Paper6

by

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Exploring voice related symptoms in children

Abstract

Introduction: Dysphonia in children are cause for significant educational and psychosocial impacts and thus early identification can improve the quality of life in children. Thus, aim of the study was to explore whether paediatric voice symptom questionnaire (PVSQ) can be utilised for eliciting early voice-related complaints by school- going children.

Methods: Participants were 36 children within the age range of 5 to 13 years; among which 20 were males and 16 females and their parents. A basic case history form was used to collect the demographic details of the participants. For administration in children questionnaire (PVSQ) is used orally and responses were noted. In parallel parents were asked to fill the questionnaire.

Results & discussion: Sensitivity & specificity was analysed statistically to know of how effectively children could report voice-related symptoms. Higher sensitivity (<75%) in all the three domains is suggestive of children could report voice-related complaints from the age of 5 years. Spearman's rank correlation & Kappa coefficient were used to compare the child's voice-related complaints to that of parents. A significant positive correlation ($p<0.001$) was obtained for the domains physical & functional. The results show that children were capable of making a subjective & autonomous evaluation of their voice by the age of 5 years. This pilot study shows that PVSQ can be used as a screening tool to early identify school going children who exhibit voice-related symptoms.

Keywords: PVSQ, screening, dysphonia

Exploring voice related symptoms in children

Background

The voice is the most peculiar form of human communication, with major impacts in social relation. Dysphonia refers to an alteration in voice quality. Varying data of prevalence of childhood dysphonia are found in the literature, ranging from 0.12% to 24%.{P. Carding, S. Roulstone, K. Northstone, 2005; M.C. Duff, A. Proctor, E. Yairi (2003); M.A. Kiliç, E. Okur, I., Yildrim, S. Güzelsoy (2003); D.H. McKinnon, S. McLeod, S. Reilly (2007).}. The causes of dysphonia can be classified into organic and functional; and the causes can range from structural damage to the structures of larynx to some type of psychogenic component and/or misuse of voice. The most common causes for voice related disorders in children is often found 8to be associated with speaking loudly and at a fast rate, continuingly (i.e., with no pauses) and during extended periods of time, and imitating animal sounds (Dias M R., Pedrosa, C S, 2013).This in turn leads to experiencing difficulties in communicating or in engaging with their peers (Aronson, 1973; Roy et al, 2007) as well as in making themselves heard and understood in contexts of socialisation (Connor et al, 2008). Psychological profiles have shown that children affected by dysphonia show personality-wise, noticeable traits of anxiety, fluctuating aggressiveness, lack of self-control, weak socialization abilities a pronounced dependency on others, a poor relation with their parents, and a marked immaturity. Many studies have also reported several effect on the listener's perception of the child due to dysphonia which includes getting judged more negatively with regard to their physical appearance, their personality, and their cognitive skills by peers and adolescent. Listeners' perception of voice thus can have adverse educational and psychosocial implications for the child. Hence, it becomes valuable to early identify dysphonia in children and propose adequate management and thereby improving their quality of life.

The belief that children with dysphonia are either unaware or not bothered about their voice disorders was challenged by the findings of Connor et al (2008) which revealed that children aged 5-13 years were aware and could express their voice related concerns. Subjective evaluation of the voice by the patient which is routinely assessed in the adult dysphonic population is, however, not included in the evaluation of paediatric population, even though if it is elicited, several questionnaires that uses only parental proxies are being used.

Paediatric voice symptom questionnaire (PVSQ) is a double form questionnaire for dysphonic children and their parents and has been proved as a valid & reliable instrument for auto-evaluation of dysphonia in child population (Ingrid, Dominique, Marc, 2011). Since children can be a source of information for assessing the subjective impact of dysphonia and when combining child and parental proxy, clinician could obtain different perspectives related to dysphonia which can be useful in holistic therapeutic management.

The aim of the study was to explore whether paediatric voice symptom questionnaire (PVSQ) can be utilized for eliciting voice-related complaints by school- going children. This was accomplished by two objectives

To study the ability of school going children to express the voice-related complaints using child version of PVSQ

To compare the children's voice-related complaints with those of their parents using the parent & child version of PVSQ

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Materials and methods

Participants:

Participants were 36 children within the age range of 5 to 13 years (mean age is 8.5 years); among which 20 were boys and 16 girls and their mothers. Details of the study was explained to the parents and an informed consent form was signed. These children were randomly selected based on their age.

Tool:

Paediatric voice symptom questionnaire which is a double form questionnaire contains a child version to be answered by children and a parental version to be answered by the parents. Each version contains 19 items (for each form) which explains different voice-related symptoms. And four item have four subsections which assess the voice problems in various conditions and the responses are rated on a 4 point scale (0=never, 1=sometimes, 2=often, 3=always). For the children, answer options were presented both verbally and as symbols of small to large circles: each circle represents never, sometimes, often, always according to their sizes. It is rated on 4 point scale.

Procedure:

The demographic details of the participants in the study were collected using a basic case history form (appendix 1) which also contained information regarding their medical history, food habits, and extracurricular activities.

First, parents were explained about the relevance of the questionnaire and vocal misuse patterns usually seen in school – going children. Parents were asked to rate the questionnaire on

4point rating scale by self. For administration in children questionnaire (PVSQ) is used orally and in parallel, child's parent was asked to fill in the parent form of the PVSQ at home.

Statistical analysis

	Physical domain	Functional domain	Emotional domain

Data was entered in Microsoft excel and statistical analysis was performed using SPSS version 16.0 .The data were described by mean, Standard Deviation (sd) minimum and maximum. Relationship between parental version and child version were assessed by spearman correlation. Measure of kappa coefficient was also found out to confirm the correlation. Scatter diagram was used to identify the relation between the two versions.

Results

The questions were categorised into physical, functional, and emotional aspects based on what each question intends to elicit. The questions aiming physical illness of children due to voice problem were categorised under "physical", those aiming on functional use such as misuse or abuse of voice by children were categorised under "functional", and those aiming at emotional or psychological feelings of children were categorised under "emotional" domains.

Table 1 describes the mean, standard deviation, minimum and maximum of scores obtained in parental version and child version in physical, emotional, and functional domains.

	Parental version	Child version	Parental version	child version	Parental version	Child version
Mean	10.1	9.7	1.8	1.6	5.3	2.0
Minimum	0	0	0	0	0	0
Maximum	100	58	7.0	7.0	24.0	17.0
Standard deviation	21.6	16.0	1.7	1.9	5.8	3.0

As shown in the Table 1, the mean value do not differ much in the parental and child version for physical domain (parental version=10.1, child version=9.7 with a standard deviation (parental version=21.6, child version=16.0)), and for function domain (parental version=1.6, child version=1.6 with a standard deviation (parental version=1.7, child version=1.9)) . Thus these values reveal that children are able to report their voice related problem as that of parents in terms of physical and functional aspects.

In emotional domain the mean value (parental version=5.3, child version=2.0) and standard deviation (parental version=5.8, child version=3.0) of both version are not comparable. This indicates that children were able to correctly trace their emotional problem but the parents couldn't.

To find out the agreement between parental and child version, Kappa coefficient was done. Sensitivity and specificity was also calculated to found out how much of reliability is there between parental version and child version. As depicted in table 2,kappa coefficient shows a positive agreement in all domains between parental and child version. This is further proven by

the results of Spearman correlation as shown in table 3. Higher sensitivity (<75%) in all the three domains is suggestive of children could report voice-related complaints from the age of 5 years.

Table 2 shows the Kappa agreement scores, sensitivity and specificity between parental and child version on the three domains

Domain	Kappa coefficient	Sensitivity	Specificity
Physical	0.3	96.2%	33.3%
Functional	0.3	76.0%	63.6%
Emotional	0.1	75.0%	45.0%

Table 3 shows the Spearman correlation between parental and child version on the 3 domains

Domain	r value
Physical	0.5
Functional	0.5
Emotional	0.1

P<0.001

In each domain the Spearman correlation r value less than 1 indicate that there is a positive correlation between parental and child version which is the sign of children are able to report their voice problems.

Discussion:

From this study it is found that there is a positive correlation between parental version and child version in both physical and functional domain. This shows that children with in the age group of 5 to 13 are capable of expressing their voice related symptoms by themselves in Indian context as well. In third domain which is emotional domain shows no positive relation between parental version and child version might be because emotional aspects are known only by the child. Thus our study suggest that children aged 5–13 years have the ability to express themselves about their voice; the children in our study were able to account for physical, emotional, and functional aspects of their voice. Studies in the literature support these findings. A study by Verduyckt and Remacle (2009) revealed that children aged 6–12 years have the ability to express themselves about their voice; whereas Roulstone and Carding (2005) proved that at 8 years of age children are able to report their voice related symptoms by self Henceforth this capability needs to be utilised in the subjective evaluation. Even though discordances are observed between the complaints expressed by the children and by their mothers, it is not to a large extent. Thus it can be concluded that PVSQ can be used as screening tool for early identification of voice related symptoms in school going children with in the age group of 5 to 13 years. Also this tool can be used for increasing awareness among parents about the voice related problems usually seen in school going children, to facilitate early identification of the laryngeal pathologies and warrant early intervention for better quality of life.

Conclusion:

The results show that children were capable of making a subjective & autonomous evaluation of their voice by the age of 5 years in Indian context. This pilot study shows that PVSQ can be used as a screening tool to early identify school going children who exhibit early

voice-related symptoms. However, further studies are warranted to document the efficacy of PVSQ for this purpose.

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Table 2

Appendix 1

Case history:

Name: Age/Sex: Class STD:

Use of Voice:

- ✓ At Home:

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- Loudly Speaking
- Rate of Speech
- Voice use when speaking with sibling
  - ✓ At School
  - ✓ Any Voice Training (if so ;)
- Type of voice training
- Years of training
- Duration of Practice per day (or; per week)
- Type of Music
- Any abuse or misuse (if so; specify the situation)
  - ✓ Professional voice user (if so; mention what type of user)

- ✓ MPD

|a|:- |i|:- |u|:-

Medical History

- ✓ Asthma or Allergy
- ✓ Frequent upper respiratory tract infection or ear infection
- ✓ Previous surgery or treatment
- ✓ Undergone any medication (if so; mention)
- ✓ Any other (Hyperactivity, speech and language delay, Hearing loss etc) if so; mention

Habits

- ✓ Food

- Diet
- Meal Time
- Sleeping Time

✓ Physical Activities (if so; years of training and practice duration)

- Yoga
- Swimming
- Sporting Events (mention what)
- Dancing
- Any Other (Sporting grunts)

✓ Dressing

294 ✓ Weight Lifting

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299 **Appendix 2: Paediatric Voice symptom questionnaire**

	Parental version Answer alternatives (Never, sometimes, often, always) Does it happen that your child :	Never	Sometimes	Often	Always	Total
1a	Has a tired voice when or after he/she (talks, play games, talks on the phone…)?					
1b	Has a tired voice when or after he/she (plays theatre, reads texts or poetry aloud,)?					
1c	Has a tired voice when or after he/she (sings solo, in a choir, karaoke,)?					
1d	Has a tired voice when or after he/she (has been at the scouts, played outside, did sports)?					
		Total item 1				
2	Is asked to repeat what he said, because of his/her voice?					

3	Has to push in order to bring out his voice?					
4	Is irritated because of his/her voice?					
5a	Is afraid of using his/her voice when he/she (talks, play games, talks on the phone,)?					
5b	Is afraid of using his/her voice when he/she (plays theatre, reads texts or poetry aloud,)?					
5c	Is afraid of using his/her voice when he/she (sings solo, in a choir, karaoke,)?					
5d	Is afraid of using his/her voice when he/she (has been at the scouts, played outside, did sports)?					
		Total item 5				0
6	Has to strain his/her voice to talk?					
7	Is made fun of because of his voice?					
8	Cannot speak because the sounds do not come out from his mouth?					
9	Is angry because of his/her voice?					
10	Is afraid of ruining					

	his/her voice?					
11a	Has a painful throat when he/she (talks, play games, talks on the phone,)?					
11b	Has a painful throat when he/she (plays theatre, reads texts or poetry aloud,)?					
11c	Has a painful throat when he/she(sings solo, in a choir, karaoké, …) ?					
11d	Has a painful throat when he/she(has been at the scouts, played outside, did sports) ?					
		Total item 11				
12	Is asked what is wrong with his/her voice ?					
13	Needs to cough or clear his/her throat when he/she is speaking, even when he/she is not ill ?					
14	Has a hoarce voice even when he/she is not ill ?					
15	Can not finish his sentences because of his/her voice ?					
16a	Needs to rest his/her voice when or after he/she (talks, play games, talks on the phone,…) ?					
16b	Needs to rest his/her voice when or afterhe/she (plays					

	theatre, reads texts or poetry aloud, …) ?					
16c	Needs to rest his/her voice when or afterhe/she (sings solo, in a choir, karaoké, …) ?					
16d	Needs to rest his/her voice when or afterhe/she (has been at the scouts, played outside, did sports) ?					
		Total item 16				
17	Has an itching throat even though he/she is not ill ?					
18	Is sad because of his/her voice ?					
19	Wishes that his/her voice would change ?					

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312 **Appendix 3**

Child version Answer alternatives (Never, sometimes, often, always) Does it happen that you :		Never	Sometimes	Often	Always	Total
1a	Have a tired voice when or after you (talk, play games, talk on the phone,…) ?					
1b	Have a tired voice when or after you (play theatre, read texts or poetry aloud, …) ?					
1c	Have a tired voice when or after you (sing solo, in a choir, karaoké, …) ?					
1d	Have a tired voice when or after you (have been at the scouts, played outside, did sports) ?					
		Total item 1				
2	Are asked to repeat what he said, because of your voice ?					
3	Have to push in order to bring					

	out your voice ?					
4	Are irritated because of your voice ?					
5a	Are afraid of using your voice when you (talk, play games, talk on the phone,…) ?					
5b	Are afraid of using your voice when you (play theatre, read texts or poetry aloud, …) ?					
5c	Are afraid of using your voice when you (sing solo, in a choir, karaoké, …) ?					
5d	Are afraid of using your voice when you (have been at the scouts, played outside, did sports) ?					
		Total item 5				
6	Have to strain your voice to talk ?					
7	Are made fun of because of your voice ?					
8	Can not speak because the sounds does not come out from your mouth ?					
9	Are angry because of your voice ?					
10	Are afraid of ruining					

	your voice ?					
11a	Have a painful throat when you (talk, play games, talk on the phone,…) ?					
11 b	Have a painful throat when you (play theatre, read texts or poetry aloud, …) ?					
11c	Have a painful throat when you (sing solo, in a choir, karaoké, …) ?					
11 d	Have a painful throat when you (have been at the scouts, played outside, did sports) ?					
		Total item 11				
12	Are asked what is wrong with your voice ?					
13	Need to cough or clear your throat when you are speaking, even when you are not ill ?					
14	Have a hoarse voice even when you are not ill ?					
15	Can not finish your sentences because of your voice ?					
16a	Need to rest your voice when or after you (talk, play games, talk on the phone,…) ?					
16	Need to rest your voice when or after you (play					

b	theatre, read texts or poetry aloud, …) ?					
16c	Need to rest your voice when or after you (sing solo, in a choir, karaoké, …) ?					
16 d	Need to rest your voice when or after you (have been at the scouts, played outside, did sports) ?					
		Total item 16				
17	Have an itching throat even though you are not ill ?					
18	Are sad because of your voice ?					
19	Wish that your voice would change ?					

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ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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