project consists of a broad study with teachers treated at a school hospital, contemplating the group of teachers that were contacted by telephone, letter and / or email.

A prospective observational study was conducted with teachers, who were sent by the municipal occupational health service with a diagnosis of dysphonia, which made combined traditional voice therapy directly and indirectly ⁹, from January 2012 to December 2013 and they were discharged from speech therapy.

The direct speech therapy approach provides a change in the voice operation by using techniques for voice, in order to encourage more effective production. In a complementary way, the indirect approach favors the understanding of vocal use, psychological and environmental factors that can lead to change of voice and develop strategies to minimize such risk factors ¹⁰.

The teachers were selected for the study according to the inclusion and exclusion criteria. Inclusion criteria were: being female, sent by the municipal occupational health service operating in any levels of education, management or teaching coordination, which were discharged from speech therapy during the stated period and they agreed to participate.

Exclusion criteria were: male teachers, given the small number of them in the Speech Therapy Clinic; the teachers who did not respond to the Voice Activity and Participation Profile Protocol (VAPP) at the beginning of vocal therapy, those who left treatment, and who underwent speech therapy in another hospital after discharge from the Speech Therapy Clinic.

Among 140 teachers, 11 were excluded from the study for not having responded to VAPP in the early speech therapy and 13 for lack of telephone contact. For these 13 teachers were sent letters without return. Phone contacts with the 116 teachers eligible for the survey were conducted from January to July 2014, and permits to send the questionnaires were asked to be sent by email, which were sent in the period from March to June 2014.

The information related to the pre-speech therapy period the data were collected from medical records, including the results of VAPP and (s) cycle (s) of teaching performance; and information on the segment of speech therapy discharge, a questionnaire and VAPP were sent online. For the online questionnaire the following questions were selected: age, total working time in school; vocal symptoms, such as cough, dry cough, dry throat, bites, burning, choking, shortness of breath, strange body sensation in the throat, after prolonged use of voice, fatigue after a brief use of voice, laryngeal irritation, laryngeal constriction and pain; noise in the classroom and outside the school and contact with chalk power; microphone use and

hydration during the class; constant practice of vocal exercises of vocal warm-up and slowdown, and physical activity associated with vocal use. The data on the impact of voice on quality of life were collected through the VAPP protocol.

<Insert Attachment 1 >

The VAPP is a questionnaire with strategies for evaluating the impact of voice on quality of life ¹¹, it is easy to apply and it provides a better description of the degree of functional capacity related to the use of the voice. The higher the results, the greater the difficulty and restriction imposed on the participation of voice activities ^{12,13}.

It is known that the self-assessment protocols reveal greater quantifying of the perspective of the subject of his speech problem ¹⁴, and are important tools in measuring the results of speech therapy for teachers with behavioral dysphonia ¹⁵.

The scores of VAPP parameters used in this study, applied pre and post speech therapy were: vocal self-perception, the effects of the impact of dysphonia at work, daily and social communication, emotion, and total. Additional scores VAPP protocol: Scoring Limitation on Activities (PLA) and the Restriction Score Participation (PRP) were not analyzed in this study.

For the application of VAPP and the online questionnaire after discharge from speech therapy, the teachers were contacted through phone calls, to invite them to participate. Questionnaires were sent by e-mail, with a minimum segment of four months and a maximum of two years and two months of speech therapy discharge.

Before starting the questionnaire, the participants should be required to read and agree to the IC, according to resolution number 466 of 12/12/2012 of the National Health Council / Ministry of Health.

The information obtained from medical records were stored in Microsoft Office Excel spreadsheets.

The analysis of the data was performed quantitatively through the statistical program IBM - SPSS, version 19. We conducted a descriptive analysis of the data with measures of central tendency and dispersion. In the comparison of median of VAPP parameters pre and post speech therapy was used the Wilcoxon test. The verification of the factors associated to the parameters of social communication and emotion after

speech therapy was performed using the nonparametric Mann-Whitney test for independent samples. Considered the confidence level of 95%.

RESULTS

Among 116 teachers, 54 responded to the online questionnaire, representing a response rate equal to 46.6%.

The survey was conducted from the medical records of 54 teachers, aged 24-61 years, average of 41 years (SD = 8.26); and almost two-thirds of them (69%) teach in two shifts and 14 of them (31%) in a shift. The most prevalent teaching cycles were 30 early childhood education (53%) and primary education 20 (35%).

There was statistical difference between the groups of social communication and emotion parameters. There was no difference in relation to the self-awareness parameters, work, daily and total communication. In the comparison of VAPP parameters in pre and after speech therapy discharge, there was a reduction of the median in all aspects investigated. Comparing the number of reported symptoms, pre-speech therapy groups and after speech therapy discharge, there were differences between them.

Almost two thirds of teachers (67%) answered the questionnaire after the interval of four to twelve months speech therapy discharge for voice treatment.

As for working conditions it was found that most teachers realize the presence of sound competition with external noise in school and they have no contact with chalk powder; and 54% mentioned sound competition with noise in the classroom.

According to reference to behavioral factors, one third of them uses microphone. Most of them reported hydration during classes, physical activity associated with the use of voice and vocal exercises, and they perform vocal exercises of warm-up and slowdown frequently.

By correlating the VAPP parameters in which the groups differed - social communication and emotion - with behavioral and occupational aspects after discharge, we observed a statistical difference between the groups regarding the absence of noise generated in the classroom. The other independent variables did not differ between the groups.

Table 1. Comparison of median parameters protocol profile of participation and vocal activities and symptoms vocal autorrelatos pre-speech therapy and after four twenty- six -month high speech.

Variables of interest		median	average + - SD	Standard deviation	Minimum value	Maximum value	P value
Self-perceived of voice	Pre- speech therapy	3.7	3.7	3.0	0.0	9.9	0.175
	post- speech therapy	3.2	3.2	2.7	0.0	9.1	
Job	Pre- speech therapy	11.0	10.8	10.4	0.0	36.6	0.920
	post- speech therapy	6.0	10.8	11.5	0.0	38.3	
Daily communication	Pre- speech therapy	18.5	24.4	27.0	0.0	104.3	0.141
	post- speech therapy	7.7	18.7	21.3	0.0	82.5	
Social communication	Pre- speech therapy	1.7	4.7	6.8	0.0	29.2	0.027*
	post- speech therapy	0.4	2.3	5.17	0.0	24.2	
Emotion	Pre- speech therapy	7.5	12.4	14.3	0.0	66.0	0.030*
	post- speech therapy	3.5	9.3	11.4	0.0	39.0	
Total score	Pre- speech therapy	33.1	54.7	54.8	0.3	214.0	0.121
	post- speech therapy	24.1	44.3	46.7	0.0	173.5	
No. of Symptoms	Pre- speech therapy	3.0	3.8	2.9	0.0	11.0	0.003*
	post- speech therapy	2.0	2.9	2.3	0.0	10.0	

* Statistically significant values ($p \leq 0.05$) - Wilcoxon test
SD = standard deviation.

Table 2. Statement of variable independent and comparison with the median of parameters social communication and after high emotion phonotherapy.

Variables of interest		N(%)	Social communication after discharge median	P value	Emotion after discharge median	P value
Discharge time	4 to 12 months	32 (67)	24.4	0.937	24.13	0.792
	13 a 26 months	16 (33)	24.7		25.25	
Microphone use	YES	19 (35)	26.2	0.659	28.7	0.670
	NO	35 (65)	28.1		26.8	
Noise in the classroom	YES	25 (46)	34.5	0.002*	34.8	0.001*
	NO	29 (54)	21.5		21.2	
External noise school	YES	44 (81)	28.2	0.453	28.4	0.384
	NO	10 (19)	24.2		23.6	
Contact chalk dust	YES	11 (20)	29.6	0.609	34.2	0.111
	NO	43 (80)	27.0		25.8	
Hydration	YES	50 (93)	27.8	0.572	27.5	0.934
	NO	4 (07)	23.4		28.1	
Physical activity with voice	YES	50 (93)	28.0	0.402	27.4	0.817
	NO	4 (07)	21.4		29.3	
Vocal exercises	YES	48 (89)	27.3	0.831	27.4	0.879
	NO	6 (11)	28.7		28.4	

* Statistically significant results ($p = 0.05$) - Mann Whitney Test.

DISCUSSION

The study shows that the speech therapy intervention promotes positive impact on the voice of teachers, observed by reducing the number of reported

vocal symptoms after speech therapy discharge. There is improvement in aspects of quality of life, verified by the reduction in the limitation of dysphonia in all parameters analyzed, with significant differences for social communication and emotional profile.

The results indicate that after the speech therapy discharge, it appears to have maintenance of healthier vocal adjustments, and reduction of the limitation of the vocal problem and the individuals' desire to participate in daily activities when compared to the initial treatment period.

Despite the long period between the speech therapy discharge and the realization of the second data collection, there is no difference between teachers who were discharged for shorter or longer period than 12 months, for the social communication and emotion parameters, which corroborate other findings⁸. The other parameters were not analyzed in relation to speech therapy discharge time.

The positive impacts of speech therapy in improving quality of life through awareness and maintenance of vocal care were observed in some studies using therapeutic approaches and different research methods.^{12,15-18} A recent study found that the vocal stability of patients with dysphonia after voice therapy remains for a period of six to 24 months¹⁹. There are few studies with teachers, who suffer of dysphonia, which analyze the results in long-term of speech therapy on quality of life.

As for the findings of VAPP, it is emphasized that there is a reduction of the limitations and restrictions on the vocal activities in all analyzed parameters, but the only ones that have significant changes, comparing pre and post speech therapy periods, were the social communication and the emotion. Reducing the social communication parameter in this study, post-speech therapy, is similar to that found in other studies with teachers^{15,17}. The reduction and significant improvement in all parameters after the speech therapy were observed in other studies^{12,15}.

It seems that the lack of difference between the groups pre and post speech therapy in some parameters of this study may be related to the small number of teachers that participated in the research, which reduces the statistical power of the analysis. There is a great variability of results in the analysis of VAPP parameters, verified by high values of standard deviation, indicating a heterogeneity of the studied population in these aspects. This can be explained by subjectivity in the perception of teachers on the use of voice in the various dimensions of life that is independent of the auditory perception aspect of vocal quality. The number of participants also prevented groups of teachers with less speech therapy discharge time variation were compared, it may influence the results.

We see a similarity scores of vocal self-perception when comparing the pre and post speech therapy, as similar to that found in other studies with teachers^{17,20}. This finding may suggest the difficulty of the teacher to recognize his vocal changes, since the found average values are low and correspond to the perception of a slight change of voice. It is known that knowing the perception of the teacher in relation to the vocal and the consequent limitation generated in personal and social life is essential for motivation and adherence to speech therapy²¹.

It is still valid to suppose that, by acting as voice professionals, occupational aspects of the teacher influence the demand for use of voice and are directly related to vocal behavior, in the everyday life and emotion. Thus, the teacher exposed to the worst working conditions are prone to excessive use of voice, and negative vocal behavior, signaled in his voice, for example, by fatigue and hoarseness, among other health problems that cause losses in their daily communication and work^{22,23}.

According to behavioral factors, a third of teachers reports the use of microphone after the treatment. The use of sound amplifier, when properly used, suggests benefits by reducing the vocal effort²⁴. And the chalk powder is not part of the work by the most teachers studied. It is believed that this finding is related to the predominant role in this study, the teachers in early childhood education cycle.

Nearly all participants claim to hydration and do vocal exercises after discharge from speech therapy. The hydration and the frequency of the vocal exercises of vocal warm-up and slowdown demonstrated beneficial adhesions to speech therapy guidelines^{8,12}. However, despite instructions about vocal hygiene, most teachers remains practicing physical activities associated with the use of voice.

The use of voice interferes less in the social communication and excitement of the teachers who perceive less noise at school. As for the external noise at school, and most teachers talked about sound competition, which was also found in another study with teachers²⁵.

The study found average noise levels in schools between 68.65 dB (A) and 80.10 dB (A), far above the recommended, and found that the noise intensity is competitive with the voice of the teacher and the student will tend to present difficulties in teaching and learning process, related to the difficulty of understanding the message and keep the attention²⁶, and it

may cause harmful interference to the dynamic quality in the classroom.

The results showed that the perception of noise in the classroom after speech therapy is related to the greatest limitation of the voice to the parameters of social communication and emotional aspects. The noisy places cause the vocal abuse, and the continuous demand of this process can lead to waste on phonation structures and produce, over the time, voice disorders²⁷. Noise can also favor stress and it increased psychological stress among teachers²⁸.

Cross-sectional study with 682 teachers, held in Spain's schools, with the objective of evaluating the effects of the school environment on vocal health of teachers found an association between noise and acoustics of classrooms with the occurrence of vocal symptoms among teachers²⁹. Another study showed that the teacher in working environment with unfavorable acoustics tend to feel less comfortable and most of them at risk of school clearance^{30,31}.

The median of social communication and emotion parameters are lower among teachers who reported absence of noise in the classroom. It can be inferred that with speech therapy, enhances the development of specific strategies work management to deal with the students, which reduces the occurrence of vocal abuse and promotes interaction and communication in the classroom between the student and the teacher, making the most pleasurable and satisfying work.

It is believed that the speech therapy, by providing healthy vocal production, is related to the improving of teacher's quality of life, promoting social, communicative processes and self-confidence, thus reducing median VAPP parameter social and emotional communication, as observed in this study, in line with other authors¹⁵.

Despite the limitations of the study and the small number of participants and following the losses in the segment of teachers and the variability of speech discharge time, the results show that healthy vocal behaviors are maintained after speech therapy and it should pay special attention to the control of noise in the classroom, within the context of each school.

CONCLUSION

The speech therapy brings positive impact on the voice of teachers in relation to behavioral and occupational factors, reducing the number of reported vocal symptoms. After speech therapy, the scores of social communication and emotion parameters reduced,

indicating a lower limit of dysphonia vocal activities, especially in the absence of noise in the classroom.

REFERENCES

1. Behlau M, Feijó D, Madazio G, Rehder MI, Azevedo R, Ferreira AE. Voz profissional: aspectos gerais e atuação fonoaudiológica. In: Behlau M, organizadora. Voz: o livro do especialista. Vol. II. Rio de Janeiro: Revinter; 2005. p. 312.
2. Cutiva LCC, Vogel I, Burdorf, A. Voice disorders in teachers and their associations with work-related factors: A systematic review. *J Commun Disord*. 2013;46(2):143-55.
3. Araújo TM, Reis EJFB, Carvalho FM, Porto LA, Reis IC, Andrade JM. Fatores associados a alterações vocais em professoras. *Cad Saúde Pública*. 2008;24(6):1229-38.
4. 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.
5. Giannini SPP, Latorre MRDO, Ferreira LP. Distúrbio de voz relacionado ao trabalho professora: um estudo caso-controle. *CoDAS*. 2013;25(6):566-76.
6. Organização Mundial de Saúde. Ambientes de trabalho saudáveis: um modelo para ação: para empregadores, trabalhadores, formuladores de política e profissionais. /OMS; tradução do Serviço Social da Indústria. – Brasília: SESI/DN, 2010.
7. Leslie PF, Latorre MRDO, Giannini SPP, Ghirardi ACAM, Karmann DF, Silva EE et al. Influence of Abusive Vocal Habits, Hydration, Mastication, and Sleep in the Occurrence of Vocal Symptoms in Teachers. *J Voice*. 2010;24(1):86-92.
8. Gama ACC, Bicalho VS, Valentim AF, Bassi IB, Teixeira LC, Assunção AA. Adesão a orientações fonoaudiológicas após a alta do tratamento vocal em professores: estudo prospectivo. *Rev CEFAC*. 2012;14(4):714-20.
9. Ruotsalainen J, Sellman J, Lehto L, Verbeek J. Systematic review of the treatment of functional dysphonia and prevention of voice disorders. *Otolaryngol Head Neck Surg*. 2008;138(5):557-65.
10. Pasa G, Oates J, Dacakis G. The relative effectiveness of vocal hygiene training and vocal function exercises in preventing voice disorders in primary school teachers. *Logoped Phoniatr Vocol*. 2007;32(3):128-40.
11. Cutiva LCC, Burdorf, A. Factors associated with voice-related quality of life among teachers

- with voice complaints. *J Commun Disord.* 2014;52(9):134-42.
12. Kleemola L, Helminen M, Rorarius E, Isotalo E. Twelve-month clinical follow-up study of voice patients' recovery using the Voice Activity and Participation Profile (VAPP). *J Voice.* 2011;24(5):245-54.
 13. Ricarte A, Bommarito S, Chiari B. Impacto vocal de professores. *Rev CEFAC.* 2011;13(4):719-27.
 14. Dragone MLS, Ferreira LP, Giannini SPP, Simões-Zenari M, Viera VP, Behlau M. Voz do professor: uma revisão de 15 anos de contribuição fonoaudiológica. *Rev Soc Bras Fonoaudiol.* 2010;15(2):289-96.
 15. Ribeiro MB, Gama ACC, Bassi IB, Teixeira LC. Parâmetros vocais, laringeos e de autopercepção de professoras disfônicas: Análise após tratamento fonoaudiológico. *Rev CEFAC.* 2013;15(3):616-41.
 16. Ferreira JM, Campos NF, Bassi IB, Santos MAR, Teixeira LC, Gama ACC. Analysis of aspects of quality of life in teachers' voice after discharged: longitudinal study. *CoDAS.* 2013;25(5):486-91.
 17. Gillivan-Murphy P, Drinnan MJ, O' Dwyer TP, Ridha R, Carding P. The effectiveness of a voice treatment approach for teachers with self-reported voice problems. *J Voice.* 2006;20(3):423-31.
 18. Niebudek-Bogusz E, Sznurowska-Przygocka B, Fiszer M, Kotylo P, Sinkiewicz A, Modrzewska M, et al. The effectiveness of voice therapy for teachers with dysphonia. *Folia Phoniatr Logop.* 2008;60(3):134-41.
 19. Van Gogh CD, Verdonck-de Leeuw IM, Langendijk JA, Kuik DJ, Mahieu HF. Long-term efficacy of voice therapy in patients with voice problems after treatment of early glottic cancer. *J Voice.* 2012;26(3):398-401.
 20. Bassi IB, Assunção AA, Gama ACC, Gonçalves LG. Características clínicas, sociodemográficas e ocupacionais de professoras com disфония. *São Paulo. Distúrb Comum.* 2011;23(2):173-80.
 21. Santos LR, Almeida L, Teixeira LC, Bassi I, Assunção AA, Gama, ACC. Adesão das professoras disfônicas ao tratamento fonoterápico. *CoDAS.* 2013;25(2):134-9.
 22. Assunção AA, Bassi IB, Medeiros AM, Rodrigues C, Gama ACC. Occupational and individual risk factors for dysphonia in teachers. *Occup Med.* 2012;62:553-9.
 23. Karmann DF, Lancman S. Professor – intensificação do trabalho e o uso da voz. *Audiol. Commun. Res.* 2013;18(3):162-70.
 24. Teixeira LC. Exercícios de função vocal e uso de amplificador de voz: ensaio clínico randomizado. [Tese] São Paulo (SP): Universidade Federal de São Paulo; 2013.
 25. Cutiva LCC, Burdorf, A. Factors associated with voice-related quality of life among teachers with voice complaints. *J Commun Disord.* 2014;52(9):134-42.
 26. Batista JB, Carlotto MS, Coutinho AS, Pereira DA, Augusto LG. O ambiente que adoce: condições ambientais de trabalho do professor do ensino fundamental. *Cad Saúde Colet.* 2010;18(2):234-42.
 27. Guidini RF, Bertonecello F, Zanchetta S, Dragone MLS. Correlações entre ruído ambiental em sala de aula e voz do professor. *Rev Soc Bras Fonoaudiol.* 2012;17(4):398-404.
 28. Nunes MF, Sattler MA. Percepção do ruído aeronáutico em Escolas da zona Ido PEZR do aeroporto internacional Salgado Filho. *Engevista.* 2005;6(3):5-24.
 29. Cutiva LCC, Burdorf, A. Effects of noise and acoustics in schools on vocal health in teachers. *Noise Health.* 2015;17(74):17-22.
 30. Persson R, Kristiansen J, Lund SP, Shibuya H, Nielsen PM. Classroom acoustics and hearing ability as determinants for perceived social climate and intentions to stay at work. *Noise Health.* 2013;15(67):446-53.
 31. Assunção AA, Oliveira DA. Intensificação do trabalho e saúde dos professores. *Educ Soc.* 2009;30(107):349-72.

Annex 1 – Online Questionnaire

Questionnaire Number _____

Dear teacher, this questionnaire is individual and confidential, and the author of the responses will not be identified later. Please, it is essential that you answer all questions, since the absence of a response may invalidate all. Your answers should reflect your reality, so please do not exchange ideas to answer this questionnaire.

MARK THE ANSWER THAT BEST DESCRIBE YOUR CONDITION .

BLOCK 1 - VOICE

We are seeking to understand better as a voice problem may interfere with your quality of life. To answer the questionnaire below is satisfied that the ruler is a scale from 0 (zero) to 10 (ten) , with zero the nearest number of normal voice without limitation of daily activities due to his voice, and 10 is the occurrence of greatest impact voice problem for their activities.

Make a mark at the corresponding place in your assessment.

Perception of the degree of your vocal problem

1. How your voice problem is intense?

Never | _____ | Always

Effects on your job

2. Is your job affected by your voice problem?

Never | _____ | Always

3. Over the past six months did you ever consider changing your job because of your voice problem?

Never | _____ | Always

4. Did your voice problem create any pressure in your work?

Never | _____ | Always

5. In the last six months, has your voice problem affected the future of your career?

Never | _____ | Always

Effects on daily communication

6. People do ask you to repeat what you just said because of your voice problem?

Never | _____ | Always

7. In the last six months did you ever avoid talking to people because of your voice problem?

Never | _____ | Always

8. Do people have difficulty to understand you on the phone because of your voice problem?

Never | _____ | Always

9. In the last six months have you reduced phone use because of your voice problem?

Never | _____ | Always

10. Does your voice problem affect your communication in quiet environments?

Never | _____ | Always

11. In the past six months did you get to avoid conversations in quiet environments because of your voice problem?

Never | _____ | Always

12. Does your voice problem affect your communication in noisy environments?

Never | _____ | Always

13. Over the past six months did you ever come to avoid conversations in noisy environments because of your voice problem?

Never | _____ | Always

14. Does your voice problem affect your message when you are talking to a group of people?

Never | _____ | Always

15. In the last six months did you ever avoid group conversations because of your voice problem ?

Never | _____ | Always

16. Does your voice problem affect the transmission of your message?

Never | _____ | Always

17. In the last six months did you ever avoid talking because of your voice problem ?

Never | _____ | Always

Effects in the social communication

18. Does your voice problem affect your social activities?

Never | _____ | Always

19. In the last six months did you avoid social activities because of your voice problem?

Never | _____ | Always

20. Are your family , friends or co-workers bothered by your voice problem?

Never | _____ | Always

21. In the last six months have you ever avoided communicating with family, friends or co-workers because of his voice problem?

Never | _____ | Always

Effects on your emotion

22. Do you feel upset because of your voice problem?

Never | _____ | Always

23. Are you ashamed of your voice problem?

Never | _____ | Always

24. Are you low self-esteem because of your voice problem?

Never | _____ | Always

25. Are you worried because of your voice problem?

Never | _____ | Always

26. Do you feel dissatisfied because of your voice?

Never | _____ | Always

27. Does your voice problem affect your personality?

Never | _____ | Always

28. Does your voice problem affect your self-image?

Never | _____ | Always

29. Currently, which one (s) vocal symptoms do you present?

0 () none

1 () cough/ dry cough

2 () dry throat

3 () hawk

4 () bites

5 () burning

6 () choking

7 () lack of air

8 () strange body sensation

9 () fatigue after prolonged use of the voice

10 () fatigue after short use of voice

11 () laryngeal irritation

12 () laryngeal constriction

13 () ache

BLOCK 2 - GENERAL IDENTIFICATION

30. Age: _____ years old.

31. Work shift:

- In the morning in the afternoon two shifts

BLOCK 3 - WORKING ENVIRONMENT

32. In general, the noise originated in the classroom is :

- Worthless reasonable high unbearable

33. In general, the noise generated outside of school is:

- Worthless reasonable high unbearable

34. Do you make use of chalk during your classes?

a () yes

b () no

BLOCK 4 - HEALTH AND LIFE HABITS

35. In general, do you drink water during the classes ?

a () yes

b () no

36. How often do you perform any physical activity(walking, exercise, sports , etc.):

a () 3 or more times per week

b () once or twice per week

c () never

37. How often do you perform vocal exercises (warm-up and / or slowdown)?

a () always

b () frequently

c () sometimes

d () never

38. Do you use microphone during the classes?

a () always

b () frequently

c () sometimes

d () no