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# Effectiveness of two therapeutic modalities in the reduction of vocal symptoms in patients with behavioral dysphonia

## Efetividade de duas modalidades terapêuticas na redução dos sintomas vocais em pacientes com disfonia comportamental

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### ABSTRACT

**Purpose:** To evaluate the effectiveness of two therapeutic approaches in reducing vocal symptoms in patients with behavioral dysphonia. **Methods:** This was an explanatory, quantitative and interventional study. A total of 99 patients of both sexes with behavioral dysphonia who sought speech therapy participated in this study. These patients were allocated into two groups: individual therapy (IT) and group therapy (GT). All participants were subjected to therapy with an eclectic approach. Eight sessions were conducted, comprising a first and a last session for evaluation, with six intervention sessions in between them. A descriptive and inferential statistical analysis was performed to compare the groups and the moments before and after the intervention. **Results:** The majority of participants were female, and there was a predominance of patients who did not use their voice professionally and who had a diagnosis of a laryngeal lesion in the membranous portion of the vocal fold. It should be noted that patients presented similar mean scores at the beginning of therapy regardless of the group to which they were allocated, which indicated the homogeneity of the groups. There were reductions in all Vocal Symptoms Scale (VoiSS) scores after individual and group therapy. No significant differences were observed when comparing the mean posttherapy VoiSS scores between the groups in either domain. Some VoiSS items were unable to detect differences between the pre- and posttherapy timepoints. **Conclusion:** Individual and group therapeutic modalities are effective in significantly reducing self-reported vocal symptoms. The type of intervention influences the reduction in vocal symptoms. Some items of the VoiSS, mainly in the area of limitations, were more sensitive at the posttherapy timepoint in both modalities.

**Keywords:** Dysphonia; Speech therapy; Group practice; Protocols; Signs and symptoms; Voice.

### RESUMO

**Objetivo:** Avaliar a efetividade da terapia de grupo na redução dos sintomas vocais em pacientes com disfonia comportamental compará-la a uma modalidade de terapia tradicional/individual. **Métodos:** Trata-se de uma pesquisa explicativa, quantitativa e de intervenção. Participaram 99 pacientes com disfonia comportamental, de ambos os sexos, alocados em dois grupos: Terapia Individual (TI) e Terapia de Grupo (TG). Todos foram submetidos à terapia com abordagem eclética. Foram realizadas oito sessões, sendo a primeira e a última destinadas à avaliação e as outras seis de intervenção. Realizou-se análise estatística descritiva e inferencial para comparar os grupos e os momentos pré e pós-intervenção. **Resultados:** A maioria dos participantes era do sexo feminino, não usava a voz profissionalmente e com lesão na porção membranosa da prega vocal. Ambos os grupos apresentavam escores médios semelhantes, no início da terapia, fato que mostra a homogeneidade dos grupos. Houve redução de todos os escores da Escala de Sintomas Vocais (ESV) no momento pós-intervenção individual e em grupo. Não foi observada diferença significativa, ao comparar as médias dos escores da ESV pós-terapia entre os grupos. Em relação aos itens da ESV, foi possível observar que alguns podem não detectar as diferenças entre os momentos pré e pós-intervenção. **Conclusão:** Tanto a TI, quanto a TG foram efetivas na redução significativa dos sintomas vocais. Não houve diferença ao comparar os grupos. Alguns itens da ESV, principalmente no domínio limitação, foram mais sensíveis nos momentos pós-intervenção, em ambas modalidades. O tipo de intervenção influencia a redução dos sintomas vocais.

**Palavras-chave:** Disfonia; Fonoaterapia; Prática de grupo; Protocolos; Sinais e sintomas; Voz.

Study carried out at Laboratório Integrado de Estudos da Voz – LIEV, Departamento de Fonoaudiologia, Universidade Federal da Paraíba – UFPB – João Pessoa (PB), Brasil.

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## INTRODUCTION

The voice is an innate neurophysiological function that develops under the influence of other biopsychosocial aspects according to the individual's bodily transformation<sup>(1)</sup>. The voice is an important tool for the process of human communication and socialization and can enrich the transmission of the articulated message by increasing emotional content and expressiveness<sup>(2)</sup>.

When an individual experiences changes or difficulty with their voice, he or she is said to have dysphonia<sup>(3)</sup>. There are several proposals for the classification of dysphonias. The systematic review by Ruotsalainen et al.<sup>(4)</sup> concludes that there is no universally accepted classification, but the most internationally known guideline classifies dysphonia as both behavioral and bodily types<sup>(5,6)</sup>.

Behavioral dysphonia is characterized by vocal alterations related to the vocal behavior of the subject due to inadequate use of the voice or exposure to vocal risk factors; bodily dysphonia features tissue or structural alterations in the organs involved in phonation or other systems that impede the natural production of the voice, independently of the vocal behavior of the individual<sup>(6)</sup>. Therefore, researchers have verified that both genetic and environmental factors have roles in the emergence of voice problems and that this interference can be even greater when the person has some type of occupation that demands use of their voice<sup>(4,5)</sup>.

The literature<sup>(7,8)</sup> indicates that dysphonia mainly manifests through symptoms, the most frequent of which are hoarseness, vocal fatigue, burning and/or pain in the throat and neck area, difficulty in maintaining the voice, variations in fundamental frequency, lack of volume and vocal projection, loss of voice efficiency, and loss of voice.

Studies have shown that one way of treating vocal symptoms and dysphonia is vocal therapy<sup>(9,10)</sup>. Speech therapy can be provided in the traditional manner by a therapist to a single patient<sup>(4,10)</sup> or in a group setting that is described in the literature as quite promising in the area of voice therapy<sup>(11-14)</sup>.

Speech therapy, in its historical process, was more focused on individual therapeutic practice, which is the most traditional approach and is based on the curative medical model. It is a process that involves procedures based on a more direct approach, from the execution of exercises, often aiming only at the installed pathology, since, initially, there is no observation of the patient's social and emotional behavior. For this reason, it is possible that in this model, vocal exercises and orientations little directed to the real life conditions of patients are prioritized with regard to their perception of the disease and its interference in daily life and their social inclusion<sup>(12,13,15,16)</sup>.

In relation to group therapy (GT), some interventions have been carried out for promotion of the population's vocal health and prevention of vocal dysfunction, in addition to rehabilitation, when dysphonia occurs. This therapeutic modality has been shown to be effective, especially in behavioral dysphonia, as this treatment makes it possible to observe the vocal behavior of participants in the social environment, as well as their concerns, doubts and difficulties related to vocal therapy, allowing the selection of exercises and vocal orientations more directed to vocal habits and complaints through an eclectic therapeutic approach<sup>(13,14)</sup>. In addition, a patient can provide psychological support to others by sharing positive and negative feelings and experiences related to the voice problem<sup>(11,12)</sup>.

Thus, it is extremely important to conduct research that shows scientific evidence in relation to treatments for dysphonia to help the therapist choose the best approach/modality for each patient, with gains directed to his/her voice and quality of life. Therefore, the objective of the study was to evaluate the effectiveness of GT in reducing vocal symptoms in patients with behavioral dysphonia, as well as to compare GT to a traditional/individual therapy (IT) modality.

## METHODS

This was an explanatory, quantitative and interventional study. The research was submitted to the Committee of Ethics in Research with Human Beings of the Health Sciences Center of a public educational institution and was approved under protocol number 383.061/2013.

### Study population

Ninety-nine patients with behavioral dysphonia, of both sexes, participated in this study; these subjects voluntarily sought speech therapy in the voice service provided by the Integrated Laboratory of Voice Studies (LIEV) at UFPB, within the scope of the Speech Therapy School Clinic, between February and December of 2016.

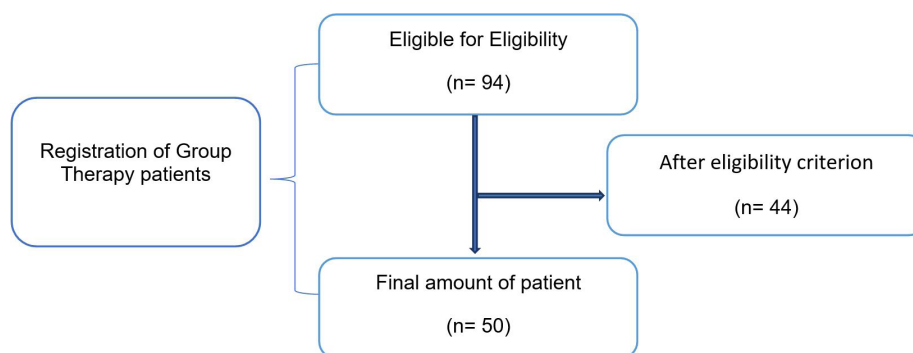
The patients were randomly allocated by the researchers into two groups by selecting medical records according to the patient's order of arrival at the service: IT and GT.

The eligibility criteria for participation in this research were as follows: being an adult with a diagnosis of behavioral dysphonia, based on a laryngological report and auditory-perceptual assessment carried out by a speech therapist; having the necessary pre- and postintervention data completed; not having more than two absences; not having a previous history of speech therapy for the voice; and having no neurological, genetic disease or any other comorbidity that affects cognition, communication and voice.

The GT group was initially made up of 94 patients from 15 therapeutic groups, with an average of six participants, whose therapy occurred throughout the research period. During the intervention, there were 24 dropouts, leaving 70 individuals. After observing the eligibility criteria, such as absence of the laryngological report and number of absences, 50 participants were selected. The IT group, on the other hand, initially had 65 patients, of whom 16 did not meet the eligibility criteria, thus totaling 49 selected participants (Figures 1 and 2). Because of dropouts, it was not possible to match the sample in relation to sex, age and number of participants in each group, but despite this fact, the GT and IT groups had similar demographic characteristics.

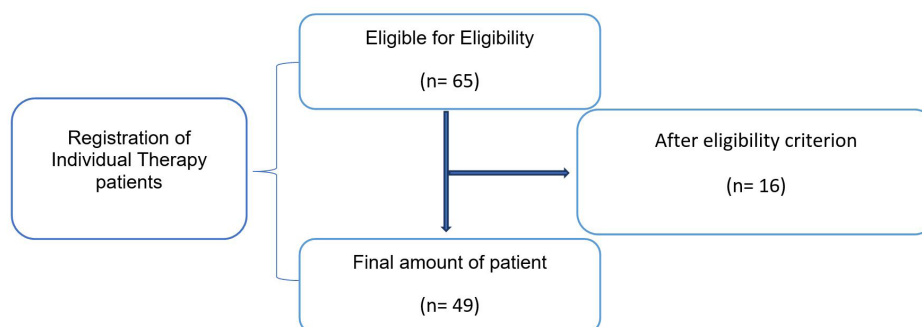
Thus, the present study included 99 patients with behavioral dysphonia of both sexes, with a mean age of 43 ( $\pm 16.1$ ) years. The IT group had 49.5% ( $n = 49$ ) of the participants, and the GT group had 50.5% ( $n = 50$ ) of the participants (Table 1).

It was possible to verify that the majority of participants (70.7%;  $n = 70$ ) were female, with 72% ( $n = 36$ ) in GT and 69.4% ( $n = 34$ ) in IT. There was a predominance of patients who did not use their voice professionally (72%;  $n = 36$  in GT and 81.6%;  $n = 40$  in IT). The majority of participants had a diagnosis of a laryngeal lesion in the membranous portion of the vocal fold (41.4%;  $n = 41$ ), 28% ( $n = 14$ ) in GT and 55.1% ( $n = 27$ ) in IT.



**Figure 1.** Diagram representing the flow of group Therapy participants

**Subtitle:** n = number of individuals



**Figure 2.** Diagram representing the flow of individual Therapy participants

**Subtitle:** n = number of individuals

**Table 1.** Characterization of the sample regarding the demographic variables of patients with behavioral dysphonia submitted to group and individual therapy

Variable	Group Therapy		Individual Therapy		Total	
	n	%	n	%	n	%
Sex						
Female	36	72.0	34	69.4	70	70.7
Male	14	28.0	15	30.6	29	29.3
Professional voice use						
No	36	72.0	40	81.6	76	76.8
Yes	14	28.0	9	18.4	23	23.2
Otorhinolaryngological report						
Lesion in the membranous portion of the vocal fold	14	28.0	27	55.1	41	41.4
Glottic cleft with no bodily or neurological cause	10	20.0	9	18.4	19	19.2
Indefinite laryngeal diagnosis	6	12.0	5	10.3	11	11.1
Absence of laryngeal injury	7	14.0	7	14.3	14	14.1
Others	12	24.0	2.0	2.0	14	14.1

**Subtitle:** n = number of individuals. Source: João Pessoa, 2016

## Data collection

Personal data, such as age, sex, profession and educational level, were collected. The VoiSS was used before and after therapy to monitor the self-assessment of vocal symptoms.

This protocol evaluated the vocal symptoms presented by the patient, providing information about the functionality, emotional impact and physical symptoms that a voice problem can cause in the life of the individual. The VoiSS contains 30 questions

covering three domains: limitation, physical and emotional. Each question can be answered on a *Likert scale* that ranges from 0 to 4, according to the frequency of occurrence noted: (0) never, (1) rarely, (2) sometimes, (3) almost always, (4) always<sup>(17)</sup>.

The limitation score is based on questions 1, 2, 4, 6, 8, 9, 14, 16, 17, 20, 23, 24, 25 and 27. The items in the emotional subscale are numbered 10, 13, 15, 18, 21, 28, 29 and 30. The physical subscale includes items 3, 7, 11, 12, 19, 22 and 26. The maximum score is 120 points. Individuals with dysphonia

have total scores greater than 16 points: 11.5 in the limitation domain, 6.5 in the physical domain and 1.5 in the emotional domain. These values are considered cut-off points for this instrument<sup>(18)</sup>.

## Methodological procedures

The study was started by informing the patient of all of the research procedures. After any questions were resolved, the Free and Informed Consent statement was signed to authorize the beginning of data collection. Two intervention modalities were performed:

IT and GT. Both groups (IT and GT) underwent therapy with an eclectic approach based on direct and indirect therapy for voice. Eight sessions were performed in total, with the first and last sessions for evaluation and the other sessions (second to seventh) used for therapy. Each IT session lasted 30 minutes and was conducted weekly for approximately two months.

The GT sessions lasted approximately 90 minutes. The subjects were approached through experiences and dynamics for 60 minutes. In the remaining 30 minutes, the same vocal exercises were performed as in the IT. The therapeutic program, including the themes and exercises worked in each session, is outlined in Chart 1.

## Data analysis

A descriptive statistical analysis was performed with the objective of describing the data collected to verify the frequencies, means and standard deviations of the studied variables. Subsequently, inferential statistical analysis was performed using appropriate tests with the following objectives:

- Paired Student's t-test: To compare the mean values of the pre- and posttherapy moments for GT and IT;
- Student's t-test for independent samples: To compare the mean VoiSS scores of the therapeutic modalities: individual and group;

**Chart 1.** Description of activities performed in group therapy in patients with voice complaints

Session	Intervention	Instrument
1	Evaluation	Application of VoiSS.
2	Indirect	<b>Therapeutic Interaction:</b> Dynamics of Presentation <b>Increase of Knowledge:</b> Anatomophysiology of vocal production, voice in the life cycle
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> Maximum Phonation Time (MPT)
3	Indirect	<b>Pedagogical Intervention; Therapeutic Interaction:</b> Myths and truths about the Voice
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> MPT <b>Intervention - Auditory; Vocal function; Skeletal muscle; Somatosensory; Respiratory:</b> Stretching/relaxation of the cervical region and scapular girdle; Fricative technique with head lateralization
4	Indirect	<b>Counseling Intervention; Increase in Knowledge:</b> Vocal Psychodynamics, Voice and Emotion
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> TMF <b>Intervention - Auditory; Vocal function; Skeletal muscle; Somatosensory; Respiratory:</b> Stretching/relaxation of the cervical region and scapular girdle; Fricative technique with head lateralization; Semi-occluded vocal tract technique with high resistance tube
5	Indirect	<b>Pedagogical Intervention:</b> Phonoarticulatory Organs and Pneuophonoarticulatory Coordination
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> TMF <b>Intervention - Auditory; Vocal function; Skeletal muscle; Somatosensory; Respiratory:</b> Stretching/relaxation of the cervical region and scapular girdle; Fricative technique with head lateralization; Technique of semi-occluded vocal tract with high resistance tube <b>Musculoskeletal - Orofacial manipulation, Somatosensory:</b> Myofunctional exercises for structures of the stomatognathic system
6	Indirect	<b>Therapeutic Interaction; Increased Knowledge:</b> Laryngeal Diseases
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> TMF <b>Intervention - Auditory; Vocal function; Skeletal muscle; Somatosensory; Respiratory:</b> Stretching/relaxation of the cervical region and scapular girdle; Fricative technique with head lateralization; Semi-occluded vocal tract technique with high resistance tube; Technique of tongue rotation associated with nasal sound <b>Musculoskeletal - Orofacial manipulation, Somatosensory:</b> Myofunctional exercises for structures of the stomatognathic system
7	Indirect	<b>Counseling Intervention; Pedagogical; Therapeutic interaction:</b> Non-verbal communication and expressiveness
	Direct	<b>Respiratory Intervention:</b> Respiratory Support <b>Respiratory Support and Vocal Function:</b> TMF <b>Intervention - Auditory; Vocal function; Skeletal muscle; Somatosensory; Respiratory:</b> Stretching/relaxation of the cervical region and scapular girdle; Fricatives technique of with head lateralization; Semi-occluded vocal tract technique with high resistance tube; Technique of tongue rotation associated with nasal sound <b>Musculoskeletal - Orofacial manipulation, Somatosensory:</b> Myofunctional exercises for structures of the stomatognathic system; Over-articulation technique
8	Reevaluation	Application of VoiSS.

**Subtitle:** VoiSS = Voice Symptoms Scale; MPT = Maximum Phonation Time

- Chi-square test: Associations between variables: To associate the frequency of reduction in posttherapy symptoms and the type of speech-language intervention performed. The reduction was obtained from the difference between the post- and pretherapy groups or individual scores in the three domains of the VoiSS. Thus, when post-VoiSS scores were lower than pretherapy scores (post < pre), the vocal symptoms were considered to have been reduced;
- Wilcoxon test: To compare the VoiSS items before and after individual and group therapies.

It is important to mention that to classify the laryngeal diagnoses, the patients were allocated into four categories: absence of laryngeal lesion, glottic cleft without bodily or neurological cause, lesion in the membranous portion of the vocal folds (nodules, polyps and cysts)<sup>(19)</sup> and indefinite laryngeal diagnosis with behavioral involvement.

Differences were considered significant when  $p < 0.05$ . Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 13.0 (IBM Brasil, São Paulo, SP, Brazil).

## RESULTS

The comparison of the means of the ESV scores in the pre- and postintervention moments in both groups showed that, in the therapy group, there was a reduction in all the domains of the ESV (Table 2). The average total score decreased from  $45.56 (\pm 23.10)$  to  $32.20 (\pm 18.85)$  ( $p < 0.0001$ ); the limitation domain, from  $25.77 (\pm 13.67)$  to  $18.64 (\pm 11.48)$  ( $p < 0.0001$ );

the emotional domain, from  $8.46 (\pm 8.15)$  to  $4.88 (\pm 5.87)$  ( $p < 0.0001$ ); and the physical domain, from  $11.36 (\pm 4.95)$  to  $8.68 (\pm 4.21)$  ( $p < 0.0001$ ). In IT, there was a significant reduction in the mean of the total ESV score, which decreased from  $47.85 (\pm 27.21)$  to  $36.12 (\pm 24.26)$  ( $p = 0.001$ ); in the limitation domain, from  $27.67 (\pm 16.09)$  to  $21.20 (\pm 14.32)$  ( $p = 0.002$ ); in the emotional domain, from  $9.32 (\pm 9.13)$  to  $6.85 (\pm 7.45)$  ( $p = 0.025$ ); and in the physical domain, from  $10.85 (\pm 6.60)$  to  $8.06 (\pm 5.77)$  ( $p = 0.004$ ). Thus, it was possible to observe that patients undergoing IT also had a significant reduction in their vocal symptoms.

It is important to mention that a comparison of the means of the ESV scores between the GT and IT groups was performed. Notably, patients had similar scores at the beginning of therapy, regardless of the group to which they were allocated, a fact that shows the homogeneity of the groups. There was no significant difference when comparing the means of the ESV scores between the groups in any of the domains. These data indicate that the therapeutic sessions, both in the IT group and in the GT group, were effective in reducing vocal symptoms, as observed in the reduction in pre- and postintervention means.

Table 3 contains data on the association of the frequency of increase and reduction in scores in the ESV domains with the pre- and postgroup and individual intervention moments. Although both modalities were effective, the reduction in symptoms was associated with the type of therapy to which the individual was submitted and was significantly greater in the GT group; in the total domains ( $p = 0.049$ ), in which 54.9% ( $n = 45$ ) of the volunteers improved emotionally ( $p = 0.002$ ) and in which 60.9% ( $n = 42$ ) had reduced scores at the subsequent time; and in the physical domain ( $p = 0.007$ ), with 57.9% ( $n = 44$ )

**Table 2.** Comparison of the means of the VoiSS domains in the pre- and post-therapy timepoints for group and individual therapy in individuals with behavioral dysphonia

Variable	Pre-therapy		Post-therapy		p-value
	Average	Standard deviation	Average	Standard deviation	
VoiSS - T (GT)	45.56	23.10	32.20	18.85	0.0001*
VoiSS - L (GT)	25.77	13.67	18.64	11.48	0.0001*
VoiSS - E (GT)	8.46	8.15	4.88	5.87	0.0001*
VoiSS - P (GT)	11.36	4.95	8.68	4.21	0.0001*
VoiSS - T (IT)	47.85	27.21	36.12	24.26	0.001*
VoiSS - L (IT)	27.67	16.09	21.20	14.32	0.002*
VoiSS - E (IT)	9.32	9.13	6.85	7.45	0.025*
VoiSS - P (IT)	10.85	6.60	8.06	5.77	0.004*

Paired Student's t-test; \* significance  $p \leq 0.05$

**Subtitle:** GT= Group therapy; IT= individual therapy; VoiSS - T = Total Voice Symptom Scale; VoiSS - L = Voice Symptom Scale Limitation domain; VoiSS - E = Voice Symptom Scale Emotional domain; VoiSS - P = Voice Symptom Scale Physical domain

**Table 3.** Association between reduction and increase of scores of the ESV domains with the type of therapy to which the individual was submitted

Variables		group therapy		individual therapy		p-value
		n	%	n	%	
VoiSS - T Post	Reduction	45	54.9	37	45.1	0.049*
	Increase	5	29.4	12	70.6	
VoiSS - E Post	Reduction	42	60.9	27	39.1	0.002*
	Increase	8	26.7	22	49.5	
VoiSS - P Post	Reduction	44	57.9	32	42.1	0.007*
	Increase	6	26.1	17	73.9	

Chi-square test; \*significance  $p < 0.05$

**Subtitle:** VoiSS - T = Total Voice Symptom Scale; VoiSS - E = Voice Symptom Scale Emotional domain; VoiSS - P = Voice Symptom Scale Physical domain

reduced scores in relation to the pretherapy moment; that is, GT stood out in the reduction in total vocal, emotional and physical symptoms. The reduction or increase in the scores of the limitation domain was not associated with the type of therapy ( $p = 0.142$ ) (Table 3).

Regarding the modification of the ESV items by comparing the responses given by the patients, in the moments before and after the group intervention, the items that showed significant changes in the moment after the intervention were 02, 03, 04, 07, 08, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28 and 29. Thus, 63.4% ( $n = 19$ ) of items from the ESV changed after

group intervention, and 36.6% ( $n = 11$ ) showed no changes (Table 4).

Table 5 shows the modification of the items on the Voice Symptoms Scale by comparing the responses of IT. The items that showed significant changes were 04, 10, 11, 12, 13, 14, 15, 17, 19, 20, 23, 24, 25 and 29. Thus, 46.6% ( $n = 14$ ) of ESV items changed at the time of IT, and 53.4% ( $n = 16$ ) of the ESV items did not change. In all of these questions, the responses at the postintervention moment were equal or significantly lower in number than those at the preintervention moment among the patients evaluated for behavioral dysphonia (Table 5).

**Table 4.** Analysis of the modification of VoiSS's items by comparing pre- and postgroup therapy responses

VoiSS ITEMS		Post<Pre (n)	Post>Pre (n)	Post=Pre (n)	p-value
02	Do you have problems singing?	25	4	21	0.0001*
03	Is your throat sore?	17	8	25	0.036*
04	Is your voice hoarse?	24	7	19	0.001*
07	Do you cough or clean your throat?	24	10	16	0.006*
08	Do you have a weak voice?	21	10	19	0.007*
11	Does it feel as if there is something stuck in your throat?	22	8	20	0.025*
15	Does your voice problem make you feel stressed and nervous?	17	7	26	0.014*
16	Do you have difficulty competing against background noise?	22	8	20	0.021*
17	Are you unable to shout or raise your voice?	25	5	20	0.001*
18	Does your voice problem put a strain on your Family and friends?	16	9	25	0.047*
19	Do you have a lot of phlegm in your throat?	21	13	16	0.037*
20	Does the sound of your voice vary throughout the day?	23	6	21	0.008*
21	Do people seem irritated by your voice?	17	12	31	0.003*
22	Do you have a blocked nose?	20	8	22	0.028*
23	Do people ask what is wrong with your voice?	20	7	23	0.008*
24	Does your voice sound creaky and dry?	20	8	22	0.020*
25	Do you feel you have to strain to produce voice?	25	6	19	0.001*
28	Does your voice make you feel incompetent?	18	3	29	0.007*
29	Are you ashamed of your voice problem?	17	3	30	0.0001*

Wilcoxon Test; \*significance  $p < 0.05$

Subtitle: n = number of individuals; VoiSS = Voice Symptoms Scale

**Table 5.** Analysis of the modification of VoiSS's items by comparing the pre- and post individual therapy responses

VoiSS ITEMS		Post<Pre (n)	Post>Pre (n)	Post=Pre (n)	p-value
04	Is your voice hoarse?	23	4	28	0.001*
10	Do you feel miserable or depressed because of your voice problem?	16	5	28	0.042*
11	Does it feel as if there is something stuck in your throat?	20	8	21	0.012*
12	Do you have swollen glands?	16	8	25	0.016*
13	Are you embarrassed by your voice problem?	19	6	24	0.011*
14	Do you find the effort of speaking tiring?	26	12	11	0.011*
15	Does your voice problem make you feel stressed and nervous?	23	7	19	0.004*
17	Are you unable to shout or raise your voice?	20	6	23	0.006*
19	Do you have a lot of phlegm in your throat?	24	10	15	0.023*
20	Does the sound of your voice vary throughout the day?	21	7	21	0.003*
23	Do people ask what is wrong with your voice?	22	5	22	0.0001*
24	Does your voice sound creaky and dry?	21	8	20	0.002*
25	Do you feel you have to strain to produce voice?	24	9	16	0.019*
29	Are you ashamed of your voice problem?	16	10	23	0.044*

Wilcoxon Test; \*significance  $p < 0.05$

Subtitle: n = number of individuals; VoiSS = Voice Symptoms Scale

## DISCUSSION

This study evaluated speech therapy data in two modalities: individual therapy (IT) and group therapy (GT). Both had an eclectic approach and showed effectiveness in reducing vocal symptoms for the population with behavioral dysphonia. Studies provide evidence that IT is effective in reducing vocal symptoms<sup>(14,20)</sup>. Therefore, it was important to research the effectiveness of GT in this aspect to support group practices in health services that meet high demands.

Speech therapy has three types of intervention approaches: direct therapy, which covers vocal exercises; indirect therapy, which provides advice and guidance on vocal hygiene; and eclectic care, which uses a combination of direct and indirect approach strategies<sup>(4)</sup>. All of these approaches have the same goal of reducing vocal changes and the professional, social and emotional impacts resulting from dysphonia.

Currently, speech therapists use both approaches and create a customized treatment program, or eclectic vocal therapy<sup>(11)</sup>. Ruotsalainen et al.<sup>(4)</sup> categorized interventions to treat behavioral dysphonia in direct and indirect treatment techniques. In the use of direct techniques, the intervention is focused on the speech apparatus, working with the components of vocal production itself, such as breathing and laryngeal configuration. The indirect techniques, on the other hand, start from the assumption that an educational approach helps the individual to identify the factors that maintain the problem and, thus, lead to awareness and behavior change. Indirect therapy focuses on eliminating factors that maintain vocal alteration. In this type of treatment, the intervention is focused on modifying mental or bodily functions that influence voice production. The study mentions the possibility of combining the two approaches, through voice-oriented health education, added to techniques designed in vocal quality.

Regarding the research population, both groups were formed by a majority of subjects who were females, non-voice professionals, and diagnosed with lesions in the membranous portion of vocal folds or glottic cleft.

Studies have shown that women have more voice disorders than men, as they are twice as likely to develop vocal problems due to anatomophysiological issues related to their laryngeal configuration<sup>(21,22)</sup>. In addition, women seek health services more than men do and represent up to 76% of clinical referrals to voice clinics<sup>(23)</sup>.

It was noticed that there was a greater demand for patients who did not use their voice as a means of work, a fact that may indicate that vocal symptoms are present in different populations, despite the knowledge that people with highly demanding professions are more at risk of developing voice problems. The data showed that the concern and complaints related to the voice go beyond having it as a work tool. The demand for vocal rehabilitation is related to the intensity with which the problem affects the quality of life and daily tasks<sup>(19)</sup> and not necessarily the profession.

In general, there are several factors that contribute to the appearance of symptoms and vocal changes, a fact that makes it clear that dysphonia cannot be explained by a single cause<sup>(24)</sup>. The appearance of dysphonia is related to numerous etiological factors that are common among the general population. Personality type, lifestyle and vocal habits can contribute to healthy or

unhealthy patterns of vocal production<sup>(25)</sup>. These situations can increase the risk of dysphonia.

Most of the patients in the study presented lesions in the membranous portion of the vocal fold. Behavioral dysphonias include these lesions, in addition to glottal clefts, or voice alteration with no laryngeal modification. The appearance of this type of dysphonia is associated with the incorrect or abusive use of the voice, which can generate repetitive phonotrauma, contributing to the installation of laryngeal lesions. This is the most common diagnosis found in the dysphonic population<sup>(26)</sup>.

The most common benign lesions are nodules, vocal polyps, granulomas, Reinke's edema and leukoplakia, with the nodule being the most common lesion in women and the most frequent in clinical practice. Speech therapy is considered effective in the treatment of these vocal disorders<sup>(4,8)</sup>.

GT was effective in reducing vocal symptoms in all domains of the ESV, as well as in individual scores. In the postgroup intervention period, despite being a more recent therapeutic modality, GT proved to be an excellent strategy, especially in public services, where there is a great demand for speech therapy.

Almeida et al.<sup>(13)</sup> performed a systematic literature review to verify the effects of group speech therapy in patients with dysphonia. As a result, it was observed that group vocal therapy is an effective therapeutic modality for dysphonia in all phases of the life cycle, both in actions to promote vocal health and in the prevention and rehabilitation of voice disorders.

In relation to IT, speech therapy studies for voice<sup>(6,10)</sup> have demonstrated its effectiveness and explained that it is a process that involves procedures of different types, in order to develop the best oral communication, with a reduction in phonatory effort, decrease in vocal symptoms, and adequacy of vocal quality and acoustic parameters of the voice, according to the individual's personal, social and professional needs.

Ribeiro et al.<sup>(27)</sup> carried out a retrospective study, with a review of 42 medical records of women with behavioral dysphonia, to assess the results of vocal, laryngeal and self-perception evaluations after speech therapy. Direct therapy with vocal techniques was used, and indirect therapy was used with guidance on vocal health care. After the therapy sessions, an improvement in the perceptual-auditory parameters of the general degree of dysphonia and roughness was observed with respect to the acoustic measurements of jitter and shimmer, as well as improvement of the laryngeal image and positive impact of the voice on the quality of life of the evaluated teachers after speech therapy treatment. According to the literature and this study, eclectic therapy has benefits in the multidimensional aspects of the voice.

When comparing the two modalities, the groups behaved similarly in the pre- and postintervention moments, since the intergroup comparison of individual and group therapy was not significant. This fact leads one to believe that both approaches were effective and provided important gains in reducing vocal symptoms, which confirms and adds to the literature data.

A study carried out the presentation of the Comprehensive Vocal Rehabilitation Program (PIRV), which used an eclectic approach when associating vocal techniques with the knowledge of vocal hygiene and a communicative attitude<sup>(10)</sup>. The program proposal includes six initial sessions, exploring aspects initially presented in the global approach to dysphonia. After six therapeutic sessions, the authors were able to perceive the improvement in vocal quality and laryngeal pattern, in addition

to more satisfactory values in the Voice Handicap Index and Voice Quality of Life Questionnaire<sup>(28)</sup>.

Regarding clinical evolution, GT appears to be promising<sup>(13)</sup>. Several studies have shown the effectiveness of this therapeutic modality using the eclectic approach in several vocal aspects, such as proprioceptive and auditory symptoms<sup>(22)</sup>, reduction in vocal risk factors<sup>(14)</sup>, and increasing coping strategies in dysphonia. These cited studies even used the same group of therapeutic programs applied in this study.

The research data indicated that the type of therapeutic modality significantly influenced the reduction in vocal symptoms in the total, emotional and physical domains, mainly in GT patients.

As GT is effective in the treatment of dysphonia, it was already expected that the symptoms would generally decrease, but the fact that this reduction stands out in relation to the emotional aspects related to dysphonia may reflect the favoring of better personal and interpersonal relationships in the group, which can provide a more satisfactory coping environment through sharing and exchanging experiences, in addition to assisting the patient's rehabilitation process in physical, social and emotional aspects<sup>(13)</sup>.

It was observed that some of the ESV items may not detect the differences between the pre- and postintervention moments. Therefore, it is important that other studies be carried out using this protocol to seek more information regarding the sensitivity of the items.

The items that were most sensitive to improvement, in both modalities, belong to the limitation domain, which includes symptoms related to functionality, that is, the patient's limitations in relation to the voice production caused by dysphonia<sup>(17)</sup>. In this domain, symptoms such as hoarseness, loss of voice, weak/low voice, voice failures and tiredness when speaking are considered. The literature pointed out that there is a positive correlation between the limitation domain of the ESV and the intensity of the vocal deviation; that is, patients with greater intensity of the vocal deviation may present a greater number of vocal symptoms related to the limitation<sup>(29)</sup>.

A group favors a more natural atmosphere of everyday communication, facilitates the learning of motor skills of techniques that can be more effective than those learned in the presence of only the speech therapist, and helps the individual to cope with the disease and reduce his/her anxiety levels<sup>(13)</sup>. In addition patients can provide psychological support to others because GT allows participants to interact through the sharing of experiences and knowledge, which fosters the development of a new view of themselves and others in the face of the disease, reduces the anxiety generated, and helps the individual to face the stressors better<sup>(14)</sup>. The coexistence provided by the group favors the formation of therapist-patient bonds and between patients, making the environment more welcoming and motivating for participation and causing better adherence to the therapeutic proposal<sup>(29)</sup>.

The literature proves the effectiveness of GT, in preventing vocal disorders, as well as in improving quality of life, decreasing exposure to risk factors and vocal symptoms, and reduction in the voice handicap index, acoustic and auditory-perceptual measures, during rehabilitation<sup>(5,13,14)</sup>. In addition, as already mentioned, the group generates an environment capable of covering the biopsychosocial issues of the participants so that the treatment is truly multidimensional<sup>(12)</sup>.

In view of the research results, GT stood out, relative to the individual, in reducing vocal symptoms, and it may be

concluded that the therapeutic group environment is highly conducive to voice treatment. This finding is important, as it contributes to the scientific field and to the clinical practice of speech therapists in services with high demand, enabling the practice of group processes in the rehabilitation of patients with behavioral dysphonia, with the purpose of reducing waiting lines. In addition, the present study allows the replicability of its methodology in these services.

## CONCLUSIONS

Individual and group therapy modalities were effective in significantly reducing self-reported vocal symptoms. The type of intervention influenced the reduction in vocal symptoms. Compared to IT, GT was superior in reducing symptoms assessed by VoiSS scores.

In addition, it was observed that some VoiSS items, mainly in the limitation domain, were more sensitive to improvement at the posttherapy timepoints in both modalities.

## REFERENCES

1. Maia AA, Michalick-Triginelli MF. Relação entre transtorno do déficit de atenção/hiperabilidade, dinâmica familiar, disфония e nódulo vocal em crianças. *Rev Cienc Méd.* 2012;15(5):379-89.
2. Souza OC, Hanayama EM. Fatores psicológicos relacionados adisфония funcional e a nódulos vocais em adultos. *Rev CEFAC.* 2005;7(3):388-97.
3. Behlau M. O livro do especialista. Rio de Janeiro: Revinter; 2008. Vol. 1.
4. Ruotsalainen J, Sellman J, Lic P, Lehto L, Verbeek J. Systematic review of the treatment of functional dysphonия and prevention of voice disorders. *Otolaryngol Head Neck Surg.* 2008;138(5):557-65. <http://dx.doi.org/10.1016/j.otohns.2008.01.014>. PMID:18439458.
5. Simberg S, Santtila P, Soveri A, Varjonen M, Sala E, Sandnabba NK. Exploring genetic and environmental effects in dysphonия: a twin study. *J Speech Lang Hear Res.* 2009;52(1):153-63. [http://dx.doi.org/10.1044/1092-4388\(2008/07-0095\)](http://dx.doi.org/10.1044/1092-4388(2008/07-0095)). PMID:18664695.
6. Behlau M, Zambon F, Moreti F, Oliveira G, Barros Couto E Jr. Voice self-assessment protocols: different trends among organic and behavioral dysphonias. *J Voice.* 2016. In press. PMID:27210475.
7. Servilha EAM, Pena J. Tipificação de sintomas relacionados à voz e sua produção em professores identificados com ausência de alteração vocal na avaliação fonoaudiológica. *Rev CEFAC.* 2010;12(3):454-61. <http://dx.doi.org/10.1590/S1516-18462010005000035>.
8. Choi-Cardim K, Behlau M, Zambon F. Sintomas vocais e perfil de professores em um programa de saúde vocal. *Rev CEFAC.* 2010;12(5):811-9. <http://dx.doi.org/10.1590/S1516-18462010005000075>.
9. Speyer R. Effects of voice therapy: a systematic review. *J Voice.* 2008;22(5):565-80. <http://dx.doi.org/10.1016/j.jvoice.2006.10.005>. PMID:17509828.
10. Behlau M, Pontes P, Vieira VP, Yamasaki R, Madazio G. Apresentação do Programa Integral de Reabilitação Vocal para o tratamento das disfonias comportamentais. *CoDAS.* 2013;25(5):492-6. <http://dx.doi.org/10.1590/S2317-17822013000500015>. PMID:24408556.
11. Gartner-Schmidt J, Roth DF, Zullo TG, Rosen CA. Quantifying component parts of indirect and direct voice therapy related to different

- voice disorders. *J Voice*. 2013;27(2):210-6. <http://dx.doi.org/10.1016/j.jvoice.2012.11.007>. PMID:23352061.
12. Law T, Lee KYS, Ho FNY, Vlantis AC, Van Hasselt AC, Tong MCF. The effectiveness of group voice therapy: a group climate perspective. *J Voice*. 2012;26(2):e41-8. <http://dx.doi.org/10.1016/j.jvoice.2010.12.003>. PMID:21550777.
  13. Almeida LNA, Fahning AKCA, Trajano FMP, Anjos UU, Almeida AAF. Group voice therapy and its effectiveness in the treatment of dysphonia: a systematic review. *Rev CEFAC*. 2015;17(6):2000-8. <http://dx.doi.org/10.1590/1982-021620151765815>.
  14. Silva WJND, Lopes LW, Macedo AER, Costa DBD, Almeida AAF. Reduction of risk factors in patients with behavioral dysphonia after vocal group therapy. *J Voice*. 2017 Jan;31(1):123.e15-9. PMID:26897544.
  15. Penteado RZ, Servilha EAM. Fonoaudiologia em saúde pública/coletiva: compreendendo prevenção e o paradigma da promoção da saúde. *Distúrb Comun*. 2004;16(1):107-16.
  16. Almeida AAF, Telles MAQ. Autopercepção como facilitadora de terapia vocal em grupo. *Distúrb Comun*. 2009;21:373-83.
  17. Moreti F, Zambon F, Oliveira G, Behlau M. Cross-cultural adaptation, validation, and cutoff values of the Brazilian version of the voice symptom scale: VoiSS. *J Voice*. 2014;28(4):458-68. <http://dx.doi.org/10.1016/j.jvoice.2013.11.009>. PMID:24560004.
  18. Behlau M, Madazio G, Moreti F, Oliveira G, Santos LM, Paulinelli BR, et al. Efficiency and cutoff values of self-assessment instruments on the impact of a voice problem. *J Voice*. 2016 Jul;30(4):506.e9-18. PMID:26168902.
  19. Cohen SM, Kim J, Roy N, Asche C, Courey M. Prevalence and causes of dysphonia in a large treatment-seeking population. *Laryngoscope*. 2012;122(2):343-8. <http://dx.doi.org/10.1002/lary.22426>. PMID:22271658.
  20. Vital HRMC, Lima-Silva MFB, Almeida LNA, Almeida AAF. Sintomas vocais auditivos e sensoriais pré e pós-terapia de grupo de pacientes com disфония. *Rev CEFAC*. 2016;18(5):1189-99. <http://dx.doi.org/10.1590/1982-0216201618521315>.
  21. Dejonckere PH, Bradley P, Clemente P, Cornut G, Crevier-Buchman L, Friedrich G, et al. A basic protocol for functional assessment of voice pathology, especially for investigating the efficacy of (phonosurgical) treatments and evaluating new assessment techniques. *Eur Arch Otorhinolaryngol*. 2001;258(2):77-82. <http://dx.doi.org/10.1007/s004050000299>. PMID:11307610.
  22. Cielo CA, Gonçalves BFD, Lima JPDM, Christmann MK. Afecções laringeas, tempos máximos de fonação e capacidade vital em mulheres com disфония organofuncional. *Rev CEFAC*. 2012;14(3):481-8. <http://dx.doi.org/10.1590/S1516-18462011005000126>.
  23. Gomes R, Nascimento EF, Araújo FC. Por que os homens buscam menos os serviços de saúde do que as mulheres? As explicações de homens com baixa escolaridade e homens com ensino superior. *Cad Saude Publica*. 2007;23(3):565-74. <http://dx.doi.org/10.1590/S0102-311X2007000300015>.
  24. Jones SM, Carding PN, Drinnan MJ. Exploring the relationship between severity of dysphonia and voice-related quality of life. *Clin Otolaryngol*. 2006;31(5):411-7. <http://dx.doi.org/10.1111/j.1749-4486.2006.01291.x>. PMID:17014451.
  25. Hein R, Behlau M. Voz do especialista. Rio de Janeiro: Revinter; 2006. Perfil vocal de padres e seminaristas da igreja católica.
  26. Barata LF, Madazio G, Behlau M, Brasil O. Análise vocal e laringea na hipótese diagnóstica de nódulos e cistos Vocal and laryngeal analyses in diagnostic hypotheses of nodules and cysts. *Rev Soc Bras Fonoaudiol*. 2010;15(3):349-54. <http://dx.doi.org/10.1590/S1516-80342010000300007>.
  27. Ribeiro VV, Santos AB, Prestes T, Bonki E, Carnevale L, Leite APD. Autoavaliação vocal e qualidade de vida em voz de indivíduos hipertensos. *Rev CEFAC*. 2013;15(1):128-34. <http://dx.doi.org/10.1590/S1516-18462012005000074>.
  28. Pedrosa V, Pontes A, Pontes P, Behlau M, Peccin SM. The effectiveness of the comprehensive voice rehabilitation program compared with the vocal function exercises method in behavioral dysphonia: a randomized clinical trial. *J Voice*. 2016;30(3):377.e11. <http://dx.doi.org/10.1016/j.jvoice.2015.03.013>. PMID:25959424.
  29. Lopes LW, Silva HF, Evangelista DS, Silva JD, Simões LB, Costa e Silva PO, et al. Relação entre os sintomas vocais, intensidade do desvio vocal e diagnóstico laringeo em pacientes com distúrbios da voz. *CoDAS*. 2016;58051(4):900. <http://dx.doi.org/10.1590/2317-1782/20162015062>.