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Case Series

Vocal analysis of kindergarten and nursery school teachers

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ABSTRACT

What distinguishes humans from rest of the animal kingdom, is ability to convey ideas, emotions and complex deductive logic by the human faculty referred to as speech which in turn is fundamentally dependent on tones produced by voice box or the larynx. Communication ability is a must in the present day scenario and the inability to do so leads to a lot of unpleasantness in an individual. Abuse of the same leads to numerous problems ranging from fatigue or inability to speak for long to strain and sometimes severe dysphonia affecting the normal chores of day to day living and such an upset can lead to severe depression and inferiority complexes especially in people who need voice in their profession which includes teachers, call center employees, radio jockeys, trainers, motivational speakers. With all this in mind the following study was designed to exactly understand the problem and to come up with a solution if any to counter it.

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1. Introduction

Prolonged speaking in a loud voice at work may entail a risk to vocal health.^{1,2} Teachers, who use their voices extensively, have a higher prevalence of voice problems than the general work force,²⁻⁵ with female preschool teachers apparently at especially high risk.³⁻⁷ Prior research indicates that teachers represent a high-risk group with respect to the development of voice problems. Compared with nonteachers, teachers had higher rates of current dysphonia, 11% versus 6.2%, and lifetime

prevalence of dysphonia, 57.7% versus 28.8%.³ Dysphonia may result in reduced social function and a diminished overall emotional state.⁸ 39% of teachers had to cut back in their teaching activities because of voice problems.¹⁻⁵

2. Aims & Objectives

This study is directed towards the vocal profiling of kindergarten and nursery school teachers and assess any relation between vocal abuse and development of any pathology and advise them on vocal care.

3. Materials and Methods

The study was done on kindergarten and nursery school teachers from a few schools in and around Mangalore. The study was approved by A. J. Institute of Medical science, Institutional Ethics Committee for Human Subjects Research. Randomly selected 100 teachers from kindergarten and nursery schools were enrolled in the study. The objective of the study was to do the vocal profiling of kindergarten and nursery school teachers and assess any relation between vocal abuse and development of any pathology and advise them on vocal care, over a period of one and a half year from January 2013 to June 2014 at A. J. Institute of Medical Science, Mangalore.. The

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data collected was used to identify the problems in voice including frequency, amplitude, jitter and shimmer.⁶⁻⁹

Subject had to first fill a proforma /questionnaire which included basic details of the person like age, sex, address, date of birth, number of years as teacher, mobile number, email id, name of the school.

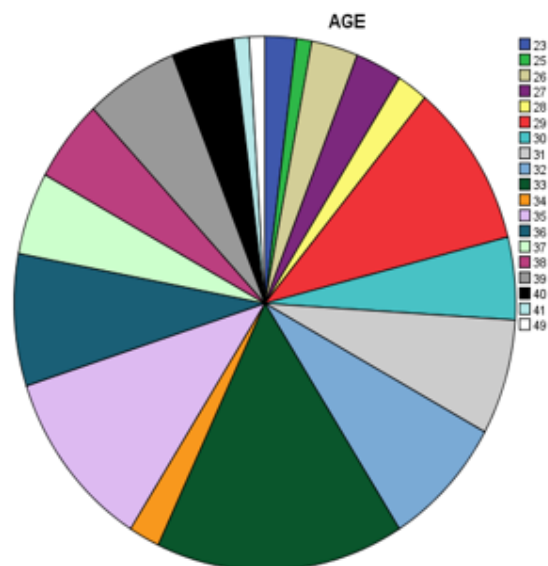
The participant volunteering for the study then filled the VOICE ACTIVITY AND PARTICIPATION PROFILE (VAPP) 15. Detailed ENT examination was done. Using the voice analysis software VAGHMI 7v1, the participant's voice was analysed for different parameters which include jitter, shimmer, intensity and amplitude. 16 If the ENT examination and voice analysis revealed abnormal parameters, then a flexible fibre optic endoscopy was performed to evaluate; all of which was done at no cost to the patient and after explanation of the same to the participant and obtaining the consent.

4. Results

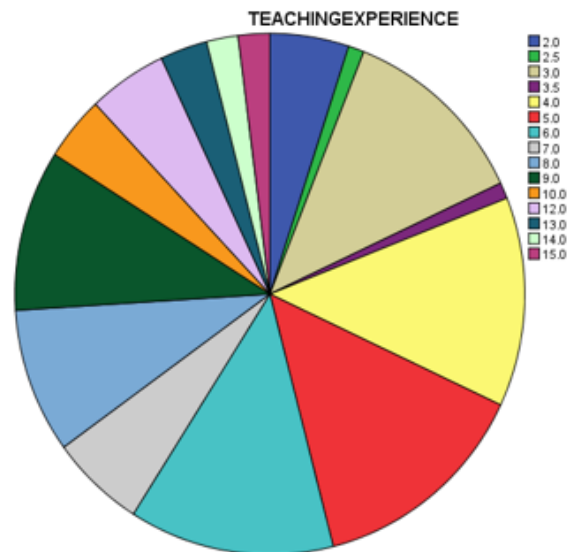
The total number of teachers involved in the study was 100. Out of the 100 teachers in the study, 55 of them were symptomatic (55%) and 45 were asymptomatic (45%). The different symptoms complained by the teachers included hoarseness of voice, frequent throat clearing, voice fatigue, change in pitch, dryness of throat and weak voice. Out of the 100 teachers in the study 56 of them had jitter abnormalities (56 %) and 44 had not much variation (44 %).¹⁰⁻¹²

Out of the 100 teachers in the study 58 of them had shimmer abnormalities (58 %) and 42 had not much variation (42 %). The teachers who had experience of 2-5 years, only 47.8% had any symptoms but teachers with 5-10 years of experience, 52.2% had symptoms and in teachers with more than 10 years of experience the symptoms were seen in 91.7%. so, this gives a clear idea that as the number of years of teaching experience increases, problems related to voice also increases. Statistical correlation with pearson chi- square shows value of 7.591, the degree of freedom being 2 and p value of 0.022 which is significant and thus establishes the relation between years of teaching experience and the onset of symptoms. 66.7% of the kindergarten teachers had symptoms but only 44.2% of Montessori teachers had symptoms. So, this gives a clear idea that kindergarten teachers are more prone to development. of symptoms. Statistical correlation with pearson chi- square shows value of 5.076, the degree of freedom being 1 and p value of 0.024 which is highly statistically significant.

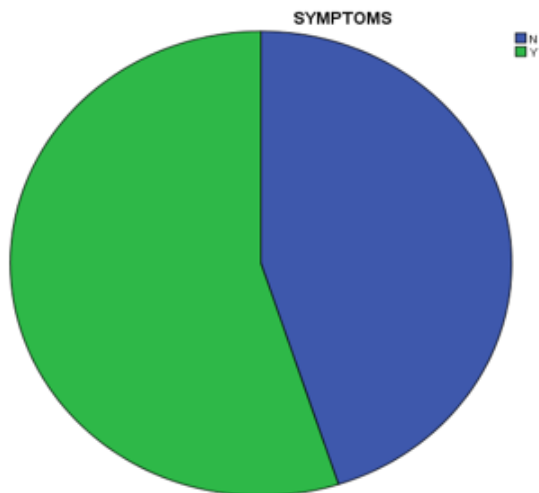
The teachers were divided into 3 groups for statistical purposes. Group 1 constituted teachers with experience between 2 and years, group 2 constituted teachers with experience between 5 and 10 years. Group 3 constituted of teachers who had more than 10 years of teaching experience. The number of teachers in group 1 were 46 in number .out of 46 teachers, 22(47.8%) had symptoms and 24(52.2%) were



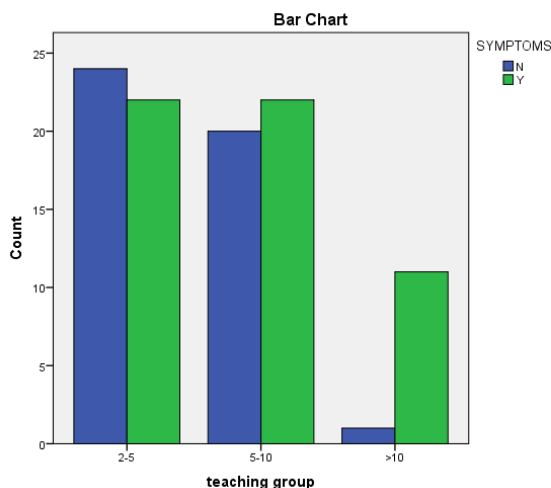
Graph 1: Shows a pie chart representation of the distribution of ages of different teachers involved in the study. The highest density being in the 33 years age group segment.



Graph 2: Shows a pie chart representation of the distribution of years of teaching experiences of different teachers involved in the study. The total number of teachers involved in the study was 100. The least teaching experience in the group was 2 years and the highest teaching experience in the study was 15 years.



Graph 3: Shows a pie chart representation of the symptoms as told by the teachers. The total number of teachers involved in the study was 100. Out of the 100 teachers in the study, 55 of them were symptomatic (55%) and 45 were asymptomatic (45%).



Graph 4: Shows bar chart comparison done between teaching experience and presence or absence of symptoms.

asymptomatic. The number of teachers in group 2 were 42 in number. Out of 42 teachers, 22(52.4%) had symptoms and 20(47.6 %) were asymptomatic. The number of teachers in group 3 were 12 in number .out of 12 teachers, 11(91.7%) had symptoms and 1(8.3 %) was asymptomatic. The result thus showing a strong association between the years of teaching experience and onset of symptoms related to voice usage. The teachers who had experience of 2-5 years, only 47.8% had any symptoms but teachers with 5-10 years of experience, 52.2% had symptoms and in teachers with more than 10 years of experience the symptoms were seen in

91.7%. so, this gives a clear idea that as the number of years of teaching experience increases, problems related to voice also increases.

5. Discussion

Prolonged speaking in a loud voice at work may entail a risk to vocal health.^{1,2} Teachers, who use their voices extensively,² have a higher prevalence of voice problems than the general work force,²⁻⁵ with female preschool teachers apparently at especially high risk.³⁻⁷ Prior research indicates that teachers represent a high-risk group with respect to the development of voice problems. Compared with nonteachers, teachers had higher rates of current dysphonia, 11% versus 6.2%, and lifetime prevalence of dysphonia, 57.7% versus 28.8%.³ Dysphonia may result in reduced social function and a diminished overall emotional state.⁸ 39% of teachers had to cut back in their teaching activities because of voice problems.⁹

The present study was conducted at A. J. Institute of Medical Science, Mangalore and was directed towards the vocal profiling of kindergarten and nursery school teachers and assess any relation between vocal abuse and development of any pathology and advise them on vocal care. The study was done on kindergarten and nursery school teachers from a few schools in and around mangalore over a period of one and a half years from January 2013 to June 2014 at A. J. Institute of Medical Science, Mangalore. A sample of 100 teachers were included in the study.

A study was done at Duke University Medical Center, North Carolina, USA from 2007 to 2008. 237 kindergarten teachers were included in the study. It included both normal and teachers with self perceived dysphonia. In this study teachers were mailed a questionnaire which included questions on demographics, personal voice health, and barriers to care using a five-point Likert scale. 22% were currently hoarse, 58% were hoarse at one point. 23% had missed work for hoarseness.¹⁰ This is correlating in the present study.

A study done at Vocational University of Arnhem, Netherlands included 214 teachers. They were evaluated on the four-point grade scale of the GRBAS and laryngostroboscopic assessment of the vocal folds. Teachers with insufficient glottal closure were rated dysphonic compared with students with sufficient glottal closure (80%). This study showed a larger percentage of students with vocal fold lesions (96%) labeled a dysphonic voice compared to students with no vocal fold problems (81%).¹¹

A study done at Universidade Federal de Minas Gerais, Brazil had chosen 88 female teachers from the municipal schools of Belo Horizonte who were in speech therapy at the same hospital. The variables studied were the age, ORL diagnosis, perceptual-hearing assessment of voice through GRBAS scale, and vocal activities and participation profile (VAPP) protocol. Vocal deviation degree 1 was

found in 56 teachers (63.6%); degree 2-27 teachers (30.6%); and without vocal deviation- five teachers(5.6%). It was found that 57.9% of the teachers presented combined ORL diagnosis. The study showed that there was negative impact of voice on the quality of life of female teachers, but these impacts were not correlated with ORL diagnosis and grade of dysphonia.¹²

6. Conclusion

The study was aimed to find out any correlation between profession of teaching and voice abnormalities as a result of vocal abuse.

The results of the study established a positive correlation between the parameters and thus proved that voice abuse caused symptoms.

1. Kindergarten teachers were more prone to develop voice abnormalities than teachers in Montessori/play schools.
2. The presence of voice abnormalities and other symptoms increased as the number of years of teaching experience increased.
3. Voice activity and participation profile (VAPP) is an effective self assessment tool and periodic self assessment should be employed by the schools.
4. Speech therapy and vocal hygiene should be provided to the teachers on a regular basis.

7. Source of Funding

None.

8. Conflict of Interest

None.

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