

Validation of Malayalam Version of the Voice Handicap Index

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ABSTRACT

Background: It is important to have a subjective measure of hoarseness. This can be best achieved if the questionnaire is in the patient's own language.

Objective: To translate the voice handicap index (VHI) into the Malayalam language, and to evaluate its clinical validity and internal consistency.

Materials and methods: One hundred and six patients with dysphonia and 20 asymptomatic subjects were included in the study. Internal consistency was analyzed through Cronbach's alpha coefficient. For the clinical validity assessment, the scores obtained in the patient group were compared with those found in asymptomatic individuals through the Mann-Whitney U-test. Also, comparison between the VHI scores before and after phonosurgery on 14 out of the studied 106 patients was done using the nonparametric Wilcoxon signed ranks test. Spearman rank correlation was used to find the effect of patient's age on VHI scores. Finally, the gender-wise average VHI score and its three subsets was analyzed using Wilcoxon signed ranks test.

Results: The internal consistency was found to be excellent ($\alpha = 0.946$). The control group scored significantly lower than the patients group ($p < 0.001$). Similarly, significant improvement was seen in the postoperative average VHI scores ($p < 0.004$). All of the preceding proves the validity of the translated questionnaire. Age showed a significant negative correlation for the overall VHI and their three domains ($p < 0.001$) in the dysphonic patients. There was no such correlation between male and female patient groups.

Conclusion: This Malayalam language version of the VHI questionnaire is a valid instrument for use in the voice clinic.

Clinical implication: Encouragement to all voice clinicians in India to develop and use the VHI in their native tongues.

Keywords: Dysphonia, Voice handicap index, Validation study.

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INTRODUCTION

The symptom of hoarseness is one that can affect the patient in different ways. This would depend on factors as varied as his/her personality, occupation and life-style. Consequently, the subjective handicap felt may not always correlate with the objective finding. This is in contrast to most other diseases where the physician can predict the

patient's handicap from the diagnosis. In such a background, many subjective evaluation forms have been devised for the dysphonic patient. The most popular and validated one is the voice handicap index (VHI).¹ It is now accepted as a useful tool in a dedicated voice clinic.

We have used a vernacular (Malayalam) version of the VHI questionnaire in our clinic. The present study is a pilot attempt to test its validity. Apart from a Hindi version, this is the first ever such attempt in India.

MATERIALS AND METHODS

The adapted VHI form with all 30 questions translated into Malayalam was initially tested on a few patients in the general ENT OPD, along with discussion among the faculty. It was then administered to patients attending our voice clinic. For the purpose of this study, 106 consecutive patients completed the form. As controls, doctors and staff in ENT department (all asymptomatic for voice problems), 20 in number, were administered the form.

Surgical cases (microphonosurgery for vocal fold cysts and polyps) were administered another VHI form after due healing period following surgery. This was around 1 month postoperatively, depending on appointment to the clinic. These were 14 in number, and formed the group for comparison between pre- and postoperative VHI scores.

Statistical Analyses

The internal consistency of the translated questionnaire was analyzed through Cronbach's alpha coefficient. This is a statistical measure to determine the internal consistency among test items. A value of $\alpha > 0.9$ is considered excellent, 0.8 to 0.9; good and >0.7 ; satisfactory. To confirm the internal consistency, a correlation was also done between each item and total VHI scores using Spearman rank correlation coefficient.

For the clinical validity assessment, the scores obtained in the patient group were compared with those found in asymptomatic individuals through the nonparametric Mann-Whitney U-test. In addition, comparison between the pre and postoperative scores of 14 patients who underwent surgery was done using the nonparametric Wilcoxon signed ranks test.

Finally, the effect of age and gender on overall VHI and its three subscales were analyzed, using Spearman rank correlation and Wilcoxon signed rank test respectively.

All statistical analysis was performed using the statistical software SAS 9.1 (Statistical Analysis Software 9.1, SAS Institute Inc, Cary, NC).

RESULTS AND OBSERVATIONS

Total number of patients was 106 (n = 106).

There were 45 men and 61 women (M = 45, F = 61).

Mean age of the patients was 39.09 ± 14.35 years, with a range of 9 to 75. Out of these 106, 14 subjects underwent surgery ($S_n = 14$).

Controls (asymptomatic) subjects were 20. ($C_n = 20$). Their mean age was 26.1 ± 7.3 years, ranging from 18 to 41.

Internal consistency: This was found to be excellent (Cronbach's alpha = 0.946). There was high correlation for all the three domains vis-a-vis total VHI ($r = 0.9086, 0.87945, 0.9321$ for functional, physical and emotional respectively). Similarly, the estimated correlation between each item and total VHI was also found to be high (Table 1).

Validity: Total VHI score of control and patients were 0.6 ± 2.087 and 46.877 ± 25.395 respectively. Thus, the control group scored significantly lower than the patient group ($p < 0.001$) on comparison of the average of three domain scores and total VHI score. The other statistic that we have checked is the comparison between the VHI scores of patients before and after microphonosurgery. It revealed a significant improvement in the average total VHI scores ($p < 0.0042$). The total VHI score before and after were 44.357 ± 29.63 and 25.571 ± 23.441 respectively (Tables 2 and 3).

Table 1: Correlation between individual item and total VHI and measurement of the reliability of the 30 items in Malayalam VHI using Spearman rank correlation coefficient

Item	Item/total VHI score correlation	
Functional domain	F1	0.554763
	F2	0.604252
	F3	0.573853
	F4	0.261536
	F5	0.572615
	F6	0.616014
	F7	0.643048
	F8	0.620909
	F9	0.573752
	F10	0.450341
Physical domain	P1	0.520083
	P2	0.470039
	P3	0.667660
	P4	0.410142
	P5	0.686754
	P6	0.715105
	P7	0.535361
	P8	0.709843
	P9	0.444535
	P10	0.461949
Emotional domain	E1	0.726945
	E2	0.673231
	E3	0.502268
	E4	0.767420
	E5	0.564717
	E6	0.670778
	E7	0.728060
	E8	0.727107
	E9	0.713887
	E10	0.639329

Cronbach's alpha 0.946705

Table 2: Comparison between the dysphonic patients and controls using nonparametric Mann-Whitney U-test

Group	n	Mean \pm SD	p-value
Functional	Patients	106	12.99 ± 8.623
	Control	20	0.2 ± 0.8944
Physical	Patients	106	20.841 ± 8.992
	Control	20	0.3 ± 0.9234
Emotional	Patients	106	13.037 ± 10.24
	Control	20	0.1 ± 0.447
Total VHI	Patients	106	46.877 ± 25.395
	Control	20	0.6 ± 2.087

Table 3: Comparisons of VHI (Domain and total) scores among before and after surgery using Wilcoxon rank signed test

Domain	Surgery	Mean \pm SD	p-value
Functional	Before	13.786 ± 11.735	0.0554
	After	8.1428 ± 8.716	
Physical	Before	19.357 ± 8.61	0.0042*
	After	11.4285 ± 7.812	
Emotional	Before	11.212 ± 11.032	0.0032*
	After	5.00 ± 8.1050	
Total VHI	Before	44.357 ± 29.63	0.0042*
	After	24.571 ± 23.441	

*Statistically significant at $p < 0.05$

Table 4: Correlation between age and VHI (domain and total) scores among dysphonic patients and controls using Spearman rank correlation

Domain	Age	
	Patients	Control
Functional	r = -0.33948 p < 0.001	r = 0.1806 p = 0.4461
Physical	r = -0.41251 p < 0.001	r = 0.29157 p = 0.2123
Emotional	r = -0.32544 p < 0.001	r = 0.1806 p = 0.4461
Total VHI	r = -0.39391 p < 0.001	r = 0.2897 p = 0.2154

Age and sex: In the patient group, age showed statistically significant negative correlation to the overall VHI score and to its three domains, namely, functional, physical and emotional. {- 0.39391 (p < 0.001), - 0.33948 (p < 0.001), - 0.41251 (p < 0.001), - 0.39391 (p < 0.001) respectively}. In the control group, age did not show significant correlation (Table 4).

Among patients, the mean total VHI score for male subjects was 46.04 ± 24.043 , while for the female subjects it was 47.04 ± 26.530 ; the difference was not statistically significant (p = 0.9669). The difference between mean scores of males and females functional, physical, emotional VHI scores was also not statistically significant (p = 0.516, p = 0.093, p = 0.7465 respectively).

DISCUSSION

Role of VHI in the management of voice disorders: The voice handicap index has been proven beyond doubt as the preferred subjective evaluation score for dysphonic patients. Consisting of 30 questions, it was devised by Jacobson et al in 1997.¹ Literature search reveals many studies asserting its utility.²⁻⁴ One article describes it as a useful instrument for quantifying the biopsychosocial impact of a voice disorder.⁵

Role of translation: The true clinical advantage of a purely subjective questionnaire depends on its comprehensibility to the patient. To this end, it becomes essential that the questions be in the patient's native tongue. There are enough documented reports in literature of the VHI being adapted and validated into local languages all over the world.⁶⁻⁸ An Indian version has been described but with no language specification.⁹ Befittingly, a version in our national language, Hindi, has been the first to be reported as validated.¹⁰ To the best of our knowledge, no other vernacular VHI has been reported from India. So, the present study is a first in that sense.

Malayalam is the native language of the people of the state of Kerala. It is spoken by approximately 35 million

people, worldwide. Our Institution is a tertiary referral center in the premier metropolitan city in the state. A separate voice clinic was set up in the ENT department, consisting of the laryngostroboscope and voice analysis software. We felt the need for the VHI score too to complement the objective evaluation modalities. Soon, we realized the inadequacy of the process of the doctor or physician assistant translating each of the 30 questions of the English VHI form to the patient. Hence, the felt need for its translation.

Process of translation: The Mapi Research Institute monograph describes this in excellent detail.¹¹ It states the ideal of the translated questionnaire to be its understandability to most respondents in a given population, irrespective of low education level. The full-fledged process of linguistic validation of a questionnaire should ideally consist of three steps. These are 'forward translation', 'backward translation' and 'patient testing'.¹¹

Relevant to our Malayalam adaptation, the first step was done as part of the dissertation project of an SLP student. The next step, viz. retranslating into English, was not attempted in a formal manner. cursory oral checking was done in our department by the first author. Then the actual patient testing was done by administering the questionnaire. Here, the aim should be to check whether the translation is acceptable, with use of simple language such that it is understood in the clinically desired manner.¹¹

It was also tested on some of the patient's relatives, who were asymptomatic for any voice issue. After being sufficiently convinced that the above aims were achieved, we decided to proceed with the next logical step, i.e. validation of the form.

Our voice clinic is conducted weekly. All patients with voice complaints are referred here after basic screening. The Malayalam VHI forms were administered here with instruction regarding the importance of responses by the patient herself. Approximate time taken to complete the form was found to be between 15 and 20 minutes. We noted occasional (<10%) age and level of literacy-related difficulties in comprehension. These were addressed by the physician assistant in the clinic, taking care to avoid bias toward scoring.

Reliability testing for a questionnaire requires its repeat administration after a reasonable time gap, prior to starting any treatment. We have not been able to do this for the present study; timing and the natural course of management initiation being an issue. So, this is a lacuna to be filled. Other studies have reported reliability.¹⁰

Statistical Analyses

In the present study, the significant difference, in all three domains, between the scores of patients and asymptomatic

controls proves the validity of our Malayalam version of VHI.

The other test that we have used is the difference between the scores of patients prior to and after undergoing surgery for the excision of benign vocal fold lesions. It has been proven that subjective and objective parameters improve after microphonosurgery for vocal fold cysts and polyps.^{12,13} This improvement is reflected in our VHI scores. We consider this as evidence of its construct validity.

In addition, we have studied the age and gender correlations also. Here, in contrast to few similar studies, we have found that older dysphonic patients tend to have lesser subjective complaints. No such difference was seen between the two sexes.

CONCLUSION

The Malayalam version of the standard voice handicap index questionnaire has been proved to be valid. This is an added, effective tool in the assessment of patients in our voice clinic. We hope that such vernacular adaptations are tried in other Indian languages too.

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REFERENCES

1. Jacobson BH, Johnson A, Grywalski, et al. The voice handicap index (VHI): Development and validation. *Am J Speech Lang Pathol* 1997;6(3):66-70.
2. Schindler A, Bottero A, Capaccio P, Ginocchio D, Adorni F, Ottaviani F. Vocal improvement after voice therapy in unilateral vocal fold paralysis. *J Voice* 2008;22(1):113-18.
3. Thomas G, de Jong FICRS, Kooijman PGC, Cremers CWRJ. Utility of the Type D scale and voice handicap index to assist voice care in students and teachers. *Folia Phoniatr Logop* 2006;58(4):250-63.
4. Hsiung MW, Lu P, Kang BH, Wang HW. Measurement and validation of the voice handicap index in voice-disordered patients in Taiwan. *J Laryngol Otol* 2003;117(6):478-81.

5. Maertens K, de Jong FI. The voice handicap index as a tool for assessment of the biopsychosocial impact of voice problems. *B-ENT* 2007;3(2):61-66.
6. Nunez-Batalla F, Corte-Santoz P, Senaris-Gonzalez B, Llorente-Pendas JL, Gorriz-Gil C, Suarez-Nieto C. Adaptation and validation to the Spanish of the voice handicap index (VHI-30) and its shortened version (VHI-10). *Acta Otorrinolaringol Esp* 2007;58(9):386-92.
7. Malki KH, Mesallam TA, Farahat M, Bukhari M, Murry T. Validation and cultural modification of Arabic voice handicap index. *Eur Archives of Oto Rhino Laryngol* 2010;267(11):1743-51.
8. Xu W, Han D, Li H, Hu R, Zhang L. Application of the Mandarin Chinese version of the voice handicap index. *J Voice* 2010;24(6):702-07.
9. Konnai RM, Jayaram M, Scherer RC. Development and validation of a voice disorder outcome profile for an Indian population. *J Voice* 2010;24(2):206-20.
10. Datta R, Sethi A, Singh S, Nilakantan A, Venkatesh MD. Translation and validation of the voice handicap index in Hindi. *J Laryngol Voice* 2011;1(1):12-17.
11. Varni JW. Linguistic validation of the PedsQL™: A quality of life questionnaire. Mapi Research Institute.
12. Cheng J, Woo P. Correlation between the voice handicap index and voice laboratory measurements after phonosurgery. *Ear Nose Throat J* 2010;89(4):183-88.
13. Toran KC, Lal BK. Objective voice analysis for vocal polyps following microlaryngeal surgery. *Kathmandu Univ Med J* 2010;30(8):185-89.

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