

Voice Workshop / UWTSD MA in Voice Pedagogy

Independent Study Module (Extended) (BMPF7013)

Exploring the potential for the therapeutic use of Yoga for Muscle Tension

Dysphonia: A review of the literature

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Part 1 – portfolio and rationale

Introduction and rationale for the project

This project will aim to identify if there are any applications benefits in using yoga – specifically the practices of prāṇāyāma (controlled breathing) and āsana (postures) – for the treatment of Muscle Tension Dysphonia (MTD) in singers.

A desktop literature review will be undertaken to explore the etiologies, assessment methods, symptoms and current treatments for MTD, so that a clear definition and frame of reference can be established. The literature review will also explore peer-reviewed, published literature looking specifically at yoga and its applications in singing training and voice therapy.

The researcher has previously worked with singers who have received a clinical diagnosis of MTD and has been able to note anecdotally and through preliminary reading that movement protocols encouraging the relaxation of muscles in the neck and shoulders are very beneficial. Received wisdom from other teachers and articles also suggests that working with breath pressure SOVT¹ exercises has benefit for this condition, but as a vocal coach and singing teacher – rather than a speech and language therapist or pathologist – it is important and necessary to undertake further and more specific reading to be able to draw any meaningful conclusions.

As an experienced yoga practitioner, the researcher has noted that there is a great similarity between the breath and posture work done in the voice studio and the prāṇāyāma and āsana work done in the yoga studio. There is also crossover with the

¹ Semi-Occluded Vocal Tract

use of meditation and mindfulness in yoga, and the potential link between common mental health disorders such as anxiety with voice disorders observed by Rocha et al. (2019).

Therefore, the researcher intends to read as widely and as deeply as possible on the crossover between these disciplines to try and establish an evidence base for further pilot-study research into the therapeutic application of yoga in singers with MTD.

Main Aims of Project

The main aims of this project are to lay out an evidence-based case for developing a therapeutic programme of yoga for the treatment of MTD. This ground clearing work will then pave the way for further, practical research in the future. It is clear from initial reading that there is plenty of literature on the subject of MTD, allowing the researcher to deepen his knowledge on the subject and form a clear understanding of the assessment and treatment methods currently used in voice therapy. There is also a useful amount (although not huge) of literature discussing the application of yoga to singing training in general, allowing for useful comparisons between these disciplines to be drawn.

Despite this, it is noted by the researcher that there is only one paper available at the time of writing that looks in detail at the potential therapeutic application of yoga. This leaves a gap in current knowledge to be explored and, ultimately, filled.

Singers have an above-average incidence of MTD diagnosis (Sielska-Badurek et al., 2017) and given the apparent application of yoga as a voice training tool for singers, this seems an excellent group to focus on in this research project.

It is hoped that the results of this study will prove useful to voice and singing teachers working within the field of vocal rehabilitation, in giving them an evidence-based holistic approach to working with the breath, body and mind when treating MTD.

Role and Relevant Expertise

The author has worked as a vocal coach for over 20 years with professional singers in the Musical Theatre and CCM fields, both in private practice and as Director of Voice Faculty at READ College. He has provided specialist singing coaching for those rehabilitating from vocal injury since 2011, receiving referrals from Speech & Language Therapists and Multi-Disciplinary Voice Clinics, and is an expert assessor for the Vocal Health First Aid programme run by VHE². He has practiced and studied yoga for 6 years and regularly includes both yogic breathing (prāṇāyāma) and physical postures (āsanas) and mindfulness in his voice teaching work.

As already noted, whilst the researcher is an experienced voice pedagogue he is not trained as a voice therapist, and so conducting this initial desktop study is extremely important to underpin practice with theoretical knowledge. It is not the job of the voice coach or singing teacher to diagnose MTD or any other condition, and nor is it for them to offer anything approaching a 'cure'.

However, there is an important role to be played in supporting the rehabilitation of professional voice users who rely on very specific vocal techniques in order to undertake their work. An experienced and well-trained singing teacher or vocal coach

² Vocal Health Education, a non-profit organisation providing vocal health training internationally

can be of great benefit in these circumstances when collaborating with a speech and language pathologist/therapist (Goffi-Fynn and Carroll, 2013).

The researcher's experience and expertise in the subject areas being addressed mean that he is well placed to undertake this project and also to commit to further research if this initial project proves successful.

Main Aims and Objectives

The main aims of this study will be:

- To widen and deepen the researcher's knowledge of MTD in the following key areas:
 - Symptoms
 - Etiologies
 - Diagnoses and Assessment Methods
 - Treatments
- To widen and deepen the researcher's understanding of yoga in singing training
- To explore any literature that touches on the therapeutic application of yoga to singers with disordered voices
- To search for any literature that shows an evidence base for using yoga as a therapy for areas linked to MTD, such as neck/shoulder injuries, breathing difficulties and common mental health disorders

The main objectives of this project will be:

- To establish key authors and/or texts who have authority in the areas of study, and to include these in the literature review

- To search for evidence in the literature of the overlap between singing training, voice therapy, and yoga practice
- To establish a hypothesis that a targeted, evidence-based use of yoga prāṇāyāma and āsana practices may be beneficial in the treatment of MTD in singers
- To lay the foundations for further practical research in this area

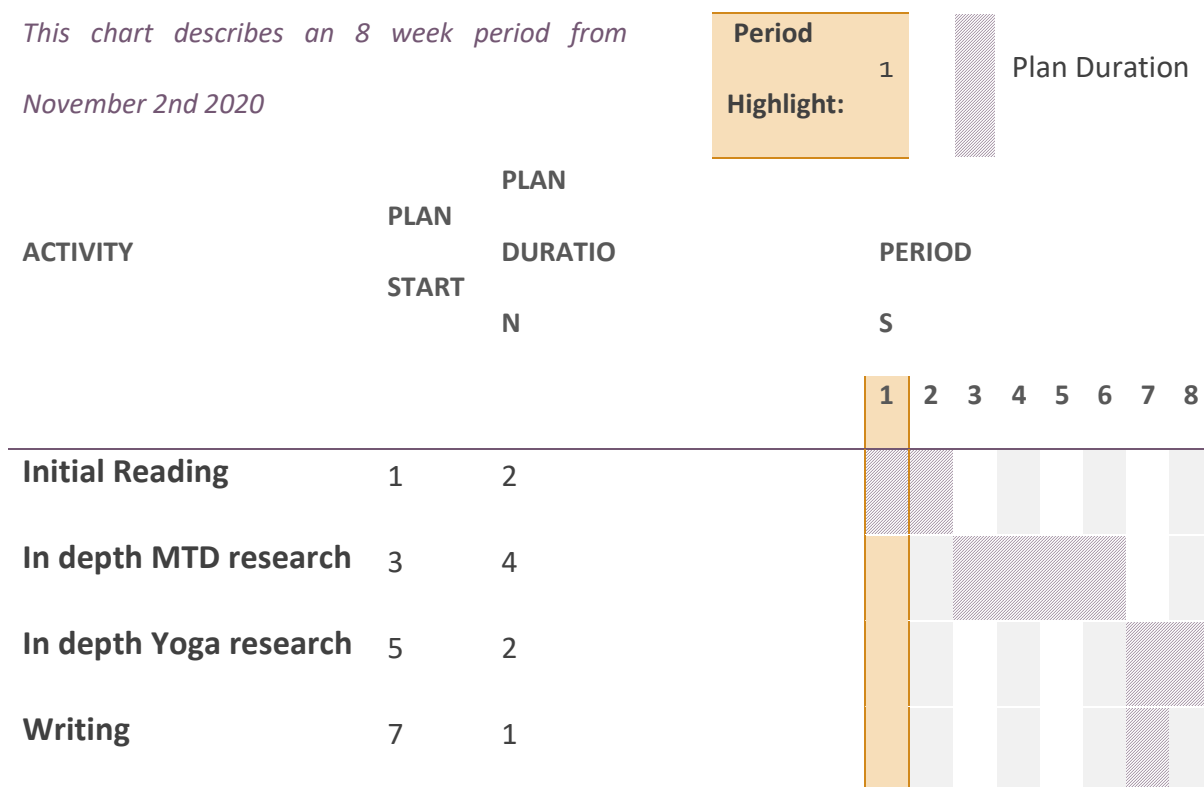
Time Scale of Project

The initial reading phase of this project will begin on November 2nd, with in-depth research in the areas of MTD and yoga to follow thereafter. This phase will take a combined 7 weeks, with one full week to write the literature review. The Gant chart overleaf gives an indication of the timescale.

This project fits well into both the work and personal calendar of the researcher, with the 2nd lockdown of 2020 creating some quieter time to focus at the start of the project, and the academic winter break providing 2 weeks of clear time at the end of the project.

Research Plan

This chart describes an 8 week period from November 2nd 2020



Resources

Resources that will be required for this project are simple and are in the possession of the researcher. These resources will include:

1. Access to academic journals and books for the literature review. The majority will be sourced via the UWTSD online library service, with books of particular interest being purchased by the researcher
2. Study space. The researcher is fortunate to have a home studio/office away from busy professional and family life, allowing for quiet and reflective working

3. Computer and internet access, both provided within the studio/office environment
4. Time to complete the research, as detailed in the research plan

Specific Skills and Knowledge That Will Be Gained

Through this project, the researcher will aim to understand the potential application of therapeutic yoga for singers suffering with MTD.

The researcher also hopes to develop a better understanding of MTD as a condition, and how it is currently treated within the voice therapy community.

Finally, the researcher hopes to synthesise the results of this research to form a pedagogical standpoint from which further research can be conducted.

Literature Review Process

Conducting a thorough review of current literature in any chosen field is key to the success of further research and can ensure the integrity of a project (Hart, 1998). Therefore, during this project the researcher will be considering a range of literature taking in different disciplines including voice therapy, singing teaching, yoga practice and health/wellbeing. The range of subject matters means that the researcher will need to interpret both qualitative and quantitative data, from scientific studies to more experiential work.

Narrowing the field will be an important first step in keeping the review focussed and preventing it from becoming unclear or irrelevant (Randolph, 2009). To a certain extent this work has already been started by the researcher in a tutorial with his supervisor, when the breadth of voice disorders that might benefit from yoga treatment was

narrowed down to MTD, that being the most commonly reported voice disorder in voice clinics (Kempster et al., 2009; Sielska-Badurek et al., 2017).

Whilst it will be necessary to look at historical literature to gain perspective on the developments within the field, the researcher will give priority to research written in the last ten years to ensure that the understanding gained is current.

Cooper's 1988 'taxonomy of literature reviews' (Cooper, 1988) seeks to categorise desktop literature reviews in the following characteristics –

Focus, Goal, Perspective, Coverage, Organisation, and Audience

Each characteristic can then be categorised further, to help provide focus in the research process (Randolph, 2009). Using this system, the researcher has been able to establish the following goals:

1. The focus of the project will be the research outcomes, in other words gaining a clearer understanding of the field of research and where this may lead
2. The goal of the project is to integrate and generalise findings, to draw conclusions and comparisons between the different areas of study
3. The perspective will be that of espousing a position. The researcher will have a stated hypothesis that will be either supported or rejected by the end of the project. It is worth noting the conclusions of Hart (1988) that almost all reviews are written from a particular standpoint and with a certain audience in mind, and therefore being aware of one's own value judgements is important to ensure proper respect for research that explores other ideas
4. The coverage of the literature review cannot be exhaustive, since it is not possible to read every piece of literature written about such a vast area as MTD.

The timescale of the project also plays into this, with a need for a clear and systematic approach leading to the need for representative coverage (Boell and Cecez-Kecmanovic, 2014)

5. The literature review will be organised both conceptually - exploring the hypothesis and focussed on exploring this rationale - and methodologically – setting out an introduction, research method, analysis and conclusion.
6. Finally, the audience can best be described as specialised scholars, and so an academic writing style will be adopted throughout

Furthermore, Rhoades (2011) lays out clear steps for undertaking a literature review. The researcher has found this process useful in previous work, and will followed the steps detailed:

1. Defining the Topic or Research Question
2. Identifying Relevant Information
3. Conducting the Search
4. Screening
5. Scrutinizing
6. Extracting Data
7. Synthesizing Findings
8. Develop Conclusion

The research topic and question have previously been identified in this paper. Identification of relevant information will certainly be key and preliminary reading for this literature review is already underway, starting in the area of yoga as a form of singing training since this is a less-researched field and is less familiar to the researcher. The book 'Yoga for Singers' by Judith E. Carman has provided an

excellent start, and the researcher is currently conducting advanced online searches in the UWTSD library for literature in all areas covered by this project.

At the time of writing, peer-reviewed journals being cross-referenced as part of the 'Search' phase include the Journal of Voice, NATS Journal of Singing, International Journal of Yoga, Journal of Manipulative and Physiological Therapeutics and the research of other MA Voice Pedagogy students at Voice Workshop / UWTSD.

Screening will be necessary to rule out studies that are either irrelevant to the central research question or have been superseded by newer research. Due care will be given to make sure that all literature included in the review is from peer-reviewed sources, and/or acknowledged experts in the field.

Only relevant literature will then be scrutinized to find emergent patterns and themes, with quantitative and qualitative data been extracted to give a clear picture of the evidence either for or against the researcher's hypothesis.

Findings will be synthesised in the form of data analysis to fully explore the key themes in the literature, and finally conclusions will be drawn to propose areas ripe for further research. (Rhoades, 2011)

All literature that is read in the preparation of this review will be annotated and filed, to allow easy access to information when writing. Bell (2005) suggests logging all such information, and to allow easy access the researcher has created a virtual document store on Microsoft OneDrive and will also be using <https://www.citethisforme.com> to store references and citations throughout the process.

Critical reflection

This project aims to fill a gap in current knowledge for both the researcher and the wider voice community. It is hoped that it will lead to further research that will inform the treatment of singers with MTD and that the researcher will be able to use this work to inform his practice in the voice studio.

In the ever-changing field of voice pedagogy, the researcher recognises the importance of developing new skills and awareness. Johns (2004) says that critical reflective practice is “the antidote to complacency, habit and blindness” and this project intends to open up new areas of research in this way. As a pedagogue it is extremely important to try and take an unbiased standpoint when working with clients – most especially those with disordered voices who are naturally more vulnerable – and to engage in critical reflection or ‘hunting assumptions’ (Brookfield, 2017).

A concern at the beginning of the project was that there would be insufficient academic writing on the subject of yoga, and particularly on its links to singing practice and teaching. This concern proved to be unfounded, with both voice and yoga-specific journals providing plenty of potential reading matter. In particular Judith E. Carman has written several books and papers on the subject, with various papers also addressing the topic in the NATS Journal of Singing. This led to a fleeting concern that others may have already addressed the research question and topic put forward for this project, but in fact almost no literature was found making the link from MTD therapy to yoga practice. Therefore, it may be possible to produce a so-called integrative literature review, with the potential to generate new knowledge within the field of study (Torraco, 2016).

Initially, the field of study in the area of voice disorder was vast and unwieldy, with too many potential avenues to explore. The research recognises a tendency to read voraciously and to 'butterfly' from one study to another, finding fascinating but ultimately irrelevant articles and books. After a timely and useful tutorial discussing the project, it was decided to limit the area of study in voice disorders to MTD, bringing much more focus and clarity to the review. Research into literature review methodologies (Cooper 1988; Randolph, 2009; Boell and Cecez-Kecmanovic, 2014; Rhoades 2011; Torraco, 2016) helped to retain this focus, and a thorough process of screening the literature helped to keep reading on track.

Gaps in the researcher's knowledge were established in the treatment of MTD, and alongside research conducted through reading, the researcher undertook CPD opportunities working alongside several colleagues at VHE as a community of practice, assimilating their views and understanding into both research and teaching practice (Moon, 2013). Such a process is especially useful in a pedagogical setting, since it has been noted to help to improve both outcomes for learners as well as facilitating professional development and empowerment for pedagogues (Hine, 2013).

Work on this project has coincided with the nationwide lockdowns imposed due to the coronavirus pandemic in 2020 and 2021. This has had both positive and negative effects on both the author and the work itself. From a positive perspective, it has cleared sections a usually busy work diary and allowed managing family and work life balance much more achievable. It has allowed for long and uninterrupted periods of reading and reflection, which has fed into this project. However, from a negative perspective it has prevented the researcher from engaging in two activities: face-to-face vocal coaching with clients, and regular yoga tuition. Both activities have continued online with some degree of success, but since both activities are very much

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experiential by their nature and have traditionally involved 'hands-on' contact between teacher and student, it has been limiting to some extent and there was no possibility to engage in Reflection on Action - in other words, the researcher was unable to adequately learn from experiences, whether positive or negative (Schön, 1983).

Throughout the writing process, upon completion of the research, the author was able to stop and take time to reflect on the process using Gibbs 'Learning by Doing: A guide to teaching and learning methods' Reflective Model (Gibbs, 1988). Being cut off from face-to-face practice resulted at times in a stagnation of teaching methodology and approach to working. This clearly had the potential to have a negative effect both on practical work in the studio, but also on the research project as both yoga and the treatment of voice disorder are areas that the researcher feels passionately about and any loss of energy behind the project would be compromising.

In addressing these issues, the researcher saw that engaging with a wider community of practice and CPD had the potential to help re-energise both teaching and writing this project, and this certainly proved to be the case.

Having noticed the effect of the lockdowns on mental health and connection to the project, the researcher then continued through a period of reflection on physical health, which resulted in engagement with online yoga courses and regular, personal practice at home to deepen the experience of learning and learning about the practices included in this research.

The resulting work has had not only positive effects on the researcher but has also opened up the potential for new fields of study.

Ethical Considerations

In order to progress this field of research any further beyond the end of this project, it is necessary to understand the ethical issues of working in both singing voice rehabilitation coaching and yoga.

Neither field is currently regulated in terms of training, delivery or supervision at the current time, in contrast to speech and language therapists/pathologists and others in the medical field.

Whilst several programmes exist in the US to train singing voice rehabilitation specialists, these vary hugely and there is no accredited, comprehensive programme for training (Gerhard, 2015). The researcher is aware of a level 4 Vocal Health Practitioner programme launching in the UK in 2021 through his work as an assessor with VHE, but this course is not yet developed or available for study. Also Voice Workshop in partnership with UWTSD offer a Vocal Rehabilitation Coach pathway through the MA Voice Pedagogy programme being followed by the researcher. Literature on this pathway clearly states that being a VRC is not regulated, and the qualification can be used to deepen knowledge but should not be seen as a stand-alone training pathway. It is suggested that someone wishing to pursue a career as a VRC should also seek clinical experience, contact with voice clinics, ethics considerations and also to work towards British Association of Performing Arts Medicine (BAPAM) accreditation (Voice Workshop, 2021).

BAPAM offers registration for VRC's and seeks 'BAPAM approved competencies' as qualification which are available on request, however the researcher notes that at the time of writing the BAPAM register is currently closed to new applicants (BAPAM, 2021).

Similarly, there is a lack of clarity in the training of yoga practitioners at this time. The British Wheel of Yoga runs level 4 regulated training courses (<https://www.bwy.org.uk/>, 2021) but there are also many other private training providers offering qualifications in various areas.

Hoch and Sandage (2017) seek to create a common language and use of terminology for voice scientists, coaches and those in the medical professions through a brief literature review, but this paper only cites 4 sources and doesn't present any conclusion.

Finally, there is an important difference between what is considered rehabilitation (improving or recovering skills required for daily living that have been lost or impaired) and habilitation (helping a client to learn or improve skills for daily living). In the context of most vocal coaching, it can be argued that it falls into the category of habilitation with the work of speech and language pathologists being more rooted in rehabilitation. However, a VRC may fall between these two camps and so it is important to draw boundaries about what a coach (and therefore non-medical practitioner) is able to undertake.

With the above in mind, it will be very important to lay clear boundaries as to what evidence must be excluded from further research on the grounds of relevance and authority, and how a programme could be developed within some regulatory approval or ethical, evidence-based framework to ensure academic rigour.

Part 2 – research project

Introduction

Muscle Tension Dysphonia (MTD) is among the most common causal factors in those attending voice clinics with voice disorders (Kempster et al., 2009; Sielska-Badurek et al., 2017). It is recognised to have causes and symptoms that are both physical and psychological in nature, and effective treatments have included those focussing on the release of the muscular hypertension; better control of the breath; and, emotional/psychological relaxation techniques (Altman, Atkinson and Lazarus, 2005; da Cunha Pereira et al, 2018).

Since these key elements of body, breath and mind are also the core components of yoga practice and training (Carman, 2012), and as yoga is increasingly used in the training of singers (Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017; Moliterno, 2008) the hypothesis of the author is that targeted yoga practice could form an effective, holistic therapy for MTD. This literature review aims to explore the current understanding of MTD and its various treatments, and the application of yogic techniques in voice training and therapy, to form a basis for further research.

The author has worked as a vocal coach for over 20 years with professional singers in the Musical Theatre and CCM³ fields, both in private practice and as Director of Voice Faculty at READ College. He has provided specialist singing coaching for those rehabilitating from vocal injury since 2011, receiving referrals from Speech & Language Therapists and Multi-Disciplinary Voice Clinics. He has practiced and

³ Contemporary Commercial Music

studied yoga for 6 years and regularly includes both yogic breathing (prāṇāyāma) and physical postures (āsanas) in his voice teaching work.

Literature Review

To make the clearest sense of the current available information, the literature review is split into two sections: MTD and Yoga in Singing Training.

MTD

A definition:

The term Muscle Tension Dysphonia was first coined in 1983 by Morrison et al to describe a pathophysiology that includes the hypertension of the extrinsic laryngeal muscles, leading to an elevated laryngeal position (Sielska-Badurek et al., 2017), posterior glottal chink and consequently a breathier sound (Altman, Atkinson and Lazarus, 2005), and isometric and/or supraglottic constriction within the vocal tract (Van Houtte, Van Lierde and Claeys, 2011). Alongside this pathophysiology in the neck and vocal tract, it has been noted that the resulting abnormal tension in other parts of the system – such as the chest, tongue, jaw and the abdominal wall – can lead to a lack of healthy function in the laryngeal musculature resulting in loss of resonance and control, hoarseness and vocal fatigue. (Sielska-Badurek et al., 2017; Jafari et al., 2017).

Additionally, symptoms for singers (using a broader range of frequency and longer phrasing than speakers) can include limited access to the full vocal range, fatigue after short periods of singing and a shorter maximum phonatory time (MPT) (Emerich Gordon and Reed, 2019; Sielska-Badurek et al., 2017). Those with high vocal demands – such as singers – are reported by Van Houtte et al (2011) to have a greater

prevalence of MTD diagnosis, and it is noted that improper use of the phonatory musculature can cause disturbances to the resonance focus, loss of pitch/loudness control and, if left untreated, decompensation of the voice (Van Houtte, Van Lierde and Claeys, 2011).

It is widely agreed that MTD can be a causal factor in mucosal changes to the vocal folds themselves, such as vocal nodules, polyps and cysts (Kempster et al., 2009; (Altman, Atkinson and Lazarus, 2005). Conversely, MTD can be viewed as a compensatory vocal gesture for these pathologies (Altman, Atkinson and Lazarus, 2005) and also for other underlying organic disorders including LPR⁴, and Reinke's oedema (Van Houtte, Van Lierde and Claeys, 2011).

There is also general agreement in the current literature that MTD has multiple contributing factors and etiologies which include high vocal demands, inefficient or incorrect posture, psychological factors and underlying organic pathology. (Altman, Atkinson and Lazarus, 2005; Sielska-Badurek et al., 2017; Kempster et al., 2009).

Earlier literature has referred to MTD in a variety of terms, including 'hyperfunctional dysphonia', 'musculoskeletal dysphonia' (da Cunha Pereira, de Oliveira Lemos, Dalbosco Gadenz and Cassol, 2018) and even 'muscle misuse dysphonia' (Van Houtte, Van Lierde and Claeys, 2011).

Van Houtte et al (2011) also note, importantly, that MTD as a term is not simply synonymous with functional voice disorder, but specifically refers to the excessive tension in the paralaryngeal muscles resulting in dysphonia.

Diagnosis:

⁴ Laryngopharyngeal Reflux

The method of diagnosis for MTD is quite consistent across all of the literature, with the following key themes emerging:

1. Video Laryngostroboscopy examination is the most commonplace approach, allowing an ENT or SLT to look for laryngeal/pharyngeal constriction and any vocal fold pathology that may either be causal or an effect of MTD (Sielska-Badurek et al., 2017; Altman, Atkinson and Lazarus, 2005; Lowell et al., 2020; Van Houtte, Van Lierde and Claeys, 2011)
2. Visible and/or palpable tension in the neck and surrounding the larynx is also an important assessment technique (Van Houtte, Van Lierde and Claeys, 2011; Emerich Gordon and Reed, 2019; Altman, Atkinson and Lazarus, 2005). Sielska-Badurek et al (2017) put forward a detailed palpation protocol for the vocal tract structures, including the abdominal wall, lower chest, upper chest, sub-mandibular area, lateral pharyngeal walls, thyrohyoid space and the mandible.
3. Perceptual measurements of the voice were also commonplace in establishing the level of dysphonia, including acoustic analysis, VHI-10⁵, MPT and measurement of F° (Fundamental Frequency) (Jafari et al., 2017; Gelfer and Van Dong, 2013; Lowell et al., 2020).

Da Cunha Piera et al (2018) also note the importance of distinguishing between primary and secondary MTD diagnoses. A classification of primary MTD relates to the absences of any other pathology or structural changes in the larynx, whereas a secondary MTD classification would note the presence of tissue reactions. This has important implications for a singing teacher or vocal coach, as any change to the

⁵ Voice Handicap Index Questionnaire

pathology of the vocal folds is not something that can be dealt with in a singing studio and would require medical diagnosis and treatment. Whilst there is a developing commonality of language between speech language pathologists and singing voice coaches/teachers (Hoch and Sandage, 2017) it is important to keep in mind at all times that the two jobs are very different, with different training and regulatory frameworks.

Treatments:

Both direct and indirect voice therapies have been used to treat MTD (da Cunha Pereira et al, 2018) and studies using Vocal Function Exercises (VFE) have also shown a positive effect on releasing vocal tensions (Jafari et al., 2017; Gelfer and Van Dong, 2013).

There is consensus that a multi-disciplinary approach to treatment is most effective (Altman, Atkinson and Lazarus, 2005; da Cunha Pereira, de Oliveira Lemos, Dalbosco Gadenz and Cassol, 2018; Lowell et al., 2020). This may include standard voice therapy techniques such as yawn-sigh and muscle tension reduction (Jafari et al., 2017), working with a vocal coach using Stemple's Vocal Function Exercises (VFE's) (Gelfer and Van Dong, 2013), circumlaryngeal manual therapy with a qualified manual therapist (Van Houtte, Van Lierde and Claeys, 2011), or respiratory training such as the Accent Method (Altman, Atkinson and Lazarus, 2005) or Respiratory Lung Volume-based Training (RLVT) (Lowell et al., 2020).

Since it is also noted by Altman et al (2005), da Cunha Piera (2018) and Jafari (2017) that personality and psychological factors are also contributing factors to MTD, it can also be said that counselling, psychotherapy, or other mental health treatments may prove beneficial in some cases as part of a holistic approach to treatment.

In all examples above, it is agreed that the primary goal of treatment for MTD is to release the excessive paralaryngeal tensions and thereby restore normal phonation. From personal experience of more than 20 years, the researcher can confirm that clients are often passed on from SLT⁶ to a vocal coach due to high case loads and limited timeframes. There is a lack of cohesive and comprehensive accredited training in the field of singing voice rehabilitation coaching (Gerhard, 2015) and so there is potential for singers suffering with MTD to be left without adequate support.

Noting the key areas in the literature on MTD of breath control, appropriate muscle work (and therefore the release of inappropriate muscle work) and good mental health, the researcher has been able to show the areas in which there might be crossover with yoga practices, which are explored in the next section of this review.

Yoga in Singing Training

Breathing:

Most evidently of all in the research, it is agreed that the practice of deliberately controlling the breathing is common to both yoga and singing (Carman, 2004; Emmons, 1988; Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017). An efficient, deep inhalation followed by a controlled, slow exhalation is necessary to sing long phrases of music in a vocally healthy way (Emmons, 1988) and this can be linked to the yogic practice of prāṇāyāma (Carman, 2012; Moliterno, 2008) where very similar exercises are employed.

Such techniques have not only been used to train the breath, but also to help performers to overcome anxiety in performance, often termed MPA or Music

⁶ Speech and Language Therapy

Performance Anxiety (Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017; Edman, Kondrad and Rakel, 2012).

Lung vital capacity is higher in singers than in non-singers due to this training (Irzaldy, Wiyasihati and Purwanto, 2016), and the same study notes that people attending regular yoga classes increase their vital capacity, creating an advantage when singing. Desjardins and Bonilha (2020) also note that 8 out of 13 studies looking at breathing exercises for adults included *prāṇāyāma* and showed a positive impact on voice outcomes.

In 1995, Wrycza Sabol, Lee and Stemple noted the similarity of *prāṇāyāma* and singing training (specifically VFE's) with participants often describing the exercises as 'yoga for the voice'. The VFE's were again shown to have a positive outcome on the voice quality and control.

Yogic breathing uses several 'bandhas' (variously translated as locks or bonds) in the abdominal region, which have benefit for the singer's breath training (Neely, 2020; Carman, 2012). The 'mula bandha' refers to the pelvic floor region, and the 'uddiyana bandha' refers to the abdominal wall, and both are engaged in prolonged, controlled exhalation (Neely, 2020; Emmons, 1988; Carman, 2004).

Physical Postures:

The physical postures, or *āsanas*, in traditional yogic practice are used to both strengthen and stretch muscles around the body, and to bring focus to the body to provide awareness of tension and/or injury (Carman, 2004; Moliterno, 2008; Neely, 2020).

In her book 'Yoga for Singing: A Developmental Tool for Technique & Performance' (2012), Judith Carman details a full programme of 57 different yoga āsanās, laying out their application for singing training. Postures include specific strengthening and stretching for the abdominal muscles, the back, the neck and the face, amongst others, and have a direct application to the training for good posture, breath technique, and physical awareness for singers (Moliterno, 2008; Carman, 2004; Carman, 2012).

Similar applications are used for singers by Neely (2020) and Lloyd et al (2017) and were observed by Catherine Fitzmaurice in her founding work towards Fitzmaurice Voice Work (Nilsson, Laukkanen and Syrjä, 2020). The regular practice of yoga as part of a singing warm up has also been shown to improve posture, vocal accuracy and concentration (Cook-Cunningham and Grady, 2018).

Excess tensions in the body, which can often cause difficulty to the singer, can be highlighted by the practice of āsanās (Moliterno, 2008) and supervised yoga practice is also recommended by Bussieres et al (2016) for the clinical treatment of neck pain associated disorders, which have commonality with the paralaryngeal musculature seen in MTD.

Āsanās such as 'Table Top', 'Boat Pose', 'Reverse Crunches with Eagle Legs', 'Reverse Triangle Pose' and 'Warrior II' were noted by Neely (2020) to develop abdominal strength and flexibility that was beneficial for singers' breath and posture.

Psychological, Emotional and Other Applications:

Yoga practice has benefits for the emotional wellbeing of the performer, as well as their physical health (Edman, Kondrad and Rakel, 2012). Control of the exhalatory

breath slows the respiratory rate (Carman, 2012; Irzaldy, Wiyasihati and Purwanto, 2016) and thus has a calming effect on the singer (Lloyd et al, 2017).

So-called 'alternative medical therapies' (which included the use of yoga for therapeutic reasons) are prevalent among singers (Surow and Lovetri, 2000), and in a study looking at the voice demands of professional newsreaders in India, Gunasekaran, Boominathan and Seethapathy (2016) noted that the phonation and breathing exercises taught in yoga showed a beneficial effect in maintaining vocal health in this group of professional voice users.

Chan (1994) noted in a study looking at vocal hygiene education for teachers (another statistically high vocal load group), that one subject reported more improvement in her vocal health than others. It transpired that she was attending regular yoga classes, and that the relaxation and breathing training from these classes served as a therapy for her voice, bringing about significant vocal improvements alongside the training offered in the study.

Cook-Cunningham and Grady (2018) noted that, in his book 'Teach Music', Kuhn (2006) saw an improvement in concentration, accuracy and posture when yoga was added to warm-ups for singer, which links to the mindful awareness of our breath/body connection noted by Carman (2004). Amongst the problems presented by singing students that could be addressed by yogic practice, Carman includes a lack of physical strength/co-ordination and poor breathing technique, alongside a distracted mind and a lack of emotional connection to the material.

In the only paper found by the author within the scope of this literature review to deal specifically with yoga in voice therapy (rather than voice training), the authors note its positive impact on the upper airway physiology, on disruptive posture, co-ordination

and as a behavioural treatment for hyperfunctionality in phonatory gestures (Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017).

Analysis

In conducting this literature review the author sought to deepen and clarify current knowledge and understanding of MTD and to look for links in the symptoms and treatment for MTD with exercises commonly practiced in yoga.

The research shows that primary MTD most commonly affects the paralaryngeal musculature of the neck and vocal tract, and that releasing this tension and restoring normal muscular function is common amongst treatments for the condition (Altman, Atkinson and Lazarus, 2005; da Cunha Pereira et al, 2018; Jafari et al., 2017; Lowell et al., 2020; Sielska-Badurek et al., 2017; Van Houtte, Van Lierde and Claeys, 2011).

The literature also shows that singers (and other professional voice users with a high vocal load) are statistically more likely to present with MTD, and that alongside traditional voice therapies, singers will often seek 'alternative medical therapy' which may not have proof of its efficacy and requires further understanding and research. (Altman, Atkinson and Lazarus, 2005; Cazden, 2012; Edman, Kondrad and Rakel, 2012)

Yoga has been used for singing training in a variety of settings and has been anecdotally successful in its application. Studies have also been conducted which have shown that yogic breathing techniques (prāṇāyāma) are effective in developing breathing technique in singers and can help with performance anxiety and general stress levels. Such anxiety/stress levels can be one of the etiologies for MTD. (Carman, 2004; Carman, 2012; Chan, 1994; Cook-Cunningham and Grady, 2018;

Singh Sekhon, 2016; Emmons, 1988; Gunasekaran, Boominathan and Seethapathy, 2016; Irzaldy, Wiyasihati and Purwanto, 2016; Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017; Moliterno, 2008; Neely, 2020; Nilsson, Laukkanen and Syrjä, 2020; ÖZGÜR, 2020).

Yoga postures (*āsanas*) have been recommended for the clinical treatment of muscular injury in the neck by physical therapists, and the combination of strength and flexibility training in yoga postures is beneficial to developing good posture in singers, and thus the instrument as a whole (Bussieres et al., 2016; Carman, 2004; Moliterno, 2008; Nilsson, Laukkanen and Syrjä, 2020; Özgür, 2020). There are also specific yoga postures that can target inhalation, exhalation, and specific tensions in the abdominal wall, neck and chest (Carman, 2012), and the increase in lung vital capacity which can be created using such breathing exercises, is beneficial for singers (Desjardins and Bonilha, 2020; Irzaldy, Wiyasihati and Purwanto, 2016; Singh Sekhon, 2016).

The only paper discovered by the author to discuss the use of yoga in voice therapy (rather than training) concludes that regular yoga practice creates a co-ordinated body alignment, improves strength, decreases tension and relaxes the mind of the performer (Lloyd, Hoffman-Ruddy, Silverman and Lehman, 2017). This paper includes the use of 'resonant voice strategies' which show similarities to so-called VFE's and also to yogic chanting, both of which have documented positive effects of MTD (Wrycza Sabol, Lee and Stemple, 1995; Carman, 2012; Gelfer and Van Dong, 2013).

Drawing on this information, it is possible to see how a targeted and well-designed programme of yoga (both *prāṇāyāma* and *āsana* practices) could have a beneficial and potentially therapeutic effect on singers with MTD. Such a programme would need to take a holistic approach to the singer, with practices to work on:

- Performance or other unrelated anxiety (meditation)
- Breathing practices to encourage lung vital capacity and controlled exhalation without tension (prāṇāyāma)
- Physical postures to bring awareness to, and ultimately release, tension of the vocal tract and paralaryngeal muscles (āsana)

Where the current literature shows that such work is already being employed in singing training, a programme designed specifically for the treatment of MTD would need to take an evidence-based approach, drawing on a thorough understanding of the diagnosis, etiologies, and multi-disciplinary treatments for this functional voice disorder. There appears to be enough evidence to warrant further research in this area, initially in the design of the programme and then perhaps in a pilot study to trial the effects of yoga on MTD. Ethical consideration must be given to recruiting a cohort of participants who have received a clinical diagnosis of MTD, and the creation of a control group to test the results.

Reflecting on practice and experience, the researcher can see that having an evidence-based course of yoga exercises to use in the treatment of MTD could formalise and give structure to much of the work done in the studio, allowing clients to gradually build up their understanding and practice of these exercises in a cohesive and cumulative way. The programme would need a solid ethical base and could possibly benefit from some regulatory framework or ultimately accreditation from a body such as the British Wheel of Yoga or similar. This would need to be explored further, and the researcher will need to undertake further preparatory work in order to establish root this programme in best practice for both vocal rehabilitation and yoga practice.

Conclusion

From reviewing the most recent literature on MTD, a widely agreed set of symptoms, emerges. These are an excessive and improper muscular tension in the vocal tract, taking in the abdominal wall, chest, neck, pharynx, tongue, jaw and intrinsic laryngeal muscles. The resulting loss of phonatory volume control, resonance, and vocal fold closure lead to a specific functional disorder that is the most widely reported problem amongst those attending voice clinics and is most prevalent in those with high vocal loads, such as singers and actors. Primary MTD presents without any mucosal or structural changes within the larynx, whereas secondary MTD will be diagnosed where there is evidence of these. It is noted that organic pathology of the vocal folds can be both causal and an effect of MTD. Aside from the physical causation, MTD can be brought about by psychological factors including personality type/disorder and performance anxiety.

MTD is diagnosed using a combination of endoscopic evaluation of the internal structures of the larynx, observation and/or palpation of the external paralaryngeal musculature, and perceptual evaluation of the voice by both the client (using VHI-10 or similar) and a qualified professional using acoustic analysis and observations of F⁰ and MPT.

There is a good base of literature showing the application of yoga to both spoken voice and singing training. There is evidence of positive outcomes from practicing both yogic breathing and postures in training singers and in assisting vocal hygiene and good practice in spoken voices.

At the present time, there is very little research showing an evidence-based approach to using yoga as a holistic therapy for MTD although the literature on both MTD and

yoga shows an interesting crossover and good potential for such a programme to be researched and developed.

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