Self-Reported Acute and Chronic Voice Disorders in Teachers

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Summary: The present study aimed to identify factors associated with self-reported acute and chronic voice disorders among municipal elementary school teachers in the city of Montes Claros, in the State of Minas Gerais, Brazil.

Methods. The dependent variable, self-reported dysphonia, was determined via a single question, "Have you noticed changes in your voice quality?" and if so, a follow-up question queried the duration of this change, acute or chronic. The independent variables were dichotomized and divided into five categories: sociodemographic and economic data; lifestyle; organizational and environmental data; health-disease processes; and voice. Analyses of associated factors were performed via a hierarchical multiple logistic regression model.

Results. The present study included 226 teachers, of whom 38.9% reported no voice disorders, 35.4% reported an acute disorder, and 25.7% reported a chronic disorder. Excessive voice use daily, consuming more than one alcoholic drink per time, and seeking medical treatment because of voice disorders were associated factors for acute and chronic voice disorders. Consuming up to three glasses of water per day was associated with acute voice disorders. Among teachers who reported chronic voice disorders, teaching for over 15 years and the perception of disturbing or unbearable noise outside the school were both associated factors.

Conclusions. Identification of organizational, environmental, and predisposing risk factors for voice disorders is critical, and furthermore, a vocal health promotion program may address these issues.

Key Words: Voice–Voice disorders–Speech, Language and Hearing Sciences–Dysphonia.

INTRODUCTION

Many studies focusing on adults with voice disorders have examined teachers because of their reportedly high risk for developing dysphonia.[1,2] The prevalence of voice disorders among teachers ranges anywhere from 8.7% to 87.3%.[3–10] Complaints such as fatigue when speaking and deterioration in voice quality are common, as well as missed work days due to voice limitations.[11]

Voice disorders among teachers are likely multicausal and related to environmental, organizational, and predisposing factors that can aggravate and/or trigger a vocal problem.[2,12,13] The Work-Related Voice Disorder[14] protocol provides examples of environmental factors including high background noise, unfavorable acoustics, inadequate room ventilation, and low humidity. Some examples of organizational factors include excessive vocal demands, high student-to-teacher ratios, inadequate equipment, and limited access to hydration. As for predisposing factors, age, sex, excessive vocal use, lack of hydration, respiratory allergies, medications, alcohol consumption, smoking, and gastroesophageal reflux disease, among others, may be related to voice disorders.

With regard to voice disorders, they are typically classified temporally as acute or chronic. Viral laryngitis usually lasts from 1 to 3 weeks, and if symptoms persist, the dysphonia is considered chronic, and a more detailed assessment is indicated.[15] Early intervention is essential to avoid exacerbation of vocal difficulties that prevent carrying out one's employment duties.

Compared to other professionals, teachers are more likely to seek treatment by otolaryngologists and speech-language pathologists.[5] However, teachers tend to seek these services when their vocal quality has deteriorated significantly,[16] at advanced stages of the voice disorder.[17]

A recent Brazilian epidemiological study[6] investigated the prevalence of dysphonia in teachers and in the general population and concluded that teaching is a high-risk occupation for the development of voice disorders. Because of this risk, many teachers seek alternative occupations. These data are cause for concern and confirm the importance of implementing informative and preventative measures, including intervention in the curriculum of teacher education programs.[6] To date, teachers rarely receive education regarding vocal care or technique during their undergraduate coursework.[18] Furthermore, environmental and organizational factors that can have a deleterious effect on the voice are rarely discussed in such courses.

Further studies are necessary to obtain a scientific basis for the development of dysphonia prevention programs,[19,20] largely directed at improved vocal health care,[7] including behavioral approaches, such as body posture, respiration, phonation, and articulation,[21] as well as approaches to improve workday organizational and environmental modifications such

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as enhanced classroom acoustics. A systematic review on preventing voice disorders has not found high evidence to support the practice of giving training to teachers to prevent voice disorders. Future treatment studies are necessary.[22]

The verification of current symptoms to identify the presence or absence of dysphonia, and to define whether the problem is acute or chronic is necessary to precisely analyze whether voice problems are related to behavior, separating these issues from acute alterations related to viral inflammatory processes such as acute laryngitis.

In that regard, identifying the factors associated with self-reported acute and chronic voice disorders may serve as the foundation for designing a targeted health education program. Such analyses may provide insight into early detection and mechanisms to direct treatment for this challenging population. To address this issue, we sought to identify factors associated with self-reported acute and chronic voice disorders among teachers of municipal schools located in a medium-sized city in the State of Minas Gerais, Southeastern Brazil.

METHODS

This epidemiological, cross-sectional, and analytical study with a probability sample was carried out in Montes Claros, a city located in the North of the State of Minas Gerais (Southeastern Brazil) with approximately 370 thousand inhabitants and represents the main regional urban center. The study was approved by the Research Ethics Committee of the *Universidade Estadual de Montes Claros* under number 2889.

The target population was composed of women teachers in elementary schools. According to data from the Municipal Department of Education, the network is composed of 25 urban schools with 640 teachers. The sample was calculated by simple random sampling to estimate the prevalence of self-reported voice disorders. A confidence level of 99% was adopted, with accuracy of 5% and prevalence of voice disorder of 11.6%, which was previously reported in a Brazilian population-based survey.[6] On the basis of these criteria, 196 municipal school teachers were required, taking into account attrition. Male teachers were excluded not only because of their small number in primary education, but also because of biological differences in the larynx. Teachers who were not teaching at the time were also excluded, as well as those who were on a sick leave and those who were involved in school administration. Physical education teachers were also excluded because of the differences in vocal demands.

A self-administered questionnaire was used, which had been previously piloted with 31 teachers at three schools in the city for children with special needs. Data collection occurred through visits to the schools during 2012 and the first semester of 2013. Questionnaires were distributed to the teachers in an individual envelope.

The dependent variable, self-reported voice disorder, was based on the answer to the question "Have you noticed changes in your voice quality?" which had five possible answers: (1) no; (2) yes and this has lasted 1 week; (3) yes and this has lasted between 2 and 3 weeks; (4) yes and this has lasted more than 3 weeks up to 1 month; (5) yes and this has lasted more than 1 month. Subsequently, this variable was simplified into three categories: (1) no; (2) acute alteration (3 weeks or less); and (3) chronic alteration (more than 3 weeks). The distinction between acute and chronic voice disorders followed the recommendation of the guideline of the American Academy of Otolaryngology–Head and Neck Surgery Foundation,[15] which defines acute alterations as those that last 3 weeks or less. In addition, teachers were asked about the presence of any of the following symptoms; hoarseness, voice loss, throat clearing, fatigue when speaking, vocal effort, pain when speaking, burning throat, stinging sensation in the throat, lump in the throat, dry throat, others.

To define the factors associated with dysphonia, the independent variables were divided into blocks, and those with more than one response option were dichotomized: block 1—socio-demographic and economic data: age (<40 years/≥ 40 years), level of education (higher education with specialization/high school to higher education), marital status (with partner/without partner), number of children (none/≥1), family income (≥R$2500.00/< R$2500.00); block 2—lifestyle: physical activity (yes/no), smoking status (nonsmoker/current smoker or exsmoker), frequency of consumption of alcoholic drinks (never or once a month/twice a month or more), quantity of alcoholic drinks (none or one unit/>2 U), consumption of ≥5 U of alcoholic drinks at a time (never or less than once a month/monthly, weekly, daily), water intake during classes (yes/no), water consumption per day (≥4 or more glasses/<4 glasses), daily intake of fruit juice (yes/no), amount of juice per day (>2 glasses/none to one glass); block 3—organizational and environmental data: duration of teaching (≤15 years/>15 years), class hours per week (20 hours/40 hours), periods per day of teaching (morning/afternoon), number of students per classroom (≤25/>25), perception of noise in the classroom (negligible to tolerable/disturbing to unbearable), inside the school (negligible to tolerable/disturbing to unbearable), outside the school (negligible to tolerable/disturbing to unbearable), perception of ventilation (satisfactory to acceptable/precarious to very precarious), availability of drinking water close to the classroom (almost always or always/never or almost never); block 4—Health-disease process: treatment for gastroesophageal reflux disease (no/yes), medical diagnosis of respiratory allergy (no/yes), perception of respiratory problem (no/yes), use of medicines for some specific morbid condition: arterial hypertension (no/yes), diabetes (no/yes), depression or anxiety (no/yes), sleep alterations (no/yes); block 5—voice: self-assessment of the frequency of voice use in the daily routine (does not talk much or talks moderately/talks a lot or talks excessively), absenteeism from work due to voice disorders (no/yes), if she has ever had a leave from work due to voice disorders (never/yes), sought a medical consultation due to voice disorders (no/yes), attended a speech-language pathology consultation due to voice disorders (no/yes).

First, a bivariate analysis was performed via Pearson chi-square test between the independent variables and the outcome variable. The variables which were associated up to the level of significance of 20% ($P \leq 0.20$) were included in multiple analysis.