

# Development and Validation of the Children's Voice Questionnaire (CVQ)

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**Summary: Objectives.** This study developed and validated the children's voice questionnaire (CVQ), a new self-administered instrument for children, and evaluated its internal consistency and reliability.

**Study design.** Observational, prospective, cross-sectional study.

**Methods.** The initial preparation of the CVQ was conducted in four steps. First, individual interviews were conducted with dysphonic and non-dysphonic children and their parents, teachers, and speech pathologists. Second, the responses collected from the interviews were arranged into a comprehensive list of 175 items. Third, this list was reduced to a preliminary 21-item version of the questionnaire, which was tested as a pilot with 254 children. Fourth, a further reduction to 18 items was performed to construct the final version of the CVQ. The questionnaire was then administered to 342 children (73 dysphonic, 269 non-dysphonic) aged 6–18. Simultaneously, the parents of these children completed the pediatric voice handicap index (pVHI). Finally, after 2 weeks, 30 randomly selected children (nine dysphonic, 21 non-dysphonic) completed the CVQ again to evaluate test-retest reliability.

**Results.** High reliability was found for the CVQ (Cronbach's  $\alpha = 0.94$ ). Test-retest revealed strong and statistically significant reliability ( $r = 0.79$ ,  $P < 0.001$ ). A highly significant group difference was found between the CVQ scores obtained for the dysphonic and non-dysphonic groups ( $t[78.25] = 6.22$ ,  $P < 0.001$ ). In addition, significant medium-to-strong positive correlations were found between the children's evaluations using the CVQ and their parents' evaluations using the pVHI ( $0.59 < r < 0.66$ ,  $P < 0.01$ ).

**Conclusions.** The newly developed CVQ is a valid and reliable instrument. Findings reveal general agreement between children and their parents, but also show that children's perspective on their dysphonia is not equivalent to the parent's perspective. This demonstrates that combining both perspectives provides a more holistic and complete overview of dysphonic children's voice-related quality of life. The self-administered CVQ reliably differentiates dysphonic from non-dysphonic children and may serve as a valuable tool for the initial or ongoing evaluation of children with voice disorders in clinical and research settings.

**Key Words:** Dysphonia–Pediatric–Children–Self-assessment–Quality-of-life–Questionnaire.

## INTRODUCTION

Voice disorders are considered common in children, with a reported estimated prevalence between 2% and 53%.<sup>1–4</sup> This wide range of reported prevalence values may be attributed to various methodological inconsistencies between studies, such as age and gender differences, sample size, cultural differences, and the lack of uniform criteria for defining voice disorders. Clinicians and researchers view adverse vocal behaviors (eg, shouting, crying, or excessive vocal use) as the primary cause of voice disorders in children.<sup>5</sup> Accordingly, the most commonly reported laryngeal finding in children is vocal nodules, associated with intensive and unregulated vocal use.<sup>6,7</sup>

At younger ages, dysphonia is more common in boys.<sup>8–10</sup> This is typically explained by gender-related behavioral differences and differences in preferred social and physical activities between boys and girls.<sup>2</sup> Nonetheless, this observed trend shifts around puberty as voice disorders become more prevalent in young and older women compared to men.<sup>9</sup> Along this line, the personality of dysphonic children (specifically, those diagnosed with vocal nodules) has been described as more extroverted, socially dominant, impulsive, and aggressive, compared to their non-dysphonic peers.<sup>11,12</sup>

Dysphonia may negatively affect children's quality of life. This was shown to impact their general health, overall communication, social and educational development, and lower self-esteem and self-image, thus impeding their social interactions.<sup>13</sup> Moreover, similar to dysphonic adults,<sup>14</sup> dysphonic children are evaluated negatively by listeners. This negative attitude toward dysphonic children was found among adult naïve listeners<sup>15</sup> and among teachers.<sup>16,17</sup> Adult listeners associated dysphonic children with traits like dirty, weak, sick, and ugly. Not only were negative attitudes found in adult listeners, but similar attitudes were seen amongst peers of dysphonic children, who associated dysphonia with negative physical, personality, and cognitive traits.<sup>18,19</sup>

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Dysphonic children are often viewed by their parents and clinicians as unaware or indifferent to their disordered voices.<sup>20</sup> Others, however, suggested that teenagers and young children with chronic dysphonia might show awareness and concern about their voices.<sup>21</sup> Hence, proper guidance and treatment are advocated early to ensure the disorder does not persist into adolescence and adulthood.<sup>21,22</sup>

Over the years, self-assessment voice questionnaires have become integral to the multidimensional evaluation of voice disorders.<sup>23</sup> These instruments provide insight into the personal and psychosocial aspects of voice disorders, as experienced by the speakers.<sup>24,25</sup> Because the patients experience their voice disorder first-hand, it is recognized that only they can provide a valid description of the subjective experience of how their voice affects them personally, psychologically, socially, and professionally.<sup>23</sup> Moreover, from a clinical perspective, an added value of using self-assessment voice questionnaires is that, in many cases, merely answering the questionnaire raises the patients' awareness of the effects of their dysphonia and promotes motivation for a change.<sup>26</sup>

Several self-assessment voice questionnaires are currently available, mainly developed for dysphonic adults. However, only a few attempts have been made to develop an equivalent instrument for children. The pediatric voice handicap index (pVHI)<sup>27</sup> aims to quantify dysphonia's effect on children's quality of life. However, since children are traditionally considered less reliable as providers of medical information, this instrument is filled out by the parents of the dysphonic children, rather than by the children themselves. Two similar parents' questionnaires, albeit less frequently used in clinical and research settings, are the pediatric voice outcome survey (PVOS)<sup>28</sup> and the pediatric voice-related quality of life (PV-RQoL).<sup>29</sup> Later, as teachers were shown to evaluate dysphonic children similarly to speech pathologists but differently from parents,<sup>30</sup> an attempt was made to develop a questionnaire for teachers of dysphonic children.<sup>31</sup> Yet, as noted, all these questionnaires were designed for parents/teachers but not for the dysphonic children themselves. The single available questionnaire that directly addresses dysphonic children is the children's voice handicap index-10 (CVHI-10).<sup>32</sup> This questionnaire was developed based on the original voice handicap index-10,<sup>33</sup> by slightly adjusting and modifying wordings and statements to be suitable for children aged 8–14 years. For example, the original statement "My voice problem causes me to lose income" was changed to "My voice difficulties reduce my school outcome"; or "My voice makes me feel handicapped" was changed to "My voice makes me feel inferior to other children". The CVHI-10 was later translated and adapted to different languages.<sup>34–37</sup>

In summary, the standard approach for evaluating voice handicaps in dysphonic children is using parent questionnaires. The only available questionnaire designed to address the children directly is an adaptation of the shortened adult VHI-10. On the one hand, studies have shown a discrepancy between parents' and children's reports, but on the other hand, children are often viewed as less reliable

providers of medical information. Yet, some studies have suggested that dysphonic children are capable of reporting on their dysphonia even at the early ages of 5 or 6 years.<sup>12,21,38</sup> The subjective information obtained from self-reports made by dysphonic children regarding their voice handicap (socially, emotionally, and functionally) is essential for understanding their perspective. This is vital for initial evaluation and for treatment planning. Therefore, there is a need for a self-assessment voice questionnaire specifically designed for children rather than relying on parents' questionnaires, which do not necessarily capture the children's perspective. Therefore, the present study aimed to develop and evaluate the validity and reliability of a new pediatric voice assessment questionnaire to be completed by the children themselves.

## MATERIALS AND METHODS

### Scale development and preparation

The development of the new questionnaire was conducted in four steps. Firstly, we aimed to identify themes relevant to the self-evaluation of voice by dysphonic children. To that end, our research team members performed four series of individual interviews. The first series of interviews were performed with 30 children (13 boys, 17 girls) aged 6–16. Of these children, 20 identified themselves and were judged by their parents as dysphonic, and 10 as non-dysphonic. The second series of interviews was done with the parents of these children (29 mothers, one father). These interviews were performed individually and separately from the children. The third series consisted of 10 speech pathologists (four men, six women), specializing in voice disorders, with 4–41 years of professional experience. The fourth series consisted of 10 teachers (four men, six women) with 3–15 years of professional experience.

Due to the preliminary nature of this study, we used semi-structured interviews with both open-ended and closed questions. Also, in light of the standard format of the currently available self-report questionnaires (ie, VHI<sup>24</sup> or pVHI<sup>27</sup>), we aimed to identify themes related to three domains: physical, functional, and emotional. The following are examples of closed- and open-ended questions included in the interviews. The children's interviews included questions such as: "How does your voice make you feel?", "When children are hoarse, does it bother their friends? How?", "Do you avoid any activity when your voice is hoarse? Why?", "How does it feel to have a hoarse voice?". The parents' interviews included questions such as: "How does your child feel about his/her voice?", "Does it bother you to hear a hoarse child? Why?", "Are you concerned when your child is hoarse? Why?", "How do children behave when their voice is hoarse?", "What situations are more difficult/challenging for your child, because of his/her hoarseness?", "What do you think your child physically feels when he/she is hoarse?", "Can you specify typical complaints made by hoarse children?". The speech pathologists' and the teachers' interviews included questions

such as: "In your opinion, what are the difficulties dysphonic children encounter?", "Based on your experience, is there a specific personal characteristic associated with children with voice disorders? Please specify", "Do children with disordered voice tend to avoid specific activities? Please give a few examples", "Do you offer any assistance or make exemptions to children with a voice disorder?", "In your experience, are dysphonic children concerned about their voice? In what way?"

Review and arrangement of the responses obtained from the 80 interviews (30 children + 30 parents + 10 teachers + 10 SLPs) yielded 53 items from the children's interviews, 52 from the parents, 36 from the SLPs, and 34 from the teachers. These 175 responses were then systematically arranged and consolidated into 21 items (seven items for each of the three domains: physical, functional, emotional) by merging identical or similar items. Each item was followed by a 5-point scale (0–4) on which the children indicated the extent to which they agreed with the statement (ie, never, almost never, sometimes, almost always, always). This preliminary 21-item version was then presented online, as a pilot, to 254 children (46 dysphonic children [22 boys, 24 girls], and 208 non-dysphonic children [105 boys, 103 girls]), age range 8–16, recruited through voice clinics and social media forums. After filling out the questionnaire, all children were also interviewed individually about the content and format of the questionnaire, as well as about its wording and phrasing. Then, Cronbach's  $\alpha$  values were calculated for each item to evaluate internal consistency.

Following the pilot phase, specific items were modified or reworded. Three items ("I speak less with my family because of my voice", "There are things I cannot do because of my voice", and "My voice worries other people") were removed due to their low correlations with the total score revealed in item analysis. Consequently, the final version of the questionnaire consisted of 18 items (see [Appendices A and B](#)).

### Participants

This study was conducted after approval from the Tel-Aviv University ethics committee (#0001327-1), and written consent from the parents was accepted. Three hundred and 42 children (164 boys, 178 girls) aged 6–18, who have not been included in any of the preliminary phases, participated in the final phase of this study. The parents also participated in the study. Like the participants in the previous phases, the children and their parents were recruited through voice clinics and social media forums. Of these children, 73 were dysphonic (46 boys, 27 girls), with a mean age of 11.1 years (range 7–18). The remaining 269 children (118 boys, 151 girls) were non-dysphonic, with a mean age of 11.4 (range 6–18). All participants were native Hebrew speakers and capable readers. Exclusion criteria included reported cognitive impairment, history of hearing problems, insufficient reading skills or prior participation in voice therapy. A child was assigned to the dysphonic group if a positive response was accepted for one or more of the

questions: "Is your voice hoarse?" "Do you have a voice problem?" (for the children), and "Does your child have a hoarse voice?", "Does your child have a voice problem?" (for the parents).

### Procedures

As noted, before participating in the study, all parents signed an informed consent form, and the children signed an assent form. After this, the parents completed the Hebrew version of the pVHI,<sup>39</sup> followed by an anamnesis questionnaire. The children completed the CVQ separately from the parents and then completed an anamnesis questionnaire. All questionnaires were completed online using a smartphone, tablet or computer. The average time for individual participation was approximately ten minutes.

To evaluate test-retest reliability, 30 children (nine dysphonic, 21 non-dysphonic) were randomly selected to complete the CVQ again after 2 weeks. Special attention was given to ensure that none of these children had received voice therapy during this period. In addition, the parents of these children were instructed to avoid discussing their voice or the questionnaire with them.

### Statistical analysis

Statistical analyses were performed using SPSS software (ver. 28).<sup>40</sup> The validity of the questionnaire was estimated using exploratory factor analysis to examine construct validity, and  $t$  tests to examine concurrent validity. Internal consistency was evaluated using Cronbach's coefficient  $\alpha$ , and a Pearson coefficient was calculated for test-retest reliability evaluation. A Pearson correlation coefficient was calculated to examine the association between age and CVQ scores, and an independent samples  $t$  test was used to examine the association between gender and CVQ scores. Finally, Pearson correlation coefficients were calculated to evaluate the associations between the children's scores on the CVQ and the parents' scores on the pVHI.

## RESULTS

### Demographic characteristics

No significant age difference emerged between the groups ( $t$  [340] = 1.11,  $P$  = 0.27). In contrast, the groups differed in gender, ( $\chi^2$ [1] = 8.44,  $P$  = 0.004), with a larger proportion of boys in the dysphonic group than girls, compared to the non-dysphonic group.

### Internal consistency, reliability and validity

Internal consistency of the CVQ was high, with  $\alpha$  = 0.94. Test-retest reliability was also high ( $r$  = 0.79,  $P$  < 0.001).

As noted, the CVQ consists of 18 items, originally arranged to represent three domains: physical, functional, and emotional. To evaluate the structure validity of the questionnaire, factor analysis was performed, with principle component analysis (PCA) as the method of initial factor extraction. The first three factors with the lowest Eigenvalue being 1.15, explaining 62.0% of the variance,

were retained for Varimax rotation. Results demonstrated that items from the 'functional' and 'emotional' domains were loaded, in most cases, on the same factor. Consequently, a second-factor analysis was performed, limiting the solution to two factors ('physical' and 'functional-emotional'), with Eigenvalues of 8.50 and 1.51, explaining 55.6% of the items' variance. In this analysis, one item was loaded on both factors. Then, an additional analysis was performed on each group separately to evaluate measurement inter-group differences. In the non-dysphonic group, the first factor explained 33% of the variance, and the second-factor 11%. At the same time, in the dysphonic group, the first factor explained 52% of the variance and the second-factor 9%. We interpreted these analyses as suggesting a single general factor differentiating between dysphonic and non-dysphonic children. Accordingly, [Table 1](#)

summarizes the results obtained for the dysphonic and non-dysphonic groups for all 18 items of the CVQ, along with the results of the independent-sample *t* tests performed for each item. As shown, statistically significant group differences were found for each item, supporting the CVQ concurrent validity.

The mean overall CVQ score was 14.66 (SD = 14.06) for the dysphonic children and 4.20 (SD = 5.58) for the non-dysphonic children. This group difference was statistically significant, using an independent-sample *t* test ( $t[78.25] = 6.23, P < 0.001$ ). Youden's index was used to differentiate between dysphonic and non-dysphonic children. Results demonstrated that a score of five may be taken as a 'cut-off point. Specifically, approximately 78% of the dysphonic children reported this value or higher, compared to 33% of

**TABLE 1.**  
**Mean Values, Standard Deviations (SD), Cohen's *d*, and *t* Values Obtained for the Two Groups for All 18 CVQ Items**

Statement	Group	mean	SD	Cohen's <i>d</i>	<i>t</i>
My throat hurts when I speak	control	0.38	0.64	0.747	5.93***
	study	1.14	1.05		
My throat burns when I speak	control	0.14	0.41	0.576	4.77***
	study	0.70	0.97		
My throat feels scratchy when I speak	control	0.26	0.57	0.707	3.17**
	study	0.67	1.07		
I run out of air when I speak	control	0.58	0.84	0.913	5.94***
	study	1.44	1.16		
My voice breaks when I speak	control	0.40	0.69	0.839	4.91***
	study	1.14	1.23		
My voice runs out on me when I speak	control	0.28	0.59	0.752	5.27***
	study	1.03	1.17		
I participate less in class, because of my voice	control	0.14	0.48	0.589	2.93**
	study	0.45	0.88		
I speak less with other kids, because of my voice	control	0.09	0.44	0.518	2.34*
	study	0.30	0.74		
It is hard to hear me, because my voice is weak	control	0.22	0.61	0.753	3.68***
	study	0.73	1.13		
I strain my voice when speaking	control	0.14	0.47	0.721	6.98***
	study	1.21	1.28		
Other kids notice the problems in my voice	control	0.08	0.33	0.671	6.49***
	study	1.08	1.31		
I worry because of my voice	control	0.12	0.44	0.646	4.24***
	study	0.68	1.12		
I don't like my voice	control	0.46	0.88	0.98	3.00**
	study	0.95	1.29		
My voice frustrates me	control	0.20	0.55	0.742	3.99***
	study	0.78	1.22		
I am embarrassed because of my voice	control	0.14	0.50	0.587	2.87**
	study	0.44	0.83		
My voice makes me angry	control	0.10	0.34	0.578	3.45***
	study	0.53	1.07		
I wish I had a different voice	control	0.36	0.79	0.896	4.19***
	study	0.99	1.21		
I am ashamed of my voice	control	0.10	0.44	0.571	2.97**
	study	0.41	0.91		

\*  $P < 0.05$ .

\*\*  $P < 0.01$ .

\*\*\*  $P < 0.001$ .

**TABLE 2.**  
Means and Standard Deviations (in Parentheses) for CVQ and pVHI Scores (Physical, Functional and Emotional) Obtained for the Children and Their Parents, in the Dysphonic and Non-dysphonic Groups.

Measure	Group			
	Dysphonic		Non-dysphonic	
	Boys	Girls	Boys	Girls
CVQ	13.74 (13.77)	16.22 (14.15)	4.63 (6.36)	3.86 (4.84)
pVHI-P	13.50 (8.07)	12.56 (7.88)	2.49 (3.26)	1.64 (2.84)
pVHI-F	7.76 (6.83)	4.22 (4.09)	2.52 (3.32)	2.19 (3.03)
pVHI-E	7.59 (6.26)	4.81 (4.82)	1.46 (2.74)	1.09 (2.20)

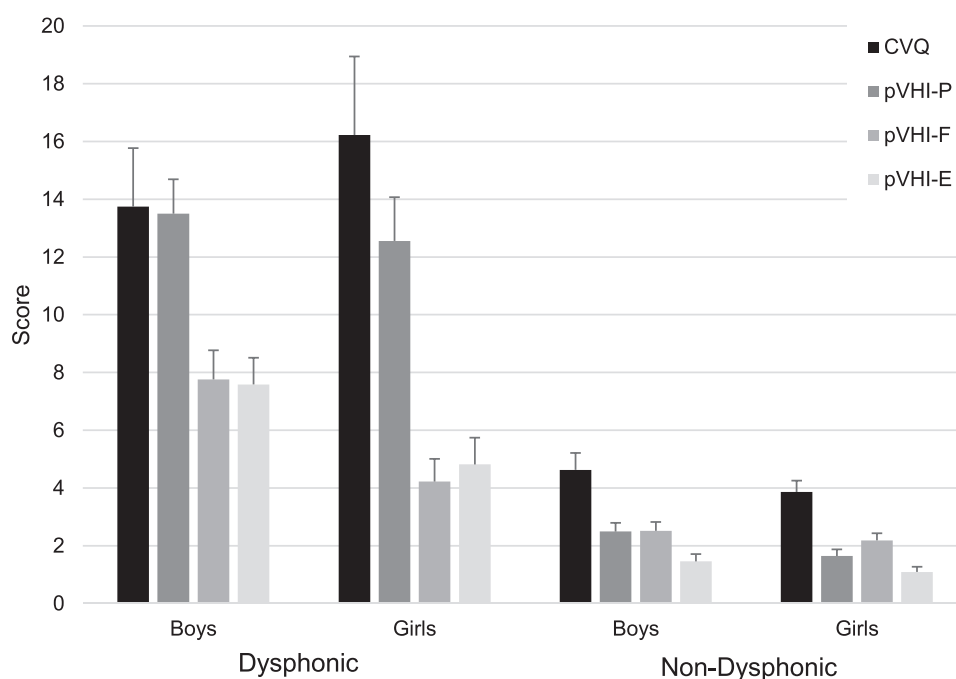
the non-dysphonic children. No significant differences were found in CVQ scores between boys and girls in either the dysphonic or non-dysphonic group ( $t(71) = 0.73, ns$ ) and ( $t/267] = 1.12, ns$ ), respectively]. No significant correlations were found between CVQ scores and age in the dysphonic and non-dysphonic groups ( $r = 0.18, ns$ , and  $r = 0.07, ns$ , respectively). Table 2 summarizes the total scores for the CVQ obtained from boys and girls in both dysphonic and non-dysphonic groups and the parents' mean scores on the pVHI (physical, functional and emotional).

Group differences are illustrated in Figure 1. As shown, similar patterns of group differences were observed for the overall CVQ obtained from the children and for the three scores obtained from the parents on the pVHI. In addition, medium-strong correlations were found between the CVQ scores and the three scores of the pVHI questionnaire (physical, functional and emotional [ $r = 0.64, P < 0.001$ ;  $r = 0.59, P < 0.001$ ;  $r = 0.66, P < 0.001$ , respectively]).

## DISCUSSION

The primary aim of this study was to develop and validate the new Children's Voice Questionnaire. The CVQ was developed, as a first step, in the Hebrew language, yet the English version of the questionnaire has been prepared and is readily available (see Appendix B). After completing the preliminary phases, the 18-item questionnaire was administered to dysphonic and non-dysphonic children while their parents completed the pVHI<sup>39</sup> questionnaire. Results demonstrate that the CVQ reliably differentiates dysphonic from non-dysphonic children, and it has strong internal consistency, test-retest reliability, and face and external validity.

As noted, our results demonstrated that the value of five points on the CVQ score may be taken as a possible cut-off point between dysphonic and non-dysphonic children. Nevertheless, this result should be interpreted cautiously because the CVQ—like all subjective self-report questionnaires—is not an independent diagnostic instrument.



**FIGURE 1.** Means and standard error bars for CVQ scores obtained from the children, and the three pVHI scores (physical, functional and emotional) obtained from the parents, in the dysphonic and non-dysphonic groups.

Instead, it describes how dysphonic children perceive their voice and how dysphonia affects their voice-related quality of life. As such, the CVQ aims to provide insight into the individual subjective experience of the dysphonic speaker rather than differentiate between groups.

Traditionally, children are considered insufficiently reliable for providing medical information.<sup>41</sup> This view has impacted the field of voice disorders and promoted the development of questionnaires for parents (and teachers) of dysphonic children, rather than for the dysphonic children themselves. Nevertheless, in line with the declaration of the Committee on the Rights of the Child at the United Nations,<sup>42</sup> the present study examined how dysphonic children report on their voice and dysphonia. Moreover, when embarking on this project, it was deemed necessary to ensure that this instrument represented themes directly relevant to dysphonic children rather than adopting items from existing adult questionnaires. Therefore, an important finding of our study was that children's responses to all items of the CVQ were highly reliable (Cronbach's  $\alpha$ : 0.70–0.95). Moreover, the children's responses remained consistent after 2 weeks, with strong test-retest reliability ( $r = 0.79$ ,  $P < 0.001$ ). This demonstrates that children can reliably report on their dysphonia and voice-related quality of life, providing that the questionnaire is designed specifically for children. This is reminiscent of previous reports suggesting that using instruments well suited for a specific population might lead to erroneous results when applied to studying other populations.<sup>43</sup> Therefore, we conclude that the CVQ, developed explicitly for the pediatric population, is a valid and reliable instrument for capturing the dysphonic children's perspective on their dysphonia.

Our results demonstrated that CVQ scores are not affected by the children's age or gender. Nevertheless, two issues related to gender distribution should be noted. Firstly, in our cohort, the children in the two groups (dysphonic and non-dysphonic) were similar in age, but their gender was distributed differently. Specifically, the non-dysphonic group included comparable numbers of boys and girls, but the dysphonic group consisted of more boys than girls. This could be expected due to the higher prevalence of dysphonia in pre-pubertal boys compared to girls.<sup>2,44</sup> Secondly, most parents who participated in our study were mothers (85.2%). This is similar to many other reports, showing that mothers participate more than fathers in studies examining children's health-related quality of life.<sup>41</sup> This point is of particular interest because fathers are typically under-represented in these studies, and because mothers of dysphonic children were found to be more concerned than fathers about their child's dysphonia.<sup>39</sup> Therefore, it is suggested that future research should aim for a more balanced representation of parents of both genders.

Another finding has emerged from the factor analysis. As noted, the new CVQ was initially designed to cover three domains (physical, functional, and emotional) in line with the available self-administered adult voice questionnaires.<sup>24,27</sup> However, examining the different possibilities for factor constructs has led to the conclusion that the CVQ converges into a single factor rather than two or three factors. In other words, children responded similarly to items that could represent the three domains. Similar findings of a single factor for children's responses were previously reported on the CVHI-10 and PSVQ questionnaires.<sup>32,38</sup> Hence, our findings confirm that despite the new questionnaire being carefully developed for children, rather than using modified or adjusted adult questionnaires, no multiple factors were found for dysphonic children's responses, but rather a single factor.

Our result revealed consistent associations between the children's and parents' perceptions of dysphonia. This was evident by the significant medium-strong correlations ( $0.59 \leq r \leq 0.66$ ) between the children's score on the CVQ and the parents' responses on the pVHI. As shown in [Figure 1](#), the parents of the dysphonic children rated the physical domain more severely than the two other domains. In other words, they feel that their children are concerned mainly with the physical aspect of dysphonia rather than the functional or emotional aspects. However, the children experience their dysphonia differently from what their parents think. Therefore, the observed statistically significant correlations confirm that the children's and parents' responses are indeed closely related on the one hand. However, on the other hand, they are not interchangeable, as they complete each other. In light of this observation, we suggest that combining the children's perception with that of the parents (ie, using both CVQ and pVHI) is of value for obtaining a broader and more holistic overview of the children's dysphonia. This empirical finding supports previous clinical recommendations for combining parents' and children's perspectives when evaluating dysphonia in children.<sup>27,32,45,46</sup> Moreover, from a clinical perspective, the synergy between the parents, the children and the clinician could be of great importance in evaluating and treating voice disorders. This joint involvement may support the therapeutic process, as both parties are engaged actively, where the parents express their concerns, and the children participate in the decision-making process.<sup>26,47,48</sup>

## CONCLUSIONS

The CVQ is a valid and reliable instrument for capturing and quantifying children's perceptions of their voice and dysphonia. It differentiates between dysphonic and non-dysphonic children and correlates with parents' responses

on the pVHI questionnaire. Beyond its strong reliability and validity, the CVQ is simple to use, it requires only a short time to complete, and the children themselves can complete it in a paper-and-pencil format or digitally. As such, it is suitable for research and clinical settings for children aged 7–18. Finally, while the CVQ was initially developed in Hebrew, it was translated and adapted to English. The English version is readily available for further examination and may be used for clinical and research purposes after it is validated among English-speaking dysphonic children.

### Declaration of Competing Interest

None.

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## Appendix A: The Children's Voice Questionnaire (CVQ)—(Hebrew version)

הוראות: עבור כל משפט, יש להקיף בעיגול את התשובה המתארת עד כמה המשפט נכון עבורך

תמיד	לעיתים קרובות	לפעמים	לעיתים רחוקות	אף פעם	
4	3	2	1	0	1. כואב לי בגרון כשאני מדבר
4	3	2	1	0	2. שורף לי בגרון כשאני מדבר
4	3	2	1	0	3. מגרד לי בגרון כשאני מדבר
4	3	2	1	0	4. נגמר לי האוויר כשאני מדבר
4	3	2	1	0	5. הקול שלי נשבר כשאני מדבר
4	3	2	1	0	6. הקול נגמר לי באמצע הדיבור
4	3	2	1	0	7. אני משתתף פחות בכיתה, בגלל הקול שלי
4	3	2	1	0	8. אני מדבר פחות עם ילדים אחרים, בגלל הקול שלי
4	3	2	1	0	9. קשה לשמוע אותי, בגלל שהקול שלי חלש
4	3	2	1	0	10. אני צריך להתאמץ לדבר, בגלל הקול שלי
4	3	2	1	0	11. ילדים אחרים שמים לב לבעיית הקול שלי
4	3	2	1	0	12. אני דואג, בגלל הקול שלי
4	3	2	1	0	13. אני לא אוהב את הקול שלי
4	3	2	1	0	14. הקול שלי מתסכל אותי
4	3	2	1	0	15. אני נבוך, בגלל הקול שלי
4	3	2	1	0	16. הקול שלי מכעיס אותי
4	3	2	1	0	17. הייתי רוצה שיהיה לי קול אחר
4	3	2	1	0	18. אני מתבייש בקול שלי

**Appendix B: The Children's Voice Questionnaire (CVQ)—(English version)\*****Instructions:** Circle the Response That Best Describes How Often You Experience the Following

	Never	Almost never	Sometimes	Almost always	Always
1. My throat hurts when I speak	0	1	2	3	4
2. My throat burns when I speak	0	1	2	3	4
3. My throat feels scratchy when I speak	0	1	2	3	4
4. I run out of air when I speak	0	1	2	3	4
5. My voice breaks when I speak	0	1	2	3	4
6. My voice runs out on me when I speak	0	1	2	3	4
7. I participate less in class, because of my voice	0	1	2	3	4
8. I speak less with other kids, because of my voice	0	1	2	3	4
9. It is hard to hear me, because my voice is weak	0	1	2	3	4
10. I strain my voice when speaking	0	1	2	3	4
11. Other kids notice the problems in my voice	0	1	2	3	4
12. I worry because of my voice	0	1	2	3	4
13. I don't like my voice	0	1	2	3	4
14. My voice frustrates me	0	1	2	3	4
15. I am embarrassed because of my voice	0	1	2	3	4
16. My voice makes me angry	0	1	2	3	4
17. I wish I had a different voice	0	1	2	3	4
18. I am ashamed of my voice	0	1	2	3	4

\* The English version of the CVQ was translated and adapted from the original Hebrew version using a standard two-way translation procedure. Specifically, three native English speakers, who are also fluent speakers and readers of Hebrew, independently translated the original version from Hebrew to English. The resulting three translated versions were then translated back to Hebrew by three native Hebrew speakers, who are also fluent speakers and readers of English. Then, the final English version, presented here, consists of the items that were translated back and forth most accurately. Note that this version was not yet validated among English-speaking dysphonic children.

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