

Reliability and Validation of the Turkish Version of the Pediatric Voice-Related Quality of Life Survey

*Ziya Salturk, *Erdi Ozdemir, *Tolgar Lutfi Kumral, †İbrahim Sayin, ‡Kürşat Yelken, *Hüseyin Sari, *Güler Berkiten, *Yavuz Atar, *Belgin Tutar, *Ahmet Arslanoglu, and *Yavuz Uyar, *†‡İstanbul, Turkey

Summary: Objective. To evaluate the effect of dysphonia in children, several methods have been developed, including the Pediatric Voice Outcome Survey, the Pediatric Voice Handicap Index, and the Pediatric Voice-Related Quality of Life (PVRQOL) Survey. The aim of this study was to analyze the validity of the Turkish version of the PVRQOL Survey.

Methods. The PVRQOL Survey consists of 10 questions that evaluate the effects of dysphonia on quality of life. We translated it into Turkish by working with two translators and faculty from the English Grammar and Literature Department. The Turkish version was translated back into English by two bilingual individuals to assess accuracy. The final version was tested by 15 parents for pilot study. Following the pilot study, we enrolled 52 children who had been admitted to the outpatient clinic with dysphonia and 79 children who had no voice complaints. The parents of the children under 7 years were asked to answer the survey. Children aged between 7 and 9 years completed the survey with their parents, and children over 9 years completed the survey by themselves.

Results. The results of the pilot study revealed no difference between the two groups. Intergroup comparisons revealed that there were statistically significant differences between the control and patient groups in terms of question responses. When the total scores of the two groups were compared, there was a significant difference.

Conclusion. The Turkish version is a valid and reliable instrument for assessing dysphonic patients and healthy subjects.

Key Words: Dysphonia–Children–Turkish version–Reliability–Validation.

INTRODUCTION

Voice is a unique characteristic of the human personality that reflects personal characteristics, mood, and general well-being, and it affects an individual's social and professional life.^{1–3} Voice problems may evolve into psychosocial conditions if they persist.⁴ Unfortunately, the exact prevalence of voice problems is unknown and is likely underestimated. Previously published studies have reported that 3.9%–24% of the pediatric population have voice problems, which are most common in children aged 5–10 years.^{5–7} These problems have effects on children's lives, both present and future. Problems are experienced at school and in their social lives.⁸ Childhood is an extremely important period of time that greatly impacts personality development; thus, children with voice problems should be thoroughly evaluated to prevent future issues.

To evaluate the effect of dysphonia in children, several methods have been developed, including the Pediatric Voice Outcome Survey (PVOS), the Pediatric Voice Handicap Index (PVHI), and the Pediatric Voice-Related Quality of Life (PVRQOL) Survey. All of these surveys can assess voice problems and their potential effects on patients, including sensitivity to therapeutic approaches, and can also be used to screen for particular conditions.^{9–13}

The PVRQOL is a well-known survey that can be applied to parents of young children or teenagers with dysphonia. The survey

consists of 10 questions that evaluate the effects of dysphonia on quality of life and is classified into two main categories: physical and social-emotional. Six questions relate to physical characteristics, and four questions relate to social-emotional characteristics. As the score goes higher, quality of life gets lower.

The only scale that has been validated for Turkish is the PVHI.¹⁴ This scale was applied only to parents of the children, but teenagers can explain problems themselves. Therefore, we decided to analyze the validity of the Turkish version of the PVRQOL Survey.

MATERIALS AND METHODS

Institutional Review Board approval was obtained from the Okmeydanı Training and Research Hospital Ethics Committee.

Initially, the PVRQOL was created and validated in English by Boseley et al.⁹ We translated it into Turkish by working with two translators and faculty from the English Grammar and Literature Department. The Turkish version was translated back into English by two bilingual individuals to assess accuracy. The final version was tested by 15 parents (Appendix A).

We first measured the reliability of the survey using a pilot study that enrolled 15 children with dysphonia. The children's parents signed an informed consent form prior to the commencement of the study and completed the survey twice with 2-week intervals. Treatment and voice therapy were initiated on the third visit. The parents of the children under 7 years were asked to answer the survey. Children aged between 7 and 9 completed the survey with their parents, and children over 9 years completed the survey themselves. The same parents completed the survey on the second visit.

Following the pilot study, a cross-sectional study was performed at the Okmeydanı Training and Research Hospital. In this study, we enrolled 52 children who had been admitted to

Accepted for publication June 20, 2017.

From the *Okmeydanı Training and Research Hospital ENT Clinic, İstanbul, Turkey; †Bakırköy Sadi Konuk Training and Research Hospital ENT Clinic, İstanbul, Turkey; and the ‡Uskudar University Vocology Clinic, İstanbul, Turkey.

Address correspondence and reprint requests to Erdi Ozdemir, Okmeydanı Training and Research Hospital ENT Clinic, Kaptanpaşa Mah. Darülaceze Cad. Şişli, İstanbul, Turkey. E-mail: erdiozdemir67@hotmail.com

Journal of Voice, Vol. ■■, No. ■■, pp. ■■–■■
0892-1997

© 2017 The Voice Foundation. Published by Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jvoice.2017.06.014>

the outpatient clinic with dysphonia and 79 children who had no voice complaints. The children were aged between 4 and 17 years. Healthy children were recruited during visits to various schools. The parents of all participants signed an informed consent form prior to the study onset.

Data were evaluated using SPSS for Windows software (version 22.0; IBM Corp., Armonk, New York). A Shapiro-Wilk test was performed to assess the distribution of the data, and a Mann-Whitney *U* test was conducted for comparisons among groups. To evaluate consistency among groups, a Wilcoxon signed-rank test was utilized. An internal correlation coefficient was used to assess the internal consistency of each question. A *P* value of <0.05 was taken to indicate statistical significance.

RESULTS

In total, the pilot study included nine (60%) male and six (40%) female children, with a mean age of 9.87 years (standard deviation [SD] = 2.92 years). The results from the pilot study are listed in Table 1. We observed no differences in answers for each respective question.

A cross-sectional study, conducted for validation purposes, enrolled 131 children 78 (59.5%) males and 53 (40.5%) females with a mean age of 10.12 years (SD = 3.84 years). Eleven children were at preschool age, 41 children were students in the dysphonia group, eight children were in preschool, and 71 children were students in the control group. None of the parents of the participants smoked cigarette, and none of the children smoked.

The mean age of the control and patient groups were 10.07 years (SD = 4.27 years) and 10.26 years (SD = 1.87 years), respectively. There was no significant difference in age (*P* > 0.05) or gender distribution between the two groups (*P* > 0.05).

For both groups, the responses to each question in weeks 0 and 2 are listed in Table 2. Intergroup comparisons revealed that there were statistically significant differences between the control and patient groups in terms of question responses (*P* < 0.05). However, in intragroup comparisons, only the responses to questions 1, 3, and 6 showed statistically significant differences

in the control group, and no differences were detected in the patient group. Table 3 lists the total scores of each group. Internal consistency coefficients are given in Table 4.

DISCUSSION

The PVRQOL, PVHI, and PVOS are validated instruments used to measure voice self- or caregivers' perception in pediatric patients.⁹⁻¹¹ The surveys can be administered directly to a child or to a caregiver in the case of young children. The creator of the PVRQOL, Boseley et al,⁹ stated that it was important to administer the instrument to caregivers because they are the individuals most affected by children with low voice quality. The PVRQOL measures physical-functional and social-emotional dimensions, and also provides an overall score.^{9,12} It is composed of 10 questions that are scored according to a standard formula, in which a high score reflects a lower self-perception. The PVRQOL provides an easy means of measuring voice quality and can be utilized for baseline evaluation and to assess the effectiveness of follow-up therapy in the clinic.^{15,16} A previous study using the PVRQOL showed that responses from parents are strongly correlated to those of their child, although there are some exceptions.¹⁷ In our study, children who were over 9 years old completed the survey by themselves, and children aged between 7 and 9 years completed the survey with their parents.

Validity was analyzed by comparison of the results of the test and the retest (Table 2). Internal consistency coefficient was used to analyze test-retest reliability (Table 4). The results from our study indicated that responses to questions 1, 3, and 6 of the PVRQOL, related to physical-functional characteristics, were statistically different among children in the control group. In a previous study validating the Turkish version of the pediatric voice handicap index-10 (PVHI-10), responses on physical category items differed more significantly compared with those on functional characteristics items.¹⁴ Our study did not show any difference in physical-functional scales in the patient group. It also showed no difference in the social-emotional category. The social-emotional category was also consistent in the control group.

TABLE 1.
Pilot Study Results

	First Survey	Second Survey	<i>P</i> Value*
	Mean ± SD (Median)	Mean ± SD (Median)	
Question 1	1.87 ± 1.46 (1)	1.87 ± 1.46 (1)	1.000
Question 2	1.93 ± 1.33 (1)	1.73 ± 0.70 (2)	0.334
Question 3	1.80 ± 1.27 (1)	1.87 ± 1.40 (1)	0.317
Question 4	1.93 ± 1.39 (1)	1.93 ± 1.39 (1)	1.000
Question 5	1.80 ± 1.42 (1)	1.93 ± 1.39 (1)	0.157
Question 6	1.93 ± 1.44 (1)	2.07 ± 1.44 (1)	0.157
Question 7	1.87 ± 1.46 (1)	1.93 ± 1.44 (1)	0.317
Question 8	1.47 ± 1.13 (1)	1.53 ± 0.92 (1)	0.564
Question 9	1.87 ± 0.35 (1)	2.00 ± 1.41 (1)	0.157
Question 10	1.13 ± 0.35 (1)	1.20 ± 0.41 (1)	0.317
Total score	17.60 ± 11.44 (14)	17.93 ± 10.93 (13)	0.360

Wilcoxon signed-rank test.

* *P* < 0.05.

Abbreviation: SD, standard deviation.

TABLE 2.
Comparison of the Results of the Patient and Control Groups

		Controls		Patients		P Value*
		Mean ± SD (Median)	Mean ± SD (Median)	Mean ± SD (Median)	P Value*	
Question 1	First survey	1.43 ± 0.83 (1)	2.92 ± 1.38 (3)		0.001§	
	Second survey	1.33 ± 0.69 (1)	2.81 ± 1.3 (3)		0.001§	
	P value†	0.021‡	0.380			
Question 2	First survey	1.41 ± 0.74 (1)	2.31 ± 1.23 (2)		0.001§	
	Second survey	1.33 ± 0.61 (1)	2.46 ± 1.24 (3)		0.001§	
	P value†	0.180	0.441			
Question 3	First survey	1.46 ± 0.94 (1)	1.92 ± 1.29 (1)		0.081	
	Second survey	1.25 ± 0.59 (1)	1.88 ± 1.31 (1)		0.015‡	
	P value†	0.004§	0.705			
Question 4	First survey	1.09 ± 0.33 (1)	2.38 ± 1.42 (2)		0.001§	
	Second survey	1.04 ± 0.19 (1)	2.31 ± 1.49 (2)		0.001§	
	P value†	0.102	0.414			
Question 5	First survey	1.03 ± 0.16 (1)	2.12 ± 1.37 (1)		0.001§	
	Second survey	1.03 ± 0.16 (1)	2.00 ± 1.33 (1)		0.001§	
	P value†	1.000	0.180			
Question 6	First survey	1.15 ± 0.48 (1)	2.35 ± 1.38 (2)		0.001§	
	Second survey	1.09 ± 0.33 (1)	2.46 ± 1.36 (2.5)		0.001§	
	P value†	0.025‡	0.417			
Question 7	First survey	1.05 ± 0.27 (1)	2.15 ± 1.46 (1.5)		0.001§	
	Second survey	1.05 ± 0.22 (1)	2.15 ± 1.38 (2)		0.001§	
	P value†	1.000	1.00			
Question 8	First survey	1.09 ± 0.46 (1)	1.73 ± 1.12 (1)		0.001§	
	Second survey	1.06 ± 0.29 (1)	1.73 ± 1.12 (1)		0.001§	
	P value†	0.414	1.000			
Question 9	First survey	1.53 ± 0.77 (1)	2.77 ± 1.27 (3)		0.001§	
	Second survey	1.57 ± 0.71 (1)	2.92 ± 1.32 (3)		0.001§	
	P value†	0.467	0.248			
Question 10	First survey	1.01 ± 0.11 (1)	2.04 ± 1.46 (1)		0.001§	
	Second survey	1.01 ± 0.11 (1)	1.85 ± 1.46 (1)		0.001§	
	P value†	1.000	0.059			

* Mann-Whitney U test.

† Wilcoxon signed-rank test.

‡ P < 0.05.

§ P < 0.01.

Abbreviation: SD, standard deviation.

We believe that the results that we obtained from the control group may have been due to three questions being misunderstood by the parents. For example, it may be difficult for a parent to hear a child in a noisy environment or while on the telephone. In addition, if the child is undergoing puberty, vocal changes may result

in inconsistent answers among parents for question 3. Furthermore, a child's voice may be more influenced than that of an adult in various sociocultural and emotional contexts. These three questions were related to the physical-functional category, so they might have been misinterpreted because control group participants

TABLE 3.
Comparison of Total Scores from the First and Second Surveys

	Controls		Patients		P Value*
	Mean ± SD (Median)	Mean ± SD (Median)	Mean ± SD (Median)	P Value*	
First survey	12.23 ± 2.86 (11)	22.69 ± 7.84 (22.5)		0.001‡	
Second survey	11.76 ± 2.31 (11)	22.54 ± 7.48 (23)		0.001‡	
P value†	0.002‡	0.647			

* Mann-Whitney U test.

† Wilcoxon signed-rank test.

‡ P < 0.01.

Abbreviation: SD, standard deviation.

TABLE 4.
Results of Test-Retest Reliability

	Control Group	Patient Group
	Internal Correlation Coefficiency (Confidence Interval)	Internal Correlation Coefficiency (Confidence Interval)
Question 1	0.877 (95%)	0.859 (95%)
Question 2	0.730 (95%)	0.377 (95%)
Question 3	0.702 (95%)	0.918 (95%)
Question 4	0.485 (95%)	0.945 (95%)
Question 5	0.487 (95%)	0.949 (95%)
Question 6	0.824 (95%)	0.859 (95%)
Question 7	0.583 (95%)	0.940 (95%)
Question 8	0.742 (95%)	0.968 (95%)
Question 9	0.801 (95%)	0.865 (95%)
Question 10	100 (95%)	0.943 (95%)

Wilcoxon signed-rank test.

did not experience the events like the patient group did. They might have thought that the third question could have been related to content of speech and that the sixth question could have been related to social anxiety. On the other hand, these are the events the patients experienced, and they could understand the questions easily. With regard to the patient group, we observed no statistical differences among respondents' answers to any of the questions.

Translation processes were done by professional translators and bilingual people. Translation from English to Turkish was completed by two professional translators. Two bilingual persons who could speak both Turkish and English translated the survey back to English, and they were blind to the original survey. Then the two versions were compared.

A limitation of our study can be the short interval between test and retest times, although most of the studies used this interval.^{9,12,14} In addition, our translators were not speech language pathologists, unlike those in the study of Ribeiro et al.¹²

CONCLUSION

The results from this study indicate that the Turkish version of the PVRQOL is a valid and reliable instrument for assessing dysphonic patients. In light of these results, we believe that this test should be utilized to evaluate and monitor dysphonic children in the clinic.

Acknowledgments

We would like to thank Sümeyra Özdemir, Füsün Ürer, and Esin Caba for their contribution.

APPENDIX A

PEDİATRİK SES İLE İLGİLİ HAYAT KALİTESİ ANKETİ

Lütfen aşağıdaki soruları çocuğunuzun son iki haftadaki sesine göre cevaplandırınız. (Eğer 13–19 yaş arası bir cevaplayan iseniz, kendi sesinize göre cevap veriniz.) Lütfen sorunun hem ne kadar

ağırhemde ne kadar sıklıkla olduğunu düşünerek aşağıdaki maddeleri puanlandırınız.

Aşağıdaki değerlendirme yelpazesini kullanınız;

1-Hiç sorun değil

2-Biraz

3-Oldukça

4-Çok

5-Olabildiğince kötü

6-Uygun değil

Çocuğumun sesine göre bu ne kadar sorundur?

1) Çocuğum gürültülü ortamlarda yüksek sesle konuşmakta veya sesini duyurmakta zorluk çeker.

1 2 3 4 5 6

2) Çocuğum konuşurken nefessiz kalır ve sık nefes alıp verme ihtiyacı duyar.

1 2 3 4 5 6

3) Çocuğum konuşmaya başladığında bazen ağzından ne çıkacağını bilmez.

1 2 3 4 5 6

4) Çocuğumbazen (sesinden dolayı) endişeli ve hayal kırıklığına uğramış hisseder.

1 2 3 4 5 6

5) Çocuğum (sesinden dolayı) bazen kendini depresif hisseder.

1 2 3 4 5 6

6) Çocuğum telefon kullanırken yada arkadaşlarıyla ile yüzyüze konuşmakta zorluk çeker.

1 2 3 4 5 6

7) Çocuğum (sesinden dolayı)işini yada okul ödevlerini yapmakta zorluk çeker.

1 2 3 4 5 6

8) Çocuğum (sesinden dolayı)sosyalleşmek için dışarı çıkmaktan kaçınır.

1 2 3 4 5 6

9) Çocuğum anlaşılmak için,söylediklerini tekrar etmek zorunda kalır.

1 2 3 4 5 6

10) Çocuğum (sesinden dolayı)daha az dışa dönük hale geldi.

1 2 3 4 5 6

REFERENCES

1. Trentini LCM, Hutz CS, Bandeira DR, et al. Correlações entre a EFN—Escala Fatorial de Neuroticismo e o IFP—Inventário Fatorial de Personalidade. *Aval Psicol.* 2009;8:209–217.
2. Figueiró MT, Martins LNR, Leite LRC, et al. Traços de personalidade de estudantes de Psicologia. *Psicólogo inFormação.* 2010;14:13–28.
3. Mathieson L. Communicative functions of the voice. In: Mathieson L, ed. *Greene and Mathieson's the Voice and Its Disorders.* 6th ed. Whurr publishers; 2001:3–13.
4. Deary IJ, Wilson JA, Carding PN, et al. From dysphonia to dysphoria: Mokken scaling shows a strong, reliable hierarchy of voice symptoms in the Voice Symptom Scale Questionnaire. *J Psychosom Res.* 2010;68:67–71. doi:10.1016/j.jpsychores.2009.06.008.
5. Roy N, Holt KI, Redmond S, et al. Behavioral characteristics of children with vocal fold nodules. *J Voice.* 2007;21:157–168.
6. Duff MC, Proctor A, Yairi E. Prevalence of voice disorders in African American and European American preschoolers. *J Voice.* 2004;18:348–353.
7. Silverman EM. Incidence of chronic hoarseness among school-age children. *J Speech Hear Disord.* 1975;40:211–215.

8. Sederholm E, McAllister A, Dalkvist J, et al. Aetiologic factors associated with hoarseness in ten-year-old children. *Folia Phoniatr Logop.* 1995;47:262–278.
9. Boseley ME, Cunningham MJ, Volk MS, et al. Validation of pediatric voice related quality of life survey. *Arch Otolaryngol Head Neck Surg.* 2006;132:717–720.
10. Zur KB, Cotton S, Kelchner L, et al. Pediatric Voice Handicap Index (PVHI): a new tool for evaluating pediatric dysphonia. *Int J Pediatr Otorhinolaryngol.* 2007;71:77–82.
11. Hartnick CJ. Validation of pediatric voice quality of life instrument: the Pediatric Voice Outcome Survey. *Arch Otolaryngol Head Neck Surg.* 2002;128:919–922. doi:10.1001/archotol.128.8.919.
12. Ribeiro LL, de Paula KMP, Behlau M. Voice related quality of life in pediatric population: validation of Brazilian version of the Pediatric Voice Related Quality of Life Survey. *Codas.* 2014;26:87–95.
13. Branski RC, Cukier-Blaj S, Pusic A, et al. Measuring quality of life in dysphonic patients: a systematic review of content development in patient-reported outcomes measures. *J Voice.* 2010;24:193–198.
14. Özkan ET, Tuzuner A, Tadıhan E, et al. Reliability and validity of Turkish Pediatric Voice Handicap Index. *Int J Pediatr Otorhinolaryngol.* 2015;79:680–684. doi:10.1016/j.ijorl.201502.14.
15. Gasparini G, Behlau M. Quality of life: validation of the Brazilian version of the Voice-Related Quality of Life (V-RQOL) measure. *J Voice.* 2009;23:76–81.
16. Steen IN, MacKenzie K, Carding PN, et al. Optimizing outcome assessment of voice interventions, II: sensitivity to change of self-reported and observer-rated measures. *J Laryngol Otol.* 2008;122:46–51.
17. Cohen W, Wynne DM. Parent and child responses to the Pediatric Voice-Related Quality-of-Life Questionnaire. *J Voice.* 2015;29:299–303. doi:10.106/j.jvoice.2014.08.004.