

Prevalence of Voice Symptoms and Risk Factors in Teacher Students

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Summary: Teacher students seem to have low awareness of the vocal demands in their future professions, and students with vocal symptoms are at risk for developing voice disorders during their professional careers. The purpose of the present study was to determine the prevalence of voice problems in teacher students at the very beginning of their education at the university. Of 1636 students approached in the first couple of days, 1250 (76%) answered two questionnaires about voice symptoms, Screen6 and Swedish Voice Handicap Index (Sw-VHI), and one questionnaire about potential risk factors. A majority of the students were women, and their mean age was 23 years (range, 18–52 years). The results showed that 208 of 1250 students (17%) had voice problems, defined as at least two symptoms weekly or more often in Screen6. The proportion of women was larger in the group with voice problems than in the group without voice problems. Significant risk factors for voice problems were vocal fold problems in childhood and adulthood, frequent throat infections, airborne allergy, smoking, hearing problems, previous work as teacher or leader, voice demanding hobbies, and previous speech therapy or voice training. There was a clear association between the number of potential vocal risk factors and the number of voice symptoms. There was also a strong association between the scores of the two questionnaires, the Sw-VHI and the Screen6. Students with voice problems according to Screen6 scored 23.1 (mean Sw-VHI) compared with 7.8 for students without voice problems.

Key Words: Teacher students—Prevalence of voice symptoms—Potential risk factors—Screening instrument—Voice Handicap Index.

INTRODUCTION

Teachers constitute about 6% of the working force in Sweden, approximately 250 000–300 000 persons. In the United States, the corresponding number is 4%. At the same time, teachers are overrepresented among patients with voice disorders, in Sweden 16% and in the United States 20%.^{1–3} Prevalence of voice problems among teachers varies from 7% to 80% depending on what groups were studied, how the questions were phrased, and the response rate.^{4–13} Roy et al² reported voice problems in 11% of 1243 teachers compared with 6% in 1288 nonteachers and that 58% of the teachers some time in their career had experienced voice problems compared with 29% among the nonteacher group. Ahlander et al¹⁴ found voice problems in 13% of Swedish teachers. Generally about one-third of the teacher work-force experience or have experienced voice problems. A study in Finland⁶ indicates that voice problems increased in a group of teachers during a 12-year period. Obvious risk factors for voice problems among teachers are frequent use of the voice at work in combination with ambient noise and unsatisfying room acoustics, dry air, distress, and too little time for recovery.^{14–24} Another important risk factor is lack of professional voice education. Voice training programs for teachers show improved vocal health and increased vocal awareness.^{25–28} Teacher students seem to have low awareness of the vocal demands in their

future professions, and students with vocal symptoms are at risk for developing voice disorders during their professional careers.^{29,30} In a study of voice disorders among 226 teacher students in Finland, Simberg et al³¹ found that 20% of the students reported frequently occurring vocal symptoms. In another study, Simberg et al³² found that vocal symptoms were more frequent among teacher students than among other university students in Finland.

This report is a part of a study about voice function and voice education intervention among teacher students in Sweden. The purpose of the present study was to determine the prevalence of voice problems in teacher students as well as potential risk factors, at the very beginning of their education at the university.

METHODS

The study was carried out at the Departments of Teacher Education at two universities in southern Sweden in the autumn of 2009 and in spring 2010. Together with the general welcome letter from the Departments of Education, sent to the new students before the start of the semester, an additional letter presented the study and its background and purpose. At the general introduction for new teacher students, on the first day of the semester, the study was presented and the students were asked whether they would like to participate. Then the screening was performed. Of 1636 students, 1250 (76%) participated. The mean age was 23 years (range, 18–52 years), and a majority of the students were women.

The students signed a letter of consent, answered background questions (Table 1), and completed two questionnaires about voice symptoms, namely Screen6³³ and Swedish Voice Handicap Index (Sw-VHI).³⁴

Screen6 is based on a questionnaire developed for a screening test by Simberg et al,³³ translated into Swedish. The screening questionnaire by Simberg et al includes seven questions, but the

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TABLE 1.
Sex, Age, and Prevalence of Potential Risk Factors for Voice Problems in 1250 Teacher Students With or Without Voice Problems as Assessed by Questionnaires

Risk Factor	All Students (n = 1250) (%)	Voice Problems (n = 208) (%)	Not Voice Problems (n = 1042) (%)	P Value*
Sex (proportion of women)	77	80	73	0.032
Mean age, y (range)	23 (18–52)	23 (18–45)	23 (18–52)	0.207
Vocal fold problems in childhood	1	4	1	0.005
Vocal fold problems in adulthood	2	5	1	0.001
Frequent throat infections	22	43	18	<0.001
Airborne allergy	22	36	20	<0.001
Smoking today	13	17	12	0.047
Smoking earlier	12	18	11	0.007
Hearing problems	12	19	11	<0.001
Voice-demanding work	40	47	38	0.016
Voice-demanding hobbies	33	39	32	0.031
Previous speech therapy	5	10	4	<0.001
Previous voice training	8	13	7	0.002
Mother tongue other than Swedish	11	11	11	0.874

* Group differences tested by chi-square test, Fisher exact test, or *t* test (mean age).

last one, about voice loss, was excluded in this study because periods of voice loss were shown to be rare among teacher students in the studies by Simberg et al.^{31,32} as well as in pilot tests before this study. Thus, Screen6 constitutes the screening test for vocal symptoms in this study and includes six questions about vocal symptoms: (1) Does your voice become strained or tired? (2) Does your voice become low or hoarse? (3) Does your voice break? (4) Do you have difficulties in being heard? (5) Do you need to clear your throat or to cough? (6) Do you have a sensation of pain or lump in the throat? The students reported the vocal symptoms that had occurred during the past year. The response alternatives were (1) every day, (2) every week, (3) less often, and (4) never. Students who reported two or more daily or weekly voice symptoms during the past year were assigned to the group with voice problems as suggested by Simberg et al.,³³ whereas the other students were considered having no voice problems. The other questionnaire, Sw-VHI, is based on a worldwide questionnaire³⁵ translated and validated for Swedish conditions.³⁴ It contains 30 statements representing three different aspects of voice experience in everyday life: physical, functional, and emotional. Each aspect is represented by 10 statements, for example, “I run out of air when I talk” (physical); “I use the phone less often than I would like” (functional); and “I am tense when talking with others because of my voice” (emotional). Each statement is scored on a five-point scale (0 = never, 1 = almost never, 2 = sometimes, 3 = almost always, and 4 = always). Each of the three subscales ranges from 0 to 40 points. The highest total score of 120 points indicates the highest possible negative impact on everyday life because of voice problems.

Statistical analysis

Chi-square tests (or Fisher exact test when the expected numbers are small) were used to test for differences in propor-

tions between the two groups. A *t* test was used for data obtained from continuous variables, as well as for the Sw-VHI total score, which can be considered semicontinuous. Correlations were calculated using the Spearman rank correlation coefficient. The Cochran-Armitage test was used to test for trends.

RESULTS

According to the definition of two or more voice symptoms weekly or more often on Screen6, there were 208 of 1250 students having voice problems in this study, a prevalence of 17% (95% confidence interval, 14.6–18.7).

The students' experiences regarding potential risk factors differed significantly between the students in the voice problem group compared with those in the group without voice problems (Table 1). There was no difference between groups regarding mean age (23 years), but there was a sex difference. The proportion of women was larger in the group with voice problems.

A history of vocal fold problems was rare in both groups, but it was more frequent among the students in the voice problem group. The most common symptoms were hoarseness and vocal fold nodules in childhood and laryngitis and hoarseness in adulthood. Frequent throat infections were more common among students with voice problems. This was also true for airborne allergy, the most common allergens being birch pollen, pelt, and dust. A larger proportion of the students with voice problems were smokers or ex-smokers. Students with voice problems had been smoking for 1.8 years (range, 0–20) on average, as compared with 1.1 years (range, 0–20) for students without voice problems ($P = 0.003$, not shown in Table 1). Also, hearing problems (including tinnitus) were significantly more frequent in the group with voice problems. Previous voice-demanding work was more frequent among the students with voice problems, and the most common type of such work was as a teacher or as leader for groups of youngsters.

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