

AN EVALUATIVE STUDY OF VOCAL HYGIENE AWARENESS PROGRAM IN PROFESSIONAL VOICE USERS (PROSPECTIVE TEACHERS)

¹Rajasudhakar R, ²Pramoda K, ³Yeshoda K, & ⁴Geetha Y.V.

Abstract

Vocal hygiene education program addresses the importance of proper care of vocal fold tissue suggesting certain changes in behaviors, patterns, life style and diet. It is an effective method to create awareness, reduce vocal abuse and prevent onset and progression of voice problems among the teachers and other professional voice users. The effectiveness of such sensitization programs has not been documented in the Indian context. The present study aimed to evaluate the short-term effect of a vocal hygiene awareness program among the teacher training students in Mysore city. The program consisted of three consecutive sessions on anatomy of voice production, causes of voice disorders and vocal hygiene tips to teachers, delivered audio-visually by experienced speech language pathologists. A basic questionnaire consisting of 10 questions (one open ended and nine close ended) was prepared, which was divided into three sections based on different areas of voice. The questionnaire was administered prior to and after the sensitization program. The efficacy was determined based on participant's ability to answer the questions. The results showed that the average percent scores improved from 58% (pre-test) to 73% (post-test) after attending the program. Further studies that address other voice care domains in the questionnaire like vocal and non-vocal practices, diet, and classroom management and the long-term effect of such programs have to be addressed to understand the effectiveness of such programs.

Key words: *Teacher, awareness, voice education, vocal hygiene, voice disorders*

Teachers are at high risk for developing voice problems due to their professional demands for excessive voice usage. Teachers report voice problems at a rate nearly three times that of members of other randomly selected professions (Smith, Gray, Dove, Kirchner & Heras, 1997). In a study conducted in India, 49% of teachers reported voice problems (Boominathan, Rajendran, Nagarajan, Seethapathy & Gnanasekar, 2008). Prolonged voice use for verbal instruction in the presence of background noise is the primary cause of voice problems among the members of this profession (Smith, Lemke, Taylor, Kirchner & Hoffman, 1998). Other causes include improper dietary habits, medical conditions, stress, anxiety and psychological factors. Deviant voice qualities, inability to sustain phonation, vocal fatigue, pain during phonation and throat irritation are some of the reported voice problems resulting from these causes (Yiu, 2002; Boominathan et al., 2008). Owing to professional demands, voice problems in teachers lead to reduced effectiveness at work (Sapir, Keidar & Mathers-Schmidt, 1993). In addition, voice problems reportedly interfered with future job options (Smith et al., 1998). However, teachers do not always seek professional help unless the impact of the voice problem worsens (Smith et al., 1998). Voice

disorders in teachers affect their students learning and the community immensely (Calas, 1989).

There is an old dictum 'Prevention is better than cure' and it still holds well even in the modern world. Several authors have addressed the importance of the prevention of voice disorders among those who work in vocally demanding occupations, such as teachers (e.g. Fritzell, 1996; Verdolini & Ramig 2001; Morton & Watson 2001a; Yiu, 2002; Roy, Merrill et al., 2004). Marge (1991) has identified two types of prevention. Primary prevention refers to elimination of something that might cause a voice disorder. For example, quitting smoking is a preventive act in-order to prevent future occurrence of voice disorders, while secondary prevention involves early detection and treatment of voice disorders. There is another level in the prevention called tertiary prevention, also called as rehabilitation, which includes physical, psychosocial and vocational measures taken to restore the patient back to or near normal condition.

Several studies have reported on the outcome of vocal hygiene education and voice training for subjects who do not suffer from voice disorders but who belong to the risk groups for such

¹Lecturer in Speech Sciences, All India Institute of Speech & Hearing (AIISH), Mysore-06, E-mail: rajasudhakar82@gmail.com, ²Research Officer, AIISH, E-mail: pramodahere@gmail.com, ³Lecturer in Speech Sciences, AIISH, E-mail: k_yeshoda@hotmail.com, & ⁴Prof. in Speech Sciences, AIISH, Mysore-06, E-mail: geethayelimeli@gmail.com

problems. Kaufman and Johnson (1991) developed a preventative voice program for teachers including a videotape and a booklet in which the anatomy and physiology of voice production, common voice pathologies, prevention strategies and early warning symptoms for voice disorders were provided. According to the authors, the program received a positive response from the teachers; however, no further evaluation of the effectiveness of the program was made. Bistrisky and Frank, (1981) found improvements in awareness of voice function and self-evaluation of voice in a group of teachers who attended vocal hygiene programs. In a prospective experimental study by Chan (1994) concerning the effects of preventive vocal hygiene education for daycare center teachers, the participants attended a 90-minute workshop session and followed a vocal hygiene regimen for two months. The results indicated that the participants showed significant voice improvement compared to daycare center teachers who did not participate in the vocal hygiene education program.

Duffy and Hazlett (2004) investigated the primary prevention of occupational dysphonia among 55 training teachers, who were randomly assigned to three groups, including control, indirect and direct group. The vocal performance of the three groups was measured at two points: first before any teaching or training began, and again after the first teaching practice. Acoustic and self-perceptual measurements were used to assess the multidimensional outcomes. The self-rating scores varied in agreement with the acoustic results. The acoustic results showed deterioration from first to second measure for control group, improvement for direct group and no change for the indirect group. The study indicated that the training had been effective. Boominathan et al., (2008) conducted vocal hygiene awareness program aimed at educating professional voice users regarding prevalent voice use, abuse, and misuse and address ways to prevent voice problems. Their study investigated the efficacy of a program on vocal hygiene education designed for schoolteachers in Chennai. Sixty-five teachers were asked to complete a questionnaire twice i.e., before and after one month (post education) and the results showed teachers had better awareness after the program. Boominathan, Chandrashekhar, Ravi and Krupa (2009) evaluated the impact of Vocal Hygiene Awareness Program (VHAP) based on knowledge gained, implementation of vocal hygiene practices and concern for prevention of voice problems. Thirty-two teachers who attended VHAP two years back were asked to complete a questionnaire, which was based on the contents of VHAP. The authors found that

the majority of teachers followed dietary modifications, vocal tips and were not following classroom modifications. The authors concluded that VHAPs were effective in increasing knowledge, modifying practices and adapting a positive attitude. The above study addressed the impact of the VHAP and had not assessed the immediate sensitivity of the program.

In both the studies conducted by Boominathan et al., (2008 and 2009), the number of participants included was less in number and were practicing teachers. The effectiveness of the sensitization program immediately after the program was not appraised. In addition, there is a dearth of literature and empirical data on the effectiveness of sensitization program on prospective teachers in the Indian context. Hence, the present study aimed to evaluate the effectiveness of VHAP in student teachers in Mysore city. Also, this study was not intended to measure any behavioral changes because of vocal hygiene lectures.

Method

The current study was carried out in three phases. Phase 1 involved development of the questionnaire to assess the effectiveness of orientation program to the participants. Phase 2 involved administration of the developed questionnaire followed by a detailed presentation on voice anatomy, causes of voice disorders and prevention and care of voice with demonstration. Phase 3 involved re-administration of the questionnaire soon after the sensitization program.

Phase 1: Development of the questionnaire

A questionnaire (shown in Appendix 1) consisting of 10 questions was prepared. Out of these questions, nine were closed ended and had multiple-choice answers and one was open-ended question. The questionnaire was divided into the following sections:

- (i) Demographic data
- (ii) Section A - had questions related to anatomy of voice production mechanism.
- (iii) Section B - had questions related to causes of the voice disorders.
- (iv) Section C - had questions related to preventive voice care.

Phase 2: Administration of the questionnaire

Participants:

320 trainee teachers (154 females and 166 males) who are native Kannada speakers, from five B. Ed colleges in Mysore city, participated in the study. The age of the participant ranged from 21 years to 26 years (Mean age: 23.5 years). None of the subject reported any of the following:

exposure to previous vocal hygiene education, a history of voice disorder, a psychosomatic or psychiatric history, a history of endocrinal or neurological disorder, or significant hearing loss.

Procedure:

The questionnaire was administered twice i.e. just prior to and after vocal hygiene program. The participants of the program were asked to complete pre-test questionnaire before the commencement of the lecture cum demonstration program. The aim was to measure the baseline awareness level on different aspects of voice and voice production systems. The filled questionnaires were collected back before the subjects attended vocal hygiene lectures, which were conducted in same premises by experienced speech language pathologists. The post-test was given after an hour of conclusion of the lectures to evaluate the efficacy of the program. The teachers took about 10 minutes to complete the questionnaire. The efficacy was gauged based on participant’s ability to answer the same questions, post lectures and demonstration.

Vocal hygiene lecture and demonstration program

The program consisted of three consecutive sessions on (a) anatomy of voice production, (b) causes and management of voice problems and (c) vocal hygiene tips to teachers, delivered audio visually by experienced speech language pathologists. The program consisted of 3 sessions; each lasting for 30-40 minutes of audio-visual presentation and demonstration. The first presentation covered aspects of voice production (brief overview of voice production). The risk factors, common causes for voice problems, sources of voice misuse/abuse, and overuse in teachers included vocal and non-vocal habits, classroom voice habits, general and dietary influences on voice were presented during the second presentation. The last session discussed the management, vocal hygiene and voice care tips, guidelines, Do’s and Don’ts for efficient voice use particularly for teachers.

Scoring

Responses of the participants were separately scored for pre- and post-test. The percentages of each correct choice of answers given by the participants were calculated.

Statistical Analyses

Statistical package for social sciences (SPSS) software-version 15 was employed for statistical analyses. The percentages of correct answers for each question given by the participants at pre- and post-test were compared. To compare the significance of percent responses, Chi-square test of significance was used.

Results and discussion

Section A: Analyses of the answers obtained for the questions regarding the voice production mechanisms

Table 1 shows the trainee teachers’ knowledge on the voice production systems that was poor during pre-test and improved during the post-test. After the three sessions of sensitizing program, 98% of the trainee teachers reported breathing is important for voice production. 69% of the trainee teachers reported that the vocal folds were the vibrating structure responsible for voice production and 79% of the student teachers knew the pitch range used by women, children, was high in general and adult males it was low, in particular. There was a reduction in the percentage of teachers who chose ‘lungs and trachea’ as responsible for voice modification, instead of ‘throat and mouth’. This may be attributed to the emphasis given in the lecture on the anatomy of voice source alone than resonatory and articulatory system, which might have contributed to chose wrong answer.

Table 1: *Trainee teachers’ pre- and post-test scores on voice production mechanism*

Q No.	Questions probed	Pre-test (%)	Post-test (%)
1	Importance of voice production	95.9	98.1
3	Vibrating structure for voice production	64.3	69.3
4	Modification of voice	65.3	59.4
5	Adult male pitch	36.9	78.8

Table 2 shows the percentage of trainee teachers who were aware of the terminology used for voice production system. 69% of the student teachers responded correctly after the orientation program as ‘larynx’ for the second question, which was the only open-ended question in the questionnaire.

Table 2: *Trainee teachers’ pre- and post-test scores on open-ended question*

Q No.	Question probed	Pre-test (%)	Post-test (%)
2	Another term for voice box	25.3	68.7

Results of Chi-square test revealed that the scores obtained in pre-test for the questions 1, 2, and 3 were significantly different from the post-test scores. The improvement in the scores can be attributed to the increased knowledge gained about the voice production systems, after attending the lecture.

Section B: Analyses of the answers obtained for the questions regarding the causes of voice problems

Table 3 reveals that the trainee teachers' knowledge on the causative factors for voice disorders. 71% of trainee teachers were aware that the voice problem is the most common in teaching community. Their awareness about the susceptibility of voice problems in females teachers increased after the audio-video presentation.

Table 3: Trainee teachers' pre- and post-test scores on causes of voice disorder

Q No.	Question probed	Pre-test (%)	Post-test (%)
6	Voice problems are common	64.3	71.2
7	Causes of voice disorder	47.9	83.4
8	Cough and throat clearing	57.2	64.1

The student teachers were sensitized about the causes for voice disorders and 83% of them reported that the vocal practices like shouting, smoking and consuming alcohol were the main causes for voice difficulties in the post-test. Results of Chi-square test revealed that the scores obtained in pre-test for the questions 6, 7, and 8 were significantly different from the post-test scores suggesting that the awareness program enhanced the participants' knowledge on causes of voice disorders at 0.05 level.

Section C: Analyses of the answers regarding the preventive voice care

Table 4 shows the trainee teachers' knowledge about the preventive voice care prior to- and after presentation. 83% of the teacher trainees awareness about the role of voice/speech therapist, improved after the orientation program. The scores increased from 48% (pre-test) to 83% (post-test) which could be attributed to the knowledge gained in the audio-video demonstration given by experienced speech-language pathologists about the early identification, prevention and management of voice problems in teachers by voice/speech therapists. Results of Chi-square test revealed that the score obtained in pre-test for the questions 9 was significantly different from the post-test score.

Table 4: Trainee teachers' pre- and post-test scores on preventive voice care

Q No.	Question probed	Pre-test (%)	Post-test (%)
9	Professional who deals with voice problems	47.9	83.4
10	Use of gesture or non-vocal sounds	63.7	61.7

62% of the trainee teachers reported that the usage of gestures or non-vocal expressions damage the vocal folds instead of protecting the vocal folds. Though, the score for this question has reduced from pre-test (64%) to post-test (62%), after the orientation sessions, but there is no statistical significant difference seen between the scores. The reduced scores could be attributed to the less emphasis given on the non-verbal communication aspects in the lectures or because of the position of this question, which occurred as the last in the questionnaire. Overall, comparison of the pre- and post-test scores revealed an average of 15% increase, which was statistically significant at 0.01 level.

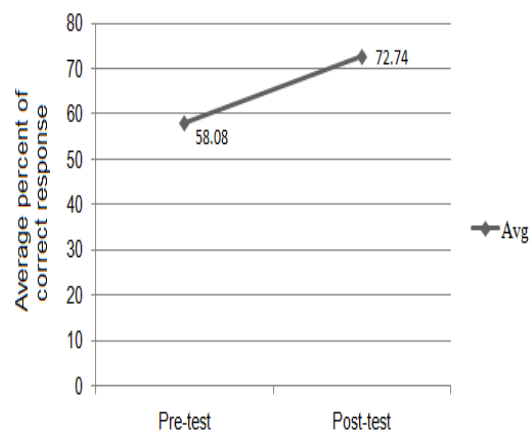


Figure 1: Average (overall) improvement of percent scores between pre- and post-test.

Figure 1 shows the overall (average) improvement in percent scores between pre- and post-test performance. Of all the areas probed (section A, B and C), the increased percent of scores suggesting that the trainee teachers' awareness of voice production system, causes of voice disorders and preventive voice care were better after attending the program. The results are in consonance with the findings of Boominathan et al, (2008) study who reported that there was 9% increase in the post-test percent scores in teachers. The higher percent score in the present study may be a short-term effect and further, the long-term effect (practice) in the real life needs to be evaluated. Chan (1994) reported that the kinder-garden teachers showed improvement in voice after attending vocal hygiene awareness program. In addition, Duffy and Hazlette (2004) reported significant improvement in multi-dimensional voice outcome of teachers who attended training than those teachers who did not attend. The present study findings are in agreement with the studies of Chan (2008), and Duffy and Hazlette (2004) who found improvement in voice performance or knowledge after attending voice related training programs.

Summary and Conclusions

The current study aimed to investigate the short-term effect of a vocal hygiene awareness program among teacher training students in Mysore city. The awareness program consisted of three sessions namely, anatomy of voice production, causes of voice disorders and voice care tips for class-room teachers which were delivered audio-visually by experienced speech-language pathologists. A questionnaire was administered prior to and after the sensitization program. The results indicated that the average (overall) percent scores improved from 58% (pre-test) to 73% (post-test). This increased percent scores after the awareness program suggested that the student trainees' awareness on voice and its disorders and its preventive care were better after attending the program. The increased percent score also reflects the immediate short-term memory effects of the participants and the long-term effects and its practices in the daily life need to be assessed. Very few questions and less number of voice care domains were considered in the questionnaire which can become the limitations of the study. Further studies need to address on more voice care domains in the questionnaire like vocal and non-vocal practices, diet, and classroom management.

References

- Boominathan, P., Chandrasekhar, D., Nagarajan, R., Madraswala, Z., & Rajan, A. (2008). Vocal hygiene awareness programme for professional voice users (teachers): An evaluative study from Chennai. *Asia Pacific Journal of Speech, Language and Hearing, 11* (1), 39-45.
- Boominathan, P., Chandrasekhar, D., Ravi, S., & Krupa M (2009). Impact of 'Vocal Hygiene Awareness Programme' in Professional Voice Users (Teachers). *Journal of Indian Speech and Hearing Association, 23*, 10-18.
- Boominathan, P., Rajendran, A., Nagarajan, R., Seethapathy, J., & Gnanasekar, M. (2008). Vocal abuse and vocal hygiene practices among different level professional voice users in India: A survey. *Asia Pacific Journal of Speech, Language and Hearing, 11* (1), 47-53.
- Boone, D.R. (1983). *The Voice & Voice Therapy* (3rd ed.). New York: Prentice Hall, INC, Englewood Cliffs.
- Bistrisky, Y., & Frank, Y. (1981) In Mattiske, J. A., Oates., & K. M. Greenwood (1998). Vocal problems among teachers: A review of prevalence, causes, prevention and treatment. *Journal of Voice, 12* (4), 489-499.
- Calas, M. (1989). In J. A. Mattiske; J.M. Oates, & K. M. Greenwood (1998). Vocal problems among teachers: A review of prevalence, causes, prevention and treatment. *Journal of Voice, 12* (4), 489-499.
- Chan, R.W. (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*, 279-291.
- 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.
- Fritzell, B. (1996). Voice disorders and occupations. *Logopedics Phoniatrics Vocology, 21*, 7-11.
- Kaufman, T.J., & Johnson, T.S. (1991). An exemplary preventative voice program for educators. *Seminars in Speech and Language, 12*, 40-48.
- Morton, V. & Watson, D.R. (2001a). Voice in the classroom. A re-evaluation. In P.H. Dejonckere (Ed.), *Occupational voice: Care and cure* (pp. 53-69). Hague: Kugel Publications.
- Rantala, L., Paavola, L., Körkkö, P., & Vilkmán, E. (1998). Working-day effects on the spectral characteristics of teaching voice. *Folia Phoniatrica et Logopaedica, 50*, 205-211.
- Roy, N., Merrill, R.M., Thibeault, S., Gray, S.D., & Smith, E.M. (2004). Voice disorders in teachers and the general population: effects on work performance, attendance, and future career choices. *Journal of Speech, Language, and Hearing Research, 47*, 542-551.
- Smith, E., Gray, S.D., Dove, H., Kirchner, L., & Heras H. (1997). Frequency and effects of teachers' voice problems. *Journal of Voice, 11*, 81-87.
- Smith, E., Kirchner, H.L., Taylor, M., Hoffman, H., & Lemke J.H. (1998). Voice problems among teachers: Differences by gender and teaching characteristics. *Journal of Voice, 12*, 328-334
- Verdolini, K., & Ramig, L.O. (2001). Review: Occupational risks for voice problems. *Logopedics, Phoniatrics, Vocology, 26*, 37-46.
- Yiu, E.M. (2002). Impact and prevention of voice problems in the teaching profession: Embracing the consumers' view. *Journal of Voice, 16*, 215-228.

Acknowledgement

The authors would like to thank the Director, All India Institute Speech & Hearing, Mysore, for the support and permitting to carry out this study. The authors also thank the staff of the Department of Speech-Language Sciences and the participants of the study.

Appendix 1

Department of Speech-Language Sciences
Orientation Programme for Prospective teachers on 'Conservation of Voice'

Name: _____ College: _____
 Class: _____ Date: _____

Pre-Test / Post test

Please, answer all the questions.

Section A:

1. _____ is very important for voice production
 (a. breathing b. eating c. bathing).
2. Voice box is also called as _____
3. The vibrating structure responsible for voice production is _____
 (a. vocal folds b. lips c. ary-epiglottic folds)
4. Voice is modified by _____
 (a. Lungs & trachea b. stomach & liver c. throat & mouth)
5. The pitch/tone used by an adult male is _____
 (a. Mid b. Low c. High)

Section B:

6. Voice problems are very common among, _____
 (a. Accountant b. School-teachers c. Librarians)
7. What are the main causes for voice disorders. Put a tick (✓) mark against the appropriate answer.

<i>Running</i>	<i>Smoking</i>
<i>Screaming</i>	<i>Alcohol</i>
<i>Chanting</i>	<i>Jumping</i>
8. Severe cough and frequent throat clearing lead to _____ problem
 (a. improve b. damage c. preserve).

Section C:

9. The professional who is responsible for improving voice/speech is _____
 (a. Physiotherapist b. Occupational therapist c. Speech therapist)
10. Use of gestures or non-vocal sounds can _____ the voice/vocal folds.
 (a. Protect b. damage c. harm)