

**DEVELOPMENT OF A MULTIMEDIA MANUAL FOR SCHOOL  
TEACHERS ON VOICE AND ITS DISORDERS**

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**Register No: 19SLP025**

A Dissertation Submitted in Part Fulfillment of Degree of Master of Science

(Speech-Language Pathology)

University of Mysore

Mysore



**ALL INDIA INSTITUTE OF SPEECH AND HEARING**

**MANASAGANGOTHRI, MYSURU—570 006**

September 2021

## **CERTIFICATE**

This is to certify that this dissertation entitled “**Development of a multimedia manual for school teachers on voice and its disorders**” is a bonafide work submitted in part fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student Registration Number: 19SLP025. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for an award of any other diploma or degree.

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## **DECLARATION**

This is to certify that this dissertation entitled “**Development of a multimedia manual for school teachers on voice and its disorders**” is the result of my own study under the guidance of Dr. Reuben Thomas Varghese, Scientist-B, Department of Speech Language Sciences and Co- guidance of Dr. R. Rajasudhakar, Associate Professor, Department of Speech Language Sciences at All India Institute of Speech and Hearing, Mysore and has not been submitted earlier to any other University for award of any other diploma or degree.

Mysuru

**Register No: 19SLP025**

September, 2021

## **ACKNOWLEDGEMENT**

### **GURU IS INSPIRATION, GURU IS ASPIRATION**

*It's my sincere gratitude to my beloved guide Dr. Reuben Thomas Varghese, for his continuous support and guidance for my work. The one who guided me very patiently throughout my work. Also I would like to thank my co-guide Dr. R. Rajasudhakar for his valuable inputs. I am glad that I worked under your supervision.*

*Also I would like to thank our beloved director Dr. M. Pushpavathi for permitting me to conduct the current study. Also I extend my gratitude towards Dr. Vasanthalakshmi for her great help.*

*I would like to thank the institutes like St. Joseph school, Chamarajanagar, Dheena bandhu school, Chamarajanagar for their support in the data collection process. Special thanks to the teachers, Mr. Prakash, Ms. Rukmini. M, Mrs. Bhavani devi, for their continuous support to carry out the study. Let me thank the participants (all the teachers) who took their valuable time to participate in this study. My work became so easy and efficient with the help of my guru Mr. Abhilash Kori. Thank you for your time and support to develop the manual.*

*I will take this opportunity to thank my all-time supporters Sushmitha, Geethesh, Shridevi, Chethan, Bhagyashree. Thank you for my Dharwad family for the great support. I thank my supporter Pradeep anna for all your helps.*

*I also thank my moral supporter and guider Mr. A.V. Sumanth for his valuable inputs. Also I would like to thank my senior Rohith anna, and juniors Niru, vathsa, thejaswini for your helps. Thank you abhichu, and Guru for the motivation to complete my work.*

*I would like to thank my friends Niranjana, Veda, Thanuja, Sumathi, Madhusudhan, and all my classmates, (19SLP, B) who helped me a lot to carry out this work. Thanks to the faculties Mr. Sabarish, Mr. Arvinda, Mrs. Sandhya, Mr. Darshan, Mr. Deepak for their continuous support and suggestions.*

*Finally, I would like to thank my parent, sisters, brothers for their support and help.*

## TABLE OF CONTENTS

CHAPTER	TITLE	PAGE NO.
	List of Tables	i
	List of Figures	ii
<b>I</b>	Introduction	1-6
<b>II</b>	Review of Literature	7-14
<b>III</b>	Method	15-20
<b>IV</b>	Results	21-24
<b>V</b>	Discussion	25-26
<b>VI</b>	Summary & Conclusion	27-28
	References	29-34
	Appendix	35-49

**LIST OF TABLES**

---

<b>Table No.</b>	<b>Title of Table</b>	<b>Page No.</b>
2.1	Table depicting the studies on Vocal Hygiene Program delivered among school teachers	12
4.1	Mean, and Standard deviation of the teachers before (pre) and after(post), the presentation of the developed multimedia manual	22

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**LIST OF FIGURES**

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<b>Figure No</b>	<b>Title of Figure</b>	<b>Page No</b>
2.2	Cognitive theory of multimedia learning	13
3.1	Photo depicting that the school teachers filling the questionnaire before the presentation of the developed multimedia manual	18
3.2	Photo depicting that the researcher showing the developed multimedia manual to the school teachers with in computer.	19
3.3	Photo depicting that the school teachers filling the questionnaire after the presentation of the developed multimedia manual.	20
4.2	Median pretest and posttest scores Graph	22
4.3	Line graph of the school teachers in the pre-post test scores.	23

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## Chapter I

### INTRODUCTION

Voice is a very important aspect of communication. Voice is defined as the laryngeal modulation of the pulmonary air stream, which is further reformed by the configuration of the vocal tract (Bracket 1971). A normal voice should have a pleasant quality, appropriate age, and gender -matched, amplitude, pitch, and loudness. Further, any deviation from the above-mentioned parameters results in voice disorders. (Johnson et al. 1965).

Voice disorders arise due to variations in structural, neurological, psychological, behavioral problems as well as systemic conditions (Green & Matheison, 2001). American Speech-Language-Hearing Association (ASHA; 1993), classified voice disorders as organic, structural, neurological, functional, and psychogenic voice disorders. Voice disorders are common amongst professional voice users. Professional voice users refer to those individuals who use their voice as a primary means for their livelihood. Kaufman and Isaacson (1991) classified professionals based on their vocal demands into four different groups: elite vocal performers, professional voice users, non-vocal professionals, and non-vocal non-professionals. School teachers belong to Level II i.e. professional voice users, in which even moderate vocal problems could impede sufficient job performance.

Gotaas and Starr, (1993) reported that the prevalence of voice problems among school teachers varies from 11% to 80% based on the description of voice disorders, the method used in research, and as well as the subjects handled by the school teachers i.e. mathematics, language, physical education, etc. Further, compared to the prevalence

of voice problems in the general population, teachers especially in the nursery, primary and secondary schools are at risk (Merrill et al., 2004). Moreover, studies have reported that 16% to 18% of the voice patients referred to Speech-Language Pathologist (SLPs) are from the teaching profession (Williams, 2003). Considering the Indian scenario, Sebastian et al., (2012) conducted a study to investigate the prevalence of voice problems among school teachers in Vellore and found that out of 448 teachers evaluated for voice disorders, 39 (i.e.9%) teachers had voice disorders. Yeshoda and Jaykumar (2018) conducted a study on school teachers in Mysore, the results revealed that that voice disorders were prevalent in teachers with a point prevalence rate of 8.6%. Menon et al. (2021) evaluated the prevalence of voice problems among 702 school teachers in Kochi, Kerala. The results of the study indicated that 319 (i.e.45.4 %) reported voice problems. The above studies revealed that prevalence of the voice disorder is more among school teachers.

The risk elements for voice problems among teachers have been linked to working environments such as background noise, long teaching hours with no rest, and poor situations in classrooms such as air quality, dryness, dust, poor working posture, stress, and insufficient apparatus. (Himberg & Pentti, 1992; Mattiske et al., 1998; Jonsdottir, Boyle, Martin, & Sigurdardottir, 2002 & Ilomaki et al., 2009). Further, smoking, allergy, respiratory infections, reduce, ability to hear, stress, and body posture can even exacerbate vocal health in school teachers. Further, compared to male teachers, the risk of voice disorders was found to be 18.5 percent among female secondary school teachers compared to male teachers (Fritzell, 1996; Joshi & Mukundan, 2020). To summarize, teachers are highly susceptible to developing voice disorders and these vocal problems can lead to various symptoms such as vocal fatigue

(Sapir & Mathers 1993), hoarseness (Morton & Watson 1998), throat pain or discomfort (Sala et.al 2001), a weak voice, dryness, or a lower pitch (Roy, 2004).

Voice hygiene programs conducted among teachers have resulted in improving their understanding and awareness regarding voice and its disorders, as well as ways to avoid vocal abuse and misuse. Chan (1994) conducted a study to evaluate the effect of a voice hygiene awareness program on 12 female kindergarten teachers in Hong Kong. Instrumental and acoustic voice evaluation was done before and after the voice hygiene program. During the vocal hygiene awareness program, the teachers were given orientation for a 1-hour duration using handouts and pamphlets regarding voice, its disorders, and tips to prevent voice disorders or vocal abuse and misuse among school teachers. Further, anatomy and laryngeal mechanisms, etc. were shown using pictures and models by a Speech-Language Pathologist. The author reported that after attending the voice hygiene awareness program, the teachers demonstrated significant improvement in voice quality in various voice parameters such as jitter, shimmer, harmonic to noise ratio during the instrumental evaluation. Further, it was also noticed that the teachers reduced their vocal abusive behaviors and took care of their voice during their teaching sessions.

Wait (1999) conducted a voice awareness program among college professors in Illinois, USA. The participants were placed into two groups: the experimental group, which received vocal hygiene teaching, and the control group which did not receive the vocal hygiene training by a Speech-Language Pathologist (SLP). The SLP provided the vocal hygiene training for a time of 30 minutes once every week for a duration of 3 weeks. During the awareness program, information related to anatomical framework and functioning of the voice, voice disorders, treatment of voice disorders, and vocal

hygiene were presented using PowerPoint presentations. The authors concluded that after a period of 3 weeks, the experimental group reported better knowledge and awareness regarding voice and its disorders compared to the control group who had not attended the vocal hygiene program.

Boominathan et al., (2008) conducted a study on 65 school teachers in Chennai, to improve the awareness regarding voice and its disorders by conducting a vocal hygiene program titled “Care of the Professional Voice – for Teachers”. The school teachers were asked to fill the questionnaire two times, before and after the vocal hygiene program. The vocal hygiene awareness program was delivered by qualified Speech-Language Pathologist in different schools in Chennai. A 45-minute audio-visual lecture-demonstration of vocal hygiene program was held in English. Further pre-voice awareness and post-voice awareness test scores were compared. The results of the study showed that the post-test scores were 9 % greater than the pretest scores, indicating that the teachers showed an improved awareness regarding voice and its disorders as well as ways to prevent voice disorders during their teaching career.

Bolbol et al., (2017) conducted a vocal hygiene program among Egyptian school teachers to improve the school teacher's awareness regarding vocal hygiene. The awareness program was conducted by a Speech-Language Pathologist on topics such as anatomical framework and physiology of the voice, voice disorders, causes of voice disorders, and vocal hygienic tips. The awareness program was conducted using PowerPoint presentation which included images and video clips. The pre and post-test awareness scores were documented by using a questionnaire. The authors concluded that after taking part in a vocal hygiene programme, the teachers showed an improvement in awareness regarding vocal hygiene measures such as sufficient

hydration, balanced vocal diet, body alignment and posture, and vocal exercises while teaching to prevent vocal abuse and misuse.

To summarize the above-mentioned studies, it indicates that teachers exhibited an increase in awareness regarding voice and its disorders as well as ways to prevent voice disorders after attending the vocal hygiene program by Speech-Language Pathologists.

“Multimedia is characterized by the presence of text, pictures, sound, animation, and video; some or all of which are organized into some coherent program” (Phillips, 1997). Studies have reported that people learn/ understand in multimedia learning compared to printed/ text format (Mayer et al., 2010). Multimedia-based learning has the following advantages: Firstly, multimedia learning uses the ability of the brain to link oral and visual data representation, this leads to a deeper reflection, supporting the transfer of learning into another context. The visual processing is a large percentage of the human brain. Therefore, it stimulates the brain with images, video and animations and a text. Learner’s attention and retaining ability increase. Secondly, studies have reported multimedia-based learning also improves the learner’s mood during the learning process, making them more active and proactive during the learning process (Vijayalakshmi & Reddy, 2020). To summarize, the above studies indicates, that multimedia-based learning facilitates understanding and retaining the concepts better in learners.

### **Need for the study:**

The literature indicates that voice problems are predominant among school teachers and school teachers are at greater risk of evolving voice problems. Further, it can be noticed that voice disorders can adversely affect the quality of life (QoL) in

teachers. Limited awareness programs are conducted in teachers in the Indian context regarding voice, its disorders, and ways to prevent vocal abuse/misuse in school teachers. Normally, vocal hygiene programs are not taught/ demonstrated during their training period, especially in the Indian context. Moreover, studies have reported that awareness programs regarding voice care have been shown to improve teachers' awareness regarding voice and its disorders and ways to preventing voice problems.

Generally, awareness programs regarding voice and its disorders are conducted using talks/ lectures as well as by using presenting the information using pamphlets, and manuals by SLPs using printed or paper-based format. Limited manuals are available in the multimedia format regarding voice and its disorders. Studies have reported that multimedia-based learning facilitates understanding and retaining the concepts better in learners. In addition, a multimedia based manual regarding voice and its disorders has not been developed in the Kannada language. Therefore, the current study was aimed to develop a multimedia manual of voice and its disorders for school teachers in the Kannada language.

**Objectives:**

- To develop a multimedia manual to create awareness about the human voice, its disorders, among school teachers.
- To find the effectiveness of the developed multimedia manual in improving the awareness regarding voice and its disorders among school teachers

## **Chapter II**

### **REVIEW OF LITERATURE**

#### **2.1 Voice and its disorders**

Voice is an acoustic signal generated by the vocal folds which are situated in the larynx for talking, singing, laughing, crying, etc., The human voice satisfied several roles in the process of oral communication. Human voice contributes significantly to verbal communication's audibility. Voice disorders arise due to variations in structural, neurological, psychological, behavioral problems as well as systemic conditions (Greene & Matheison 2001). Teachers are three times more vulnerable than other (vocal) professionals to develop voice problems (Smith et al. 1997). Voice problems in teachers cause personal, social, vocational, and economic consequences (Thomas, de Jong, Koojiman, Donders & Cremers, 2006).

Studies have reported that workers in vocally demanding jobs, such as teachers, are more likely to get voice issues. (Mattiske, Oates, & Greenwood, 1998; Alves et al., 2009). Voice-related problems are associated with a greater risk of developing a disorder, which has been observed in professional voice users such as teachers. Voice problems can be diagnosed using a combination of self-reported symptoms and clinically observed signs.

#### **2.2 Effect of voice disorders on Quality of life (QoL) of teachers**

Quality of life (QoL) is a broad term for explaining well-being in economic, social, and psychological domains. Any restriction or reduction in participation in daily activities can lead to a decline in quality of life. The effect of a voice disorder affects daily activities and social function. According to the study done by Ma and Yiu (2001),



the author evaluated the awareness of voice problems, activity restraint, and participation restriction using the voice activity and participation profile (VAPPP) questionnaire. The VAPPP was administered to 40 dysphonic subjects to assess their perceptions of voice difficulties, activity limitations, and participation restrictions. The results of the study indicated that the individuals with dysphonia stated problems in the occupation, daily communication, social communication, and emotional functioning.

Verdolini and Ramig (2001) reported that voice problems have affected the activities and functioning of teachers in various social settings . A large number of teachers lost their job because of their voice problems. Further, more than 60% of teachers experienced recurrent throat pain or vocal weariness at the end of the working day, and roughly 55 percent stated hoarseness. The above mentioned studies indicated that voice disorders have affected the quality of life in school teachers.

### **2.3 Prevalence of the voice disorders among school teachers**

Gotaas and Starr, (1993) reported that the prevalence of voice disorders among school teachers varies from 11% to 80% based on the definition of voice disorders, the method used in research, and as well as the subjects handled by the school teachers i.e. mathematics, language, physical education, etc. Further, compared to the prevalence of voice disorders in the general population, teachers especially in the nursery, primary and secondary schools are at risk (Merrill et al., 2004). Moreover, studies have reported that 16% to 18% of the voice patients referred to Speech-Language Pathologist (SLPs) are from the teaching profession (Williams, 2003). Considering the Indian scenario, Sebastian et al., (2012) conducted a study to investigate the prevalence of voice disorders among school teachers in Vellore and found that out of 448 teachers evaluated for voice disorders, 39 (i.e. 9%) teachers had voice disorders. Yeshoda and Jaykumar

(2018) conducted a study on school teachers in Mysore, the results shown that voice complaints were prevalent in teachers with a prevalence rate of 8.6%. Menon et al. (2021) estimated the prevalence of voice disorders among 702 school teachers in Kochi, Kerala. The results of the study indicated that 319 (i.e.45.4 %) reported voice problems. The above studies shown that prevalence of the voice problems is more among school teachers.

#### **2.4 Risk factors for developing voice disorders in school teachers**

Teachers experience increased vocal fatigue compared to other professional voice users. Since the majority of them increased their loudness to produce better intelligibility in noisy situations. Arathi et.al (2017) conducted a study to investigate the various risk factors, influence of voice disorders on the physical, psychosocial and functional aspects of a teacher's life. A total of 105 teachers took part in this study and were asked to complete a questionnaire. The results revealed that 81% of the participants had voice complaints at some point in their careers. A total of 26% of them were diagnosed with a voice disorder. The link between upper respiratory infections, DNS, and GERD and voice disorders was discovered to be statistically significant. Furthermore, it was discovered that teachers with voice abnormalities had a lower quality of life than those who did not have a vocal disorder. Furthermore, environmental issues such as background noise, bad class-room acoustics, lengthy speaking distance, air quality, dust, poor body alignment and posture, stress, and insufficient apparatus, all these are contributed to voice problems in school teachers.

#### **2.5 Comparison of voice disorders among Male v/s Female school teachers**

According to Russell et al. (1998), females are twice as likely as males to have vocal difficulties. The reason for the increase in voice disorders in female teachers is

due to the anatomical structure of the vocal cords. The percentage of collagenous fibers and hyaluronic acid in the female vocal folds is less compared to males. (Fernandez-Pello & Hirano, 1983).

## **2.6 Effect of the voice awareness program on voice and its disorders on school teachers**

### *2.6.1. Global studies on the effect of vocal hygiene program among school teachers*

Chan (1994) conducted a study to evaluate the effect of a voice hygiene awareness program on 12 female kindergarten teachers in Hong Kong. Instrumental and acoustic voice evaluation was done before and after the voice hygiene awareness program. During the voice hygiene awareness program, the teachers were given orientation for a 1-hour duration using handouts and pamphlets regarding voice, its disorders, and tips to prevent voice disorders/ vocal abuse and misuse among school teachers. Further, anatomy and laryngeal mechanisms, etc. were shown using pictures and models by a Speech-Language Pathologist. The author reported that after attending the voice hygiene awareness program, the teachers demonstrated significant improvement in voice quality in various voice parameters such as jitter, shimmer, harmonic to noise ratio during the instrumental evaluation. Further, it was also noticed that the teachers reduced their vocal abusive behaviors and took care of their voice during their teaching sessions.

Wait (1999) conducted a voice awareness program among college professors in Illinois, USA. The participants were placed into two groups: the experimental group, which attended vocal hygiene training, and the control group which did not attend the vocal hygiene training by a Speech-Language Pathologist (SLP). The SLP provided the vocal hygiene training for a duration of 30 minutes once every week for a period of

3 weeks. During the awareness program, information related to anatomical framework and functioning of the voice, voice disorders, treatment of voice disorders, and vocal hygiene were presented using power-point presentation. The authors concluded that after a period of 3weeks, the experimental group reported better knowledge and awareness regarding voice and its disorders compared to the control group who had not attended the vocal hygiene program.

Bolbol et al., (2017) conducted a vocal hygiene program among Egyptian school teachers to improve the school teachers awareness regarding vocal hygiene. The awareness program was conducted by a Speech-Language Pathologist on topics such as anatomy and physiology of the voice, voice disorders, causes of voice disorders, and vocal hygienic tips. The awareness program was conducted using power point presentation which included images and video clips. The pre and post-test awareness scores were documented by using a questionnaire. The authors determined that after receiving the vocal hygiene program, the teachers showed an improvement in awareness regarding vocal hygiene measures such as adequate hydration, balanced vocal diet, bodyposture and alignment, and vocal practices while teaching to prevent vocal abuse and misuse. The results showed that the vocal hygiene programme aided in raising teachers' awareness of potentially harmful phono-traumatic actions and vocal health.

#### *2.6.2. Indian studies on the effect of vocal hygiene program among school teachers*

Boominathan et al., (2008) had conducted a study on 65 school teachers in Chennai, to improve the awareness regarding voice and its disorders by conducting a vocal hygiene program titled “Care of the Professional Voice – for Teachers”. The school teachers were requested to fill the questionnaire two times, before and after the

vocal hygiene program. The vocal hygiene awareness program was held by qualified speech pathologist in different schools in Chennai. The vocal hygiene program comprised of a 45-minute audio-visual lecture-demonstration in English. Further pre-voice awareness and post-voice awareness test scores were compared. The results of the study showed that the post-test scores were 9% higher than the pretest scores, indicating that the teachers showed an improved awareness regarding voice and its disorders as well as ways to prevent voice disorders during their teaching career as shown in Table 2.1

**Table 2.1**

*Table depicting the studies on Vocal Hygiene Program delivered among school teachers*

<b>Authors</b>	<b>Subjects</b>	<b>Method of delivering the presentation</b>
Kaufmann and Johnson (1991)	School teachers	Summary booklet, and pamphlets Videotape presentation for 20 minutes
Chan (1994)	12 female kindergarten teachers in Hong Kong	1-hour duration using handouts and pamphlets
Wait (1999)	17 college professors in Illinois	Power point presentation for 30 minutes thrice a week for 3 weeks
Boominathan et al., (2008)	65 school teachers in Chennai	45-minute audio-visual lecture demonstration
Bolbol et al., (2017)	156 school teachers of Egypt	Power point presentation which included images and video clips.

The above table revealed that lectures, PowerPoint presentations, images, video clips, and pamphlets were used in the English language to improve teacher's knowledge regarding voice and its disorders. However, none of the studies included multimedia in the Kannada language to improve the knowledge of school teachers.

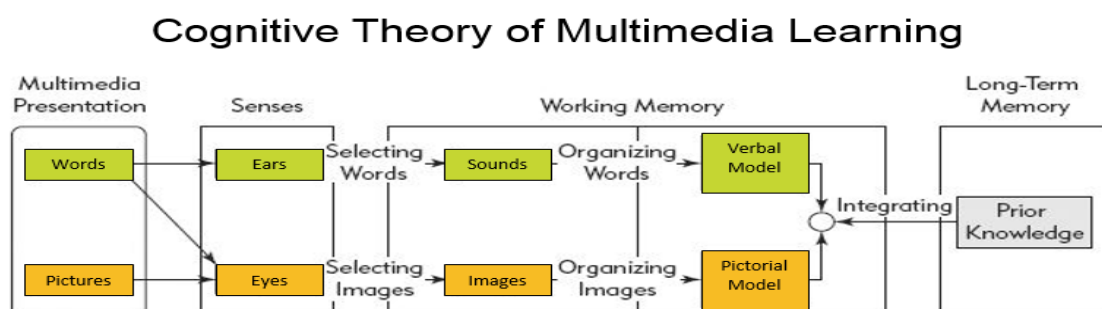
## 2.7 Effect of the Multimedia on improving the knowledge

“Multimedia is characterized by the presence of text, pictures, sound, animation, and video; some or all of which are organized into some coherent program” (Phillips, 1997). Studies have reported that multimedia modality will enhance learning in a better way (Mayer et.al., 2010) using the Cognitive theory of multimedia learning (as shown in Figure. 2.1) According to the authors the advantage of using multimedia is as follows:

1. There are two distinct channels for information processing (i.e., auditory and visual).
2. The capacity of each channel is limited (finite).
3. Filtering, selecting, organizing, and integrating information based on prior knowledge is an active process of learning. (Mayer et al., 2010)

**Figure 2.2**

*Cognitive theory of multimedia learning*



The above theory and studies revealed that multimedia will help in better knowledge retention also promotes learning as more dynamic and long-lasting. Hence it is an effective way to incorporate learning.

## **2.8 Research gaps**

Unfortunately, in the Indian scenario, throughout their training period, teachers receive no formal guidelines or education on proper voice use, vocal hygiene, or ways to prevent vocal abuse and misuse. Many studies have reported that vocal hygiene programs have provided knowledge about the voice, its disorders, and voice care, and showed better results in terms of improving their knowledge regarding voice and its care.

Further, multimedia learning results in increased knowledge retention on learners as opposed to those following a classical face to face verbal mode of learning. This concept validates multimedia as a promising tool to improve learner's motivation and retention and to support the learning and teaching process (Vijayalakshmi & Reddy, 2020). There is evidence that cognition load will be reducing when learners learn through multimedia mode. Generally, awareness programs regarding voice and its disorders are conducted using talks/ lectures as well as by using presenting the information using pamphlets, and manuals by SLPs using printed or paper-based format. Limited manuals are available in the multimedia format regarding voice and its disorders. Studies have reported that multimedia-based learning facilitates understanding and retaining the concepts better in learners. In addition, a multimedia-based manual regarding voice and its disorders has not been developed in the Kannada language. Therefore, the current study was aimed to develop a multimedia manual of voice and its disorders for school teachers in the Kannada language.

## Chapter III

### METHODS

**Study Design:** Pre-post test design

**Participants:** The participants of the study included 30 school teachers who were teaching in the Kannada medium schools in Mysore. The participants were in the age range of 30-50 years. (*Mean age range:34.33years*). Further, based on gender, there were 9 male teachers and 21 female teachers. Informed written consent was taken from all the participants (as shown in Appendix III).

#### *Inclusion Criteria*

The following inclusionary criteria were used to select the participants:

- The teachers who were in the teaching profession for the last 5 – 10 years
- Teachers who were not oriented regarding any vocal hygiene program
- Teachers who were teaching subjects such as science, mathematics, language, etc., where it requires more use of their voice

#### *Exclusion Criteria*

The participants with the following characteristics were excluded from the study:

- Teachers who were in the training period
- Teachers who were below 30 years of age
- Teachers who had experience with less than 5 years
- Teachers with any neurological and medical issues
- Teachers with alcohol and smoking habits



- Teachers who had attended the previous vocal hygiene program
- Arts/crafts teachers, physical education teachers who do not use voice more are excluded from the study

## **Procedure**

The current study was conducted in two phases. Phase I dealt with the development of a multimedia manual for school teachers on voice and its disorders and phase II dealt with the administration and evaluating the effectiveness of the developed multimedia manual.

### **Phase I: Development of the multimedia manual**

In Phase I, the multimedia manual was developed by using the following steps;

#### **Step 1: Collecting the resources**

The various sources of information were collected from journals, books, and internet websites regarding voice and its disorders, vocal hygiene tips, etc., The images and videos which are included in the multimedia manual were taken without any copyright issues.

#### **Step 2: Content preparation**

The content required for the multimedia manual was arranged in the following heading.

- A personal experience of a school teacher regarding the voice problems after teaching for 5 years.
- Animated video of voice production.
- A brief description of voice and its disorders

- Causes of voice problems
- Classification of voice disorders
- Impact of voice disorders on the quality of life of teachers
- Professionals involved in the assessment of voice disorders.
- Management of the voice disorders
- Vocal hygiene measures and ways to prevent vocal abuse in teachers.

### **Step 3: Content validity and finalizing the content**

The developed multimedia manual was given to two trained Speech-Language Pathologists who were native Kannada speakers for content validity, who had more than 5 years of experience in voice research, voice assessment, and management using content validity questionnaire (as shown in Appendix II). The suggestion given by the two qualified Speech-Language Pathologist were listed as below;

- To use simple words
- To increase the font size
- To enlarge the size of the picture
- To modify some of the words of Kannada which conveys the meaning more simply.
- To modify some of the images for better understanding.

Later, all these suggestions of the Speech-Language Pathologist were incorporated and the final multimedia manual was developed.

**Step 4: Development of the pre-post test questionnaire.**

A pre-posttest questionnaire was developed in Kannada with 15 multiple-choice questions. And it was given to two Speech-Language Pathologists for content validity, who had more than 5 years of experience in voice research, voice assessment, and management. After, incorporating suggestions from the SLPs, the final questionnaire was developed (as shown in Appendix I).

**Phase II****Step 1: Evaluating the knowledge of the school teachers before the presentation of the multimedia manual**

The awareness of the teachers regarding the voice and its disorders was evaluated by using a pretest questionnaire to the participants through a google form before the presentation of the multimedia manual (as shown in Figure 3.1).

**Figure 3.1**

*Photo depicting that the school teachers filling the questionnaire before the presentation of the developed multimedia manual*



### **Step 2: Presentation of the developed multimedia manual**

The developed multimedia manual was presented to the participants by the researcher for 30 minutes. The contents of the multimedia manual contained a lot of images, animated videos, etc. Further, the manual was presented in the Kannada language and in a simpler way for better understanding (as shown in figure 3.2).

#### **Figure 3.2**

*Photo depicting the researcher presenting the developed multimedia manual to the school teachers*



### **Step 3: Evaluating the effectiveness of the developed multimedia manual**

The same questionnaire as that of pre-test was presented again to the teachers post the multimedia manual presentation and to estimate the effectiveness of the multimedia manual (as shown in Figure 3.3).

**Figure 3.3**

*Photo depicting that the school teachers filling the questionnaire post the presentation of the developed multimedia manual*



After the pre-post test scores were obtained, statistical analysis was done using the Statistical Package for Social Science (SPSS) version 21 software. Descriptive statistics was done to get the mean, standard deviation, and median scores. Shapiro Wilk test was used to evaluate the normality. As the data did not follow assumptions of normal distribution, therefore, non-parametric test, Wilcoxon signed-rank was done to evaluate whether significant difference was noticed in the pre and post-test scores among the school teachers before and after the presentation of the developed multimedia manual.

## **Chapter IV**

### **RESULTS**

Voice problems are present among school teachers. Further, there is a lack of awareness among school teachers regarding the voice and its disorders. It's necessary to create awareness among voice, voice disorders, treatments. Studies reported that teacher's knowledge about voice and its disorders has been improved after attending the vocal hygiene program. Voice manual has been developed for other populations such as primary health center doctors. And manuals are available in English. Further, no multimedia manual has been developed for school teachers in the Kannada language.

Hence the present study aimed at developing a multimedia manual in Kannada for school teachers on voice and its disorders and to find the effectiveness of the multimedia manual among the school teachers. Then the multimedia manual was presented to 30 Kannada medium school teachers. A questionnaire containing 15 multiple choice questions was developed based on the multimedia manual. It was administered as a pre-posttest before and after the introduction of the multimedia manual to school teachers.

#### **4.1 To study and compare the effectiveness of the multimedia manual across school teacher's groups**

The knowledge of the school teachers was assessed before and after the presentation of the developed multimedia manual. The descriptive scores for pre and post-test were analyzed. The mean and standard deviation across the school teachers are depicted in Table 4.1. The trend in the participant's scores before and after the presentation of the developed multimedia manual in terms of median scores is illustrated in figure 4.2.

**Table 4.1**

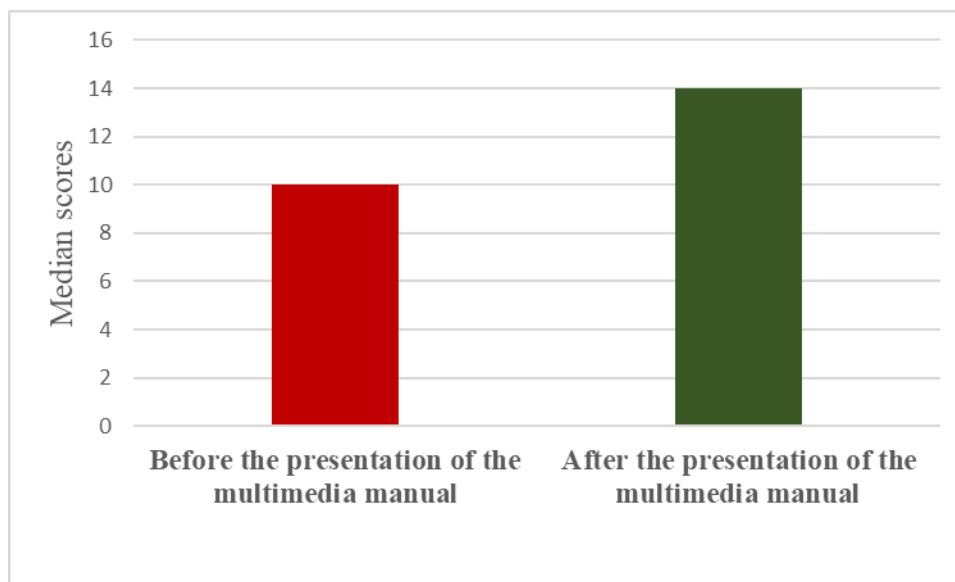
*Mean, and Standard deviation of the teachers before (pre) and after(post), the presentation of the developed multimedia manual*

<b>Participants</b>				
<b>Pretest</b>			<b>Posttest</b>	
<i>N = 30</i>			<i>N = 30</i>	
	<i>Mn</i>	<i>SD</i>	<i>Mn</i>	<i>SD</i>
<b>Scores</b>	8.50	2.08	12.63	1.85

*Max score: 15*

**Figure 4.2**

*Median scores of the participants*



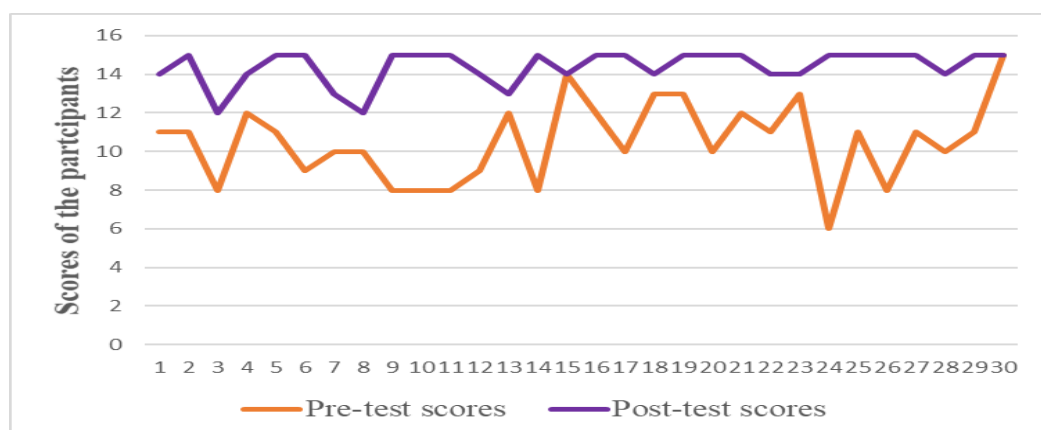
The descriptive scores illustrated better performance for the posttest compared to pre-test scores. An obvious difference was noticed in the mean and median scores across the participant groups, the data were subjected to the Wilcoxon Signed Rank test to evaluate whether significant differences were noticed in the pre-post presentation of

the developed multimedia manual The results revealed that there was a statistically significant difference before and after the presentation of the developed multimedia manual among school teachers ( $Z= 4.72, p<0.001$ ).

Further, it was observed that during the pretest phase, most of the school teachers answered correctly to the questions related to the anatomy and functional aspect of the voice. However, after the presentation of the developed multimedia manual, the teachers in addition to answering questions related to anatomy and functional aspects of voice, the teachers answered correctly to the questions related to signs and symptoms of voice disorders, assessment, professionals involved in the treatment of voice disorders and ways to prevent vocal abuse/misuse. The results are represented in a graphical form as shown in Fig 4.3. The figure clearly indicates that the majority of the questions were answered wrong by most of the school teachers in the pretest phase, however, after the presentation of the developed manual the teachers answered majority of the questions correctly. This indicates that the manual was effective in improving the knowledge and awareness regarding voice and its disorders among school teachers.

**Figure 4.3**

*Line graph depicting the questionnaire response scores before and after the presentation of the multimedia manual.*





To summarize, the above results of the study clearly indicates that the multimedia manual worked as an effective tool in providing knowledge and awareness on voice and its disorders, ways to protect their voice for the school teachers. This would help the teachers in taking self-care of voice and in turn improve their quality of life.

## Chapter V

### DISCUSSION

From the epidemiological studies it can be observed that there is a high prevalence rate of voice disorders among school teachers in India and the impact of voice disorders on the quality of life and occupation is also adverse. This suggests the need to bring the awareness of voice and its disorders among school teachers and also knowledge about assessment and management options for school teachers. School teachers are belonging to level II voice professions. Hence, aim of the present study was to develop a multimedia manual in Kannada for school teachers and to find the effectiveness of the developed multimedia manual among teachers.

Hence this study was done in both phases. Phase I consisted of the development of the multimedia manual by collecting and compiling information from different resources. The school teacher's awareness about voice and its disorders was checked using a pre-test questionnaire. In phase II the developed multimedia manual was presented to school teachers. After the presentation of the multimedia manual regarding the voice and its disorders, the effectiveness of the manual was checked using a post-test questionnaire.

#### **5.1 Investigating the effectiveness of the developed multimedia manual of voice and its disorders in improving the knowledge and awareness regarding voice and its disorders among school teachers**

It was discovered in the current study that after the presentation of the developed multimedia manual to school teachers, there was a significant improvement in their knowledge and awareness regarding voice and its disorders which can be noticed in the

better scores in the post test phase. The following factors might have attributed to the findings. Usually, voice manuals presented to teachers in written format/ using pamphlets. However, the presentation of the developed manual was in the multimedia format, which contained information in the audio-video format. Further, in the present study, the multimedia manual was presented in native language (Kannada) of school teachers and also in simple language. All these factors might have enhanced the knowledge regarding voice and its disorders among school teachers. The result of the present study is in consensus with the previous studies done by Russel et al. (1998), Wai (1994) and Chan (1994) who had reported similar results.

During the presentation of the developed multimedia manual, teachers were oriented regarding voice hygiene tips such as like speaking in a lower voice rather than shouting in the class, using some gestures/actions often, avoid whispering, and taking adequate voice rest in a day or between periods whenever possible. Further, teachers were also oriented about classroom management techniques such as moving nearer to students while teaching and reducing background noise, consumption of healthy food regularly, avoiding paan/tobacco and smoking, avoiding alcohol and carbonated drinks, avoiding oily and spicy foods, limiting beverage consumption, and having plenty of water etc. The teachers were also informed to consult an Otolaryngologist/Speech therapist whenever they notice a change in voice and other symptoms of voice disorders.

## Chapter VI

### SUMMARY AND CONCLUSIONS

Voice is an important component of speech. A normal voice should be pleasant to perceive with appropriate age and gender-matched, pitch and loudness. Any disturbances for this cause voice disorders. Many epidemiological studies have found a higher prevalence of voice disorders among school teachers in India. And the effect of these voice disorders on teacher's quality of life is adverse. This initiated to create awareness among school teachers regarding voice, its disorders, evaluation, and treatments. But there was no multimedia manual was available in the Kannada language. Hence, the current study was done with an aim to develop a multimedia manual of voice and its disorders in Kannada.

The research was held in two stages. Phase I consisted of the development of the multimedia manual by collecting and compiling information from different resources. First, the school teacher's awareness about voice and its disorders was checked using a pre-test questionnaire. In phase II, the developed multimedia manual was presented to school teachers. After the presentation of the multimedia manual, the effectiveness of the manual was checked using a post-test questionnaire.

The knowledge of the school teachers was assessed before and after the presentation of the developed multimedia manual. The descriptive scores for pre and post-test were analyzed. The mean, median, and standard deviation scores across the school teachers were taken. Further, significant differences were noticed in the post-test scores especially with regard to questions related to signs and symptoms of voice disorders, assessment, professionals involved in the treatment of voice disorders and ways to prevent vocal abuse/misuse.

### **Limitation of the present study**

- The present study was conducted only in 30 school teachers. Future studies with more number of participants can bring about better generalization of the results

### **Implications**

- This is the first multimedia manual about voice and its disorders in Kannada language for school teachers
- Since the developed multimedia manual is in the PowerPoint format, it can be accessed by school teachers in the online delivery mode even in pandemic situations like COVID-19.
- As the manual is in multimedia format, it helps in better understanding and retaining the concepts better in school teachers compared to pamphlets/books.

### **Future directions**

The current study focused on the development of the multimedia manual about voice and its disorders among school teachers. Future studies with more number of teachers, teachers teaching different subjects, teachers in different age-groups and gender is warranted. Moreover, the developed multimedia manual can be adapted to different Indian languages for catering to teachers from different parts of the country.

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## APPENDIX I

**Questionnaire to evaluate both pre-posttest awareness regarding the voice and its disorders among school teachers in Kannada in google form.**

(ಶಾಲಾ ಶಿಕ್ಷಕರ ಧ್ವನಿ ಮತ್ತು ಅದರ ಅಸ್ವಸ್ಥತೆಗಳ ಬಗೆಗಿನ ಜಾಗೃತಿಯನ್ನು ತಿಳಿಸುವ ಪೂರ್ವ-ನಂತರದ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ)

Name: \*

Your answer

Age/Gender: \*

Your answer

email id or phone number: \*

Your answer

1. ಯಾವ ಅಂಗವು ಧ್ವನಿಯ ಉತ್ಪಾದನೆಗೆ ಬಹಳ ಮುಖ್ಯವಾಗಿದೆ?

ಬಾಯಿ

ಶ್ವಾಸಕೋಶ

ಧ್ವನಿಪೆಟ್ಟಿಗೆ

2. ಧ್ವನಿಗೆ ಸಹಾಯವಾಗುವ ನಾಲ್ಕು ಕ್ರಿಯೆಗಳು ಯಾವುವು?

ಜೀರ್ಣಾಂಗವ್ಯವಸ್ಥೆ, ಶ್ವಾಸಾಕ್ರಿಯೆ, ಅನುರಣನಕ್ರಿಯೆ, ಉಚ್ಚಾರಣಾಕ್ರಿಯೆ.

ರಕ್ತಪರಿಚಲನಾ ವ್ಯವಸ್ಥೆ, ಅನುರಣನಕ್ರಿಯೆ, ಉಚ್ಚಾರಣಾಕ್ರಿಯೆ, ಮತ್ತು ಶ್ವಾಸಕ್ರಿಯೆ.

ಶ್ವಾಸಕ್ರಿಯೆ, ಉಚ್ಚಾರಣಾಕ್ರಿಯೆ, ಅನುರಣನಾಕ್ರಿಯೆ ಮತ್ತು ಆರ್ಟಿಕ್ಯೂಲೇಟರಿ (ಅಭಿವ್ಯಕ್ತಿ) ವ್ಯವಸ್ಥೆ.

3. ವೋಕಲ್ಯಾಡ್ಯೂಲ್ / ಗಾಯನಗಂಟುಗಳು ಯಾವಾಗ ಉಂಟಾಗುತ್ತವೆ?

ಹೆಚ್ಚು ಸಮಯ ಧೀರ್ಘವಾಗಿ ಮಾತನಾಡುವುದರಿಂದ

ಹಾರ್ಮೋನ್ಗಳ ವ್ಯತ್ಯಾಸದಿಂದ

ಮಾನಸಿಕರೋಗಗಳು.

4. ಧ್ವನಿತಂತಿಗಳ ಪಾರ್ಶ್ವವಾಯುಗಳ ವಿಧಗಳು ಯಾವುವು?

ಏಕಪಕ್ಷಿಯ ಪಾರ್ಶ್ವವಾಯು

ದ್ವಿಪಕ್ಷಿಯ ಪಾರ್ಶ್ವವಾಯು

ಏಕಪಕ್ಷಿಯ ಪಾರ್ಶ್ವವಾಯು ಮತ್ತು ದ್ವಿಪಕ್ಷಿಯ ಪಾರ್ಶ್ವವಾಯು

5. ಭಾಷೆ, ಧ್ವನಿ ಸಮಸ್ಯೆ, ಮತ್ತು ನುಂಗುವ ಸಮಸ್ಯೆಗಳನ್ನು ..... ಪರಿಶೀಲಿಸುತ್ತಾರೆ?

ಮಾನಸಿಕ ವೈದ್ಯರು

ವಾಕ್ಯ ಮತ್ತು ಭಾಷಾತಜ್ಞರು

ಶಸ್ತ್ರವೈದ್ಯರು

6. ಅಸಮಾನ್ಯವಾದ ಬೆನ್ನುಮೂಳೆಯ ಆಕಾರವು ಧ್ವನಿಗೆ ಸಮಸ್ಯೆ ಉಂಟುಮಾಡುತ್ತದೆ?

ಹೌದು

ಇಲ್ಲ

ಭಂಗಿಗೂ ಧ್ವನಿಗೂ ಸಂಬಂಧವಿಲ್ಲ

7. ಧ್ವನಿಗೆ ಕಾರಣವಾಗುವ ವ್ಯವಸ್ಥೆಗಳು ಯಾವುದರ ಹಿಡಿತದಲ್ಲಿರುತ್ತದೆ?

ನರಮಂಡಲ

ರಕ್ತ ಸಂಚಲನ

ನುಂಗುವ ವ್ಯವಸ್ಥೆ

8. ಧ್ವನಿಮಟ್ಟವು ಯಾರಲ್ಲಿ ಹೆಚ್ಚು ಇರುತ್ತದೆ?

ಯುವಕರಲ್ಲಿ (120HZ)

ಯುವತಿಯರಲ್ಲಿ (240HZ)

ಮಕ್ಕಳಲ್ಲಿ (350HZ)

9. ಧ್ವನಿ ತಂತಿಗಳ ಕಂಪನದಿಂದ ಹೊರಬಂದ ಶಬ್ದವು ..... ನಂತೆ ಇರುತ್ತದೆ.

ಗಾಳಿ

ಬಜ್ಜೆ

ಧ್ವನಿ

10. ಬಜ್ಜಂತೆ ಹೊರಬಂದ ಶಬ್ದವು ಧ್ವನಿಯಾಗುವುದು .....ಗಳ ಸಹಾಯದಿಂದ.

ಲ್ಯಾರಿಂಗ್ಸ್

ಹೊಟ್ಟೆ

ನಿರೂಪಕಗಳ

11. ಧ್ವನಿ ಅಸ್ವಸ್ವತೆಗಳ ನಿರ್ವಹಣೆಯು .....ಸಾಧ್ಯವಾಗುತ್ತದೆ.

ಆರೋಗ್ಯಕರ ಧ್ವನಿ ವಿಧಾನಗಳು

ಶರೀರ ವಿಜ್ಞಾನದ ಧ್ವನಿ ಚಿಕಿತ್ಸೆ

ಮೇಲಿನ ಎರಡು ಚಿಕಿತ್ಸೆಗಳು

12. ತೀವ್ರವಾದ ಧ್ವನಿ ತೊಂದರೆಗಳನ್ನು ಸಂರಕ್ಷಿಸಲು ಯಾವ ಚಿಕಿತ್ಸೆ ಸೂಕ್ತ?

ಶರೀರ ವಿಜ್ಞಾನದ ಧ್ವನಿ ಚಿಕಿತ್ಸೆ.

ಫೋನೋ ಸರ್ಜರಿ

ರೋಗಲಕ್ಷಣದ ಧ್ವನಿಚಿಕಿತ್ಸೆಗಳು.

13. ಬೆನ್ನು ಮೂಳೆಗಳೂ ಸುರುಳಿಯಾದಾಗ ಶ್ವಾಸಕೋಶವು

ಸಂಕುಚಿತಗೊಳ್ಳುತ್ತವೆ.

ಹಿಗ್ಗುತ್ತವೆ

ಉಸಿರಾಟ ಉತ್ತಮವಾಗುತ್ತದೆ

14. ಧ್ವನಿ ಅಸ್ವಸ್ವೆಯ ಪರಿಣಾಮದಿಂದ

ಹತಾಶೆ, ಆತಂಕ ಮತ್ತು ಬಿನ್ನತೆ ಉಂಟಾಗುತ್ತದೆ.

ಸಾಮಾಜಿಕ ಜೀವನ ಕುಗ್ಗುತ್ತದೆ.

ಮೇಲಿನವು

15. ಕೆಲಗಿನವುಗಳಲ್ಲಿ ಯಾವ ವೃತ್ತಿಪರರು ಧ್ವನಿತೊಂದರೆಗಳಿಗೆ ಹೆಚ್ಚು ಒಳಗಾಗುವುದಿಲ್ಲ.

ಶಿಕ್ಷಕರು

ಇಂಜಿನಿಯರ್ಸ್

ಗಾಯಕರು

## APPENDIX II

**Feedback Questionnaire for multimedia manual of voice and its disorders manual:**

**Name and designation:**

**Date:**

SL.NO	Parameters	Verypoor	Poor	Fair	Good	Excellent
1	Simplicity					
2	Familiarity					
3	Size of the picture					
4	Color and appearance					
5	Clarity of the video					
6	Presentation					

**Put a tick in the appropriate box**

**a. Any other suggestions:**



**APPENDIX III**  
**CONSENT FORM**

**DISSERTATION TOPIC: DEVELOPMENT OF A MULTIMEDIA MANUAL FOR SCHOOL TEACHERS ON VOCE AND ITS DISORDERS.**

**Information to the participants**

I, Ms. Priyanka.N, II MSC, studying at AIISH, Mysore is pursuing my dissertation titled “DEVELOPMENT OF A MULTIMEDIA MANUAL FOR SCHOOL TEACHERS ON VOCE AND ITS DISORDERS”. This dissertation is done under the guidance of Dr. Reuben Thomas Varghese, Scientist-B, Dept. of Speech-Language Sciences, AIISH, Mysore. Investigator evaluates the knowledge regarding the voice and its disorders before and after the presentation of the developed multimedia manual. Recording of the data from the school teachers will be done for further analysis. The procedure involved in the study is purely non-invasive and the duration of the procedure is about 30 minutes. There is also no risk involved to the participants. Further, I also assure you that the findings obtained from this study will be kept confidential. There is no influence or pressure of any kind by the research scholar. Your cooperation in the study will go a long way in helping us in understanding the effectiveness of the developed multimedia manual for school teachers.

**Informed Consent**

I have been informed about the aims, objectives, and procedure of the study. I understand that I have a right to refuse participation as a participant or withdraw my consent at any time.

I, -----, the undersigned, give my consent to be a participant in this investigation/study.

Signature of the participants

Signature of investigator

Date:

**APPENDIX IV****Multimedia manual for school teachers on voice and its disorders****DEVELOPMENT OF A MULTIMEDIA MANUAL FOR SCHOOL  
TEACHERS ON VOICE AND ITS DISORDERS****Candidate**

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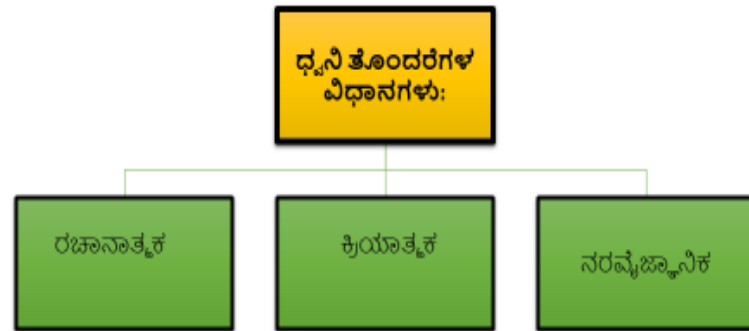
(A video of teacher's basic voice complaints and voice production)

### ಧ್ವನಿ ತೊಂದರೆ ಎಂದರೇನು ?

ವ್ಯಕ್ತಿಯು ತನ್ನ ಧ್ವನಿಯನ್ನು ಸರಿಯಾದ ರೀತಿಯಲ್ಲಿ ಉಪಯೋಗಿಸಲು ಸಾಧ್ಯವಾಗದಿರುವಾಗ, ಉದಾಹರಣೆ: ಅತಿ ಎತ್ತರದ ಶ್ರುತಿ ಅಥವಾ ಕಮ್ಮಿ ಶ್ರುತಿ, ಸಣ್ಣಗಿನ ಸ್ವರ, ಗಡಸು ಅಥವಾ ಕರ್ಕಶವಾದ ಧ್ವನಿ. ಈ ಪರಿಸ್ಥಿತಿಯನ್ನು ಧ್ವನಿ ತೊಂದರೆ ಎಂದು ಕರೆಯಲಾಗುವುದು.



### ವಿಧಾನಗಳು



## ಧ್ವನಿ ತೊಂದರೆಗೆ ಕಾರಣಗಳು :

ಶೇಕಡೆ 50% ಕ್ಕಿಂತ ಹೆಚ್ಚು ಜನರು ಧ್ವನಿ ತೊಂದರೆಯಿಂದ ಬಳಲುತ್ತಾರೆ.

ಹೆಚ್ಚು ಹೊತ್ತು ಮಾತನಾಡುವುದು, ಅಧಿಕವೇಳೆ ಹಾಡುವುದರಿಂದ, ಜೋರಾಗಿ ಕಿರುಚುವುದು ಧ್ವನಿಗೆ ಹಾನಿಕಾರ.



ಹೆಚ್ಚು ಅವಧಿ ಧ್ವನಿ ಮಾರ್ಪಾಡುಮಾಡುವುದರಿಂದ .

ವೃತ್ತಿಪರ ಧ್ವನಿ ಬಳಕೆದಾರರು ಆದ ಗಾಯಕರು, ಶಿಕ್ಷಕ ಮತ್ತು ಶಿಕ್ಷಕಿಯರು ವಕೀಲರು, ವ್ಯಾಯಾಮ ಶಿಕ್ಷಕರು ಮುಂತಾದವರು ತಮ್ಮ ಧ್ವನಿಯನ್ನು ಅತೀ ಹೆಚ್ಚು ಬಳಸುತ್ತಾರೆ.

ಹಾಗಾಗಿ ಇವರೆಲ್ಲ ಹೆಚ್ಚಾಗಿ ಅಪಾಯದಲ್ಲಿರುತ್ತಾರೆ. ಅದಕ್ಕಾಗಿ ಅವರಿಗೆ ಸರಿಯಾದ ಧ್ವನಿ ವಿರಾಮ ಬಹಳ ಮುಖ್ಯ.

ಧ್ವನಿ ನಿಂದನೆ ಮತ್ತು ಧ್ವನಿ ದುರುಪಯೋಗ ಅಭ್ಯಾಸಗಳು

## ಇತರೆ ಕಾರಣಗಳು:

01

ಶೀತ, ಅಲರ್ಜಿ, ಮೇಲ್ಭಾಗದ ಶ್ವಾಸೇನ್ದ್ರಿಯಸಂಕುಗಳು, ಧ್ವನಿತಂತುಗಳ ಉಬ್ಬುವಿಕೆಗೆ ಕಾರಣವಾಗುತ್ತದೆ.

02

ಗಂಟಲು ನಿರ್ಜಲೀಕರಣ: ಧ್ವನಿತಂತುಗಳ ಸುತ್ತಲೂ ಸರಿಯಾದ ಪ್ರಮಾಣದಲ್ಲಿ ನೀರಿನಾಂಶವಿರಬೇಕು.

03

ಜಲರ ಹಿಮ್ಮುಖ ಪರಿವೃ ರೋಗ

04

ಧೂಮಪಾನ

05

ವಯಸ್ಸು ಮತ್ತು ನರವೈಜ್ಞಾನಿಕ ಪರಿಸ್ಥಿತಿಗಳು.

06

ಮಾನಸಿಕ ರೋಗಗಳು

07

ಹಾರ್ಮೋನ್‌ಗಳ ವ್ಯತ್ಯಾಸಗಳು.

### ಧ್ವನಿ ತೊಂದರೆಯ ಗುಣಲಕ್ಷಣಗಳು ಯಾವುವು ?

- ಕರ್ಕಶವಾದ ಧ್ವನಿ
- ಧ್ವನಿಯಲ್ಲಿ ಆಯಾಸ
- ಅಸಹಜ ಸ್ವರ ಮತ್ತು ಜೋರುತನ
- ಧ್ವನಿ ಬಾರದಿರುವುದು
- ಧ್ವನಿಯಲ್ಲಿ ನಡುಕ ಮತ್ತು ಒಡಕುಗಳು ಉಂಟಾಗುವುದು
- ಬಲಹೀನವಾದ ಧ್ವನಿ
- ಮಾತನಾಡಲು ಅಧಿಕವಾದ ಪ್ರಯತ್ನ ಪಡುವುದು
- ಧ್ವನಿಯ ಗುಣಮಟ್ಟದಲ್ಲಿ ವೈಪರೀತ್ಯ ಕಂಡುಬರುವುದು
- ಗಂಟಲಿನಲ್ಲಿ ಅತಿಯಾದ ಒತ್ತಡ ಅಥವಾ ಉದ್ದೇಗ ಉಂಟಾಗುವುದು
- ಪದೇ ಪದೇ ಗಂಟಲನ್ನು ಕೆಮ್ಮುತ್ತ ಸರಿಮಾಡಿಕೊಳ್ಳುವುದು
- ಹರಿಯದ ಹುಡುಗರಿಗೆ ಅಥವಾ ಹುಡುಗಿಯರಿಗೆ ಸಮಂಜಸ ಧ್ವನಿ ಬಾರದಿರುವುದು

### ವೋಕಲ್ ನಾಡ್ಯೂಲ್ ಅಥವಾ ಗಾಯನ ಗಂಟುಗಳು

ಇವು ಧ್ವನಿತಂತಿಗಳ ಮೇಲೆ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತವೆ.

ಸಾಮಾನ್ಯವಾಗಿ 1.5 ಮಿಮೀನಷ್ಟು ಗಾತ್ರದಲ್ಲಿರುತ್ತವೆ.

ಸಮೀಧೀಯ, ಎರಡು ಧ್ವನಿತಂತಿಗಳ ಮೇಲೆ ಉಂಟಾಗುತ್ತದೆ.

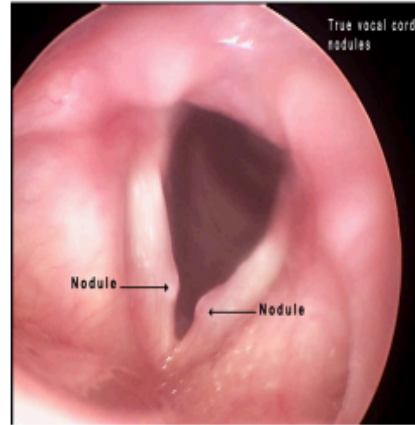
ಸಾಮಾನ್ಯವಾಗಿ ಧ್ವನಿತಂತಿಗಳ ಮುಂಭಾಗದಲ್ಲಿ ಮತ್ತು ಮಧ್ಯಭಾಗದಲ್ಲಿ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತದೆ.

ಧ್ವನಿಯು ಬಹಳ ಒರಟಾಗಿ, ಗಡುಸಾಗಿ, ಕೆಳಸ್ವರವಾಗಿ ಮತ್ತು ಉಸಿರಾಟದ ಧ್ವನಿಯಿಂದ ಕೂಡಿರುತ್ತದೆ.

ಧ್ವನಿಯ ವ್ಯಾಪ್ತಿ ಕೂಡ ಕಡಿಮೆಯಾಗುತ್ತದೆ.

ಧ್ವನಿಯನ್ನು ಹೆಚ್ಚು ಬಳಸುತ್ತಿದ್ದಂತೆ ಹಾಳಾಗುತ್ತದೆ.

ಧ್ವನಿಯನ್ನು ಮಿತಿ ಮೀರಿ ಬಳಸಿದಾಗ ಈ ತೊಂದರೆ ಉಂಟಾಗುತ್ತದೆ.



<https://www.youtube.com/watch?v=K83C68j-aw>

## ವೋಕಲ್ ಪಾಲಿಪ್

ಧ್ವನಿ ತಂತಿಯ ಪೂರ ಮೇಲೆ ಅಸಹಜವಾಗಿ ಪಾಲಿಪ್ ಬೆಳೆದಿರುತ್ತವೆ.

ಸಹಜವಾಗಿ ಧ್ವನಿ ತಂತಿಯ ಮೇಲೆ ಸಂಪೂರ್ಣವಾಗಿ ಬೆಳೆದಿರುತ್ತವೆ.

ಧ್ವನಿಯು ಗಡುಸಾಗಿ, ಉಸಿರಾಟದ ಧ್ವನಿಯಾಗಿ ಕಮ್ಮಿ ಶ್ವಿತಿಯಾಗಿ ಬದಲಾಗುತ್ತದೆ.

ಧ್ವನಿ ಬಳಕೆ ಮಾಡುತ್ತಿದ್ದಂತೆ ಹೆಚ್ಚು ಹಾಳಾಗುತ್ತದೆ.

ಧ್ವನಿಯನ್ನು ಅವಶ್ಯಕತೆಗಿಂತ ಹೆಚ್ಚು ಬಳಸಿದಾಗ ಈ ತೊಂದರೆ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತದೆ.



<https://www.youtube.com/watch?v=nMu2kg3Bk5M>

## ಧ್ವನಿ ಪೆಟ್ಟಿಗೆಯ ಸಂಪರ್ಕ ಹುಣ್ಣುಗಳು:

ಸಾಮಾನ್ಯವಾಗಿ ಇವು ಧ್ವನಿ ತಂತಿಗಳ ಹಿಂಭಾಗದಲ್ಲಿ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತವೆ.

ಈ ಸಮಸ್ಯೆಯಿಂದ ಕೀರಲು ಧ್ವನಿ, ಶ್ವಮದಾಯಕ ಪೋನ್‌ನೇಷನ್, ಧ್ವನಿಯ ಶ್ರುತಿ ಕಡಮೆಯಾಗುವುದು, ಒರಟು ಧ್ವನಿ ಮುಂತಾದವುಗಳು ಉಂಟಾಗುತ್ತವೆ.



## ಧ್ವನಿತಂತಿಗಳ ಪಾರ್ಶ್ವ ವಾಯು /ಪ್ಯಾರಲಿಸಿಸ್ :

ನರಗಳಿಗೆ ಹಾನಿಯಾದಾಗ, ಧ್ವನಿತಂತಿಗಳ ಚಲನೆಗಳು ಅನುಪಸ್ಥಿತಿಯಿಂದ ಕೂಡಿರುತ್ತದೆ.

ಧ್ವನಿತಂತಿಗಳ ಪಾರ್ಶ್ವ ವಾಯು

ಪಾರ್ಶ್ವವಾಯುವಿನ ವಿಧಾನಗಳು:

ಏಕಪಕ್ಷೀಯ ಪಾರ್ಶ್ವವಾಯು

ದ್ವಿಪಕ್ಷೀಯ ಪಾರ್ಶ್ವವಾಯು

ಒಂದು ಧ್ವನಿತಂತಿ ಸಮಸ್ಯೆಗಳಾಗಿರುತ್ತದೆ.

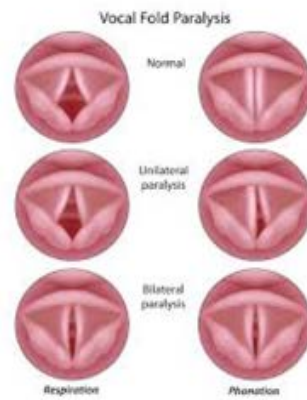
ಎರಡು ಧ್ವನಿತಂತಿಗಳು ಸಮಸ್ಯೆಗಳಾಗಿರುತ್ತವೆ.

### ಏಕಪಕ್ಷೀಯ ಪಾರ್ಶ್ವವಾಯು

ಉಸಿರಾಟದ ಧ್ವನಿ,  
ಪಿಸುಗುಡುವ ಧ್ವನಿ,  
ಸ್ವರದಲ್ಲಿ ನಡುಕ, ಮುಂತಾದವುಗಳು.

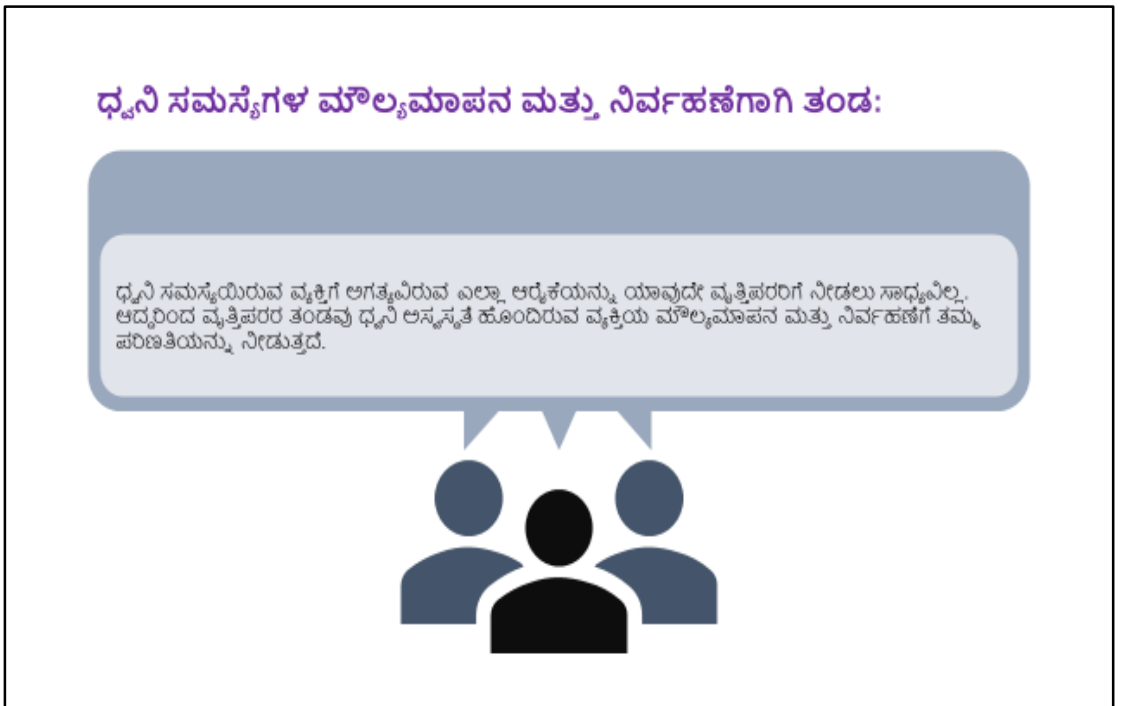
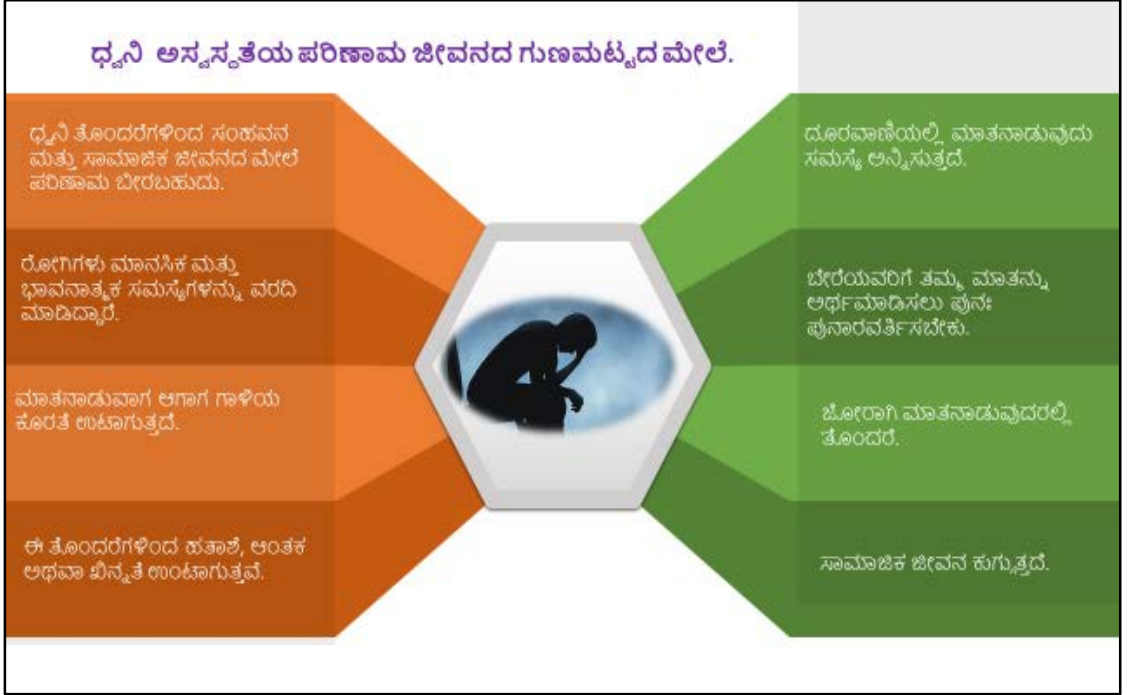
### ದ್ವಿಪಕ್ಷೀಯ ಪಾರ್ಶ್ವವಾಯು

ಧ್ವನಿತಂತಿಗಳ ವ್ಯಾಪಕ ಅಂತರದಿಂದ ಧ್ವನಿ ಪಿಸುಗುಡುವಂತಾಗುತ್ತದೆ.  
ಜೋರಾಗಿ ಮಾತನಾಡುವ ಸಾಮರ್ಥ್ಯ ಕಡಿಮೆಯಾಗುತ್ತದೆ.



<https://www.youtube.com/watch?v=8GI1WKRA9yE>









ಭಾಷೆ, ಅರಿವಿನ ಸಂವಹನ, ಧ್ವನಿ ನಿರರ್ಗಳತೆ ಮತ್ತು ನುಂಗುವ ಅಸ್ಪಷ್ಟತೆಗಳನ್ನು ಮಾತು ಮತ್ತು ಭಾಷಾ ತಜ್ಞರು (ಎಸ್‌ಎಲ್‌ಪಿ) ರೋಗನಿರ್ಣಯ ಮಾಡಿ ಚಿಕಿತ್ಸೆ ನೀಡಿ ಸಹಾಯ ಮಾಡುತ್ತಾರೆ.

ಶ್ರವಣೇಂದ್ರಿಯ- ಗ್ರಹಿಕೆ ಮೌಲ್ಯಮಾಪನ, ಆಕೌಸ್ಟಿಕ್ ಮತ್ತು ವಾಯುಬಲವೈಜ್ಞಾನಿಕ ವಿಧಾನಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಎಸ್‌ಎಲ್‌ಪಿ ಕ್ಷಂಟನ ಧ್ವನಿಯನ್ನು ನಿರ್ಣಯಿಸುತ್ತಾರೆ.

( ಎಸ್‌ಎಲ್‌ಪಿ ) ಮಾತು ಮತ್ತು ಭಾಷಾ ತಜ್ಞರುಗಳು ಧ್ವನಿಯನ್ನು ಸೂಕ್ತ ಸಮಯದಲ್ಲಿ ಪರಿಶ್ಲೇಷಣೆ ಮಾಡಲು ನೆರವಾಗುತ್ತಾರೆ.





ಧ್ವನಿ ತೊಂದರೆಯನ್ನು ನಿವಾರಿಸಲು ಓಟೋಲೋಗಿಸ್ಟ್‌ರೊಂದಿಗೆ ಸಮಾಜ ಸೇವಕರು, ಉಸಿರಾಟದ ಚಿಕಿತ್ಸಕರು, ಗ್ಯಾಸ್‌ಟ್ರೋಎಂಟರಾಲಜಿಸ್ಟ್, ಸೈಕೋಲೊಜಿಸ್ಟ್, ಭೌತಚಿಕಿತ್ಸಕ ಮತ್ತು ತೆ ದ್ಯೋಗಿಕ ಚಿಕಿತ್ಸಕರಂತಹ ವೃತ್ತಿಪರರು ಬಹಳ ಅವಶ್ಯಕ.

ಈ ತಂಡವನ್ನು ಯಾವಾಗಲೂ ಓಟೋರಿನೋಲರಿಂಗೊಲಿಸ್ಟ್ ಅಥವಾ ಮಾತು, ಭಾಷಾ ತಜ್ಞರು ಮುನ್ನಡೆಸುತ್ತಾರೆ.

ಈ ರೀತಿಯ ಮಲ್ಟಿಡಿಸಿಪ್ಲಿನರಿ ತಂಡದ ವಿಧಾನವು ವ್ಯಕ್ತಿಯ ಧ್ವನಿ ಸಮಸ್ಯೆಗಳಿಗೆ ಉತ್ತಮವಾದ ಆರೈಕೆಯನ್ನು ಪಡೆಯುವಂತೆ ಬಾಹ್ಯಗೊಳಿಸುತ್ತದೆ.

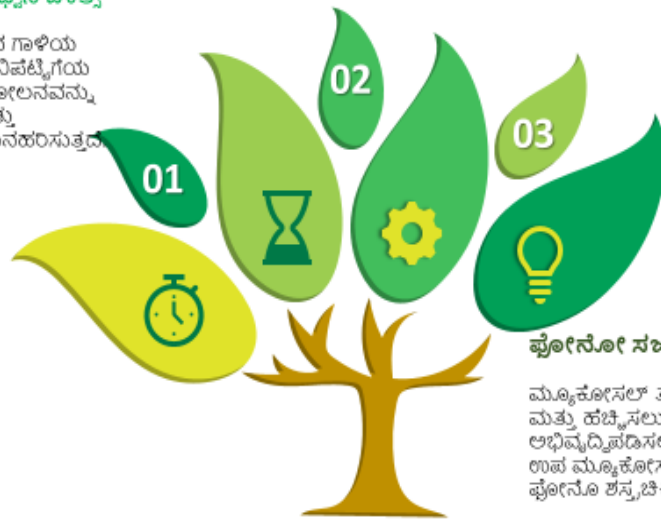
## ಧ್ವನಿ ಅಸ್ವಸ್ವತೆಗಳ ನಿರ್ವಹಣೆ:

- 01 ಆರೋಗ್ಯಕರ ಧ್ವನಿ ವಿಧಾನಗಳು
- 02 ರೋಗಲಕ್ಷಣದ ಧ್ವನಿ ಚಿಕಿತ್ಸೆಗಳು .
- 03 ಸ್ಕೋಪೋಜಿನ್‌ಕ್ ಧ್ವನಿ ಚಿಕಿತ್ಸೆ - ಧ್ವನಿ ಅಸ್ವಸ್ವತೆಗೆ ಕಾರಣವಾದ ಮತ್ತು ರೋಗಿಯ ಭಾವನಾತ್ಮಕ ಮಾನಸಿಕ ಸ್ಥಿತಿಯ ಮೇಲೆ ಕೇಂದ್ರೀಕರಿಸುತ್ತದೆ.



## ಶರೀರ ವಿಜ್ಞಾನದ ಧ್ವನಿ ಚಿಕಿತ್ಸೆ -

ಧ್ವನಿಗೆ ಬೆಂಬಲಿಸುವ ಗಾಳಿಯ ಹರಿವಿಗೆ ಹಾಗೂ ಧ್ವನಿಪೆಟ್ಟಿಗೆಯ ಸ್ವಾಯುಗಳ ಸಮತೋಲನವನ್ನು ಮಾರ್ಪಡಿಸುವ ಮತ್ತು ಸುಧಾರಿಸುವತ್ತ ಗಮನಹರಿಸುತ್ತದೆ.

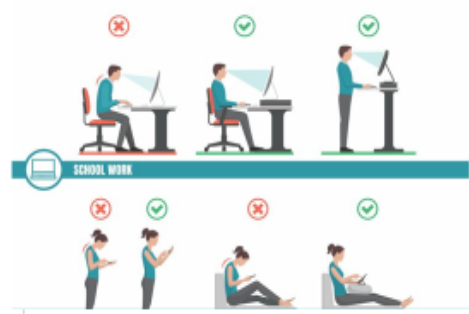


## ಫೋನೋ ಸರ್ಜರಿ:

ಮ್ಯೂಕೋಸಲ್ ತರಂಗವನ್ನು ಸಂರಕ್ಷಿಸಲು ಮತ್ತು ಹೆಚ್ಚಿಸಲು ಇದನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸಲಾಗಿದೆ. ಮ್ಯೂಕೋಸಲ್ ಅಥವಾ ಉಪ ಮ್ಯೂಕೋಸಲ್ ಕಾಯಿಲೆ ಪ್ರತಿಕ್ರಿಯಾತ್ಮಕ ಫೋನೋ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಯನ್ನು ಸೂಚಿಸಲಾಗುತ್ತದೆ.

## ಧ್ವನಿಯ ಮೇಲೆ ದೇಹದ ಭಂಗಿಯ ಪರಿಣಾಮ

ನಿಮ್ಮ ಬೆನ್ನು  
ಮೂಳೆಯನ್ನು  
ಸುರುಳಿಯಾಗಿ ಮತ್ತು  
ಭುಜಗಳನ್ನು ಮುಂದಕ್ಕೆ  
ಚಲಿಸಿದಾಗ, ಶ್ವಾಸಕೋಶವು  
ಸಂಕುಚಿತಗೊಳ್ಳುತ್ತದೆ.



ಓರೆಯಾದ ಅಥವಾ  
ತಿರುಚಿದ ಭಂಗಿಯು  
ಉಸಿರಾಟ ಮತ್ತು  
ಧ್ವನಿಯ ಮೇಲೆ  
ಪರಿಣಾಮ ಬೀರುತ್ತದೆ.

ಅಸಮನ್ವಯವಾದ ಬೆನ್ನು ಮೂಳೆಯ ಆಕಾರದಿಂದ ಉಸಿರಾಟದ  
ಕ್ರಿಯೆಗೆ ಮತ್ತು ಮಾಸ್ಕೂಲೋ ಸ್ಕೆಲೆಟಲ್ ವ್ಯವಸ್ಥೆಯ ಮೇಲೆ  
ದೀರ್ಘಕಾಲೀನ ಪರಿಣಾಮಗಳನ್ನು ಬೀರುತ್ತವೆ.



## ಆರೋಗ್ಯಕರ ಧ್ವನಿ ವಿಧಾನಗಳು:



ದಿನಕ್ಕೆ 6 ರಿಂದ 7 ಗ್ಲಾಸ್ ನೀರು ಸೇವಿಸಿ.



ನಿಮ್ಮ ಧ್ವನಿ ಮಟ್ಟವನ್ನು ಅರಿತು, ಅದರಲ್ಲಿ ಮಾತನಾಡಲು ಪ್ರಯತ್ನಿಸಿ.



ದಿನನಿತ್ಯ ದೀರ್ಘ ಉಸಿರಾಟ ವ್ಯಾಯಾಮ ಮಾಡಿ.



ದೀರ್ಘವಾಗಿ ತರಗತಿಯಲ್ಲಿ ಭೋದಿಸುವಾಗ ನೀರಿನ ಬಾಟಲಿಯನ್ನು ಸದಾ ಇಟ್ಟುಕೊಳ್ಳಿ.



ತರಗತಿ, ಶಾಲೆಯಲ್ಲಿ ಅತಿ ಹೆಚ್ಚಿನ ಕೇಳುಗರು ಇದ್ದಾಗ ಧ್ವನಿವರ್ಧಕಗಳನ್ನು ಉಪಯೋಗಿಸಿ.



ಸುತ್ತಲೂ ಗದ್ದಲ ಇದ್ದಾಗ ಜೋರಾಗಿ ಫೋನಿನಲ್ಲಿ ಮಾತನಾಡಬಾರದು.



ಅನೇಕ ಪ್ರಾಣಿಗಳ, ವಾಹನಗಳ, ಪ್ರಸಿದ್ಧ ವ್ಯಕ್ತಿಗಳ ಅನುಕರಣೆಯನ್ನು ಮಾಡಬೇಡಿ, ಧ್ವನಿಯ ಗುಣಮಟ್ಟ ಕಡಿಮೆಯಾಗುತ್ತದೆ.



ನಿರಂತರವಾಗಿ ಗಂಟಲು ಸರಿಮಾಡಬಾರದು; ಇದು ಧ್ವನಿತಂತಿಗಳನ್ನು ಹಾನಿಮಾಡುತ್ತದೆ.





ಪಿಸುಗುಡುವುದನ್ನು ಮಾಡಬಾರದು;  
ಇದು ಧ್ವನಿತಂತಿಗಳಲ್ಲಿ ಹೆಚ್ಚು ಒತ್ತಡ  
ಉಂಟುಮಾಡುತ್ತದೆ.



ಕಿರುಚುವುದು, ಜೋರಾಗಿ  
ಮಾತನಾಡುವುದರಿಂದಲೂ ಸಹಾ ಧ್ವನಿ  
ತಂತಿಗಳಲ್ಲಿ ಒತ್ತಡ ಉಂಟಾಗುತ್ತದೆ.



ಭಾರವಾದ ವಸ್ತುವನ್ನು  
ಹೇರುವಾಗ ಮತ್ತು ವ್ಯಾಯಾಮ  
ಮಾಡುವಾಗ  
ಮಾತನಾಡಬಾರದು.



ಕಾಫೀ, ಟೀ ಇವುಗಳನ್ನು ಹೆಚ್ಚು  
ಸೇವಿಸಬಾರದು.



ತಂಪು ತಿಂಡಿ- ತಿನಿಸುಗಳನ್ನು ಹೆಚ್ಚು ಸೇವಿಸಬಾರದು.



ಅತೀ ಬಿಸಿಯಾದ ಪದಾರ್ಥಗಳನ್ನು ಹೆಚ್ಚು ಸೇವಿಸಬಾರದು.



ಧೂಮಾಪಾನ ಮತ್ತು ಮದ್ಯಪಾನ ಮಾಡಬಾರದು.



ಸಿಟ್ರಿಕ್ ಪಾನೀಯಗಳನ್ನು ಸೇವಿಸಬಹುದು.





ಹರ್ಬಲ್ ಟೀ ಆರೋಗ್ಯಕರ ಧ್ವನಿಗೆ ಅವಶ್ಯಕ.



ನಿಧಾನವಾಗಿ ಮಾತನಾಡಿ.

ನಿಮ್ಮ ಧ್ವನಿಯನ್ನು ನೀವು ಹೊಂದಿರುವಾಗ, ನಿಮ್ಮ ಶಕ್ತಿಯನ್ನು ನೀವು ಹೊಂದಿದ್ದೀರಿ ಎಂದರ್ಥ

