

Voice therapy in the context of Telespeech therapy in dysphonic patients: an integrative review

Terapia vocal no contexto da Telefonaudiologia em pacientes disfônicos: revisão integrativa

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ABSTRACT

Purpose: To describe the characteristics of telespeech therapy for dysphonic patients. **Research strategy:** The research was based on the PCC method (Population/Concept/Context) and involved developing the research question, finding and selecting the studies, extracting the data, and clinically assessing the papers, based on Joanna Briggs protocol. The studies were searched in VHL, PubMed/MEDLINE, Web of Science, Scopus, and EMBASE in English, Portuguese, and Spanish, with descriptors from DeCS, MeSH, and Emtree and using the Boolean operators. **Selection criteria:** Original studies addressing telespeech therapy for the dysphonic population were included, with no restriction of publication year. Duplicate publications in the databases were excluded. **Results:** A total of 5,740 studies were found, of which only four were included based on the eligibility criteria. The studies were published between 2015 and 2020, and most of them were from the United States. Most studies were carried out with older women. The intervention had a variety of functioning methods, data safety, number, frequency, and duration of the sessions, and therapeutic exercises. There were improvements in various voice parameters assessed in the studies. **Conclusion:** Telespeech therapy for dysphonic patients is aimed at different audiences with different voice problem etiologies. Various methodologies were employed in remote voice healthcare with positive voice parameter results and the patients' satisfaction with the treatment they received in this format.

Keywords: Voice; Dysphonia; Voice disorders; Voice training; Telerehabilitation

RESUMO

Objetivos: Descrever as características da terapia vocal por meio da Telefonaudiologia com pacientes disfônicos. **Estratégia de pesquisa:** A pesquisa foi baseada na metodologia PCC (População/Conceito/Contexto) e envolveu a elaboração da questão a ser investigada, localização e seleção de estudos, extração de dados e avaliação crítica dos trabalhos, segundo protocolo Joanna Briggs. A busca dos estudos foi realizada nas bases BVS, PubMed/MEDLINE, Web of Science, Scopus e Embase, nos idiomas inglês, português e espanhol, por meio dos descritores do DeCS, MeSH e Emtree, entre os operadores booleanos. **Crterios de seleção:** foram incluídos estudos originais, sem limite de ano de publicação, que envolvessem o atendimento à população disfônica, por Telefonaudiologia. Foram excluídas as publicações repetidas nas bases de dados. **Resultados:** Foram encontrados 5.740 estudos, dos quais apenas quatro artigos foram incluídos após os critérios de elegibilidade. As publicações foram registradas entre 2015 e 2020, com maior número nos Estados Unidos da América. A maioria dos trabalhos foi realizada com mulheres idosas. A intervenção apresentou variações quanto ao método de funcionamento, segurança de dados, número, frequência e duração de sessões, além de exercícios terapêuticos. Ademais, foram apontadas melhorias em diversos parâmetros vocais avaliados nos estudos. **Conclusão:** A Telefonaudiologia junto a pacientes disfônicos é voltada para diferentes públicos com etiologias vocais diversas. Além disso, há diferentes metodologias empregadas para o atendimento em voz à distância, com resultados positivos relacionados aos parâmetros vocais, bem como satisfação do paciente quanto ao tratamento realizado nesse formato.

Palavras-chave: Voz; Disfonia; Distúrbios da voz; Treinamento da voz; Telerreabilitação

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INTRODUCTION

Distance speech-language-hearing care, known as telespeech therapy, is a regulated practice, previously carried out in specific therapeutic contexts. This practice was aimed at patients with difficulties accessing the professionals in person⁽¹⁾, with the additional benefit of being a low-cost measure that decreased the therapists' and/or patients' traveling time^(1,2) and the movement of individuals with impaired physical mobility⁽³⁾.

In the context of the COVID-19 pandemic, the telespeech therapy gradually expanded, especially given the need for social distancing and isolation. Although telespeech therapy was regulated by the Brazilian Federal Speech-Language-Hearing Council in 2013⁽⁴⁾, it was not used massively, as it is now in the pandemic^(5,6). Hence, due to the world health scenario, it was necessary to restructure the provision of this service, reaffirming virtual care with the new telespeech therapy regulation, in 2020⁽⁷⁾.

Some barriers are faced in distance health care. In most cases, they are related to the patients' lack of access to technological resources, their unwillingness to use this new attention format, or even their preference for in-person visits. The professionals, in their turn, have adherence and applicability difficulties for not knowing how to handle the virtual tool or for the low quality of the image/audio/Internet connection, which may cause the session to be discontinued^(1-3,8).

There are additional specific difficulties in the field of voice, related to the need for in-person assessment and the use of software with high-quality video and audio recording, calibrated with an acoustic speech processor⁽⁹⁾. Despite the difficulties in the field, there has been a prevailing need on the part of patients with Parkinson's disease, in whose cases positive post-treatment results have been recorded, particularly regarding the use of the Lee Silverman-LSVT[®] method⁽¹⁰⁻¹²⁾ in telespeech therapy. Further in the virtual setting, besides the LSVT, other methodologies are also used in voice clinics, such as vocal instructions^(13,14), resonant voice therapy, voice function exercise, relaxation, and directed speech tasks⁽¹⁴⁾. Generally, the various studies highlight improvements in the self-perception of voice⁽¹⁵⁾, maximum phonation time (MPT)⁽¹⁴⁾, acoustic voice parameters, with emphasis on the sound pressure level^(11,12), auditory-perceptual parameters, such as the overall degree of dysphonia^(14,15), roughness⁽¹⁴⁾, asthenia⁽¹⁴⁾, and loudness^(10,12). Therefore, this distance voice rehabilitation modality can benefit patients with dysphonia.

This research questions: "What are the characteristics of voice telespeech therapy with dysphonic patients?". Telespeech therapy is approached as an additional modality in

the health care of dysphonic patients, involving the possibility of using various technologies, with positive results and user satisfaction.

Considering that this health care modality is growing and given the current need for telespeech therapy, preserving people's safety and health, it is necessary to know more in-depth the voice therapy experiences in this format. This study aimed to synthesize the scientific knowledge on the characteristics of this voice clinical practice format. The objective was to point out evidence for clinical speech-language-hearing therapists to provide distance care with confidence. This review also contributed to developing voice promotion, assessment, monitoring, and therapy strategies in telespeech therapy.

OBJECTIVE

To describe the characteristics of voice telespeech therapy with dysphonic patients.

Research strategy

This review followed these stages: (1) constructing the research question; (2) developing the eligibility criteria and searching the literature; (3) extracting data from the selected articles; (4) critically assessing the studies; (5) interpreting/discussing the findings; (6) presenting the integrative review⁽¹⁶⁾.

The research question was: "What are the characteristics of voice telespeech therapy with dysphonic patients?". The question was based on the PCC strategy, in which P (Population) = individuals with dysphonia; C (Concept) = voice therapy; C (Context) = telespeech therapy⁽¹⁷⁾.

To answer the question, original articles were surveyed in the databases: BVS, PubMed/MEDLINE, Web of Science, Scopus, and Embase, with descriptors in English, Spanish, and Portuguese, selected from DeCS (Health Sciences Descriptors), MeSH (Medical Subject Headings), and Emtree (Embase Subject Headings). The collection took place from January 28 to February 20, 2021. The following descriptors were used in English: Dysphonia OR "voice disorder" AND "voice training" AND telerehabilitation AND voice; in Spanish: Disfonía OR "trastornos de la voz" AND "entrenamiento de la voz" AND telerehabilitación AND voz; and in Portuguese: Disfonia OR "distúrbios da voz" AND "treinamento da voz" AND telerreabilitação AND voz. The strategies are described in Chart 1.

The literature was searched based on articles that approached only telespeech voice therapy in dysphonic patients. Hence, the

Chart 1. Databases surveyed and the respective search strategies employed

Databases	Search strategies
PubMed	((dysphonia OR "voice disorder") AND "voice training" AND telerehabilitation AND voice))
BVS	((dysphonia OR "voice disorder") AND "voice training" AND telerehabilitation AND voice))
BVS	disfonía OR "Trastornos de la Voz" AND "Entrenamiento de la Voz" AND Telerehabilitación AND voz
BVS	disfonia OR "Distúrbios da Voz" AND "Treinamento da Voz" AND Telerreabilitação AND voz
Scopus	dysphonia OR "voice disorder" AND "voice training" AND telerehabilitation AND voice
Embase	dysphonia OR voice disorder AND voice training AND telerehabilitation AND voice
Web of Science	dysphon* OR voice disord* AND voice training AND tele* AND voice

broad terms, such as telemedicine, telehealth, and telemonitoring, were not excluded.

The articles were identified by two independent reviewers, who first read the title and abstracts, applying the inclusion or exclusion criteria. Lastly, all articles were read in full. In case of disagreement between the two initial reviewers, a third one was asked to participate in the article analysis. This reviewer's participation was only necessary to judge articles about which the two first reviewers disagreed.

Selection criteria

The inclusion criteria were as follows: original articles (cross-sectional, case-control, cohort, quasi-experimental, and randomized clinical trials) addressing the health care provided to the dysphonic population via telespeech therapy, with no limits regarding the year of publication. Duplicate publications in the databases were excluded.

Data analysis

The data were extracted and managed in a spreadsheet developed in Excel and filled in by the reviewers. The following data were analyzed and extracted from each study included in the review: author/year; place of the study; design; objectives; population (age range, number of subjects, sex); method (functioning method of the distance health care; data security; resources used, number of sessions, type of exercise); results.

The critical assessment of the studies consisted of analyzing the methodological quality of the selected articles. This phase was conducted by two reviewers, based on the protocols of the Joanna Briggs Institute (JBI)⁽¹⁸⁾, according to the study design. Thus, only articles with at least 60% of positive items in the JBI protocols⁽¹⁹⁾ were included in this review.

RESULTS

Of the 5,740 articles found in the databases, two were selected from PubMed, eight from BVS, four from Scopus, zero from Embase, and 5,726 from Web of Science. However, only four were included in the integrative review (Figure 1). After the methodological quality assessment, these four papers remained.

The studies were published between 2015 and 2020; they were predominantly from the United States (50%); the designs were quasi-experimental (50%) and clinical trial (50%); the objectives, in general, were to investigate the application of distance voice therapy sessions in individuals with various etiologies – Parkinson's disease (25%); muscle tension dysphonia (50%), and older adults with voice changes (25%). The sample sizes ranged from eight to 69 subjects, with a notable presence of females and populations that included from young people to, especially, older adults. Concerning voice telespeech therapy, some papers addressed only distance interventions^(11,20) and research comparing groups with telespeech therapy and conventional therapy^(21,22). Concerning rehabilitation, they were mostly synchronous^(11,21,22). As for data security, two articles^(11,20) used the SSL system (Secure Sockets Layer) and Adobe Connect. The interventions were held in eight to 12 sessions, once or twice a week, lasting from 20 to 90 minutes, with a variety of interventions (vocal hygiene, Lee Silverman-LSVT® method, airflow exercise, semi-occluded vocal tract exercises, voice function exercises, and perceived-control exercises for individuals with voice problems). Most findings from the studies indicated improved acoustic and auditory-perceptual parameters, MPT, and voice self-perception, besides the patients' acceptability and usability of the treatment in this format, using different resources (software, application, and videoconference platform). Charts 2 and 3 show the characteristics of the studies included in this review.

Chart 2. Overall characterization of the studies included in the review

Author	Place	Type of study	Objective	Sample
Lin et al. ⁽²¹⁾	China	Randomized Clinical Trial	To examine the hypothesis that voice therapy via telepractice is not inferior to traditional voice therapy.	69 subjects distributed into two groups: telepractice (33 participants – 14 women and 19 men – aged 57 to 82 years and mean of 66 years) and conventional therapy (36 participants – 19 women and 17 men – aged 58 to 81 years and mean of 69 years).
Quinn et al. ⁽¹¹⁾	Australia	Quasi-experimental	To establish the feasibility of a speech maintenance program for people with Parkinson's disease, via telerehabilitation.	8 subjects with Parkinson's disease – 2 women and 6 men – aged 61 to 81 years and mean of 69 years.
Nguyen-Feng et al. ⁽²⁰⁾	USA	Quasi-experimental	To establish the feasibility, usability, and acceptability of an online perceived-control intervention for individuals with voice disorders and collect preliminary data on the effectiveness of the intervention.	20 dysphonic patients distributed into two groups: 10 university students with muscle tension dysphonia and 10 subjects who self-reported as dysphonic; 12 women and 8 men, 18 to 80 years old.
Rangarathnam et al. ⁽²²⁾	USA	Prospective Randomized	To establish the usefulness of telepractice to conduct flow phonation exercises for people with primary muscle tension dysphonia.	14 individuals with muscle tension dysphonia, divided into two groups: telepractice (7) and conventional therapy (7); 11 women and 3 men, 16 to 81 years old and mean age of 50 years.

Subtitle: USA = United States of America

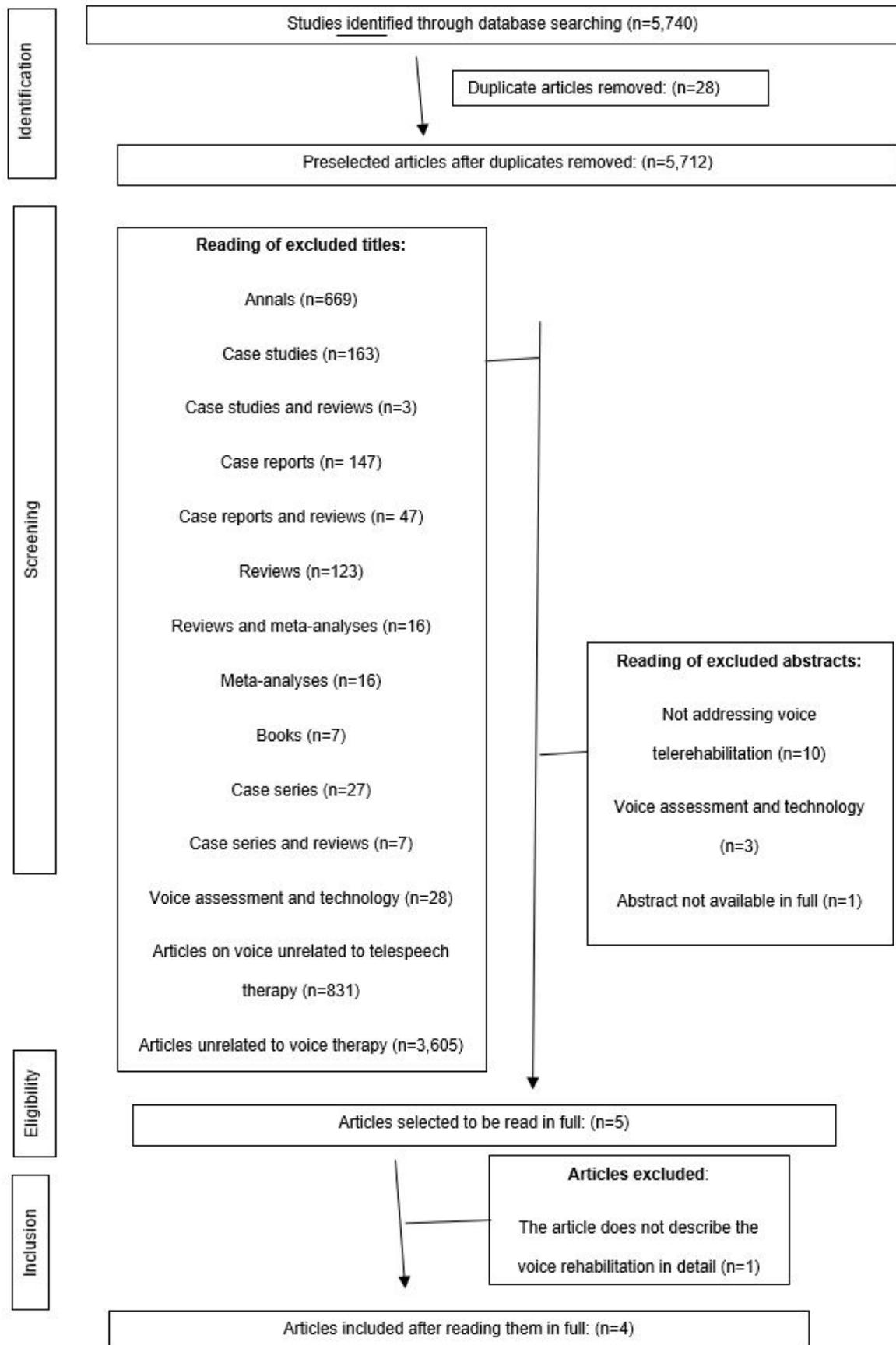


Figure 1. Flowchart of study selection
Subtitle: n = number of studies

Chart 3. Methodological characterization of the studies included in the review

Author	Assessment	Intervention	Therapeutic Data	Functioning Method	Data Security	Resources	Main Results
Lin et al. ⁽²¹⁾	(Before and after): VHI-10; GRBAS; Acoustic; MPT and VLS.	Vocal Hygiene, SOVTE, VFE, and RVT.	8 sessions, once a week, 30 to 45 minutes.	Synchronous	Not Informed	The telepractice group used the App Line, besides the therapist's equipment (video camera, lapel microphone, and earphones), and the patient used a mobile phone.	Improved variables in both groups (VHI-10, MPT, GRBAS, and acoustics). In stroboscopy, both groups had a variation in mucous wave mobility and decreased glottal area. Differences between the assessment moments only in sustained phonation, reading, and SPL monologue. Psychosocial assessment: No significant differences between the assessment moments. Satisfaction questionnaire: High satisfaction level with the treatment effectiveness, usability, and overall satisfaction.
Quinn et al. ⁽¹¹⁾	(Before, immediately after, and 3 months after the treatment): Acoustics; Psychosocial assessment and telehabilitation satisfaction questionnaire.	LSVT	8 sessions, twice a week, 90 minutes.	Synchronous	Adobe Connect for data security.	-Software: Adobe Connect -Therapist's equipment: webcam, microphone, and speaker. This software was installed by the therapist on the patient's computer.	Differences between the assessment moments only in sustained phonation, reading, and SPL monologue. Psychosocial assessment: No significant differences between the assessment moments. Satisfaction questionnaire: High satisfaction level with the treatment effectiveness, usability, and overall satisfaction.
Nguyen-Feng et al. ⁽²⁰⁾	(Before and after): Administering voice handicap questionnaires (VHI-10); perceived control (Scale of stressful events for perceived control adapted to perceived control of the voice problems); Psychosocial anguish (Inventory of psychopathological symptoms - BSI-18); Perceived stress (Scale of perceived stress -PSS4); Feasibility, Usability, and Acceptability of the program (Usability and acceptability measures).	Initial and final modules (description of the perceived control experiences) and Perceived Control Exercises (description of the actions to control the voice problems; presentation of strategies to improve vocal hygiene and deal with physical and emotional symptoms and opinions).	8 sessions, twice a week. The duration was not informed.	Asynchronous	SSL System	-Software: Red Hat Enter- Premium Linux Server Version 6.9 -Schedule -Reminder via email -Milestone conclusion	VHI-10 had a significant decrease between the moments before and after the treatment. However, the other variables (perceived control, psychosocial anguish, and perceived stress) showed no differences.
Rangarathnam et al. ⁽²²⁾	(Before and after): Laryngeal; APA (CAPE-V); Acoustics; Aerodynamics and elf-perception (VHI).	Vocal hygiene and airflow exercises.	12 sessions, twice a week. Total duration of 45 min (vocal hygiene + intervention). The exercises lasted from 20 to 25 minutes.	Synchronous	Not informed	Tandberg videoconference platform with audio and video unit.	Telepractice versus in-person: No differences between the groups in the variables (APA, acoustics, aerodynamics, and self-perception). Analysis before and after: Significant differences in the CAPE-V, comfortably sustained phonation, maximum sustained phonation, and VHI.

Subtitle: VHI-10 = voice handicap index-10; MPT = maximum phonation time; APA = auditory-perceptual assessment; GRBAS = overall grade of dysphonia/roughness/breathiness/asthenia/strain; VLS = videolaryngostroboscopy; ETVSO = semi-occluded vocal tract exercises; VFE = vocal function exercises; RVT = resonant voice therapy; SPL = sound pressure level; LSVT= Lee Silverman Voice Treatment; VHI = voice handicap index; CAPE-V = consensus Auditory-Perceptual Evaluation of Voice; SSL = Secure Sockets Layer; BSI-18 = Brief Symptom Inventory; PSS4 = Perceived Stress Scale-four-item version

DISCUSSION

The objective of this integrative review was to describe the characteristics of voice telespeech therapy in dysphonic patients. The article analysis revealed that telespeech therapy is currently employed in voice clinics to attend different publics with voice changes, using a variety of resources and resulting in user satisfaction.

In the context of health, there is a range of terms related to distance care, namely: telemedicine⁽²³⁾, telehealth⁽²³⁾, telerehabilitation⁽²⁴⁾, telepractice⁽²²⁾, and telecare⁽²⁵⁾. In speech-language-hearing therapy, the associations use a variety of expressions. In Brazil, the Federal Speech-Language-Hearing Council (CFFa, in Portuguese) started using telehealth in 2013⁽⁴⁾ but changed it to telespeech therapy in 2020⁽⁷⁾. In the United States, the American Speech-Language-Hearing Association (ASHA) uses teleaudiology, telespeech, speech teletherapy, and telepractice⁽²⁶⁾; in the United Kingdom, the Royal College of Speech and Language Therapists (RCSLT) uses telehealth⁽²⁷⁾. Hence, given the diversity of national and international terminology, this review chose to use telespeech therapy, as it is a current concept used by the Federal Speech-Language-Hearing Council⁽⁷⁾.

Besides the concept, another important point is the functioning method of distance health care, which can be classified as asynchronous, synchronous, and hybrid^(7,26). The asynchronous format is when the interaction between the participants occurs offline, according to the subjects' time availability. In this model, the files are stored and accessed later by the patient or the professional. It can use voice recordings, audio or video tasks, plan exercises, instruct on vocal hygiene, and assess acoustic, aerodynamic, and auditory-perceptual measures^(26,28). In the second model, the synchronous one, the contact between the participants takes place in real-time, and they interact via audio and video in videoconferences. Applications can likewise be shared in this model^(7,26). Lastly, the hybrid stands out as a combination of both formats, the synchronous and asynchronous^(7,24). In this review, the synchronous format predominated^(11,21,22). Only one study functioned asynchronously⁽²⁰⁾. Indeed, the synchronous model reinforces the possibility of providing online, real-time attention to the patients to better follow up their performance in rehabilitation.

It is important to highlight that the service had various focuses, such as diagnosis, therapy, therapeutic monitoring, consultancy, education, and formative second opinion (synthetic analysis of the best evidence, to aid professionals when facing problems)^(4,7,8,29-31). However, this review was focused on the investigation of the therapeutic process in the field of voice.

Concerning the years of publication, attention is called to the linearity of the pieces of research published in the last 10 years, especially the predominance of papers conducted in 2020^(20,21). This demonstrates the current interest of authors in investigating this topic more in-depth in the field of voice. Moreover, they reveal that there was a need in 2020 to continue researching the distance therapeutic process, as a means to adjust to the new world health condition in the COVID-19 pandemic. In the pandemic period, the research of voice telespeech therapy increased, making it possible to compare these two therapy modalities to find more in-depth the effectiveness of these services.

As for the origin of distance speech-language-hearing attention, the first studies date back to the 1970s⁽³²⁾, aiming to assess and treat communication disorders. After the 2000s, there was a predominance of research in audiology, speech, and language^(8,30,33). Hence, this modality is increasingly gaining space in speech-language-hearing therapy, thus reaching all the specialties, including the field of voice.

In the geographical distribution, the United States was the country with the most publications. This is probably related to their high technological development, favoring the implementation of this format of health services. Similar to the finding in the present study, systematic reviews^(8,12,33) also found many telespeech therapy publications from the USA and Australia. The United States is a pioneer in research that addresses distance care. Australia, in its turn, stands out for pointing out that speech-language-hearing therapists need to provide care to patients who have difficulty attending in person because of the long geographical distances in the country⁽³²⁾.

It is important to highlight that the present review found no telespeech therapy research conducted in Brazil, perhaps for the professionals' lack of investment in distance health care. To reinforce this reality, a systematic review on telehealth in Brazil indicated that the main publications were focused on tele-education. Moreover, the most researched fields in the country were audiology and educational speech-language pathology⁽³⁰⁾. This restates that telespeech therapy is still little researched in the field of voice.

Another highlighted aspect is data security. Only two articles^(11,20) mentioned the topic. One of them⁽²⁰⁾ reported using the encrypted SSL system (Secure Sockets Layer) between the participants and researchers. The second one⁽¹¹⁾ used Adobe Connect as a tool to ensure security and privacy in the sessions. Thus, attention is called to these authors' care and concern in maintaining the patients' confidentiality, preserving their data and identity.

The study designs were equally distributed between quasi-experimental and randomized clinical trials. The quasi-experimental papers^(11,20) investigated nonrandomized intervention programs. In the randomized clinical trials, the authors needed to prove that distance voice therapy can be used in a clinical context as a new therapy modality⁽²²⁾ without loss in relation to in-person care⁽²¹⁾.

The objective that stood out among the studies was to apply voice telespeech therapy in groups with different diagnoses and needs – such as Parkinson's disease⁽¹¹⁾, muscle tension dysphonia^(20,22), and in older adults⁽²¹⁾ with vocal fold atrophy, unilateral vocal fold paralysis, muscle tension dysphonia, nodules, and polyps. Applying voice telespeech therapy in patients with muscle tension dysphonia calls attention, given the difficulty of laryngeal palpation in virtual rehabilitation. Nonetheless, this public can also benefit from this new modality, although the physical examination is not carried out. Other studies were predominantly conducted in the population with neurogenic dysphonia, especially individuals with Parkinson's disease^(10,12,15,32,34). Besides this etiology, vocal nodules^(14,35), dysarthria⁽³⁶⁾, laryngeal edema⁽³⁵⁾, and muscle tension dysphonia⁽³⁵⁾ were also found. This situation is presented in a study⁽³⁴⁾ that found that only 3% of those in the field of voice use speech-language-hearing telerehabilitation – which indicates the need for further research on this format.

As for the participants' data – sex, age range, and sample size –, women predominated in most studies⁽²⁰⁻²²⁾. In only one

study⁽¹¹⁾ the number of male participants was higher than that of females. Contrary to the results presented in this review, there is in the speech-language-hearing literature an inconsistency regarding researched sex. Some do not investigate the participants' sex^(10,12,33,34), whereas others show a predominance of females⁽¹⁴⁾ or males^(15,35). Given such variation, sex may not be a determining variable when opting for telespeech therapy. Further studies are needed to clarify this issue.

The predominant age range of the researched subjects includes older adults, ranging from 60 to 82 years. The relevance of this finding must be pointed out, especially because the studies^(20,21) published in 2020 approached a population at high risk for the new coronavirus. This review also observed that two studies had age ranges from young people to older adults^(20,22), while one piece of research ranged from adults to older adults⁽²¹⁾. However, the literature indicates a study approaching voice therapy in 28 dysphonic people 6 to 18 years old who participated in the rehabilitation with MP4 videos⁽³⁵⁾. This demonstrates that voice telespeech therapy can be employed in all age ranges, from childhood to old age. In the present review, though, the articles encompassed young people, adults, and older adults, according to the established eligibility criteria and critical assessment.

The papers ranged in sample size, although most of them attended the patients in groups⁽²⁰⁻²²⁾, while only one used an individual modality⁽¹¹⁾. As for the total number of participants, the publications ranged from eight to 69 subjects^(11,20-22). This amount agrees with the range of participants in other studies on speech-language-hearing telespeech therapy, which range from two to 100^(33,34). In the field of voice, the studies range from 10 to 51^(10,14,15,28,35,37). This discrepancy may be related to the methodological variations of the studies conducted on telespeech therapy.

Regarding the therapy modalities, two studies in this review compared in-person care with telespeech therapy^(21,22) and found no differences in the vocal parameters (acoustic, auditory-perceptual, MPT, aerodynamics, and self-perception). This may indicate that telespeech therapy is not inferior to traditional therapy, as they have similar therapy results. Hence, it can be used in vocal clinics as a new intervention format. This situation is also found in the literature, which verifies gains in acoustic and auditory-perceptual parameters, as well as in in-person therapy⁽³⁷⁾. If analyzed in the current circumstances, the applicability of this distance format may be feasible, especially in the pandemic period. A national study⁽³⁸⁾ pointed out that the in-person visit in a health care center lasting 30 minutes during the pandemic was replaced with telespeech therapy, lasting from 20 to 60 minutes, according to the patient's case. It must be pointed out that, in Brazil, there are no comparative studies between the therapeutic modalities. Considering the pandemic moment, it is necessary to develop papers with such analysis to find the different therapeutic realities experienced in this new health context.

In most studies, the attention lasted eight sessions^(11,18,21), twice a week^(11,20,22). However, the therapy session lasted from 30 to 90 minutes^(11,20-22). In the literature, the methodologies are presented differently in terms of the number of sessions, ranging from nine to 18^(10,15,34,39); frequency of three^(14,15) to four times a week^(10,37); lasting 1 hour^(10,37,38), 30 minutes⁽¹⁵⁾, or 45 minutes⁽¹⁴⁾. These realities also show a lack of therapy standardization.

In the voice intervention process, vocal hygiene stood out⁽²⁰⁻²²⁾ as a vocal instruction measure before doing the therapy exercises. These exercises varied in the studies, expressing a

post-training improvement between vocal parameters (vocal self-perception, MPT, aerodynamics, auditory perceptual, and acoustics)^(11,20-22), besides the user satisfaction with the online intervention⁽¹¹⁾ and the acceptability and usability of the program⁽²⁰⁾. This evidence points to the effectiveness of this attention modality in the field of voice. It calls attention as a therapeutic possibility that maintains in the virtual setting the same gains as in the in-person therapy.

In this review, two pieces of research stood out^(11,21) as they indicated home exercises as a means to carry on vocal rehabilitation. One of the studies⁽²¹⁾ gave illustrations of the vocal hygiene instructions, vocal function exercises (VFE), and resonant voice therapy. They also used a form to follow up the exercises performed at home, to facilitate feedback. The other study⁽¹¹⁾ read aloud the required home exercises concerning phonatory tasks, reading, and conversation. The researchers always reviewed the activities made at home at the beginning of each therapy session. These two pieces of research indicate that, even in distance care, it is possible to monitor the voice therapy, as home exercises are requested and followed up.

The resources used in most studies were software^(11,20), applications⁽²¹⁾, and videoconference platforms⁽²²⁾. Other resources were also used to present a good video and image quality, namely: video cameras or webcams, microphones, earphones, and speakers. Another important aspect was that the therapists had to go to the patient's home to install the software⁽¹¹⁾ or test the Internet⁽²¹⁾ before the intervention. However, only one study⁽²²⁾ informed that a team was available in case the user had questions. These last data point out the need for a favorable setting for the virtual modality to function properly, either with good equipment or technical support.

Lastly, the studies selected in this review had been published in the United States, Australia, and China. Therefore, distance care approaches may differ in Brazil because of cultural and socioeconomic differences. In Brazil, the publications in the field of telespeech therapy are focused on tele-education with voice instruction measures^(13,30), teleconsultancy exercises^(31,38), and therapy telemonitoring⁽³⁸⁾. Due to the COVID-19 pandemic, future publications may have a distance health care profile closer to that of the said countries.

The limitations of this review were the small number of studies on voice telespeech therapy and the lack of methodological standardization in the virtual interventions. Hence, further studies with high methodological rigor addressing voice telespeech therapy are needed to provide a theoretical foundation to the professionals and improve health care with information and communication technologies (ICTs). Moreover, it is important to develop new research in Brazil since the country's cultural diversity provides a new look into this field. It is also necessary to develop studies comparing in-person health care with telespeech therapy in Brazil to understand the differences between these modalities in the national scenario. Lastly, voice telespeech therapy protocols should be developed to standardize the research and methodologies in future studies.

CONCLUSION

Telespeech therapy provided to dysphonic patients aims at different publics with various voice etiologies, such as Parkinson's disease, muscle tension dysphonia, and older adults with voice changes. Also, different methodologies are

employed in distance voice health care, including the sample, functioning method, data security, number of sessions, weekly frequency, duration of the intervention, and types of exercises. They reported improved vocal parameters (acoustic, auditory-perceptual, MPT, aerodynamics, and self-perception), as well as user satisfaction with the treatment in this format.

Thus, distance voice intervention is a promising possibility of health care modality. The professionals must be trained to deal with telespeech therapy, also considering possible solutions to the current barriers.

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