



A Survey of Prevalence of Voice Problems in School Teachers of Mysuru, India

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Abstract

The study aimed to estimate the prevalence of voice problems in teachers with a minimum of 5 years of teaching experience using Survey method. 372 school teachers (327 females and 45 males) from 60 schools in the city and six taluks of Mysuru participated. A validated questionnaire was used and all participants completed the questionnaire individually. Analysis involved compiling the scores obtained from the questionnaires to determine the risk factors for developing a voice problem. In general the results revealed that voice problems are prevalent in teachers with a point prevalence rate of 8.6%. A few variables (locality and type of environment of the schools and hours of teaching) were found to have significant effects on the voice of the participants. Life styles issues combined with individualistic vocal habits cultivated over a period of time to carry out professional responsibilities could be speculated as the main cause for the prevalence of most voice problems. Such insights prove beneficial in formulating strategic the management options for teachers' voice problems and also sensitization programs to prevent the incidence of voice problems in teachers

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Introduction

Professional voice users require better voice production quality and skills. Although the range of vocal sophistication varies greatly across the range of occupations, most professional voice users depend on vocal endurance (Benninger, Jacobsen & Johnson, 1994; Sataloff, 2001). Teaching is a profession where the teachers have to be heard in spite of the poor acoustic conditions and noisy classroom. They are required to go from talking at a normal loudness level to shouting in the classroom within a split second (Sapir, Keidar & Mathers-Schmidt, 1993; Vilkmann, 2000).

It has been demonstrated that teachers are constantly exposed to upper respiratory tract infections which are known to have detrimental effects on the vocal mechanism (Smith, Gray, Dove, Kirchner & Heras, 1997). Many studies have demonstrated that teachers had to elevate their loudness levels in order to be heard in spite of the presence of background noise (Pekkarinen, Himberg, & Pentti, 1992; Ohlsson, Jörvholm & Löfqvist, 1987) and their job involved frequent shouting in order to be heard (Martin & Darnely, 2004). It was reported that primary school teachers consistently used a high vol-

ume whereas those who taught for secondary classes and higher reported a more balanced use of high and medium volume (Siebert, 1999). Insufficient knowledge on voice use leads to significant voice problem in the initial stages of their career and later career voice problems are majorly due to aging or due to the wear and tear that has happened over the years (Allen, 1995).

Eighty percent of teachers were reported to have stated that they suffered from vocal fatigue (Pekkarinen, et al., 1992; Gotaas & Starr, 1993). More than 20 percent of teachers reported that voice problems prevented them from attending work ranging from one day to one week during the academic year. Vocal fatigue, hoarseness, sensations of pain or discomfort in the throat, weak voice and lower pitch were the most commonly reported symptoms in teachers (Roy, Merrill, Thibeault, Gray & Smith, 2004; Smith, Lemke, Taylor, Kirchner & Hoffman, 1998a; Morton & Watson, 1998). Vocal symptoms experienced during the academic year were found to improve during the vacations (Morton & Watson, 1998). These findings indicate that there is a strong association between teaching and voice problems.

Several studies on prevalence of voice disorders report of widely varied output based on the region of

survey and the methodology adopted. A survey to identify the prevalence of voice problems in 425 female full-time Polish teachers and 83 non-teachers using an extensive questionnaire, voice measures and videostroboscopic examinations revealed that the overall lifetime vocal symptoms were more frequent in the teachers than in the non-teachers (69% vs. 36%) and voice problems in particular related to permanent and recurrent hoarseness and dryness in the throat. The authors concluded that the prevalence of self-reported symptoms and clinical signs of voice disorders was around 2-3 times more frequent in Polish female teachers than in non-teachers (Sliwiska-Kowalska, Niebudek-Bogusz, Fiszer, Los-Spychalska, Kotylo, Sznurowska-Przygocka & Modrzewska, 2006).

The prevalence of voice problems in teachers of Naples district, Italy was significantly greater in teachers compared to not-teachers (8.7% vs. 2.9%). Report of prevalence of voice disorders during their lifetime was also noticed to be greater in teachers than not-teachers (51.4% vs. 25.9%). It was detailed that women compared to men had a higher lifetime prevalence of voice disorders. It was evidenced that 116 workers of the teachers group (23.01%) were forced to miss the job for problems related to voice (Angelillo, Di Maio, Costa, Angelillo & Barillari, 2009).

For teachers along with prolonged voice use, environmental factors such as background noise, acoustic conditions and air quality are also known to be potential risk factors for voice disorders (Vilkman, 2000; Morton & Watson, 1998; Pekkarinen & Viljanen, 1991). Several studies have demonstrated that classrooms often have poor acoustic conditions Pekkarinen & Viljanen, 1991; Knecht, Nelson, Whitelaw, & Feth, 2002). Background noise poses difficulty for students to perceive speech (Crandell & Smaldino 2000). Therefore, teachers often have to teach in a loud voice to ensure audibility of their voices over the background noise and in reverberant classrooms (Pekkarinen & Viljanen, 1991 and Nelson & Soli, 2000).

Numerous studies have demonstrated that teachers report that their voice problems affect their work performance negatively (Sapir, et al., 1993; Smith, et al., 1997; Smith, et al., 1998a; Roy, Merrill, Thibeault, Parsa, Gray & Smith, 2004; Russell, Oates & Greenwood, 1998). An adequately functioning voice is also important for students because it is a tool for communication and affects the ability of the listeners to comprehend whatever is taught in the classroom (Laukkanen, Ilomäki, Leppänen & Vilkman, 2008). It is important to take into account the number of teachers with prevalent voice problems and disorders. This could help in understanding the job related vocal demand, impact of this on voice and also others factors that may aggravate the risk for developing voice problems. In a study (Pasa,

Oates & Dacakis, 2007) involving teachers in training programs aimed at preventing voice problems was found to be very effective. Majority of the studies in the area of teachers' voice focus on voice problem or disorders in teachers during profession related voice load as most teachers seek expert guidance only when their voice is affected. Thus, it is necessary to estimate the prevalence of voice problems in teachers for early detection and primary prevention of voice problems in teachers.

The Right of Children to Free and Compulsory Education Act (2009) states that the teacher to student ratio should be 1:30 (The Right of Children to Free and Compulsory Education Act, 2009). In India, the total organized employment was 28 million (National Sample Survey 2009-2010 (68th round) 2011-12), of whom 6.7 million were employed as teachers (Ministry of Statistics and Programme Implementation, Sept. 2015). According to the "Education in Karnataka State, 2011-12, A State-level and District-Wise Analytical Report" of July 2012, Department of Education, Government of Karnataka, a total of 34079 teachers were working in the district of Mysuru from primary grades to high school. Among them, 20828 were female teachers and 13251 were male teachers and the female to male teachers' ratio was 1.57:1 (http://ssakarnataka.gov.in/pdfs/data/2011-12_Analytical_Report.pdf).

The workforce consisting of teachers is considerably high and requires closer inspection. Hence, the current study was planned to estimate the prevalence of voice problems in school teachers in and around Mysuru, district in the state of Karnataka, India using a validated questionnaire. This district was chosen because of the proximity to the national institute (All India Institute of Speech and Hearing). The results of such a study would motivate to plan suitable assessment and management options for teachers with voice disorders and also preventive strategies for reducing the incidence of voice problems in teachers in Mysuru district. Further, similar programs could help in understanding the job related vocal demands, risk factors for developing voice problems and also in planning awareness programs and extension to other districts in the state of Karnataka as a preliminary effort.

Method

The present study aimed to estimate the frequency of occurrence of voice problems in school teachers between January-August, 2013 in the district of Mysuru. The study used cross sectional survey design. It was a free-will voluntary participation for all the subjects included in the study.

Participants

A total of 372 (327 females and 45 males) school teachers participated in the study. They were from 60 schools (voluntary sampling) in the city of Mysuru and six taluks of Mysuru district. School teachers in the age range of 30-45 years with a minimum of five years of teaching experience were considered for the present study. Teachers who taught mathematics, arts, craft, computers and physical education were not included for this study owing to their less occupational vocal load.

Written consent was obtained from all the participants after explaining the objectives of the study. The study conformed to the institutional ethical guidelines.

Questionnaire

A questionnaire developed and validated by (Koul, 2004) and (Koul & Yeshoda, 2008) was used in this study (the same is given in the Appendix). The questions were present in two languages (Kannada and English). The questionnaire consisted of 41 questions which were divided into 4 sections. The first 10 questions in section-A required descriptive answers and hence they were not considered for the statistical analysis. The remaining questions required the participants to rate their answers on a categorical adjusted to 4-point equal appearing interval rating scale. The following were the sections of the questionnaire:

Section A: Classroom condition and general information (contained 13 questions)

Section B: Lifestyle (contained 9 questions)

Section C: Vocal habits (contained 6 questions)

Section D: Symptoms exhibited (contained 13 questions)

Procedure

The participants were seated comfortably and were asked to complete the questionnaire in a quiet environment in their respective schools individually.

Analysis

Scoring and analysis of the Questionnaire

The first 10 questions were not included for statistical analysis as they required descriptive answers. The scores obtained from the remaining questions of the questionnaire were tabulated individually for statistical analysis. The scores obtained for each sections of the questionnaire were summed separately and then converted as percentage using the following formula,

Percentage Score =

$$\frac{\text{Total score obtained by the participant in a section}}{\text{Maximum total score possible for that particular section}} \times 100$$

For example, if a participant obtained a total score of 7 under the section "Classroom condition and general information", the percentage score was 77.7% with the maximum total score possible being 9 for that section.

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 responses of the questionnaire and estimate the prevalence. Data showed non normal distribution under Shapiro-Wilk's test. Hence, Non-parametric tests, Mann Whitney and Kruskal-Wallis tests were used to compare across the various sections of the questionnaire.

Results

The scores obtained through the questionnaire were converted to percent scores for the four sections for the statistical analysis. Non parametric tests were used to compare the four sections in the questionnaire (Classroom condition and general information; Lifestyle; Vocal habits; Symptoms exhibited).

Questionnaire analysis

The individual scores of all the participants obtained through the questionnaire for Sections C and D were converted to percent scores for the four sections for statistical analysis and shown in Table 1.

Table 1: Number of participants and their percent score range for Sections C and D of the questionnaire

Percent scores range	Number of participants
0-25	10
26-30	57
31-35	102
36-40	78
41-45	65
46-50	29
51-55	17
56-60	8
61-65	4
66-70	3

Maximum number of the participants (102) obtained score between of 31-35%. Only 3 participants obtained scores between 66-70%.

Summary of results from the questionnaire

The summary of data obtained from the questionnaire is presented in percent for each question in Table 2 beginning with question 11. The scores obtained for the last two sections of the questionnaire namely "vocal habits" and "symptoms exhibited" were considered for ascertaining the presence of a voice problem. The percentage scores obtained by each of the participant on these two sections were summed. A cut off criteria of 50% was used for differentiating those with and without voice problems. Thus, a total of 32 participants (8.6%) were categorized as having a voice problem from the questionnaire as shown in Table 2.

To outline the results, question 11 of Section A (Classroom condition and general information) had least percent (2%) of participants indicating "always" for being affected by URTI while teaching. Whereas, question, 12 had the highest percent (5%) of the participants indicating being disturbed by the surrounding noise during teaching. In Section B (Lifestyle) question 22 had the highest percent of participants (21%) indicating "always" for using voice to discipline children at home whereas, questions 18 and 19 had none of the participants indulging in smoking or alcohol consumption. In Section C (Vocal Habits) the highest and lowest percent scores were as follows-10% of the participants indicated that they indulged in "loud talking" always for question 23 while, for question 28, 1% of the participants reported that they "practiced vocal exercises". For Section D (Symptoms Exhibited) question 39 received the highest score of 6% (always) and none of the participants indicated always (zero percent) for question 33.

Identification of the factors related to voice problems

Analysis of the responses to the questionnaire led to identification of variables that could influence the voice characteristics of the participants. Further analysis of the responses to the questionnaire revealed certain variables that could influence voice and hence the participants were sub-grouped as follows to check effect: Gender (Male/Female), Type of locality (Urban/Rural), Type of setup (Private/Government), Number of students in the classroom (below 30/above 30), Classes taught (Primary/Secondary/Nursery/Both), Type of environment (Noisy/Quiet), Teaching experience (below 10 years/ above 10 years), Subjects taught (languages only/language + others/ others), Number of teaching hours (less than 3/more than 3) and Type of Board used (White /Black/Both). The frequency distributions of participants across the different variables are mentioned in Table 3.

Table 3 revealed that 87.9 % of the participants were females and the rest were males. More sam-

ples were drawn from schools in urban locality (89%) compared to rural (11%). Majority of the participants were from private schools (97.3%) and only 2.7% were from government schools. The results also showed that 70% of the schools had more than 30 students in a classroom and about 41% of the participants taught only primary grade pupils. About 71% of the participants were chosen from the schools in quiet environment and the majority (60.2%) of the participants had 10 years or less than 10 years of experience in their careers. 47.8% of the participants taught both languages and other subjects and 86% of the participants taught for more than three hours per day. 87.4% of the teachers used only blackboards for teaching.

Mann Whitney and Kruskal-Wallis tests were used for comparison of the variables of two sub-categories and variables of more than two sub-categories respectively across the different sections of the questionnaire and the results are shown in Table 4. The following results were obtained. First, Mann Whitney test revealed significant difference for participants from rural/ urban locality and Section B (lifestyle) ($|Z|$ -value: 3.48, p -value <0.01) and Section D (Symptoms exhibited) ($|Z|$ -value: 2.60, p -value <0.01) sections of the questionnaire.

Second, significant difference was found between type of environment (quiet and noisy) and Section A (Classroom condition and general information) ($|Z|$ -value: 2.46, p -value <0.05) and Section B (Lifestyle) ($|Z|$ -value: 2.47, p -value <0.05). Third, significant difference was found for hours of teaching and Section A (Classroom condition and general information) ($|Z|$ -value: 2.77, p -value <0.01) section of the questionnaire. Significant difference was not noted for other variables, namely, gender, type of setup, number of students in the classroom, classes taught, teaching experience, subjects taught, type of board used across the scores of different sections of the questionnaire.

Discussion

Prevalence of voice problems

Based on the questionnaire alone 8.6% of the participants were identified as having voice problems. Hence, the point prevalence rate was 8.6% and is in consonance with findings of (Roy, et al., 2004; Angelillo, et al., 2009 and Behlau, Zambon, Guerrieri & Roy, 2012). In the literature the consensus regarding the exact prevalence of voice disorders in teachers is equivocal. According to Western studies, prevalence rates have been estimated to be as low as 8.7% (Behlau, et al., 2012) and as high as 69% (Sliwinska-Kowalska, et al., 2006) in teachers. The vast differences among the prevalence rates in the studies could be due to several reasons. Some studies included difference in the population selected in terms

Table 2: Summary of results obtained from the questionnaire

Q. No.	Questions	Responses			
		No	Sometimes	Frequently	Always
<i>Section A: Classroom condition and general information</i>					
11.	Upper Respiratory Tract infections	63%	28%	7%	2%
12.	Surrounding noise disturbing during teaching	50%	40%	5%	5%
13.	Clearing throat while teaching	50%	44%	3%	3%
<i>Section B: Lifestyle</i>					
14.	Long continuous chat	41%	38%	11%	10%
15.	Eating spicy or hot food	36%	42%	12%	10%
16.	Living in noisy environment	80%	9%	3%	8%
17.	Living in dusty environment	83%	9%	2%	6%
18.	Smoking habit	99.7%	0.3%	0%	0%
19.	Consumption of alcohol	97%	2%	1%	0%
20.	Tuition	75%	3%	2%	20%
21.	Indulging in extra voice usage through lecturing, chanting, announcement, singing, cheering	81%	13%	2%	4%
22.	Usage of voice to discipline children at home	22%	44%	13%	21%
<i>Section C: Vocal habits</i>					
23.	Indulging in loud talking	29%	46%	15%	10%
24.	Screaming or shouting in classroom	32%	50%	11%	7%
25.	Screaming or shouting at home	48%	42%	7%	3%
26.	Clearing throat frequently	62%	33%	3%	2%
27.	Habit of singing loudly	67%	26%	5%	2%
28.	Practice of vocal exercises	94%	4%	1%	1%
<i>Section D: Symptoms exhibited</i>					
29.	Voice tiring very soon	50%	40%	8%	2%
30.	Roughness in your voice	64%	27%	4%	5%
31.	Sensations such as pain, soreness/ irritation or lump in throat	67%	26%	5%	2%
32.	Use of any Ayurvedic solutions, salt water, mint etc. to relieve your throat	74%	23%	2%	1%
33.	Better voice in the mornings or evenings	53% *	30% #	17% **	0
34.	Difficulty in increasing loudness	68%	23%	5%	4%
35.	Experience episodes of loss of voice / voice breaks while speaking	74%	23%	2%	1%
36.	Undergone any of the surgeries related to head and neck? (Eg: Thyroidectomy, Adenoidectomy, Tonsillectomy or others)	96%	2%	1%	1%
37.	Sensation of dryness in throat	48%	45%	5%	1%
38.	Experience of acid reflux, chest pain/ heart burn	64%	26%	8%	2%
39.	Allergic to AC, dust, medicine	66%	21%	7%	6%
40.	Is voice influenced by any of the following medical problems and or subsequent medication? Diabetes, High blood pressure or others?	96%	2%	1%	1%
41.	Suffering from anxiety, mental tension or stress	61%	31%	6%	2%

* same throughout the day, # better in the mornings, ** better in the evenings

Table 3: Frequency distribution of participants across the different variables

Variable	Total number of subjects = 372		
	Sub-categories	Frequency	(%)
Gender	Female	327	87.9
	Male	45	12.1
Type of locality	Urban	331	89.0
	Rural	41	11.0
Type of Setup	Private	362	97.3
	Government	10	2.7
No. of Students in the classroom	Less than or equal to 30	111	29.8
	More than 30	261	70.2
Classes taught	Primary	152	40.9
	Secondary	102	27.4
	Nursery	41	11.0
	Primary and secondary	77	20.7
Type of environment	Noisy	109	29.3
	Quiet	263	70.7
Teaching experience	Less than or equal to 10 yrs	224	60.2
	More than 10 yrs	148	39.8
Subjects taught	Language only	114	30.6
	Language+ others	178	47.8
	Others	80	21.5
No. of teaching hours	Less than or equal to 3	52	14.0
	More than 3	320	86.0
Type of board used	Black	325	87.4
	White (dust free)	22	5.9
	Both	25	6.7

Table 4: |Z| and p-value of Mann Whitney and Kruskal Wallis tests for different sections of the questionnaire across different variables.

Variables		Section A	Section B	Section C	Section D
Gender (Mann-Whitney)	Z -value	0.008	0.80	1.49	0.39
	p-value	0.99	0.43	0.14	0.69
Type of locality (Mann-Whitney)	Z -value	0.60	3.48	0.64	2.60
	p-value	0.55	0.001**	0.52	0.009**
Type of Setup (Mann-Whitney)	Z -value	0.76	1.07	0.15	0.17
	p-value	0.45	0.29	0.88	0.86
No. of Students in the classroom (Mann-Whitney)	Z -value	1.75	0.99	0.51	1.40
	p-value	0.08	0.32	0.61	0.16
Classes taught (Kruskal-Wallis)	Chi-Square	2.10	1.56	0.62	1.30
	p-value	0.55	0.67	0.89	0.73
Type of environment (Mann-Whitney)	Z -value	2.46	2.47	0.16	0.94
	p-value	0.014*	0.013*	0.87	0.35
Teaching Experience (Mann-Whitney)	Z -value	1.02	1.12	0.17	1.81
	p-value	0.31	0.26	0.86	0.07
Subjects taught (Kruskal-Wallis)	Chi-Square	1.95	4.17	1.56	2.33
	p-value	0.38	0.12	0.46	0.31
No. of Teaching Hours (Mann-Whitney)	Z -value	2.77	1.54	0.46	1.42
	p-value	0.006**	0.12	0.65	0.16
Type of Board used (Kruskal-Wallis)	Chi-Square	0.99	1.47	0.75	0.30
	p-value	0.61	0.48	0.69	0.86

*p-value <0.05, **p-value <0.01

of age, gender, working hours etc (Jardim, Barreto & Assunção, 2007) and methods of data collection and analysis (whether only questionnaires were used, or only laryngological examinations or a combination of both were used), geographical location.

The prevalence estimated in the present study is less owing to facts such as, the questionnaire in the present study used 4 points equal appearing interval rating and participants had to score their symptoms and hence was more precise. Also the participants were interviewed and questionnaire was distributed and collected after completion on the same day. A few other studies in Indian context used forced choice questionnaires checking only for the presence or the absence of the symptoms pertaining to voice problems. 49% prevalence of voice problems was found in a sample of 100 teachers of high school and higher secondary grades surveyed based on answers (forced choice) to a questionnaire consisting of six questions (Boominathan, Rajendran, Nagarajan, Seethapathy & Gnanasekar, 2008). A point prevalence rate of 17.4% of voice problems was reported in 1082 primary school teachers using a forced choice (yes/ no) self-reporting questionnaire (Devadas, Belur, & Maruthy, 2017).

The other possible reasons may be due to the differences in methods, sample sizes, etc. The difference could also be due to the methods used to ascertain the presence of voice problems- inclusion of a laryngological examination along with subjective measures could help detect the early stages of a vocal pathology which may otherwise go unnoticed.

Comparison of the variables

Majority of the participants were females (87.9%) and males were less in comparison (12.1%) and with career experience of less than or equal to 10 years (60.2%). More participants were from schools in urban, quiet environments, private set-up, using blackboards, teaching language and other subjects for only primary grade classes for more than 3 hours per day and with more than 30 pupils in classrooms (89%, 70.7%, 97.3%, 87.4%, 47.8%, 40.9%, 86% and 70.2% respectively) (Table 3). Factors such as, permission from the school authorities, willingness and consent of the participants, availability of teachers on the days of recording and confirming to the stringent inclusion criteria could be the major reasons for the variabilities. Even though the distributions of schools across rural and urban regions and male female ratios of teachers are maintained (http://www.ncert.nic.in/programmes/education_survey/pdfs/Schools_Physical_Ancillary_Facilities.pdf), female participants are more in the present study. Of all the variables three gained statistical significance and they are highlighted separately.

a) Type of Locality (Rural versus urban setup): participants from urban and rural localities differed significantly on Sections A ($|Z|$ -value: 3.48, p-value

<0.01) and D ($|Z|$ -value: 2.60, p-value <0.01) of the questionnaire (Table 4). It was noticed that the participants from urban locality scored high (exhibited more problems) than the participants from the rural regions. The difference in lifestyle, environment issues (higher pollution) and performance stress and anxiety to improve the overall results of the pupils could have contributed to higher scores in participants from urban locality. The higher symptoms exhibited in urban teachers may have also been due to the higher awareness of the vocal symptoms in the participants in the urban settings.

b) Type of environment (Quiet versus noisy environment): When the participants were sub-grouped as participants from quiet and noisy environments, the scores were significantly different between relating to Sections A (Classroom condition and General information) ($|Z|$ -value: 2.46, p-value <0.05) and B (Lifestyle) ($|Z|$ -value: 2.47, p-value <0.05) (Table 4). The participants who taught in a noisy environment obtained higher scores in both these sections than the participants who taught in quiet environment. The section A included specific questions such as, do you have upper respiratory tract infections, does the surrounding noise disturb you during teaching and section B had a specific question whether you live in a noisy environment. More number of the participants from noisy environments could have answered affirmatively and also with higher rating on such specific questions. Such responses could have escalated the scores leading to significant difference between these two sub-groups of participants.

c) Number of teaching hours: based on the number of teaching hours, the total participants were divided into two subgroups: those who taught for less than or equal to 3 hours per day and those who taught for more than 3 hours per day. The two groups differed in Section A (Classroom condition and general information) ($|Z|$ -value: 2.77, p-value <0.01) of the questionnaire (Table 4). Participants who taught for less than or equal to 3 hours got higher values in this section of the questionnaire. Even though the participants taught for lesser hours, the background noise might have forced them to increase their loudness thereby causing them to use louder voice which could have influenced the results. It has been reported that teachers are predisposed to use loud voice to ensure audibility of their voices over the background noise and in reverberant classrooms (Nelson & Soli, 2000; Pekkarinen & Viljanen, 1991) prolonged voice use, environmental factors such as background noise, acoustic conditions, air quality are also known to be potential risk factors for voice disorders (Vilkman, 2000; Morton & Watson, 1998) along with frequent exposure to viruses causing upper respiratory tract infections due to the close contact with children (Smith, et al., 1997 and Sala, Airo, Olkinuora, Simberg, Ström, et al., 2002).

Conclusions

The results in general revealed that voice problems are prevalent in teachers with a point prevalence rate of 8.6%. A few variables (locality and type of environment of the schools and hours of teaching) were found to have significant effects on the voice of the participants. Life styles issues combined with individualistic vocal habits cultivated over a period of time to carry out professional responsibilities could be speculated as the main cause for the prevalence of most voice problems. Such insights prove beneficial in formulating strategic management options for teachers' voice problems and also sensitization programs to prevent the incidence of voice problems in teachers.

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APPENDIX I
QUESTIONNAIRE FOR PREVALENCE OF VOICE DISORDERS IN TEACHERS

Name: (ಹೆಸರು)	Age: (ವಯಸ್ಸು)	Sex: (ಲಿಂಗ)
Family: Joint /Nuclear ಕುಟುಂಬ : ಅವಿಭಕ್ತ/ ವಿಭಕ್ತ	Education: ವಿದ್ಯಾರ್ಹತೆ:	Married/Unmarried ವಿವಾಹಿತ/ಅವಿವಾಹಿತ
Personal address: (ಮನೆಯ ವಿಳಾಸ)		School address: (ಶಾಲೆಯ ವಿಳಾಸ)

Instruction:

Section A: Answer in detail to the question no. 1 to 10. Section B, C and D: Indicate your choice by (✓) ticking against the numbers. Each of the numbers refers to

0: No 1: Occasionally 2: Frequently 3: Always

ವಿಭಾಗ A ಸಂಖ್ಯೆ 1 ರಿಂದ 10 ರವರೆಗಿನ ಪ್ರಶ್ನೆಗಳಿಗೆ ವಿವರವಾಗಿ ಉತ್ತರಿಸಿ. ವಿಭಾಗ B, C ಮತ್ತು D ಗಳಿಗೆ ನಿಮ್ಮ ಆಯ್ಕೆಯನ್ನು 0,1, 2,3 ಸಂಖ್ಯೆಗಳ ಮುಂದೆ ಟಿಕ್ (V) ಹಾಕುವ ಮೂಲಕ ಸೂಚಿಸಿರಿ. ಪ್ರತಿಯೊಂದು ಸಂಖ್ಯೆಯ ಅರ್ಥ:

0: (ಇಲ್ಲ) 1 : (ಒಮ್ಮೊಮ್ಮೆ) 2 : (ಮತ್ತೆ ಮತ್ತೆ) 3: (ಯಾವಾಗಲೂ)

SECTION A: Classroom condition and General information (ತರಗತಿಯ ವ್ಯವಸ್ಥೆ ಹಾಗೂ ಸಾಮಾನ್ಯ ಮಾಹಿತಿ)

1. Comments about your voice:
ನಿಮ್ಮ ಧ್ವನಿಯ ಬಗ್ಗೆ ವ್ಯಾಖ್ಯಾನ ನೀಡಿ.
2. How many students are there in your class?
ನಿಮ್ಮ ತರಗತಿಯಲ್ಲಿ ಎಷ್ಟು ಜನ ವಿದ್ಯಾರ್ಥಿಗಳಿದ್ದಾರೆ?
3. Do you teach primary or secondary grade classes?
ನೀವು ಪ್ರಾಥಮಿಕ ತರಗತಿಗಳಿಗೆ ಭೋಧಿಸುತ್ತೀರಾ ಅಥವಾ ಪ್ರೌಢ ತರಗತಿಗಳಿಗೆ ಭೋಧಿಸುತ್ತೀರಾ?
4. Where is your school located—Noisy environment/Quiet environment?
ನಿಮ್ಮ ಶಾಲೆಯ ವಾತಾವರಣವು ಶಬ್ದಮಾಲಿನ್ಯದಿಂದ ಕೂಡಿದ ವಾತವರಣದಲ್ಲಿ ಇದೆಯೇ ಅಥವಾ ನಿಶ್ಯಬ್ದವಾಗಿರುವ ವಾತಾವರಣದಲ್ಲಿ ಇದೆಯೇ?
5. Since how long you are working as a teacher?
ನೀವು ಎಷ್ಟು ವರ್ಷಗಳಿಂದ ಶಿಕ್ಷಕರಾಗಿ ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದೀರಾ?
6. Mention the subjects you teach (past and present)
ನೀವು ಈಗ ಮತ್ತು ಈಗಾಗಲೇ ಯಾವ ಯಾವ ವಿಷಯಗಳನ್ನು ಭೋಧಿಸುವಿರಿ (ಮೊದಲು ಹಾಗೂ ಈಗ)?
7. What is the maximum number of hours you teach regularly?
ನೀವು ದಿನಕ್ಕೆ ಹೆಚ್ಚು ಅಂದರೆ ಎಷ್ಟು ತಾಸು ಪಾಠ ಭೋಧಿಸುವಿರಿ?
8. What is the minimum number of hours you teach regularly?
ನೀವು ದಿನಕ್ಕೆ ಕಡಿಮೆ ಅಂದರೆ ಎಷ್ಟು ತಾಸು ಪಾಠ ಭೋಧಿಸುವಿರಿ?
9. Do you have history of ear infections or hearing problem?
ನಿಮಗೆ ಕಿವಿಯ ಸೋಂಕು ಅಥವಾ ಕೇಳಿಸಿಕೊಳ್ಳಲು ತೊಂದರೆ ಇದೆಯೇ?
10. Do you use black board or white board? Specify.
ನೀವು ಭೋಧನೆಗೆ ಕಪ್ಪು ಹಾಗೂ ಬಿಳಿ ಬೋರ್ಡ್ ಗಳಲ್ಲಿ ಯಾವುದನ್ನು ಉಪಯೋಗಿಸುತ್ತೀರಾ? ತಿಳಿಸಿ.
11. Do you suffer from constant upper respiratory infections?
ನೀವು ಶ್ವಾಸಕೋಶಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟ ಸೋಂಕುಗಳಿಂದ (ಗಂಟಲು ನೋವು, ಶೀತ, ಕೆಮ್ಮು) ಪದೇ ಪದೇ ಬಳಲುತ್ತಿರುತ್ತೀರಾ?

0	1	2	3
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12. Does surrounding noise disturb you during teaching?
ನಿಮಗೆ ವಾತಾವರಣದಲ್ಲಿನ ಶಬ್ದಮಾಲಿನ್ಯದಿಂದ ಪಾಠ ಮಾಡಲು ತೊಂದರೆಯಾಗುತ್ತದೆಯೇ?

0	1	2	3
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13. Do you clear your throat while teaching?
ಪಾಠ ಮಾಡುವಾಗ ಗಂಟಲು ಸರಿಮಾಡಿಕೊಳ್ಳುವ ಅಭ್ಯಾಸ ನಿಮಗೆ ಇದೆಯೇ?

0	1	2	3
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SECTION B: Lifestyle (ಜೀವನ ಶೈಲಿ)

14. Do you indulge in long continuous chat?
ನೀವು ಸ್ವಭಾವತಃ ತುಂಬಾ ಹೊತ್ತು ಮಾತನ್ನಾಡುವಿರಾ?

0	1	2	3
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15. Do you eat spicy or hot food?
ನಿಮಗೆ ತುಂಬಾ ಖಾರವಾದ ಅಥವಾ ಬಿಸಿಯಾದ ಆಹಾರವನ್ನು ಸೇವಿಸುವ ಅಭ್ಯಾಸವಿದೆಯೇ?

0	1	2	3
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16. Do you live in noisy environment?
ನಿಮ್ಮ ಮನೆಯು ಶಬ್ದಮಾಲಿನ್ಯದಿಂದ ಕೂಡಿದ ವಾತಾವರಣದಲ್ಲಿ ಇದೆಯೇ?

0	1	2	3
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17. Do you live in dusty environment?
ನಿಮ್ಮ ಮನೆಯು ವಾಯು ಮಾಲಿನ್ಯ, ಧೂಳು ಅಥವಾ ಹೊಗೆಯಿಂದ ಕೂಡಿದ ವಾತಾವರಣದಲ್ಲಿ ಇದೆಯೇ?

0	1	2	3
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18. Do you smoke?
ನೀವು ಧೂಮಪಾನ ಮಾಡುವಿರಾ?

0	1	2	3
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19. Do you consume alcohol?
ನೀವು ಮದ್ಯಪಾನ ಮಾಡುವಿರಾ?

0	1	2	3
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20. Do you take tuition? If yes, for how many hours?
ನೀವು ಮಕ್ಕಳಿಗೆ ಮನೆ ಪಾಠವನ್ನು ಹೇಳಿಕೊಡುತ್ತೀರಾ? ಹೌದಂದರೆ ಎಷ್ಟು ಹೊತ್ತು ಹೇಳಿಕೊಡುತ್ತೀರ. ತಿಳಿಸಿ.

0	1	2	3
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21. Do you indulge in any of the following? If yes, indicate the number of hours against your choice/s
- Lecturing - Chanting - Announcement - Singing - Cheering
ನೀವು ಈ ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದನ್ನಾದರೂ ಮಾಡುತ್ತೀರಾ? ಹೌದಂದರೆ ಪ್ರತಿಯೊಂದು ಕೆಲಸಗಳಿಗೆ ಎಷ್ಟು ಸಮಯ/ತಾಸು ಕಳೆಯುತ್ತೀರ ಎಂದು ಪ್ರತಿಯೊಂದು ಆಯ್ಕೆಯ ಮುಂದೆ ಬರೆಯಿರಿ.
- ಉಪನ್ಯಾಸ ನೀಡುವುದು - ಭಜನೆ ಮಾಡುವುದು - ಘೋಷಣೆ ಕೂಗುವುದು
- ಹಾಡುವುದು - ಉದ್ದೋಷಿಸುವುದು

0	1	2	3
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22. Do you use voice to discipline children at home?
ನೀವು ಮನೆಯಲ್ಲಿ ಮಕ್ಕಳಿಗೆ ಶಿಸ್ತನ್ನು ಕಲಿಸಲು ಧ್ವನಿಯನ್ನು ಉಪಯೋಗಿಸುವಿರಾ?

0	1	2	3
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SECTION C: Vocal habits (ಧ್ವನಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಹವ್ಯಾಸಗಳು)

23. Do you indulge in loud talking?
ನಿಮಗೆ ಏರು ಧ್ವನಿಯಲ್ಲಿ (ಜೋರಾಗಿ) ಮಾತನಾಡುವ ಅಭ್ಯಾಸ ಇದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
24. Do you indulge in screaming or shouting in classroom?
ನಿಮಗೆ ತರಗತಿಯಲ್ಲಿ ಜೋರಾಗಿ ಕೂಗಾಡುವ ಅಭ್ಯಾಸ ಇದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
25. Do you indulge in screaming or shouting at home?
ನಿಮಗೆ ಮನೆಯಲ್ಲಿ ಜೋರಾಗಿ ಕೂಗಾಡುವ ಅಭ್ಯಾಸ ಇದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
26. Do you clear your throat frequently?
ನಿಮಗೆ ಗಂಟಲನ್ನು ಪದೇ ಪದೇ ಸರಿ ಮಾಡಿಕೊಳ್ಳುವ ಅಭ್ಯಾಸ ಇದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
27. Do you have habit of singing loudly?
ನಿಮಗೆ ಜೋರಾಗಿ ಹಾಡುವ ಅಭ್ಯಾಸ ಇದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
28. Do you practice any vocal exercises to project/improve your voice? Specify.
ನಿಮ್ಮ ಧ್ವನಿಯ ಸುರಕ್ಷತೆಗೆ ಅಥವಾ ಧ್ವನಿಯನ್ನು ಉತ್ತಮಗೊಳಿಸಿಕೊಳ್ಳಲು/ ಸಮರ್ಪಕವಾಗಿ ಉಪಯೋಗಿಸಲು ನೀವು ಯಾವುದಾದರೂ ಧ್ವನಿಗೆ ಸಂಬಂಧಪಟ್ಟ ವ್ಯಾಯಾಮಗಳನ್ನು ಮಾಡುತ್ತಿರುವಿರಾ? ವಿವರಿಸಿ.
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|

SECTION D: Symptoms exhibited (ರೋಗಲಕ್ಷಣಗಳು)

29. Does your voice tire very soon?
ನಿಮ್ಮ ಧ್ವನಿಯು ಬೇಗನೆ ಆಯಾಸಗೊಳ್ಳುವುದೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
30. Do you perceive roughness in your voice?
ನಿಮ್ಮ ಧ್ವನಿಯು ಗಡಸಾಗಿದೆ ಅಥವಾ ಕರ್ಕಶವಾಗಿದೆ ಎಂದು ನಿಮಗೆ ಭಾಸವಾಗುತ್ತದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
31. Do you experience sensations like pain, soreness/irritation or lump in throat?
ನಿಮಗೆ ಗಂಟಲು ನೋವು, ಗಂಟಲಿನಲ್ಲಿ ಕಿರಿಕಿರಿ ಅಥವಾ ಗಂಟಲಿನಲ್ಲಿ ಒತ್ತುವಂತೆ ಭಾಸವಾಗುತ್ತದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
32. Do you use any solutions/ Ayurvedic solutions, salt water, mint etc to relieve your throat?
Specify.
ನಿಮ್ಮ ಗಂಟಲನ್ನು ಸರಿ ಮಾಡಿಕೊಳ್ಳಲು ನೀವು ಯಾವುದಾದರೂ ಆಯುರ್ವೇದದ ಔಷಧ ,ಉಪ್ಪು ನೀರು,ಚೂರ್ಣ, ಪೆಪ್ಪರ್ ಮಿಂಟು ಅಥವಾ ಬೇರೆ ಯಾವುದಾದರೂ ದ್ರವ್ಯವನ್ನು ಉಪಯೋಗಿಸುತ್ತೀರಾ? ವಿವರಿಸಿ.
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
33. Do you feel that you have better voice in the mornings or evenings? Specify.
ನಿಮ್ಮ ಧ್ವನಿಯು ಬೆಳಿಗ್ಗಿನ ಹೊತ್ತು ಅಥವಾ ಸಂಜೆಯ ಹೊತ್ತು ಉತ್ತಮವಾಗಿರುತ್ತದೆಯೇ? ವಿವರಿಸಿ.
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
34. Do you feel difficulty in raising your voice (increase the loudness)?
ನಿಮಗೆ ಧ್ವನಿಯನ್ನು ಏರಿಸಿ (ಜೋರಾಗಿ) ಮಾತನಾಡಲು ಕಷ್ಟವಾಗುತ್ತದೆಯೇ?
- | | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
|---|---|---|---|
35. Do you experience episodes of loss of voice/ voice breaks while speaking?

ಕೆಲವು ಸಮಯ ಧ್ವನಿಯ ಒಡಕು ಅಥವಾ ಧ್ವನಿಯು ಹೊರಡದೆ ಇರುವ ಪ್ರಮಯಗಳಿವೆಯೇ?

0	1	2	3
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36. Have you undergone any of the following operations?
a. Thyroidectomy b. Adenoidectomy c. Tonsillectomy d. Others related to head and neck.
If yes, did you notice any voice change after the operation?

ನೀವು ಈ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಗಳನ್ನು ಒಳಗೊಂಡಿದ್ದೀರಾ? ಅ. ಥೈರಾಯ್ಡೆಕ್ಟಮಿ

ಆ. ಅಡಿನಾಯ್ಡೆಕ್ಟಮಿ ಇ. ಟಾನ್ಸಿಲ್ಯೆಕ್ಟಮಿ ಈ. ತಲೆ ಹಾಗೂ ಕತ್ತಿನ ಸಂಬಂಧಿ ಇತರ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆ. ಹೌದೆಂದರೆ ಈ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಯ ನಂತರ ನಿಮ್ಮ ಧ್ವನಿ ಬದಲಾಗಿದೆಯೇ?

0	1	2	3
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37. Do you have sensation of dryness in your throat?

ನಿಮಗೆ ಗಂಟಲು ಒಣಗಿದ ಹಾಗೆ ಅನಿಸುತ್ತದೆಯೇ?

0	1	2	3
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38. Do you experience acid reflux, chest pain/ heart burn?

ನೀವು ಹುಳಿ ತೇಗು, ಎದೆ ನೋವು, ಎದೆ ಉರಿಗಳಿಂದ ಬಳಲುತ್ತಿದ್ದೀರಾ?

0	1	2	3
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39. Are you allergic to AC, dust, medicine? Specify

ನಿಮಗೆ ಏ.ಸಿ., ಧೂಳಿಗೆ ಅಥವಾ ಔಷಧಕ್ಕೆ ಅಲರ್ಜಿ ಇದೆಯೇ? ವಿವರಿಸಿ.

0	1	2	3
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40. Do you feel that your voice is influenced by any of the following medical problems and or subsequent medication? (a) Diabetes (b) High blood pressure (c) Others

ನಿಮ್ಮ ಧ್ವನಿಯ ಮೇಲೆ ಈ ರೋಗಗಳು ಪರಿಣಾಮ ಬೀರುತ್ತದೆಯೆಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇನು?

ಅ. ಮಧುಮೇಹ, ಆ. ರಕ್ತದೊತ್ತಡ, ಇ. ಇತರ ರೋಗಗಳು.

0	1	2	3
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41. Do you suffer from anxiety, mental tension or stress?

ನೀವು ಉದ್ವೇಗ, ಚಿಂತೆ ಅಥವಾ ಮಾನಸಿಕ ಒತ್ತಡದಿಂದ ಬಳಲುತ್ತಿದ್ದೀರಾ?

0	1	2	3
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