

Promoting the vocal well-being of the teacher: analysis of a distance course

Promovendo o bem-estar vocal do professor: análise de um curso dado à distância

Promoción del bienestar vocal del docente: análisis de un curso a distancia

Léslie Piccolotto Ferreira* 

Raiza Brasileiro Rocha* 

Daniella Spacassassi Centurion* 

Thelma Mello Thomé de Souza** 

Susana Pimentel Pinto Giannini** 

Abstract

Introduction: although issues related to the teacher's voice are extensively researched, few intervention initiatives in the remote modality have been analyzed. **Objective:** to assess the knowledge of information related to self-care about the voice, from the perspective of teachers, who completed the course "Promoting the Teacher's Vocal Well-Being" conducted by the Municipal Health School of São Paulo, in the online modality. **Method:** research, observational and transversal, analyzed the responses of 162 participants given to a questionnaire presented at the beginning and at the end of a course that included eight modules and three face-to-face meetings (total 40 hours). Through the statistical analysis, knowledge of self-care information and practices was compared with the voice. Results: a statistically significant difference was registered at the end of the course, with a report of greater knowledge about care to maintain a healthy voice; how the voice is produced; use of verbal and non-verbal expressiveness resources; observation of the interference of emotions in the voice and thinking of strategies to improve

* Pontifícia Universidade Católica de São Paulo, SP, Brazil

** Hospital do Servidor Público Municipal de São Paulo, SP, Brazil.

Authors' contributions:

LPF: Study conception, design, and analysis, data interpretation and article writing.

RBR: Data collection and article writing.

DSC: Article writing.

TMTS, SPPG: Study analysis, data interpretation and article writing.

Correspondence email address: Daniella Spacassassi Centurion - danispaca@gmail.com

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the work environment. The vocal warm-up and cool-down exercises and the resonance exercises were practiced by several subjects below the expected. **Conclusion:** most of the teachers who participated in the course “Promoting Teacher’s Vocal Well-Being” were sensitized, with a record of greater knowledge about voice production and self-care. Some adjustments must be made in the offer of this course to the next classes, regarding the realization and incorporation in the day-to-day practices presented.

Keywords: Voice; Voice disorders; Faculty; Health education

Resumo

Introdução: apesar das questões relacionadas à voz do professor serem muito pesquisadas, poucas iniciativas de intervenção na modalidade remota têm sido analisadas. **Objetivo:** avaliar o conhecimento de informações referentes ao autocuidado sobre a voz, na perspectiva de professores, que concluíram o curso “Promovendo o Bem-Estar Vocal do Professor” realizado pela Escola Municipal de Saúde de São Paulo, na modalidade on-line. **Método:** pesquisa, de natureza observacional e transversal, analisou as respostas de 162 participantes dadas a um questionário apresentado no início e ao final de um curso que contou com oito módulos e três encontros presenciais (total 40 horas). Por meio de análise estatística foi comparado o conhecimento de informações e práticas de autocuidado com a voz. **Resultados:** diferença estatisticamente significativa foi registrada ao final do curso, com relato de maior conhecimento sobre os cuidados para manter a voz saudável; como a voz é produzida; uso de recursos de expressividade verbal e não verbal; observação da interferência das emoções na voz e pensar em estratégias para melhorar o ambiente de trabalho. Os exercícios de aquecimento e desaquecimento vocal e os de ressonância foram praticados por um número de sujeitos aquém do esperado. **Conclusão:** os professores que participaram do curso “Promovendo o Bem-Estar Vocal do Professor”, em sua maioria, foram sensibilizados, com registro de maior conhecimento sobre a produção da voz e autocuidado. Alguns ajustes devem ser feitos na oferta deste curso a próximas turmas, quanto à realização e incorporação no dia a dia das práticas apresentadas.

Palavras-chave: Voz; Distúrbios da voz; Docentes; Educação em saúde.

Resumen

Introducción: aunque los temas relacionados con la voz del docente están ampliamente investigados, se han analizado pocas iniciativas de intervención en la modalidad remota. **Objetivo:** evaluar el conocimiento de la información relacionada con el autocuidado de la voz, desde la perspectiva de los docentes, quienes completaron el curso “Promoción del Bienestar Vocal del Docente” impartido por la Escuela Municipal de Salud de São Paulo, en la modalidad en línea. **Método:** investigación, observacional y transversal, analizó las respuestas de 162 participantes entregadas a un cuestionario presentado al inicio y al final de un curso que incluyó ocho módulos y tres encuentros presenciales (total 40 horas). Mediante análisis estadístico se comparó el conocimiento de la información y las prácticas de autocuidado con la voz. **Resultados:** se registró una diferencia estadísticamente significativa al final del curso, con un reporte de mayor conocimiento sobre el cuidado para mantener una voz sana; cómo se produce la voz; uso de recursos de expresividad verbal y no verbal; observación de la interferencia de las emociones en la voz y pensar en estrategias para mejorar el clima laboral. Los ejercicios vocales de calentamiento y enfriamiento y los ejercicios de resonancia fueron practicados por un número de sujetos por debajo del esperado. **Conclusión:** los docentes que participaron en el curso “Promoción del Bienestar Vocal del Docente”, en su mayoría, fueron sensibilizados, con un historial de mayor conocimiento sobre producción de voz y autocuidado. Se deben realizar algunos ajustes en la oferta de este curso para las próximas clases, en cuanto a la realización e incorporación en las prácticas del día a día presentadas.

Palabras clave: Voz; Trastornos de la voz; Docentes, Educación en salud.



Introduction

Daily stress combined with long work hours, inadequate organization of the work environment, noise competition caused by high levels of noise in the classrooms (which most of the time are at the limit of the capacity of students), and personal concerns, among others, are just some of the problems included in the daily routine of most teachers¹.

These psychic, physical or functional factors can affect the lives of teachers and, mainly, their primary object of work and communication: their voice^{2,3}.

In 2005, after the approval of Decree No. 45,924/2005 referring to Law No. 13,778/2004, the Municipal Government of São Paulo (PMSP, or *Prefeitura Municipal de São Paulo*) developed the Municipal Vocal Health Program, which allowed for the conduction of in-person initiatives called Workshops of Vocal Health, among others. Although not mandatory, these activities were offered every six months at the Regional Education Boards (DRE, or *Diretorias Regionais de Educação*), and 104 Vocal Health Workshops taught by speech-language pathologists were conducted in approximately five years. In total, 2,329 teachers from the PMSP Municipal Education Network participated in this action⁴.

In turn, some problems were observed in this experience, especially the constant absences of teachers from the course, due to excessive work and transport difficulties^{4,5}.

Distance Learning (DL) is understood as a possible strategy by those responsible for the Municipal Vocal Health Program, since this type of education aims to awaken in people the desire to learn and exchange experiences during the teaching-learning process. In addition to some authors reporting that the DL process has been gaining ground at all educational levels and modalities⁵⁻⁷, the COVID-19 pandemic recently forced several speech-language pathology practices to be carried out in this way, recording positive results⁸⁻¹⁰.

Thus, PMSP and the Laboratório de Voz (LaborVox) of the Pontifícia Universidade Católica de São Paulo (PUC-SP) planned a distance course given in a partnership that began in 2011, aiming to

solve this problem, in addition to helping teachers in the development of the autonomy with regard to voice care, prevention and identification of voice disorders. The course called “Promoting Teacher’s Vocal Well-Being” has been offered since 2014 and, at this time, aimed to assess the knowledge acquired regarding self-care about the voice, from the perspective of teachers who completed one of the classes in this course.

Thus, this analysis aims to discuss the possibility of establishing a quality indicator of this course and enabling adjustments to be made in future classes.

Method

This is an observational and cross-sectional study, which was approved by the Research Ethics Committee (CEP) of PUC-SP under the No. CAAE-52496715.90000.5482. Data collection included the database provided by the management group, which was responsible for the course “Promoting Teacher’s Vocal Well-Being”, which is offered on a Moodle platform that allows distance learning (DL).

The platform is managed by the Municipal School of Health (EMS), which is currently called the Center for Development, Teaching and Research in Health – CEDEPS, while the course is managed by the Professional Health Management Coordination of the Management Department of PMSP. The course planning was prepared by a group that included professionals from the PMSP and members of the LaborVox at PUC-SP.

This course was offered to several classes, and the management group tried to analyze a different aspect each time. In addition, the 40-hour course was divided into eight modules, plus eight assessments with the completion of tasks and three face-to-face meetings. Each group had 20 to 30 participants and a tutor, who answered questions and monitored assessments. Chart 1 shows the face-to-face meetings and modules, including title, content, and questions raised and discussed at the end of each module in the forums that have always been managed by the responsible tutors.

Chart 1. Course presentation, regarding face-to-face meetings, with eight modules, according to the title, content and questions in each Forum.

1st face-to-face meeting	Presentation of the course operation, as well as information about the use of Moodle.
Module 1	"What is voice?"
Content	This module addressed issues related to voice production, in order to relate the use of voice with emotional aspects and teaching work, highlighting that voice is an important working tool and, therefore, professionals need to take care of it, in addition to an emphasis on the anatomophysiological aspect.
Questions on the Forum	1st Teacher, do you see yourself as a voice professional? Why? 2nd This module showed that voice production depends on several aspects, such as breathing, articulation (diction), and resonance. In your opinion, which of these aspects is more difficult to perceive?
Module 2	"Voice care"
Content	This module clarified that keeping the vocal folds well hydrated is one of the most important factors to ensure voice well-being. This module addresses factors such as general health care, clothing, enough sleep and leisure time, sudden changes in temperature, smoking, alcoholic beverages, air conditioning, use of anesthetic sprays and drops.
Questions on the Forum	1st In your opinion, what factors mentioned in this module impact your voice? What do you do to try to solve this issue? 2nd What factors were you unaware of that could affect vocal production?
Module 3	"Voice at teaching work"
Content	In this module, teachers were able to notice that there are adverse conditions in teaching work, both from physical environment and organization of work that may impact on their voice well-being, such as: noise, dust and chalk dust, irritant chemicals used in cleaning, fans and air conditioning, excessive number of students per class, school renovation, overwork, violence, and indiscipline.
Questions on the Forum	1st Did you recognize yourself in any of the situations addressed in this module? In your opinion, what can be done as an alternative to change the situations related to the physical environment and work organization that may be affecting the health of the workers at your school? 2nd Is there an Internal Commission on Accident Prevention at your school? If so, is it active? What has this Commission been doing? If not, what is your opinion on an Internal Commission on Accident Prevention? Why?
Module 4	"Body, posture and voice"
Content	This module highlights the importance of having a good body posture, especially during working hours to avoid injuries. The module also includes some stretching practices that facilitate vocal production.
Questions on the Forum	1st Do you notice any part of your body that gets more tense during your professional activity? What have you done to improve it? 2nd Among the exercises in this module, which one(s) did you put into practice? What did you notice?
2nd face-to-face meeting	Exercises corresponding to the contents covered in modules 1 to 4, including answering questions.
Module 5	"Breathing"
Content	This module allows to learn on the importance of breathing for the body and the vocal production. The respiratory cycle consists of two stages: Inspiration, which allows air to be moved into the lungs, and is given by the contraction of the diaphragm and the intercostal muscles; and Expiration, which is when the air leaves the lungs and there is a relaxation of the diaphragm and of the intercostal muscles.
Questions on the Forum	1st Have you ever paid attention to your breathing? Have you ever noticed any changes in your breathing? 2nd Which of the exercises presented have you already put into practice? What was it like?
Module 6	"Articulation / Resonance"
Content	We transform the sound of the voice into words through the articulation when we speak, and this favors vocal projection. In this module, teachers were able to learn that they must use the resonator chambers (nose, mouth and pharynx) in a balanced way in order to enable a more enjoyable and effortless voice.
Questions on the Forum	1st How do you perceive your articulation? Do you notice any change when producing a sound, vowel or consonant? 2nd What did you notice during articulation exercises? And what about resonance exercises?

1st face-to-face meeting	Presentation of the course operation, as well as information about the use of Moodle.
Module 7	"Expressiveness"
Content	This module highlights the importance of the entire body in communication. This is called expressiveness, which can be verbal (speech and voice resources) and non-verbal (body resources). The use of verbal and non-verbal expressiveness during class ensures a more effective communication in teaching activity.
Questions on the Forum	1st Regarding verbal and non-verbal resources discussed in this module, which ones are most commonly used in the classroom? 2nd Which one holds the attention of students? Did you put into practice the exercises mentioned? What was it like?
Module 8	"Voice and emotion"
Content	In this module, we see that emotions may impact on breathing control, vertical positioning of the larynx, relaxation of the vocal folds and muscles of the pharynx, larynx, neck and shoulders. All stress may affect the voice: breathing changes, the habitual tone varies, the articulation gets locked, in fact, various parameters are changed.
Questions on the Forum	1st In your opinion, are there stressors in your school environment? If so, what can you do to mitigate the stress? 2nd Are there any factors that make you feel stressed and that do not impact on your co-worker on the same way?
3rd face-to-face meeting	Exercises corresponding to the contents covered in modules, including answering questions. Distribution of a bookmark with a record of vocal warm-up and cool-down exercises to be performed daily by teachers.

Source: Adapted from Ferreira et al. (2019)¹¹. Face-to-face meetings were included at this time of the study

In particular for this study, the sixth class was highlighted by an interest in analyzing the questionnaire presented for evaluation. At that time, the management of the municipal network decided that the course would be offered for validation due to merit and would no longer be considered for functional evolution, as it was in the previous classes.

Although the class analyzed in this study had 473 registered teachers, 372 teachers were present at the beginning of the course. Among these initial participants, 278 answered the questionnaire before taking the course and 163 after completion, which means that 115 (41.3%) teachers did not continue the course. In addition, a participant who did not respond to the initial assessment, but only to the final one, was also excluded from the analysis of this study. Thus, 162 teachers remained in the study, which corresponds to a participation rate of 58.2% in relation to the total of those who started the course.

Over the eight modules provided weekly in the course, participants learned about the following contents: 1- What is voice?; 2- Voice care; 3- Voice at teaching work; 4- Body, posture and voice; 5- Breathing; 6- Articulation and Speech/Resonance and Projection; 7- Expressiveness; and Voice and emotion¹¹.

The eight assessments carried out by the participants raised issues related to the content

presented in the course, while the face-to-face meetings were divided in a previously planned way. At the first meeting, before the course, the researchers presented the course and guided the professors on the dynamics of the course and on how to access the modules on the platform. In turn, the second meeting included the practice of body and vocal exercises, while concepts and practices were reviewed in the last meeting at the end of the course.

In the first and third face-to-face meetings, teachers were asked to answer the questionnaire with 12 questions referring to their knowledge about voice, body, posture, breathing, articulation/speech, resonance, expressiveness, work environment and daily habits. As these aspects were addressed in the course, the questions helped to assess knowledge about them, at the beginning and at the end of the course. Each question offered two answer alternatives (No and Yes), and, in the case of an affirmative answer, the participants were asked to explain their choice. E.g.: Do you observe your body regarding posture and tension while teaching? If YES, describe what you have observed regarding your posture and body tension. This type of question aimed to obtain more spontaneously what each participant had acquired as knowledge, without inducing a response through questions with alternatives. Candidates' explanations for an

affirmative answer were categorized according to content recurrence¹². A question was added to the questionnaire completed at the end of the course, requesting feedback on the content and time of the course, in addition to offering a space for participants to make any comments.

All data were entered into a Microsoft Excel spreadsheet and exported to STATA version 14 in order to perform statistical analysis. Descriptive data analysis was performed using absolute values and proportions for qualitative variables and means, standard deviations, medians, minimum and maximum values for quantitative variables. In turn, the Chi-squared Test and Fisher's Exact Test were used for categorical variables to compare knowledge and self-care practices with the voice recorded at both times (before and after the course). The Chi-

Squared Test was used for variables in which the number of cases observed was sufficient, while the Fisher's Exact Test was used in situations where there was at least one cell with an expected count of less than 5¹³. A significance level of 5% was adopted to all assessments.

Results

Among the 162 teachers who took the course and answered the questionnaires, most were female (95.7%), with up to 10 years of time in the profession (52.5%), working in Child Education (80, 2%) and with main employment as a teacher with a specific class defined (75.3%), and 38.8% reported spending 31 hours or more with students every week (Table 1).

Table 1. Distribution of teachers according to demographic and functional characteristics (n=162).

Variables	N	%
Gender		
Female	155	95.7
Male	7	4.3
Time in the profession		
Less than 1 year	4	2.5
1 to 5 years	31	19.1
6 to 10 years	50	30.9
11 to 15 years	39	24.1
16 to 20 years	29	17.9
More than 20 years	9	5.6
Area of expertise		
Child education	130	80.2
Elementary School I	20	12.3
Elementary School II	12	7.4
Main Employment Relationship		
Teacher with a specific class defined	122	75.3
Teacher who has been definitively readapted	1	0.6
Teacher who has been temporarily readapted	6	3.7
Substitute teacher	25	15.4
Pedagogical coordinator	1	0.6
Assistant Dean	3	1.9
Dean	4	2.5
Number of weekly hours with students		
Up to 10 hours/week	15	9.3
From 11 to 20 hours/week	23	14.2
From 21 to 30 hours/week	61	37.7
From 31 to 40 hours/week	25	15.4
More than 41 hours/week	25	15.4
I don't work directly with students.	13	8.0

Table 2 shows the results of knowledge and practices on vocal well-being comparing the two assessment moments (before and after the course). When starting the course, most of the 162 participants were aware of practices and knowledge of vocal well-being, and more emphasis was given to the habit of drinking water during the day (93.8%), thinking about strategies to improve the work environment (59.9%), knowing the necessary care to keep a healthy voice (55.6%), use of verbal and non-verbal expressiveness resources (51.9%) and noticing interferences of emotions in the voice (51.2%).

There was a statistically significant difference between the two moments found in the comparison

between the assessment phases, with an increase in responses after the course for almost all aspects. The only exception was the question about the need for hydration which, as reported above, the participants were already aware of, even before starting the course. Some improvements should be highlighted: knowing the precautions to keep the voice healthy (from 55.6% to 98.8%; $p < 0.001$), knowing how the voice is produced (from 30.2% to 92.6%; $p < 0.001$), use of verbal and non-verbal expressiveness resources (from 51.2% to 90.1%; $p < 0.001$), noticing interference of emotions in the voice (from 51.9% to 88.9%; $p < 0.001$), and thinking of strategies to improve the work environment (from 59.9% to 87.0%; $p < 0.001$).

Table 2. Distribution of teachers according to knowledge and practices about vocal well-being and assessment phase (before and after the course, $n=162$).

Knowledge and practices	Response	Before the course	After the course	p*
		n (%)	n (%)	
Do you know how the voice is produced?	Yes	49 (30.2)	150 (92.6)	<0.001(Q)
	No	113 (69.8)	12 (7.4)	
Do you know the necessary care to keep your voice healthy?	Yes	90 (55.6)	160 (98.8)	<0.001(F)
	No	72 (44.4)	2 (1.2)	
Do you usually drink water during the day?	Yes	152 (93.8)	158 (97.5)	0.170(F)
	No	10 (6.2)	4 (2.5)	
Do you do any vocal warm-up exercises?	Yes	12 (7.4)	72 (44.4)	<0.001(Q)
	No	150 (92.6)	90 (55.6)	
Do you do any vocal cool-down exercises?	Yes	5 (3.1)	40 (24.7)	<0.001(F)
	No	157 (96.9)	122 (75.3)	
Do you think about new strategies to improve your work environment?	Yes	97 (59.9)	141 (87.0)	<0.001(Q)
	No	65 (40.1)	21 (13.0)	
Do you observe your body (posture and tension) while teaching?	Yes	40 (24.7)	123 (75.9)	<0.001(Q)
	No	122 (75.3)	39 (24.1)	
Do you watch your breathing while teaching?	Yes	27 (16.7)	112 (69.1)	<0.001(Q)
	No	135 (83.3)	50 (30.9)	

Knowledge and practices	Response	Before the course	After the course	p*
		n (%)	n (%)	
Do you observe your articulation and speak while teaching?	Yes	30 (18.5)	113 (69.8)	<0.001(Q)
	No	132 (81.5)	49 (30.2)	
Do you notice the resonance of your voice while teaching?	Yes	14 (8.6)	73 (45.1)	<0.001(Q)
	No	148 (91.4)	89 (54.9)	
Do you use verbal and non-verbal expressiveness resources while teaching?	Yes	83 (51.2)	146 (90.1)	<0.001(Q)
	No	79 (48.8)	16 (9.9)	
Do you notice the impact of emotions on your voice?	Yes	84 (51.9)	144 (88.9)	<0.001(Q)
	No	78 (48.1)	18 (11.1)	

Among the participants, 97 reported in the data collection carried out before starting the course that they think about strategies to improve the work environment. There were 18.6% positive responses to this question, but many of the responses did not detail the aspect to be improved, with the most frequent improvement in the signal-to-noise ratio (69.1%). In the evaluation after the course, 141

teachers reported that they think of strategies to improve the work environment, and the most frequently reported strategies were seeking to improve the signal-to-noise ratio (36.2%) and reorganize the work environment (25.5%), with a statistically significant difference in both when comparing the two moments ($p < 0.001$) (Table 3).

Table 3. Distribution of teachers according to strategies to improve the work environment and assessment phase (before the course, $n=97$; after the course, $n=141$).

Strategies used	Response	Before the course	After the course	p*
		n (%)	n (%)	
Trying to improve the signal-to-noise ratio	No	30 (30.9)	90 (63.8)	<0.001(Q)
	Yes	67 (69.1)	51 (36.2)	
Taking care of the environment (ventilation/humidity/dust)	No	94 (96.9)	134 (95.0)	0.744(F)
	Yes	3 (3.1)	7 (5.0)	
Reorganization of the environment	No	92 (94.8)	105 (74.5)	<0.001(F)
	Yes	5 (5.2)	36 (25.5)	

* (F) = Fisher's Exact Test; (Q) Chi-Squared Test

Table 4 shows the data referring to the topics covered in five modules (from 4 to 8) and it is possible to notice that the total number of answers is always lower before the beginning of the course, when compared to the number after the course.

As for aspects related to the body in both moments, the observation habits most frequently reported were the perception of poor posture, body tension and pain (77.5% before the course, and 74.8% after the course) and the interference of body/posture problems in vocal production (10.0% before the course, and 19.5% after the course). There were no statistically significant differences between the two phases of assessment in any of the aspects mentioned.

With regard to breathing, among the 27 teachers who pointed out this aspect before the course, the most frequent observation was the presence of changes in breathing (77.8%). After the course, the most frequent reports among the 112 teachers were the better self-perception of breathing (42.9%), the presence of breathing changes (40.2%) and the perception of changes due to emotional problems (17.9%). The same table also shows that there was a statistically significant difference in the observation of breathing between the two phases of assessment.

In addition to the increased frequency of self-reported breathing (from 0.0% to 42.9%; $p < 0.001$), there was also an increase in the perception of voice/breathing change due to emotional problems (from 0.0% to 17.9%; $p = 0.013$). On the other hand, there was a decrease in the frequency of reports of changes in breathing (from 77.8% to 40.2%; $p < 0.001$) and in the non-perception of differences in the breathing pattern (from 14.8% to 0.9%; $p = 0.005$).

As for the observation of articulation/speech, 30 teachers reported this aspect before the course and 113 reported it after the course. There was a

statistically significant difference between the two phases of the course ($p < 0.001$), with an increase from 6.7% to 46.0% in the reported improvement in the articulation and a decrease from 36.7% to 21.2% in the difficulty to articulate.

As for the observation of voice resonance, 14 teachers reported this aspect before the course and 73 reported it after the course. There was also a statistically significant difference between the two phases of the course ($p = 0.037$), with a decrease from 42.9% to 15.1% for the report of noticing little resonance when speaking.

As for expressiveness resources, among the 83 teachers who reported this aspect before the course, the use of non-verbal expressiveness (59.0%) was more frequent, followed by verbal expressiveness (49.4%). The opposite was found among 146 teachers before the course, more frequently reporting the use of verbal expressiveness (80.1%) and a little less than non-verbal expressiveness (72.6%), with a statistically significant difference between the two phases (use of verbal expressiveness from 49.4% to 80.1%, $p < 0.001$; and use of non-verbal expressiveness from 59.0% to 72.6%, $p = 0.035$).

Before the course, 84 teachers reported noticing the interference of emotions in their voice, with reports of voice changes (65.5%). In turn, among the 144 teachers who reported this aspect after the course, there was a higher frequency of reports of noticing differences in the voice compared to situations involving emotions (74.3%). When comparing the two phases of assessment, there was a statistically significant difference to notice less interference of emotions in the body ($p = 0.001$), which is probably due to greater control of emotions (14.3% before the course to 2.1% after the course).

Table 4. Distribution of teachers according to aspects related to observation of the body/posture, breathing, articulation/speech, resonance, expressiveness and emotions and assessment phase (before and after the course).

Reported aspect	Response	Before the course	After the course	p*
		n (%)	n (%)	
Poor posture, body tension and pain	No	9 (22.5)	31 (25.2)	0.730 (Q)
	Yes	31 (77.5)	92 (74.8)	
Impact on vocal production	No	36 (90.0)	99 (80.5)	0.229 (F)
	Yes	4 (10.0)	24 (19.5)	
Breathing changes	No	6 (22.2)	67 (59.8)	<0.001 (Q)
	Yes	21 (77.8)	45 (40.2)	
Improved self-perception of breathing	No	27 (100.0)	64 (57.1)	<0.001 (F)
	Yes	0	48	
Change in voice/breathing due to emotional issues	No	27 (100.0)	92 (82.1)	0.013 (F)
	Yes	0 (0.0)	20 (17.9)	
Articulation/Speech	Difficulty in articulation	11 (36.7)	24 (21.2)	<0.001 (F)
	Improvement in articulation	2 (6.7)	52 (46.0)	
	Did not notice any differences	12 (40.0)	19 (16.8)	
	Did not specify	5 (16.7)	18 (15.9)	
Voice resonance	Low resonance	6 (42.9)	11 (15.1)	0.037 (Q)
	Did not notice any change	2 (14.3)	8 (11.0)	
	New adaptations	2 (14.3)	35 (47.9)	
	Did not specify	4 (28.6)	19 (26.0)	
Uses verbal expressiveness	No	42 (50.6)	29 (19.9)	<0.001 (Q)
	Yes	41 (49.4)	117 (80.1)	
Uses non-verbal expressiveness	No	34 (41.0)	40 (27.4)	0.035 (Q)
	Yes	49 (59.0)	106 (72.6)	
Notices an interference in the voice	No	29 (34.5)	37 (25.7)	0.156 (Q)
	Yes	55 (65.5)	107 (74.3)	
Notices an interference in the body	No	72 (85.7)	141 (97.9)	<0.001 (F)
	Yes	12 (14.3)	3 (2.1)	
Notices or looks for improvements	No	84 (100.0)	140 (97.2)	0.299 (F)
	Yes	0 (0.0)	4 (2.8)	

Finally, Table 5 shows the responses of the 162 participants when asked if they would recommend the course to a colleague (71.0%), if they gained new knowledge about the voice (95.7%) and if they

believed that the duration of the course is enough (97.5%). Only few participants reported having unanswered questions (4.3%) and difficulties in accessing modules (5.6%).

Table 5. Distribution of teachers according to recorded responses regarding course evaluation at the end of training (n=162).

Questions	Response	n	%
Would you recommend the course to a colleague?	Yes	115	71,0
	No	47	29,0
Did you gain knowledge about voice that you didn't know?	Yes	155	95,7
	No	7	4,3
Was the proposed time enough?	Yes	158	97,5
	No	4	2,5
Did you have questions regarding voice issues that were not clarified?	Yes	7	4,3
	No	155	95,7
Did you have difficulties with access issues?	Yes	9	5,6
	No	153	94,4

Discussion

The characterization of the sample is similar to that found in other studies that analyzed the participants of the fourth and fifth classes of the same course¹⁴. The data in the three surveys show that the greatest demand for the course “Promoting Teacher’s Vocal Well-Being” is from women who teach in early childhood education and have a defined class.

The results show that among the various contents related to voice care, before starting the course, participants had more knowledge about the importance of hydration. This is probably due to the frequent approach to this aspect in actions to promote health or prevent voice disorders and in rehabilitation processes carried out by speech-language pathologists^{15,16}.

In addition, this information is widely disseminated in the media in general, on the occasion of voice campaigns, in celebrations of the World Voice Day, which is held on April 16¹⁷. Furthermore, this information is also often included in different sites when asking “what is good for the voice?”.

In turn, the vocal warm-up and cool-down exercises were much discussed during the course, with detailed explanations given online by the tutors, and also carried out in two of the three face-to-face meetings. However, although a significant

difference was found in the comparison between before and after the course, few participants reported having included this habit in their daily lives.

The literature describes that vocal warm-up and cool-down have positive effects on the perception of those who perform such practices and should be taught in order to prevent vocal changes¹⁸.

As well as the practice of other exercises, this practice has been discussed by the management group that has been concerned with raising awareness about the need to perform these exercises on a daily basis^{17,18}. It should be noted that distance learning limits the presentation of many of these practices, which are often difficult for subjects to understand even in person, and that managers have sought to present different strategies to each class (inclusion of drawings and videos).

As an aspect more difficult to be perceived, even with the support of videos, the resonance exercises were reviewed in the second meeting (carried out after the presentation of three modules), but few teachers attended as it was not mandatory. Thus, many teachers still did not have the perception of resonance in the last face-to-face meeting, but it was not possible to provide individualized attention due to the large number of participants. This leads to the conclusion that resonance practices are the most difficult practices to be learned in the course.

It should be noted that, in addition to following the exercises carried out in a procedural way during



the course, managers must also find ways to look for ways to carry them out after their completion. After participating in a course, it is common for a practice to be carried out, but it is not incorporated into the routine and is left aside after a while. In this sense, it is important to encourage studies that analyze the follow-up of knowledge acquired in an intervention, as this ensures the assessment of the real effectiveness of the action. In a study that compared the knowledge acquired by two groups (the fourth and the fifth classes) after six and twelve months of completion of this course¹⁴, the author found that the aspects learned, and that remained after that time, were related to vocal self-care to avoid screaming, to the need for hydration and to perform some vocal exercises.

Given the current ease of recording something using a cell phone, it is suggested that participants of the next groups send recordings of the exercises, so that tutors can follow the exercise, not being restricted to the graphic record, which includes the difficulties reported.

Furthermore, it is important to note that almost 60% of teachers reported having started the course with knowledge about the inadequate situation of the work environment. In recent studies in Speech-Language and Hearing Sciences, and even in Psychology, when researchers focus on issues related to Occupational Health, they have highlighted the poor work environment of teachers. It can be noticed in the factors of the work environment and organization, which results in a growing number of cases of voice and mental disorders in these professionals¹⁹⁻²¹.

When comparing the two moments (before and after the course), there is a significant increase in reports of perception of the relationship between the noise present in the classroom and the use of the voice, which is an old and frequently reported relationship in studies^{22, 23}. It should be noted that the potential issues of noise should be prioritized when planning the construction of a school. However, this issue is very complex, as the need to maintain a ventilated environment contrasts with the presence of noise, since the more open and ventilated a given location, the greater the possibility of noise. In addition, the structure of the environment can also determine greater presence of noise, based on the materials used in the construction of the school and classrooms²⁴.

Before the course, participants reported noticing bad posture, body tension and pain, and there was a greater number of reports after the course was completed, which is probably due to the development of the idea of self-perception of the body in the course. The prevalence of musculoskeletal symptoms in teachers has been discussed as another factor that can negatively impact the quality of life of these professionals²⁵. Concerned with this issue, the management group responsible for the course included students and professors from the Physiotherapy course at PUC-SP, in the course offered to the fourth class¹¹, who were able to help in the better preparation of the module that discusses these issues. However, the results show that strategies involving self-perception and especially body work still need more attention.

The course aims to stimulate reflection among participants on the importance of self-assessment and self-care for the development of the subjects' emancipatory process, allowing a critical analysis of their actions and the possibility of changes, not only individual, but also collective²⁶. In this sense, one of the modules addresses and encourages issues related to the organization and functioning of the Internal Accident Prevention Commission (CIPA) as a possible solution to some of the problems related to risk factors present in the work environment and organization.

Despite the complexity of the goal to be achieved, the responses of the participants show that the researched group managed to acquire knowledge about the information that was planned with the distance education strategy, which is an increasingly present modality in education²⁷⁻²⁹, especially in actions focused on health²⁸.

Given that this study aimed to assess knowledge related to self-care about the voice, the results allowed us to organize three categories that can help the management group in planning the course to be offered to the next groups, as follows: 1- Aspects that were reported after the course by a much larger number of participants and that presented a statistically significant difference when compared to results before the course; 2 - Aspects that registered a statistically significant difference, but with a still small number of subjects' reports, indicating an increase, despite the reports of still few participants; and 3 - Aspects little reported both before and after the course, and that should be revised regarding their presentation in the course.

Thus, the first category includes aspects resulting from knowledge acquired by the participants who, after taking the course, were able to spontaneously speak more about them. It can be concluded that the course provided them with knowledge about many aspects, such as: how the voice is produced; some precautions that must be taken to keep the voice healthy; strategies to improve the work environment, with emphasis on issues involving the presence of noise; the importance of observing the body, breathing and articulation while teaching; the importance of using verbal and non-verbal expressiveness resources while teaching, and they also observed less interference of emotions in the body after completing the course.

In turn, the second category includes activities that depend on being put into practice, such as vocal warm-up and cool-down exercises and resonance exercises, which were practiced by a smaller number of subjects than expected.

Finally, the last category includes questions related to interference of the body, posture, and voice emotions, as they were rarely mentioned and no statistically significant difference was found.

The theoretical framework proposed by Zabala was used to support the analysis and to better understand these categories³⁰. This author discusses the content to be learned, and establishes the classification of these contents into conceptual (what you should know), procedural (what you should know how to do) and attitudinal (those that should be incorporated into the subject's daily life). When relating these categories, it is possible to notice that most aspects in the first category are conceptual content, which means that, when finishing the course, participants became aware of the presentation of various concepts and, therefore, understood what can help in vocal well-being.

On the other hand, the second and third categories are associated with procedural concepts, which shows that the participants were presented with different strategies to perform specific exercises related to the body, breathing, resonance and vocal warm-up and cool-down, and, although a significant difference has been found, most participants did not adhere to the tasks of some of these aspects. It is clear that, if this step was not completed, the incorporation of these practices in the participants' daily lives (attitudinal) would be unlikely.

Although the course has achieved its objective in terms of raising awareness among teachers about

vocal issues, with a positive assessment of participants who reported having gained new knowledge about voice and who would recommend the course to a colleague, the reflections presented in this analysis should be considered because there is a concern of the management group to make adjustments at each completion of a class^{4, 11}. The course time was understood as sufficient for almost all participants, although it is necessary to review the high percentage of withdrawals (41.3%).

Finally, there are two aspects that should be mentioned. The first aspect concerns the need for monitoring by tutors who manage content and practice, as they may be responsible for greater participation and, consequently, better performance by participants in a distance course. The effective participation of those who advised the class under analysis can be traced based on the report of a few participants who had doubts regarding issues that were not clarified or had some difficulty in accessing the course. In this context, the tutor must know how to discuss with the group at a distance, encourage new challenges, and seek to understand the difficulties of the participants, among other functions⁵.

Finally, given the intensive training for the use of online platforms imposed by the COVID-19 pandemic, the second aspect is that new possibilities will certainly be incorporated in this course to the next classes. Thus, the next classes should incorporate teacher monitoring strategies, since the high number of tasks will certainly result in difficulties in putting into practice what was worked on, both in the individual and collective context.

Conclusion

Most teachers who participated in the course "Promoting Teacher's Vocal Well-Being" were made aware of the topic, obtaining greater knowledge about voice production and self-care. Some adjustments must be made in the design of this course for the next groups, regarding the conduct and incorporation of different exercises presented in daily life.

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