

Effectiveness of a Voice Training Program for Student Teachers on Vocal Health

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Summary: Objectives. The effectiveness of a preventive training program on vocal health for German student teachers was investigated on specific vocal parameters.

Methods. The voice quality as described by the Dysphonia Severity Index of 204 student teachers (training group: $n = 123$; control group: $n = 81$) was measured at the beginning and at the end of the student teachers training period (duration 1.5 years). Additionally, for investigating the voice-carrying capacity, a vocal loading test (VLT) was performed. Finally, participants had to provide a subjective judgment of a possible Voice Handicap Index.

Results. The training program improved the voice quality of the trained group compared with that of the control group, whose voice quality declined. The trained group was also able to better sustain their voice quality across the VLT than the control group. Both groups, however, reported a similar increase in subjective vocal strain.

Conclusions. The presented training program clearly showed a positive impact on the voice quality and the vocal capacity. The results maintain the importance of such a training program to be integrated in the education and occupational routine of teachers.

Key Words: Voice–Teachers–Vocal health–Vocal loading–Prevention.

INTRODUCTION

The voice is an essential tool in the teaching profession. It is not only necessary to impart knowledge but also to communicate emotions and personal characteristics. Hence, vocal problems have direct consequences on the teaching abilities. Studies showed that teachers with vocal disorders had a negative influence on the pupils' learning outcome.^{1,2} It is therefore important that teachers maintain a good vocal function during their professional life.

Teachers, however, often experience voice disorders, and it has been shown that they are at greater risk for developing voice disorders compared with those in other professions.^{3–5} On average, up to 50% of teachers complained about having experienced a serious vocal problem at least once in their teaching career.^{6–9} Furthermore, the onset of voice problems is not only limited to older teachers with years of working experience. Younger teachers may also experience voice complaints within the first few years of teaching. Simberg¹⁰ showed that 39% of student teachers reported voice symptoms. Nevertheless, prevalence of reported voice problems in teachers largely ranges between 5% and 90%. This variety depends mostly on different definitions of voice problem and how it was reported.⁴

To prevent vocal problems, various voice training programs have been developed. For example, on the basis of the concept of the Schlaffhorst-Anderson method, Saatweber¹¹ published several practical exercises for teachers' voices. Other voice programs for teachers focused on group training and were

methodologically divided into an “indirect” training (including lectures about the functionality of and influences on the voice) and a “direct” training (with personal coaching and practical exercises).

Several studies investigated the effects of these training methods on voice aspects. Timmermans et al¹² found that students ($n = 49$) who participated in 9 months of voice training (indirect and direct) showed a positive effect on the quality of the voice described by the Dysphonia Severity Index (DSI¹³) compared with a group without voice training ($n = 20$). The trained group obtained a significantly higher DSI of 4.3 than the control group (DSI of 3.2). Additionally, they used the self-assessment questionnaire for vocal symptoms, the Voice Handicap Index (VHI¹⁴), and found that both groups scored similarly.

In a follow-up study, Timmermans et al¹⁵ investigated another short voice training program (6 hours) in future teachers and found no significant effects of the DSI and the VHI between the trained group ($n = 35$) and the control group ($n = 30$). Even with an addition of 30 minutes of individual voice counseling, no significant changes could be observed.¹⁶

Duffy and Hazlett¹⁷ compared two groups of student teachers with voice programs of either indirect ($n = 20$) or direct ($n = 12$) voice training with a control group without training ($n = 23$). The results showed no differences in the mean values of the VHI. Measuring the DSI, they found an increase for the direct voice training group, no difference for the indirect group, and a decrease for the control group. The results, however, did not reach statistical significance.

Similarly, Bovo et al¹⁸ investigated kindergarten teachers with indirect and direct training ($n = 21$) compared with matched untrained persons ($n = 20$). They found large positive effects in several acoustic voice parameters (such as maximum phonation time (MPT), jitter, and shimmer) and in the VHI. These effects still remained in a 12-month retest but were slightly reduced.

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TABLE 1.
Content of Each Session of the Voice Training Program

Session	Topic
1	Voice hygiene and voice functioning
2	Movement and postural alignment
3	Breathing behavior
4	Finding the individual pitch during speaking
5	Vocal intensity
6	Resonance and cavities
7	Articulation
8	Prosodic elements
9 + 10	Recaps and presence
Always	Care packet

As there are several more publications on this subject, two literature reviews on the effectiveness of voice trainings have been performed. Ruotsalainen et al¹⁹ selected, out of a body of over 5000 references, only two studies that confirmed the criteria required, such as homogenous population, study design, and measurements performed. The amount increased up to six studies in a later repeated review but they could not find evidence for the effectiveness of voice training in improving vocal function.²⁰ Hazlett et al²¹ performed a similar review with 10 studies included. They also found no clear evidence for positive effects of voice training and concluded, as there have been studies showing that voice training did improve aspects of the quality of the voice, that more robust research should be performed. Both reviews criticized that the methodological quality in most of the studies was poor mainly because of rather small sample sizes, nonrandomized designs, the large diversity of training programs (content, length in time, and amount of sessions), and the rather short time between training and follow-up measurements, which should be at least 1 year.²⁰

Since these reviews, several studies addressing the topic have been published. Nanjundeswaran et al,²² for instance, investigated the effects of two different training programs (indirect and indirect combined with direct) in student teachers ($n = 31$) on the VHI value compared with a control group. They found a decrease of the VHI in both trained groups. For the subjects with low VHI values at the beginning, however, the VHI increased. Because of the small sample size, they only described the positive effect of the training. Pizolato et al²³ measured acoustic parameters of the voice

to analyze effects between a group of teachers with vocal training ($n = 30$) and a control group ($n = 43$). They found that the fundamental frequency ($F0$) of the trained male participants decreased but increased in the trained female participants. There were no significant differences of both groups between the initial and final measurements after 3 months, except that only the control group increased their mean voice intensity.

Regarding all these studies, there is still no clear evidence of the positive effects of voice training on vocal functioning.

The aim of this study was to analyze vocal outcome of a prevention training program on vocal health in a homogenous sample with a larger sample size ($n = 204$ German student teachers). It was hypothesized that vocal function was improved for subjects getting vocal training within the prevention program, where vocal function was impaired for those who had no such voice training.

MATERIALS AND METHODS

Voice training protocol

The training program was integrated into the teaching education period for student teachers (duration 1.5 years). It was set to eight sessions of 90 minutes during the first half year of the education period, two refreshing sessions of 90 minutes in the second half year, and an individual teacher observation at school for all participants of the intervention group by the voice teachers in the last half year. The individual voice topics of the training of all sessions are listed in Table 1.

Each session included the so-called “care packet.” This is a short program that can be performed in <10 minutes containing selected exercises of all topics such as body stretching, jaw massage, breathing, activating the articulation, and pronouncing syllables. It was designed as a repeatable procedure across the whole training program and to be used to activate the voice and the body before a working day or a voice-demanding situation.

The courses were given at the institutions where the seminars for the teaching education period took place. They were organized in groups of 10–12 people and were led by professionally educated voice teachers.

Participants

The sample of the study comprised a total of 266 vocally healthy student teachers, who just started with their education

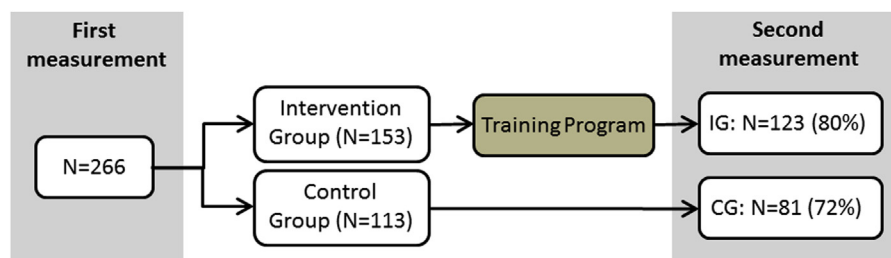


FIGURE 1. Study design and number of participants at both evaluation times.

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