

# Prevalence and Risk Factors of Voice Problems Among Primary School Teachers in India

\*Usha Devadas, †Rajashekhhar Bellur, and †Santosh Maruthy, \*Manipal, India, and †Mysore, India

**Summary: Objectives.** Teachers are more prone to develop voice problems (VPs) when compared with other professional voice users. The aim of present study was to investigate the prevalence and risk factors of VPs among primary school teachers in India.

**Study design.** Epidemiological cross-sectional survey.

**Methods.** Self-reporting questionnaire data were collected from 1082 teachers.

**Results.** Out of 1082 teachers who participated in the present study, 188 teachers reported VPs that account for a prevalence rate of 17.4%. Tired voice after long hours of talking was the most frequently reported symptom, followed by sore/dry throat, strain in voice, neck muscle tension, and difficulty in projecting voice. The adjusted odds ratio values showed number of years of teaching, high background noise levels in the classroom, experiencing psychological stress while teaching classes, improper breath management (holding breath while speaking), poor focus of the tone (clenching jaw/teeth while speaking), upper respiratory tract infection, thyroid problems, and acid reflux as significant risk factors for the development of VPs in the current cohort of teachers.

**Conclusions.** Current results suggest that teachers develop VPs due to multiple risk factors. These factors may be either biological, psychomotor, or environment-related factors. A holistic approach (which could include educating teachers about voice care during their training, and if they develop VP during their career, then managing the VP by taking into consideration different risk factors) addressing all these factors needs to be adopted to prevent VPs in primary school teachers.

**Key Words:** primary school teachers–voice problems–prevalence–phonotrauma–risk factors.

## INTRODUCTION

Teachers depend on their vocal endurance and voice quality for their livelihood. Unlike the other professional voice users, teaching requires frequent voice use with elevated volume for long hours. Hence, teachers are more prone to develop voice problems (VPs). In the literature, multiple studies have reported that teachers experience VPs more frequently than the general population.<sup>1–5</sup> The prevalence rates of VPs in teachers range between 11% and 81%.<sup>1,3,4,6–10</sup> This wide range in prevalence rates may be mainly because of differences in the study population, type of methods used, and the definition of the VP.<sup>1</sup> In most studies, questionnaires have been commonly used in studying the prevalence of VPs in teachers. However, some were supplemented with laryngoscopic examinations.<sup>8</sup>

VPs in teachers can manifest as vocal fatigue, hoarseness, throat pain, or discomfort, weak voice, dryness, and lower pitch.<sup>1,4,9–11</sup> Among the different risk factors, the most frequently reported one is phonotrauma.<sup>4,12</sup> In teachers phonotrauma may occur because they need to speak for long hours.<sup>1,4,10,11,13–16</sup> Other reported risk factors include being female, poor acoustic environment due to noise generated in and around the classroom, speaking without amplification devices and using excessive loudness levels, systemic illnesses, hormonal problems, gastro-

intestinal reflux, repeated exposure to upper respiratory tract infections, stress, anxiety, and psychological factors.<sup>1,17</sup> Personality factors, diet issues like untimely food intake, skipping breakfast, fast-food culture, consumption of alcohol and tobacco, caffeinated and carbonated drinks are also other reported risk factors.<sup>17</sup>

VPs in teachers can significantly impact their quality of life.<sup>17</sup> Due to VPs, teachers may need to go for longer periods of sick leave which can have financial consequences.<sup>1</sup> Hence, it is important to provide professional voice care for teachers by establishing the relationship between their VPs, teaching demands, and different risk factors. Unfortunately, in Indian context, there are no published research evidence regarding the prevalence of VPs in primary school teachers. Like other countries, even in India, teachers during their training do not receive any formal instructions or training about appropriate voice use or knowledge about vocal hygiene. However, unlike other developed countries, in India primary school teachers may face different demands. First, number of classes per day, number of students in each class, and background noise level may be different when compared with teachers from other countries. Second, other environmental issues like dust, dry weather, and higher temperature and humidity may also add to the development of VPs. Hence, the prevalence of VPs may be different in Indian teachers when compared with teachers in other countries. Estimating the prevalence will help in planning the prevention and management of VPs. In this context, there is a need to establish prevalence of VPs and identify different risk factors for the same. Hence, objectives of the study include the following: (a) to investigate prevalence of self-reported VPs in primary school teachers, and (b) to identify the potential risk factors associated with VPs in primary school teachers in India.

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From the \*Department of Speech and Hearing, School of Allied Health Sciences, Manipal University, Manipal, India; and the †Department of Speech-Language Sciences, All India Institute of Speech and Hearing, Manasagangothri, Mysore, India.

Address correspondence and reprint requests to Santosh Maruthy, All India Institute of Speech and Hearing, Naimisham Campus, Manasagangothri, Mysore, Karnataka 570006, India. E-mail: [santoshm79@gmail.com](mailto:santoshm79@gmail.com)

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## METHOD

### Study design and data collection

The present cross-sectional survey targeted primary school teachers of Mysore District of Karnataka state, India. Approval from institutional ethical committee was obtained to conduct the study prior to data collection. Eighty government schools and 24 private schools were randomly selected. The researchers contacted the head teachers of these schools during the period of September 2012 to October 2013, and were requested to distribute the questionnaires to the teachers working in their school. In each school the questionnaires were distributed depending on the number of teachers. The questionnaire included a cover letter explaining the purpose of the study and a consent form. The participation of the teachers in the study was voluntary. All the teachers, regardless of which subjects they were teaching, participated in the present study. However, physical education teachers, music teachers, mathematics teachers, and those who were involved more in administrative activities were excluded from the study as their vocal demands will be different from those of the target population. The individual school head teachers distributed the questionnaires in their school, collected, and returned them after 15 days. There were 1500 questionnaires distributed across 104 primary schools. Among the 1500 questionnaires, 1100 filled questionnaires were returned with a response rate of 73%. Of these, 18 were incomplete questionnaires. Hence, these were excluded and responses from the remaining 1082 questionnaires were analyzed and discussed. Follow-up of non-responders was not done due to inability to contact them individually.

### Self-reported questionnaire

A self-reporting questionnaire was developed which included questions to determine the prevalence of the VPs in primary school teachers, to identify the variables associated with the risk of VPs in teachers, vocal symptoms experienced by the teachers, physician or speech language pathologist (SLP) consultation by the teachers for their VPs, the effect of VPs in teachers, and knowledge of voice care among teachers (Appendix). This questionnaire was designed in Kannada language based on the other previously published literature on VPs in teachers.<sup>1,10,17,18</sup> The questionnaire addressing the above-mentioned issues was distributed among five experienced SLPs, and were asked to give their comments on the content of the questionnaire. Their suggestions and comments were incorporated in the questionnaire. The questionnaire was then distributed to 30 primary school teachers for the familiarity check, and they were asked to answer (1) whether this questionnaire includes relevant information related to teaching profession? (2) did the researchers miss anything that is important for teachers? (3) were there any questions teachers were not sure how to answer? If yes, why were teachers not sure? As there was no ambiguity or difficulty in understanding the terminologies as reported by the teachers, it was accepted for use as the final version.

The questionnaire included the following sections: (1) demographic details (age and gender), (2) teachers' work organization at school (number of years as a teacher, average

number of classes per day, duration of each class, average number of students in the class, vocal loudness while teaching (whether soft, loud, or too loud), use of amplification devices if any, whether they are trained singers, and if yes, then number of years of training and type of singing), (3) work environment (presence of background noise, level of noise in the classroom, measures taken to reduce noise level in the classroom, stress experienced by the teachers), (4) vocal behaviors exhibited by the teachers in the classroom (yelling/shouting, holding breath while talking, clenching jaw while talking, starting the class by ignoring background noise, singing, or mimicry, stop speaking when voice gets tired), (5) vocal symptoms experienced by teachers (loss of voice, excessive coughing, frequent throat clearing, shortness of breath, sore/dry throat, neck muscle tension, vocal fatigue, difficulty raising the voice, strained voice, husky/hoarse voice, difficulty projecting the voice, monotone voice, and need to put extra effort to talk), (6) seeking help from physician or SLP (whether they had consulted a physician for their voice problem? whether they had consulted an SLP for their voice problem? if yes how many times? whether their voice improved after consultation with an SLP? did teachers attend any voice care related programs?), (7) health-related factors (whether they had any major illnesses in the past? whether they had any major surgeries in the past? whether they suffer from any allergy? or whether they suffered from any medical condition associated with voice disorder such as pharyngitis, laryngitis, thyroid problems, etc, and whether they had taken any medication or treatment in the past that may have an effect on voice like anti-histamines, steroids, hormone replacement therapy etc)? (8) lifestyle factors (smoking cigarettes, consumption of beverages like alcohol, tea, and coffee, water consumption per day, and participation in physical activities like exercise), (9) knowledge about voice care, (10) effect of voice problem on job performance (how many days were they functionally impaired due to voice problem? the number of missed working days due to voice problem, and the degree of impairment to which voice limits or makes them unable to perform certain tasks or work-related activities). To identify the prevalence of voice problems, teachers were asked to answer yes or no pertaining to the question "Any time your voice does not work, perform, or sound as it normally should, so that it interfered with communication and job performance".<sup>1</sup> Further, teachers were asked to describe their VP: history of frequent VP, when did they notice the problem, onset of the VP, and any variation of the problem (getting worse or better).

### Statistical analysis

Statistical analysis was done using Statistical Package for Social Sciences 16.0 (IBM, Inc., Austin, TX) software. Percentage was used to summarize the prevalence of VPs. Pearson chi-square test was used to compare the differences between teachers with and without VPs for different risk factors. Further, adjusted odds ratio (OR) with corresponding 95% confidence intervals with multiple logistic regression using Wald forward selection criteria was used to assess the association between reporting VP and different risk factors. The significance level was set at ( $\alpha = 0.05$ ).

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