

THE ROLE OF YOGASANAS AND PRANAYAMA TECHNIQUES IN CORRECTING THE FUNCTIONAL DISORDERS OF VOICE PRODUCTION

T. INDIRA RAO¹ & HONGSANDRA RAMARAO NAGENDRA²

¹Department of Yoga and Humanities, SVYASA, Bangalore, Karnataka, India

²Department of Yoga and Life Sciences, SVYASA, Bangalore, Karnataka, India

ABSTRACT

The three types of vocal disorders are organic, functional and neurological. The organic disorders can be corrected with surgery. Faulty use of voice, yelling, screaming and loud talking may cause functional disorders. Precautions are to be taken to avoid functional disorders. People like singers, orators and teachers who use their voice hours together are supposed to know the fundamental and optimum frequency of their phonation which can be measured with stroboscope. Otherwise forceful use of voice either in high pitch or low pitch other than optimum level leads to the damage of the vocal cords. Studies in the West have scientifically investigated the methods of correcting these functional disorders. Indian traditional practices of yoga and pranayama on voice culture are yet to be investigated. There are asanas which stimulate the vocal muscles and strengthen them. Pranayama helps in soothing the vocal muscles and relaxing them. The influence of the traditional practices of yogasanas and pranayama can be studied scientifically.

KEYWORDS: Functional Disorders, Optimum Frequency, Pranayama, Stroboscope, Voice Culture, Yogasanas

INTRODUCTION

Voice is a powerful medium of expression. Unlike the other musical instruments, it has features like warmth, modulations, elasticity, adjustable resonators and articulation. The main anatomical structures required for the production of voice are the actuators (lungs), vibrators (voice box) and the resonators (throat, mouth, lips, teeth, and nose) which work together. The energy that is produced by the actuator is converted into compressions and rarefactions by the vibrator and the resonators enrich the tonal quality. The problems in voice production are due to organic (physical abnormality), functional (faulty use of vocal mechanism) and neurological (impairment in the coordination of vocal muscles) vocal disorders (Yoga for Voice culture, n.d.).

Vocal Disorders

Organic Disorders

Organic causes such as nodules (growth on the vocal cords) due to excessive use of vocal cords, polyps (growth on the vocal cords) due to inability of the vocal cords coming together, laryngitis due to inflammation of the mucous membrane of the larynx and hemorrhaging (bleeding) can be corrected with surgery (Yoga for Voice Culture, n.d.).

Functional Disorders

In spite of the absence of anatomical factors, if the voice has any of the problems like hoarseness, harshness, tightness, loss of voice, vocal fatigue or any defect of speech (dysphonia), it is understood that it may have developed

functional disorder. The functional disorders are named as 1 throatiness, 2 unsteadiness, 3 breathiness, 4 break in voice registers, 5 voice fatigue, 6 thin or feeble voice, 7 white tone, 8 nasality, 9 huskiness, 10 hoarseness, 11 register weakness and 12 uneven voice (Durga, 2007).

Reasons for Functional Disorders

The reasons for functional disorders are forceful singing, yelling, screaming and loud talking without paying attention to the fundamental and optimum frequency of phonation that can be measured with stroboscope. Aphonia is another vocal disorder observed in conditions like schizophrenia and depression. Yet another reason of the inflammation of the vocal cords is the result of allergies, bacterial or fungal infections or vocal overuse (Yoga for Voice culture, n.d.).

Merits and Demerits of the Voice of the Singers

Moreover, there are merits and demerits of voice. Sharangadeva in his *Sangeetaratnakara* gives the blemishes of voice as 1 dry 2. broken 3 hollow 4. hoarse 5. lack of sweetness 6. difficulty in the production 7. frail and 8. grunting. According to him an ideal voice is one which is 1. pleasing 2. sweet 3. creamy and full 4. uniform in all the three registers 5. soothing 6. rich 7. tender 8. strong 9. audible from a distance 10. inspire pathos in the minds of the listeners 11. being heard at a distance 12. not dry 13. flowing 14. capable of creating interest among the listeners and 15. faultless. Bharatmuni in his *Natyashastra* mentions the six qualities of an ideal voice which are *shravaka* –can be heard from a long distance-, *ghana*- loud and pleasing-, *snigdha*-loud but not harsh-, *madhura* –pleasant-, *avadhanavana*- neither too loud nor too soft- and *tristanashobi*-pleasant in producing all the notes of the three octaves.

Other Factors

Along with the anatomical and physiological aspects, language, culture and civilization also have their influence on the quality of voice production. Different systems of music have different concepts of an ideal voice. In the Western system of music, nasality is admired. In the East, the Chinese and Japanese look for nasality as perfection (Durga, 2007).

Whatever may be the type of voice, it has to be cultivated and in the process of cultivation certain muscles of the body play a very important role. The working of all these muscles is responsible for the production of sound. The range of voice also can be improved by voice training.

LITERATURE SURVEY

The scientific research has proved that the quality of voice can be improved by following certain norms in using the voice and certain strategies in maintaining the routine.

It was found that the teachers were able to improve their voices if they significantly reduced vocal abuses in daily life and practised specific strategies to maintain classroom order and reduce the use of voice in teaching (Chan, 1994). The four, 1-hour class sessions on vocal hygiene, including anatomy and physiology of the phonatory mechanism, vocally abusive behaviors, voice disorders commonly seen in singers, and measures to prevent voice disorders reported minimal changes in vocal hygiene behaviors and perceptual voice characteristics (Lawrence et al., 2000). Voice functional exercises are useful alternative or adjunct to vocal hygiene programs in the treatment of voice problems in teachers (Roy et al., 2001). The teaching profession causes the risk of occupational dysphonia. The training of how to use the voice

to the students of postgraduate certificate of education (PGCE) course at the University of Ulster, Northern Ireland proved to be beneficial (Duffy and Hazlett, 2004). A course inclusive of two lectures, a short group voice therapy, home-controlled voice exercises, and hygiene is a feasible and cost-effective primary prevention of voice disorders in a homogeneous and well-motivated population of teachers (Bovo et al., 2007).

Preventative voice training for teachers is likely to be effective (Pasa et al., 2007). The vocal health educational actions had a positive effect on the quality of life and voice of teachers both from the psycho-emotional and functional aspects of the voice (Pizolato et al., 2013). Vocal fatigue from the daily use of the voice could be treated as a chronic wound. With vocal loading exercises the voice can be recovered (Hunter and Titze, 2009).

NEED AND SCOPE OF THE STUDY

The literature review throws light on the practices which the West offers for voice disorders. In India Yoga is being practised for a number of ailments either as an alternative or adjunct therapy. Yoga also offers special techniques for voice improvement. Studies have not yet focused on the benefits of practising yoga and pranayama in a traditional way for improving the voice quality and correcting the vocal problems.

Hence this is an attempt to conceptualize the yogasanas and pranayama practices in a traditional way that help in correcting the functional disorders of voice production. Singers need to practice yoga and pranayama to keep their voice intact.

AIM

The aim of this study is to find out the breathing exercises, asanas and pranayama practices from the existed literature of yoga that influence the vocal mechanism.

OBJECTIVES

- To find out from the existing yoga literature the asanas that correct the defects of voice production.
- To find out from the existing yoga literature the pranayama practices, helpful for strengthening the voice.

HYPOTHESIS

Breathing exercises, yogasanas and pranayama practices (mentioned in the yoga texts) are helpful in correcting the voice disorders. Those may play a great role in culturing the voice of the singers in particular by correcting the functional disorders. The practice of the breathing exercises, asanas and pranayama may increase the range and pitch of the voice.

PRACTICES FOR CORRECTING THE FUNCTIONAL DISORDERS OF THE VOICE

The aim of voice training is to remove the blemishes and the functional defects of the voice and make it as powerful as possible. The first step for vocal hygiene is proper breathing and coordinating sound production with breathing. The objectives of breathing techniques are to produce a powerful voice and to increase its range. Breath control is the primary requirement of singing. There are a series of breathing practices to increase the breath power.

REVIEW OF LITERATURE

Breathing Exercises

Smooth flow of air in the lungs is the primary source of energy for voice production. In fact, voice is produced by the vibrations of the vocal cords. These vibrations are influenced by the respiratory muscles. The intensity of the voice depends upon the flow of the breath caused by these respiratory muscles. For singing, voluntary control over breathing is required. Singing requires not only more air but controlled exhalation which can be obtained through diaphragmatic breathing. In normal breathing, the rate of respiration is approximately fourteen to sixteen minutes per minute but in the process of singing the rate of respiration is lowered to six times per minute (Durga, pp. 31-38).

To increase the breath holding time, the breathing practices help to increase the capacity of the lungs.

Breathing practices like hands stretch breathing dog breathing and tiger stretch increase the capacity of the lungs and tongue massaging, tongue in and out, tongue rotation, lip stretch, laughter, jaw twisting and tongue twisting increase the capacity of the resonators (Yoga for Voice Culture, n.d.).

Yogasanas (Physical Postures)

The traditional practices of yogasanas help in unlocking the pent-up energy in the body. They harness the body and mind connections and relax the stressed muscles. They help in improving the function of the muscles (Voice Improvement Techniques, 2011). They help in smooth functioning of the lungs and diaphragm, which are tightened up by the emotional tensions (Saraswati, p. 11). Swami Satyananda Saraswati gives an account of the asanas that work on different organs related to voice production. Simhasana (lion posture) relieves the tension from chest and diaphragm. It helps to reduce the stuttering. It is an excellent asana for the eyes, nose, ears, mouth and the throat. It develops a strong and beautiful voice. Ushtrasana (camel pose) stretches the front of the neck toning the organs in that region. It helps in curing asthma. Dhanurasana (bow pose) improves respiration. Ardha Chandrasana (half moon posture) releases the feelings of congestion by giving a good stretch to the neck, shoulders, back and chest. Padahastasana (hand under foot pose) helps in nasal and throat diseases.

Sarvangasana (shoulder stand pose) revitalizes the ears, eyes and tonsils (Saraswati, pp. 115- 261). It exerts pressure against the throat and clears throat congestion. The throat muscles get stimulated and the circulation of blood gets improved. (Natural Therapy Pages, n.d. para, 4) There is a set of asanas which stimulate the muscles of the vocal cords and remove the phlegm and the toxins from the body. They are Matyasana (fish pose), Bhujangasana (serpent pose), Dhanurasana, Ushtrasana, Ardha chandrasana and Simhasana (Voice Improvement Techniques, 2011). The special asanas for culturing the voice are Prasarita Paschimottanasana (expanded back-stretching pose), Vakrasana (spinal twist pose), Ardhamatsyendrasana (half spinal twist pose), Matyasana and Prasarita Halasana (expanded plough posture) (Yoga for Voice Culture, n.d. pp. 36 - 45).

Chanting

Chanting provides a number of benefits. Due to the vibrations produced by chanting, the prana (vital force) blocks are cleared, peace can be achieved and metabolism can be changed. The stamina and strength of the voice can be improved. The vibrations and modulations improve the voice quality (Yoga for voice improvement, n.d. para 6, 7.). Vedic chanting increases the pitch and develops the voice (Yoga for voice culture, n.d., p. 26). 'Om' chanting strengthens

the lung capacity, removes the stress and strengthens the mind (Gokhale, p.108, as cited in Banerjie, 2013). It improves the base of the voice and increases the stamina of the voice (Voice Improvement Techniques, 2011).

Pranayama (Controlling the Inhalation and Exhalation with Breath Holding)

Pranayama brings balance in breathing and releases the trapped energy (Saraswati, p. 272, 273). It clears the congestion in the voice box. It helps in pitch control and range of the voice. The vital capacity of the lungs is increased when the breath is held after inhalation and exhalation. More air rushes in. There are different practices of pranayama. Anuloma viloma (alternate nostril breathing) brings balance in breathing (Saraswati, p. 388). The very useful pranayama practice for singers in particular is ujjai (closed lips and contracting throat) (Yoga for Voice Improvement, 2010) and bhramari (producing humming female bee sound) and bhramara (producing humming male bee sound) (Yoga for voice Culture, n.d. p. 26).

Ujjai pranayama is a tranquilizing pranayama. It also has a heating effect on the body. In this pranayama it is to be imagined that the breath is being drawn in and out through the throat. There is a snoring sound which is audible to the practitioner only (Saraswati, p. 402,403).

Bhramari and bhramara pranayama increases the range and pitch of the voice due to the vibrations inside the throat and also throughout the body (Yoga for voice Culture, n.d. p. 26). Nadanusandhana (fixing one's attention on the inner sound) pranayama increases the pitch and volume of the singers and orators (Yoga for Voice Culture, pp. 30-33).

Kapalabhati (passive inhalation and active exhalation) cleans the full respiratory system. It gives good resonance, synchronization of voice production and improves the depth of voice. It activates mooladhara (root) and swadhishtana (sacral) chakras and thereby increases of energy (Banerjie, 2013).

Bandhas

Bandhas (locks) are four in number. Mooladhara (perineum/cervix retraction lock), uddiyana (abdominal retraction lock) jalandhara (throat lock) and mahabandha (three together). Bandhas activate the psychic knots (Saraswati, p. 471). Jalandhara bandha gives pressure on the throat alleviating throat disorders. It improves the quality of the voice (Muktibodhananda, p. 353)

Diaphragmatic Breathing

The singers have to sing from the diaphragm and not from the throat. Singing requires more air in the chest. The exhalation also needs to be controlled. In diaphragmatic breathing, the diaphragm is made to descend to a larger extent. The abdomen is compressed increasing the abdominal pressure. This pressure against the diaphragm controls the exhalation. The capacity of the chest increases and the singer gets more quantity of air (Durga, p. 37).

Integrated Approach of Yoga Therapy

In addition to the above practices integrated approach of yoga therapy (a package of asanas, pranayama, kriyas (cleansing techniques) diet control, counseling, devotional sessions) helps in maintaining good physical as well as mental health and stamina (Nagaratna and Nagendra, 2008) which is the basic requirement for the singers as they need hours of practice and performance.

MEASUREMENTS

Scientific experiments for measuring the vocal tones can be carried out by Oscilloscope, Spectrogram and Kymograph. These experiments provide the changes in the vibrations of the resonators which enrich the tonal quality. The harmonic and inharmonic overtones of the voice frequency can be measured with Fourier analysis and Vercelli analysis respectively (Durga, p. 84).

CONCLUSIONS

There are many asanas and pranayama practices documented in the yogic literature. The efficacy of those asanas and pranayama practices can be investigated empirically, scientifically and statistically.

ACKNOWLEDGEMENTS

The authors express their gratitude to Ms. G. Padmashree, Dr. K. Subrahmanyam and Dr. T. M. Srinivasan for their guidance.

REFERENCES

1. Banerjee, M. (2013). New Approach and Possibilities of Voice Culture in Hindustani Classical Music. Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/7570/11/11_chapter%207.pdf
2. Bovo, R., Galceran, M., Petruccelli, J., & Hatzopoulos, S. (2007). Vocal problems among teachers: evaluation of a preventive voice program. *Journal of Voice*, 21(6), 705-722.
3. Broaddus-Lawrence, P. L., Treole, K., McCabe, R. B., Allen, R. L., & Toppin, L. (2000). The effects of preventive vocal hygiene education on the vocal hygiene habits and perceptual vocal characteristics of training singers. *Journal of Voice*, 14(1), 58-71.
4. Chan, R. W. K. (1994). Does the voice improve with vocal hygiene education? A study of some instrumental voice measures in a group of kindergarten teachers. *Journal of Voice*, 8(3), 279-291.
5. Duffy, O. M., & Hazlett, D. E. (2004). The impact of preventive voice care programs for training teachers: A longitudinal study. *Journal of Voice*, 18(1), 63-70.
6. Durga, S. A. K. (2007). *Voice culture, the art of voice cultivation*. Delhi: B.R. Rhythms.
7. Hunter, E. J., & Titze, I. R. (2009). Quantifying vocal fatigue recovery: Dynamic vocal recovery trajectories after a vocal loading exercise. *The Annals of otology, rhinology, and laryngology*, 118(6), 449.
8. Mozzarella, R. (2003). 'How to speak with power'. *Paper presented at the 14th International conference on frontiers in yoga research and applications*. Bangalore: Swami Vivekanada Yoga Prakashana.
9. Muktibodhananda, S. (2009). *Hatha Yoga Pradeepika*. (3rd edn.). Munger: Yoga Publications Trust.
10. Nagaratna, R. & Nagendra, H. R. (1986). *Self management of excessive tension*. Bangalore: Swami Vivekanada Yoga Prakashana.
11. Nagaratna, R., & Nagendra H. R. (2008). *Yoga for positive health*. Bangalore: Swami Vivekanada Yoga Prakashana.

12. Pasa, G., Oates, J., & Dacakis, G. (2007). The relative effectiveness of vocal hygiene training and vocal function exercises in preventing voice disorders in primary school teachers. *Logopedics Phoniatrics Vocology*, 32(3), 128-140.
13. Pizolato, R., Rehder, M., Meneghem, M., Ambrosano, G., Mialhe, F., & Pereira, A. (2013). Impact on quality of life in teachers after educational actions for prevention of voice disorders:a longitudinal study, *Health and Quality of Life Outcomes*. 11(28), <http://www.hqlo.com/content/11/1/28>, doi:10.1186/1477-7525-11-28.
14. Roy, N., Gray, S. D., Simon, M., Dove, H., Corbin-Lewis, K., & Stemple, J. C. (2001). An Evaluation of the Effects of Two Treatment Approaches for Teachers With Voice Disorders: A Prospective Randomized Clinical Trial. *Journal of Speech, Language, and Hearing Research*, 44(2), 286-296.
15. Saraswati. S. S. (2009). *Asana Pranayama Mudra Bandha*. (4th edn.). Munger: Yoga Publications Trust.
16. Shringey, R. K. & Sharma P. (2007). *Sangitaratnakara of Sharangadeva. Text and English translation*, vol. I &II. 2007. New Delhi: Munshiram Manoharlal Publishers Private Ltd.
17. *Voice Improvement Techniques*, (2011). Retrieved from <http://www.yogawiz.com/askquestion/427/voice-improvement-techniques-what-can-i-do-to-make.html>
18. Yoga for Voice Culture. (n.d.) Retrieved from <http://indianmedicine.nic.in/writereaddata/linkimages/7196039746-yoga%20for%20voice%20culture4.pdf>.
19. Yoga for Voice Improvement. (n.d.) In *Natural Therapy Pages*. Retrieved from http://www.naturaltherapypages.co.nz/article/Yoga_for_Voice_Improvement.

