



Atena
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PROFESSIONAL VOICE:

Integrated Practices of Teaching,
Research and University Extension

Maria Fabiana Bonfim de Lima-Silva
Aline Menezes Guedes Dias de Araújo
Patrícia Brianne da Costa Penha
Gabriella Lucena Feitosa
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PREFACE

Maria Fabiana Bonfim de Lima-Silva

This e-book is a collection of experiences from my insertion, in 2011, as a professor in the Department of Speech Therapy at the Federal University of Paraíba (UFPB). Upon joining this institution, I developed an extension project called the Voice Advisory Program for Teachers (ASSEVOX), based on the knowledge I gained during the period in which I took my master's and doctorate, at the Pontifical Catholic University of São Paulo (PUC-SP), under the guidance of the Professor Dr. Leslie Piccolotto Ferreira and Prof. Dr. Zuleica Camargo.

So, in the following year, with the desire that extension students could experience the reality of professors through practical experiences that went beyond the walls of the university, I submitted ASSEVOX to the UFPB 2012 Probex Notice, but unfortunately we did not receive the scholarship. Even so, with a pioneering group of six students, we started our actions through a Fluex project (Project only with volunteer students) in a private school with the objective of promoting vocal health for teachers and the school community. I remember that we went through several challenges, because the room that the school gave us for collection was not a clean, pleasant environment, however, we did not get discouraged and cleaned, painted the walls and renovated the entire room. Shortly after the renovation, we started our vocal health assessments and workshops. I remember to this day that many teachers were surprised by our act of cleaning the room, as no one had ever done anything to improve that room, and they said: "*It was an abandoned room*"; "...it was a real storage room for the school, now there is another room, well *organized and clean*".

It is worth noting that in the first meeting with the director of this school, it was emphasized that we would carry out vocal assessments of the teachers, but that after these procedures, the teachers participating in the project would receive the reports with the diagnosis and then participate in voice experience workshops with content theoretical and practical, within the school. In addition, our team inserted vocal health actions in the school calendar events (student day, teacher's day, family day, among others).

Then, in 2013, we took an important step towards ASSEVOX, we managed to get the project approved with a grant in the Probex 2013 Notice, and we entered into a partnership with the Department of Education and Culture of João Pessoa (SEDEC-JP). Thus, between 2012 and 2019, with the support of the Edital Probex and Fluex (UFPB), more than 60 extension workers participated in our project, from undergraduate, graduate and other courses (Psychology, Physiotherapy, among others). Currently, ASSEVOX has managed to cover 15 schools in the public and private network, including kindergarten, elementary and

high school. In addition, during these seven years, in person, we carried out an average of 420 vocal screenings, 44 voice experience workshops and 21 lectures. In the last lecture, held in 2019, we were invited by SEDEC-JP to talk about the importance of voice in teaching work and handling voice amplifiers, in which my doctoral student Patrícia Penha and I presented relevant data from the research developed by ASSEVOX and strategies correct handling of microphones (voice amplifiers). It is worth noting that more than 500 amplifiers were delivered to the teachers participating in this event.

Such actions carried out during this period, yielded us several products, including participation in local, regional and national events (congresses, seminars, meetings), 10 publications of scientific articles in national and international journals, 14 book chapters, 73 complete, expanded abstracts and annals, 21 course conclusion works, 31 scientific initiation works, 5 dissertations, among others.

However, in the first months of 2020, we were surprised by the onset of the SARS-CoV-2 pandemic, a rapidly spreading respiratory syndrome. Since then, several measures by the World Health Organization (WHO) have been taken to prevent the spread of this virus, including social distancing. This fact brought as the main impact to the ASSEVOX project the impossibility of carrying out the actions (workshops, screening and attendance) in person. As a result of these various changes, the project had to reinvent itself and adapt to the new reality, using digital platforms to continue developing its activities and contributing, more than ever, to society and the academic community. In addition, the project, which was previously aimed only at teachers, expanded its target audience to all voice professionals (teachers, telemarketers, digital influencers, actors, singers, telejournalists and others) and thus came to be called Vocal Advisory Program for Voice Professionals (ASSEVOX).

According to this new appearance, ASSEVOX showed itself to have solid foundations and an excellent potential to adapt to new situations. In this period, we idealized to make our *Instagram* profile a digital magazine, containing information accessible to voice professionals and the entire community. Through meetings, we create content, develop means of interaction and broaden our view of the most diverse forms of health promotion. With this, we continue with our scientific initiation projects, discuss book chapters, participate in open classes and regional events, publish scientific articles and, above all, drive our dreams!

Currently, we had the project "Analysis of the effects of a distance vocal health program for teachers in the state of Paraíba" approved in the Universal Demand Notice n° 09/2021, promoted by the Foundation for Research Support of the State of Paraíba (FAPESQ), which brings unprecedented insofar as there are no other proposals in force in the state with the purpose of assisting and supporting the essential professional for the development of our society, such as the teacher. issues related to the health and quality of life of several educators in the state, especially those who do not have the financial possibilities or conditions to be accompanied by a professional speech therapist.

This *e-book* is part of a beautiful journey full of challenges. A path traveled with dedication, responsibility and union. Therefore, we invite you, the reader, to know a little more about the work performed by the ASSEVOX group over these 10 years.

I wish you a good read and that this work is an inspiration for all those who wish to tread the paths of university extension, teaching and research.

PRESENTATION

This *e-book* entitled “**Professional Voice: Integrated Teaching, Research and University Extension Practices**” is the result of an extension project called “Vocal Advisory Program for Voice Professionals” (ASSEVOX), which has been developed since the year of 2012 with the support of the public notice for the Extension Scholarship Program (PROBEX) of the Federal University of Paraíba (UFPB), whose main objective is to promote vocal health and prevent voice disorders in the most diverse professionals who depend on it to perform their work.

In this work, 14 chapters were gathered that explain from the experience of students and teachers who participated in the voice advisory program, to themes related to the prevention of voice disorders, vocal health promotion and around expressiveness. In them, there are studies about teachers, telemarketers, telejournalists and digital influencers. The purpose of this e-book is to expand the knowledge of undergraduate, graduate and Speech-Language Pathology professionals, as well as all those interested in studying voice professionals. In addition, we hope to encourage and drive the development of research through the vision and experiences of a university extension.

It is important to highlight that this work is composed of results of scientific initiation research and experiences around the ASSEVOX university extension. The chapters were prepared by students (undergraduate and graduate students) and by professional researchers from UFPB and other institutions (UNIPÊe PUC-SP) who, in a responsible and qualified way, proposed to explain their studies with current and relevant themes for the scientific community and society as a whole.

We wish you a great read!


Maria Fabiana Bonfim de Lima-Silva
Aline Menezes Guedes Dias de Araújo
Patrícia Brianne da Costa Penha
Gabriella Lucena Feitosa
Mayra Hadassa Ferreira Silva

SUMÁRIO

CAPÍTULO 1..... 1

EXPERIENCES OF EXTENSIONISTS PART OF A VOCAL ADVISORY PROGRAM FOR VOICE PROFESSIONALS - ASSEVOX


Lorena Sampaio Duarte
Giulia Alfredo Moreira
Maria Paloma Costa Carvalho
Eduardo Lucas Sousa Enéas

 <https://doi.org/10.22533/at.ed.6192230051>

CAPÍTULO 2..... 11

ASSEVOX THAT MADE SENSE: EXPERIENCE REPORTS FROM PUBLIC SCHOOL TEACHERS IN JOÃO PESSOA, PB


Adriana Carla de Sousa Turczinski
Viviane Maria da Silva
Iago Victor Amorim Teixeira
Eduardo Lucas Sousa Enéas

 <https://doi.org/10.22533/at.ed.6192230052>

CAPÍTULO 3..... 20

SELF-PERCEPTION OF THE EXPRESSIVITY OF THE TEACHER OF EARLY CHILDHOOD EDUCATION IN REMOTE EDUCATION


Mayra Hadassa Ferreira Silva
Gabriella Lucena Feitosa
Cícera Geangela Alves Félix
Rebecka Victoria Ferreira de Sousa
Danilo Augusto de Holanda Ferreira
Patrícia Brianne da Costa Penha

 <https://doi.org/10.22533/at.ed.6192230053>

CAPÍTULO 4..... 29

WORK AND VOICE CONDITIONS OF ELEMENTARY EDUCATION TEACHERS IN THE REMOTE CONTEXT

Rebecka Victória Ferreira de Sousa
Patrícia Brianne da Costa Penha
Clara Horrana Amaral Santos
Gabriella Lucena Feitosa
Mayra Hadassa Ferreira Silva
Danilo Augusto de Holanda Ferreira

 <https://doi.org/10.22533/at.ed.6192230054>

CAPÍTULO 5..... 38

WORKING CONDITIONS AND SELF-PERCEPTION OF VOICE AND EXPRESSIVENESS

OF HIGHER EDUCATION TEACHERS IN THE REMOTE CONTEXT


Gabriella Lucena Feitosa
Patrícia Brianne da Costa Penha
Mayra Hadassa Ferreira Silva
Rebecka Victória Ferreira de Sousa
Danilo Augusto de Holanda Ferreira
Maria Fabiana Bonfim de Lima-Silva

 <https://doi.org/10.22533/at.ed.6192230055>

CAPÍTULO 6..... 47

RELATIONSHIP BETWEEN VOCAL USE AND SELF-REPORTED BODILY PAIN BY TEACHERS


Tháise Sara Costa Dias
Pâmela Pontes dos Santos
Soeme Ferreira dos Santos
Patrícia Brianne da Costa Penha

 <https://doi.org/10.22533/at.ed.6192230056>

CAPÍTULO 7..... 56

PERCEPTUAL ASPECTS OF THE SPEECH EXPRESSIVITY OF TELEOPERATORS IN AN EMERGENCY CALL CENTER


MaryelleThayane Lins da Silva
Bárbara Tayná Santos Eugênio da Silva Dantas
Ana Beatriz Santana de Moraes
Cláudio da Cruz Santos
Giulia Alfredo Moreira
Aline Menezes Guedes Dias de Araújo

 <https://doi.org/10.22533/at.ed.6192230057>

CAPÍTULO 8..... 65

RELATIONSHIP BETWEEN PERCEPTUAL PARAMETERS AND THE PLEASANTNESS OF THE VOICE OF TELEMARKETERS AT AN EMERGENCY CALL CENTER

Stherfanny Maia Evangelista de Lima
Bárbara Tayná Santos Eugênio da Silva Dantas
Helmana de Macêdo Nunes
Débora Nayara do Vale Moraes
Aline Menezes Guedes Dias de Araújo
Maria Fabiana Bonfim de Lima-Silva


 <https://doi.org/10.22533/at.ed.6192230058>

CAPÍTULO 9..... 73

ASPECTS OF QUALITY AND VOCAL DYNAMICS OF TELEOPERATORS OF AN EMERGENCY CALL CENTER

Maria Luiza Cruz Leite Lira
Bárbara Tayná Santos Eugênio da Silva Dantas


Cláudio da Cruz Santos
Aline Menezes Guedes Dias de Araújo

 <https://doi.org/10.22533/at.ed.6192230059>

CAPÍTULO 10..... 82

RELATIONSHIP BETWEEN COVID-19 SYMPTOMS AND VOICE QUALITY OF LIFE AMONG TELEOPERATORS IN AN EMERGENCY CALL CENTER


Ana Beatriz Santana de Morais
Bárbara Tayná Santos Eugênio da Silva Dantas
Cláudio da Cruz Santos
Aline Menezes Guedes Dias de Araújo
Larissa Nadjara Alves Almeida
Millena Irley Batista da Silva
Maria Fabiana Bonfim de Lima-Silva

 <https://doi.org/10.22533/at.ed.61922300510>

CAPÍTULO 11..... 90

RELATIONSHIP BETWEEN VOCAL AND STRESS SYMPTOMS IN EMERGENCY TELEOPERATORS

Soeme Ferreira dos Santos
Gabriela Lucena Feitosa
Camila Macêdo Araújo de Medeiros
Tháise Sara Costa Dias
Valdízia Domingos da Silva
Patrícia Brianne da Costa Penha

 <https://doi.org/10.22533/at.ed.61922300511>

CAPÍTULO 12..... 99

EFFECTS OF A VOICE ADVISORY PROGRAM FOR POLICE EMERGENCY TELEOPERATORS


Vanderssom Correia Lima
Eduardo Lucas Sousa Enéas
Maria Fabiana Bonfim de Lima-Silva

 <https://doi.org/10.22533/at.ed.61922300512>

CAPÍTULO 13..... 107

PHONETIC VARIATION OF THE REGIONAL ACCENT IN TELEJORNAL PRESENTERS: AN EVALUATION THROUGH VOCAL PROFILE ANALYSIS SCHEME

Wégina Jordana da Silva
Ewelin Maria Lemos Fernandes
Telma Dias dos Santos
Maria Fabiana Bonfim de Lima-Silva

 <https://doi.org/10.22533/at.ed.61922300513>

CAPÍTULO 14..... 117

DIGITAL INFLUENCERS: ANALYSIS OF EXPRESSIVENESS AND THE CONTRIBUTION OF COMMUNICATION TO THE CONSUMER MARKET IN THE CITY OF JOÃO PESSOA

Ana Carla Cardoso Guedes Moreira

Hionara Nascimento Barboza

Laurinda Soares da Franca Pereira

Weidinara de Oliveira Rodrigues da Fonseca

Telma Dias dos Santos

Maria Fabiana Bonfim de Lima-Silva

 <https://doi.org/10.22533/at.ed.61922300514>

AUTHORS 126

EFFECTS OF A VOICE ADVISORY PROGRAM FOR POLICE EMERGENCY TELEOPERATORS

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ABSTRACT: Telemarketers use the voice as their main work tool, and during long working hours they adopt inadequate vocal adjustments during long working hours. To assist in the promotion of vocal and occupational health of these workers regarding vocal disorders, speech therapy intervention strategies can be discussed.

Objective: To verify the effects of a proposal for intervention in vocal health for telemarketers at a police emergency service center. **Methods:** This research is characterized as an interventional and field research with a quantitative approach, in which 10 telemarketers participated in an assessment during two moments (pre- and post-intervention) with the support of questionnaires being the voice self-assessment, aiming to observe the condition of the voice profile of the teleoperator (PVOT); and the second specific for vocal health and hygiene (QSHV), in addition, there was the auditory-perceptual analysis of

vocal quality sent for evaluation by three judges with training and experience in the GRBASI scale. The intervention period was carried out in seven meetings, in the first moment there was an evaluation and in the last one, all the volunteers underwent a re-evaluation, in the other meetings, guidance regarding vocal health was addressed. The answers obtained by the questionnaires were tabulated in the Microsoft Office Excel 2010 program database and later submitted to statistical R tests. **Results:** The analyzed data indicate a significant reduction in vocal symptoms and laryngopharyngeal sensations when compared to the time interval of the interventions, such results were ratified by the auditory-perceptual analysis when verifying an improvement in the parameter of general degree of vocal alteration. **Conclusion:** The proposed intervention actions promoted changes in relation to the perception of vocal health and knowledge about care to maintain healthy vocal patterns.

KEYWORDS: Voice, Occupational Health, Self-Assessment.

1 | INTRODUCTION

Among the studies of voice is observed a need for expansion of research focused on speech therapy, and thus can be discussed actions of prevention and promotion of vocal health, especially directed to the groups of voice professionals. These workers, when they receive specialized guidance on the proper use of the voice, are able to work more efficiently, as

well as present a reduction in cases of vocal illness (FERREIRA et al., 2008).

Teleoperators use the voice as the main tool of work, during their performance at the emergency call centers must provide relevant information to the requester, capture and provide the location and nature of emergencies, as well as, pass on as much information to the responsible sectors (firefighters, military and civil police, or medical teams), aiming at greater effectiveness in attending the occurrence (SANTOS et al., 2016).

The vocal complaints presented by teleoperators happen due to factors such as unfavorable environmental conditions and issues related to the wrong individual behaviors, for example, the low intake of water and the work shift without breaks, such elements contribute to the development of symptoms of Work-Related Voice Disorder (WRVD) (GIRARDI et al., 2017). As Araújo (2013) points out, the guidance received by voice professionals is insufficient for efficient vocal use in their work spaces.

To help teleoperators affected by voice disorders different phonoaudiological interventional modalities can be applied, whether applied in individual or group format (RIBEIRO et al., 2012). It is possible to classify the interventions in relation to the approach, therapeutic, such as: a) direct, in which are provided a modification in the physiology of the voice with vocal exercises; b) indirect, focusing on understanding the correct use of voice, in addition to adjustments of ergonomic, psychological and environmental factors that can lead to vocal impairment and the use of strategies to reduce the influence of such factors; c) eclectic, the result of the association of the previous approaches (PASA et al., 2007)

In view of the above, this chapter aims to discuss the effects of an intervention proposal in vocal health for teleoperators of a call center to police emergencies.

2 | METHODS

The present research has an explanatory, field, quantitative and intervention character, approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Paraíba on May 28, 2021, under process number 0532/14 and CAAE:36516514.0.0000.5188.

The research was developed in a police emergency call center, in which a total of 10 teleoperators participated, formed by a group with firemen, military and civil police officers. To obtain voice-related data we used the following instruments: a) Questionnaire "Vocal Profile of Telemarketing Operator" (PVOT), made up of 29 questions about personal, functional, organizational, environmental and vocal aspects; b) Questionnaire of Vocal Health and Hygiene (QSHV), made up of 31 items for assessing the level of knowledge about vocal health and hygiene.

To collect the speech sample in the pre- and post-intervention period, and later on the perceptual-auditory evaluation, the corpus consisted of the emission of the sustained vowel

/ɛ/ and passages of semi-spontaneous speech. The samples recorded in an acoustically treated environment with a professional unidirectional headset microphone (Logitech) were recorded with FonoView® software (CTS Informática, version 4.6 h) using a sampling rate of 44100.

The samples obtained were edited and sent for analysis by three speech therapists specialized in voice and experienced in using the GRBASI scale (DEJONCKERE et al., 1996). With perceptual-auditory evaluation it was possible to assess the vocal quality of each teleoperator, from the point of view of the overall grade of the evaluation.

The teleoperators participated in 7 interventional meetings lasting approximately 60 minutes each meeting. In the first and seventh meeting data collection involving the application of the PVOT, QSHV and voice sample collection took place, in addition to the post-intervention evaluation there was a new collection two months after the end of the program. Between the second and the sixth meeting eclectic interventions were applied, called “vocal health workshops”.

In each workshop moment the volunteers were grouped in groups of three to four teleoperators, and the workshopers combining direct and indirect approaches mediated the activities in the training. Indirect tools were used for therapeutic interaction, knowledge enhancement, pedagogical and counseling interventions, with an average duration of 30 minutes, and direct tools such as auditory, vocal function, musculoskeletal, somatosensory and respiratory interventions, with an average duration of 30 minutes. Direct therapy involved the performance of exercises using various techniques aimed at phonation and vocal expression with an average duration of 30 minutes.

The data obtained were tabulated in Microsoft Office Excel 2010 software. For recording in the database, the PVOT questionnaire questions were categorized, the answers “never”, “rarely” and “don’t know” were grouped as absence, and the answers “sometimes” and “always” were grouped as “presence”.

Subsequently, the variables were analyzed descriptively (absolute and relative frequency, mean and standard deviation) and inferentially with the use of Kappa tests, to observe the inter and intra-judge reliability in the perceptual-auditory analysis of the vocal samples. Moreover, the chi-square test was applied to verify the association between the pre- and post-intervention periods, symptoms and vocal sensations, besides the vocal quality through the perceptual-auditory analysis and Pearson’s correlation test, to correlate correct answers in the QSHV, symptoms and vocal sensations, for such we used the statistical software R, version 2.11.0. with a significance level equal to 5%.

3 | RESULTS AND DISCUSSION

From the data found with the application of questionnaires and perceptual-auditory analysis of the samples we compared the vocal aspects of all teleoperators with and without complaints of voice disorder before and after the intervention program. Of the 10 teleoperators we noticed a predominance of females, $n=8$ (80.00%), with age of 34.8 years and a mean time of service of 6.4 years.

Women have a greater tendency to develop voice problems because their laryngeal configuration, which has a reduced glottal proportion, favors a greater impact between the vocal folds during phonation (CIELO; BEBER, 2012).

The volunteers' workload is made up of shifts of 12 hours a day followed by two days off, from Monday to Sunday, totaling 36 (thirty-six) hours a week, which may sporadically be added to overtime. This data becomes worrisome, because the long and excessive workload can impair vocal function, and consequently contribute to the development of possible DVRT.

As far as occupational conditions are concerned, the operators most frequently reported the stressful work rhythm (100%), strong noise in the company (100%), unsatisfactory acoustics (20.00%), dust (100%) and echo (70.00%) in the workplace.

Teleoperators when working under stressful conditions present a higher average of vocal and sensory symptoms than the group that does not work under such condition (SANTOS et al., 2016). The stressful work rhythm can influence the daily social relations of the teleoperator, since they are subjected to calls with demands that require a constant state of attention, speed, objectivity, the use of more than one interface of the technology systems and clarity in attendance (ARAÚJO, 2013)

The presence of very high environmental noise highlighted by the participants is one of the frequent occupational risk factors among call centers, due to this element the teleoperator is motivated to apply inadequate vocal adjustments, such as elevation of their speech intensity (MOREIRA et al., 2010). Thus, acoustically adequate work environments, clean and with good ergonomic structures avoid the triggering of possible voice disorders (CIELO; BEBER, 2012).

As for the analysis of the pre-intervention QSHV 3 teleoperators had dysphonia, based on the cutoff value established to separate dysphonic from vocally healthy individuals. Post-intervention, none of the subjects had a cut-off value below the established value, and the overall sum showed an upward trend, suggesting an increase in the level of knowledge about vocal health and hygiene among teleoperators. According to Hazlett and Moorhead (2011), voice professionals after receiving some voice training acquire knowledge and awareness about the proper use of the voice.

When compared to the prevalence of vocal symptoms and laryngopharyngeal

sensations alone at the pre- and post-intervention program, there was a significant reduction for almost all symptoms post-therapy, as shown in Table 1.

Self-reported vocal symptoms		Moment				p-value	Laryngo-pharyngeal sensations		Moment				p-value
		Pre-Therapy		Post-Therapy					Post-Therapy		Pre-Therapy		
		n	%	n	%				n	%	n	%	
Hoarseness	A. P.	0 10	0,00 100	8 2	80,00 20,00	0,0001*	Sore throat	A. P.	3 7	30,00 70,00	9 10	90,00 10,00	0,006*
Voice Loss	A. P.	3 7	30,00 70,00	10 0	100 0,00	0,001*	Sand in throat	A. P.	5 5	50,00 50,00	10 0	100 0,00	0,010*
Voice cracks	A. P.	1 9	10,00 90,00	7 3	70,00 30,00	0,006*	Sore throat	A. P.	3 7	30,00 70,00	9 1	90,00 10,00	0,006*
Shortness of Breath	A. P.	4 6	40,00 60,00	8 2	80,00 20,00	0,068	Cough	A. P.	1 9	10,00 90,00	6 4	60,00 40,00	0,019*
Thin Voice	A. P.	4 6	40,00 60,00	8 2	80,00 20,00	0,068	Dry cough	A. P.	0 10	0,00 100	8 2	80,00 20,00	0,0001*
Thick Voice	A. P.	2 8	20,00 80,00	9 1	90,00 10,00	0,002*	Cough with phlegm	A. P.	1 9	10,00 90,00	10 0	100 0,00	0,0001*
Thin/thick voice	A. P.	3 7	30,00 70,00	9 1	90,00 10,00	0,006*	Pain when speaking	A. P.	5 5	50,00 50,00	10 0	100 0,00	0,010*
Weak voice	A. P.	3 4	30,00 40,00	7 3	70,00 30,00	0,074	Pain when swallowing	A. P.	5 5	50,00 50,00	9 1	90,00 10,00	0,051
							Difficulty swallowing	A. P.	5 5	50,00 50,00	8 2	80,00 20,00	0,160
							Sore throat	A. P.	2 8	20,00 80,00	7 2	70,00 20,00	0,025*
							Catarrh in the throat	A. P.	2 8	20,00 80,00	8 2	80,00 20,00	0,007*

							Dry throat	A. P.	1 9	10,00 90,00	6 4	60,00 40,00	0,019*
							Tiredness when speaking	A. P.	2 8	20,00 80,00	5 5	50,00 50,00	0,0160*
							Straining when talking	A. P.	2 8	20,00 80,00	7 3	70,00 30,00	0,025*

Legend: A(Absent); P(Present); Chi-square test - * $p < 0,05$.

Table 1 - Numerical (n) and percentage (%) distribution of self-reported vocal symptoms and laryngopharyngeal sensations by teleoperators

Source: Prepared by the authors (2021).

Voice disorders can be justified by the behavior of vocal misuse and abuse. These professionals, in general, often complain of dryness in the throat, tiredness to speak, effort, hawking, coughing, voice loss and failure, hoarseness, burning and foreign body in the throat. These symptoms can be related to unfavorable environmental conditions and work organization, for example, the use of air conditioning, which causes dryness of the laryngeal mucosa, the presence of excessive environmental noise, improper furniture, or factors linked to the individual's own behavior, such as muscle tension, lack of respiratory support, altered posture, alcoholism, smoking, little water intake, improper diet, among others (HAZLETT, MOORHEAD, 2011; AMORIM et al, 2011; SANTOS et al., 2016; GIRARDI et al., 2017).

The most frequent vocal symptoms by teleoperators were: hoarseness, voice failure, thick voice, and voice loss, while the most self-reported sensations were: hawking, dry cough, cough with phlegm, and dry throat. Thus, the data obtained converge with the vocal characterization presented in the literature regarding teleoperators (OLIVEIRA; BEHLAU; GOUVEIA, 2009; CIELO; BEBER, 2012; ARAÚJO, 2013) The study conducted with 27 patients when comparing the auditory, proprioceptive and total symptoms pre- and post-therapy of group of patients with dysphonia reported a decrease in total symptoms after the intervention (VITAL et al.,2016).

When analyzing the pre-intervention period it is observed that eight participants had a mild degree of vocal deviation, while at the post-intervention time there was a reduction to six, of which only 1 remained in a moderate degree indicative of vocal deviation. The acoustic and aerodynamic evaluations of the voice complement the perceptual-auditory evaluation, due to the greater sensitivity to changes in vocal patterns (SIMBERG et al., 2006; LAW et al., 2012; RIBEIRO et al., 2013).

The speech therapy intervention combining direct and indirect guidance resulted in positive individual modifications in the post-intervention period. Participants in the

workshops demonstrated an increase in voice knowledge and care. Through the workshops of voice experience that took place in the company and during the service period, these teleoperators attributed a greater appreciation to their work instrument.

The dynamics of group therapy allowed the participants to interact by sharing experiences and knowledge, in which one motivated the other to perform vocal exercises and stretching exercises in their work routine. In general, the context of the workshops was one of welcoming and motivation for participation and better adherence to the therapeutic proposal. Thus, individuals participate more actively in the rehabilitation process, which corroborates the significant reduction of vocal symptoms and vocal quality.

Therefore, the group interventions have been presented as a very effective strategy in the treatment of voice, providing participants with better capacity for self-perception and identification of vocal symptoms, as well as strategies to remedy the voice problem. (ALMEIDA et al., 2015).

4 | CONCLUSION

Thus, the proposed intervention program promoted changes in the perception of vocal health and knowledge about care to maintain healthy vocal patterns. As well as, real changes were identified in the vocal characteristics regarding symptoms and self-reported vocal sensations between the interventional interval, which were observable from the perceptual-auditory point of view.

The group intervention proposal proved to be effective, and, therefore, we recommend its discussion around strategies that aim at healthy working conditions for teleoperators. Still, it is important to encourage callcenter investments in health promotion programs, so that they can act in the prevention of diseases and care services to these professionals.

The workshops aimed to promote individual awareness to reduce inappropriate vocal habits, which resulted in the reduction or absence of inappropriate vocal symptoms.

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