Can vocal exercises prevent or treat vocal tension and nodules?

Adriana S. Ramírez

Module 1

Student ID 2316808

The Voice Study Center

Word Count 4,012

Introduction

The most valuable instrument of expression as a professional vocal performer or vocal teacher is the voice (Carding and Wade, 2000). As a voice teacher, the workload, lifestyle, and vocal demands (Sataloff, 1981) may expose us to many dangers that may jeopardize our voice (Carding and Wade, 2000). After all, we are the 'Olympic athletes of the voice world' (Sataloff, 1981, p.3). Just as sports athletes need proper sporting gear, training practices, and warm-up stretches before sporting events or exercises (Johns Hopkins Medicine, 2019a), we should have the proper vocal techniques to prevent injuries and take care of our instrument (Davids and LaTour, 2017). Knowing the proper care for the voice does not make us exempt from vocal injuries (Harvard Health Publishing, 2022) it just makes us conscious and aware of it (Latham *et al.,* 2017). As a voice teacher, I aim to teach my students the importance of vocal hygiene, proper technique, and vocal exercises.

Before becoming a voice teacher, throughout my journey of preparation and learning, I was diagnosed with vocal nodules. Vocal nodules, also known as 'singer's nodules', are benign (noncancerous) growths that form on the vocal folds (Children's Hospital of Philadelphia, 2016) preventing the folds from vibrating normally (Esper, 2022) and causing the voice to sound raspy, hoarse, or breathy (Esper, 2022). I understand the feeling of guilt and shame that comes with having a voice disorder as a singer, even though it may not be our fault (Williams and Howard, 2011). I went through various treatments to cure my vocal folds, and over time, the vocal nodules went away. To achieve this, I visited a doctor who prescribed medication and did vocal rest. Once the nodules disappeared, I performed different vocal exercises, with the guidance of a singing teacher, to recover my voice and bring it back to its full potential.

As a teacher who runs her private voice and piano studio, various questions have arisen regarding vocal exercises concerning vocal misuse and vocal disorders like tension and nodules. Can vocal teachers use vocal exercises to treat symptoms of vocal misuse? Can they work to prevent vocal injuries? A vocal teacher can never substitute a doctor and medical advice, but we should be able to help the students following the doctor's treatment and guidance (Institute for Vocal Advancement, 2015).

Vocal Misuse

Before undertaking an evaluation of the literature surrounding the use of vocal exercises to prevent or treat vocal injuries, I would like to explain some terms that would be used in the document. For centuries we have used the term vocal abuse, recent studies show that the term

‘abuse’ has a high association with negative judgments and punishment towards a patient (National Institute on Drug Abuse, 2021). That is why we use ‘vocal misuse’ because it takes the blame off singers (Sabini and Titze, 2007). Vocal misuse can be defined as anything that harms or strains the vocal folds (John Hopkins Medicine, 2019b). The vocal folds are ‘two small bands of muscle within the larynx that vibrate to produce the sound’ (National Cancer Institute, 2011a). The larynx, also known as the voice box, is the area of the throat that contains the vocal folds and is used for breathing, talking, and swallowing (National Cancer Institute, 2011b). Vocal misuse occurs when our vocal folds are forced to come together too strongly (Underbrink, 2020). Some vocal injuries may happen over time or instantly (Alberta Health Service, 2021). When this becomes a habit, it may strain the larynx and turn into a voice disorder (Underbrink, 2020). John Hopkins Medicine (2019b) defines voice disorder as a problem with pitch, volume, tone, and other voice qualities that are affected and may last for more than a few weeks and are diagnosed by a doctor. The difference between vocal misuse and voice disorder is that vocal misuse refers to the inappropriate or incorrect use of the voice and voice disorder refers to any abnormality or disfunction in voice production (Mathew, 2022).

Over time, vocal misuse can cause various symptoms ranging from mild to severe (Mathew, 2022). Some symptoms include raspy or hoarse voice (Underbrink, 2020), voice loss during speaking and singing, tiredness in voice, throat pain, vocal fatigue, difficulty in pitch changing (Mathew, 2022), and breathiness (John Hopkins Medicine, 2023a). Severe symptoms may lead to calluses on the vocal folds, known as vocal nodules (John Hopkins Medicine, 2023a). Vocal nodules form due to repeated irritation from loud singing or speaking (Alberta Health Service, 2021). Over time, this stress can cause small tears in the vocal fold tissue (National Library of Medicine, 2018). These tears lead to inflammation, causing the vocal fold's inner lining (tissue) to swell and thicken, potentially resulting in the development of small nodules on the edges of the vocal folds due to chronic irritation (NLH, 2018). Vocal misuse can be unintentional or result from intentional behaviors (Williams and Howard, 2011). Unintentional factors contributing to vocal misuse may include a lack of knowledge or awareness about proper vocal technique (Willims and Howard, 2011), environmental factors like climate change (Taylor, 2020), genetics (Stemple et. al, 2003), and underlying medication (Boston Medical Center, 2024).

According to Williams and Howard (2011), intentional factors contributing to vocal misuse among singers may include smoking (Carding, 2003), alcoholism (Carding and Wade, 2000), constant clearing of the throat, too much coughing, excessive talking, and shouting (Underbrink, 2020). Additionally, individuals may knowingly engage in behaviors that strain or damage their

vocal folds, such as imitating certain styles or sounds or pushing their voices beyond limits for performance purposes. As a voice teacher, it is not my place to diagnose a voice disorder, but I should be able to identify the signs of vocal misuse because I see my students regularly (Feder, 1990). In such cases, referring our students to the appropriate medical professionals is essential. To ensure I have the knowledge to help singers in my care prevent vocal injuries as much as possible, I am responsible for undertaking this study and using the result to develop my safe practice (Ramig and Verdolini, 1998). Our role is to inform our students with accurate and up-to-date information because we 'play a major role in dispelling common myths and misinformation about vocal health' (Voice Study Center, 2024, para. 3).

Physiology of the Voice

In order to identify which vocal exercises are adequate for preventing vocal injuries or used as treatment, it is important to understand how the normal voice is produced (The Voice Foundation, 2015). The physiology of the voice involves the interactions of the larynx, vocal folds, respiratory system, and several muscles and structures involved in sound production (Zhang, 2016). All these elements can be structured into three systems, the respiratory, phonatory, and resonatory systems (Temple Health, 2018) see Figure 1.

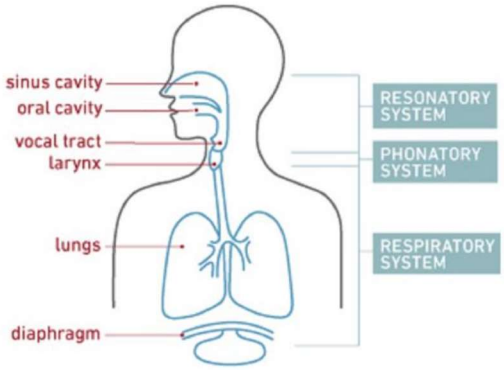

Figure 1. Respiratory phonatory, and resonatory systems (Temple Health, 2018)

The respiratory system plays an important role in voice production (Temple Health, 2018). The voice is generated by the airflow that comes from the lungs (NIDCD, 2023). When the air blows through our vocal folds at a high speed, it causes them to vibrate, producing the sound we call the voice (NIDCD, 2023). The diaphragm, a muscle in our upper abdomen, regulates the airflow in and out of the lungs and can help project the singing voice, rather than taking shallow breaths from the throat and chest (MasterClass, 2022). This breathing technique is called clavicular breathing (McCarther, 2024). When we breathe, contracting our diaphragm helps our lungs fill to

their maximum capacity and we can sing powerfully, this is called diaphragmatic breathing (Harvard Health Publishing, 2016) see Figure 2.

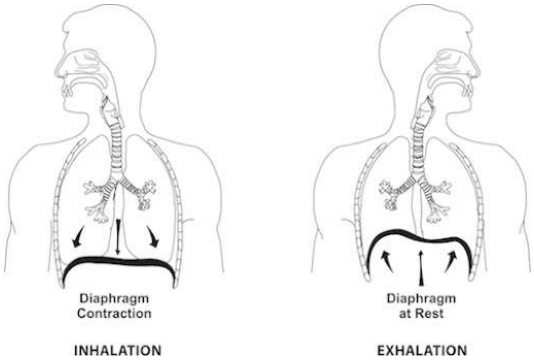

Figure 2. Diaphragmatic (Nixon, 2015)

The second system is the phonatory system. This system is responsible for the production of sound (Moulton, 2024). The sound source originates from the vibration of the vocal folds, also known as phonation (Temple Health, 2018). When the air from our lungs passes, it goes through the trachea to the larynx to produce sound (Rosine, 2024). The trachea connects our larynx to our lungs (Cleveland Clinic, 2021), see Figure 3. The larynx also functions as the structure that houses the vocal folds (Rosine, 2024), see Figure 3.

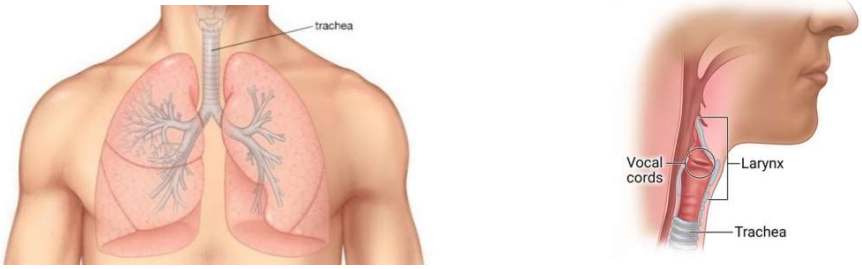

Figure 3. Trachea (Department of Cardiothoracic Surgery, 2024) and Larynx Structure (Staff, 2023)

Inside the larynx, we can also find the false vocal folds (Levendoski *et al.,* 2014). They are situated above the true vocal folds, within the larynx, see Figure 4 (Zheng *et al.,* 2009). They help protect the true vocal folds and airways by closing tightly during activities such as swallowing to prevent food and liquids from entering the airway (Zheng *et al.,* 2009).

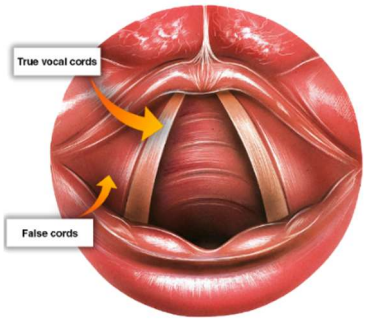

Figure 4. False folds and true vocal folds

When the true vocal folds open, we can see the glottis (National Cancer Institute, 2020). The glottis is the space between the vocal cords in the larynx (Esling, 2006), see Figure 5. It allows air to pass through and causes the vocal folds to vibrate (Esling, 2006).

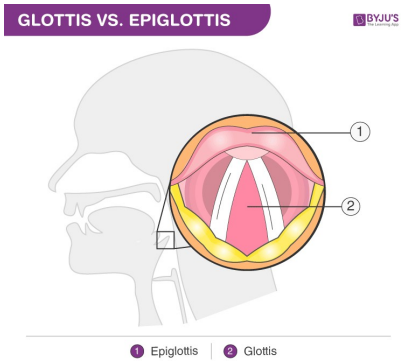

Figure 5. Glottis vs. epiglottis (BYJUS, 2024)

Also, near the larynx, we find the epiglottis (Cleveland Clinic, 2022a). The epiglottis helps protect the larynx and trachea from food going in and helps us swallow, see Figure 6 (Cleveland Clinic, 2022a). It is located behind the tongue, above and in front of the larynx, see Figure 6 (Cleveland Clinic, 2022a).

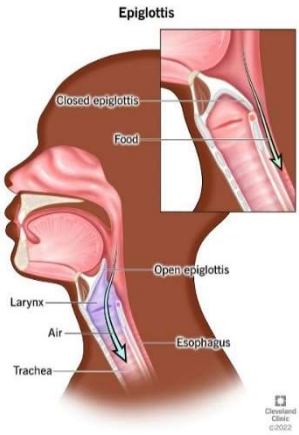

Figure 6. Epiglottis opened and closed

Even though the epiglottis is not directly involved in sound production, like the glottis, its position and movements can influence the shape and configuration of the vocal tract, and it can affect resonance and articulation during singing (Cleveland Clinic, 2022a). The different locations of the glottis and epiglottis can be seen in Figure 5.

The third system provides the voice with its distinct and unique qualities both in singing and speech (San Diego Voice and Accent, 2020). The resonatory system includes the pharynx, nasal cavity, and oral cavity. The pharynx, often referred to as the throat, is a muscular tube located in the middle of our neck, behind the nose and mouth, and in front of the spine, see Figure 7 (Cleveland Clinic, 2021). It serves as a passageway for air, food, and liquids (Cleveland Clinic, 2021). The nasal cavity is a passage that allows us to articulate nasal consonants such as m, n, and ng (Montreal Voice Coach, 2024), see Figure 7.

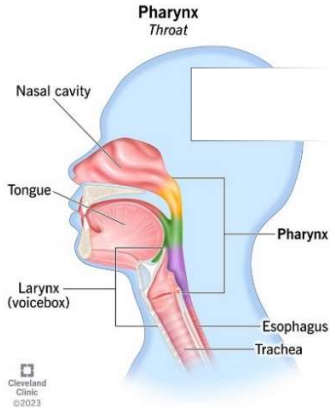

Figure 7. Pharynx and Nasal cavity

The oral cavity is accountable for altering the tone of the produced sound (StudySmarter, 2024). We humans can manipulate the structures within to produce different tones (StudySmarter, 2024). Some parts of the oral cavity include lips, teeth, hard and soft palate, and tongue (Better Health Channel, 2012), see Figure 8.

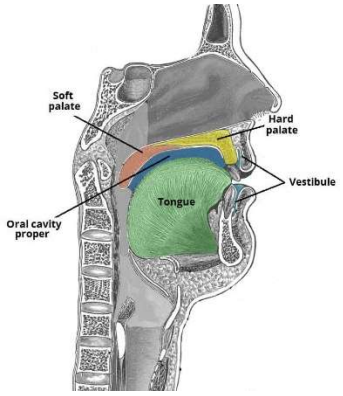

Figure 8. Oral Cavity (Jones, 2017)

All this explanation of the physiology of the voice can be summarized in two words, vocal tract (Kain, 2023). The vocal tract refers to the complex system of structures involved in speech production, including, throat, mouth, and nasal passages (Kain, 2023). By adjusting the position and movements of its components, we can articulate a wide range of vowels, consonants, and vocal sounds during singing (Kain, 2023). The shape of the vocal tract can be modified by changing the position of the larynx, affecting the voice quality and efficiency of the vocal folds (Rosine, 2024). 'The cleaner and more efficiently the folds vibrate, the clearer and healthier the sound' (Rosine, 2024, para. 3).

Vocal Misuses and Current Treatments

As mentioned, we always try to find that healthier and cleaner sound when singing. To obtain this, it is important to maintain good vocal hygiene and technique (Leisure Industry, 2024). When we do not maintain or implement this, we can experience vocal misuse (UNC School of Medicine, 2017). 'Good vocal technique focuses primarily on good singing, such as breathing, posture, support, tone, placement of sound, range', and more (SingWise, 2022, para. 9). Vocal hygiene refers to a set of daily practices that help maintain the health of our vocal folds (UNC School of Medicine, 2017). Some examples of good vocal hygiene are hydrating, resting, and warm-up exercises (UNC School of Medicine, 2017). Bad health habits would be yelling, screaming, singing, talking too much, and smoking (Larrazabal, 2022). These bad habits can be defined as vocal misuse. In time, if we do not stop or change them, it may become a vocal injury or disorder. Vocal injuries occur when the vocal folds and muscles around it are injured due to overuse (Penn Medicine, 2022).

There are several outcomes for vocal misuse. One of them is vocal tension (SLT, 2024). Tension on the vocal folds occurs when the folds fail to come together properly (SLT, 2024). This tension is caused by opposing muscles surrounding the larynx pulling apart at the same time (SLT, 2024). Some symptoms are that the voice sounds hoarse, raspy, rough, breathy, airy, or weak (Dhillon, 2023). Currently, the recommended treatment for vocal tension is voice therapy (Dhillon, 2023). Voice therapy is a program that consists of different tasks 'designed to eliminate harmful vocal behavior, shape healthy vocal behaviors, and assist in vocal fold wound healing after injury or surgery' (American Speech-Language-Hearing Association, 2024). However, other treatments that help release tension like massage, acupuncture, and physical therapy may also be suggested (Dhillon, 2023). Another symptom of misuse, already mentioned, is vocal nodules. With voice therapy or vocal rest, vocal nodules typically improve 'within two to six months' (Cleveland Clinic, 2019, para. 22). Some symptoms and signs of nodules are

hoarseness, breathiness, rough voice, neck pain, voice tiredness, and less ability to change pitch (ASHA, 2009).

Vocal Exercises for prevention or treatment?

Overall, current treatments exist for vocal nodules and tension, which is why it is important to get medical advice. Over the years, a doctor named Joseph Stemple (1993) created Vocal Function Exercises (VFEs) based on those first described by Barness (1977). These exercises were designed to strengthen and stabilize the vocal musculature and aimed to assist in a therapeutic technique for voice disorder treatment (Stemple *et al.,* 2018). A study conducted by Angadi *et al.,* (2019, p.13) emphasized that 'VFEs were developed as a physiologic approach for treating voice disorders via direct manipulation of the anatomy and physiology for healthy voice production.' One of their conclusions was that VFEs aim to simultaneously enhance the function and balance of all three vocal systems, respiration, phonation, and resonance, particularly in the treatment of vocal tension. They improve the voice by strengthening the laryngeal muscles and enhancing vocal tract resonance. Another conclusion was that VFEs effectively address voice problems in both adults and young individuals, offering preventive measures for those with significant vocal demands.

Another study made by Antonetti *et al.* (2023), is based on semi-occluded vocal tract exercises, also known by its initials SOVTE. SOVTE exercises involve partially closing or narrowing the vocal tract. These exercises can enhance how the vocal source and tract interact by alternating the vocal tract's acoustic properties and resistance. This occurs in people with healthy voices, with voice disorders or signs of misuse. This study aimed to assess how effective the SOVTE therapy program is in improving vocal quality and self-assessment, comparing it to VFE. In conclusion, SOVTE benefits self-assessment in individuals with mild behavioral tension and yields similar results to VFE.

Moreover, McHenry and Johnson (2009) conducted another study to determine the relative effectiveness of specific versus combined warm-up strategies. Their study concluded that vocal warm-ups only or with aerobic exercises have a positive effect on voice production and help reduce vocal effort in male and female voices. In addition to this study, Behlau and Madazino (2009) also researched and concluded that a thorough muscle warm-up prepares both body and mind for demanding activities, improves muscle function, ensures optimal performance preparation, and helps prevent vocal injuries. McHenry and Johnson (2009) also studied vocal cool-downs, but little was known then. Years later, Ragan (2016) studied the impact of them. It

concluded that these exercises helped singers return to their normal speaking voice better after a heavy voice load.

Different combinations of vocal exercises help prevent and treat vocal tension and nodules (Tayla, 2024) (see Appendix A and B). SOVTE exercises generally include tongue and lip trill, hand-over-the-mouth, resonance tube method, humming, voiced high-frequency oscillation, and Lax Vox technique (Antonetti *et al.,* 2023). 'Tongue and lip trills, resonance tube method, and Lax Vox technique and voiced high-frequency oscillation are considered fluctuating exercises' (Antonetti *et al.,* 2023, p.216). Fluctuating exercises mean that there is a second vibration source that creates oral pressure oscillations, leading to a massage effect that reduces excessive tension in the laryngeal muscle (Antonetti *et al.,* 2023). VFE may include exercises for breath support, pitch glides, vocal fry, siren exercises, and resonance tunning exercises (University of Florida, 2024). An example of a vocal exercise for treating tension is straw phonation because it helps adjust glottal pressure between the vocal fold by closing efficiently, balancing airflow, and enhancing resonance (Manjunatha, Suresh, and Bhat, 2020). It 'creates a back pressure that helps reduce excess tension in the vocal folds' (S.L. Hunter Speechworks, 2022). For more examples of structured exercises for preventing nodules and treating tension, see Appendices A and B.

Conclusion

In conclusion, different vocal exercises play a vital role in preventing and treating vocal injuries like vocal nodules and tension. Performing warm-up and cool-down exercises for the voice before and after singing helps prevent vocal abuse and misuse (LinkedIn, 2024). They help by increasing 'blood flow, flexibility, and coordination in the vocal mechanism, reducing the risk of strain or injury' (Reid, 2023, para. 9). Warm-up exercises are essential to prepare our vocal folds for singing (LinkedIn, 2024). It stimulates the muscles utilized in vocal production, including the larynx, diaphragm, and muscles responsible for articulation (Reid, 2023). Cooling down helps lower the temperature of our voice which helps prevent inflammation and relaxes the voice (Ragan, 2016; LinkedIn, 2024). Examples of effective warm-up and cool-down exercises to include in your practice would be gentle lip trills, humming, scales, or arpeggios that gradually increase and decrease in pitch and volume (LinkedIn, 2024; Antonetti *et al.,* 2023; Miwa and Chung, 2023). It is important to incorporate various vocal exercises and adopt healthy vocal habits to reduce the risk of vocal tension and nodules (Reid, 2023). Some examples of healthy vocal habits are staying hydrated, taking vocal naps, maintaining a healthy diet, and not overusing the voice (NIDCD, 2015).

As a voice teacher, understanding the physiology of the voice is crucial for us to determine appropriate exercises for preventing vocal injuries (Bennett, 2017). It is also important for us to detect changes in voice quality and production so we can help our students sing healthily (Bennett, 2017). In addition, vocal exercises can also be beneficial for singers already experiencing voice difficulties and can be used as an integral component in voice therapy, helping to rehabilitate the voice and restore optimal function (Cleveland Clinic, 2022b). Therefore, it is important to include regular exercises like VFEs or SOVTE in our routine, whether as a preventive measure or as part of a therapeutic regimen (Reid, 2023). This is essential for maintaining a healthy voice and ensuring that it is clear, strong, and sustainable for both professional and everyday use (Reid, 2023). My recommendation as a voice teacher is to always do warm-ups and cool-downs before and after singing (LinkedIn, 2024) like tongue and lip trills, and straw phonation (Ragan, 2016). Also, maintain healthy vocal habits (NIDCD, 2015), go to an otolaryngologist for yearly checkups (St. Olaf College, 2024), and take vocal lessons with a qualified teacher (Flippo, 2022).

Critical Reflection

Gibbs' Reflective Cycle

1. Description

My first task for this assignment was to identify my topic. I knew what I wanted to research but was unsure how to start and narrow it down. I scheduled a meeting with my tutor and got guidance on the assignment. After creating an outline of the topic, I searched for reading material on the impact of vocal exercises and voice physiology (Linford, 2014). I found a lot of material for both topics. When I was researching material for vocal physiology, I found tons of material. It was challenging to only mention some points and narrow it down. Most of the material for vocal exercises pointed out that SOVTE and Vocal Function Exercises help treat and prevent vocal injuries. I found the purpose and the why but did not find how to play the vocal exercises. I just mentioned the specific exercises that work.

2. Feelings

I felt confident when starting the assignment. Along the way, I started to panic because I thought I would not finish in time. When I started to write, I had different readings in my hand. On the way, I started to notice that I needed more information. Unbelievably, I also panicked because I then had too much information and was afraid I would exceed the word count. When writing

about the glottis and epiglottis I got confused and started to worry that I explained it incorrectly on the paper. Even though I felt a rollercoaster of emotions I learned a lot and now that information will help strengthen my teaching (Nast, 2019). That calmed me.

3. Evaluation

Good- I found different sources and did not feel the assignment was repetitive compared to my last assignment. I never got stuck on the information, new information always appeared. I learned a lot about the physiology of the voice, terms, and definitions I did not know. I already knew information about the different vocal exercises, it helped expand my knowledge.

Bad- My time management was slightly off compared to my formative assignment. In my previous assignment, I felt like I had more time to complete the task, despite not having an organized outline like the one for the current assignment. I finished like two weeks before the first draft due date and this assignment I finished on the same due date week. I think I got confident that I would finish on time and did not pressure myself like the last assignment. I always like to be ahead of the due dates just in case something unexpected happens (Ritchie, 2023).

4. Analysis

I think the reason my assignment went well was because I was organized (Indeed Editorial Team, 2023). When I decided to research this topic, I already knew information about the specific vocal injuries mentioned. My last assignment was about vocal abuse. Also, years ago, I was diagnosed with vocal nodules. That is one of the reasons I wanted to research vocal exercises for them. I was prescribed to do certain vocal exercises, but I was not entirely informed why to do those exercises in particular. Now that I am a teacher, I encountered one student who was diagnosed with vocal polyps. I wanted more information regarding vocal exercises as treatment and how to help her. I encountered that different combinations of vocal exercises can help vocal injuries, especially the ones used as treatment (Tayla, 2024).

5. Conclusion

Throughout the assignment, I struggled to keep the writing in the first person. I was taught always to write in the third person, and it has been a challenge for me. I think I am also struggling to write in the past and present because I tend to switch a lot.

When I finished my last assignment, my paper was completely off-topic. It was because I never went back to check the topic. For this assignment, I constantly went back and re-read the topic

to ensure I was on the right track and the information was directed to it (*Utah State University,* 2002).

6. Action Plan

If I had to do the same assignment again, I would use my time better and organize myself to do a little research every day instead of doing a lot in one day (*ActiveCollab*, 2024). That can be overwhelming and frustrating. Using the Gibbs model helped me notice and use a different approach when doing my next research.

I can make sure I act differently the next time I do research by using a reflective model before handing in the assignment. I can also use Schön's reflective model to reflect in action during the writing process (University of Hull, 2022).

Personal Development Plan (PDP)

Personal Development Plan (PDP)			
Activity	**Objective**	**Action**	**Timescale**
Improve my knowledge of vocal health.	Obtain the Vocal Health First Aid Certification.	- Enroll in the Vocal Health First Aid course. - Watch short courses on vocal health in the Voice Study Center.	- Ongoing. - Certificate in August 2024.
Research about male voices.	Improve my knowledge of male registration and limits.	- Watch short courses on the Voice Study Center.	- Ongoing.
Learn about the twang singing technique.	Learn, study, and research about the twang technique to teach it correctly.	- Attended short courses. - Read articles and journals on the twang technique. - See educational videos of it.	- September 2024.
Learn about young voices.	Learn about young voices physiology, how they work, and different vocal exercises.	- Attend a VSC ITOL certificate on Working with Young Voices	- Certificate June 2024.

References

ActiveCollab (2024) *8 Steps to Break Down Tasks Into Manageable Pieces*. Available at: https:// activecollab.com/blog/project-management/break-down-tasks (Accessed: 8 April 2024).

Alberta Health Service (2021) *Vocal nodules*. Available at: https://myhealth.alberta.ca/speech-language-hearing/voice-and-resonance/learn-more/vocal-nodules#:~:text=Nodules%20can%20develop%20quickly%20(e.g (Accessed: 19 April 2024).

American Speech-Language-Hearing Association (2024) *Frequently Asked Questions About Voice Therapy*. Available at: https://www.asha.org/sl p/clinical/frequently-asked-questions-about-voice-therapy/#:~:text=Voice%20therapy%20is%20a%20program (Accessed: 22 April 2024).

Angadi, V., Croake, D. and Stemple, J. (2019) 'Effects of Vocal Function Exercises: A Systematic Review', *The Voice Foundation,* 33(1), pp. 124.e-13-124.e34. https://doi.org/10.1016/j.jvoice.2017. 08.031.

Antonetti, A., Vitor, J., Guzmán, M., Calvache, C., Brasolotto, A. and Silverio, K. (2023) 'Efficacy Of A Semi-Occluded Vocal Tract Exercises-Therapeutic Program In Behavioral Dysphonia: A Randomized And Blinded Clinical Trial', *Journal of Voice,* 37(2), pp.215-225. https://doi.org/10.1016/j.jvoice.2020.12.008.

ASHA (2009) *Vocal Cord Nodules and Polyps*. Available at: https:// www.asha. org/public/speech/disorders/Vocal-Cord-Nodules-and-Polyps (Accessed: 19 March 2024).

Barnes, J. *Voice Therapy.* Presented at the meeting of the Southwestern Ohio Speech and Hearing Association. Cincinnati, OH; 1997.

Behlau, M. and Oliveira, G. (2009) 'Vocal hygiene for the voice professional', *Current Opinion in Otolaryngology and Head and Neck Surgery*, 17(3), pp.149–154. doi:https://doi.org/10.1097/moo.0b013e32832 af105.

Bennett, G. (2017) *The Science of Singing: A Voice Lesson from Anatomy and Physiology.* Available at: https://digitalcommons.cedarville.edu/cgi/viewcontent.cgi?article=1398&context=research_scholarship_symposium#:~:text=Not%20only%20does%20knowing%20the (Accessed: 1 April 2024).

Benninger, M., Abitbol, J. (2006) 'Voice: Dysphonia and the Aging Voice', *American Academy of Otolaryngology- Heck and Neck Surgery Foundation,* pp. 66-85. Available at: https://www.entnet.org/wp-content/uploads/files/Chapter_3_0.pdf (Accessed: 19 March 2024).

Better Health Channel (2012) *Mouth*. Available at: https://www.betterhealth.vic.gov.au/health/conditionsandtreat:ments/mouth. (Accessed: 18 March 2024).

BYJUS (2024) *Difference Between Glottis and Epiglottis - Comparison Chart*. Available at: https://byjus.com/biology/difference-between-glottis-and-epiglottis/ (Accessed: 19 March 2024).

Boston Medical Center (2024) *Effects of Medications on Voice.* Available at: https://www.bmc.org/effects-medicat:ions-voice (Accessed: 19 March 2024).

Carding, P. (2003) 'Voice pathology in the United Kingdom', *BMJ:British Medical Journal*, 327(7414), pp.514–515. doi: https://doi.org/10.1136/bmj.327.7414.514.

Carding, P. and Wade, A. (2000) 'Managing dysphonia caused by misuse and overuse', *BMJ*, 321(7276), pp.1544–1545. doi: https://doi.org/10.1136/bmj.321.7276.1544.

Children's Hospital of Philadelphia (2016) *Vocal Cord Nodules Causes, Symptoms and Treatment*. Available at: https://www.chop.edu/conditions-diseases/vocal-cord-nodules#:~:text=Vocal%20cord%20nodules%20(referred%20to. (Accessed: 13 March 2024).

Cleveland Clinic (2019) *Vocal Cord Lesions (Nodules, Polyps and Cysts) Cleveland Clinic*. Available at: https://my.clevelandclinic.org/health/diseases/15424-vocal-cord-lesions-nodules-polyps-and-cysts (Accessed: 19 March 2024)

Cleveland Clinic (2021) *Pharynx: Anatomy, Function, Throat, Tonsils*. Available at: https://my.clevelandclinic.org/health/body/21869-pharynx (Accessed: 18 March 2024).

Cleveland Clinic (2021) *Trachea (Windpipe): Function and Anatomy*. Available at: https://my.clevelandclinic.org/health/body/21828-trachea (Accessed: 18 March 2024).

Cleveland Clinic (2022) *Voice Therapy: What It Is, Exercise, Studies*. Available at: https://my.clevelandclinic.org/health/treatments/22339-voice-therapy (Accessed: 1 April 2024).

Cleveland Clinic (2022) *What: Is Your Epiglottis?* Available at: https://my.clevelandclinic.org/health/body/24278-epiglottis (Accessed: 19 March 2024).

Connected Speech Pathology (2024) *Effective Strategies in Resonant Voice Therapy*. Available at: https://connectedspeechpathology.com/blog/effective-strategies-in-resonant-voice-therapy#:~:text=Strategies%20include%20lip%20trills%2C%20tongue (Accessed: 26 March 2024).

Davids, J., and Latour, S. (2017) *Vocal Technique: A Guide for Conductors, Teachers, and Singers*. Illinois: Waveland Press.

Department of Cardiothoracic Surgery (2024) *Diseases of the Trachea and Airway*. Available at: https://med.stanford.edu/ctsurgery/clinical-care/thoracic-surgery-services/diseases-of-the-trachea-and-airway.html (Accessed: 18 March 2024).

Dhillon, V.K, M.D. (2023) *Muscle Tension Dysphonia*. Available at: https://www.hopkinsmedicine.org/health/conditions-and-diseases/muscle-tension-dysphonia#:~:text=What:%20are%20the%20symptoms%20of (Accessed: 19 March 2024).

Esling, J.H. (2006) 'States of the Glottis', *Encyclopedia of Language and Linguistics,* 2, pp. 129-131.doi: https://doi.org/10.1016/B0-08-044854-2/05098-7.

Esper, M. (2022). *Vocal Cord Nodules, Cysts, and Polyps*. Available at: https://www.dukehealth.org/treatments/voice-disorders/vocal-nodules#:~:text=Vocal%20cord%20nodules%2C%20vocal%20cord (Accessed: 19 April 2024).

Feder, Robert J. (1990) *Vocal Health*. Available at: pp. 23-25 https://cmed.ku.edu/privat:e/federarticle.html (Accessed: 13 Dec. 2023).

Flippo, A. (2022) *Do you need a vocal coach or a voice teacher?* Available at: https://www.sagemusic.co/blog/voice-teacher-or-vocal-coach /#:~:text=Your%20teacher%20will%20let%20you (Accessed: 2 April 2024).

Harvard Health Publishing (2016) *Learning diaphragmatic breathing*. Available at: https://www.health.harvard.edu/healthbeat/learning-diaphragmatic-breathing (Accessed: 20 April 2024).

Harvard Health Publishing (2022) *Vocal Cord Disorders - Harvard Health*. Available at: https://www.health.harvard.edu/a_to_z/vocal-cord-disorders-a-to-z (Accessed: 19 March 2024).

Institute for Vocal Advancement (2015) *Voice Teachers are not doctors*. Available at: https://www.vocaladvancement.com/en-us/blog/article/voice-teachers-doctors (Accessed: 10 March 2024).

Indeed Editorial Team (2023) *16 Tips To Help You Stay Organized In Colleges (Plus Benefits).* Available at: https://www.indeed.com/career-advice/career-development/college-organizing-tips#:~:text=Better%20grades%3A%20Organization%20may%20help,time%20to%20study%20for%20exams (Accessed: 8 April 2024).

Jafari N, Salehi A, Izadi F, Talebian Moghadam S, Ebadi A, Dabrimoghadam P, Faham M, and Shanbazi M. (2017) 'Vocal Function Exercises for Muscle Tension Dysphonia: Auditory-Perceptual Evaluation and Self-Assessment Rating', *Journal of Voice,* 31(4), pp. 506.e25-506.e31. https://dx.doi.org/10.1016/j.jvoice.2016.10.009.

John Hopkins Medicine (2019). *Preventing Sports Injuries*. Available at: https://www.hopkinsmedicine.org/health/conditions-and-diseases/sports-injuries/preventing-sports-injuries (Accessed: 19 April 2024).

John Hopkins Medicine (2019) *Voice Disorders*. Available at: https://www.hopkinsmedicine.org/health/conditions-and-diseases/voice-disorders#:~:text=Vocal%20abuse%20is%20anything%20that (Accessed: 1 December 2023).

John Hopkins Medicine (2023) *Vocal Cord Disorders*. Available at: https://www.hopkinsmedicine.org/health/conditions-and-diseases/vocal-cord-disorders#:~:text=Vocal%20cord%20disorders%20are%20often (Accessed: 16 March 2024).

Jones, O. (2017) *The Oral Cavity*. Available at: https://teachmeanat:omy.info/head/organs/oral-cavity/ (Accessed: 18 March 2024).

Kain, Nicole. (2023) *Vocal Tract Anatomy, Function and Diagram.* Available at: https://study.com/learn/lesson/vocal-tract-diagram-anat:omy.html#:~:text=The%20vocal%20tract%20is%20the,to%20the%20lips%20and%20nose (Accessed: 18 March 2024).

Larrazabal, M. (2022) *Vocal Hygiene: What: Is It and Why It Is Important to Maintain?* Available at: https://www.betterspeech.com/post/vocal-hygiene#:~:text=Functional%20voice%20disorders%20are%20usually (Accessed: 20 March 2024).

Latham, K., Messing, B., Bidlack, M., Merritt, S., Zhou, X. and Akst, L.M. (2017) 'Vocal Health Educat:ion and Medical Resources for Graduate-Level Vocal Performance Students', *Journal of Voice*, 31(2), pp.251.e1–251.e7. doi:https://doi.org/10.1016/j.jvoice.2016.07.011.

Leisure Industry (2024) *How can you prevent and heal vocal injuries?* Available at: https://www.linkedin.com/advice/0/how-can-you-prevent-heal-vocal-injuries-skills-vocal-coaching#:~:text=The%20best%20way%20to%20prevent (Accessed: 19 March 2024).

Levendoski, E.E., Leydon, C. and Thibeault, S.L. (2014) 'Vocal Fold Epithelial Barrier in Health and Injury A Research Review', *Journal of speech, language, and hearing research: JSLHR*, 57(5), pp.1679–1691. doi:https://doi.org/10.1044/2014_JSLHR-S-13-0283.

Linford, J. (2014) *Essay Planning: Outlining with a Purpose What Is an Outline? How Do I Develop an Outline?* Available at: https://www.sjsu.edu/writing center/docs/handouts/Essay%20Planning%20-%20Outlining.pdf (Accessed: 8 April 2024).

LinkedIn (2024) *How can you prevent vocal abuse and misuse.* Available at: https://www.linkedin.com/advice/1/how-can-you-prevent-vocal-abuse-misuse-skills-vocal-coaching (Accessed: 23 March 2024).

Mann, E.A., McClean, M.D., Gurevich-Uvena, J., Barkmeier, J., McKenzie-Garner, P., Paffrat:h, J. and Patow, C. (1999) 'The Effect of Excessive Vocalization on Acoustic and Videostroboscopic Measures of Vocal Fold Condition', *Journal of Voice,* 13(2), pp. 249-302. https://doi.org/10.1016/S0892-1997(99)80035-6.

Manjunatha, U., Suresh, P., and Bhat, J.S. (2020). 'Can Straw Phonation Be Considered As Vocal Warm Up Among Speech Language Pathologists?', *Journal of Voice,* 36(5), pp. 735.e1-735.e6. https://doi.org/10.1016/j.jvoice.2020.08.016.

MasterClass (2022) *How Singing From Your Diaphragm: 3 Simple Singing Tips.* Available at: https://www.masterclass.com/articles/how-to-sing-from-your-diaphragm (Accessed: 16 March 2024).

Massey, A. (2024) *Is a mirror useful for singing practice? – Oxford Singing Lessons*. Available at: https://www.oxfordsinginglessons.co.uk/mirrors-for-singing-practice/ (Accessed: 26 March 2024).

Mathew, R. (2022) *Voice Disorders Due To Vocal Abuse And Vocal Misuse And Their Prevention.* Available at: https://www.torontospeechtherapy.com/blog/2022/voice-disorders-due-to-vocal-abuse-and-misuse-and-their-prevention-3nchk (Accessed: 18 March 2024).

Mccarther, S. (2024) *A Review of the Breathing Mechanism for Singing Part II: Methods of Breathing*. Available at: https://www.rider.edu/sites /default/files/files/vthc-a-review-of-the-breathing-mechanism-for-singing-part2.pdf (Accessed: 20 April 2024).

McHenry, M., Johnson, J. and Foshea, B. (2009) 'The Effects of Specific Versus Combined Warm-up Strat:egies on the Voice', *Journal of Voice,* 23(5), pp 572-576. https://doi.org/10.1016/j.jvoice.2008.01.003.

Medlineplus (2018) *Upper respiratory tract: MedlinePlus Medical Encyclopedia Image*. Available at: https://medlineplus.gov/ency/imagepages/19378.htm (Accessed: 18 March 2024).

Metropolitan Cantor Institute (2024) *VOICE LESSON #8. Pp.1-6.* Available at: https://mci.archpitt.org/music/Voice_Lesson_8_Integrat:ion.pdf (Accessed: 23 March 2024).

Miwa and Chung (2023) *Vocal Function Exercises - ADULT SPEECH THERAPY*. Available at: https://theadultspeechtherapyworkbook.com/vocal-function-exercises/ (Accessed: 23 March 2024).

Miwa & Chung (2024). *The Yawn-Sigh Technique Made Easy*. Available at: https://theadultspeechtherapyworkbook.com/yawn-sigh-technique/ (Accessed: 26 March 2024).

Montreal Voice Coach (2024) *Nasal Cavities and Sinuses – Vocal Technique*. Available at: https://www.vocaltechnique.ca/nasalcavity/#:~:text=The%20Nasal%20Cavities%20%26%20Sinuses (Accessed: 18 March 2024).

Moulton, Sunday. (2024) *The Physiology of Human Language and Speech: Respiratory, Phonatory, and Articulatory Systems.* Available at: https://study.com /academy/lesson/ the-physiology-of-human-language-speech.html#: ~:text=Study.com%20Member.-,The%20Phonat:ory %20System,which%2 0is%20actually%20quite%20complicat:ed (Accessed: 16 March 2024).

Nast, C. (2019) *7 Little Ways to Deal With the Emotional Roller Coaster That Is College*. Available at: https://www.self.com/story/feel-better-in-college-tips (Accessed: 8 April 2024).

National Cancer Institute (2011) *Vocal Cord.* Available at: https://www.cancer.gov/publications /dictionaries/cancer-terms/def/vocal-cord (Accessed: 16 March 2024).

National Cancer Institute (2011) *Larynx.* Available at: https://www.cancer.gov/pu blicat:ions/dictionaries/cancer-terms/def/larynx (Accessed: 16 March 2024).

National Cancer Institute (2019) *Oral Cavity.* Available at: https://www.cancer. gov/publications/dictionaries/cancer-terms/def/oral-cavity (Accessed: 18 March 2024).

National Cancer Institute (2020) *Glottis.* Available at: https://www.cancer.gov/publicat:io ns/dictionaries/cancer-terms/def/glottis (Accessed: 19 March 2024).

National Institute On Deafness And Other Communication Disorders (NIDCD*)* (2021) *Taking Care of Your Voice*. Available at: https://www.nidcd.nih.gov/health/taking-care-your-voice#3 (Accessed: 26 March 2024).

National Institute On Deafness And Other Communication *Disorders* (NIDCD) (2023) *How Does the Human Body Produce Voice and Speech?.* Available at: https://www.nidcd.nih. gov/news/multimedia/how-does-human-body-produce-voice-and-speech-text-version#:~:text=Voice%20is%20generat:ed%20by%20airflow (Accessed: 16 March 2024).

National Institute on Drug Abuse (2021) *Words Matter - Terms to Use and Avoid When Talking About Addiction*. Available at: https://nida.nih.gov/nidamed-medical-health-professionals/health-professions-educat:ion/words-mat:ter-terms-to-use-avoid-when-talking-about-addiction (Accessed: 1 March 2024).

National Library of Medicine (2018). *Vocal nodules.* Available at: https://www.nc bi.nlm.nih .gov/books/NBK534635/#:~:text=Vocal%20nodules%20(also%20known%20as (Accessed: 19 April 2024).

Nicgabhann, S. (2023) *Is body tension what's causing your singing woes?* Available at: https://www.sineadthesinger.ie/post/is-body-tension-what-s-causing-your-singing-woes#:~:text=Places%20we%20can%20hold%20tension (Accessed: 26 March 2024).

NIDCD (2015) *Taking Care of Your Voice*. Available at: https://www.nidcd.nih.gov/health /taking-care-your-voice (Accessed: 1 April 2024).

Nixon, M. (2015) *Breathing Technique For Singing*. Available at: http://www.howtosingsmarter.com/breat:hing-technique-for-singing. (Accessed: 16 March 2024).

Pedrosa V, Pontes A, Pontes P, Behlau M, and Peccin S.M. (2015) 'The effectiveness of the comprehensive voice rehabilitation program compared with the vocal function exercises method in behavioral dysphonia: a randomized clinical trial', *The Voice Foundation,* 30(3), pp. 377. e11-377.e19. https://doi:10.1016/j.jvoice.2015.03.013.

Penn Medicine (2022) *Vocal Cord Strain.* Available at: https://www.pennmedicine.org/for-pat:ients-and-visitors/pat:ient-informat:ion/conditions-treat:ed-a-to-z/vocal-cord-strain#:~:text=Vocal%20cord%20strain%20occurs%20when (Accessed: 19 March 2024).

Pfitzner, K. (2023) *How stretching exercises can help singers & stretches to try*. Available at: https://katrinapfitzner.com/how-stretching-exercises-can-help-singers/#:~: text=Stretching%20exercises%20can%20be%20beneficial (Accessed: 26 March 2024).

Ragan, K. (2016) 'The Impact of Vocal Cool-down Exercises: A Subjective Study of Singers' and Listeners' Perceptions', *Journal of Voice*, 30(6), pp.764.e1–764.e9. doi: https://doi.org/10.1016/j.jvoice.2015.10.009.

Ramig, L.O. and Verdolini, K. (1998) 'Treatment Efficacy', *Journal of Speech, Language, and Hearing Research*, 41(1), pp. S101-S116. doi:https://doi.org/10.1044/jslhr.4101.s101.

Reid, R. (2023) *Vocal Warm-ups: The Secret to Preventing Vocal Strain and Injury*. Available at: https://medium.com/@rebeccareidvocalstudio/vocal-warm-ups-the-secret-to-preventing-vocal-strain-and-injury-b6625b97938d#:~:text=Gentle%20singing%20exercises %3A%20Start%20with (Accessed: 1 April 2024).

Ritchie, D. (2023) *How to Stay Ahead of Deadlines*. Available at: https://www.calendar.com /blog/how-to-stay-ahead-of-deadlines/#:~:text=Submit%20your%20work%20ahead %20of%20 the%20deadline.&text=Your%20reliability%20will%20make%20them (Accessed 8 April 2024).

Rosine, A. (2024) *Phonation.* Available at: https://kstat:elibraries.pressbooks.pub/vocal-techniques/chapter/chapter-4/ (Accessed: 18 March 2024).

Sabini, T and Titze I.R. (2007) ‘Vocal Abuse: Exploring the Content of a Term’, *Journal of Voice,* 21(5), pp.590-598. (Accessed: 16 March 2024).

San Diego Voice and Accent (2020) *The Basics of Voice Production Part 4: Resonatory Exercises*. Available at: https://sandiegovoiceandaccent.com/voice-and-public-speaking/the-basics-of-voice-production-part-4-resonat:ory-exercises#:~:text=The%20resonat:ory%20system%20provides%20the (Accessed: 18 March 2024).

Sataloff, R.T. (1981) ‘Professional singers: The science and art of clinical care’, *American Journal of Otolaryngology*, 2(3), pp.251–266. doi:https://doi.org/10.1016/s0196-0709(81)80022-1.

Sataloff, R. Heman-Ackah, Y., and Hawshaw, M. (2007) ‘Clinical Anatomy And Physiology Of The Voice’, *Otolaryngologic Clinics of North America,* 40 (5), pp. 909-929. doi:https://doi.org/10.1016/j.otc.2007.05.002.

Sauder, C., Roy, N., Tanner, K., Houtz, D. and Smith, M. (2010) ‘Vocal Function Exercises for Presbylaryngis: A Multidimensional Assessment of Treatment Outcomes’, *Annals Publishing Company,* 119(7), pp. 460-467. https://doi.org/10.1177/000348941011900706

Savareh, S., Moradi, N. Yazdi, M., Soltani, M. and Lat:ifi, M. (2023) ‘Immediate Effect of Semi-occluded Vocal Tract Exercises as a Vocal Warm-Up in Singers’, *Journal of Voice,* 37(6), pp.875-880. https://doi.org/10.1016/j.jvoice.2021.05.014.

School of Rock (2021) *6 Easy and Effective Breath Exercises for Singers*. Available at: https://www.schoolofrock.com/resources/vocals/6-easy-effective-breat:h-exercises-for-singers#:~:text=As%20singers%2C%20it%20is%20essential (Accessed: 16 March 2024).

SingWise (2022) *Vocal Coaching or Vocal Technique Instruction - WHAT:’S THE DIFFERENCE?* Available at: https://www.singwise.com/articles/coaching-vs-technique#:~:text=A%20vocal%20technique%20instructor%20focuses (Accessed: 19 March 2024).

SLT (2024) *Tension of the vocal cords | SLT | Expert providers of speech and language therapy throughout the UK.* Available at: https://www.slt.co.uk/conditions/voice-problems /tension-of-the-vocal-cords/#:~:text=Tension%20of%20the%20vocal%20cords%20is%20when%20both%20vocal%20folds (Accessed: 19 March 2024).

S.L. Hunter Speechworks (2022) *Straw Phonation: How an item in your cupboard can save your voice!* Available at: https://slhunterspeechworks.com/Resources/Blog /October-2022/Straw-Phonation-How-an-item-in-your-cupboard-can-s#:~: text= Straw%20phonation%20is%20a%20type (Accessed: 22 April 2024)

Staff, Healthwise (2023) Normal Vocal Cords. *Healthwise.* Available at: https://www.uvmhealth.org/healthwise/topic/zm6118 (Accessed: 18 March 2024).

Stemple, J. C., Glaze, L. E., and Klaben, B. G. (2003) 'Non-behavioral Influences on Vocal Function and Dysfunction*', Otolaryngologic Clinics of North America,* 36(5), pp.923-929. (Accessed: 20 March 2024).

Stemple, J., Danielle, M. and Fede, D. (2018) *Abstract The Effectiveness Of Vocal Function Exercises (Vfes) On Vocal Measures With Healthy Adult Male Trained Singers*. Available at: https://scholarworks.calstat:e.edu/downloads/6t053h55r?locale=zh#:~:text= Joseph%20Stemple%20creat:ed%20Vocal%20Function (Accessed: 23 March 2024).

Stemple, J.C. *Voice Therapy; Clinical Studies*. St Luis, MO Mosby Year Book; 1993.

St. Olaf College (2024) *Staying Hydrated – Musician Health and Wellness*. Available at: https://wp.stolaf.edu/musician-health/staying-hydrated/#:~:text=Drinking%20p lenty%20of%20water%20does (Accessed: 26 March 2024).

St. Olaf College (2024) *When to See a Doctor – Musician Health and Wellness*. Available at: https://wp.stolaf.edu/musician-health/when-to-see-a-doctor/#:~:text=Even%20 if%20nothing%20is%20wrong (Accessed: 2 April 2024).

StudySmarter UK (2024) *Oral Cavity: Definition and Function | StudySmarter*. Available at: https://www.studysmarter.co.uk/explanat:ions/english/phonetics/oral-cavity/#:~: text=The%20oral%20cavity%20is%20the%20resonat:ing%20chamber%20that:%20alter s%20the (Accessed: 18 March 2024).

Tayla. (2024) *6 Simple Daily Vocal Exercises When Suffering Vocal Disorders*. Available at: https://tmrgsolutions.com/blogs/articles/6-simple-daily-vocal-exercises-suffering-vocal-disorders#:~:text=Bring%20the%20tip%20of%20your (Accessed 8 Apr. 2024).

Taylor, C. (2020) *Environmental Factors that: affect the Voice.* Available at: https://www. chynnat:aylor.com/post/environmental-factors-that:-affect-the-voice (Accessed: 4 March 2024).

Temple Health and Neck Institute (2018) *How Does My Voice Work?* Available at: https://www. templehealth.org/about/blog/how-does-my-voice-work (Accessed: 16 March 2024).

The University of Edinburgh (2020) *Gibbs' Reflective Cycle*. Available at: https://www.ed.ac .uk/reflection/reflectors-toolkit/reflecting-on-experience/gibbs-reflective-cycle (Accessed: 8 April 2024).

The Voice Foundation (2015) *Voice Anatomy and Physiology*. Available at: https://voicefoundat :ion.org/health-science/voice-disorders/anat:omy-physiology-of-voice-production/ (Accessed: 16 March 2024).

UChicago Medicine (2018) *Why it's important to care for your voice*. Available at: https://www .uchicagomedicine.org/forefront/surgery-articles/world-voice-day (Accessed: 26 March 2024).

University of Florida (2024) *Vocal Function Exercises» Laboratory for the Study of Upper Airway Dysfunction» College of Public Health and Health Professions» University of Florida*. Available at: https://uad-lab.slhs.phhp.ufl.edu/2021/03/26/vocal-function-exercises/ (Accessed: 23 March 2024).

University of Hull (2022) *LibGuides: Reflective writing: Schön*. Available at: https://libguides. hull.ac.uk/reflectivewriting/schon#:~:text=The%20Sch%C3%B6n%20Reflective%20Mod el (Accessed: 8 April 2024).

University of Mississippi Medical Center (UMMC Health Care) (2023) *Diaphragmatic Breathing*. Available at: https://www.umc.edu/Healthcare/ENT/Pat:ient-Handouts/Adult/Speech-Language-Pat:hology/Voice/Diaphragmat:ic-Breat:hing.html#:~:text=People%20 often%20get%20into%20a (Accessed: 16 March 2024).

UNC School of Medicine (2017) *Taking Care of Your Voice: What is Vocal Hygiene?* Available at: https://www.med.unc.edu/ent/uncvoicecenter/wp-content/uploads/sites/516/2017/ 11/voca l-hygiene.pdf. (Accessed: 22 March 2024).

Underbrink, M.P. (2020) *What is Vocal Abuse/Misuse? (Signs, Causes, and Treatment)*. www.houstonent.com. Available at: https://www.houstonent.com/blog/what:-is-vocal-abuse/misuse-signs-causes-and-treat:ment (Accessed: 23 December 2024).

Utah State University (2002) Available at: https://www.usu.edu/markdamen/writin gguide/21qu est.htm#:~:text=One%20of%20the%20most%20importan t,does%20more%20damage%20than%20good (Accessed: 8 April 2024).

Verdolini Abbott K, Lin N, Branski R, Rosen C, Grillo E, Steinhauer K, and Hebda P. (2012) 'Vocal exercise may attenuate acute vocal fold inflammation', *Journal of Voice,* 26(6), pp. 814.e1-814.e13. https://doi:org/10.1016/j.jvoice.2012.03.008.

Verdolini, K., and Ramig, L. (2001) 'Review: Occupational risks for voice problems', *Logopedics Phoniatrics Vocology,* 26 (1), pp. 37-46. https://doi.org/10.1080/14015430119969.

Voice Study Center (2024) *What Every Singing Teacher Should Know About Vocal Health: Fact-finding and Myth-busting.* Available at: https://voicestudycentre.com/short-courses/what-every-singing-teacher-should-know-about-vocal-health-fact-finding-and-myth-busting-with-leda-scearce (Accessed: 20 April 2024).

Williams, J and Howard, D.M. (2011) ‘Vocal Misuses and Abuse: A Review and Recommendations for Practice’, *Journal of Singing,* 68(2), pp. 201-212. (Accessed: 16 March 2024).

Worcestershire Acute Hospital (2023) Release Of Excess Tension In The Vocal Tract. Available at: https://www.worcsacute.nhs.uk/documents/documents/pat:ient-informat:ion-leaflets-a-z/release-of-excess-tension-in-the-vocal-tract/#:~:text=Blow%20your%20lips%20so%20that (Accessed: 23 March 2024).

Zhang, Z. (2016) ‘Mechanics of human voice production and control’, *The Journal of the Acoustical Society of America*, 140(4), pp.2614–2635. doi:https://doi.org/10.1121/1.4964509.

Zheng, X., Bielamowicz, S., Luo, H. and Mittal, R. (2009) ‘A Computational Study of the Effect of False Vocal Folds on Glottal Flow and Vocal Fold Vibration During Phonation’, *Annals of Biomedical Engineering*, 37(3), pp.625–642. doi:https://doi.org/10.1007/s10439-008-9630-9.

Ziegler, A., Dastolfo, C., Hersan, R., Rosen, C.A., and Gartner-Schmidt, J. (2014) ‘Perceptions of Voice Therapy From Patients Diagnosed With Primary Muscle Tension Dysphonia and Benign Mid-Membranous Vocal Fold Lesions’, *Journal of Voice,* 28(6), pp. 742-752. https://doi.org/10.1016/j.jvoice.2014.02.007.

Appendix

Appendix A

Releasing Vocal Tension

Objective:

- Guide participants through a series of vocal exercises to release vocal tension.

Materials:

- Water for hydration
- Mirror (optional)

Stretching the body (5-10 minutes):

- Correct posture
- Gentle neck stretches.
- Shoulder shrugs
- Deep breathing exercises
- Diaphragmatic breathing exercises

Introduction (5 minutes):

- Discuss the importance of releasing vocal tension for healthy vocal production.
- Explain how tension can lead to strain, fatigue, and potential injury.

Warm-up exercises (5 minutes):

- "Sustain the vowel / i / for as long as possible on the musical note F."

Vocal Tension Exercises (30-40 minutes):

1. Lip trills (5 minutes)
2. Tongue trill (5 minutes)
3. Humming (5 minutes)- glide up and down their vocal range.
4. Yawning and sighing (5 minutes)- deep and relaxed
5. Jaw stretches (5 minutes)- gentle jaw movements (side-to-side, up-and-down)
6. Vocal sirens (5-10 minutes)- smoothly from low to high pitch and back down
7. Straw phonation (5 minutes)- rising and descending tones- SOTVE

Cool-downs (5 minutes)

- Gentle stretching for the neck, shoulders, and jaw
- Straw phonation- from bottom to top scale
- Gentle vocal fry for 5 seconds, repeat five times.

References:

Miwa and Chung (2023), University of Florida (2024), Worcestershire Acute Hospital (2023), Ragan (2016), Metropolitan Cantor Institute (2024), St. Olaf College (2024), Pfitzner (2023), Nicgabhann, (2023), Tayla (2024)

Appendix B

Preventing Vocal Nodules

Objective:

Educate singers about vocal health practices and techniques to prevent vocal nodules.

Materials:

- Handouts with information on vocal health
- Water for hydration

Introduction (5 minutes):

- Introduction of vocal health and prevention of vocal nodules
- Explain the importance of vocal health for individuals who depend on their voices for daily communication and work.

Vocal Nodule (10 minutes):

- Explain vocal nodules and their causes, symptoms, and impact on vocal function.
- Discuss risk factors for vocal nodules, such as vocal misuse, poor vocal hygiene, shouting, clearing throat, and dehydration.

Preventing Vocal Nodules (15 minutes):

- Proper vocal technique (breath support, resonance, and relaxed phonation)
- Vocal hygiene (vocal rest, avoid smoking, and hydration)
- Stress management.
- Adequate rest/sleep
- Seek medical attention for persistent issues.

Vocal Warm-ups (10 minutes):

- Gentle stretches for neck, shoulders, and jaw
- Breathing exercises (deep breathing and sigh release)
- Gentle humming and lip trills

Vocal Exercises (30 minutes):

- Yawning and sighing (5 minutes) (Miwa and Chung, 2024)
- SOVTE (10 minutes): lip trills, tongue trill, straw phonation
- Vocal sirens (5 minutes): low to high pitch
- Resonance exercises (10 minutes): nasal consonants (m,n,ng) and vowel modifications for oral resonance

Cool-downs (5 minutes):

- Gentle stretches and deep breaths
- Tongue trill
- Water hydration
- Straw phonation
- Vocal rest

Reference:

(St. Olaf College, 2024), (Ragan, 2016), (Pfitzner, 2023), (Miwa and Chung, 2024), (UChicago Medicine, 2018), (Connected Speech Pathology, 2024), (National Institute On Deafness And Other Communication Disorders, 2021)