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The impact of voice therapies on vocal-fatigue-related pathologies of occupational voice users. Treating symptoms and building a functional voice.

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Component 1

1.1 Introduction

Rationale

As a primary school curriculum music teacher, private vocal coach, and master's degree student in voice pedagogy, I have found it challenging to identify effective strategies to mitigate vocal fatigue in occupational voice users. My interest in this area stems from both personal experience and findings from a prior study I conducted on vocal fatigue resistance training strategies among music teachers. These influences led me to review existing literature on the causes of vocal fatigue and related pathologies, behavioural factors, and current vocal therapy practices.

A significant turning point in my inquiry came through the testimony of a colleague, an experienced voice professional, who ultimately resigned from her teaching position after three years due to a diagnosis of muscle tension dysphonia. Despite applying evidence-based vocal fatigue management strategies, her condition worsened. She reported that only structured voice therapy helped restore her vocal function.

This case highlights a broader trend: an increasing number of occupational voice users are experiencing vocal health issues, with many seeking assistance from specialised voice clinics (Roy et al., 2004). In more severe cases, individuals are resigning, changing careers, or moving to roles with reduced vocal demands (Allen & Hu, 2024). While anecdotal evidence from colleagues supports the efficacy of voice therapy, empirical studies further support its value. For example, a randomised controlled trial by Laukkanen et al. (2021) demonstrated that semi-occluded vocal tract exercises noticeably reduced vocal fatigue and improved vocal quality after four weeks of guided therapy. Similarly, Roy et al. (2001) found that resonant voice therapy improved vocal efficiency and alleviated symptoms of discomfort.

These findings suggest that vocal therapy has significant potential not only in treating vocal fatigue but also as a proactive strategy to build and maintain a functional voice in occupational voice users.

Justification

The use of a singing voice slightly differs from the use of a speaking voice (Lindblom and Sundberg, 2014). Voice pedagogy has focused on skill acquisition, but there is a gap in linking the practice to occupational voice users (Hoch and Sandage, 2018; Ruben, 2014). No vocal fatigue resistance training exists (Casper and Leonard, 2006; Stemple, Roy, and Klaben, 2018; Oates and Winkworth, 2008), and since voice therapy teaches the basics of the speech function (Sataloff, 2017), reviewing the literature related to their application in the context of vocal fatigue might be an

essential tool for designing the training. This way, I might be one step closer to helping my colleagues and future generations of teachers build their vocal endurance, which is much needed not only in the school environment where high demand of vocal tasks and responses is required (Hunter, Cantor-Cutiva and van Leer, 2020).

1.2 Planned Programme of Study

Context

The prevalence of voice disorders in occupational voice users has been confirmed by many studies (Morawska and Niebudek-Bogusz, 2017; Verdolini and Ramig, 2001). According to Zenhoff-Dinnesen (2019), vocal fatigue is defined as a phenomenon occurring after voice overuse. Besides the excessive voice effort, Shembel and Nanjundeswaran (2025) attribute the vocal fatigue to the unprepared vocal tract body physiology. This indicates the need for a specific training foundation. Vocal fatigue symptoms are a warning of a pathology that should not be overlooked in this era, as 74% of individuals seeking treatment at voice clinics are diagnosed with vocal pathology, most commonly vocal nodules and muscle tension dysphonia (van Houtte et al., 2011). A growing number of occupational voice users are now seeking help at voice clinics, highlighting the increasing demand for specialised voice care and early intervention (Koufman et al., 2023). Recent clinical data indicate that over 30% of patients visiting voice clinics are professional voice users, such as teachers, call centre staff, and performers (Rogerson and Bless, 2022).

Aims & Objectives

My general aim is to investigate the various types of voice therapy. I am considering additional sub-research questions that could help refine my main research question and contribute to answering it more effectively. First, I will examine how vocal fatigue is conceptualised and measured across current voice therapy literature. Second, I will explore which voice therapy techniques and interventions demonstrate measurable improvements in vocal endurance, resilience, strength, and resistance. Finally, I will identify existing evidence-based training models.

- To identify and categorise the types of voice therapies currently used in clinical and occupational contexts.
- To evaluate the evidence for measurable outcomes (e.g., improved vocal endurance, reduced fatigue, increased vocal strength) following these therapies.
- To focus the literature review on interventions reporting positive therapeutic outcomes.
- To assess findings for the development of evidence-based training protocols for occupational voice users (e.g., teachers, performers, call-centre professionals).
- To reflect critically on the scope, limitations, and directions of the reviewed research and its relevance to future occupational voice training frameworks.

My investigation and the following critical reflection of found resources might also take me to the neurobiological and biomechanical aspects of the vocal fatigue phenomenon.

Expected Learning Outcomes (LO)

LO1: Develop a familiarity with the different types of literature reviews and learn to select and apply a tailored methodological approach.

LO2: Gain foundational knowledge of voice therapies, enabling critical engagement with existing research in the field.

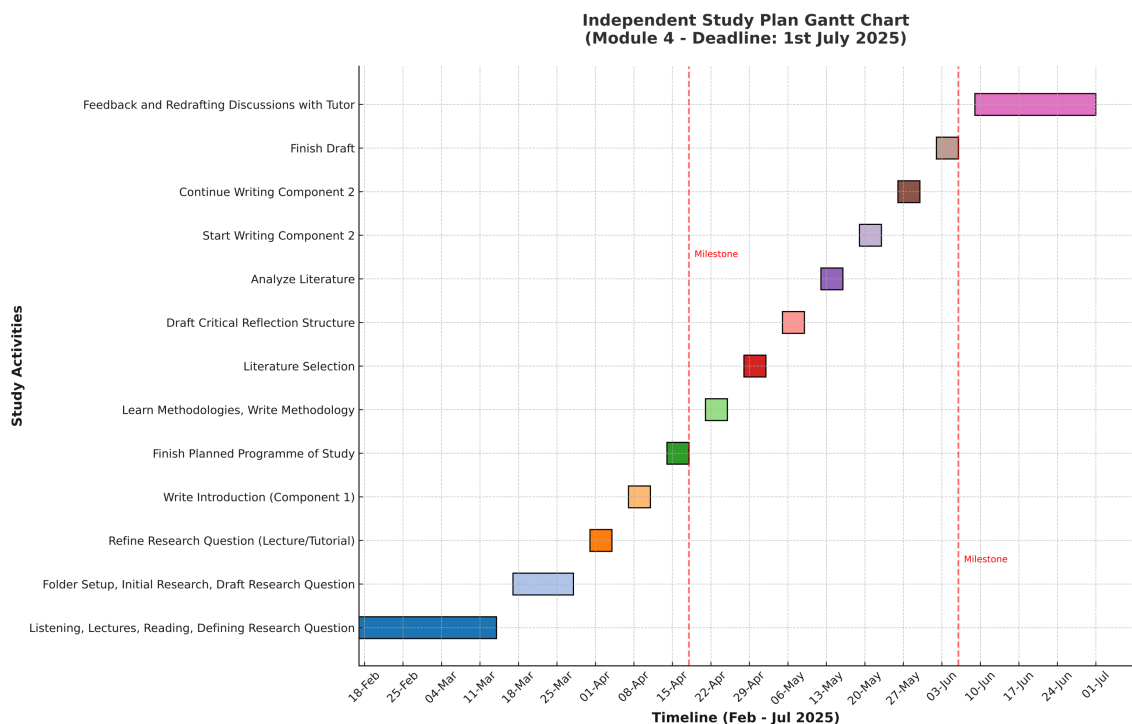
LO3: Enhance literature search strategies through the application of Boolean operators and develop the ability to identify credible academic sources.

LO4: Strengthen critical reflection skills by learning to identify and manage personal bias in academic writing.

LO5: Apply problem-solving techniques developed through academic inquiry to both research and personal development contexts.

LO6: Begin to conceptualise the conversion of a research hypothesis into a practical training portfolio aimed at improving vocal fatigue resistance and endurance for occupational voice users (in preparation for Module 5).

Activities & Timeline



1.3 Methodology

Rationale

My previous work - A study on vocal fatigue resistance training with participants, consisted of reviewing literature related to musclework and its relatedness to the training of laryngeal muscles. Neasbitt (2023) said that the latest research on methods for vocal fatigue has begun to explore the parallels between exercise science and scientific principles. Sokolowsky (1943) stated that intrinsic muscles are muscles of a specific group and might function differently from body muscles; therefore, I tried to draw on biomechanical and neurophysiological processes affecting the vocal fatigue pathology previously, too. With my current secondary research study, I aim to resolve my hypothesis regarding voice therapies as a tool to build a functional voice for occupational users and apply the Systematised Literature Review to achieve this.

I am a beginner writer with a risk of bias. I considered writing with a narrative approach first. However, the healthcare type of literature, inclusion and exclusion criteria emerging from my research question, thematic analysis, and freedom for narrative synthesis lead me to the systematised literature review type, which, in comparison with the solo narrative approach, maintains rigour (Grant and Booth, 2009).

Process Documentation

With my systematised literature review, I can conduct an exhaustive literature review applying inclusion and exclusion criteria according to my research question. However, to reduce the risk of bias, I will utilise a reflective journal and revisit my aims in addressing the research question. I already have an idea of the existing literature on the topic from my previous works. By narrowing my research question, I must exactly determine the inclusion and exclusion criteria. Primarily, I will focus on any hint of positive voice therapy's impact that would not only sustain, but also improve the voice in my search. I want to avoid studies on general statistics on how pathologies impact occupational voice users. This will require me to understand the purpose of voice therapy's application, results, and any suggestions for training with them for long-term positive effects on voice functionality.

My first choice of search platform/database is Google Scholar. I use LibKey Nomad and the University of Wales Trinity Saint David login to be automatically redirected to full-text articles, E-journals, and publishers' websites. I want to avoid descriptions and publications that lack pre- and post-intervention data, and instead focus on research evaluating therapeutic outcomes for vocal fatigue, clinical trials, meta-analyses, and systematic reviews.

Resource Credibility Demonstration

To maintain high resource credibility, this research will primarily draw from peer-reviewed, high-impact, "white" literature sources relevant to voice science and clinical intervention. Primary databases and journals include the Journal of Voice (Titze et al., 2021), Logopedics Phoniatrics Vocology, and the Journal of Speech, Language, and Hearing Research (Boone et al., 2020), as well as the American Speech-Language-Hearing Association (ASHA) and the National Centre for Voice and Speech (NCVS). Where white literature is limited, more contemporary or second-tier resources may also be consulted. This includes clinical trials, grey literature, or conference proceedings where practice-based evidence is prominent. The Adams Framework (Adams et al., 2017) will be important during synthesis, helping to validate and integrate grey literature alongside evidence.

Justification of specific sources

By focusing on literature that reports pre- and post-intervention outcomes, and by excluding general statistical overviews of pathology prevalence, this review maintains a targeted focus on therapeutic efficacy (Boone et al., 2020; Behrman, 2005). My research question is performance-oriented and will incorporate clinical literature that reflects the treatment and rehabilitation needs of occupational voice users. To contribute meaningfully to the discourse on the vocal fatigue phenomenon, it is essential to also prioritise evidence-based resources that evaluate the outcomes of therapeutic interventions (van Houtte et al., 2011).

The long-term post-functionality of the voice remains an under-researched area, and grey literature, such as practitioner-generated reports and conference proceedings, may be used to supplement peer-reviewed findings when necessary. As Grant and Booth (2009) explain, while the systematised literature review maintains less rigour than a systematic review, it still embraces both precision and flexibility while allowing the inclusion of both white and grey literature. This is especially relevant where clinical innovation may outpace formal publication processes (Adams et al., 2017).

Using tools such as Google Scholar in combination with LibKey Nomad and institutional access facilitates broad, efficient retrieval of both types of literature (Gusenbauer and Haddaway, 2020). This sourcing strategy will help me to draw multifaceted hypotheses, such as that voice therapy could be a tool for both vocal performance and sustainability in occupational voice users (Titze et al., 2021).

Component 2

2.1 Introduction

In this section of my work, I will explore each of the vocal therapy approaches and their protocols. Based on the inclusion and exclusion criteria for the literature selection and based on nearing towards answering my research question, I want to critically evaluate types of therapies, their applications, and their impact on building a functional voice for occupational voice users. Occupational voice user is a profession which uses voice as one of the main tools to carry out everyday job tasks (Phyland and Miles, 2019). This includes professional and extensive use of voice, often in a louder environment (Vilkman, 2004).

Vocal fatigue, which occurs regularly and over a long term, is defined as a pathology (Solomon, 2008). While this definition provides a useful foundation, it is important to note that the conceptualisation of vocal fatigue is not universally agreed upon. Some researchers frame it as a multifactorial condition influenced by physiological, psychological, and environmental factors, rather than strictly as a pathological state (Hunter & Titze, 2009; Nanjundeswaran et al., 2015).

Another common vocal fatigue-related pathology, often diagnosed in primarily teaching occupational voice users, is muscle tension dysphonia. A significant portion of the reviewed literature focused on comparing therapies applied mainly for muscle tension dysphonia (Roy et al., 2000; Van Houtte et al., 2011). I believe this is closely related to my research question, as dysphonia could result from untreated symptoms of vocal fatigue. It is frequently described as voice overuse (Narasimhan and Gowda, 2022). Occupational voice users face an extensive vocal load that is challenging for both untrained and trained voice professionals to manage (Van Puyvelde et al., 2018; Brown, Hunt and Williams, 1988).

Voice therapies are generally divided into two main subcategories based on the origin of the pathology: physiologic and psychogenic (Payten et al., 2024). Based on these two primary approaches, a treatment plan is developed. Psychogenic voice therapy addresses the psychological causes of a voice disorder. Triggers may include stress, anxiety, or emotional conflict, which can affect physiological voice functions, including muscle activity and related biomechanical and neurophysiological processes (Leborgne and Rosenberg, 2024).

Many vocal pathologies are caused by vocal fatigue. As someone who uses their voice professionally and has looked into this topic before, I've noticed that vocal fatigue is often not properly treated. Stretching and relaxation exercises would need to be performed daily and consistently, which can be difficult for busy occupational voice users. Fatigue temporarily reduces the power-producing capacity of muscles (Zadeh et al., 2024). Specificity, overload, reversibility, and fatigue management have become emerging areas of interest among voice scientists in

addressing the vocal challenges of occupational voice users (Hoch and Sandage, 2018). To build muscular strength, muscles must be pushed beyond their typical level of effort (overload); the specific muscle groups involved in an activity must be targeted (specificity); individual differences in ability and vulnerability must be acknowledged (individuality); and training must be maintained over time to preserve gains (reversibility) (Johnson, 2021). Although laryngeal muscle tension is influenced by multiple factors, these “borrowed” training principles are increasingly being applied in voice therapy approaches.

There are various therapy approaches, protocols, and combined treatments used depending on the type of vocal pathology. Stemple and Hapner (2019) recommend expiratory muscle strength training and phonation resistance training, but more research is needed to confirm how effective these are across different patient groups. Roy (2008) suggests vocal hygiene programmes for managing vocal fatigue, though some studies question whether hygiene alone is enough without active therapy. McCabe and Titze (2002) propose using singing-based exercises in Chant Therapy to help regulate speech voice function in cases of vocal fatigue. While these approaches show potential, their overall effectiveness is still uncertain, and more consistent, high-quality research is needed to determine which methods work best.

The primary clinical goal of therapy has traditionally been to rehabilitate vocal pathologies, reduce the patient’s vocal load (vibration dose), and systematically strengthen the voice through targeted exercises (Roy et al., 2003). I believe that the principles of individuality, specificity, overload, and reversibility are crucial components of any future training aimed at improving vocal fatigue resistance and endurance in occupational voice users. My objective is to review each therapy, evaluate its effect on vocal fatigue and related pathologies, and identify components with the potential to build the functional voice of occupational voice users.

2.2 Review

Vocal Function Exercises

To assess the efficacy of voice therapies against vocal fatigue and related voice disorders, a vocal fatigue (VFI), voice handicap index (VHI), and self-rating scale measurable tools were used in qualitative or mixed methods studies (Devin, 2023). There also exist other measurable tools available for measuring vocal fatigue in quantitative or mixed-methods studies, such as jitter, shimmer or maximum phonation time (Madoule, 2024). These acoustic-related methods require equipment to measure and can provide more transparent results than the self-rating scales, however it is recommended to use a combination of subjective and objective methods for research purposes, as the application can support both aspects of treating the voice - the user’s experience, and a scientific proof (Casper and Leonard, 2006). Therefore, the combination of measuring tools for vocal fatigue presence would function as an ideal, reliable base for applying results measured from all aspects.

Stemple (1994), the creator of vocal function exercises (VFE), explains the therapy as a systematic voice manipulation. He compares this with physical therapy, but in this case, the physical therapy is of the voice. He explains that the only difference is that “we can’t see the vocal mechanism” (Medbridge, 2018); therefore, sensation is a leading parameter to proceed. The main goal is to balance the respiratory, phonation, and resonance voice subsystem, concretely, sustaining, contracting, and developing the muscle coordination along with the placement. This should lead to the result of strengthened and coordinated laryngeal musculature.

Studies suggest that Vocal Function Exercises (VFE) can improve maximum phonation time (MPT) in individuals with voice problems, including occupational voice users, older adults, smokers, and teachers (Gillivan-Morphy, 2006; Angadi, Croake, & Stemple, 2019). However, the strength and consistency of these results require further evaluation. Some research shows that changes to the VFE protocol do not always lead to significant improvements (Pasa et al., 2006), indicating that the effectiveness of VFE may depend on how closely the original method is followed and on individual differences. Bane et al. (2022) found that increases in maximum phonation time (MPT) are mainly linked to the sustained phonation part of the exercises, which raises questions about whether the other components are necessary. In addition, lower Voice Handicap Index (VHI) scores - often used to show the therapy’s benefits - may reflect patients’ personal experiences rather than actual improvements in vocal function (Pedrosa et al., 2016; Antonetti et al., 2023). Overall, while VFE appear to offer benefits, its effectiveness may vary, and some parts of the program may be more useful than others.

Combined Functional Vocal Therapy

There is limited protocol-based evidence supporting the use of Combined Functional Voice Therapy (CFVT). This approach has arisen from behavioural characteristics of the voice, which vocal function exercises or other physiologic therapy are not able to fully address (Sielska-Badurek et al., 2017). It is an integration of indirect techniques, such as posture (Feldenkrais method), breathing, and circumlaryngeal massage (manual therapy), influencing the voice system physiology (Picciotti et al., 2023). The main reason behind applying combined functional voice therapy is uncontrollable muscular tension associated with muscle tension dysphonia (MTD) (Pereira et al., 2018). The combination and complex approach has the potential to accelerate the therapy process for occupational voice users (Sielska-Badurek et al., 2017). The therapist has to tailor the treatment plan to avoid any adverse effects when working with the advanced pathology clients (Shewell and Sansom, 2024).

The assessment and evaluation process in Combined Functional Voice Therapy (CFVT) considers muscular tension; therefore, a combination of acoustic analysis, circumlaryngeal massage, perceptual voice assessment, and palpation tools is recommended (McGlashan et al., 2023). Combined Functional Voice Therapy resolves vocal fatigue not only locally, but also targets all

areas that might affect the voicing mechanism. Intrinsic, extrinsic muscles, and muscles surrounding the larynx are often affected by shoulder, neck, and head tension or poor breathing management (Mansuri et al., 2019). CFVT is considered an untraditional rehabilitation due to its holisticsity (Picciotti et al., 2023). Despite this, the gap in efficient treatments of vocal fatigue in occupational voice users persists. If this approach could be adapted to an appealing program for non-professional speakers, we might lessen the incidence of vocal fatigue pathologies and save several professions.

Conversation Training Therapy

Conversation Training Therapy (CTT) is not specifically designed to rehabilitate vocal fatigue; however, it adopts a naturally personalised approach for occupational voice users (Gillespie et al., 2019). Under the guidance of a Speech Level Therapist, patients can develop self-awareness of clear and correct speech habits directly through their own voice (Gartner-Schmidt, 2021). One of the most challenging aspects for occupational voice users is transferring therapeutic techniques into daily vocal tasks (Gillespie et al., 2019). CTT addresses this gap by serving as a post-vocal rehabilitation tool, facilitating the transition to effective everyday vocal use.

Interestingly, Conversation Training Therapy (CTT) has been used to treat muscle tension dysphonia (MTD) and benign vocal fold lesions such as nodules and polyps (Gartner-Schmidt, 2013), conditions often associated with or preceded by vocal fatigue. However, no studies to date have directly examined the use of CTT for addressing the symptoms of vocal fatigue itself. A growing body of literature (Van Stan, 2024; Gillespie et al., 2019; Vinney et al., 2023; Ferrán et al., 2024) supports the efficacy of CTT in reducing the severity of dysphonia and improving voice-related quality of life. For example, Simpson et al. (2020) conducted a prospective controlled study comparing CTT to standard voice therapy in patients with MTD and benign lesions, reporting significant improvements in Voice Handicap Index (VHI) scores and perceptual voice quality. Moreover, CTT required fewer sessions, indicating more efficient gains in vocal function. Verdolini et al. (2012) argue that CTT is not used for vocal fatigue because the condition involves underlying physiological changes. In contrast, Brown and Miller (2018) hypothesise that CTT may help by reducing maladaptive muscle tension patterns associated with dysphonia.

Stretch and Flow Voice Therapy/ Flow Phonation

Stretch and Flow Therapy appears to be a valuable complement to resonant therapy or vocal function exercises. It has been suggested that while this technique may enhance voice quality in individuals with normal vocal function, its effectiveness may be limited in cases of pathological speech (Verdolini et al., 1995; Roy et al., 2001). The approach aims to reduce vocal strain and address hyperfunctional voice use through behavioural vocal therapy (Watts et al., 2015). Although it does not directly target vocal resistance, it can lead to improved vocal endurance (Boone et al.,

2013). Additionally, it emphasises breath management during speech, with the therapeutic protocol following a structured hierarchical model (Stemple et al., 2020).

A randomised controlled trial of Stretch and Flow voice therapy for muscle tension dysphonia by Watts et al. (2015) confirms a significant reduction in Voice Handicap Index (VHI), an increase in maximum phonation time, and more harmonious and regular vibration of the vocal folds, as indicated by an improved Cepstral Peak Prominence (CPP). These outcomes suggest potential benefits for individuals presenting with hoarse, raspy, breathy, and strained voice qualities.

As discussed in my previous work with participants, breath work consciousness is an essential component of any future vocal fatigue training for occupational voice users. This is not only due to the role of subglottal and supraglottal air pressures in “cushioning” the vocal folds during phonation (Titze, 2000), but also because of the critical role oxygen delivery plays in the biochemical functioning of laryngeal musculature (Sandage et al., 2013).

Mykhailova (n.d.) examined the impact of Flow Phonation Therapy by reviewing findings from several key studies, including those by Titze (2015), Watts et al. (2015), McCullough et al. (2012), Rangarathnam et al. (2015), and Kapsner-Smith et al. (2015). The critically reviewed literature generally reported positive outcomes, particularly regarding improvements in voice quality among dysphonic patients. Nevertheless, further systematic research is recommended to rigorously compare the efficacy of Flow Phonation Therapy with alternative therapeutic interventions.

Resonant Voice Therapy (RVT)

The principle of Resonant Voice Therapy (RVT), which involves forward voice placement and optimal resonance distribution, is grounded in the efficient utilisation of the vocal tract's resonating spaces. This technique promotes sustainable voice production - an essential component for professional voice users such as teachers, singers, and public speakers (e.g., Titze, 2001; Stemple et al., 1994). The therapeutic protocol typically progresses from basic humming exercises to more complex tasks like conversational speech. However, some literature has noted limitations regarding its generalisability across diverse patient populations (e.g., Verdolini Abbott et al., 2012). This may be due to its reliance on sensory feedback mechanisms, which can be challenging for individuals with reduced somatic awareness or limited proprioceptive sensitivity. Despite these constraints, RVT remains deeply rooted in physiological principles and is supported by a growing body of clinical evidence (e.g., Behrman, 2005). Emerging perspectives argue that RVT should not be viewed solely as a therapeutic endpoint but rather as a dynamic tool within a comprehensive voice rehabilitation framework (e.g., Chen et al., 2020).

Contemporary thinking argues for its use not as a final goal, but as a powerful therapeutic tool within a comprehensive treatment framework, adaptable to a range of voice disorders and patient needs (Stemple, 2005; Hacıoğlu & Bengisu, 2023). Although it is promising, the current

documented evidence remains limited to small-scale observational studies, underscoring the need for larger randomised controlled trials to validate its wider effectiveness (Yiu, Lo, & Barrett, 2016).

Vocal Facilitation Techniques

Vocal Facilitation Techniques (VFT) is a therapeutic approach that combines both direct and indirect methods of voice therapy. It draws on a range of evidence-based techniques, including resonant voice therapy (Verdolini et al., 1995), vocal function exercises (Stemple et al., 1994), semi-occluded vocal tract (SOVT) exercises (Titze, 2006), Yawn-Sigh (Boone et al., 2014), Chant Talk, and Glottal Fry (Behrman, 2005). VFT aligns with the principles of Combined Functional Voice Therapy, aiming to address behavioural voice issues that may not be easily resolved through circumlaryngeal massage alone (Roy et al., 2001), while also supporting a physiologic approach to voice training and rehabilitation.

VFT offers a flexible framework by incorporating semi-occluded tasks, chant-based exercises, and glottal fry. It has been used across a diverse population, including both occupational and professional voice users (Gillivan-Murphy et al., 2006). Reports suggest it may effectively support recovery from both pathological and non-pathological voice disorders, including vocal fatigue (van der Merwe et al., 2011).

However, VFT is not without limitations. Even though preliminary outcomes are encouraging, further empirical research is required. In particular, more randomised controlled trials (RCTs) and cross-linguistic validation studies are necessary to establish the method's clinical efficacy and generalizability (Carding et al., 2009).

As a vocal pedagogue, I have encountered a wide range of opinions about the use of glottal fry. Many professionals with classical training believe that glottal fry is harmful to vocal health and may lead to vocal damage (Colton, Casper & Leonard, 2011; Behrman, 2005). This belief often stems from the idea that speaking or singing with glottal fry encourages a "throat-based" way of producing sound, which can cause vocal tension and inefficient technique (Andrews et al., 2002). However, research on this topic does not fully support one clear conclusion. While some studies support these concerns, others suggest that using glottal fry occasionally, especially in speech or in certain musical styles, may not be harmful and might even serve specific purposes, such as helping the voice relax or adding expressiveness (Zimman, 2012; Yuasa, 2010). These mixed findings show that more research is needed to better understand when and how glottal fry might be risky. Therefore, while it is reasonable to be cautious, especially with beginners or those with existing vocal issues, it is also important to question whether these traditional views are based on actual risk or stylistic preferences rooted in classical training.

However, from both a therapeutic standpoint and my own pedagogical experience, the intentional and controlled use of glottal fry within vocal exercises has demonstrated efficacy. Specifically, I have found it beneficial in promoting relaxation of the vocal mechanism and in developing greater

resistance and closure of the vocal folds (Titze, 2006; Verdolini Abbott et al., 2012). When applied mindfully and within a structured framework, glottal fry can serve as a valuable tool in vocal rehabilitation and technical development, without risking vocal damage. Furthermore, vocal fry onset exercises have been recognised as a safe and effective foundation for developing the scream technique used in rock and contemporary commercial music genres (Bozeman, 2013; Mills, 2017).

Optimal Phonation Task (OPT)

The Optimal Phonation Task (OPT) is best understood as a supplemental clinical tool, valued for its intuitive use in bringing improved voicing in patients with functional voice disorders (Verdolini, 1998; Stemple et al., 2010). Although it is widely employed in clinical practice, questions remain regarding whether Vocal Facilitation Techniques (VFTs) such as OPT should serve primarily diagnostic or therapeutic functions (Behrman, 2005). While these techniques are often effective in demonstrating the potential for improved phonatory output, which can be highly motivating for patients at the start of therapy, they lack empirical rigour and have not been systematically evaluated through controlled research (Roy et al., 2003).

Both the Optimal Phonation Task and Stretch and Flow Phonation Therapy (SFT) aim to address the therapeutic demands of Muscle Tension Dysphonia (MTD), specifically by low-effort phonation. However, their theoretical and methodological foundations differ. The OPT does not have a well-defined theory behind it, apart from some general ideas about how the vocal tract should be adjusted and how the vocal folds should come together (Titze, 2006). In contrast, Stretch and Flow /Phonation Therapy, originally developed by Stone and Casteel and later refined by Colton, Casper, and Leonard (2006), is grounded in motor learning theory. SFT follows a hierarchical progression, beginning with unvoiced airflow exercises and gradually advancing to voiced phonation and conversational speech (Colton et al., 2006; Roy et al., 2001). Its objective is to systematically retrain maladaptive voicing habits through structured repetition and sensory feedback.

Despite its limitations, the Optimal Phonation Task (OPT) remains a widely used and clinically accepted tool (Stemple et al., 2010). However, for OPT to gain greater credibility in both clinical and academic settings, there is a need for clear procedural guidelines that cover how to deliver instructions, task duration, and define evaluation criteria (Behrman, 2005). In addition, its role in diagnosis and treatment planning must be backed by empirical research. Without these developments, the use of OPT will continue to depend largely on clinician experience and personal decisions, which limits its reliability and generalisability within evidence-based voice therapy (Roy et al., 2003). As a result, applying it consistently in the everyday practice of occupational voice users continues to be difficult, leaving a gap in practical voice care.

Sob voice quality (SVQ)

The sob voice variation task is commonly applied in voice therapy for muscle tension dysphonia (MTD) (Madill et al., 2021). The sob or cry effect is also utilised in singing technique to achieve higher pitches without engaging in vocal squeezing (Madill et al., 2021). Madill et al. (2021) identified this approach as an "active ingredient" in voice therapy. The Active Ingredient in Voice Therapy is a recently recognised technique that leverages specific voice effects to generate therapeutic outcomes (Madill et al., 2021). The core principle involves isolating individual muscle groups from one another, typically achieved by evoking the expression of a "sad" emotion while simultaneously producing sound (Madill et al., 2021). Technically, this process enables the dissociation of muscular tension, allowing for a strong vocal output without counterproductive anatomical coordination (Madill et al., 2021).

Other research indicates that Voicecraft (technique that includes sob voice quality effect) was originally developed as a speech-language pathology (SLP) approach (Bagnall et al., 2005) and later adopted in singing pedagogy to assist vocalists in "hitting high notes" through selective activation or separation of specific laryngeal muscles (Bagnall et al., 2005). Although the sob voice quality helps resolve the behavioural symptoms of MTD, it is best categorised as a physiological therapy, rather than purely behavioural (Bagnall et al., 2005). It functions as a rehabilitation tool with a structured hierarchical application (Bagnall et al., 2005).

From personal experience, I have used this technique in vocal exercises and applied it with students who had excessive phonatory tension when singing high notes. Activating the sob effect provided a protective mechanism, ensuring that only the appropriate laryngeal muscles were engaged. Although sob voice quality is especially popular among contemporary vocalists and is often considered an alternative to the belting technique for achieving a powerful, clear head voice, Kempster et al. (2009) relying too heavily on the emotional cues of sobbing or crying can lead to an unprecise understanding of the technique, particularly among beginner voice users.

Negative Practice

Negative practice is a behavioural technique used in certain forms of speech pathology therapy. Its objective is to promote patient independence by directly addressing the underlying causes of symptoms. The method involves the conscious repetition of maladaptive speech behaviours to build awareness and facilitate their avoidance. Historically, it was first applied to the treatment of stuttering by Charles Van Riper in the 20th century (Van Riper, 1973). In voice therapy, the modification of maladaptive vocal behaviours that may lead to vocal injury requires motor learning. According to Boone et al. (2020), negative practice must be applied with caution, as inappropriate use may reinforce the placebo effect, support maladaptive behaviour, or even cause injury.

Conversation Training Therapy (CTT) incorporates negative practice as part of its protocol, focusing on enhancing the learned vocal behaviours. Furthermore, Schöllhorn et al. (2012) suggest that differential learning can be a useful addition to traditional speech motor rehabilitation methods. This is especially helpful for patients who struggle to sense or understand how their voice works. In support of this, Behrman (2005) highlights that using negative practice can reveal whether a person is learning to control their voice effectively through sensorimotor feedback. Negative practice may be an appropriate therapeutic tool for selected patients who could benefit from experiential learning to improve vocal habits. However, its use is not universally recommended. Clinicians must carefully assess whether this method aligns with the specific needs and responsiveness of the individual patient. As noted by Verdolini Abbott et al. (2008) and Boone et al. (2020), such practice can again reinforce the maladaptive voice behaviours when not supervised.

Empirical evidence regarding the long-term efficacy of negative practice remains limited, and standardised clinical protocols are lacking. This creates variability in its application across therapeutic settings. In pedagogical contexts, such as vocal instruction, negative practice has occasionally been used to contrast effective and ineffective vocal techniques. For example, in my own teaching, I have demonstrated both correct and incorrect methods to highlight key distinctions in technique. However, these demonstrations were performed by me, not by the students, thereby avoiding potential harm. It is important to recognise that encouraging clients to engage in phonatory behaviours known to cause vocal strain may conflict with the ethical principle to not harm, the obligation by ASHA (2016). This ethical consideration further highlights the importance of clinician wisdom and evidence-informed practice in deciding whether to apply negative practice.

Respiratory Lung Volume Training (RLVT)

Respiratory Lung Volume Training (RLVT) focuses on the regulation of subglottic air pressure and the adjustment of laryngeal positioning to optimise speech production. This training contributes to the activation of the respiratory and phonatory musculature, therefore enhancing the overall functionality of the vocal mechanism. The integration of these techniques has been shown to support sustained phonation and improve vocal quality (Ziegler et al., 2014). Empirical studies indicate that speaking at lower lung volumes significantly increases laryngeal muscle activation, resulting in enhanced vocal effort (Iwarsson et al., 2013). In individuals diagnosed with muscle tension dysphonia (MTD), ineffective lung volume regulation is frequently observed, often resulting in diminished phonatory endurance and reduced vocal quality (Fujiki et al., 2022).

Expiratory Muscle Strength Training (EMST) strengthens the abdominal and chest muscles using resistance breathing exercises. This helps reduce strain on the voice box, supports better vocal fold vibration, and improves the muscle support needed for a strong, clear voice. As a result, EMST plays an important role in building long-term resistance to vocal fatigue, especially for people who use their voice professionally (Behrman et al., 2024). In contrast, Inspiratory Muscle Training (IMT) targets the diaphragm and external intercostals with the intent of increasing inspiratory capacity

and mitigating respiratory fatigue (Behrman et al., 2024). Given its emphasis on breath control and coordination, IMT may also serve as a relevant approach for addressing behaviorally affected vocal issues.

There is a growing body of literature supporting the efficacy of both EMST and IMT across healthy and clinical populations. Studies have documented improvements in phonation time, vocal intensity, and overall vocal function (Kim et al., 2023; Troche et al., 2010; Sapienza & Troche, 2012; Nichols et al., 2020). Moreover, Phonation Resistance Training Exercises therapy - a therapeutic method that combines high-effort phonation with functional speech tasks - has demonstrated superior outcomes when implemented in conjunction with EMST, particularly among older adults (Ziegler et al., 2021).

Semi-Occluded Vocal Tract Postures

The use of semi-occluded vocal tract (SOVT) postures has become a core principle in modern voice therapy, especially for addressing vocal fatigue and functional dysphonia in occupational voice users. SOVT exercises include phonatory gestures such as lip trills, straw phonation, humming, voiced fricatives, and nasal consonants that partially occlude the vocal tract, therefore modifying the intraglottal and supraglottal pressures to facilitate more efficient phonation (Titze, 2006). While extensively applied in both rehabilitative and pedagogical contexts, critical scrutiny reveals that the evidence supporting the efficacy of SOVT therapy is still evolving, particularly regarding its long-term utility in preventing fatigue-related pathologies among professional voice users.

The theory of SOVT postures originates in the need to reduce phonatory effort by optimising the acoustic and aerodynamic environment of the vocal folds. Titze (2006) explains that partially closing the vocal tract (semi-occlusion) helps the vocal folds vibrate more easily by lowering the pressure needed to start sound and improving airflow resistance in a helpful way. This effect is particularly relevant to occupational voice users who regularly encounter high vocal loads in unfavourable acoustic environments (Hunter, Cantor-Cutiva & van Leer, 2020).

Critically, the idea that SOVT exercises help all types of voice problems might oversimplify the complex way they affect the body. Verdolini Abbott et al. (2012) observed significant vocal efficiency gains in dysphonic subjects using straw phonation; however, the observed benefits were often acute rather than sustained. While these exercises can provide short-term improvements in vocal output and perceived effort (Verdolini Abbott et al., 2012), there is limited research on whether they result in long-term muscular adaptations necessary for building vocal strength and endurance.

Studies exploring the utility of SOVT exercises in resolving vocal fatigue are generally promising but contextually limited (Morawska & Niebudek-Bogusz, 2017). However, the study does not

isolate occupational voice users as a subgroup, nor does it include long-term follow-up to assess post-therapy resilience, a key concern for pedagogical voice professionals (Morawska & Niebudek-Bogusz, 2017). SOVT exercises are often integrated within multifaceted therapy programs, such as Vocal Facilitation Techniques (VFT), sometimes making it difficult to isolate their contribution to therapeutic outcomes (Gillivan-Murphy et al., 2006). This raises the question of whether the SOVT approach is efficacious in and of itself or only complementary.

Except for being used in early rehabilitation phases as warm-ups, they are often applied without consideration of individual anatomical, neurophysiological, and behavioural differences. These tools may be less accessible to individuals with limited body awareness or neurological conditions (Yiu, Lo & Barrett, 2016), and there is no dosage protocol. Research by Bane et al. (2022) surprisingly suggests that sustained phonation in VFE programs may strengthen the voice more effectively than using SOVT exercises alone. This might mean SOVT serve more as a tool of transition or preparation within a broader therapy or training.

Conclusion

This critical literature review aimed to explore how vocal therapies function and differ in their mechanisms and outcomes for occupational voice users. Through the process, I deepened my understanding of diverse approaches, such as Vocal Function Exercises (Stemple, Roy & Klaben, 2018), Resonant Voice Therapy (Yiu, Lo & Barrett, 2016), and Combined Functional Voice Therapy (Sielska-Badurek et al., 2017). I also became more aware of the psychological and behavioural factors in voice rehabilitation (Payten et al., 2024).

As both a practitioner and a novice researcher, I encountered challenges including personal bias, real-time methodological learning, and trouble identifying the effects of a single therapy because multiple treatments are used at the same time (Gillivan-Murphy et al., 2006). While the systematised review allowed flexibility, it lacked the full rigour of a systematic review (Grant and Booth, 2009), and the inclusion of grey literature might have made the quality of the evidence inconsistent (Adams, Smart & Huff, 2017).

Future research should focus on the long-term efficacy of therapies, especially for occupational users, and support the development of a standardised vocal fatigue resistance training program. Integrating exercise science principles—specificity, overload, and reversibility—is crucial (Johnson, 2021; Hoch & Sandage, 2018). Greater interdisciplinary collaboration is also essential to bridge clinical practice and voice pedagogy (Hunter, Cantor-Cutiva & van Leer, 2020). This study has changed my view of how the voice works and emphasised the need for a balanced, lasting approach to vocal health. I believe that all the voice therapies I researched, along with their tools, methods, and practical applications, will help shape the future of voice training for professional voice users.

2.3 Critical Reflection

Engaging with this study has been an eye-opening journey, not just in terms of academic development but in discovering my own voice and health challenges. Initially, I approached the literature review with the intent to understand how vocal therapies function and what evidence exists for their effectiveness. I soon realised that this project was not only about other occupational voice users but also deeply personal. I began to suspect that I, too, might suffer from behavioural Muscle Tension Dysphonia (MTD) based on the recurring patterns I observed in the literature and my lived experiences as a vocal coach and music teacher.

To frame my critical reflection, I chose Gibbs' Reflective Cycle (1988) for its accessible and, at the same time, comprehensive structure. The model allows me to transition through the stages of description, feelings, evaluation, analysis, conclusion, and action planning. I found this particularly helpful in evaluating both my learning experience and its consequences for my personal and professional practice. As Moon (1999) argues, structured reflection develops deeper learning, and I aimed to apply this insight to examine my development through this module.

Description and Feelings

From the beginning of the study, I felt a mix of curiosity and pressure. I had a personal interest in the topic of vocal fatigue, but the formal academic structure of a literature review was unfamiliar territory. Reading about vocal pathologies, I recognised my own symptoms: persistent vocal fatigue after long teaching days, neck tension, and a diminished vocal range. These signs, when compared with the literature on behavioural MTD (Narasimhan & Gowda, 2022; Roy, 2008), led me to reflect on whether I had developed unhelpful compensatory strategies that were now habitual.

Evaluation and Analysis

The turning point in this process was reviewing literature on Combined Functional Voice Therapy (CFVT) and Vocal Function Exercises (Stemple et al., 2018; Sielska-Badurek et al., 2017). Both highlighted the importance of coordinated muscle work, breath flow, and individualised treatment plans. This contrasted strongly with my personal lack of structured vocal care. The literature emphasised that muscle tension dysphonia is often underdiagnosed among voice professionals who, ironically, believe they are using their voices correctly (Solomon, 2008). My experience resonated with this paradox. I had long believed that vocal technique knowledge protected me, but the literature challenged this assumption. This critical awareness encouraged me to consider that behavioural MTD might be managed or even reversed with the same therapies I was researching.

Conclusion

Critically evaluating the types of literature reviews (Grant & Booth, 2009) helped me appreciate the balance between rigour and accessibility. I chose a systematised review because it allowed the freedom to include grey literature while maintaining a level of structure. However, as a novice, I became aware of my limitations: I struggled with bias in article selection and often returned to literature that aligned with my prior beliefs. This highlighted a gap in my critical thinking, as discussed by Brookfield (2017), who stresses the importance of recognising and challenging our beliefs during reflective practice.

Action Plan and Application

Having identified the symptoms of MTD in myself, my next step is to seek a professional voice assessment and possibly begin therapy. This personal experience of mine might inspire future vocal fatigue resistance training, which I aimed to draft in Module 5 and test in Module 6. According to Behrman (2005), early intervention with appropriate voice therapy can prevent chronic conditions. I also plan to implement daily stretching and breath coordination techniques, as emphasised in Flow Phonation and Stretch-and-Flow Therapy (Watts et al., 2015; Mykhailova, n.d.).

Professionally, I intend to revise my pedagogical approach by embedding voice care routines into my teaching. This includes vocal warm-ups rooted in semi-occluded vocal tract (SOVT) exercises (Titze, 2006) and an emphasis on body awareness. Furthermore, I plan to explore the role of Conversation Training Therapy (Gartner-Schmidt, 2021) as a transitional tool to reinforce vocal habits in real-life speaking scenarios.

In summary, this study has reshaped my understanding of vocal health. It made me confront my assumptions, apply critical thinking, and align evidence with practice. While initially daunting, this reflective process has empowered me both personally and professionally. As Moon (2004) states, reflection is not a passive activity but a vital part of academic and practitioner growth. I now understand that building a functional voice begins with recognising its dysfunction - even in ourselves.

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