

Paediatric vocal fold nodules: management strategies to restore normal phonation—Speech-Language Pathologists perspective: A cross-sectional survey

Mariya Iqbal¹, Nazia Mumtaz², Ghulam Saqulain³, Nayab Iftikhar⁴

Abstract

Vocal fold nodules are benign vocal cord lesions which develop in voice abusers, including children, though chronic cough, sinusitis, and reflux may also be the causative agents. Since low or no-evidence treatment strategies, like the boone technique, are in use in paediatrics, this study was conducted to determine the treatment strategies used by speech-language pathologists in paediatric vocal fold nodules using a cross-sectional survey at Riphah International University, Lahore, from October 2016 to May 2017. Sixty-five speech-language pathologists working with children in private clinics and multidisciplinary settings were recruited using purposive sampling. A self-structured questionnaire was used for data collection. Analysis using SPSS -18 revealed that a combination of voice therapy and vocal hygiene was the most favoured treatment used by 65 (100%) speech-language pathologists, followed by 58 (89.2%) who also favoured respiratory and relaxation exercises, and 56 (86.2%) who also included parental counselling. Hence, a combination of voice therapy and vocal hygiene is a good therapeutic technique being practiced by speech pathologists for the treatment of vocal nodules among paediatric population.

Keywords: Paediatric Population, Vocal Nodules, Vocal Hygiene, Voice Therapy.

DOI: <https://doi.org/10.47391/JPMA.4236>

Introduction

Vocal fold nodules (VFN) are non-neoplastic lesions at the junction of anterior and middle third of the vocal folds caused due to trauma associated with vocal abuse and many other conditions, including allergies, post-nasal drip, gastroesophageal reflux, chronic cough, and sinusitis.¹ Vocal nodules are commonly seen in singers, call centre

^{1,2}Department of Speech Language Pathology, Riphah International University, Lahore, Pakistan; ³Department of Otorhinolaryngology, Capital Hospital Post Graduate Medical Institute, Islamabad, Pakistan; ⁴ Department of Speech Language Pathology, Centre of Clinical Psychology, University of Punjab, Lahore, Pakistan.

Correspondence: Ghulam Saqulain. e-mail: ghulam_saqulain@yahoo.com

operators, teachers and even children due to crying, screaming, shouting, yelling, and imitating animal sounds. The predisposing factors include allergies, hearing impairment, upper respiratory tract infections, velopharyngeal insufficiency, environmental noise, attention deficit hyperactivity disorder, and having siblings since it results in over use of loud voice at home.² The symptoms usually evolve over a year with dysphonic voice characteristics of being hoarse, breathy, low pitch and vocal fatigue.¹

Dysphonia in children is common with a prevalence of 6% below the age of 14 years with vocal nodules being the most common cause (22%).³ Common differential diagnosis of VFN are organo-functional pathologies, including polyps and Reinke's oedema.¹ The paediatric VFNs still lack standardised treatment, hence the treatment is extrapolated from work done with adult patients. The options include voice therapy and surgery, surgery alone, voice therapy alone or no treatment. Vocal hygiene as well as voice therapy are the essentially required conservative measures; however, in very few cases surgery is mandated.⁴ Therapy techniques include direct voice therapy to modify vocal attitudes for a healthy voice, while indirect voice therapies modify the cognitive, psychological, behavioural and physical environment, including the patient's education, good vocal hygiene techniques and counselling. With low or no-evidence strategies like boone's technique⁵ of voice therapy being used in paediatrics, research is required⁶ to develop techniques, including tailored, evidence-based treatment strategies.⁷ Henceforth, need for research to appreciate the SLP's use of voice therapy strategies in patients with vocal nodules is vouched, since this has significant importance due to high prevalence of dysphonic children with nodules and a dearth of local literature. It will help to highlight the voice therapy treatment strategies for vocal fold nodules, and assisting the practitioners in the selection of therapies for their patients. Hence, this study was conducted with the objective to determine the treatment strategies used by speech-language pathologists in paediatric vocal fold nodules.

Patients/Methods and Results

This cross-sectional study, using purposive sampling, recruited a sample of 65 speech-language pathologists (SLPs) practicing with paediatric population for at least one year in clinics and multidisciplinary settings with no age and gender limitation. The study was conducted at the Riphah International University, Lahore, over a period of eight months—from October 1, 2016 to May 31, 2017. A sample size of 65 was calculated using the on-line calculator for one proportion cross-sectional studies.⁸

The study was initiated after obtaining ethical approval from the Ethical Review Committee of the Riphah International University, Lahore, vide registration number REC/RCRS/16/1050 dated September 10, 2016.

A self-structured questionnaire with 15 statements, was developed using literature review and expert opinion. Screening items were pretested for content adequacy which provided for construct validity by allowing deletion of conceptually inconsistent items. The questionnaire was piloted and reviewed by experts in the field for construct validity.

SPSS Version 18 was used to analyse the data. Descriptive statistics were utilised and Chi-square was used to see the associations of responses with qualification of SLPs. Demographics (Figure) reveal that most 62(95.4%) SLPs were between 22 and 30 years of age, and 57(87.7%) were females. Most 30(46.2%) were holders of master’s degree, out of whom 25(38.5%) had an experience of 0-1 year. The study revealed that a combination of voice therapy and

vocal hygiene was most favoured, agreed upon by all the 65(100%) SLPs and followed by 58(89.2%) who also favoured the view that respiratory and relaxation exercises are good; responses revealed significant association with qualification (Table). Of the total, 56(86.2%) SLPs were also of the view that parental counselling was necessary. According to 56 SLPs soft glottal attack was a direct technique and widely used, 52(80%) SLPs were of the opinion that vocal hygiene and educational programme was an indirect technique and necessary. While 52(80%) SLPs agreed that Yawn sign was a direct technique and is the top management option for children with vocal nodules, and SLP’s response showed significant association with qualification.

Discussion

A number of voice therapy strategies are in use, with lack of evidence and pros and cons of their own.⁹ However, voice therapy is a valid option¹⁰ and results in improvement in perceived quality of voice¹¹ with failure cases requiring surgical intervention.⁴

With hard glottal attack seen quite frequently with bilateral VFNs,¹² the current study revealed that in the opinion of 86.2% SLPs soft glottal attack was widely used in treating VFNs in children, since in soft glottal attack vocal cords are less tense, reducing phono-trauma & VFNs.¹ Chant talk was also noted to be a good strategy & 86.2% SLPs agree with this because it is known to remove vocal fatigue.¹ Most (66.2%) SLPs favour open mouth approach as the best management strategy, since it also causes relaxation and helps to manage VFNs. It is helpful in mass adjustments

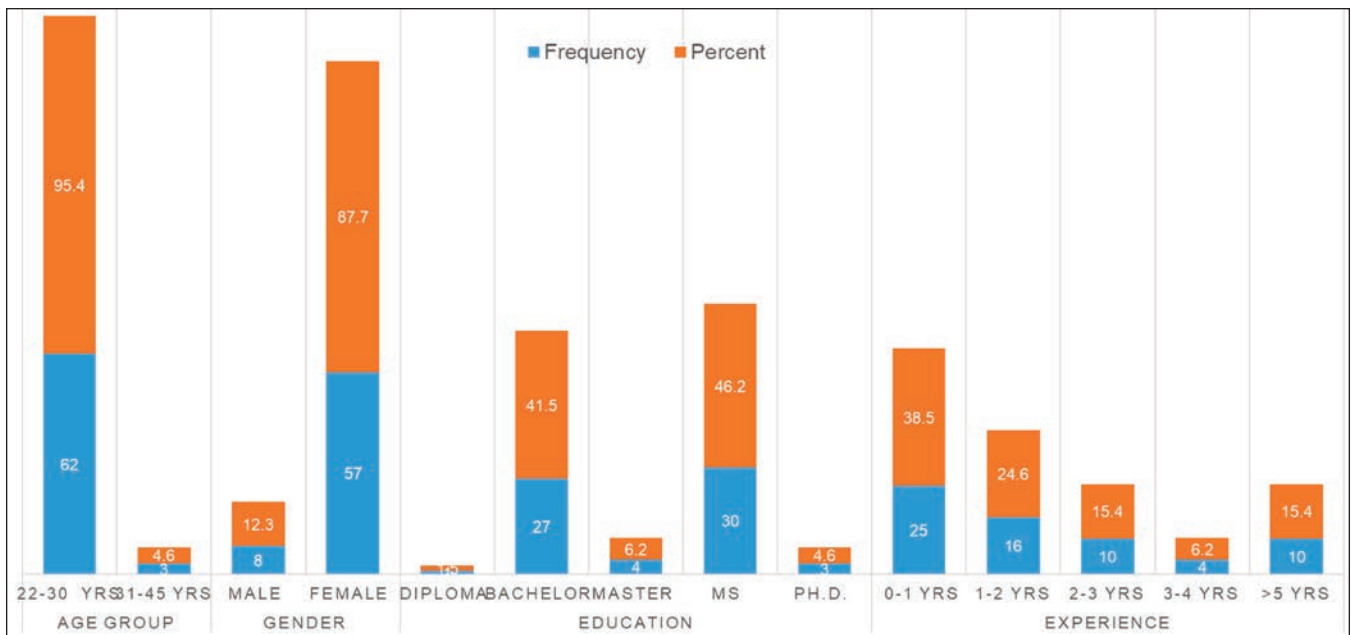


Figure: Demographic characteristics of speech and language pathologists (n=65).

resulting in optimum vocal cord approximation, thus helping to deal with the problem of pitch, quality, and loudness of voice.¹³

Vocal hygiene and education programme is essentially

required as it is a major part of the management plan of VFNs.¹⁴ Hence, in the current study, 80% SLPs agreed to this. Similarly, the result of the current study shows that 80% SLPs established that yawn sigh technique was a useful behavioural technique to deal with hypofunction of

Table: Management of vocal fold nodules, Questions with response distribution * Qualification of SLP's. Cross Tabulation with Chi-Square Association. (n=65).

Question Statement	Response	Qualification of speech- language pathologist					Total n (%)	x ² p-value
		Diploma	Bachelors	Masters	MS	Ph.D.		
Soft glottal attack is direct technique of voice therapy that is used widely in treating vocal fold nodule in children.	Agree	1	20	4	28	3	56 (86.2)	0.547
	Neutral	0	4	0	2	0	6 (9.2)	
	Disagree	0	3	0	0	0	3 (4.6)	
Chant talk is direct technique of voice therapy that is good strategy for treating vocal fold nodules in paediatric population.	Agree	1	12	4	22	2	41 (63.1)	0.241
	Neutral	0	15	0	7	1	23 (35.4)	
	Disagree	0	0	0	1	0	1 (1.5)	
Open mouth approach is direct technique of voice therapy that is considering to be best management strategy.	Agree	1	21	2	17	2	43 (66.2)	0.714
	Neutral	0	6	2	11	1	20 (30.8)	
	Disagree	0	0	0	2	0	2 (3.1)	
Vocal hygiene and educational programme is indirect technique of voice therapy necessary in treating children with vocal fold nodules.	Agree	1	17	4	27	3	52 (80)	0.144
	Neutral	0	1	0	2	0	3 (4.6)	
	Disagree	0	9	0	1	0	10 (15.4)	
Yawn sigh is direct technique of voice therapy that is top management for children with vocal fold nodules.	Agree	1	20	3	26	2	52 (80)	0.012
	Neutral	0	7	1	4	1	13 (20)	
	Disagree	0	0	0	0	0	-	
Respiratory and relaxation exercises are good for managing vocal fold nodules.	Agree	1	25	2	28	2	58 (89.2)	0.012
	Neutral	0	2	1	2	1	6 (9.2)	
	Disagree	0	0	1	0	0	1 (1.5)	
Resonant voice therapy is direct technique that is suggestively not worthy for treating vocal fold nodules.	Agree	1	9	4	16	2	32 (49.2)	0.091
	Neutral	0	16	0	9	0	25 (38.5)	
	Disagree	0	2	0	5	1	8 (12.3)	
Confidential voice therapy is direct technique that cannot be used for handling kids with vocal fold nodules.	Agree	1	19	3	16	2	41 (63.1)	0.616
	Neutral	0	7	1	10	0	18 (27.7)	
	Disagree	0	1	0	4	1	6 (9.2)	
Environmental manipulation is indirect technique of voice therapy that can be done for improvement in vocal quality.	Agree	1	18	4	27	3	53 (81.5)	0.504
	Neutral	0	5	0	2	0	7 (10.8)	
	Disagree	0	4	0	1	0	5 (7.7)	
Parental counselling is also necessary for managing vocal fold nodules in children.	Agree	1	21	4	27	3	56 (86.2)	0.699
	Neutral	0	6	0	2	0	8 (12.3)	
	Disagree	0	0	0	1	0	1 (1.5)	
Combination of voice therapy and vocal hygiene is the finest ever treatment.	Agree	1	27	4	30	3	65 (100)	
Surgery is mandatory for treating vocal fold nodules in children.	Agree	1	16	1	9	2	29 (44.5)	0.174
	Neutral	0	6	1	4	0	11 (16.9)	
	Disagree	0	5	2	17	1	25 (38.5)	
Surgery only is considered the best management of vocal fold nodules in children.	Agree	1	10	0	2	0	13 (20)	0.004
	Neutral	0	9	2	5	2	18 (27.7%)	
	Disagree	0	8	2	23	1	34 (52.3%)	
Combination of surgery and voice therapy is the best treatment of vocal fold nodules in children.	Agree	1	13	1	17	2	34 (52.3%)	0.807
	Neutral	0	8	1	8	1	18 (27.7%)	
	Disagree	0	6	2	5	0	13 (20%)	
No treatment is mandatory for treating vocal fold nodules in children.	Agree	1	2	0	4	0	7 (10.8%)	0.154
	Neutral	0	8	1	7	2	18 (27.7%)	
	Disagree	0	17	3	19	1	40 (61.5%)	

the larynx by increasing the supply of air and relaxing the larynx as described in literature,¹⁵ since it involves an inhalation with open mouth which is followed by a long open mouth sigh.¹³ Also, 89.2% SLPs were of the view that respiratory and relaxation exercises were good for treating VFN.

With moderate evidence of focusing resonant voice therapy in clinical practice¹⁶ in the current study, 49% SLPs agreed and 12.3% disagreed that resonant voice therapy is not a good treatment. Also, most (63.1%) SLPs stated that confidential voice therapy was not a good treatment strategy, perhaps indicating a lack of sufficient knowledge. In the present data, 81.5% SLPs agreed that environmental manipulation can be performed for improving voice quality, due to negative effects of environmental irritants.

In the current study, majority (86.2%) of SLPs favoured parental counselling since parental counselling has an important role. There was 100% agreement among SLPs that combination of voice therapy and vocal hygiene was the best treatment option, in conformity with the available literature.¹⁷

As regards surgery being mandatory for treatment of VFNs, the opinion of SLPs was quite divided, with 44.5% agreeing to it. However, things were clearer when in response to the statement that surgery alone was best for VFNs in children, majority (52.3%) disagreed.

Almost half of the sample, 52.3% agreed that combination of surgery and voice therapy is the best treatment and voice therapy can also reduce the chances of surgical intervention.⁴ A few SLPs agreed on giving no treatment for VFNs in children because children were not trained regarding how to use their voices safely. However, in reality this can only be done for children in whom nodules start regressing while the children are progressing into adolescence.¹⁸

Conclusion

The combination of vocal hygiene methods and voice therapy is the best treatment option for vocal fold nodules.

Limitations: The study had a small sample size, hence the results cannot be generalised.

Disclaimer: The article is part of MPhil (Speech-Language Pathology) Thesis.

Conflict of interest: None.

Funding disclosure: None.

References

1. Vasconcelos D, Gomes AOC, Araújo CMT. Vocal Fold Polyps: Literature Review. *Int Arch Otorhinolaryngol* 2019; 23: 116-24.
2. Tuzuner A, Demirci S, Oguz H, Ozcan KM. Pediatric Vocal Fold Nodule Aetiology: What Are Its Usual Causes in Children? *J Voice* 2017; 31: 506.e19-506.e23.
3. Rameshkumar E, Rosmi TK. Prevalence of age, gender and pathological conditions of vocal cords leading to hoarseness of voice in a tertiary care hospital. *Int J Adv Med* 2016; 3: 345-8
4. Yilmazer R, Köprücü Süzer G, Süoğlu Y. The efficacy of voice therapy in vocal cord nodules. *Tr-ENT* 2019; 29: 28-33
5. Boone DR, McFarlane SC. *The voice and voice therapy*. 5th ed. Englewood Cliffs, New Jersey: Prentice Hall. 1994; P 1-314.
6. Alegria R, Vaz Freitas S, Manso MC. Effectiveness of voice therapy in patients with vocal fold nodules: a systematic search and narrative review. *Eur Arch Otorhinolaryngol* 2020; 277: 2951-66.
7. Bohlender J. Diagnostic and therapeutic pitfalls in benign vocal fold diseases. *GMS Curr Top Otorhinolaryngol Head Neck Surg* 2013; 12: Doc01.
8. Lwanga SK, Lemeshow S, World Health Organization. *Sample size determination in health studies: a practical manual* / S. K. Lwanga and S. Lemeshow. World Health Organization; 1991
9. Gambalonga M, Brotto D, Favaretto N. Voice therapy in paediatric dysphonia. *Hear. Balance Commun* 2020; 18: 79-84.
10. Elmaghraby RM, Ras YAA, Elkarasky MM. Formulation of a program for treatment of childhood dysphonia. *Egypt J Otolaryngol* 2019; 35: 189-4.
11. Schindler A, Mozzanica F, Ginocchio D, Maruzzi P, Atac M, Ottaviani F. Vocal improvement after voice therapy in the treatment of benign vocal fold lesions. *Acta Otorhinolaryngol Ital.* 2012; 32: 304-8.
12. Andrade DF, Heuer R, Hockstein NE, Castro E, Spiegel JR, Sataloff RT. The frequency of hard glottal attacks in patients with muscle tension dysphonia, unilateral benign masses and bilateral benign masses. *J Voice* 2000; 14: 240-6.
13. Kosztyła-Hojna B, Moskal D, Łobaczuk-Sitnik A, Kraszewska A, Zdrojkowski M, Biszewska J, et al. Psychogenic voice disorders. *Otolaryngol Pol* 2018; 72: 26-34.
14. Hosoya M, Kobayashi R, Ishii T, Senarita M, Kuroda H, Misawa H, et al. Vocal Hygiene Education Programme Reduces Surgical Interventions for Benign Vocal Fold Lesions: A Randomised Controlled Trial. *Laryngoscope* 2018; 128: 2593-9.
15. Marquardt T. Yawn-Sigh Technique. In: Damico JS, Ball MJ, Editors. *The SAGE Encyclopaedia of Human Communication Sciences and Disorders*. Thousand Oaks, CA: SAGE Publications, Inc. 2019; p. 2131-2132.
16. Yiu EM, Lo MC, Barrett EA. A systematic review of resonant voice therapy. *Int J Speech Lang Pathol* 2017; 19: 17-29.
17. Liu H, Chen SH, Gao L, Li J, Liu B, Raj H, et al. Comparison Between Combination of Resonant Voice Therapy and Vocal Hygiene Education and Vocal Hygiene Education Only for Female Elementary School Teachers. *J Voice*. 2020; S0892-1997(20)30372-6.
18. Martins RHG, Branco A, Tavares ELM, Gramuglia ACJ. Clinical Practice: Vocal nodules in dysphonic children. *Eur J Paediatr* 2013; 172: 1161-5.