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To what extent is water hydration the best method of maintaining voice protection among frequent voice users?

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Abstract. The research investigates various solutions for voice protection and their effectiveness, and ultimately concludes that hydration is the most effective sole way to achieve voice protection, but combining it with other methods like herbal use and avoiding overuse of vocal cords is optimal. The study reviews the function and mechanism of the vocal cords, finding the reason why people's throats (vocal cords) hurt and listing solutions from current readings. Next, the comparison of different methods, the usefulness of different methods among demographics, and the combination of various ways will be discussed. Finally, the research will evaluate the extent of the effectiveness of hydration in voice protection. The purpose of the study is to identify the ways the vocal cords generate voice, explore reasons why people's throats hurt, and identify different ways of protecting the throats and measure the effectiveness, especially for water hydration, which is the most popular among all methods. Through examining various solutions, the study found a complex process of generating voice and different solutions for protecting the throat. While voice problems have become increasingly serious around the world, fewer people are paying attention to the problems. Thus, the study hopes to increase the visibility of vocal protection and encourage more people, especially voice professionals, to raise their awareness of vocal health.

Keywords: voice protection, water hydration, vocal cords, frequent voice users

1. Introduction

Voice protection has been taken less seriously over time. Since 2002, every 16th of April has become "World Voice Day" in order to increase the importance of protecting the throat. According to World Voice Day [1], in 2018, "Almost 800 entries from 55 countries were registered at the WORLD VOICE DAY webpage (Figure 1), with a total of 1,974 activities".

These numbers decreased to 703 entries from 51 countries with 689 events in 2019. In 2024, there are only "nearly 350 World Voice Day events from around 55 countries spanning every continent". As a result, the visibility of vocal protection has decreased significantly. However, an increasing number of people are suffering from this problem. During the pandemic, a large number of people suffered from throat issues, and some even had after-effects. El-Anwar et al. [2] mentioned that "the most common ENT manifestations for COVID-19 were sore throat (11.3%) and headache (10.7%)". The problems have become more serious, but are paid less attention to, especially among voice professionals [3].

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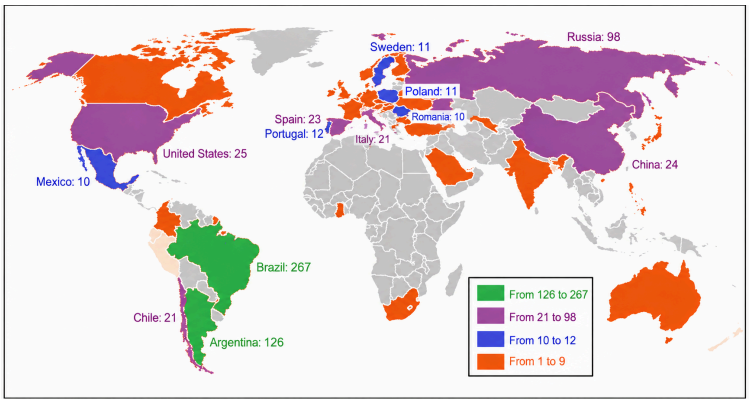

Figure 1. Global distribution of World Voice Day registered activities in 2018

Meanwhile, the methods to protect the throat need more research. The opinions on effective vocal protection methods range substantially. Some believe that doing vocal warmups will not help reduce the vocal pressure, a key factor that is related to vocal disorders [4]. However, some evidence shows that singers and music teachers prefer to conduct vocal warmups before performing or teaching [5]. Also, some believe that hydration is the most effective method to reduce vocal pressure, and there are various ways to conduct hydration, like drinking water and making the environment more humid. However, all of the methods have similarities, that is, they help protect the throat by focusing on the function and mechanisms of the throat, mostly the vocal cords. The process of the throat generating voice is complex, which involves many parts [6]. To make these parts more effective or easier to conduct is how vocal protection focuses. This research aims to analyse various methods and explore which of the methods is the most effective by looking at its effect on making the generation of voice much easier. The research will mainly focus on hydration, as this is the most commonly addressed method.

To study voice protection, in the literature review, the function and mechanism of vocal cords, the reason why people's throats hurt, and the solutions will be researched. Solutions include vocal hygiene, avoiding bad habits, changing the environment, and herbal use. Then, in the discussion section, a comparison of different methods, the usefulness of different methods among different demographics, and the combination of various methods will be discussed to explore which of the methods is solely the most effective, and how to combine the methods with other methods in order to make the most effective care plan.

In conclusion, the main purpose of the research is to find the most effective way to protect people's voices and to explore the usefulness of hydration for this purpose, specifically among frequent voice users. By doing so, a clearer effective solution will be found for voice professionals, allowing them to protect their throats in the best way. Also, it is hoped to increase the visibility of vocal protection and to help everyone pay more attention to vocal health.

2. Literature review

In this section, in order to explore the extent to which water hydration helps to maintain voice protection, the function of the vocal cords will be discussed first. Then, the potential threats to vocal health will be listed in order to later conclude on which solution is most effective at responding to those threats. Moreover, various solutions will be given and evaluated, but water hydration will be analysed mainly, as it is one of the most popular methods mentioned in the literature. Murry and Rosen [7], Behlau and Oliveira [8], Hartley and

Thibeault [9], Alves et al. [10], Sivasankar and Leydon [11], Leydon et al. [12], and UCI Health [13] all mentioned hydration.

2.1. Background—the function and importance of vocal cords

According to Jiang et al. [6], it is an elaborate process to make voices. It involves circulatory system processes, vocal cord vibrating, muscle functioning, and vocal resonance. Vocal cords are first shaped as a narrow channel. When air is breathed out, the pressure at the glottis (the channel between the vocal cords) will rise, and the vocal cords will open to a larger extent. After the glottis opens, three main forces act on the vocal cords in order to close them. They then open and close again repeatedly in a high speed, which produces a voice. This is a complex process.

According to Jiang et al. [6], "The vocal folds act as an energy transducer that converts aerodynamic power, generated by the chest, diaphragm, and abdominal musculature, into acoustic power radiated at the lips that is heard as voice". Vocal cords are therefore essential for voice production.

2.2. Why do people's throats hurt

2.2.1. Voice disorders

Vocal disorders are the main reason why people's vocal cords are not able to generate voice. According to Martins et al. [3], vocal disorders are common among a large number of people, especially voice professionals like teachers, across different age groups. Notably, the reading found that among the teacher participants, 32% suffered from voice disorders. The factors causing the problem are overuse of the vocal cords, because teachers often work for a long period of time and thus speak too much. Similarly, a leaflet from Johns Hopkins Medicine [14] emphasized this impact of vocal abuse. Furthermore, teachers could easily breathe in dust from chalk, which also causes vocal disorders. These kinds of problems are called respiratory problems. According to Lin et al. [15], "Chalk generates a large amount of airborne dust, and particularly submicrometer dust and nanoparticles that can penetrate into the respiratory system". From Section 1 of this Review, this study can know that to generate voice, air is needed, and so, inhalation and exhalation are crucial for generating voice. When dust is inhaled, the system is affected, leading to voice disorders. Apart from dust-induced breathing problems, some professional singers also suffer from respiratory issues like rhinitis, which can also lead to voice disorders. According to Santos et al., there are a large number of female singers who complain about respiratory problems like rhinitis, which is a factor in causing voice disorders [16].

In addition, according to Martins et al. [3] and UT Health San Antonio [17], and UNC Medical School [18], Laryngopharyngeal Reflux (LER) and Gastroesophageal Reflux (GERD) are two similar causes of vocal disorders. Based on Campagnolo et al. [19], LER is defined as "the retrograde flow of stomach content to the larynx and pharynx whereby this material comes in contact with the upper aerodigestive tract" and GERD is defined as "the flow of stomach acids back into the esophagus". More than 50% of the patients with LER have vocal disorders, and according to Santos et al. [16], GERD is also a major cause of vocal disorders. The acidity of the pharynx (near the vocal cords) and esophagus is neutral, while the acidity of the stomach acids is extremely acidic, so LER and GERD reflux would strongly damage the pharynx and vocal cords. The symptoms of LER are throat clearing, coughing, hoarseness, and globus pharyngeus. Thus, the management of LER is strongly required to protect the vocal cords.

2.2.2. Improper vocal habits

Having outlined the effects of voice disorders, vocal habits, another main reason will be examined. Unlike voice disorders, it will now examine common avoidable activities that people can choose to stop doing to prevent further damage to their throats. According to Santos et al. [16], "among the vocal abuses prevalent in

singers, there was lack of hydration, alcohol use, tobacco use, lack of appropriate vocal technique for singing, sleep dysregulation, bad eating habits, exposure to noisy and smoky environments, as well as vocal abuse". These improper vocal habits among singers can lead to GERD and respiratory problems, ultimately causing vocal disorders and harming the vocal cords. Among the improper vocal habits, alcohol and tobacco use are the most significant. It is for this reason that tobacco use is mentioned by the UNC Medical School [18] as a major irritant to the throat.

3. What are possible solutions

3.1. Vocal hygiene

Vocal hygiene is the most popular method discussed by the research. Murry and Rosen [7] mentioned when demonstrating vocal hygiene: "The voice professional and singer can maximize professional voice use if he or she can control the traumatic and injurious aspects of voice production in daily life". According to a leaflet from the UNC School [18], "Vocal Hygiene is a daily regimen of good habits to maintain the health of your vocal folds". Similarly, according to Behlau and Oliveira [8], vocal hygiene is a tool for treatment in order to modify vocal habits and to promote improved vocal health. Meanwhile, they also suggest that vocal hygiene has evolved to "vocal well-being", considering both individuals and the outer environment. The components of vocal hygiene are listed:

3.1.1. Hydration

The research has shown hydration to be the most effective method of maintaining vocal hygiene in the daily lives.

According to Behlau and Oliveira [8], there are three types of hydration: Systemic hydration, that is, hydration of intracellular water; surface hydration, that is, hydration of vocal fold mucosa; and environmental hydration.

3.1.1.1. Systemic hydration

Systemic hydration is defined as hydration of intracellular water, which includes drinking water. According to Hartley and Thibeault [9], there are increasing references in the literature about systemic hydration being an influence on vocal function. Also, Alves et al. [10] believe that systemic hydration is the easiest and most cost-effective method.

However, further investigation is needed, as recent research has suggested that different studies yield varying results on the impact of systemic hydration on vocal health. In contrast, according to Sivasankar and Leydon [11], "Increased systemic hydration was also observed to mitigate some of the adverse phonatory effects of vocally-fatiguing tasks". They conducted an experiment in which speakers read for long hours. They found that phonation pressure threshold (also known as Phonation Threshold Pressure, PTP) increased significantly in subjects with low systemic hydration, which suggests that systemic hydration is an effective way of protecting the voice and reducing vocal stress. As a result, systemic hydration plays a role in improving vocal cord health.

3.1.1.2. Surface hydration

Surface hydration is hydration on the vocal fold mucosa, which includes nebulization. This type of hydration is also beneficial for protecting vocal cords. Leydon et al. [12] suggest that "vocal fold surface liquid is maintained in part by salt and water fluxes across the epithelium" (Figure 2). The following diagram in that source demonstrates this:

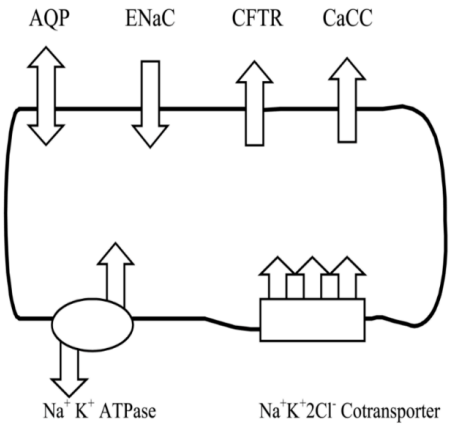

Figure 2. Model of transport proteins underlying transcellular ion and water fluxes across vocal-fold epithelium [12]

Through the demonstration of flux of ions and water by transport proteins on the surface, the authors suggest that the vocal fold surface, by conducting the process when surface hydration occurs, could maintain a moist environment during vibration and thus protect the vocal cords and the throat. Similarly, Sivasankar and Leydon [11] claim that "Enhancing surface hydration by nebulizing fluid to the vocal fold surface was also effective at lowering PTP temporarily". Also, UCI Health [13] believes drinking at least 8 glasses of water per day would help maintain good vocal health. Thus, the readings all agree that surface hydration is useful.

3.1.1.3. Combination of hydration methods

Combined hydration methods are the most effective, reducing PTP and "may reduce vocal fatigue after prolonged reading" [8]. This is also agreed by Sivasankar and Leydon [11], who claim that when combining the two hydration methods, clinical results such as reducing PTP, vocal effort, and jitter (measurement of stability of vocal fold vibration) are shown, but are of small magnitude. In conclusion, combined hydration is perfectly effective in reducing stress when vocal cords are generating sounds and thus protecting them.

3.1.2. Vocal warmups and vocal training

Apart from hydration, vocal warmups are also popular. Based on JM Sugars [5], a large number of people, especially voice professionals like singers, will do vocal warmups. According to Milbrath and Solomon [4], vocal warmups are believed to be a way of improving vocal function. However, according to their research on whether vocal warmups influence PTP and PPE (self-perceived phonatory effort) or not, they found that there are no significant changes in PTP or in PPE, suggesting that, in general, vocal warmups, especially short-term warmups, have little influence on dealing with vocal stress and thus vocal cord protection. Meanwhile, the authors mentioned that the method has high individual variability. Behlau and Oliveira [8] agree with this. According to them, theoretically, warmups could improve muscle dynamics and prevent injury. However, there are only 12 references present about vocal warmups. Also, the function of vocal warmups in reducing stress and preventing harm is controversial, regarding the vocal folds' viscosity. Moreover, the studies show the method has high individual variability. As a result, vocal warmups are not the most effective way of protecting vocal cords due to the high individual variability.

However, a recent study by Gürel and Şalakar [20] on special vocal training on singers, the Speech Level Singing (SLS) technique, which also includes vocal warmups, shows that the technique could reduce vocal stress and vocal disorders significantly because it helps singers sing naturally and comfortably like talking

with minimal vocal stress and improved control of breath. This method has been shown to be useful among singers and is backed by scientific evidence.

3.1.3. Vocal rest

Vocal rest is also mentioned frequently in voice protection suggestions. The leaflets from UNC Medical School [18], UT Health San Antonio [17], and Johns Hopkins Medicine [14] all recommend vocal rest. According to Behlau and Oliveira [8], there are two kinds of vocal rest: complete vocal rest and modified vocal rest. Complete vocal rest (also known as absolute vocal rest) is not suggested by them and by Satallof et al. [21] because long-term absolute vocal rest could cause muscle shrinkage and may cause another injury to the vocal cords. Modified vocal rest (relative vocal rest) is more useful. According to Behlau and Oliveira [8], a "structured program of voice conservation, Voice Use Reduction Program, was associated with improved vocal quality, reduced vocal fatigue, and improvement in vocal-fold appearance after a controlled period of reduced voice use". Satallof et al. [21] also mentioned that relative vocal rest is widely used among professional singers. Nevertheless, the cost is that singers may need to cancel all their performances and trips, and can only practice with a small frequency. In conclusion, vocal rest is effective in protecting vocal cords but costly for frequent voice users.

3.1.4. Avoiding clearing throats and overuse of vocal cords

Avoiding clearing throats and overusing of vocal cords is similar to vocal rest. Both of them focus on avoiding the vocal cords from becoming worse. Clearing the throat would cause a dangerous cycle, and the force given to the vocal cords would stress them and do harm to them. According to the leaflet by UT Health San Antonio [17], when feeling something uncomfortable in the throat, throat clearing would produce saliva, and saliva goes into the throat, making people want to clear the throat more, and this goes in a cycle. Alternative methods are swallowing and drinking water. If necessary, clearing your throat silently could also be useful.

Notably, according to Behlau and Oliveira [8], vocal overuse is especially dangerous: "One survey of physicians and speech–language pathologists/voice specialists suggested that screaming and/or yelling is viewed as the most hazardous vocal behavior (55%), particularly under inadequate acoustic or physical conditions". Also, vocal use when suffering from laryngitis or upper respiratory infection is especially dangerous. Thus, it is important to be careful in clearing throats and avoiding voice abuse.

3.2. Other methods

3.2.1. Avoid bad habits

As aforementioned, bad habits could cause injuries to the vocal cords. As a result, avoiding bad habits is necessary for frequent voice users to maintain a healthy throat, improve their voice, protect their vocal cords, and be healthy generally.

3.2.1.1. Avoid drinking alcohol

Alcohol, although containing water, could cause the dysfunction of the whole body and would cause vocal disorders. According to Murry and Rosen [7], "alcohol leads to dehydration, increased demand of the respiratory system, and generally a reduced sensory awareness for loudness and voice quality". As a result, avoiding drinking alcohol is beneficial for voice professionals.

3.2.1.2. Avoid cigarettes

Smoking is also a major. First, smoking is harmful to the lungs, and the vocal cords need a respiratory system to vibrate. Meanwhile, smoking could lead to a hoarse voice. According to Murry and Rosen [7], it is known that cigarettes can cause hoarseness and eventually laryngeal cancer. Besides, dehydration, mucosal drying, irritation, and inflammation can also occur, negatively affecting voice quality. In conclusion, smoking should

be controlled among frequent voice users to maintain a good voice. Also, clinics and arts medicine professionals have the responsibility to "warn patients of the dangers of cigarette smoking and to provide assistance or referrals to clinics that specialize in smoking cessation using medically approved programs". As a result, frequent vocal users should be aware of smoking.

3.2.2. Change of environment

Because of financial or other problems, some voice professionals have problems with their living environment, and thus, their throat may be affected negatively as a result of that environment. According to the research by Santos et al. [16], some studies show that exposure to noisy and smoky environments and financial instability could cause vocal abuse and thus vocal disorders. In addition, Behlau and Oliveira [8] also agree with this idea: "...environmental factors may affect the professional voice user including background noise, poor room acoustics, distance among speakers, lack of voice amplifiers, poor air quality (including dust particularly for teachers, actors, and performers), and artificial fogs and smokes". Thus, reducing smoke and dust and improving the environmental quality is effective. Meanwhile, environmental hydration would also be useful. According to the study by Sivasankar and Leydon [11], "exposure to dry air (20% to 30% humidity) for approximately 5 minutes increased PTP and lowered vocal efficiency", which means low humidity would cause vocal disorders. Increasing environmental humidity would protect the vocal cords.

3.2.3. Using herbal plants

Calcinoni et al. [22] first identified traditional herbal use in vocal care. They found that among the herbal medicines, more than 60% of the herbal plants target the Transient Receptor Potential Ankyrin 1 (TRPA1) ion channel, which is involved in inflammatory and neuropathic pain mainly in the throat, and as a result, may activate the channel, reduce vocal pain, and thus protect vocal cords. As a result, herbal plants could be effective in vocal protection, but with less identification. Similarly, Bassoli et al. [23] suggested that according to research, TRP ion channels could be involved in mechanisms of herbal use to voice quality, "such as erysimum, ginger, eucalyptus, cinnamon and many more".

4. Discussion

Based on existing research on vocal disorders and various solutions for vocal protection, this section will engage in a comparison of methods, a discussion of the usefulness of the methods among different demographics, and a combination of the methods. The aim will be to answer the overall question of which water hydration method is best for maintaining voice protection among frequent voice users.

4.1. Comparison of methods—which is best

4.1.1. Hydration vs vocal warmups

It has been said that hydration is the most effective and easiest of all the methods. First, hydration, the most commonly mentioned method, can reduce PTP to a significant extent and thus reduce the pressure required for the vocal cords to generate voice. As explained earlier, there are 2 types of hydration: systemic and surface hydration. Systemic hydration, by conducting experiments, could reduce the PTP of the vocal cords of long-time voice users. Similarly, surface hydration was also found to be effective in temporarily lowering PTP. Therefore, combined, they are effective at reducing the strain on the vocal cords. Also, hydration is easily accessible. People normally drink water every day, and water is already essential for the bodies. Therefore, by increasing the frequency of water consumption, the vocal cords are better protected. Although some sources claim that further investigation is needed to understand the usefulness of hydration, and some believe that

hydration is not vital for vocal protection, the better view is that hydration is highly useful in vocal protection, given its accessibility and proven usefulness.

On the other hand, vocal warmups are thought to be useful at reducing vocal pressure and thus protecting the throat, as most singers do vocal warmups before performance. This perspective is backed by JM Sugars [5], which shows that 40.6% of singers and 24.0% of teachers usually do vocal warmups, and 31.3% singers and 40.0% of teachers always do vocal warmups before a performance or a lesson. Despite this, according to the experiment conducted by Milbrath and Solomon [4], vocal warmups bring no significant change in PTP and are highly individually variable. This means that they are less likely to protect their vocal cords among most voice users. As a result, doing vocal warmups is less effective than a combined systemic and surface hydration in protecting vocal cords.

4.1.2. Hydration vs vocal rest

Vocal rest is also considered to be an effective way to protect vocal cords, but it has disadvantages. For example, complete vocal rest could cause shrinkage of muscles to shrink and thus could cause further serious injuries. Meanwhile, vocal rest causes inconvenience for frequent voice users as they have to pause for a long time to rest their voice, and would need to cancel a lot of events. Thus, vocal rest may be not a cost-effective way to protect vocal cords. Only when serious vocal disorders occur and doctors advise you to rest your voice should you need to do it.

Therefore, hydration is still a more effective method of maintaining voice protection because hydration is the most used in the daily lives, and it does not have significant side effects. Meanwhile, using the hydration method does not require frequent vocal users to put off their important events to protect their throat.

4.1.3. Hydration vs avoiding overuse of vocal cords

Frequent voice users must avoid overuse of vocal cords, especially for those who are feeling that their voice is not doing well. However, using your voice is something that you have to do. According to Behlau and Oliveira [8], overuse of the throat will cause further harm to the throat, and could be serious, and may cause permanent vocal disorders. Thus, overuse of the throat will cause further harm to the throat, and could be really serious, and may cause permanent vocal disorders. Thus, avoiding the overuse of the vocal cords is always required. As a result, some people say that avoiding overuse of the throat is the best method. However, hydration is still the most effective because avoiding overuse of the throat is not really a method. It is more like a requirement for frequent vocal users when their throats are already tired. They have no choice but to stop using their throat. However, water hydration can reduce vocal stress and thus protect the throat before one really needs to stop using their voice.

4.1.4. Hydration vs avoiding bad habits

According to Santos et al. [16], bad habits like throat clearing, drinking alcoholic drinks, and smoking can result in voice disorders like LER, which affect the throat negatively to a large extent. For example, although drinking one glass of beer might not have too much effect, drinking too much can irritate vocal cords badly, "leading to dehydration, increased demand of the respiratory system, and generally a reduced sensory awareness for loudness and voice quality" [7]. However, the better view is that this is unlikely to be an effective way of protecting the throat, as you cannot guarantee that, without bad habits, the vocal cords will not still suffer from disorders. For instance, if a person has no bad habits but does not drink water, their throat would still not be in optimal condition. Therefore, avoiding bad habits only ensures that a person does not worsen their throat protection, but it does not, by itself, increase or improve throat protection.

4.1.5. Hydration vs herbal medicine

Based on previous research, herbal use is effective at protecting vocal cords by activating a particular target to reduce the pain and stress of the throat. Meanwhile, in East and Southern Asia, herbal medicine is especially popular in protecting the throat, and as a Chinese, herbal use is useful, as after using herbal medicine or herbal tea, a sense of coolness is generated from the throat. It functions by reducing the pain of the vocal cords and reducing the pressure needed to generate voice. As a result, the traditional view of local communities is that herbal medicine is effective in protecting the vocal cords.

4.2. Usefulness of the methods among different demographics

In comparing the methods, it is also important to highlight the extent to which each is suited for all types of frequent vocal users, as opposed to just a small section of the public.

4.2.1. Hydration

Based on Alves et al. [10], systemic hydration is the easiest and most cost-effective solution to improve voice quality. As a result, common understanding indicates that all kinds of people, including frequent vocal users, could use hydration to protect vocal cords, because it is effective and easy to reach. According to the aforementioned research, combining the two hydration methods can reduce PTP and vocal effort, and thus protect the throat. Also, Sivasankar and Leydon [11] suggest that people who read aloud for a long time could reduce PTP by systemic hydration, so, needless to say, it is useful for almost everyone. Moreover, hydration could be achieved by just drinking more bottles of water and increasing the humidity of the environment. In conclusion, this method is universal, being useful across various demographics.

4.2.2. Vocal warmups and SLS training method

Singers and music teachers often do vocal warmups to improve vocal function and not to have vocal disorders when giving a performance or a lesson. Meanwhile, doing vocal warmups requires techniques that take time to learn. But, teachers, for instance, put most of their effort into teaching and thus do not have the time and energy to learn vocal warmups. Similarly, Speech-Level Singing (SLS) means to sing like you are speaking in order to reduce vocal stress. This method is useful for singers because singing is more stressful on the throat than speaking. However, it is useless for other types of frequent vocal users, such as teachers, who already speak instead of singing, and so are unlikely to benefit from SLS vocal training.

4.2.3. Vocal rest

As mentioned before, vocal rest is not a useful method because it may require you to cancel a lot of your events, like performances for singers or classes for teachers. Although it equally affects different demographics of frequent voice users, it is equally inconvenient for each. In conclusion, this method is not suitable for any frequent vocal users who need to use their vocal cords immediately.

4.2.4. Changing of environment

Some frequent vocal users with a good lifestyle do not need to change too much of the environment to protect the throat because their standard of living is relatively high, and thus their environment is less likely to be dirty and cause vocal disorders. In contrast, some frequent vocal users who are in financial difficulty may need to change to a better environment, as dust in the air could contain particulates and toxic gases that are harmful to the vocal cords and the respiratory system needed to generate voice. Notably, teachers should change their chalks to markers because using chalks could cause them to breathe in more dust, increasing the likelihood of vocal disorders.

4.3. Combination of various methods

4.3.1. Hydration X herbal medicine

Drinking herbal tea like sterculia scaphigera (the seed of boat-fruited sterculia) is popular in Asia, particularly in China. According to Oppong et al. [24], "it (Sterculia) is traditionally used in China for the treatment of pharyngitis (sore throat), constipation, non-productive cough (dry cough without sputum), and pain". It is beneficial given its combination of the advantages of both hydration and using herbal medicine. Vocal cord stress and vocal pain could be reduced significantly. Although there are not many references in the academic literature related to herbal use, especially for Chinese herbs, it is traditionally believed that drinking some herbal tea is very effective at protecting the vocal cords.

4.3.2. Hydration X avoiding bad habits X avoiding overuse of voice X change of environment

This combination, in essence, combines all effective methods. Some of the methods are not that effective if used solely. However, a combination of methods could be increasingly beneficial for protecting the vocal cords. Hydration could reduce the stress of generating voice; avoiding bad habits like cigarettes and alcohol could reduce the chance of suffering from vocal disorders, respiratory problems, and vocal stress, as well as helping to generate a better voice; avoiding overuse of throats is to make sure vocal cords are not worn down; change of environment could also reduce the chance of vocal disorders and to maintain a good quality of voice.

The biggest benefit to frequent vocal users is that all of the methods examined can be easily combined without clashing or reducing the effectiveness of any individual method.

5. Conclusion

This paper has shown that the mechanism for generating sound involves the application of air pressure to the vocal cords to make them vibrate. When people's throats become hurt, this mechanism is inhibited.

The possible reasons why people's throats can become hurt have also been researched. There are mainly two reasons: vocal disorders and improper vocal habits. These two reasons provide valuable information for further investigation on which solution is the most effective.

Some people believe that there are other better methods than hydration for maintaining voice protection among frequent voice users, but it has been proven that hydration is the best. This is because, according to the research above, water hydration is the most effective method for reducing PTP and relieving vocal stress, and it is also the easiest solution to employ. Conducting both systemic and surface hydration would protect the throat to the largest extent. Although current research does not provide much evidence, it is still the most effective method to protect the throat compared to other methods. The other methods, like vocal rest and vocal warmups, have more limitations than hydration. For instance, vocal rest could cause further injuries to the throat, as well as be impractical. Also, some other methods, like avoiding overuse of the throat and avoiding bad habits, are more likely to be a requirement to prevent further injuries than to actually improve vocal health.

However, to a larger extent, the magnitude of protecting the vocal cords through hydration alone is still relatively small. As a result, a combination of other methods is most effective. Herbal tea, with water, could reduce the pain. Avoiding bad habits and overusing overuse of voice is a requirement. Meanwhile, changing to a better environment could reduce the chance of suffering from vocal issues like respiratory problems. These combinations of several methods help protect the throat the most comprehensively.

Further investigation is still needed to have a better understanding and gain evidence on the effectiveness of various methods. Protecting vocal cords needs to be increasingly paid attention to, especially among

frequent vocal users after the pandemic, as COVID-19 affected the throat negatively. However, there are still a large number of people still do not know the most effective way to protect their throats, and some may even protect their throats in the wrong way, causing injuries. Thus, further understanding of the topic is still necessary.

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