

Otorrinolaringología Pediátrica

Index of pediatric voice handicap: Translation, transculturalization and validation to Argentinian Spanish

Índice de discapacidad vocal pediátrico: traducción, transculturalización y validación al Español-Argentino

Índice de deficiência pediátrica de voz: tradução, transculturalização e validação para Argentina-Espanhola

Dra Sandra Carrera Fernandez⁽¹⁾, Dra Paula Gabaldón Massé^(a), Lic. Fabiana Wilder^(b), Dr. Diego Preciado^(c), Dr. Hugo A. Rodríguez^(a)

Abstract

Objective: Voice disorders are very common in the pediatric population, with 6% and 23% of all children presenting with some form of dysphonia [1,2]. For many years, these patients have been underdiagnosed. There has been increasing awareness and interest in the study of voice alterations in children, and, most importantly, their impact in their quality of life. To do this, an instrument capable of measuring the quality of life in pediatric patients with vocal pathology is required, which can be used extensively in the scientific community. The objective of our study is to carry out the translation, transculturalization and validation of pVHI (Pediatric Voice Handicap Index) to Argentinian Spanish-speakers

Material and Method: A study was carried out in the Hospital de Pediatría Dr. JP Garrahan in the city of Buenos Aires, Argentina. It included patients between 3 and 18 years old. The pVHI was translated and transculturalized for said population and for its validation, a survey was carried out in two groups of patients: one group being children with a background of both reconstructive larynx surgery, and dysphonia (n = 35) and the other group being control patients, without any voice pathology (n = 35). The survey was conducted among either parents or caregivers of the children in question

Results: A significant difference was found between both groups, for both overall pVHI score and survey sub-groups score ($p < 0.001$) with an

optimal internal confidence and a good Alpha Cronbach for each of the subgroups (functional 0,92; organic 0,87 and emotional 0,88). Test-retest for reliability revealed “p-values” without any significant difference ($p > 0.05$) for each of all subgroups (functional 0,68; organic 0,32 and emotional 0,72).

Conclusions: The validation and transculturalization of the rate of pediatric vocal impairment to Argentinian Spanish population presented an adequate validity and reliability. The rate of pediatric vocal impairment was identified through this simple and practical survey, offering additional information on the child's own vocal perception by part of the caregiver. We recommend this survey being included as a valuable tool in the evaluation of pediatric dysphonia in Spanish-speaking families.

Keywords: Pediatric, dysphonia, Voice handicap index

Introduction

The prevalence of voice disorders in children and teenagers ranges from 6% to 23% [1,2].

The methods using modern equipment such as videolaryngoscopy or videolaryngostroboscopy, contributed in very significant form to the diagnostic accuracy, but they have not contributed data about the impact that the dysphonic scene represents in children in the social sphere.

a HOSPITAL de PEDIATRÍA J.P. GARRAHAN, Buenos Aires, ARGENTINA

b HOSPITAL de CLINICAS José de SAN MARTÍN, Buenos Aires, ARGENTINA

c DEPARTMENT of OTOLARYNGOLOGY, Children's NATIONAL MEDICAL Center, WASHINGTON, D.C, USA

Corresponding author E-MAIL ADDRESS: sacarrera@intramed.net (S.M. Carrera Fernández).

Received 18 April 2019; Received in revised form 26 August 2019; Accepted 28 August 2019

Childhood dysphonia has both emotional and pedagogical consequences, and furthermore affects communication in a broader sense, being the voice a determining element for the higher cognitive functions [3].

Two decades ago, the importance of the influence of the voice in overall quality of life was recognized. B.H Jacobson et al. developed and validated a "The Voice Handicap Index" in 1997 [4] to be used in adult patients with dysphonia, some of which had to answer a total of 30 questions about the repercussion of the voice in physical, functional and emotional areas.

In 2007, Zur and colleagues, developed a pediatric version of the survey, which was adapted and validated to said population [5], measuring the severity of the impact of the voice in physical, functional and emotional areas. The linguistic and cultural characteristics of different populations led to the transculturalization, translation and validation in different languages. It should be noted that there are countries that have the same language but culturally present important linguistic differences, such as Spanish in Spain and Spanish in Argentina.

The motive of the following work is to achieve the translation, transculturalization and validity of pVHI to Argentinian/Spanish.

Material and Method

Development of the ARGENTINIAN-SPANISH version

The original version of pVHI in English was translated to Spanish by two public translators, one of them with no knowledge in the topic in hand and the other one with knowledge in the topic.

Subsequently, a unique version was made in said translation by a reunion of both English translators.

Said translation was submitted to an Argentinian linguistics specialist, who performed the transculturalization of the unique version delivered by the two translators.

The pVHI version already translated and transculturalized, was translated back to English by an English-speaking person, verifying each item would match the original English version.

The final version of the survey was built after the meeting held between of the present work authors, the linguistics specialist and both public translators.

The final survey was subjected to testing by a group of 11 parents or caregivers, evaluating each item's comprehension, and making sure each necessary modification was made to culturally adapt the survey (Fig. 1).

Fig. 1

INDICE DE DISCAPACIDAD VOCAL PEDIATRICO

Español Argentino

Para ser completado por el Personal
 F=
 O=
 E=
 Total=
 Locuacidad

Calificaría la capacidad de habla de mi hijo/a (locuacidad) como:
(haga un círculo en la respuesta)

1	2	3	4	5	6	7
oyente callado			hablador promedio			extremadamente hablador

A continuación, encontrará un listado de eventos relacionados con la voz que podrían ocurrirle a su hijo/a. Por favor, cuéntenos que tan frecuentemente suceden marcando con un círculo:

0="Nunca"	1="Casi nunca"	2="A veces"	3="Casi siempre"	4="Siempre"
-----------	----------------	-------------	------------------	-------------

No hay respuestas correctas o incorrectas. Si no comprende alguna cosa, por favor pida ayuda.

Parte 1 – Funcional

1) La gente tiene dificultad para oír la voz de mi hijo/a.	0	1	2	3	4
2) La gente tiene dificultad para entender a mi hijo/a en lugares ruidosos.	0	1	2	3	4
3) Nosotros tenemos dificultad para oír a nuestro hijo/a en casa si nos habla desde otra habitación.	0	1	2	3	4
4) Mi hijo/a evita comunicarse con la gente debido a su voz.	0	1	2	3	4
5) Mi hijo/a habla menos de lo que debe con sus amigos, vecinos o familiares debido a su voz.	0	1	2	3	4
6) La gente le pide a mi hijo/a que repita lo que les dice cuando les habla cara a cara.	0	1	2	3	4
7) Los problemas con la voz de mi hijo/a afectan negativamente sus actividades personales, escolares y sociales.	0	1	2	3	4

Parte II – Orgánica

1) Mi hijo/a se queda sin aire al hablar.	0	1	2	3	4
2) La voz de mi hijo/a suena diferente a lo largo del día.	0	1	2	3	4
3) La gente me pregunta: "¿Qué le pasa a tu hijo/a con la voz?"	0	1	2	3	4
4) La voz de mi hijo/a suena áspera y/o ronca.	0	1	2	3	4
5) La calidad de la voz de mi hijo/a es impredecible (no podemos saber como se va a oír a lo largo del día).	0	1	2	3	4
6) Mi hijo/a hace mucho esfuerzo para hablar (ej.: tensión)	0	1	2	3	4
7) La voz de mi hijo/a empeora por la tarde.	0	1	2	3	4
8) La voz de mi hijo/a se "agota" al hablar.	0	1	2	3	4
9) Mi hijo/a tiene que gritar para que los otros lo oigan.	0	1	2	3	4

Parte III – Emocional

1) Mi hijo/a parece tenso cuando habla con los demás debido a su voz.	0	1	2	3	4
2) La gente parece irritada por la voz de mi hijo/a.	0	1	2	3	4
3) Creo que la gente no comprende el problema de voz de mi hijo/a	0	1	2	3	4
4) Mi hijo/a está frustrado por su problema de voz.	0	1	2	3	4
5) Mi hijo/a sale menos por su problema de voz.	0	1	2	3	4
6) Mi hijo/a se siente molesto cuando la gente le pide que repita una frase.	0	1	2	3	4
7) Mi hijo/a se siente avergonzado cuando la gente le pide que repita una frase.	0	1	2	3	4

Índice global de severidad de la discapacidad de la voz

(Por favor coloque una "X" en cualquier lugar sobre esta línea para indicar la severidad de la discapacidad de la voz de su hijo/a)

Normal

Severa

Methods

A prospective, cohort study took place between May and October 2018, in the Hospital de Pediatría JP Garrahan, with previous approval from the Ethics Committee of said hospital. The translated survey was delivered to 70 parents or caregivers of patients. Each caregiver was required to have basic reading and writing comprehension skills and had to agree in participating in the study via a signature of informed consent, as well as to answer the survey in its entirety.

The ages of the patients which participated were between 3 and 18 years. The maximum time of the performance of the survey was 20 min.

- 35 patients did not present associated vocal pathology

- 35 patients presented a background of reconstructive larynx surgery, which often purports a grave vocal disorder.

STATISTICS

Every survey was subjected to the statistics evaluation with the program Stata 14.

The internal consistency of the questionnaire was determined using Cronbach's alpha coefficient. An alpha value greater than 0.8 is considered good and greater than 0.9 is considered excellent, whereas any value above 0.7 is considered satisfactory. The Student t-test was used to measure the clinical validity of the variables used in the test analysis and was used to compare the questionnaire scores between children with dysphonia and children without dysphonia.

Results

Of the total of 70 patients (between 3 and 18 years old), 37 were female, and 33 were male. From this group, 13 were preschoolers (3–5 years old), 42 were scholars (6–12 years old), and 15 were adolescents (13–18 years old). The age average of the evaluated patients was 9,5 years old with a SD of ± 3,8.

These patients were evaluated with the pediatric vocal disorder index, translated and transculturalized, and divided into two groups: one group of 35 patients which were presented at the Hospital J. P. Garrahan for non-related consultations with the pathology of the voice (control) and the remaining 35 patients had a background of reconstructive larynx surgery (dysphonic) at the Respiratory Endoscopy Service at said institution (*Table 1*).

A study was carried out in order to determinate the validity of the rate of pediatric vocal disorder, in the translated and transculturalized pVHI, through the analysis of scores in each of the survey subgroups. The control group was found to have a

mean of 0.8571 on the functional scale, 0.8285 on the psychical scale, 0.9142 on the emotional scale, and an overall survey mean score of 2.6. Compared to controls, the dysphonia group reported mean scores of 12.8857 points on the functional scale, 12.7142 on the physical scale, 7.9428 on the emotional scale, with a mean total score of 33.5428.

Table 1

Study groups and Demographic characteristics of patients.

Patients	n	male	Females
Control children	35	17	18
Dysphonic children	35	16	19
Total	70	33	37

The evaluation of the reliability of the method was performed through a re-test to 64 of the total 70 patients and the calculation of Alpha Cronbach. In the test-retest of these patients, with a confidence interval of 95%, no significant difference was observed in none of the subgroups ($p > 0.05$). The score for Alpha Cronbach was 0.9271 on the functional scale, 0.8790 on the physical scale and 0.8877 on the emotional scale, demonstrating a strong reliability (*Table 2*).

Table 2

Test-retest reliability for total Spanish PVHI scores and different subscales evaluated and Internal consistency assessed by Cronbach's alpha coefficient. (F: Functional; P: Physical; E: Emotional).

Patients n = 64	F (28)	P (36)	E (28)	Total (92)
Test	7,0937	6,7968	4,7187	18,6093
Re- Test	6,9843	7,0156	4,625	18,625
Diff	0,1093	-0,2187	0,0937	-0,0156
95% IC	(0,4322/ 0,6510)	(-0,6558/ 0,2183)	(-0,4266/ 0,6141)	(-1,0980/ 1,0668)
P ($p > 0.05$)	0,6879	0,3211	0,7201	0,9771
	Not significant	Not significant	Not significant	Not significant
Cronbach's alpha	0,9271	0,8790	0,8877	0,9514

There were statistically significant differences between the study groups in the mean total P-VHI score and the average score for each functional, physical and emotional item obtained in this groups. Using the Student t – test showed that children with dysphonia present a P-VHI with values 33.63% higher than the control group ($33.54 \pm 2.6 \pm 16.38 \pm 4.20, p < 0,001$). (*Table 3*).

The t-Student test was used, which is based on two premises; the first in the distribution of normality and the second, in the samples in which they were independent. This allowed us to compare samples.

Discussion

Dysphonia is defined as the presence of alterations in the production or quality of voice, interfering in communication and affecting the quality of life.

Currently, there has been a growing interest in the study of voice alterations, and, fundamentally, its impact in the quality of life.

While voice disorders are common in pediatric population, for many years, they were underestimated.

Videolaryngoscopy and videolaryngostroboscopy's evaluation of the larynx provide us information about the vocal cords and their pathology. While these instruments allow the organic evaluation of the causes for dysphonia, they do not provide us information regarding the child's quality of life [5].

The first instrument capable of measuring the quality of the voice, was developed in the year 1997 by B H. Jacobson et al., due to the need of quantifying the psychosocial consequences of voice disorders [4], carrying out the development and validation of the Vocal Handicap Index (VHI) aimed to adult patients. The VHI contains 30 items (organized in three groups of 10, named the physical subscale, the functional subscale and the emotional subscale).

In the year 2007, Karen B. Zur developed, adapted and validated a scale based on VHI, but adapted to pediatric patients, which was denominated "The Pediatric Voice Handicap Index" (pVHI) [5], which featured 23 questions, whom were divided according to the three aspects of the voice. In the first part, the functional aspect is evaluated and consists of 7 questions; in the second part, the physical aspect is

Table 3

Total P-VHI score and functional, physical and emotional subscales..

p-VHI	Score dysphonic children X ± SD	Score control children X ± SD	Median (CI 95%)	t-Student
Functional (28)	12,8 ± 5,8	0,85 ± 1,53	12,02 (9,99-14,06) 42,92%	p < 0,001
Physical (36)	12,7 ± 6,33	0,82 ± 2,65	11,88 (9,5-14,2) 33,3%	p < 0,001
Emotional (28)	7,9 ± 7,08	0,91 ± 1,37	7,02 (4,59-9,46) 25,07%	p < 0,001
Total (92)	33,54 ± 16,38	2,6 ± 4,20	30,94(25,23-36,64) 33,63%	p < 0,001

SD: standard derivation.

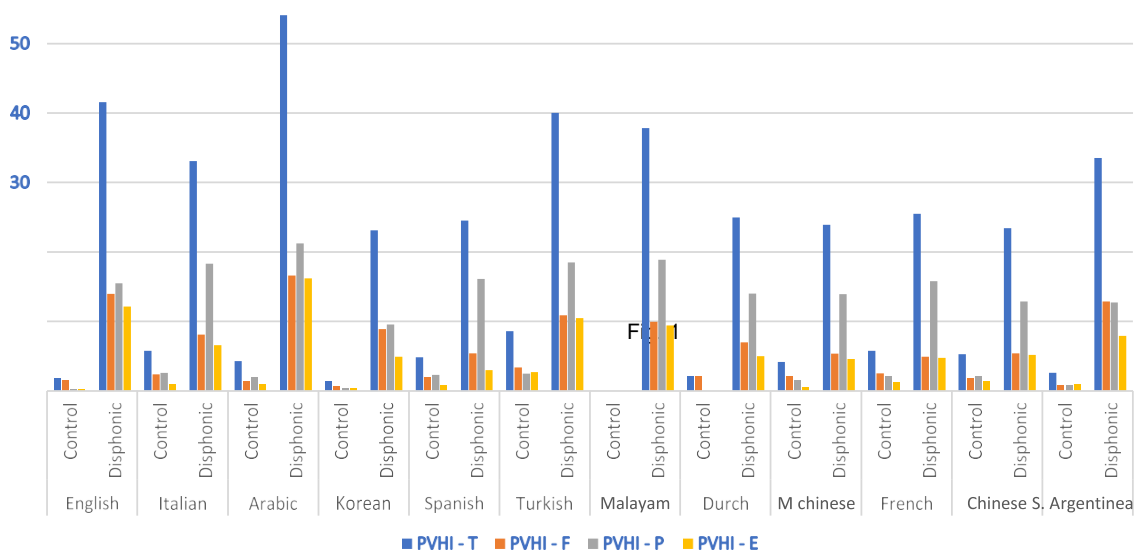


Fig. 2 . Comparison of the results of the P-VHI validated in English, Italian, Arabic, Korean, Spanish, Turkish, Malayan, Dutch, Mchisenes, French, Chinese S, and Argentinean. Comparative review of results of mean P-VHI scores between control group and group of patients with dysphonia among the different languages.

Table 4

Comparison of the results of the P-VHI validated Cronbach's alpha.

	Italian	Arabic	Korean	Spanish	Turkish	Malayan	Dutch	M Chinese	French	Chinese	S. Argentinean
PVHI - F	0,93	0,929	0,88	0,612	0,912	0,922	0,91	0,88	0,83	0,788	0,9271
PVHI - P	0,92	0,925	0,89	0,924	0,954	0,953	0,93	0,88	0,944	0,892	0,879
PVHI - E	0,89	0,929	0,85	0,428	0,928	0,923	0,92	0,92	0,846	0,902	0,8877
PVHI - T	0,95	0,931	0,97	0,811	0,972	0,974	0,96	0,95	0,929	0,944	0,9514

evaluated and consists of 7 questions; in the second part, the physical aspect is evaluated, which includes 9 questions; and the third and last part, the emotional aspect is evaluated. Of all the 23 questions, a minimum 0 points can be achieved, while a maximum of 92 points can be achieved.

Due to the broad acceptance worldwide to pVHI as a tool of evaluation in the quality of life of children with dysphonia and demonstrated with its various translations, transculturalization and validation to other languages like Italian in 2011, in charge of Schlinder et al.^[6], in Arab in 2012 by the team led by Shoeb RM. Et al^[7], in Korean in 2013, made by Porksetal et al.^[8], in Turkish, Spanish and Malayan in 2015 by the teams of Özkan ET, Sanz and Devados et al., respectively^[9-11]. In 2017, the Dutch team of Veder L et al.^[12] and in 2018 to Mandarin Chinese, French and Official Chinese^[13-15]; among other countries (Fig. 2, and Table 4). Our results are consistent with the literature presented in the same questionnaires.

Transculturalization is presented as a challenge in different countries. The translation to Spanish is not enough for native Argentinian Spanish speakers. While Spanish is the language in Argentina, the need to have a compatible survey with the linguistic characteristics of the country, led to modifying words for the appropriate understanding. A comparison of the Spanish version of the pVHI and the Argentinian.

Spanish version of the pVHI is presented as supplemental (Fig. 1).

Currently the diagnostic approach to pediatric dysphonia is based in three fundamental pillars, the instrumental visual evaluation by the use of videolaryngoscopy or videolaryngostroboscopy, the acoustic analysis of the voice, and the questionnaires about the quality of life, like (among others) pVHI.

Conclusion

This new Argentinian Spanish pVHI survey demonstrated strong validity and reliability. Therefore, we recommend including this survey as an additional tool within the international diagnostic protocols of pediatric dysphonia, for Argentinian Spanish-speaking families.

Agradecimiento:

Reprinted from: International Journal of Pediatric Otorhinolaryngology 127 (2019) 109663. Sandra M Carrera Fernández, Paula Gabaldón Massé, Fabiana Wilder, Diego Preciado, Hugo A Rodríguez. Index

of pediatric voice handicap: Translation, transculturalization and validation to Argentinian Spanish. Copyright 2019, with permission from Elsevier.

This work does not present any conflict of interest

References

1. Carding PN, Roulstone S, Northstone K, ALSPAC Study Team. The prevalence of childhood dysphonia: a cross-sectional study. *J. Voice* 20 (2006) 623–630.
2. Tavares EL, Brasolotto A, Santana ME, Padovan CA, Martins RH. Epidemiological study of dysphonia in 4–12 year-old children. *Braz. J. Otorhinolaryngol.* 77 (2011) 736–746.
3. Von Lochow H, Lyberg-Åhlander V, Sahlén B, Kastberg T, Brännström KJ. The effect of voice quality and competing speakers in a passage comprehension task: performance in relation to cognitive functioning in children with normal hearing. *Logop. Phoniatr. Vocol.* 43 (1) (2018 Apr) 11–19. <https://doi.org/10.1080/14015439.2017.1298835>. Epub 2017 Mar 13.
4. Jacobson BH, Johnson A, Grywalski C, Silbergleit A, Jacobson G, Benninger MS, et al. The Voice Handicap Index: development and validation. *Am. J. Speech Lang. Pathol.* 6 (1997) 66–70.
5. Zur KB, Cotton S, Kelchner L, Baker S, Weinrich B, Lee L. Pediatric Voice Handicap Index (pVHI): a new tool for evaluating pediatric dysphonia. *Int J. Pediatr. Otorhinolaryngol.* 71 (2007) 77–82.
6. Schindler A, Tiddia C, Ghidelli C, Nerone V, Albera R, Ottaviani F. Adaptation and validation of the Italian Pediatric Voice Handicap Index. *Folia Phoniatr Logop.* 63 (2011) 9-14.
7. Shoeb RM, Malki KH, Mesallam TA, Farahat M, Shehata YA. Development and validation of the Arabic pediatric voice handicap index. *Int J Pediatr Otorhinolaryngol.* 76 (2012) 1297-303.
8. Park SS, Kwon TK, Choi SH, Lee WY, Hong YH, Jeong NG, Sung MW, Kim KH. Reliability and validity of the Korean version of Pediatric Voice Handicap Index: in school age children. *Int J Pediatr Otorhinolaryngol.* 77 (2013) 107-12.
9. Özkan ET, Tüzüner A, Demirhan E, Topbaş S. Reliability and validity of the Turkish pediatric Voice Handicap index. *Int J Pediatr Otorhinolaryngol.* 79 (2015) 680-4.
10. Sanz L, Bau P, Arribas I, Rivera T. Adaptation and validation of Spanish version of the pediatric Voice Handicap Index (P-VHI). *Int J Pediatr Otorhinolaryngol.* 79 (2015) 1439-43.
11. Devadas U, Dhanya M, Gunjawate D. Adaptation and validation of the Malayalam pediatric voice handicap index. *Int J Pediatr Otorhinolaryngol.* 79 (2015) 1425-8.
12. Veder L, Pullens B, Timmerman M, Hoeve H, Joosten K, Hakkesteeft, M. Reliability and validity of the Dutch pediatric Voice Handicap Index. *Int J Pediatr Otorhinolaryngol.* 96 (2017) 15-20.
13. Lu D, Huang M, Li Z, Yiu EM, Cheng IK, Yang H, Ma EP. Adaptation and validation of Mandarin Chinese version of the pediatric Voice Handicap Index (pVHI). *Int J Pediatr Otorhinolaryngol.* 104 (2018) 19-24.
14. Odon PA, Boucekine M, Boyer L, Triglia JM, Nicollas R. Health-related quality of life in children with dysphonia and validation of the French Pediatric Voice Handicap Index. *Int J Pediatr Otorhinolaryngol.* 104 (2018):205-209.
15. Liu K, Liu S, Zhou Z, Ren Q, Zhong J, Luo R, Qin H, Zhang S, Ge P. Reliability and validity of the Chinese pediatric voice handicap index. *Int J Pediatr Otorhinolaryngol.* 105 (2018) 127-131.