



# Voice disorders in teachers and their associations with work-related factors: A systematic review

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## ABSTRACT

**Purpose:** To provide a quantitative assessment of the occurrence of voice disorders among teachers and to identify associated work-related and individual factors in the teaching profession.

**Method:** A systematic review was conducted using three computerized databases on the occurrence of voice disorders among teachers and their associations with work-related and individual factors. Some of the keywords used were: “teacher”, “voice disorder”, “voice problem”, and “dysphonia”. Information regarding the occurrence of voice disorders and associations between work-related and individual factors and voice disorders were extracted from each paper. Occurrence and associations were expressed in prevalence and odds ratios, respectively.

**Results:** In total, 23 publications met the criteria for inclusion. All publications were cross-sectional studies. Prevalence estimates varied widely, reflecting disparity in definitions of “voice problem”. Teachers had a significantly increased occurrence of voice disorders compared to other occupations. Several work-related and individual factors were consistently associated with voice disorders, most notably high levels of noise in classrooms, being a physical education instructor, and habitual use of a loud speaking voice.

**Conclusion:** This review shows that teachers report voice disorders more often than non-teachers. Various work-related and individual factors are associated with reported voice disorders. Longitudinal studies are urgently required to get more insight into the development of voice disorders, their work-related determinants, and the consequences of these voice disorders for functioning and work performance among teachers.

### Learning outcomes:

- Describe the occurrence of voice disorders among teachers
- Identify some work-related factors of voice disorders among teachers
- Interpret the quality of the publications to describe or analyze the relationship between working conditions and voice disorders among teachers

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## 1. Introduction

About one third of the labor force works in professions in which the voice is their primary tool (Vilkman, 2000). Excessive use or abuse of the voice at work can lead to voice disorders (Williams, 2003). ASHA defines voice disorders as the “abnormal production and/or absences of vocal quality, pitch, loudness, resonance, and/or duration, which is inappropriate for an individual’s age and/or sex” (ASHA, 1993).

Some studies suggest that workers, whose professions are vocally demanding, such as teachers, may be at greater risk for developing voice disorders (Alves, Do Carmo Cruz Robazzi, Marziale, De Felipe, & Da Conceicao Romano, 2009; Mattiske, Oates, & Greenwood, 1998; Williams, 2003). Studies that have investigated voice disorders among teachers have reported a wide range of prevalence from 4.4% to 90%. Therefore, some authors have concluded that the prevalence of voice disorders in these workers is not well-described (Mattiske et al., 1998; Williams, 2003).

Some studies have reported that voice disorders among teachers are associated with working conditions, such as background noise, extensive working hours without rest, and poor climatic conditions in classrooms (Ilomaki et al., 2009; Jonsdottir, Boyle, Martin, & Sigurdardottir, 2002; Mattiske et al., 1998; Pekkarinen, Himberg, & Pentti, 1992; Williams, 2003). Nevertheless, there is a clear lack of consensus about which working conditions are associated with the development of voice disorders in this occupation (Mattiske et al., 1998).

In order to establish the work-relatedness of voice disorders among teachers, studies are needed to characterize the relative importance of individual and work-related factors in the development of voice disorders among teachers (Vilkman, 2004). Individual factors include voice use and teaching experience and work-related factors often referred to focus on the working environment and conditions of employment and payment (Betancourt, 1999; Eurofond, 2011).

To date, no systematic review of the literature concerning voice disorders among teachers and their work-related factors is available. Such a review may contribute to the second step in the process of evidence-based practice (i.e. finding the evidence) as advised by the American Speech-Language-Hearing Association (ASHA, 2004).

Therefore, we conducted a systematic review of the available scientific literature with two aims: to provide a quantitative assessment of the occurrence of voice disorders among teachers and to identify work-related and individual factors of voice disorders among these teachers.

## 2. Method

### 2.1. Literature search

Comprehensive literature searches were conducted using three computerized databases: PubMed/MEDLINE (National Library of Medicine, Bethesda, MD) covering from 1966 to February 2011, Embase (Elsevier, Amsterdam, The Netherlands) covering from 1984 to February 2011, and The Cochrane (Central Register of Controlled Trials) covering from 1972 to February 2011. Originally, we aimed at inclusion of publications on all communication disorders, including voice disorders and hearing disorders, among teachers. However, due to the absence of studies on hearing disorders, the systematic review focused on voice disorders. The following search strings were used: (teacher OR teaching profession) AND (aphonia OR voice disease\* OR voice disorder\* OR dysphonia OR voice problem\* OR speech disorder\* OR vocal problem\* OR vocal disease\* OR voice handicap OR voice attrition OR hearing loss OR hearing impairment OR noise-induced hearing loss OR hypoacusis OR hearing illness OR vocal illness OR hearing disorder\*) NOT (blindness OR sign language OR autistic disorder OR child\*). The search was extended by screening the reference lists of all relevant publications identified.

### 2.2. Study selection

Initially, titles and abstracts of all papers identified were screened. For final inclusion, publications had to fulfill all of the following criteria: (1) report empirical data on the occurrence of voice disorders in teachers with or without a reference population; (2) present a quantitative description of the association between work-related or individual factors with the occurrence of voice disorders among teachers with or without a reference population; and (3) be published in peer-reviewed scientific journals written in English. The definition of a voice disorder was interpreted broadly and could include terms such as dysphonia, voice complaints, vocal symptoms, voice disorders, and vocal problems.

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