

Effectiveness of a Short Voice Training Program for Teachers: A Preliminary Study

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Summary: Background. Using their voices in inappropriate working conditions causes teachers to misuse their voices, because in order to be heard they need to force their voices.

Objective. This preliminary study examines the effects of a short-term voice training program aimed at teachers.

Methods. The pre- and posttraining evaluations consisted of acoustic, perceptual (GRBAS [grade, roughness, breathiness, asthenia, and strain]), aerodynamic, and subjective measurements (VHI-10).

Results. The results indicate that the voice performance of teachers improves after 25 hours of training. Specifically, significant changes are observed at the acoustic level, in fundamental frequency (F0) and in frequency perturbation measures (Jitter, PPQ [pitch perturbation quotient]), as well as in subjective voice assessment using the Voice Handicap Index (VHI-10), in both the physical subscale (VHI-P) and the total score (VHI-T).

Conclusions. This study confirms the effectiveness of the training program and discusses the most sensitive measures for evaluating the short-term effect of the change.

Key Words: Voice training—Acoustic measurements—GRBAS—Aerodynamic measures—Voice Handicap Index.

INTRODUCTION

Various studies have shown that voice problems are more prevalent in teachers (57.7%) than in persons of other occupations (28.8%).¹⁻³ However, the scientific literature contains conflicting data regarding the prevalence of voice abnormalities, possibly because there is no commonly accepted definition of this term.^{4,5} Furthermore, the data on prevalence in teachers vary depending on the number of class hours, the individual's specific characteristics, the type of teaching, the number of students, the acoustic conditions, etc.⁶⁻⁸

Using their voices in inappropriate working conditions (high number of students or unsuitable acoustics, for example) causes teachers to misuse their voices, because in order to be heard they need to force their voices. This results in an increase in muscular tension and subglottic pressure during voice production, heightening the collision force of the vocal cords and producing a greater load in the biomechanism of the vocal fold tissue.⁹ The result is often a vicious circle that leads to vocal trauma.¹⁰ Furthermore, emotional factors and stress can increase the muscular tension of the larynx, giving rise to or exacerbating voice problems.^{11,12}

Generally speaking, the kinds of voice alterations that teachers experience tend to be preceded by long-term nonorganic voice disorders that, if left untreated, can lead to larynx lesions such as polyps, nodules, edemas, and other pathologies, with the resulting professional and emotional impact,¹³ in addition to the economic costs associated with teachers who need to take sick leave. Some teachers have relapses and their professional ac-

tivity is again interrupted as a result of their voice problems, and some are even forced to change profession.¹⁴

In contrast, the use of a healthy voice is an effective communication tool in the classroom, raising the teacher's self-esteem and improving the individual's perception of his or her vocal and professional quality. This will lead to better general health and will reduce the personal, social, and economic consequences of voice problems.¹⁵

Despite the foregoing data, which point to the existence of a serious problem, official voice training programs (voice hygiene, vocal technique, etc) are still rarely made available to future teachers during their training,^{1,2,16-19} and even more rarely are they offered to teachers already exercising their profession. In consequence, some of them turn to voice training courses offered outside of their academic or professional setting, for which there are no data regarding effectiveness, as such courses do not usually do pre- and posttraining assessment, or any follow-ups.

Moreover, in the scientific literature, few studies look at the application of short-term voice training programs for teachers or future teachers,²⁰⁻²² and most of the studies that do so primarily seek to determine the effect of different voice therapy programs on various voice pathologies.

A further complication is that in the literature the terms "voice training" and "voice therapy" tend to be used interchangeably, as similar methodologies are used in both cases. However, according to Hazlett et al,²³ the term "voice training" refers to strategies aimed at preventing voice disorders and improving vocal health. The term "voice therapy" is preferred for programs designed to treat various voice pathologies.

Voice training programs for persons who use their voice professionally (teachers, operators, radio and TV commentators, etc) employ a wide array of methodologies. Some of the programs use exclusively direct training, which is based on vocal technique exercises and focuses on achieving an effective use of the voice. Other programs are based on indirect training, which consists of informing participants of a series of voice hygiene guidelines that will help them take care of their sound-producing

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apparatus. Finally, in still other voice training programs, a combination of both direct and indirect techniques is used.^{13,20}

The results obtained from studies using these methodologies vary considerably. Some studies have indicated that the most effective method is direct training,^{13,20} as it brings improvements in voice parameters and therefore in voice quality. However, other studies find that the opposite is true, that is, that indirect training has better results following the intervention.²⁴

There is also great variability in the length of the programs, generally depending on the objectives of each study.^{25,26} In fact, the ideal length of training programs has not yet been studied.

All of these are compounded by the nonexistence of standardized evaluation protocols in voice research literature,²⁷ and it is rare to find studies that use the same measurement tools. In short, all of these methodological aspects make it very difficult to compare studies.²³

In Spain, there is no voice training for future teachers and the training offered to working teachers tends to be very limited and superficial, so it is necessary that the voice training offered through official bodies be of high quality and proven usefulness. For this reason, this preliminary study's main objective was to create a short and effective voice training course for teachers. Once its potential effectiveness has been demonstrated, the educational authorities in this country could replicate it annually for teachers. For this reason, and because we wanted to be realistic, the instruments used in this study are noninvasive, economical, and easy to use. Our intention is to help teachers improve their voice quality at work, which will also have significant repercussions in other communication and social contexts.

With these considerations as its starting point, this preliminary study examines the potential effectiveness of a 25-hour voice training program for teaching professionals. The study's main objective is to help teachers use their voice functionally and comfortably. This would imply the following:

- (1) A change in acoustic, perceptual, and aerodynamic parameters and also in their physiological correlates.
- (2) An improvement in the self-perception of vocal capacity, as evaluated with Voice Handicap Index-10 (VHI-10). A topic that is increasingly being considered important when assessing the effectiveness of voice training programs is the self-perception of vocal well-being of the participant.^{28,29}
- (3) The evaluation tools used in this course will help determine whether these tools are sensitive in assessing the potential effectiveness of this type of short-term voice training programs.

METHODS

Subjects

Participating in the study were 116 teachers (85 women) aged between 25 and 55 years (average age: 40.6; standard deviation: 7.8). All of the participants work as teachers at the preschool, elementary, or secondary school level in various public schools in Granada, Spain, and they have an average teaching experience of 14.7 years (standard deviation = 7.9 years). They teach

5 hours of class every day (25 hours/week) in classes with 25 students. The participants signed up as volunteers for our course, which was called "vocal training for teachers" and was offered by the Center for Teachers in Granada, a division of the Andalusian Ministry of Education, Culture and Sports. The purpose of the center is to provide teachers with complementary training on a variety of topics, including the occupational health of teachers. The center's activities are free of charge and participation is voluntary.

This is a field study in which the groups were preformed and random assignment of participants to the groups was not possible. Furthermore, there is nothing in the general linear model (see, eg, Haase³⁰) applied in this paper that prevents the comparison of groups with disparate sample sizes. In fact, the model allows the comparison of just one subject to a group, as occurs, for example, in studies of a single case, in which one patient, for example, patient H.M., is compared with a control group (see, eg, Crawford and Garthwaite³¹).

Thus, given the potential benefits of the program used in this study, a restricted random assignment process was used to create groups in such a way that the experimental group included as many participants as possible without reducing its statistical power, while maintaining the proportionality of the sexes in the total sample. This criterion led to an experimental group of 94 teachers and a control group of 22.

The experimental group comprised 94 teachers (69 women) who take the full 25-hour course over a period of 8 weeks. The hours dedicated to each activity were as follows: lecture (1 hour), posture education workshop based on the Alexander Technique (6 hours), Mindfulness or stress-control workshop (6 hours), and voice training and vocal hygiene education (12 hours).

The control group comprised 22 teachers (16 women) who do not participate in the "vocal training for teachers" course. However, when our study ended, they were invited to take the course the next time it was offered.

Vocal training program

Each activity and workshop taking place over the 8 weeks had to be scheduled within the timetables established by the government's education bodies for this type of training activity. Therefore, the organization of the activities depended in large part on these bodies.

The activities programmed in the "vocal training for teachers" course were taught by professionals with expertise in the different subjects covered. The specific content was as follows:

- (1) Lecture on the mechanisms involved in phonation, vocal parameters (tone, intensity, timbre) and their physiological correlates, the genesis of voice pathologies, and vocal hygiene education. Different methods were used to illustrate the content (videos, animations, software, etc). At the end of the lecture, all participants received a handout containing a vocal hygiene program that synthesized the guidelines appearing in most programs proposed in the literature.³²⁻⁴⁰ All participants were encouraged to follow these guidelines in their everyday activity.

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