

# Voice therapy with a respiratory approach in older adults: the practice of Brazilian speech-language-hearing therapists

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## ABSTRACT

**Purpose:** to investigate the practice of Brazilian speech-language-hearing therapists in voice therapy for older adults focused on breathing and verify possible associations between taking specific courses and having knowledge of respiratory parameters, between using incentive spirometers and respiratory devices, and between age and the use of these instruments.

**Methods:** the sample had 156 specialists in voice, contacted via email, who answered a form in Google Forms. Specialists in voice with 3 or more years of experience were included, whereas those who did not fill out the questionnaire completely were excluded. The analysis addressed absolute and relative frequencies and associations with the chi-square test. Significance was set at 5%.

**Results:** most participants took courses on respiratory approach. The use of facilitating sounds, vocal function exercises, and respiratory instruments stood out, with reported vocal improvements. The use of incentive spirometers was associated with respiratory devices, and age was associated with the use of respiratory instruments.

**Conclusion:** speech-language-hearing therapists with expertise in voice provide voice therapy for dysphonic older people focusing on a respiratory approach. Professionals who use incentive spirometers also use respiratory devices. Older therapists are the ones who most use respiratory instruments and taking specific courses was not associated with knowledge on respiratory parameters.

**Keywords:** Aged; Voice Quality; Voice Training; Respiration; Voice Disorders

A study conducted at Universidade Federal de Pernambuco, Recife, Pernambuco.

**Financial support:** Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - Process 001.

**Conflict of interests:** Nonexistent.

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**Received on:** January 24, 2023  
**Accepted on:** July 11, 2023



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## INTRODUCTION

Aging is part of a natural, progressive, degenerative, multifactorial process, characterized by changes that decrease the anatomical and functional efficiency of body structures<sup>1</sup>. Such changes stand out in the structures involved in voice production, as they have individual characteristics and are influenced by previous vocal behaviors<sup>2</sup>.

Laryngeal aging is called presbylarynx, and natural aging-related voice changes are called presbyphonia. The signs of the latter include tremors, frequency changes, decreased intensity, fatigue, and vocal instability, commonly associated with complaints such as hoarseness, changes in quality, difficulties in projecting the voice, dry throat, and constant phlegm<sup>2,3</sup>. Among other factors, presbyphonia may result from changes in the respiratory system, as breathing plays an essential role in voice production – airflow from the lungs is responsible for the negative pressure that mobilizes the mucosa of the vocal folds, approached by the laryngeal adductor muscles<sup>4</sup>.

The rib cage stiffens over time and decreases lung elasticity, which directly influences the mechanics of breathing and oral communication<sup>1,5</sup>. Physiological changes in the respiratory system may decrease the vital capacity (VC) and maximum phonation time (MPT), thus increasing breathing pauses, decreasing speech rate, and causing breathing/speech articulation incoordination<sup>3,5,6</sup>.

Voice interventions focused on a respiratory approach in this study were based on vocal exercises (according to methods and techniques) whose performance requires greater breathing awareness than other ones. This category includes Vocal Function Exercises (VFE)<sup>7</sup>, Voice Therapy for the Elderly (VTE)<sup>8</sup>, the Lee Silverman Voice Treatment<sup>®</sup> (LSVT) aimed at Parkinsonian patients<sup>9</sup>, the Phonation Resistance Training Exercise (PhoRTE)<sup>7</sup>, glottal closure techniques, semi-occluded vocal tract exercises (SOVTE), including the use of resonance tubes<sup>10</sup>, and so forth. This study also considered instruments such as incentive spirometers (IS) and respiratory devices (RD)<sup>11</sup>.

These resources can attenuate changes brought about by aging, helping improve this population's communication-related quality of life<sup>8</sup>. Hence, this study aimed to investigate the practice of Brazilian speech-language-hearing (SLH) therapists in voice therapy focused on breathing for dysphonic older adults and verify possible associations between taking specific courses and knowing respiratory parameters, the relationship between using IS and RD, and the association between the age and the use of these instruments.

The study raised the following questions: "What is the practice of Brazilian SLH therapists in voice therapy focused on breathing for dysphonic older adults?", "Is there an association between taking specific courses and knowing respiratory parameters?", "Is there a relationship between using IS and RD?", and "Is there an association between age and the use of respiratory instruments?". It was hypothesized that most Brazilian SLH therapists use techniques and methods focused on the respiratory approach in voice intervention with older patients. It was also believed that there is a relationship between taking specific courses and knowing respiratory parameters. It was also expected that professionals who use IS also use RD. Lastly, an association was expected to be found between age and the use of respiratory instruments.

## METHODS

This cross-sectional study was approved by the Research Ethics Committee of the *Universidade Federal de Pernambuco* (UFPE), under number 4.490.530 and CAAE number 39406120.7.0000.5208. Data were collected online between April and June 2021. The research sample had 156 volunteer SLH therapists with expertise in the voice, of both sexes, aged 20 to 60 years. Most of them were females, aged 41 to 50 years, and worked in the state of São Paulo and in clinics/offices (Table 1). A little more than half of them had been working in the profession for 20 or more years. Moreover, most participants had a master's degree, followed by a specialist and doctor's degree (Table 1).

**Table 1.** Identification and professional profile of speech-language-hearing therapists who participated in the research, registered in the Brazilian Federal Speech-Language-hearing Council

Variables	Number of SLH therapists (n=156)	Relative frequency (%)
<b>Sex</b>		
Females	141	90.0
Males	15	9.6
<b>Age</b>		
Under 21 years	18	11.0
21 - 30 years	7	4.5
31 - 40 years	33	21.2
41 - 50 years	68	43.6
51 - 60 years	30	19.2
Above 60 years	18	11.5
<b>Time of experience</b>		
3 - 6 years	3	1.9
7 - 10 years	13	8.3
11 - 20 years	48	30.8
20 or more years	92	59
<b>Training (highest degree)</b>		
Specialization	25	16
Residency	1	0.6
Specialist	35	22.4
Master's	53	34
Doctoral	35	22.4
Postdoctoral	7	4.5
<b>Work settings</b>		
Clinic/office	120	76.9
Home care	41	26.3
Hospital	40	25.6
NASF/primary healthcare	4	2.6
School	8	5.1
Healthcare center at a university/college	39	25
Teaching clinic	35	22.4

Captions: SLH = speech-language-hearing; NASF = Portuguese for Family Health Support Center.

The professionals were considered experts in voice when they had 3 or more years of experience treating patients in the area of voice; had taken specialization courses in voice and/or had a specialist degree recognized by the Federal SLH Council (CFFa); and were registered in the Brazilian Regional SLH Councils (CREFONO) 1 to 9. Those who did not completely fill out the questionnaire in Google Forms were excluded.

The sample calculation was based on the number of voice specialists registered in Brazil, according to CFFa data available on its website. In January 2020, there were 1,138 registered SLH therapists. The calculation hypothesized that 75% of the SLH therapists had a specialization and/or were specialists in voice and treated older people. The calculation also considered a

20% loss, a 10% margin of error, and a 95% confidence interval, resulting in a sample of 138 SLH therapists.

### Improvement of the research instrument and data collection

A form was initially developed based on a literature review, considering voice interventions with a respiratory approach those that were based on vocal exercises (according to methods and techniques) whose performance required greater breathing awareness than other ones.

The collection instrument was improved based on an analysis performed by a group of judges with expertise in voice. They were invited according to a survey of public and private universities/colleges with

SLH programs in all Brazilian regions. Altogether, the heads of departments of 16 institutions were contacted via email, which included the following documents: 1) a brief explanation of the research objective and procedures, 2) the research project, and a consent letter. It also requested the voice specialists' e-addresses for future contact and proposed a 15-day deadline for them to return the signed document. By then, five heads of department had answered and sent a signed consent form.

After their reply, these institutions' specialists were listed and directly contacted as potential judges. They were likewise contacted via email, which included the research project, an informed consent form, a form to analyze the judge's profile, the content assessment form, and the form entitled, "Voice therapy focused on a respiratory approach in older adults: the practice of Brazilian SLH therapists", which was developed to this end. If they agreed to participate and met the profile defined in the inclusion criteria, the professionals were asked to respond by signing and sending the informed consent form, thus being considered judges of the research form. Five judges participated in this stage.

The previously developed form had 27 multiple-choice questions, divided into three parts: "Identification and professional profile", "Training and perception on therapy with a respiratory approach", and "Professional practice in voice therapy with a respiratory approach for older adults". Only one answer could be given to its questions, with a different number of options according to the type of question. There was no final score, and the data were counted by simply summing the answer options checked by all participants.

The judges analyzed the content according to the Delphi method<sup>12</sup>, divided into two rounds to obtain, guide, and compare their judgments and reach a consensus on the content of each assessment item.

The content validity index (CVI)<sup>13</sup> was calculated based on the scores given by the judges to each question. After the 15-day deadline, the judges sent their evaluation, and the form was approved with a 95% CVI. The suggestions were discussed, considered, and resent to the judges to verify the changes made and suggest any final adjustments, with a new 10-day deadline. When the judges had finished the assessment and the final version of the form had been proposed in

Docs format, the online form was developed in Google Forms and sent to the Brazilian professionals.

## Data collection

The list with the name of SLH therapists who specialized in voice was obtained from the public domain CFFa website, which presents the names of SLH therapists according to their area of specialization. Further contact information was obtained with the snowball method – i.e., some participants that had been contacted sent the invitation to other participants among their friends and acquaintances to answer the form. The researchers also asked the Regional SLH Councils 1-9, the Brazilian SLH Society, the Voice Leagues all over the country, and the specialization courses in the area to help publicize the research.

Participants received the invitation to participate, a link with a brief explanatory text, and an informed consent form. The form was made available in Google Forms to be filled out by those who agreed to participate. After 60 days, the link was no longer available, and the form could no longer be answered.

## Statistical analysis

Data were analyzed with descriptive statistics with categorical variables, according to their absolute and relative frequency distribution. For inferential analysis, data were analyzed with the chi-square association test, setting the level of significance at 5%.

## RESULTS

Most participants reported they had taken one or more short courses focused on the respiratory approach. Most of them were introduced to voice intervention focused on a respiratory approach during specialization. Also, most participants provided interventions focused on the respiratory approach (Table 2).

Regarding respiratory parameters, many participants were familiar with VC, followed by maximum expiratory pressure (MEP) and maximum inspiratory pressure (MIP). Many participants stated they had never used any instrument to assess these parameters, and less than half of them used or had already used IS. Most respondents also stated that no physical therapists or pulmonologists were present during respiratory assessments (Table 2).

**Table 2.** Identification of speech-language-hearing therapists' training and perception of work with a respiratory approach and knowledge of respiratory parameters and assessment

Variables	Number of SLH therapists (n=156)	Relative frequency (%)
<b>Course focused on respiratory approach</b>		
Took one or more specific courses focused on respiratory approach	103	66
Took a course that addressed aspects of breathing, but not in depth	42	26.9
Did not take any course addressing aspects of breathing	11	7.1
<b>Moment in training when the course was taken</b>		
Undergraduate	52	33.3
Residency	4	2.6
Specialization	104	66.7
Master's	29	18.6
Doctoral	21	13.5
Postdoctoral	4	2.6
Never took such courses	17	10.9
<b>Integration of voice intervention with a focus on a respiratory approach</b>		
Appreciated the topic and provides/would provide such care	144	92.3
Appreciated the topic, but would rather indicate another professional	9	5.8
Is not interested, but provides/would provide such care	1	0.6
Is not interested and does not/would not provide such care	1	0.6
None of the above	1	0.6
<b>Knowledge of respiratory parameters</b>		
VC	148	94.9
FEV1/VC	61	39.1
FEF	105	67.3
PEF	79	50.6
Flow-volume curve	43	27.6
MIP	108	69.2
MEP	110	70.5
Does not know	5	3.2
<b>Respiratory assessment instruments</b>		
Respiratory pressure meter	16	10.3
Spirometer	68	43.6
Peak flow	34	21.8
None of the above	71	45.5
<b>Respiratory assessment accompanied by a physical therapist and/or pulmonologist</b>		
Yes	29	18.6
No	66	42.3
Never used any of the instruments	61	39.1

Captions: SLH = speech-language-hearing; VC = vital capacity; FEV1/VC = Ratio between the expiratory volume in the 1st second and the vital capacity; FEF = forced expiratory flow; PEF = peak expiratory flow; MIP = maximum inspiratory pressure; MEP = maximum expiratory pressure.

Most professionals' therapy practice included exercises with facilitating sounds (nasal, plosive, trill, fricative, high-pitched, and vocal fry) and the glottal closure technique. Exercises with nasal sounds were the most cited among the facilitating ones. As for the

glottal closure technique, which includes SOVTE, many participants used rigid and flexible tubes immersed in water and fricative sounds. Moreover, the most used structured programs and methods were FEV and LSVT® (Table 3).

**Table 3.** Identification of voice techniques, exercises, and methods/programs with a respiratory approach used by speech-language-hearing therapists with expertise in voice in older patients

Variables	Number of SLH therapists (n=156)	Relative data (%)
<b>Voice techniques</b>		
Facilitating sounds (nasal, plosive, trill, fricative, high-pitched, vocal fry)	141	90.4
MPT	133	85.3
Glottal closure	135	86.5
Messa di Voce	54	34.6
Prolonged /b/	85	54.5
<b>Exercises with facilitating sounds</b>		
Nasal	121	77.5
Plosive	54	34.6
Trill	82	52.5
Fricative	80	51.2
High-pitched	37	23.7
Vocal fry	40	25.6
<b>Glottal closure/SOVTE</b>		
Trill (lip and tongue trill)	129	82.7
Fricative sounds	134	85.9
Nasal sounds	108	69.2
Prolonged /b/	98	62.8
Finger Kazoo	103	66
Humming	113	72.4
Rigid or flexible tubes immersed in water	139	89.1
<b>Methods/Programs</b>		
VFE	90	57.7
VTE	36	23.1
LSVT®	79	50.6
PhoRTE	22	14.1
CVP	16	10.3
None of the above	36	23.1

Captions: SLH = speech-language-hearing; MPT = maximum phonation time; SOVTE = semi-occluded vocal tract exercises; VFE = Vocal Function Exercise; VTE = Voice Therapy for the Elderly; LSVT = Lee Silverman Voice Treatment®; PhoRTE = Phonation Resistance Training Exercise; CVP = Cognitive Vocal Program.

Respiron® was the best-known and most used IS for older adults. Most of those who used IS reported a good experience with the population 60 years or older. Also, Shaker® stood out as the best-known and most-used RD in therapy with older people, reported by more than half of the participants. The experience with

Shaker® also proved to be good for most participants who had already used it (Table 4).

Most professionals responded that IR and RD improved their older patients' therapeutic progress, reporting greater gains in MPT, loudness, and VC (Table 4).

SOVTE stood out among voice intervention strategies focused on a respiratory approach in older people, particularly using rigid or flexible tubes immersed in water and self-perception respiratory

training. Increased MPT was the most cited benefit expected from the association between voice therapy and respiratory approach (Table 4).

**Table 4.** Identification, knowledge, and perception of the use of respiratory instruments by speech-language-hearing therapists with expertise in voice in older patients

Variables	Number of SLH therapists (n=156)	Relative data (%)
<b>Knowledge of IS</b>		
Respiron®	151	96.8
Cliniflo®	18	11.5
Threshold®	76	48.7
Voldyne®	91	58.3
Does not know	5	3.2
<b>IS use in older adults</b>		
Respiron®	126	80.8
Cliniflo®	6	3.8
Threshold®	27	17.3
Voldyne®	36	23.1
None of the above	28	17.9
<b>IS experience with older adults</b>		
Good	108	69.2
Average	20	12.8
Poor	1	0.6
Not applicable	27	17.3
<b>Knowledge of RD</b>		
Shaker®	136	87.2
Flutter®	46	29.5
Acapella®	57	36.5
EMST 150®	75	48.1
Does not know	19	12.2
<b>RD use in older adults</b>		
Shaker®	97	62.2
Flutter®	10	6.4
Acapella	12	7.7
EMST 150®	23	14.7
None of the above	57	36.5
<b>RD experience with older adults</b>		
Good	92	59
Average	13	8.3
Poor	0	0
Not applicable	51	32.7
<b>IS and RD in older adults' therapeutic progress</b>		
Yes	114	73.1
Does not know	4	2.6
No	2	1.3
Not applicable	36	23.1

Variables	Number of SLH therapists (n=156)	Relative data (%)
<b>Benefits expected from using IS and RD</b>		
Better voice perception	65	41.7
Increased MPT	120	76.9
Balanced resonance	70	44.9
Decreased roughness	53	34
Decreased breathiness	67	42.9
Decreased strain	67	42.9
Improved loudness	97	62.2
Improved pitch	44	28.2
Improved jitter	37	23.7
Improved shimmer	43	27.6
Improved GNE	31	19.9
Improved vital capacity	87	55.8
Does not use these instruments	27	17.3
<b>Strategies in voice intervention with a respiratory approach</b>		
Training with respiratory self-perception	133	85.3
Exercise to increase MPT	130	83.3
SOVTE	136	87.2
Flexible or rigid tube as SOVTE	129	82.7
IS	111	71.2
RD	84	53.8
<b>Benefits expected from voice intervention strategies with a respiratory approach</b>		
Better voice perception	112	71.8
Increased MPT	143	91.7
Balanced resonance	99	63.5
Decreased roughness	73	46.8
Decreased breathiness	99	63.5
Decreased strain	91	58.3
Improved loudness	127	81.4
Improved pitch	61	39.1
Improved jitter	57	36.5
Improved shimmer	63	40.4
Improved GNE	42	26.9
Improved VC	102	65.4
Does not know	0	0

Captions: SLH = speech-language-hearing; IR = incentive spirometer; RD = respiratory device; MPT = maximum phonation time; GNE = Glottal-to-noise excitation; VC = vital capacity; SOVTE = semi-occluded vocal tract exercises.

Taking specific courses focused on a respiratory approach was not associated with the knowledge of respiratory parameters. Professionals who used IS

also used RD in older people, and older professionals were the ones who used respiratory instruments (Table 5).

**Table 5.** Knowledge of respiratory parameters and specific course taken on respiratory approach; the use of incentive spirometers and respiratory devices in older people; and the use of incentive spirometers and respiratory devices with the speech-language-hearing therapists' ages

Knowledge of respiratory parameters	Took one or more courses on a respiratory approach	Did not take any course on a respiratory approach	Total	p-value*
Knows	100	10	110	0.844
Does not know	3	1	4	
Overall Total	103	11	114	
Use of incentive spirometers and respiratory devices	Uses RD	Does not use RD	Total	p-value*
Use IS	98	30	128	<0.0001
Does not use IS	2	26	28	
Overall Total	100	56	156	
Use of incentive spirometers and respiratory devices	Up to 40 years old	Above 40 years old	Total	p-value*
Acapella	6	6	12	0.123
Cliniflo	2	4	6	
EMST 150	10	13	23	
Flutter	3	7	10	
Voldyne	19	17	36	
Threshold	11	16	27	
Respiron	34	92	126	
Shaker	30	67	97	
Overall Total	115	222	337	

\* Pearson's chi-square test – level of significance at 5%  
 Captions: IS = Incentive spirometer; RD = respiratory device.

## DISCUSSION

Respiratory approaches have always been present in voice therapy, and new therapeutic resources make it possible to improve older adults' voice-related quality of life. Hence this study aimed to investigate the practice of Brazilian SLH therapists with expertise in voice concerning voice interventions focused on a respiratory approach in older adults with dysphonia.

More than half of the participants had taken courses that trained them in voice therapy focused on a respiratory approach. Even though it is essential to know respiratory parameters<sup>14,15</sup>, the search for further knowledge in this area is justified by the interest in applying respiratory instruments in voice clinical practice.

In general, professionals know all respiratory parameters. VC was the most cited respiratory measure and the one most used in clinical practice. It refers to the maximum volume exhaled from the lungs after maximum inhalation, and the spirometer measures it as either slow VC or forced VC<sup>16,17</sup>. Spirometers are commonly used to assess breathing dynamics, thus

helping verify the person's respiratory capacity, glottal efficiency, and the use of inhaled air to speak<sup>17</sup>.

MEP and MIP were other often cited respiratory parameters. This finding may be related to the need for exchange between the various areas of knowledge when approaching respiratory issues. It may also be related to older adults' decreased MIP due to inspiratory muscle weakness and decreased MEP due to less abdominal and intercostal muscle strength<sup>6,18</sup>.

MEP and MIP are knowingly assessed with respiratory pressure meters. They are respectively measured based on the volume near the residual volume and total pulmonary capacity<sup>18,19</sup>. They are often used in the follow-up and diagnosis of pulmonary and/or abdominal pathologies for being simple, low-cost, and noninvasive<sup>20</sup>, belonging to the field of action and interest of respiratory physical therapists and pulmonologists. Hence, these professionals must be present during such assessments<sup>16</sup>. Nonetheless, many professionals reported they had already used at least one of the assessment instruments, especially the spirometer – highlighting the use of more instrumental resources in the participants' clinical practice.

Nasal sounds stood out among the facilitating sound techniques used in voice therapy practice. Facilitating sounds improve loudness without straining the emission, which contributes to vocal performance. Thus, they are always an important choice for older patients, who often seek vocal compensations that avoid effort during phonation<sup>8,21,22</sup>. Moreover, nasal sounds help project the voice, decreasing laryngopharyngeal resonance, and helping balance phonation.

SOVTE stood out among glottal closure exercises, as they are often used and easy to apply, partly or totally occluding the lips<sup>23</sup>. The most cited ones were voiced breathing with rigid or flexible tubes immersed in water and fricative sound emission. Both exercises are effective regarding the tactile-kinesthetic perception of the vocal tract, increased voice intensity and resonance, and improved glottal closure<sup>23,24</sup>. They also help improve aerodynamic (subglottal pressure and glottal resistance) and acoustic measures (sound pressure level). Moreover, they are low-cost and easy to obtain, which reinforces their indication for voice therapy in older people<sup>8</sup>.

FEV and LSVT<sup>®</sup> were the most cited methods and programs already established in SLH therapy. They are also easy to apply and are based on proven scientific evidence. The result related to FEV may be due to changes in the laryngeal muscles and respiratory support in voice production, which focus on airflow and laryngeal muscle strength, balancing the voice production systems – i.e., phonation, breathing, and resonance<sup>5,25</sup>.

LSVT<sup>®</sup> is an excellent voice treatment method for Parkinsonian patients<sup>9</sup>, and applying it requires specific training. Its main goal is to increase the respiratory impulse and phonatory effort<sup>9,26</sup>, whose results indicate improved glottal closure, phonatory function, and acoustic and auditory-perceptual characteristics of voice<sup>8,25,26</sup>. The method had also proved to effectively treat subjects with presbyphonia<sup>26</sup>. Interestingly, despite the need for specific training, the professionals cited LSVT<sup>®</sup> as an often-used treatment resource.

IS are highly applicable in SLH clinical practice, especially in voice. These instruments provide simple and safe exercises to help expand the lungs, increase airway permeability, strengthen respiratory muscles, and potentialize the mechanical process of pulmonary ventilation and arterial oxygenation<sup>5,11,27</sup>. Respiro<sup>®</sup> stood out among them for being the one best known by the participants.

Study participants also cited Respiro<sup>®</sup> as the most used IS in older adults, probably because it is manufactured in Brazil, widely known in the country, inexpensive<sup>27</sup>, and ensures respiratory improvement results. Furthermore, Respiro<sup>®</sup> provides visual feedback, which encourages users to do the exercises, and comes in the Easy model as well, which is exclusively for older people and tends to change with advancing age<sup>27,28</sup>. Hence, all these factors can justify the professionals' good acceptability of this resource and experience with it.

Shaker<sup>®</sup> was reported as more used and better known than the other RD. It was also mentioned as the most used device in voice therapy for older adults. Shaker<sup>®</sup>, as Respiro<sup>®</sup>, is manufactured in Brazil, which makes it less expensive; it is also often used by respiratory physical therapists. If used in voiced activities, it may even provide direct vocal gains<sup>24</sup>. However, about one third of the professionals reported not using any such devices in older adults. One of the explanations may be related to comorbidities common to aging, which contraindicates the use of IS and RD<sup>17,24</sup>.

IS use was positively associated with RD use by professionals. This reinforces that these instruments are increasingly present in health professionals' clinical practice<sup>17</sup>, including SLH therapists. There is evidence that RD and IS use in voice therapy can increase VC and MPT of vowels and fricative phonemes, related to aspects of phonatory system stability, vocal fold glottal closure, and efficient coordination between the respiratory and phonatory systems<sup>6,19,29</sup>. They also have a great therapeutic potential to improve auditory-perceptual and acoustic vocal measures, voice self-assessment, and laryngeal imaging, thus improving the subject's overall functional capacity in their activities of daily living<sup>19,20,30</sup>.

Attention is called to the fact that SLH therapists above 40 years old use respiratory instruments more often. This result may be related to professional maturity, exposure to various professional experiences, and the need to update professionally and keep up with therapeutic innovations with faster results.

More than half of the participants perceived that IS and RD use contributes to voice therapy progress. This result agrees with studies that indicate improved voice quality, greater glottal closure efficiency, improved source-filter relationship, and gains in associated intraoral muscles<sup>8,21</sup>. Study participants also reported expected results, such as increased MPT, improved loudness and VC, and so on, which are aligned with

these instruments' objectives. These expectations are coherent with the functionality of exercises that have been proposed and results that have been obtained<sup>8,21</sup>. Moreover, there is evidence of an association between VC and MPT<sup>24,31</sup>.

The professionals reported a wide range of voice intervention strategies focused on a respiratory approach in older people. The use of SOVTE was rather evident, followed by respiratory self-perception training and MPT increase exercises – which help balance voice and breathing<sup>23,24</sup>. Voice therapy focused on a respiratory approach for older people has various goals, including increased MPT and loudness, improved voice self-perception and VC, balanced resonance, and decreased breathiness<sup>5,21</sup>.

A limitation of this research was the greater participation of SLH therapists from Southeastern Brazil, which diminished the representativity of the sample per region. Another limitation was the total number of participants, due to difficulties contacting each professional, mainly because of the Data Protection Law.

## CONCLUSION

Voice therapy focused on a respiratory approach proved to be present in the daily work of professionals with expertise in voice when treating older people. Hence, SLH therapists highlighted the use of exercises with facilitating sounds and the glottal closure technique, as well as the use of respiratory instruments.

SLH therapists reported seeking knowledge of practices related to voice-breathing, although taking specific courses was not associated with the knowledge of respiratory parameters. In everyday clinical practice with older people, professionals who used IS also used RD. Moreover, older professionals were the ones that most used IS and RD.

## ACKNOWLEDGEMENTS

Research support source: Financial support by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001 and Pró-Reitoria de Pós-Graduação da Universidade Federal de Pernambuco (PROPG-UFPE).

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#### Authors' contributions:

RLSL: Research conceptualization, investigation, methodology, writing, review, and editing;

AOCG: Formal analysis, supervision, conceptualization, resources, review, and editing;

MRGQ: Methodology and investigation;

ZSL, LMSP: Conceptualization, visualization, and formal analysis;

JAL: Supervision, project management, conceptualization, formal analysis, review, and editing.