



Is there agreement between parents and children about their vocal behavior?

Há concordância entre pais e filhos quanto a seus comportamentos vocais?

¿Hay acuerdo entre los padres y los niños sobre sus comportamientos vocales?

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Abstract

Purpose: Investigate if parents observe vocal alterations of their children and if there is agreement between vocal conduct referred by parents and children with or without voice disorders, and also investigate are there are correlations between family habits and dysphonia in children. **Methods:** 28 dysphonic children and their parents (dysphonic group) and 22 normophonic children and their parents (control group) participated. The unhealthy factors were investigated with a self-reported questionnaire. These factors were compared among the children of both groups, among children and their mothers and among children and their fathers. To compare the two groups, we used the difference of proportion test ($p < 0.05$). To verify the correlation between children's and parent's habits, the Kappa coefficient

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($0.00 < K < 1.0$ and $p < 0.05$) was used. **Results:** We verified that the individuals of the dysphonic group presented more unhealthy habits and reported living in a noisy household in a greater scale than the control group. Regarding the correlation analysis of the unhealthy factors, the Kappa coefficient revealed that for both groups there was a significant correlation for those factors between children and parents, both for their presence or absence. **Conclusion:** The presence or absence of dysphonia is correlated to family behavior of both parents and children.

Keywords: Voice Disorders; Child; Family Relations; Habits; Dysphonia.

Resumo

Objetivo: Investigar se os pais percebem as alterações vocais de seus filhos e se há concordância entre comportamentos vocais relatados por pais e filhos, considerando-se crianças com e sem alterações vocais. Método: Participaram 28 crianças disfônicas (grupo disfônico - GD) e 22 crianças sem alterações vocais (grupo controle - GC). A presença da alteração vocal foi detectada por avaliação perceptivo-auditiva. Todos responderam a um questionário com questões fechadas, referentes a fatores prejudiciais à voz nos últimos seis meses. O questionário dos pais continha uma questão sobre opinião que tinham a respeito da voz de seu filho. Aplicou-se o teste de Concordância Kappa para analisar a existência de concordância entre a opinião dos pais em relação às vozes de seus filhos e a classificação da voz das crianças realizadas por juizes. Analisou-se também a concordância entre comportamentos vocais relatados por pais e filhos. Resultado: No GD houve fraca concordância em relação à avaliação perceptivo-auditiva das vozes das crianças e a opinião dos pais e mães sobre as vozes de seus filhos. Porém no GC, houve concordância ótima para os pais, enquanto que para as mães a concordância foi perfeita. Quanto aos fatores prejudiciais à voz, houve concordância em ambos os grupos quanto à presença e à ausência de comportamentos relatados pelos pais e crianças. Conclusão: Os pais de crianças disfônicas têm dificuldade em perceber a alteração vocal de seus filhos. Além disso, houve concordância entre presença ou ausência de comportamentos vocais nocivos autorreferidos pelas crianças disfônicas e com vozes saudáveis e seus respectivos pais.

Palavras-chave: Distúrbios da voz; Criança; Relações Familiares, Hábitos; Disfonia.

Resumen

Objetivos: Investigar si los padres se dan cuenta de las alteraciones vocales de sus hijos y si hay acuerdo entre los comportamientos vocales relatados por padres y hijos, teniendo en cuenta niños con y sin trastornos vocales. Método: Participaron 28 niños disfónicos (grupo disfónico-GD) y 22 niños sin trastornos de la voz (grupo control-GC). La presencia de alteración vocal se detectó por evaluación perceptivo-auditiva. Todos contestaron a un cuestionario con preguntas cerradas, que se referían a factores nocivos para la voz, en los últimos seis meses. El cuestionario de los padres contenía una pregunta adicional sobre la opinión que tenían a respecto de la voz de su hijo. Se utilizó el Test de Concordancia de Kappa para analizar la existencia de acuerdo entre la opinión de los padres sobre las voces de sus hijos y la clasificación de la voz de los niños realizada por jueces. Se analizó también el acuerdo entre los comportamientos vocales relatados por padres e hijos. Resultado: En el GD hubo bajo acuerdo en relación a la evaluación perceptivo-auditiva de las voces de los niños y las opiniones de los padres y madres sobre las voces de sus hijos. Todavía en el GC hubo fuerte acuerdo para los padres, mientras para las madres el acuerdo fue perfecto. En cuanto a los factores nocivos para la voz, hubo acuerdo en ambos grupos en cuanto a la presencia y ausencia de comportamientos reportados por los padres y los hijos. Conclusión: Los padres de niños disfónicos tienen dificultades para percibir la alteración vocal de sus hijos. Además, hubo acuerdo entre la presencia o ausencia de comportamientos vocales autorreferidos por los niños disfónicos y con voces saludables y sus respectivos padres.

Palabras clave: Trastornos de la Voz; niño; Relaciones Familiares; hábitos; disfonía..

Introduction

The vocal alterations during childhood can be related to functional factors, such as the appearance of incomplete glottal closure and nodular lesions; congenital organic alterations, tumors and laryngeal stenosis of various severities which can be incapacitating and life threatening¹⁻⁸; respiratory, allergenic⁹ and digestive factors¹⁰, environmental and psychological factors³. These alterations are responsible for several laryngeal and vocal symptoms and can vary from 6 to 23% in children aged between 4 and 12 years¹¹. Moreover, phonatory trauma can occur due to psychosocial emotional factors, such as hyperactivity or impulsiveness, in addition to excessive crying, more common in this population^{11,12}.

Authors¹³ verified that the unhealthy vocal habits referred by children and their respective parents are more numerous in dysphonic children in comparison with what was referred by non-dysphonic children and their mothers and fathers. The noisy family environment is also one of the factors referred by dysphonic children and their parents⁹.

The development of the vocal standards of children can be related to vocal models present in the environment in which they live¹³. Family characteristics are indicated as favorable to the development and practice of adequate or inadequate vocal habits such as yelling, talking loudly, screaming, doing strained vocalizations, talking excessively, talking during inspiration, explosive vocalization or brusque vocal attack, throat clearing and talking in noisy environments^{13,14}. Some studies reveal, however, that parents and educators give little importance to vocal alterations during childhood¹⁴⁻¹⁶, which can be related to their difficulty of identifying and recognizing the dysphonia, the risk factors that can cause it, as well as its implications to the child^{9,17}.

Anyhow, the concern in observing how the vocal habits, as well as vocal and laryngeal symptoms of children are perceived by parents is recent¹⁸. A study performed with dysphonic children's parents¹⁹ identified high prevalence of risky behavior for developing dysphonia. The habit of yelling was the most frequent and hoarseness

was a sign frequently present in children aged between four and six years. A study¹⁸ performed with dysphonic children and their parents showed that children from five years of age are conscious and affected by their vocal symptoms, being capable of describing them without the help of an adult. The study also showed that the parent's assessment about the children's difficulties is not entirely in agreement with the children's self-assessment.

The treatment of dysphonia in children demands an active participation of parents and children, and disagreements on the perception of the impact of the dysphonia between them are fairly common, which can impact the adhesion to the treatment¹⁸. Although the theme is better described in some therapeutic approaches⁸, the studies that prioritize the analysis of the relation of the parent's habits with the child's habits and the appearance of dysphonia¹⁵⁻¹⁹, demonstrate incipient concern with this type of investigation

This way, the purposes of this study are to investigate whether parents perceive the vocal alterations of their children and if there is agreement between vocal behaviors reported by parents and children, considering children with and without vocal alterations.

Methods

Sample

The sample consisted of 28 dysphonic children, aged between six and 12 years and their respective mothers and fathers, totalizing 84 participants (Dysphonic Group) and 22 non-dysphonic children, with the same age, with their mothers and fathers (Control Group), totalizing 66 participants.

All parents and children were informed about the purpose of the study and invited to sign the Informed Consent previously approved by the Research Ethics Committee of the University (CEP/UTP-0029/2007).

The distribution of the individuals can be observed on Table 1.

TABLE 1. DISTRIBUTION OF THE INDIVIDUALS OF THE DYSPHONIC GROUP (N=28) AND CONTROL GROUP (N=22) ACCORDING TO AGE AND GENDER.

Groups	Gender	Children's age	Father's age	Mother's age
		Mean (SD)	Mean (SD)	Mean (SD)
Dysphonic	15 male	9,9 (+1,6)	40,5 (+6)	38,1 (+6,3)
	13 female			
Control	9 male	9,6 (+1,9)	39,5 (+7,1)	36,2 (+6,7)
	13 female			

To participate in the present study, children between six and twelve years of age without any neurological or neuromuscular alterations, deafness or any type of malformation and who have not had voice therapy or laryngeal surgery were included. In addition, the children included had live to with both parents.

Children younger than six years of age were excluded to avoid difficulties while answering questions about the study. The age range up to twelve years is because, according the child and adolescent statute, a "child" is defined as person who has not reached the age of twelve (Law n° 8.069 - art. 2°). Moreover, we attempted to avoid interferences due to voice change. Children with resonance imbalance verified by voice recording were also excluded. Further aspects such as altered phonology, frontal lisp, open bite and stuttering were not considered exclusion criteria of the sample.

After the voice recording, the parents were contacted for a feedback about the vocal results found in the recordings and to give continuance to the research. The families were counseled and the children who were detected with vocal alterations were referred to an otolaryngologist, to a speech language pathologist and for treatment, if necessary.

All parents and children were informed about the purpose of the study and invited to sign the Informed Consent previously approved by the Research Ethics Committee of the University (CEP/UTP-0029/2007).

Procedures

For developing the present study, 700 authorization requests were handed to the children's parents, from which 330 were authorized. The 330 children underwent individual triage at their school,

where a simple questionnaire was answered by the parents or someone responsible for them, with multiple-choice questions about general health and living conditions between parents and children in order to apply the study's inclusion and exclusion criteria.

In addition, the voices of the children were recorded with the purpose of constituting the groups if this study: dysphonic and non-dysphonic (control). The auditory-perceptive analysis of these voices occurred by the analysis of presence or absence of vocal alteration, using the parameter "overall severity of the vocal quality", described in the item "Vocal assessment". The children who presented resonance disorders were excluded. It is worth noting that in the present study, the children with vocal alterations were called "dysphonic", even though they did not undergo laryngological assessment to define the type of dysphonia.

Investigation of vocal behaviors

For the data collection, the 150 individuals selected answered a questionnaire elaborated for this study, with multiple choice questions, related to unhealthy factors to the voice in the last six months: a. unhealthy vocal behaviors and laryngeal/vocal signs and symptoms – coughing frequently, throat clearing, talking loudly, yelling, talking with effort, talking in a noisy environment, whispering, talking without pausing, talking during inspiration, talking too fast, talking at the same time as others or without resting, imitating sounds, characters, acquaintances or heroes, drinking little water, practicing sports with vocal use, and b. environmental characteristics – living in a noisy family environment, living among smokers. It is important to emphasize that fathers, mothers and children answered the questionnaire separately and by self-reference, without knowing what the other answered and that all questions referred to

the behaviors and to the vocal symptoms of the children and their respective parents; that is, each one answered the questions considering their own behavior. In addition to these questions, the questionnaire directed to the parents had a question that approached their opinion about their child's voice: "In your opinion is your child's voice normal or altered?"

The children who were still illiterate or who had difficulties understanding any of the questions, had help from the researchers who read the questions for them, but the researchers did not influence any of the responses; the help was only to clarify the questions. The other participants answered the questionnaire by themselves; however, children and parents who had doubts interpreting the questions, also received help from the researchers.

Vocal evaluation

To record the voices an Ultimate headset unidirectional condenser professional stereo microphone of the brand Plantronics audio 90® was used, attached to a Toshiba notebook model A135-S4737; with USP amplifier - Based Sound with preamp model 3710 from Kay Elemetrics and the professional audio edition software – Sound Forge 7.0, with sample rate of 44100 Hz, Mono canal, in 16 Bits. The children were told to speak spontaneously for 30 seconds, answering questions such as: "What do you think of your voice?" and "What do you like to play with?", while breathing naturally and talking in their natural speech rate, pitch and loudness. A speech-language pathologist who did not participate in the process of the auditory-perceptive analysis performed the recordings.

After the recordings, auditory-perceptive analysis was performed the three speech-language pathologists, specialized in voice disorders, by consensus. The most consistent answer among the raters was chosen. The raters were supposed to classify each voice as "altered" or "normal" according to the overall severity of the vocal quality of

the spontaneous speech. They used the parameter overall severity of the vocal quality ("G" of the GRBASI scale) (20,21), classified in 2 (moderate deviation) or 3 (intense deviation) to classify the child as dysphonic; "normal voice" was considered if the child presented overall severity of the vocal deviation equal to zero (no deviation) or 1 (mild deviation) in the same scale, because it is expected that children present vocal characteristics of breathiness due to the anatomic configuration of the larynx. This way, the mild deviation was kept for this group.

Only the evaluation of the children who contemplated the inclusion criteria in the voice recording were used in the analysis of agreement between the alteration found by the speech-language pathologists and the opinion of the parents.

Statistical Analysis

This study employed the Kappa coefficient ($0.00 < K < 1.0$ and $p < 0.05$) (22) using the software Statistica 7.0, to verify agreement among the opinion of the parents regarding the voices of the children and the classification of the voices performed by the raters into "normal" or "altered". This same test was used to verify the agreement between the unhealthy factors to the voice self-referred by the children and the parents.

The rates of agreement, according to the kappa coefficient (22), are: less than 0.000 no agreement, from 0.00 to 0.20 slight, from 0.21 to 0.40 fair, from 0.41 to 0.60 moderate, 0,61 to 0,80 substantial, and from 0,81 to 1 almost perfect.

Results

Tables 2 and 3 evidence the agreement between the classification of the voices of the children performed by the raters and the opinion of fathers and mothers about the voices of the children of the Dysphonic group (Table 2) and Control group (Table 3).

TABLE 2. AGREEMENT BETWEEN THE OPINIONS OF THE FATHERS/MOTHERS OF THE DYSPHONIC GROUP (DG) IN RELATION TO THE VOICE OF THEIR CHILDREN AND THE VOCAL RATING OF THE CHILDREN PERFORMED BY THE JUDGES, DURING THE AUDITORY-PERCEPTIVE ANALYSIS.

Auditory-perceptive evaluation	Opinion of the father about the child's voice		Kappa coefficient	p value	Opinion of the mother about the child's voice		Kappa coefficient	p value
	Normal Voice	Altered voice			Normal Voice	Altered Voice		
Normal Voice	0	0	0,071	*<0,0001	0	0	0,071	*<0,0001
Altered Voice	13	15			13	15		

*0,00<K<1.0 and p<0.05 – Kappa coefficient

TABLE 3. AGREEMENT BETWEEN THE OPINIONS OF THE FATHERS/MOTHERS OF THE CONTROL GROUP (CG) IN RELATION TO THE VOICE OF THEIR CHILDREN AND THE VOCAL RATING OF THE CHILDREN PERFORMED BY THE JUDGES, DURING THE AUDITORY-PERCEPTIVE ANALYSIS.

Auditory-perceptive evaluation	Opinion of the father about the child's voice		Kappa coefficient	p value	Opinion of the mother about the child's voice		Kappa coefficient	p value
	Normal voice	Altered voice			Normal voice	Altered Voice		
Voz Normal	21	1	0,909	*<0,0001*	22	0	1,000	
Voz Alterada	0	0			0	0		*<0,0001

*0,00<K<1.0 and p<0.05 – Kappa coefficient

In the dysphonic group there was significant agreement ($p<0.0001$), however slight ($k=0.017$) regarding the opinion given by the fathers and mothers and the classification of the voices given by the raters. In the control group there was also significant agreement ($p<0.0001$) of perfect order regarding the auditory-perceptual evaluation of the voices of the children of the Control Group and the opinion of fathers and mothers ($k=0.909$ e $k=1.000$, respectively).

As for vocal behavior, there was significant agreement of some frequent harmful habits to the voice in both groups, for either the presence or the absence of these habits reported by fathers, mothers and children (Tables 4 and 5). Table 4 shows

agreement among fathers, mothers and dysphonic children for the following habits: coughing, talking with effort, talking in a noisy environment, talking without pausing, talking during inspiration, talking too fast, taking without resting, living in a noisy environment and with smokers. In the control group there was agreement between fathers, mothers and children for the habits: coughing frequently, throat clearing, talking with effort, talking in a noisy environment, talking without pausing, talking during inspiration, talking without resting, living in a noisy environment and with smokers (Table 5).

TABLE 4. AGREEMENT OF THE EXISTENCE OF UNHEALTHY FACTORS TO THE VOICE AMONG CHILDREN AND FATHERS. AND CHILDREN AND MOTHERS OF THE DYSPHONIC GROUP (DG).

Unhealthy factors to the voice	Children and Fathers (DG)		Children and Mothers (DG)	
	Kappa coefficient	p value	Kappa coefficient	p Valuep
Frequent coughing	0,429	*0,010	0,500	*<0,0001
Throat clearing	disagreement	-	disagreement	-
Talking loudly	0,072	0,349	disagreement	-
Yelling	0,188	0,301	disagreement	-
Talking with effort	0,357	*0,023	0,429	*0,010
Talking in a noisy environment	0,381	*0,011	0,284	*0,029
Talking without pause	0,786	*<0,0001	0,500	*<0,0001
Talking during inspiration	0,357	*0,003	0,500	*<0,0001
Talking too fast	0,500	*<0,0001	0,357	*0,029
Talking without resting	0,429	*0,004	0,500	*0,002
Drinking little water	0,495	*0,004	0,713	*<0,0001
Living in a noisy environment	0,429	*0,007	0,455	*0,001
Living among smokers	0,286	*0,005	0,643	*<0,0001

*0,00<K<1.0 e p<0,05 – teste de Concordância de Kappa.

TABLE 5. AGREEMENT OF THE EXISTENCE OF UNHEALTHY FACTORS TO THE VOICE AMONG CHILDREN AND FATHERS, AND CHILDREN AND MOTHERS OF THE CONTROL GROUP (CG).

Unhealthy factors to the voice	Children and Fathers (CG)		Children and Mothers (CG)	
	Kappa coefficient	p value	Kappa coefficient	p value
Frequent coughing	0,455	*0,013	0,4545	*0,001
Throat clearing	0,545	*0,005	0,5455	*0,002
Talking loudly	disagreement	-	disagreement	-
Yelling	disagreement	-	disagreement	-
Talking with effort	1,0	*<0,0001	1,0	*<0,0001
Talking in a noisy environment	0,455	*0,014	0,364	*0,004
Talking without pause	0,455	*0,005	0,364	*0,004
Talking during inspiration	0,636	*<0,0001	0,636	*<0,0001
Talking too fast	0,1391	0,166	0,018	0,245

Talking without resting	1,0	*<0,0001	1,0	*<0,0001
Drinking little water	disagreement	-	disagreement	-
Living in a noisy environment	0,546	*0,002	0,546	*0,002
Living among smokers	0,636	*<0,0001	0,727	*<0,0001

*0,00<K<1.0 and p<0.05 – Kappa coefficient

Discussion

Dysphonia can be undervalued in the general population and the lack of knowledge of dysphonia in childhood and what it represents hinders the perception of a simple symptom such as a simple hoarseness. Many parents tend to consider an altered voice as normal, not perceiving the dysphonia since the voice of their child always presented in the same way²³ or because they mistake symptoms of vocal alterations for symptoms of an infection in the upper airway²³. In addition, parents and educators identify more speech and language disorders than vocal alterations^{24,25}. A study²³, however reveals that, in general, parents seem to identify vocal characteristics of their children, also perceiving relation between vocal intensity and behavior and personality characteristics.

Therefore, this study investigated the existence of agreement between the opinion of mothers and fathers about their children's voices and the result of auditory-perceptual analysis performed by professions raters, who rated the voices as "altered" or "normal". The results of this analysis showed that fathers and mothers of the DG presented with "slight" agreement, that is, they hardly notice the vocal alteration of the children's voices (Table 2). Mothers and fathers of the CG presented with "perfect" agreement regarding the children's voices (Table 3).

Thus, it is observed that for fathers/mothers the perception of normality is easier than the perception of voice problems. A study that used the "Pediatric Voice Handicap Index" in fathers and mothers of dysphonic and non-dysphonic children verified that mothers of dysphonic children evaluate voice

handicap more harshly than the fathers, while both parents of non-dysphonic children analyzed handicap in a similar way²⁶.

Regarding the vocal behaviors and laryngeal and vocal symptoms, this study revealed that in some moments children without vocal problems obtained better agreement with their mothers and fathers than the dysphonic children (Tables 4 and 5). This fact can indicate that dysphonic children or their fathers/mothers do not perceive the presence of such behaviors, whether they are or not unhealthy.

Analyzing the agreement between vocal behaviors of the children of the DG and their mothers/fathers, the results found can indicate that the habit of talking with effort is perceived and reported by the children of the DG and partly practiced by the fathers/mothers, which does not occur with the group of children with normal voices. This finding corroborates the literature that report that vocal problems in children are generally associated with excessive and abusive vocal behavior²⁷, which in this study can be considered a family behavior.

There was significant agreement of the habit "talking too fast" between mothers and fathers of the DG (Table 4), which was not observed on the CG. This habit can be associated with impulsiveness, agitation and absence of mind which are generally related to outgoing people, which are common in children with vocal problems^{23,28}. Authors refer that the Attention-Deficit/Hyperactivity Disorder (ADHD) can be a risk factor for the development of vocal nodules in children¹².

In both groups, the habits of yelling and talking too loud presented with no agreement between the children and their respective fathers and mothers (Tables 4 and 5). This fact can be interpreted as

being reported by the children and not practiced by the parents or vice-versa. That is, yelling and talking loudly are behaviors little perceived by people, regardless if they present with vocal problems.

Likewise, the behaviors of “coughing frequently”, “talking in a noisy environment”, “talking without pause”, “talking during inspiration”, “talking without resting”, “living in a noisy family environment” and “living among smokers” was concordant between fathers/mothers of both groups (Tables 4 and 5), suggesting that these behaviors may not contribute to vocal problems in children, since these aspects are present in the families of dysphonic children and in the families of children who have healthy voices.

The habit of “drinking little water” was another behavior that differed between the DG and the CG (Tables 4 and 5). There was substantial agreement between the children of the DG and the mothers, and moderate between children of the DG and the fathers, and no agreement in the CG, which implies the imitation of this habit by the dysphonic children. The habit of drinking little water may act as an aggravating factor to dysphonia. The ingestion of water is important for the hydration of the body and laryngeal tissue, and is one of the factors that contribute to the functional and organic health of the larynx, which decreases the incidence of symptoms such as dry mouth and throat, constant secretion, in addition to being important to vocal performance²⁹.

The limitation of this study consist on the absence of laryngological imaging for the children and the parents using laryngoscopy to investigate laryngeal alterations and eliminate possible dysphonias of organic nature, which can be done in future studies. Moreover, the questionnaire used in this study was formulated by the researchers. Currently there is a validated instrument directed to dysphonic children and parents, regarding the investigation of the vocal symptoms³⁰, however it has not been validated in Brazilian Portuguese.

The findings obtained in this study reaffirm the assumption that vocal and health models frequently adopted by fathers and mothers are indicators of risks that can cause, perpetuate or aggravate cases of dysphonia. This way, investigating the family regarding vocal use, habit of yelling or talking loudly in different situations, awareness of the symptoms that can characterize vocal problems, noise

levels at home, or even what each one has to say about their voice can offer revealing elements of the family dynamics against childhood dysphonia^{17,18}.

If studies advocate that the relationship of the dysphonic child with their family should be acknowledged during the therapeutic process^{8, 15, 16, 18}, this study emphasizes the importance of the family from the moment of the diagnosis, since having access to the characteristics of the family dynamics, regarding environment and communication standards, is crucial to the diagnosis, all well as for planning and developing vocal rehabilitation measures involving not only children but also the parents.

Conclusion

The parents of dysphonic children have difficulty in perceiving the vocal alteration of their children. Moreover, there was agreement between the presence or absence of unhealthy vocal habits referred by the dysphonic children and children with healthy voices and their respective parents, revealing that the vocal behavior of the parents influence the vocal behavior of the children.

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