VOCAL SYMPTOMS OF FUTURE PROFESSIONAL VOICE USERS

Sintomas vocais de futuros profissionais da voz

Carla Aparecida Cielo[1], Vanessa Veis Ribeiro[2],Carla Franco Hoffmann[1]

ABSTRACT

Purpose: characterize the vocal symptoms of future professional voice users according to the age, gender and body mass index. **Methods:** the participants answered the Voice Symptom Scale, consisting of 30 questions, 15 being from limitation domain, eight from emotional domain and seven from the physical domain. Subjects were instructed to mark the answer that corresponds to the frequency of occurrence for each of the symptoms questioned. Also have been collected occupational data, anthropometric and general health. The data were analyzed descriptively and statistically using the nonparametric tests Spearman rank correlation, Mann Whitney and Kruskal-Wallis test with a significance level of 5%. **Results:** the sample consisted by 47 subjects, aged between 19 and 37 years (mean 22,17 years), being 28 (59,57%) females and 19 (40,43%) were males, the average was 11,38 vocal problems of a possible total of 30. There was greater frequency of symptoms "you cough or hem" and "you have difficulty to speak in noisy places". **Conclusion:** the group of future professional voice users analyzed showed high average of vocal symptoms, highlighting the cough or hem and the difficulty to speak in noisy places, directly relating to incorrect vocal uses. With the increasing of the professional vocal demand, these individuals may be considered at risk for the development of voice disorders.

KEYWORDS: Dysphonia; Voice Disorders; Quality of Life; Symptoms; Voice

INTRODUCTION

Health and quality of life are no longer considered to be merely the condition of not being ill, but instead, a state of complete physical and psychosocial well-being, which may change according to the life perspectives and social roles of each individual[1-4]. The concern with the concept of quality of life refers to a movement that aims to value broader parameters than just symptom control, reduction of mortality or increase in life expectancy[3-5].

Thus, there has been an increase on the number of research works that deal with the quality of life of individuals in relation to overall health and audiology aspects[1,2,5-10]. In the area of voice, quality of life has been assessed by means of self-perception instruments[1-3,7-12].

Self-perception of voice quality is a subjective parameter of paramount importance in obtaining data on how relevant vocal disorders can be for patients. It enables them to express their knowledge and how they perceive their own voices[1,7,8].

With the intent to quantify vocal self-perception, different instruments have been developed and can be used in research or clinical practice to assess and/or monitor the individual's perception of their voice disorder throughout therapy[2,6,13]. The VoiceSymptomScale (VoiSS) stands out among these instruments, and it has been recently validated and translated to Portuguese as *Escala de Sintomas Vocais* (ESV)[13,14]. International research, which compared VoiSSa with other questionnaires used to assess voice quality of life, have found that VoiSS

(1) Departamento de Pós-Graduação em Distúrbios da Comunicação Humana da Universidade Federal de Santa Maria/UFSM, Santa Maria, RS, Brasil.

(2) Departamento de Pós-Graduação em Distúrbios da Comunicação Humana da Universidade Federal de Santa Maria/UFSM, Santa Maria, RS, Brasil; Departamento de Graduação em Fonoaudiologia da Universidade Estadual do Centro-Oeste do Parana/UNICENTRO, Irati, PR, Brasil.

Support Source: CAPES; CNPq

Conflict of interest: non-existent

was submitted to a more complex development and validation process, and it is thus more psychometrically robust and widely used in the literature as a measure of vocal self-perception for dysphonic individuals[6,9]. Its scale is sensitive to identify limitations of communication, and physical and emotional symptoms present in adults with dysphonia[15]. This scale has been recently validated[13,14], and needs to be applied to research involving the Brazilian population, such as in this present study, which examines ESV results in future professional voice users.

Professional voice users depend on a harmonic quality of voice, on the integrity of structures involved in the phonation process, and on favorable working conditions for proper and efficient personal relationships[3,16,17]. The preservation before the aggressive agents and the maintenance of voice quality are important aspects of their overall health and quality of life[18].

Although the primary function of speech is communication, in modern society, about a third of the workforce use it as a primary tool at their workplace[3,19]. Many of these professionals, who lack proper care of their vocal health, can gradually develop some type of dysphonia as a consequence of their busy routines and intense vocal demands required at work[20,21]. Physical, social, environmental, organizational, and psychological factors are known to also affect or predispose to the onset of vocal changes[22]. Improper vocal use, overall health conditions, anthropometric factors, and individual susceptibility may also favor the appearance of dysphonia[16,23,24]. Studies suggest that the prevalence of some degree of dysphonia in individuals that use their voice at work can reach 80.7%[19,25,26].

Therefore, several studies have started to analyzed the quality of life of professional voice users[1,2,5-10], however, only a few of them concern future professional voice users[11,12].

Individuals that begin using their voice professionally start to ultimately have greater demands for communication. Research on the vocal symptoms of this group of people, before they start using their voice at work, could aid the physicians when developing programs for health care and working on the improvement of patient communicative issues, contributing to a better work performance and improved voice quality of life.

Thus, this present study aimed to characterize the vocal symptoms of future professional voice users according to their age, gender, and body mass index (BMI).

METHODS

This is a cross-sectional, analytical, and quantitative field study approved by the Ethics Committee of Research under 23081.016945/2010-76. The participants were aware of the procedures and have signed an Informed Consent Form (ICF).

Data collection was conducted in public areas (parks, streets, etc.), and 65 volunteers underwent the inclusion and exclusion criteria to be selected for a convenience sample. Data were collected during a vocal health movement, the World Voice Day, held in the countryside of Rio Grande do Sul, the subjects who sought information on voice were invited to participate on this research study.

The convenience sample consisted of 47 subjects, aged from 19 to 37 (mean of 22.17), of which 28 (59.57%) were females and 19 (40.43%) were male, and who met the following inclusion criteria: signing of ICF; male or female; currently attending a higher education course or technical course geared towards a job that will require the use of voice. Exclusion criteria were: report of neurological or psychiatric diseases that might limit the reading comprehension of the ICF and of the data collection instrument (ESV), individuals who are currently using or have already used their voice as a work instrument, report of hearing problems or complaints, future singing voice professionals, and incomplete data on the collection instruments. Subjects considered to be future voice professional were exclusively those who were taking higher education or technical courses geared towards jobs that will require spoken professional voice use, regardless of their specialization areas, and who are not currently using and had never used their voice as a work instrument in the past.

The selected subjects filled out a protocol form with information on their profile, overall voice and speech records, history of professional performance and anthropometric data, and completed the ESV. Future career areas of the participants included education, physical education, special education, and social sciences (journalism and marketing).

BMI was determined according to the self-reported anthropometric data collected with the questionnaire, to learn how adipose tissue accumulation could affect nasopharynx, oropharynx, larynx, tongue and soft palate on respiratory and vocal functions[23]. This was made by dividing the value of body weight in kilograms by the square of height in meters (BMI = kg / m²). To establish the expected normality values, the classification of the World Health Organization was used. The following were considered: very low weight = BMI > 17.0; low

weight = 17.0 ≤ BMI <18.5; normal = 18.5 ≤ BMI <25.0; overweight = BMI > 25[27].

Participants answered the ESV, which consisted of 30 questions, of which 15 referred to the "limitation" (functionality) domain, eight refferred to the "emotional" (psychological effects) domain, and seven to the "physical" (organic symptoms) domain[14]. Each question was scored according to the frequency of symptoms: "never" (zero points), "rarely" (one point), "sometimes" (two points), "almost always" (three points) and "always" (four points)[13-15]. Total ESV calculated by the simple summation of the value of each question indicates the general level of voice change. Maximum score is 120 points, where 60 points refer to the limitation subscale, 32 to the emotional and 28 to the physical subscale[13]. Subjects were instructed to tick the response that corresponded to the frequency of occurrence of each symptom, limitation and questioned vocal problem. Occupational, overall health, and anthropometric data were also collected.

Data were tabulated and the variables were descriptively and statistically analyzed through nonparametric tests, Spearman correlation, Mann Whitney and Kruskal-Wallis. Significance level of 5% was adopted, ie., all confidence intervals of the study were built with 95% statistical confidence.

RESULTS

Table 1 shows the descriptive analysis on age and amount of vocal symptoms reported by future professional voice users from the fields of education, physical education, special education, and social sciences (journalism and marketing), with a mean of 11.38 problems, of a total possibility of 30.

Table 1 – Descriptive analysis of the quantity of problems reported by future professional voice users

Descriptive	Age	Quantity of Vocal Problems
Mean	22.17	11.38
Trend	20.00	13.00
Median	21.00	10.00
Standard Deviation	4.50	6.26

Descriptive Analysis

Table 2 shows data for the frequency of occurrence of vocal problems and limitations. There was greater frequency of "you cough or clear your throat" and "you have trouble speaking in loud places", with statistically significant difference

The occurrence of vocal problems and limitations between genders is shown on Table 3. No significant difference was found when comparing men and women for any of the symptoms.

Table 4 shows comparisons of the amount of vocal problems and limitations against gender, as well as BMI against age group, with no significant differences.

Table 5 shows a correlation of the amount of vocal problems and limitations against age and BMI with no significant differences.

On Table 6 brings comparisons of men and women vocal problem subscales with no significant differences.

Regarding the domain cross of scales and age groups, Table 7 shows no significant differences.

Table 8 shows the comparison of vocal problem or limitation subscales and individual BMI, with no significant differences.

Table 2 – Distribution of vocal problem frequency of occurrence

Symptom	Positive	Negative	Positive/ negative	p-value
	fo	fo	fe	
Is it hard for you to call someone's attention?	28	19	23.5	0.189
Is it hard for you to sing?	27	20	23.5	0.307
Does your throat hurt?	29	18	23.5	0.108
Are you hoarse?	19	28	23.5	0.189
When you engage in group conversations do people find it har to hear you?	23	24	23.5	0.884
Do you lose your voice?	27	20	23.5	0.307
Do you cough or clear your throat?	33	14	23.5	0.005*
Is your voice weak/low?	23	24	23.5	0.884
Is it hard for you to speak on the phone?	15	32	23.5	0.013*
Do you feel bad or depressed because of voice issues?	2	45	23.5	>0.001*
Do you feel like something is stuck in your throat?	17	30	23.5	0.057
Do you have swollen nodules (bubo) on your neck?	10	37	23.5	>0.001*
Do you feel embarrassed because of voice issues?	6	41	23.5	>0.001*
Do you get tired when speaking?	14	33	23.5	0.005*
Do you feel stressed or nervous because of voice issues?	7	40	23.5	>0.001*
Do you have trouble speaking in loud places?	35	12	23.5	>0.001*
Is it hard for you to speak loud (out loud) or scream?	20	27	23.5	0.307
Does your voice issue bother your family or friends?	7	40	23.5	>0.001*
Do you have a lot of secretion or expectoration?	21	26	23.5	0.465
Does the sound of your voice change throughout the day?	25	22	23.5	0.661
Do people seem irritated with the sound of your voice?	11	36	23.5	>0.001*
Do you have a stuffed nose?	28	19	23.5	0.189
Do people ask why your voice is as such?	7	40	23.5	>0.001*
Do you sound hoarse or dry?	20	27	23.5	0.307
Do you need to make an effort to speak?	13	34	23.5	0.002*
How often do you have throat infections?	39	8	23.5	>0.001*
Does your voice fail in the middle of a sentence?	16	31	23.5	0.028*
Does your voice make you feel ineffective?	5	42	23.5	>0.001*
Are you ashamed of your voice problem?	5	42	23.5	>0.001*
Do you feel lonely because of voice issues?	1	46	23.5	>0.001*

* Values statistically significant (p≤0.05) – Chi-square Adherence Test
Legend: fo=Observed frequency; fe= Expected frequency.

Table 3 – Comparison of vocal problem occurrence between genders

Vocal problems	Female n	Male n	p-value
Is it hard for you to call someone's attention?	28	19	0.403
Is it hard for you to sing?	28	19	0.538
Does your throat hurt?	28	19	0.085
Are you hoarse?	28	19	0.596
When you engage in group conversations do people find it har to hear you?	28	19	0.257
Do you lose your voice?	28	19	0.341
Do you cough or clear your throat?	28	19	0.148
Is your voice weak/low?	28	19	0.715
Is it hard for you to speak on the phone?	28	19	0.241
Do you feel bad or depressed because of voice issues?	28	19	0.238
Do you feel like something is stuck in your throat?	28	19	0.198
Do you have swollen nodules (bubo) on your neck?	28	19	0.915
Do you feel embarrassed because of voice issues?	28	19	0.245
Do you get tired when speaking?	28	19	0.089
Do you feel stressed or nervous because of voice issues?	28	19	0.860
Do you have trouble speaking in loud places?	28	19	0.347
Is it hard for you to speak loud (out loud) or scream?	28	19	0.741
Does your voice issue bother your family or friends?	28	19	0.430
Do you have a lot of secretion or expectoration?	28	19	0.084
Does the sound of your voice change throughout the day?	28	19	0.375
Do people seem irritated with the sound of your voice?	28	19	0.071
Do you have a stuffed nose?	28	19	0.337
Do people ask why your voice is as such?	28	19	0.528
Do you sound hoarse or dry?	28	19	0.961
Do you need to make an effort to speak?	28	19	0.933
How often do you have throat infections?	28	19	0.191
Does your voice fail in the middle of a sentence?	28	19	0.379
Does your voice make you feel ineffective?	28	19	0.320
Are you ashamed of your voice problem?	28	19	0.919
Do you feel lonely because of voice issues?	28	19	0.410

* Values statistically significant (p≤0.05) – Mann Whitney Test
Legend: n= number of subjects

Table 4 – Quantity of vocal problems in relation to Body Mass Index, gender, and age group

Quantity of Vocal Problems		Mean	p-value
BMI***	Very low weight	18.00	0.600
	Low weight	10.00	
	Normal	11.05	
	Overweight	12.11	
Gender**	Female	12.57	0.683
	Male	9.63	
Age group***	Adolescent	10.14	0.749
	Young adult	12.03	
	Adult	9.87	

* Values statistically significant (p≤0.05) – Mann Whitney U Test and Kruskal-Wallis***
Legend: BMI=Body Mass Index

Table 5 – Quantity of vocal problems in relation to Body Mass Index and age

Quantity of Vocal Problems	Corr	p-value
BMI	0.010	0.943
Age	-0.030	0.830

* Values statistically significant (p≤0.05) – Spearman Correlation
Legend: corr=coefficient of correlation; BMI=Body Mass Index

Table 6 – Subscale cross of vocal problems and gender

Domain	Male Mean	Female Mean	p-value
Limitation	40.69	43.98	0.240
Emotional	27.74	30.57	0.194
Physical	41.91	47.57	0.226
Total	44.84	49.50	0.212

* Values statistically significant (p≤0.05) – Mann Whitney Test

Table 7 – Subscale cross of vocal problems and age group

Domain	Adolescent Mean	Young adult Mean	Adult Mean	p-value
Limitation	41.18	43.38	41.03	0.888
Emotional	26.33	30.92	26.17	0.696
Physical	36.22	47.31	45.08	0.100
Total	43.28	49.02	45.62	0.584

* Values statistically significant (p≤0.05) – Kruskal-Walis Test

Table 8 – Subscale cross of vocal problems and Body Mass Index

Scores	Very low weight Mean	Low weight Mean	Normal Mean	Overweight Mean	p-value
Limitation	46.66	38.33	40.92	49.62	0.262
Emotional	37.50	25.00	28.80	31.54	0.409
Physical	53.57	39.28	44.53	48.01	0.768
Total	55.00	42.00	46.19	53.11	0.376

* Values statistically significant (p≤0.05) – Kruskal-Walis Test
Legend: BMI=Body Mass Index

DISCUSSION

Due to the multidimensional nature of dysphonia, different research instruments should be used for this matter. Thus, the use of self-assessment questionnaires is indicated[1,2,5-10]. Assessing how these symptoms may affect the personal and professional life of a subject is one of the advantages of using such instruments.

According to the literature, the application of protocol forms presents result variability associated with the target population[1,2,5-10], however, the majority of studies on this subject have used teachers as target audience, due to their high rate of dysphonia[7,8,11,16-18,20-22,24-26]. Preparing them to the market and working demands is believed to be paramount for these professionals. Thus, existing vocal symptoms should be verified for future professional voice users, with the intent to prevent and / or care for their vocal health[28].

The average amount of vocal symptoms reported by future professional voice users was 11.38 per participant – and the trend was 13 of a total of 30 options in the scale. According to the literature[29], more than three vocal symptoms per subject can be considered a high average. From this perspective, future professional voice users included in this study may already have a vocal disorder installed, or develop it with increased vocal demands. This may affect their quality of life and performance during work activity, increasing personal and social damage.

Studies on the average vocal symptoms present in professional voice users show great discrepancy from the average found in individuals with no vocal use at work[30-32]. A 30-questions research on vocal symptoms in church singers has also found high occurrence, 7.78 per subject[32]. A study comparing two groups of teachers, one that attended vocal health workshops and other that did not participate, found an average of 3.5 vocal symptoms in participants and 5.8 in non-participants[16]. Another study, however, has found one to two symptoms per subject for telemarketing operators[31].

In the case of professional voice users, the large amount of vocal symptoms reported can be due to the lack of information and awareness on voice issues, resulting in improper voice use[32]. In the long term, and with increased demand, this may be a triggering factor for the development of voice disorders.

In this present study, vocal symptoms with significant frequency of occurrence were “you cough or clears your throat” and “you have trouble speaking in loud places” (Table 2). Further studies made with college students and professional voice users show that throat clearing is a relevant symptom among such professionals[18,26,28]. A study that applied a self-assessment questionnaire to 517 college students has found dry mouth, throat and clearing as most common symptoms, respectively[28]. A Research conducted with 40 teachers has also highlighted other symptoms as being frequent: voice failures; hoarseness; difficulty to speak and dryness[26].

Another study with 37 teachers diagnosed as having normal voices, by means of audio perceptual analysis, has found that, while speech evaluation presented normal results, significant symptoms such as throat clearing and dry throat were noted. We stress the importance of researching future professional voice users, since, even before a vocal disorder is said to be installed, unfavorable vocal conditions can result in negative symptoms[17]. Thus, it is important to investigate individual self-perception, besides the vocal and audio perceptual analysis of voice[18].

Research on factors associated with throat clearing in college students has shown that possible causes were smoking, frequent respiratory infections and digestive problems. Throat clearing may also be associated with bad vocal habits and the results of this research indicate that future professional voice users are unaware of vocal health issues[28].

As for the difficulty of speaking in loud places, the literature suggests that noise interferes with

vocal self-monitoring and it is possibly associated with: hoarseness, sore throat, and a greater effort to speak. Noise mainly disrupts the professional use of voice, as reported in research with professors who have associated noise with the difficulty in developing lessons, in student learning and in their communication[33].

Considering that in this present study only future spoken voice professionals have been analyzed, and that such future jobs include teachers of lower grades in elementary school, there are also other environmental aggravating factors in the classroom itself that should be mentioned, since children are between five and ten years old and use their voice in a high sound level for their own personality and age profile, even competing vocally with other classmates. This creates a background noise in the room that goes from 50 to 80dB, and may exceed 35dB, the standard limit according to the American National Standard Institute (ANSI)[34,35]. This situation makes teachers need to raise their sound pressure by about 9.1 dB and the usual frequency in half an octave above the normal pattern, in order to thereby exercise control of the class and mediate the content of classes[25,34,36]. Such increase in loudness and the use of other vocal adaptations in the classroom, such as shouting, whispering, and interpreting other voices, without the proper support and use of proper vocal techniques, often lead to the onset of dysphonia resulting from inadequate voice use[19,21,24,37].

Regarding gender, there was no significant difference in the occurrence of vocal problems or limitations (Table 3), in the domains they refer (Table 6) nor in the amount of vocal problems or limitations (Table 4). These results are contrary to other studies that found increased susceptibility of females to the development of voice disorders, justified by anatomical differences, more frequently in medical treatment, and choice for careers that require greater use of voice[38,39].

As noted above, the anatomical or anthropometric differences may favor vocal wear. Other studies have also reported differences with increasing BMI. In the distribution of adipose tissue, it may accumulate in the nasopharynx, oropharynx, larynx, tongue and soft palate, and thus voice performance and quality may be damaged. In this present study, no significant results were found for the number of symptoms among individuals with very low weight, low weight, normal and overweight (Table 4), as well as for increased weight and number of symptoms (Table 5), contradicting this finding in the literature[23]. There was also no major impact on any of the subscales assessed (Table 8).

Advanced age and greatest vocal demand are reported to cause voice issues[26], however, in this study, this association was not found (Table 5). No relationship was found between age group and number of symptoms (Table 4), nor the greatest impact of any of the domains that the scale covers in a given age group (Table 7). Results can be justified by the unbalanced distribution of subjects in age groups, and the greatest amount of young adults, making it harder to compare age groups. The literature shows that structural changes start occurring in the larynx only from 45 years of age, and that the senescence period of voice occurs around 60, varying according to individual characteristics[40]. Considering that the average age in this study was 22.17 and the older subject in the sample was 37 years old, vocal wear and tear of age has not yet affected these subjects.

High frequency of vocal problems or limitations in this present study shows that future professional voice users may already be considered a risk group for the development of voice disorders. This finding is quite relevant, because the expansion of vocal demand in the beginning of professional activity might increase the frequency of symptoms, and may result in an actual vocal impairment with significant impact on the quality of life and work performance of these professionals. Thus, primary and vocal health care are essential to prepare professionals for the expanded use of their voices.

CONCLUSION

The group of future professional voice users included in this study has showed high average of vocal symptoms, specially coughing, throat clearing, and difficulty of speaking in loud places. With increased professional vocal demand, these individuals may be at risk for the development of voice disorders.

RESUMO

Objetivo: caracterizar os sintomas vocais de futuros profissionais da voz conforme as variáveis idade, sexo e índice de massa corporal. **Métodos:** os participantes responderam a Escala de Sintomas Vocais, composta por 30 questões, sendo 15 do domínio limitação, oito do domínio emocional e sete do domínio físico. Os indivíduos foram orientados a assinalar a resposta que correspondesse à frequência de ocorrência para cada um dos sintomas questionados. Foram coletados também dados ocupacionais, antropométricos e de saúde geral.Os dados foram analisados descritivamente e estatisticamente por meio dos testes não paramétricos Correlação de Spearman, Mann Whitney e Kruskal-Wallis, com nível de significância de 5%. **Resultados:** a amostra constituiu-se de 47 indivíduos, com idades entre 19 e 37 anos (média de 22,17 anos), sendo 28 (59,57%) do sexo feminino e 19 (40,43%) do sexo masculino,a média foi de 11,38 problemas vocais, de uma possibilidade total de 30. Houve maior frequência dos sintomas "você tosse ou pigarreia" e "você tem dificuldade para falar em locais barulhentos". **Conclusão:** o grupo de futuros profissionais da voz analisado apresentou alta média de sintomas vocais, salientando-se a tosse ou pigarro e a dificuldade para falar em locais barulhentos, diretamente relacionados a usos vocais incorretos. Com o aumento da demanda vocal profissional esses indivíduos poderão ser considerados de risco para o desenvolvimento de distúrbios vocais.

DESCRITORES: Disfonia; Distúrbios da Voz; Qualidade de Vida; Sintomas; Voz

REFERENCES

1. Kasama ST, Brasolotto AG. Percepção vocal e qualidade de vida. Pró-Fono R Atual Cient. 2007;19(1):19-28.

2. Behlau M, Oliveira G, Santos LMA, Ricarte A. validação no Brasil de protocolos de auto-avaliação do impacto de uma disfonia. Pró-Fono R Atual Cient. 2009;21(4):326-32.

3. Putnoki DS, Hara F, Oliveira G, Behalu M. Qualidade de vida em voz: o impacto de uma disfonia de acordo com o gênero, idade e uso profissional da voz. Rev Soc Bras Fonoaudiol. 2010;15(4):485-90.

4. Azevedo GPGC, Friche AAL, Lemos SMA. Autopercepção de saúde e de qualidade de vida de usuários de um ambulatório de fonoaudiologia. RevSocBrasFonoaudiol.2012;17(2):119-27.

5. Carmo RD, Camargo Z, Nemr K. Relação entre qualidade de vida e autopercepção da qualidade vocal de pacientes laringectomizados totais: estudo piloto. Rev CEFAC. 2006;8(4):518-28.

6. Wilson JA, Webb A, Carding PN, Steen IN, Mackenzie K, Dearly IJ. The Voice Symptom Scale (VoiSS) and the Vocal Handicap Index (VHI): a comparison of structure and content. Clin Otolaryngol Allied Sci. 2004;29(2):169-74.

7. Penteado RZ, Pereira IMTB. Qualidade de vida e saúde vocal de professores. Rev Saúde Pública. 2007;41(2):236-43.

8. Servilha E, Roccon P. Relação entre voz e qualidade de vida em professores universitários. Rev CEFAC. 2009;11(3):440-8.

9. Branski RC, Cukier-Blaj S, Pusic A, Cano SJ, Klassen A, Mener D et al. Measuring quality of life in dysphonic patients: a systematic review of content development in patient-reported outcomes measures. J Voice. 2010;24(2):193-8.

10. Deary IJ, Wilson JA, Carding PN, Mackenzie K, Watson R. From dysphonia to dysphoria: mokken scaling shows a strong, reliable hierarchy of voice symptoms in the Voice Symptom Scale questionnaire. J Psychosom Res. 2010;68(1):67-71.

11. Servilha EAM, Mendes GB. Autopercepção vocal, cuidados e perspectivas de uso na docência por graduandos de Pedagogia. Distúrb Comum. 2007;19(3):313-23.

12. Miranda CCI, Ladeira AC, Gouveia VL, Costa VR. Auto-análise vocal de alunos do curso de teatro. Distúrb Comum. 2012;24(3):369-78.

13. Moreti F, Zambon F, Oliveira G, Behlau M. Adaptação transcultural da versão brasileira da escala de sintomas de voz: VoiSS. J Soc Bras Fonoaudiol. 2011;23(4):398-400.

14. Moreti F. Validação da versão brasileira da Voice Symptom Scale – VoiSS. Rev Soc Bras Fonoaudiol. 2012;17(2):238.

15. Deary IJ, Wilson JA, Carding PN, Mackenzie K. VoiSS: a patient-derived voice symptom scale. J Psychosom Res. 2003;54(3):483-9.

16. Choi-Cardim K, Behlau M, ZambonF. Sintomas vocais e perfil de professores em um programa de saúde vocal. Rev CEFAC. 2010;12(5):811-9.

17. Musial PL, Dassie-Leite AP, Zaboroski AP, Casagrande RC. Interferência dos sintomas vocais

na atuação profissional de professores. Distúrb Comun. 2011;23(3):335-41.
18. Pena JJ, Servilha EAM. Tipificação de sintomas relacionados à voz e sua produção em professores identificados com ausência de alteração vocal na avaliação fonoaudiológica. Anais do XIV Encontro de Iniciação Científica da PUC-Campinas; 2009 Sep29-30; Campinas, SP. Campinas: editora PUC; 2009.
19. Behlau M, Feijó D, Madazio G, Rehder MI, Azevedo R, Ferreira AE. Voz profissional: aspectos gerais de atuação fonoaudiologica. 2. ed. In: Behlau M, editor. Voz: o livro do especialista. Rio de Janeiro: Revinter; 2005. p.287-372.
20. Aydos BRS, Motta L, Teixeira BS. Eficácia da hidratação na redução de queixas vocais de professores. J Soc Bras Fonoaudiol. 2000;1(2):10-5.
21. 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.
22. Santana MCCP, Goulart BNG, Chiari BM. Distúrbios da voz em docentes: revisão crítica da literatura sobre a prática da vigilância em saúde do trabalhador. J SocBrasFonoaudiol. 2012;24(3):288-95.
23. Cunha MGB, Passerotti GH, Weber R, Zilberstein B. Caracterização da voz do indivíduo portador de obesidade mórbida. ABCD, Arq Bras Cir Dig. 2009;22(2):76-81.
24. Vianello L, Assunção AA, Gama ACC. Estratégias implementadas para enfrentar as exigências vocais da sala de aula: o caso das professoras readaptadas por disfonia. Distúrb Comun. 2008;20(2):163-70.
25. Fuess VLR, Lorenz MC. Disfonia em professores do ensino municipal: prevalência e fatores de risco. Rev Bras Otorrinolaringol. 2003;69(6):807-12.
26. Vieira AC, Behlau M. Análise de voz e comunicação oral de professores de curso pré-vestibular. Rev Soc Bras Fonoaudiol. 2009;14(3):346-51.

Received on: October 03, 2013
Approved on: April 22, 2014

Mailing address:
Carla Aparecida Cielo
UFSM – Av. Roraima nº 1000 – Cidade Universitária – Bairro Camobi
Prédio 26 – 4º andar – Departamento de Fonoaudiologia
Santa Maria – RS– Brasil
CEP: 97105-900
E-mail: cieloca@yahoo.com.br

27. OMS, Organização Mundial da Saúde. Obesidade e Sobrepeso. Fact shet nº 311.2013. [Cited 2013 Mar 20]. Available from:<http://www.who.int/mediacentre/factsheets/fs311/en/>.
28. Ferreira LP, Penha PJ, Caporossi C, Fernandes ACN. Professores universitários: descrição de características vocais e posturais. Distúrb Comun. 2011;23(1):43-9.
29. Behlau M, Rehder MI. Higiene Vocal para o Canto Coral. Rio de Janeiro: Revinter, 2008.
30. Ferreira LP, Santos JG, Lima MFB. Sintoma vocal e sua provável causa: levantamento de dados em uma população. Rev CEFAC. 2009;11(1):110-8.
31. Dassie-Leite AP, Lourenço L, Behlau M. Correlação entre dados ocupacionais, sintomas e avaliação vocal de operadores de telesserviços. Rev Soc Bras Fonoaudiol. 2011;16(1):59-63.
32. Ribeiro VV, Santos AB, Bonki E, Prestes T, Dassie-Leite AP. Identificação de problemas vocais enfrentados por cantores de igreja. Rev CEFAC. 2012;14(1):90-6.
33. Servilha EAM, Delatti MA. Percepção do ruído no ambiente de trabalho e sintomas auditivos e extra-auditivos autorreferidos por professores universitários. J Soc Bras Fonoaudiol.2012;24(3):233-8.
34. Sodersten M, Granqvist S, Hammarberg B, Szabo A. Vocal behavior and vocal loading factors for preschool teachers at work studied with binaural DAT recordings. J Voice. 2002;16(3):356-71.
35. Ziegler A, Gillespie AI, Abbott KV. Behavioral treatment of voice disorders in teachers. Folia Phoniatr Logop. 2010;62(1):9-23.
36. Behlau M, Zambon F, Guerrieri AC, Roy N. Epidemiology of voice disorders in teachers and nonteachers in brazil: prevalence and adverse effect. J Voice. 2012;26(5):655-65.
37. Araujo TM, Reis EJFB, Carvalho FM, Porto LA, Reis IC, Andrade JM. Fatores associados a alterações vocais em professores. Cad Saúde Pública. 2008;24(6):1229-38.
38. Ferreira LP, Giannini SPP, Figueira S, Silva EE, Karmann DF, Souza TMT. Condições de produção vocal de professores da prefeitura do município de São Paulo. Distúrb Comun. 2003;14(2):275-91.
39. Kurtz LO, Cielo CA. Tempos máximos de fonação de vogais em mulheres adultas com nódulos vocais. Pró-Fono R Atual Cient. 2010;22(4):451-4.
40. Rocha TF, Amaral FP, Hanayama EM. Extensão vocal de idosos coralistas e não coralistas. Rev CEFAC. 2007;9(2):248-54.