



Original Article

Effects of Professional Vocal Hygiene Education on Vocal Hygiene Knowledge of Actors

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ABSTRACT

Background: Voice production is a complex mechanism, and the primary tool of the population of professional voice users requires special care. Hence, one area of learning provided by speech and language pathologists to this population is vocal hygiene. The current study was conducted to investigate the effectiveness of vocal hygiene education on actors' knowledge.

Methods: In this semi-experimental study of one-group clinical trials, 50 actors (29 males and 21 females aged 18-50 years) were selected based on available sampling. Participants were asked to complete the "assessment of actors' vocal knowledge" questionnaire. During 4 sessions lasting 60 minutes each, the participating actors were trained on the vocal hygiene package. One week after the last training session, participants were again asked to complete the questionnaire. Data was analyzed using SPSS software version 21, and indicators of descriptive statistics were analyzed.

Results: The mean score of voice abuse and non-abusive behaviors, which was 23.34 before training with the vocal hygiene package increased to 28.56 after education, a statistically significant change ($P < 0.001$). The level of knowledge of participants on the mechanism of phonation increased after education from an average score of 10.12 to an average score of 11.21 ($P < 0.001$). The mean score of knowledge of larynx pathology after education rose from 16.58 to 21.44, a significant change ($P < 0.001$).

Conclusion: The provided vocal hygiene educational package increased the actors' knowledge of the mechanism of phonation, voice abuse and non-abusive behaviors, and the functional and structural disorders of the voice.

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Introduction

Professional voice users are a group of people who rely on their voices for their subsistence [1], and one of the most important subcategories of this group is actors. Such people require hours of practice for their profession in order to portray different roles and characters [2]. While

performing, actors not only express a range of emotions with their voice, but they should also speak loudly enough that their voices can be heard by the audience above the sounds of music and sound effects that may also be heard in the scene [3]. Actors should dominate their voices in such a case. Some roles require an actor to shout, cry, laugh, or scream on stage, which imposes an extra load on the texture and performance of the vocal cords. Moreover, environmental and other side conditions, like smoke or make-up, can negatively affect the voice [4]. It can be said that actors endure high vocal demand due to

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their profession; thus, little or no knowledge about the voice mechanism and how to care for the voice can result in damage to an actor's vocal cords.

A recent study by Lerner on the prevalence of voice disorders in actors showed abnormalities such as incomplete glottal closure (62%), laryngeal hyperfunction (59%), and decreased mucosal wave (55%) [5]. Also, D'haeseleer saw intermittent dysphonia in a study that focused on vocal quality and vocal complaints of actors. In this study, 50% of actors reported having vocal complaints after a performance that were identified by the voice handicap index (VHI), vocal tract discomfort scale (VTD), and corporal pain scale. It was also revealed that most actors had a severe weakness in vocal health knowledge [6].

Vocal hygiene can be used with professional voice users to reduce vocal problems or as a therapeutic strategy. The main issues considered in vocal hygiene include examining the amount and type of voice use, reducing harmful vocal behaviors, and improving lifestyle to improve voice health [7]. In contrast with its high effectiveness, vocal hygiene is not usually seriously taught to actors in either academic or free environments. Zeine and Waltar examined the levels of interest and knowledge of vocal function and dysfunction among actors in three groups (professional, non-professional, and student) by questionnaire, and their findings showed that all three groups had little knowledge of vocal health, although the professional actors achieved a higher score than the other two groups. The results of their study also showed that the majority of participants were interested in promoting their knowledge in the field of vocal hygiene [2]. On the other hand, Rangarathnam studied 19 theater actors and determined the impact of knowledge and practice of vocal hygiene on measures of voice during intensive vocal performance. His findings showed that promoting knowledge and practicing vocal hygiene had little effect on the voices of actors, and vocal hygiene may not be the best way to prevent voice disorders [8]. Therefore, the current study purposed to investigate the effects of vocal hygiene education on the vocal hygiene and vocal mechanism knowledge of actors.

Methods

Participants

Participants in this cross-sectional study included 50 actors (29 men and 21 women) aged 18 to 45 years (mean age was 26.8 years with a standard deviation of 6.2). Convenience sampling was done and participants were selected according to the entry criteria (Table 1) from the universities of art and free educational centers of acting in Tehran. The study design was explained to prospective participants, and consent forms were completed before participants were included in the research. This research

was conducted under the supervision of the Educational Deputy of University of Social Welfare and Rehabilitation Sciences.

Vocal Hygiene Program

The vocal hygiene program consists of sections focusing on vocal health-related issues and was designed based on the knowledge, experience, and discussion of two speech therapists working in the field of voice therapy for professional voice users. Participants were trained for 4 weeks. The education was delivered to the subjects in one 60-minute session per week. The sessions were held by the researcher using slideshows and educational videos.

The first session consisted of participants completing the "Assessment of actors' vocal knowledge" questionnaire at the beginning of the session; an introduction to speech and language pathology and its role in the management and treatment of voice disorders; functional descriptions of the anatomy and physiology of the components of the larynx and mechanism of phonation; principles of correct breathing; examining the phenomenon of exacerbation; and the way of appropriate phonation with the help of educational films.

The second session focused on the study of etiology and the initial signs of functional and structural voice disorders, the effects of disorders on the process of phonation, a comprehensive look at the treatment of functional and structural voice disorders, and an introduction to gastroesophageal reflux and its effects on the voice with the presentation of educational films.

The third session introduced voice abuse and misuse and included discussions about health and appropriate vocal behaviors, correct breathing, correct posture and vocal hygiene as well as education on concepts such as voice rest, proper diet and gastroesophageal reflux, the effect of environment on voice, and the effects of mental and emotional issues on voice.

The fourth session comprised a review of previous sessions, discussion of voice abuse and misuse of each person during the professional period, an introduction to appropriate alternate vocal behaviors, and a question and answer period.

Evaluations

In this study, the effects of professional vocal hygiene education on the participants' vocal knowledge were evaluated by the "Assessment of actors' vocal knowledge" questionnaire [9]. The questionnaire consists of five separate sub-tests. The first part includes personal information and medical and artistic history; the second part relates to assessing the actors' awareness of the role of the speech and language pathologist in relation to the vocal mechanism; the third part is concerned with assessing the knowledge of voice abuse and misuse and nonabusive behaviors; the fourth part measures the

Table 1: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Age range of 18 to 45 years • Graduate or student in the fourth year of acting in universities or artistic free centers • Having at least 10 stage performances 	<ul style="list-style-type: none"> • Unwillingness to cooperate at each stage of the study • Absence from more than one session in training process

knowledge of the mechanism of phonation; and the fifth part relates to laryngeal pathology. Thus, the information obtained from the completion of the third, fourth, and fifth parts had a direct relation with the issue of vocal health. The three-level Likert method was used for scoring, with scores ranging from zero to two. A higher score in each section indicated a higher level of knowledge for the individual in that area. If a participant chose the correct answer, a score of 2 was calculated for them; if an incorrect answer was selected, the score was zero, and if a participant chose the option "I do not know," a score of 1 was calculated. It should be noted that the "I do not know" option in this questionnaire was designed to reduce the effect of guessing in choosing correct or incorrect choices.

All participants completed the questionnaire in two steps: once during the first session before education, and again one week after the last educational session.

Statistical Analysis

Data was analyzed using SPSS software version 21. The *Shapiro-Wilk* test was used to examine the normal distribution of variables. Due to the abnormal distribution of all variables, the Wilcoxon test was used to examine the significance of the variables of the questionnaire before and after the presentation of the educational package. The Kruskal-Wallis test was used to examine the differences in knowledge of individuals before and after education based on the level of education, and the Mann-Whitney test was used to compare the awareness of individuals based on gender variables, professionalism, and history of voice disorder at a significance level of 0.05.

Results

The present study was performed on 50 actors (29

males and 21 females) with an average age of 18.46 (SD=7.94) years. The results of the descriptive statistics of the participants are shown in Table 2.

As the results show, most of the participants were trained by an acting coach and practiced acting 14.5 hours per week on average. Also, 64% of subjects had experience performing professionally in the theater, and 20% of them reported having a voice disorder.

The mean, standard deviation, and difference in the scores of participants before and after education according to the various sub-tests in the questionnaire are reported through the Wilcoxon test in Table 3.

The Wilcoxon test results were used to compare the significance of the mean rank of participants in the sub-tests of knowledge of voice abuse and non-abusive behaviors, phonation mechanism, laryngeal pathology, and the role of the speech and language pathologist. The results revealed a significant difference between the mean of the ranks of each of the four variables of the questionnaire before and after the education ($P < 0.001$). After education, an increase in the knowledge of people in all four areas was observed. Also, the results of Kruskal-Wallis test based on the education variables of the participants and the trainer showed that there was no significant difference between before and after education (Table 4).

The mean scores of participants before and after education were compared using the Mann-Whitney test, and based on the gender variable, no significant difference was seen in any of the four parts of the questionnaire, while using the same test and at the levels of professional variables in the knowledge section of the role of the speech and language pathologist ($P < 0.05$) and disorder in laryngeal pathology, there were significant differences before and after education ($P < 0.05$).

Table 2: Demographic characteristics of participants in the study

Variable		Number	Percentage	Mean	SD
Age	Male	29	58	26.34	5.22
	Female	21	42	27.48	7.46
Education	Diploma	7	14		
	Associate degree	3	6		
	BA	25	50		
	MA	15	30		
Acting status	Non-professional	32	64		
	Professional	18	36		
Trainer	Acting coach	43	78		
	Sing coach	7	14		
Record of voice disorder	Record	10	20		
	Lack of record	40	80		

Table 3: Comparison of scores before and after education

Sun-test		Mean	SD	Score z	Significance
Voice abuse and non-abusive behaviors	Before education	23.34	4.25	-5.344	<0.001
	After education	28.56	3.95		
Phonation mechanism	Before education	10.12	2.32	-4.452	<0.001
	After education	11.82	1.93		
Laryngeal pathology	Before education	16.58	1.97	-1.161	<0.001
	After education	21.44	3.68		
The role of speech and language pathologist	Before education	5.98	1.78	-3.813	<0.001
	After education	7.18	1.27		

Table 4: Comparison of knowledge of individuals before and after education based on education level

Sun-test		Rank z				Significance
		Diploma	Associate degree	Bachelor degree	Higher education	
Voice abuse and non-abusive behaviors	Before education	23.36	26.50	22.92	30.60	0.42
	After education	18.50	20.50	26.58	27.97	0.44
Phonation mechanism	Before education	24.21	25.50	25.18	26.63	0.98
	After education	18.50	20.50	26.58	27.97	0.27
Laryngeal pathology	Before education	23.29	25.33	25.62	26.37	0.97
	After education	22	21.33	27.22	25.10	0.79
The role of speech and language pathologist	Before education	21.36	19	26.68	26.77	0.67
	After education	27.29	18.33	23.58	29.30	0.35

Discussion

The voice, as a product of a multidimensional mechanism, requires thorough and precise care of all dimensions. Actors as professional voice users need to take special care of their voices, because having a healthy voice is a precondition for this group of people for continuing their profession. Care of the voice was presented in the form of a vocal hygiene package for the prevention and treatment of voice disorders among professional voice users and those who suffer from voice disorders. To date, no research has been conducted in the Persian language on the knowledge of actors of vocal hygiene and the effect of vocal hygiene education on actors. The current research is the first in the Persian language to use a researcher-made questionnaire to measure and determine the level of actors' knowledge of vocal hygiene and the effects of education with the vocal hygiene package on the knowledge of this group of people.

Clinical experience has shown that one of the most important causes of excessive musculoskeletal tension in the larynx is voice abuse and misuse [10]. For this reason, it was expected that education on voice abuse and non-abusive behaviors could increase the level of knowledge of participants in this category. Participants' knowledge of the phonation mechanism increased after education on voice abuse and non-abusive behaviors. Inappropriate use of respiration, lack of knowledge of vocal facilities, and inappropriate use of standing and posture can all cause voice disorders [11]. For this reason, these two categories were emphasized at this level. The participants' knowledge about the effect of standing and posture on the voice was low, but it increased after education. As Table 3 shows, there was a significant difference in the level of knowledge of the participants about the laryngeal pathology before and after the education ($P < 0.001$). This level presented the greatest challenge for participants, possibly because of the use of specialized words (such as nodules, gastroesophageal reflux, laryngitis, etc.). Despite this challenge, the video clips provided at the session notably helped increase the participants' understanding of voice disorders.

As the results shown in Table 3 indicate, vocal hygiene education had a significant effect on improving the level of actors' knowledge of voice abuse and non-abusive behaviors, including the effects of the environment, diet, misuse behaviors (throat clearing and frequent coughing), and lifestyle on the voice. Most of the participants had a false belief about vocal behaviors before vocal hygiene

education, indicating that they did not have professional or scientific knowledge. For example, most participants considered the use of caffeinated tea or drinks such as coffee and energy drinks to be appropriate before a performance. Moreover, they thought such drinks would prevent dryness of the throat because of their fluidity. Conversely, these drinks cause dehydration of the vocal cords because of the caffeine found in them, and thus, they cause a change in the quality of the voice [12]. Therefore, avoiding caffeinated drinks is recommended for the care of one's voice [13-15]. The majority of participants thought that drinking alcohol had a positive or neutral effect on the voice, while alcohol increases the risk of laryngeal cancer and, due to dehydration, alters the quality of a voice [16]. It is recommended that this drink should not be used so as to increase vocal health [17, 18]. In addition to such false beliefs, the participants' lack of knowledge about behaviors such as throat clearing, coughing, and whispering was also indicative of a lack of adequate knowledge about voice abuse and non-abusive behaviors. Throat clearing and coughing can scar the vocal cords [19]; thus, avoiding these behaviors is recommended for proper voice health [14, 20]. Zeine and Waltar also measured the level of knowledge of actors about vocal hygiene and phonation mechanism in 2003. They concluded that students and non-professionals in this field especially need more vocal education [2]. It should be noted that the participants did have some knowledge about the positive or negative impacts of a number of behaviors. For example, most people knew that drinking water and getting enough sleep were good for the voice, and avoiding acidic foods and eschewing shouting would reduce possible harm to the voice.

According to the results of the current study, it can be stated that actors' knowledge of vocal hygiene was upgraded by the education; thus, education in this area can help this group of people. This finding is consistent with the results of Khodaami et al., which showed that the vocal hygiene program is required by voice therapy, although it alone would not solve all the problems [21]. Faham et al. also acknowledged that vocal hygiene education had a positive effect on teachers' voices [22]. Furthermore, in 2003, Chan provided the vocal hygiene package to singers and concluded that vocal hygiene education was a useful strategy for maintaining the performance and quality of phonation of singers [11]. On the contrary, Rangarathnam et al. concluded in 2017 that vocal health education might not be the best strategy for preventing vocal damage in actors [8], which is not consistent with the current findings.

Table 5: Comparison of knowledge of individuals before and after education based on gender variables, professionalism, and history of voice disorder

Sub-test		Gender		Being professional		Record of voice disorder	
		Male	Female	Non-professional	Professional	Record	Without record
Voice abuse and non-abusive behaviors	Mean rank	27.84	22.26	23	26.06	31.95	23.89
	Z score	-1.34		-0.71		-1.57	
	Significance	0.17		0.47		0.11	
Phonation mechanism	Mean rank	23.52	28.24	21.47	26.88	30.85	24.16
	Z score	-1.15		-1.28		-1.32	
	Significance	0.24		0.19		0.18	
Larynx pathology	Mean rank	25.90	24.95	21.76	26.72	35.70	22.95
	Z score	-0.22		-1.16		-2.48	
	Significance	0.82		0.24		0.01	
The role of speech and language pathologist	Mean rank	24.33	27.12	31.06	21.78	18.35	27.29
	Z score	-0.68		-2.22		-1.78	
	Significance	0.49		0.02		0.07	

Other research has shown that the knowledge level of this group regarding the phonation mechanism was significantly different after education (Table 3). Before education, it was observed that the actor had more knowledge about the use and effects of breathing on the voice than the effect of standing and posture on voice production.

Khodaami et al. and Faham et al. also concluded that a lack of knowledge of breathing and the phonation mechanism can be seen among patients. By training these people in vocal hygiene, their improvement can be helped [21, 22]. Zeine and Waltar confirmed the lack of knowledge of the anatomy and physiology of the larynx among actors and considered education in this category effective [2].

Knowledge of laryngeal pathology and what signs may indicate the onset of laryngeal injury is very important in preventing an increase in the severity of a disorder [23]. Because of the use of specific terminology at this level, actors were expected to obtain a low score in this category, which is consistent with the results of this study. Before education, the actors showed a greater lack of knowledge at this level; after education, however, a significant change was observed in the mean score of the actors in this area (Table 3). These results are consistent with those of Broaddus and Lawrence. They concluded that a singer's knowledge about the laryngeal pathology was significantly different after education than before it, and education at this level could prevent the development of voice disorders or result in treatment at very early stages [24]. Zeine and Walter also found that actors had little information about the pathology, symptoms, and treatment options of voice disorders [2]. The results shown in Table 5 indicate that after the implementation of the educational package, the knowledge of unprofessional people about the role of a speech and language pathologist had increased. Also, the knowledge about laryngeal injuries of people with a history of a voice disorder was significantly increased after education.

In general, it can be concluded from the results of the current study that although the larynx and phonation mechanism are important tools for actors, this group of people does not have sufficient knowledge in these areas. One problem of the participants was the existence of incorrect beliefs about the vocal mechanism, which

indicates non-scientific information in the field. Other limitations of this study were the presence of wrong training, non-academic coaches, and individual resistance to learning.

The researchers suggest that future studies on the vocal health package add practical exercises such as warm-up and cool-off tasks before and after the exercise to participants so as to make the impact of vocal education more tangible.

Conclusion

The findings of this study indicate that actors can benefit from speech and language pathology education to enhance vocal hygiene knowledge. The differences in the scores of participants in the field of vocal hygiene and the role of the speech and language pathologist before and after education indicate that experts in both the acting field and speech and language pathology can help actors through the exchange of information in the field of performing arts and voice.

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Conflict of Interests: None declared.

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