

Development and Validation of the Children's Voice Handicap Index-10 for Parents

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Summary: Objectives/Hypothesis. The Children's Voice Handicap Index-10 (CVHI-10) was introduced as a tool for self-assessment of children's dysphonia. However, in the management of children with voice disorders, both parents' and children's perspectives play an important role. Because a self-tool including both a children's and a parents' version does not exist yet, the aim of the study was to develop and validate an assessment tool which parallels the CVHI-10 for parents to assess the level of voice handicap in their child's voice.

Study Design. Observational, prospective, cross-sectional study.

Methods. To develop a CVHI-10 for parents, called "CVHI-10-P", the CVHI-10 items were adapted to reflect parents' responses about their child. Fifty-five children aged 7–12 years completed the CVHI-10, whereas their parents completed the CVHI-10-P. Each child's voice was also perceptually assessed by an otolaryngologist using the Grade Breathness Roughness (GRB) scale. Fifty-one of the 55 children underwent voice therapy (VT) and were assessed afterward using the GRB, CVHI-10, and CVHI-10-P.

Results. CVHI-10-P internal consistency was satisfactory (Cronbach alpha = .78). Correlation between CVHI-10-P and CVHI-10 was moderate ($r = 0.37$). CVHI-10-P total scores were lower than CVHI-10 scores in most of the cases. Single-item mean scores were always lower in CVHI-10-P compared with CVHI-10, with the exception of the only one item of the CVHI-10-P that directly involves the parent's experience (item 10). Data gained from one tool are not directly related to the other, suggesting that these two tools appraise the child's voice handicap from different perspectives. The overall perceptual assessment scores of the 51 children after VT significantly improved. There was a statistically significant reduction of the total scores and for each item in CVHI-10 and CVHI-10-P after VT. These data support the adoption of the CVHI-10-P as an assessment tool and an outcome measure for management of children's voice disorders.

Conclusions. CVHI-10-P is a valid tool to appraise parents' perspective of their child's voice disorder. The use of the CVHI-10 and the CVHI-10-P is recommended for objectively determining the level of voice handicap in children by parents and child.

Key Words: Voice handicap index–Children–Voice therapy–Self-assessment.

INTRODUCTION

The use of self-assessment tools in the management of voice disorders has been increasing over the last 15 years.¹ Although several tools have been developed,^{2–5} the Voice Handicap Index (VHI) appears to be the most popular one. The VHI was originally developed in 1997,² and it has been translated and adapted into many languages.^{6–23} More recently, different versions for special populations such as singers have been developed.^{24–33} All of these self-assessment tools are used worldwide in clinical practice as part of the assessment process and also as a measure of treatment outcome.^{34,35}

Although the VHI is probably the most widely adopted self-assessment tool of voice handicap, both the 30 items and the 10 items VHI (VHI-10)¹² versions cannot be used with children as the items have not been developed for this age population and

are also not easily understood by children.³⁶ For this reason, different self-assessment tools have been developed for the pediatric population,^{37–39} including the Pediatric Voice Handicap Index (pVHI),⁴⁰ which has been adapted to several languages.^{41–43} The pVHI is made of 23 items and has been developed from the adult handicap index as a parent proxy tool. To have information directly from children, the Children's Voice Handicap Index-10 (CVHI-10) has been recently introduced.⁴⁴ The CVHI-10 is made of 10 items, and it is appropriate for children aged 8–14 years. To have better content validity, it has been developed in the Italian cultural text starting from children's vision of the voice handicap rather than simply adapting the adult VHI-10 to a pediatric age group.⁴⁵ The CVHI-10 is scored from 0–3, to make it easier for the child to score his/her perceived voice handicap.

In the management of children's voice disorders, the parent's perspective plays an important role as previous research suggested that a family centered approach is recommended in the treatment of children's voice disorders.^{46,47} Knowing the relationship between the parent's impression of the voice handicap and the child's, may offer the clinician a clearer approach to the management of the voice disorder. Currently, no available tool has both a child and a parent version of the same self-assessment tool of voice handicap. Self-assessment of voice handicap in children using a complimentary set of tools for parents and children may offer independent assessment of a

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child's voice handicap not available from parent or child individually. Therefore, the aim of the study was to develop and validate an assessment tool for parents of voice-disordered children based on the CVHI-10. We called it the CVHI-10 for parents (CVHI-10-P).

MATERIALS AND METHODS

This observational, prospective cross-sectional study was carried out according to the Declaration of Helsinki, which stipulates that each parent of the child included in the study had to give a written informed consent. Statistical tests were performed using the SPSS 17.0 statistical software (SPSS, Inc., Chicago, IL). The study was divided into two phases: (1) development of the CVHI-10-P and (2) internal consistency and validity analysis of the CVHI-10-P.

Scale development

The CVHI-10 (Appendix 1) was used as a starting point for the development of the CVHI-10-P. Each CVHI-10 item was adapted through changes in the language of the statements to reflect a parent's responses about his or her child's voice. This process led to a new tool, the CVHI-10-P (Appendix 2), reflecting parental opinion of the severity of their child's voice.

Population

Fifty-five children aged 7–12 years (mean age: 9.4 years) and one of their parents were included in the study. Inclusion criterion for each child was the presence of dysphonia for at least 6 months. Exclusion criteria were reading limitations of any origin or the presence of neurological or psychiatric disorders. Inclusion criteria for each parent included their ability to read and the fact that the parent lived with the child. Each child underwent videolaryngostroboscopic examination with either rigid or flexible endoscope by an experienced phoniatrician. Vocal diagnosis was vocal fold nodules in 40 cases, spindle-shaped edema in eight cases, congenital cyst in three cases, and unilateral vergeture in four cases. Fifty-one children of the original group underwent voice therapy (VT). They completed the CVHI-10 before and after 10 sessions of VT. Children and parents completed their forms separately.

Voice therapy

Fifty-one children included in the study underwent 10 sessions of voice treatment. VT was provided by a speech-language therapist with more than 10 years of experience in VT for children. Each session lasted 40–45 minutes and was held twice a week over a period of approximately 40 days. The cooperation of the patient's family, educators, peers, and friends was requested when appropriate and possible. Counseling of parents and play therapy with the child and the family were also part of the VT program.⁴⁶ The therapeutic protocol consisted of different behaviorally based approaches including vocal hygiene, direct facilitation, respiration and distension exercises, and finally, a carryover approach. Vocal hygiene was aimed at increasing children's awareness of vocal abuse situations and behaviors and encouraging their avoidance. Their caregivers received additional information about the importance of hydra-

tion and lubrication. Direct facilitation was based on reducing loudness, yawn-sigh, humming, resonant voice, confidential voice, and strong voice attack reduction or augmentation (depending on the child and the voice disorder). Caregivers participated in vocal games designed to reinforce the practiced techniques at home. Respiration and distension exercises were used sparingly because children often consider them boring and, as a result, they also contribute to reducing children's compliance. Carryover approach involved attempts to transfer the newly learned vocal behaviors to everyday speaking situations.⁴⁷ The speech-language pathologist (SLP) recorded each child's voice during conversational speech and sustained vowels before and after VT.

Clinical assessment

An experienced phoniatrician and an experienced SLP separately rated the recorded voice of each child during conversational speech and sustained vowels. Neither the phoniatrician nor the SLP was aware of whether they were assessing the pre- or post-VT recordings. The GRB parameters of the GRBAS scale⁴⁸ were used for auditory-perceptual evaluation. Each of the 55 children filled out the CVHI-10, whereas their parents filled out the CVHI-10-P, separately.

Internal consistency and validity

Cronbach's alpha coefficient was used to analyze internal consistency of CVHI-10-P rated before VT. Values greater than 0.7 but less than 0.8 were considered "satisfactory," those greater than 0.8 but less than 0.9 were considered "good," whereas values greater than 0.9 were considered "excellent."

Mean, standard deviations, and ranges of CVHI-10-P and CVHI-10 were computed. Spearman test was used to analyze single items and total scores correlation between CVHI-10-P and CVHI-10.

Correlation between perceptual voice assessment and CVHI-10-P was used to test external validity. Correlation between perceptual assessment and CVHI-10 was also used to analyze differences between the clinician's perceptual assessment and the child's assessment of voice handicap. The correlation between CVHI-10-P, CVHI-10, and GRB scores were assessed using Spearman's correlation coefficient. The correlation strength was considered strong for values greater than 0.5, moderate for values ranging between 0.3 and 0.5, and weak for values less than 0.3.

GRB scores before and after VT were compared through Wilcoxon test to investigate whether a change in the scores was detectable after treatment. CVHI-10-P and CVHI-10 before and after VT were compared using the Wilcoxon test to analyze changes after the VT program.

RESULTS

Complete CVHI-10-P and CVHI-10 forms were obtained from all participants. CVHI-10-P internal consistency was satisfactory with Cronbach's alpha value of .78. Mean, standard deviation, and ranges of CVHI-10-P and CVHI-10 in the 55 children and their parents are reported in Table 1. CVHI-10-P total scores for most children were lower than CVHI-10 scores in

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