

Effectiveness of Vocal Therapy for the Elderly When Applying Conventional and Intensive Approaches: A Randomized Clinical Trial

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Summary: Objectives. The aim of this study was to verify the effects of the method Vocal Therapy for the Elderly and the differences in treatment efficacy when it was administered intensively or in the conventional way.

Methods. Twenty-seven elderly individuals were randomized into two groups and referred for 16 sessions of vocal therapy. The Intensive Group (IG) had therapy four times a week, whereas the Conventional Group had it twice a week. The effects of the therapy were assessed by auditory-perceptual analysis, the Voice-Related Quality of Life protocol, and visual-perceptive analysis of laryngoscopy examinations. The first stage consisted of evaluating the vocal quality and self-assessment of 15 subjects before and after a time period equal to that which they would undergo in vocal therapy. The second stage consisted of comparing the assessments of all participants in the week preceding the beginning of treatment, in the week following the end of treatment, and 1 month after that.

Results. There was no difference between perceptual voice parameters and self-assessment when the subjects were not undergoing therapy. When comparing the periods immediately before and after therapy, there was improvement in vocal quality and Voice-Related Quality of Life. One month later, the benefits that had been revealed through the self-assessment protocol, and some of the improvements in vocal parameters were maintained. There was no difference between the IG and Conventional Group with the exception of vocal fold bowing, which decreased in the IG group.

Conclusions. The Vocal Therapy for the Elderly program is effective for treating voice presbyphonia. An intensive approach may be superior with regard to vocal fold bowing.

Key Words: Voice disorders—Dysphonia—Aging—Vocal training—Speech therapy.

INTRODUCTION

Changes due to the aging process may affect the larynx and other phonation structures, impairing vocal production.¹ There are some clinical studies on voice rehabilitation in the elderly, but only three of the therapeutic methods used, two of which were initially developed to treat other types of vocal changes, have been proven effective.^{2–7} The only treatment developed specifically for the aging voice mainly addresses aspects of speaking with increased loudness.⁸

The combined use of different vocal techniques is common in Brazilian speech therapy,⁹ based on the assumption that presbyphonia derives from alteration in more than one aspect, including incomplete glottic closure,¹⁰ muscle fiber atrophy,^{11,12} irregularity of mucosa vibration,¹³ supraglottic constriction,¹⁴ and failure of respiratory support.¹⁵ These aspects mean a weaker voice and changes in pitch or vocal range,^{16–18} and the use of different techniques allows the patient to reach more than one goal during therapy. Thus, the literature supports the development of a therapeutic method for the aging voice that involves exercises from more than one technique that can adapt to patients' needs.

In voice therapy research, there is no consensus with regard to the optimum number of sessions with a speech therapist,

frequency, and duration of therapy. There are studies ranging from 4 weeks to 12 months in duration, and ranging from one¹⁹ to four²⁰ times a week. There is no scientific evidence that a higher frequency of therapeutic sessions is superior to the traditional.

The aim of this study was to verify the effects of the method Vocal Therapy for the Elderly (VTE) on vocal quality, self-assessment, and laryngeal structures, immediately after therapy and at 1-month follow-up in elderly individuals with age-related vocal complaints and to verify the differences between intensive and conventional approaches. Considering the need for scientific evidence on the effects of speech-therapy interventions in cases of presbyphonia, the hypothesis of this study is that therapy with a multi-technique approach promotes benefits for the aging voice and that it presents better results when applied intensively.

MATERIALS AND METHODS

A randomized clinical trial was conducted with the approval of the Research Ethics Committee of the institution where it was performed (certificate: 160,793), and all participants signed the consent form.

Sample power and size were calculated using the total score of the Voice-Related Quality of Life (V-RQOL) protocol, which indicated that 11 pairs of individuals had to be studied to reject the null hypothesis that the difference is zero, with the power of the study being 80%. The probability of type I error associated with the testing of this null hypothesis was 5%.

The individuals selected to participate in this study had to be aged 60 or over; present with general health,

Accepted for publication March 26, 2018.

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Journal of Voice, Vol. 33, No. 5, pp. 809.e19–809.e26

0892-1997

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<https://doi.org/10.1016/j.jvoice.2018.03.017>

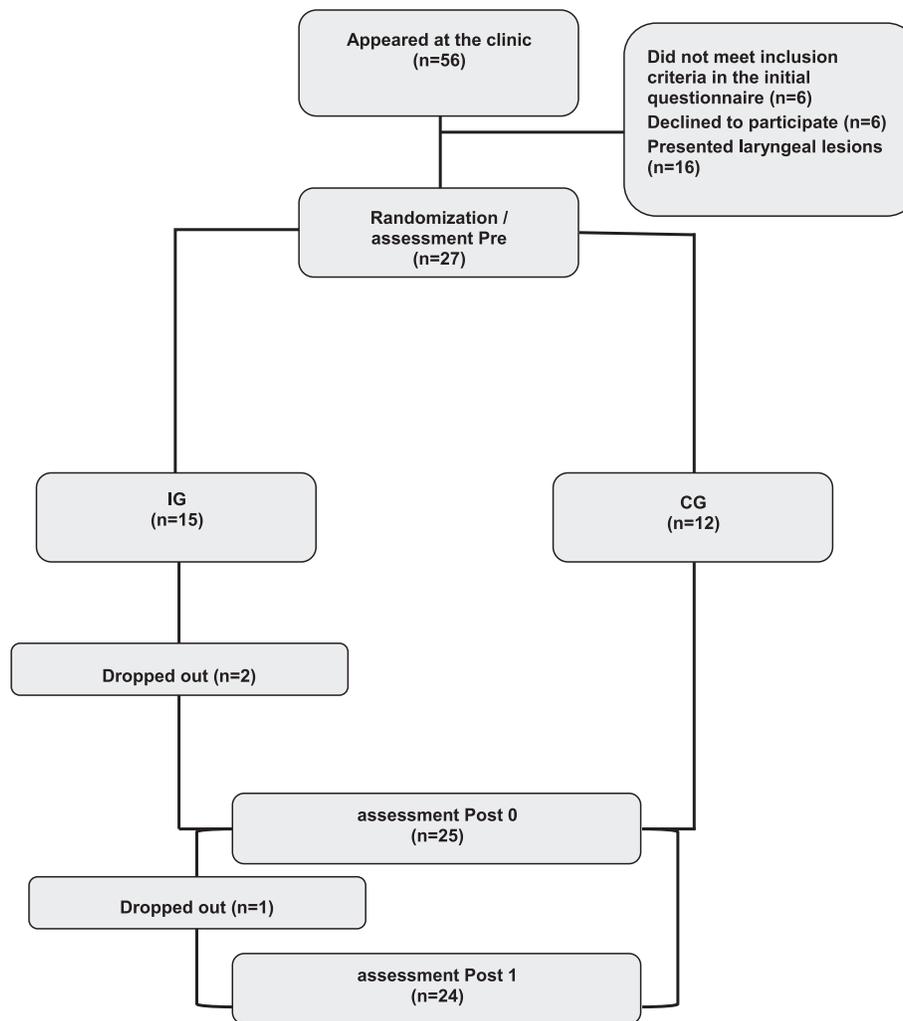


FIGURE 1. Flowchart of stage 2 of the study.

cognitive, and motor functions that enabled them to accomplish the procedures requested; present with vocal complaints originating in the aging period; and respond positively to at least one exercise of each of the techniques proposed in the therapeutic program. The exclusion criteria included reported neurological problems, structural changes or laryngeal lesions incompatible with presbyphonia, having undergone laryngeal surgery, smoking or being a nonsmoker for less than 5 years, and hearing loss that could compromise the understanding of instructions given during the assessment and therapy sessions (severe to profound hearing loss).

Fifty-six individuals aged 60 years or over attended an initial interview. Four were excluded because they were diagnosed with neurological disorders; 16 were excluded because of laryngeal lesions unrelated to the aging process; two were smokers or had quit smoking less than 5 years ago; and six dropped out before the beginning of treatment.

The elderly individuals were randomly placed into two groups. The 15 individuals in the Intensive Group (IG) received vocal therapy in 16 sessions, four times a week, and the 12 in the Conventional Group (CG) received the same type of therapy with the same number of sessions, but only twice a

week. After the start of treatment, two IG subjects dropped out because of family problems or difficulty getting to the speech therapy clinic.

The first stage of the study was the baseline assessment of 15 of the 27 participants, who remained without therapy for a period equal to the duration of treatment, until they were called again for a new evaluation (Pre). This allowed comparison of the effect of time on the parameters of voice and quality of life without treatment.

In the second stage, all participants ($n = 27$) performed the pre-evaluation, which occurred 4–7 days before the beginning of the therapy, between 3 and 7 days after the end of the therapy (Post 0), and 1 month after the end of the treatment (Post 1) (Figure 1).

The following section discusses the outcomes included in this study.

Self-assessment of the impact of dysphonia on the quality of life through the Voice-Related Quality of Life Protocol (V-RQOL)

The physical score (PS), socio-emotional score (SES), and overall score (OS) of the questionnaire were calculated. The higher

the total value obtained in the protocol, the greater the quality of the individual's life.

Auditory-perceptual voice analysis

Sustained phonation of the vowel "a" and counting from 1 to 10 were recorded in an acoustically treated room using professional audio software *Sound Forge 10.0* (Sony, New York) in a Creative Audigy II (Creative Technology Ltd, Singapore) sound card computer at a sampling rate of 44,100 Hz and Mono channel at 16 Bit, AKG model C444PP head microphone with model 3710 amplifier (KayPentax, Montvale, NJ United States). The microphone was located 45 degrees and 4 cm away from the subject's mouth; one experienced listener blindly evaluated the phonation with regard to the type of intervention and time of evaluation. The samples were randomly presented in pairs without patient identification, and each pair corresponded to two different times of voice assessment (baseline, Pre, Post 0, or Post 1). The voices were evaluated based on the following parameters: overall degree of voice deviation, roughness, breathiness, perception of loudness, instability (only for sustained vowels), and strain (only for connected speech). The listener had to indicate the behavior of the second phonation compared with the first, identifying whether

the vocal parameter increased, decreased, or presented no difference. The listener reliability was substantial (kappa test, with reliability 0.66, considering the mean of the parameters).

Visual-perceptual evaluation of the laryngeal images

The laryngoscopy examinations were presented to an experienced evaluator, who was blind to the type of intervention and the time of assessment, in a paired and randomized manner. The following parameters were analyzed: vocal fold bowing; prominence of vocal processes; glottal closure; medial or anterior-posterior vestibule constriction; and alteration of mucosa vibration, indicating whether appearance increased, decreased, or presented no difference. This evaluation was performed from the Pre, Post 0, and Post 1 assessments.

The therapeutic procedures are described in [Chart 1](#). Each exercise was performed for 4 minutes, including breaks to take breaths and hydrate; however, the "deep bubbling" exercise was performed for 2 minutes, as it was stressful. The minutes were counted using a stopwatch. Each therapy session had the duration of 30 minutes. The same program was performed for IG and CG. All of the participants were able to perform each of the voice techniques presented, and all exercises were included in each treatment program.

CHART 1.

Vocal Therapy for the Elderly (VTE) program

	Exercise	Desired Effects
Tongue or lip trills	Tongue or lip trills with continuous phonation	It improves mucosal vibration of vocal folds and assists in normotensive vocal production. ²¹
Nasal sound technique	Nasal sound "m" continuously or "m" not continuously	It facilitates vocal production with less effort, decreases roughness, ²² and balances resonance. ⁹
Vocal glide technique	Ascending and descending vocal glissandos , associated with facilitating sounds, such as trills, nasal, or fricative "z"	It increases vocal flexibility ²³ and improves glottic closure. ⁹
Maximum phonation time technique	Phonation of sustained vowels at maximum phonation time, louder than usual , maintaining adequate mouth opening, without excessive muscular effort, controlling the vocal quality throughout the phonation	It increases sound pressure levels, ²⁴ improves glottic closure, and increases resistance to expiratory air passage, helping to improve phonatory stability. It is highly effective in situations of vocal hypophonia, in which case, the exercise should be performed louder than usual. ⁹
Semi-occluded vocal tract—Lax Vox technique	Sustained "u" or "v" sound phonation in a silicone tube (Lax Vox) 35 cm long and 9–12 mm in diameter placed in the mouth, between or in front of the incisor teeth and above the tongue, which should be relaxed and may lightly touch the tube without occluding it. The other end is dipped into a plastic water bottle with a capacity of about 500 mL of liquid and filled with about 2/3 of water. The tube should be immersed in the liquid at a depth of 1–2 cm.	It enlarges the vocal tract and reduces the collision force between the vocal folds. ²⁵
Semi-occluded vocal tract—Lax Vox—"deep bubbling" technique	Sustained "u" or "v" short phonation in a silicone tube (Lax Vox) as described above, although the tube should be immersed in the liquid at a depth of 10 cm	It activates the laryngeal musculature and compensates as a strength exercise aiding in glottic closure. ²⁵

Vocal exercises were selected based on the described physiology that could promote improvement in loudness, mucosal vibration, resonance, frequency control, and phono-respiratory coordination. The combination of exercises and the amount of time required of each technique that should be performed for this clinical trial were determined after a pilot study whose participants were not included in this specific sample.

Participants were instructed to perform the vocal exercises at home every day, once a day when they had speech therapy and twice on the days they did not attend therapy. They received a sheet that directed them to conduct home practice using the same exercise sequence they used at therapy and to perform each exercise for the same amount of time, as they would do it in the presence of the speech therapist. As some of the participants of this study were illiterate, home practice was tracked through the patient's self-reports to the therapist in the next session.

The first stage of this research was to determine stability of voice quality in presbyphonia before introducing treatment so the results could be interpreted with greater confidence. The baseline evaluation and preintervention assessment of the 15 subjects who answered the self-assessment questionnaire and underwent auditory-perceptive evaluation of the voice were compared. The paired *t* test was used to compare the V-RQOL scores, and the Signal Test was used to compare the parameters of the perceptual-auditory evaluation for both times of assessment.

For the second stage of analysis, the analysis of variance for repeated measures test was applied to the V-RQOL scores; when it showed a significant difference for the variable time, therapy, or therapy versus time, the Tukey test was used. The chi-square test for proportions was applied to identify the effect of therapy on the total group of subjects for both auditory-perceptual evaluation and laryngeal images. The likelihood ratio test was used to compare IG and CG. The kappa test was used to verify intra-evaluator reliability, and 10% of the samples were repeated for the two models of perceptive analysis: auditory for voice and visual for larynx. Student *t* test was used to verify the difference between the groups in relation to age. An intention-to-treat analysis was performed, considering the individual who did not attend the Post 1 evaluation.

RESULTS

Fifty-six individuals attended the interview and initial evaluation. Twenty-seven elderly individuals aged 60–87 years, with a mean age of 71.44 years (23 women and 4 men), were referred for therapy. Following randomization, 15 were included in the IG (12 women and 3 men, with a mean age of 73.85 ± 6.76 years), and 12 were included in the CG (11 women and 1 man, with a mean age of 68.83 ± 6.04). There was no difference between groups for age ($P = 0.06$). Twenty-five subjects completed the therapeutic process: 13 from the IG and 12 from the CG. The two participants who withdrew from the treatment were women, as was the IG participant who dropped out at the Post 1 evaluation. Participants did not follow the home practice as was prescribed concerning sequence, duration, or trials. However, the majority of them reported performing

some of the prescribed vocal exercises at home daily. After calculating the power of the sample, the data indicated a normal distribution, with a study power of 97.7%.

In the first stage of the study, in the comparison of the 15 volunteers to perform the control evaluation before and after the period of time without vocal therapy, no differences were observed in the V-RQOL scores ($P > 0.05$) or in the auditory-perceptual parameters ($P > 0.05$). It is important to address that no comparisons of the laryngeal aspects of the 15 subjects were performed at the baseline.

In the second stage of the study, an analysis was performed with the intention to verify the efficacy of the VTE method to treat presbyphonia (purpose I) and to compare the intensive treatment approach to the traditional one (purpose II). For purpose I, the results of all 25 participants are presented as one group.

Concerning purpose I, V-RQOL protocol results indicated an increase in physical and overall scores immediately after therapy and an increase in socio-emotional and overall scores from the pre-evaluation to 1 month after therapy (Table 1).

In relation to the auditory-perceptual voice analysis, the results of the comparisons of the total group between the three times of assessment showed improvement in vocal parameters after therapy for sustained vowels and for connected speech. This change is maintained for most of the parameters (Tables 2, 3, and 4).

When comparing the laryngeal images of the whole sample at the three times of assessment, no differences were revealed for any parameter.

However, when comparing the IG and CG groups between assessments, there was no difference between IG and CG for the V-RQOL protocol, and there was no significant association between IG and CG for any of the analyzed parameters in relation to the auditory-perceptual voice analysis. Nevertheless, there is a difference in vocal fold bowing from Pre to Post 0 evaluation, as 38.46% of the IG individuals presented decreased bowing after therapy, whereas none of the CG participants did (Table 5).

DISCUSSION

Many studies in the voice field have been dedicated to identifying the effectiveness of treatments that benefit the aging voice.²⁶ This study was devoted to the development of a method involving exercises from several vocal techniques to reach more than one therapeutic goal in each session. The benefits of the proposed treatment were evidenced in the vocal parameters and quality of life of the elderly individuals.

When considering the results of the self-assessment, there was improvement from before to after treatment, thus corroborating data from other studies that indicate better voice-related quality of life after speech therapy in the elderly.^{27,28} It should be pointed out that, in this study, the improvement was more evident in issues related to the physical aspect of dysphonia, which have been previously described to most impact the quality of life in the elderly.^{29–31}

Regarding aspects of vocal quality, the VTE program provided improvement in auditory-perceptual parameters in both

TABLE 1.
Mean, Standard Deviation, and Comparisons Between the Groups and Between the Times of Assessment for the Socio-Emotional, Physical, and Overall Scores of the V-ROOL Questionnaire

Parameters	Pre		Post 0		Post 1		ANOVA		Tukey
	IG	CG	IG	CG	IG	CG	Effect	P	
Physical score	77.24 ± 15.72	81.60 ± 12.37	86.86 ± 18.47	85.76 ± 15.43	82.18 ± 26.62	85.76 ± 15.43	Therapy Time	0.59 0.02*	Pre < Post 0
Socio-emotional score	84.15 ± 19.36	91.69 ± 9.35	92.80 ± 15.47	93.23 ± 12.34	95.20 ± 9.91	94.80 ± 10.93	Time × therapy Therapy Time	0.93 0.57 0.03*	Pre < Post 1
Overall score	80.00 ± 15.14	85.62 ± 9.83	89.23 ± 16.84	88.54 ± 12.13	87.30 ± 17.98	89.37 ± 12.39	Time × therapy Therapy Time	0.29 0.66 0.01*	Pre < Post 0 Pre < Post 1
							Time × therapy	0.32	

* P significant <0.05.
 ANOVA, analysis of variance.

sustained phonation and connected speech, thus demonstrating ability to modify the phonatory pattern of the elderly. Sustained phonation had a lower overall deviation, roughness, breathiness, and instability, and increased loudness, whereas in connected speech, there was a decrease in roughness and the overall degree of deviation.

Regarding the laryngeal characteristics of the participants in this study, no changes were noticed from before to after the intervention. This may be related to the absence of objective methods of laryngeal assessment. Furthermore, improvements in perceptual and functional characteristics are not necessarily related to laryngeal changes but rather may be due to an increase in phonatory efficiency.³

With respect to the maintenance of the changes after the end of treatment, it is suggested that the improvement in the parameters of vocal quality reflected directly on the socio-emotional and overall score of the voice quality of life protocol 1 month later.

As for the socio-emotional improvement observed only 1 month after the end of the treatment, it is worth considering that this was the period when the patients had the opportunity to experience more communication situations and were then able to quantify the improvement in vocal performance as well as its emotional effect during social activities. The elderly population presents a great need to communicate; however, they have a tendency to describe their vocal quality in a negative way and suffer from the emotional impact of this association,³² which makes improvement in relation to socio-emotional aspects after the end of the treatment relevant. Thus, it is important to discuss the need for regular follow-up of these patients to monitor the manner they are performing exercises at home.

Concerning the vocal parameters, the improvement in the general degree of vocal deviation was maintained along with the optimization of breathiness and instability in sustained phonation and roughness in connected speech. Two studies investigating the maintenance of the benefits of vocal therapy in the medium and long terms showed that not all of its improvements are maintained after treatment ends.^{33,34} However, both studies treated conditions with neurological causes, which have a difficult prognosis, and this should be considered; in spite of that, speech therapy is still of benefit, as vocal improvement has been observed after treatment in this and other studies, enhancing individuals' quality of life.

Regarding the results of the comparison between the IG and CG groups, they differ in the decrease in vocal fold bowing following IG therapy, bringing to this discussion questions on the intensity, frequency, and duration of vocal exercise administration and the response of the laryngeal musculature given these variations.

There is little consensus on the frequency and duration of sessions that constitute intensive treatment, and there have been several discussions about the profile of the patient for whom it is intended.^{35,36} In the literature, only the Lee Silverman Voice Treatment has been described intensively and shown proven efficacy.¹⁹ The few studies on the intensive treatment proposal differentiated this treatment model by describing that the most

TABLE 2.
Comparison of the Post 0 With Pre-Evaluation for the Total Sample of Subjects

		Increase		Decrease		No Difference		<i>P</i>
		n	%	n	%	n	%	
Sustained "a"	ODVD	6	24.00	19	76.00	0	0.00	0.00*
	Roughness	7	28.00	17	68.00	1	4.00	0.01*
	Breathiness	4	16.00	20	80.00	1	4.00	0.00*
	Loudness	18	72.00	1	4.00	6	24.00	0.00*
	Instability	4	16.00	20	80.00	1	4.00	0.00*
Connected speech	ODVD	6	24.00	16	64.00	3	12.00	0.00*
	Roughness	4	16.00	18	72.00	3	12.00	0.00*
	Breathiness	8	32.00	13	52.00	4	16.00	0.13
	Strain	10	40.00	6	24.00	9	36.00	0.39
	Loudness	8	32.00	2	8.00	15	60.00	0.03*

* *P* significant <0.05.

ODVD, overall degree of voice deviation.

TABLE 3.
Comparison of the Post 1 Evaluation With the Post 0 Evaluation for All Subjects in the Sample

		Increase		Decrease		No Difference		<i>P</i>
		n	%	n	%	n	%	
Sustained "a"	ODVD	21	84.00	3	12.00	1	4.00	0.00*
	Roughness	14	56.00	6	24.00	5	20.00	0.07
	Breathiness	13	52.00	3	12.00	9	36.00	0.13
	Loudness	7	28.00	9	36.00	9	36.00	0.46
	Instability	11	44.00	4	16.00	10	40.00	0.26
Connected speech	ODVD	10	41.67	12	50.00	2	8.00	0.83
	Roughness	10	41.67	7	29.17	7	29.17	0.62
	Breathiness	10	41.67	6	25.00	8	33.33	0.45
	Strain	7	29.17	6	25.00	11	44.00	1.00
	Loudness	5	20.83	6	25.00	13	54.17	1.00

* *P* significant <0.05.

ODVD, overall degree of voice deviation.

TABLE 4.
Comparison of the Post 1 Evaluation With the Pre-Evaluation for All Subjects in the Sample

		Increase		Decrease		No Difference		<i>P</i>
		n	%	n	%	n	%	
Sustained "a"	ODVD	7	28.00	16	64.00	2	8.00	0.01*
	Roughness	7	28.00	14	56.00	4	16.00	0.07
	Breathiness	7	28.00	16	64.00	2	8.00	0.01*
	Loudness	14	56.00	7	28.00	4	16.00	0.07
	Instability	7	28.00	16	64.00	2	8.00	0.01*
Connected speech	ODVD	6	24.00	18	72.00	1	4.00	0.00*
	Roughness	6	24.00	16	64.00	3	12.00	0.01*
	Breathiness	6	24.00	13	52.00	6	24.00	0.14
	Strain	10	40.00	7	28.00	8	32.00	0.43
	Loudness	9	36.00	2	8.00	14	56.00	0.07

* *P* significant <0.05.

ODVD, overall degree of voice deviation.

TABLE 5.
Comparison of the IG and CG According to the Results Between Pre and Post 0 Visual-Perceptual Evaluation of the Laryngeal Images

	IG						CG						P
	Increase		Decrease		No Difference		Increase		Decrease		No Difference		
	n	%	n	%	n	%	n	%	n	%	n	%	
Vocal fold bowing	0	0.00	5	38.46	8	61.53	0	0.00	0	0.00	12	100.00	0.01*
Prominence of vocal processes	0	0.00	1	7.69	12	92.31	0	0.00	0	0.00	12	100.00	0.32
Glottic closure	4	30.77	1	7.69	8	61.54	3	25	2	16.67	7	58.33	0.77
Medial vestibule constriction	5	38.46	0	0.00	8	61.54	5	41.67	2	16.67	5	41.67	0.26
Anterior-posterior vestibule constriction	4	30.77	0	0.00	9	69.23	2	16.67	2	16.67	8	66.67	0.26
Alteration in mucosa vibration	4	30.77	2	15.38	7	53.84	4	33.33	2	16.67	6	50.00	0.98

* P significant <0.05.

commonly used traditional approaches are those delivered once or twice a week.^{35,37} The results showed that, in the short and medium term, the responses of the subjects did not differ between intensive and conventional treatment regarding vocal quality and VRQOL. Studies in exercise physiology have indicated that training frequency has a greater impact on gain in muscle volume with shorter periods of training.³⁸ This suggests that in more severe cases of presbyphonia in which there is evident vocal fold bowing due to muscle atrophy, intensive treatment can be of greater benefit.

In general, speech therapy for presbyphonia involves aspects related to motor learning, behavior change, and improvement of muscle tone. The literature shows benefits of many intensive treatments for other conditions with respect to these three aspects.^{38–41} Concerning behavioral dysphonia, there is no scientific evidence of the superiority of intensive over conventional treatment in acoustic, laryngeal, aerodynamic, and vocal quality parameters. The suggestion is that intensive treatment is as beneficial as traditional therapy, but it can improve patient communication in a shorter period of time³⁶; however, long-term assessments are still needed. Future studies should be performed with a sample of individuals who have only vocal fold atrophy. We emphasize the need for more long-term evaluations to verify patients' responses during long periods after treatment and the need for follow-up sessions.

Presbyphonia is characterized, among other factors, by atrophy of the laryngeal musculature,^{12,13} so a decrease in the frequency or intensity of home training can directly affect the maintenance of laryngeal musculature tone. Studies in exercise physiology have shown that an absence of training leads to atrophy or loss of acquired muscle tone.⁴² Vocally active elderly individuals present louder, clearer voices, suggesting that increased vocal activity may prevent voice aging and help maintain its longevity.⁴³ Other research focusing on treatment adherence and response to phonatory aspects at each session should be carried out to contribute more information on the type of approach used: conventional or intensive. There should be further emphasis on the individuality of each patient and factors such as lifestyle, ease of locomotion, time available, and interest in the choice of what therapeutic frequency to be used.^{35,37}

It is emphasized that the VTE is composed of vocal exercises that mainly focus on the glottis and aspects of resonance with a

goal of louder phonation. Even so, the use of sustained phonation and the absence of speech tasks in the therapeutic plan allowed generalized improvement of vocal quality in speech, as well as the maintenance of this improvement, evidencing the effectiveness of the program. Several therapeutic proposals use only exercises with sustained phonation in the vocal treatment, including the Vocal Function Exercises, and have applicability for the elderly population.⁵ In this way, it is possible to affirm that a therapeutic approach with sustained phonation enables generalization to speech situations.

One factor to consider regarding this research is the guidance given to all participants about performing the exercise plan at home, during and after treatment. Such an approach may have been responsible for the similarity between the two groups in the outcomes evaluated, especially regarding aspects of vocal quality and VRQOL. In this study, the greatest difference between CG and IG was whether vocal therapy was carried out in the presence of the speech therapist, as there are still barriers to distance monitoring regarding the manner and frequency of performing the exercises at home.

In addition, this study makes several contributions regarding vocal treatment for the aging voice, showing that an approach using several techniques produces improvements in the parameters of vocal quality impacted by aging, which generates positive responses in patients' quality of life. This indicates that both treatment approaches, an intensive one and a traditional one in terms of frequency, can generate benefits for patients. Moreover, this research suggests that vocal therapy has the potential to minimize the effects of presbylarynx when applied intensively and that this factor should be considered when choosing treatment.

CONCLUSION

The VTE program is effective in the vocal treatment of the elderly, promoting changes in quality of life and vocal quality both in the time immediately after the treatment and a month after its completion.

This research contributes evidence that VTE, applied in an intensive format, promotes benefits similar to those offered in a conventional format with regard to VRQOL and aspects of vocal quality. Intensive therapy produced different effects from

conventional therapy in terms of vocal fold bowing immediately after therapy.

Acknowledgments

This work was supported by the Fundação de Amparo à Pesquisa do Estado de São Paulo—FAPESP, Brazil. Process: 2013/09325-0.

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