

A Comparative Study of the VHI-10 and the V-RQOL for Quality of Life Among Chinese Teachers With and Without Voice Disorders

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Summary: Objectives. To investigate the differences and correlation between the Voice Handicap Index-10 (VHI-10) and the Voice-Related Quality of Life (V-RQOL) in teachers in China with and without voice disorders.

Study Design. This is a cross-sectional descriptive analytical study.

Methods. The participants were 864 teachers (569 women, 295 men) whose vocal cords were examined using a flexible nasofibrolaryngoscope. Questionnaire results were obtained for both the VHI-10 and the V-RQOL.

Results. Of the 864 participants, 409 teachers had no voice disorders and 455 teachers had voice disorders. The most common voice complaint was hoarseness ($n = 298$) and the most common throat complaint was globus pharyngis ($n = 79$) in teachers with voice disorders. Chronic laryngitis ($n = 218$) and polyps and nodules ($n = 182$) were the most frequent diagnoses in teachers with voice disorders. Significant differences were seen on the VHI-10 between teachers with and those without voice disorders ($P < 0.05$) and in function between female and male teachers with voice disorders ($P < 0.05$) and between those with different voice disorders ($P < 0.05$). Moderate to strong correlations were observed between VHI-10 total score and those for the three domains of the VHI-10 and the V-RQOL ($P < 0.0001$).

Conclusions. There is a high prevalence of voice disorders in teachers. Teachers with voice disorders have poor voice-related quality of life, with more impairment seen among female than male teachers. Different groups of voice disorders have different effects on voice-related quality of life. A moderate correlation was found between the results of the VHI-10 and the V-RQOL.

Key Words: Teachers–Voice Handicap Index-10–Voice-Related Quality of Life–Dysphonia–Voice disorder.

INTRODUCTION

Voice is a unique and important tool for communication and integral for expressing thoughts, feelings, and ideas. Voice professionals who use their voice as a primary work tool, such as teachers, singers, and lawyers, have a higher risk of developing vocal disorders than nonprofessionals. Roy et al¹ reported voice problems in 11% of 1243 teachers compared with 6% of 1288 nonteachers. Although voice problems are not life-threatening, they can affect an individual's quality of life.² Several methods are used to assess voice-related quality of life in clinical practice; currently, the most common is self-assessment instruments such as the Voice Handicap Index (VHI),³ the Voice-Related Quality of Life (V-RQOL) measure,⁴ the Voice Outcome Survey, the Voice Symptom Scale, and the VHI-10.⁵ Of these, the VHI is the most widely used for patients.⁶ Recently, the reliability and validity of the Chinese versions of the VHI and the VHI-10 have been verified.^{7,8} Although many studies have attempted to compare and correlate the results of the VHI-10 with those of other voice self-assessment instruments in teachers or nonteachers, no study has used the VHI-10 or the V-RQOL to

evaluate the voice-related quality of life of teachers in China. The purposes of this study were to compare differences in voice-related quality of life between (1) teachers with and without voice disorders, (2) female and male teachers with voice disorders, and (3) different types of voice disorders; and to explore the correlation between the VHI-10 and the V-RQOL. This is the first Chinese-language study to assess the differences and correlations of VHI-10 and V-RQOL used among teachers.

METHODS

Participants

This study was performed from October 2014 to September 2015 in the outpatient department of West China Hospital, Sichuan University, Chengdu, China. The participants were working secondary and high school teachers. Informed written consent was obtained from all participants. The inclusion criteria were as follows: age, 22–60 years; no history of voice therapy for voice disorders; and no history of neurological disease, previous laryngeal disease, cervical trauma, or laryngeal surgery that might affect vocal qualities.

Self-assessment

The participants' personal demographic information, general health status, and medical and disease histories were collected, along with any information about previous voice or throat complaints. Voice complaints included hoarseness, a weak or tired voice, loss of voice control or range, and difficulty with high- or low-pitched tones by checklist. Throat complaints included globus pharyngis and sore or dry throat. Voice-related quality of life was assessed using the Chinese-language versions of the

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TABLE 1.
Self-reported Symptoms in the Group With Voice Disorders

	Voice Complaints					Throat Complaints		
	Hoarseness	Weak Voice	Tired Voice	Loss of Voice Control and Range	Difficulty With High- or Low-pitched Tones	Globus Pharyngis	Sore Throat	Dry Throat
No. of teachers	298	26	21	14	8	79	56	43
Percent of total	65.49%	5.71%	4.61%	3.07%	1.75%	17.36%	12.30%	9.45%

VHI-10 and the V-RQOL. The VHI-10 includes the following three subscales: functional, physical, and emotional. Each item is rated from 0 to 4 (0 = never; 1 = almost never; 2 = sometimes; 3 = almost always; and 4 = always) based on the impact of the item on the patient's everyday life, with the total score ranging from 0 to 40. A higher score indicates greater impact the voice related quality of life by the voice disorder.⁵ The V-RQOL is a 10-item questionnaire that measures the impact of voice disorders. Each item is rated from 1 to 5 (from 1 = not a problem to 5 = worst problem imaginable). Responses are summed to determine the total score (0–50), and an algorithm is used for summary scores, so that sum scores and subscale scores range from 0 to 100, where 0 is poor and 100 is optimal.⁴

Nasofibrolaryngoscopy

All participants underwent nasofibrolaryngoscopy performed by the same doctor using a flexible 4.9-mm nasopharyngoscope (Olympus Medical Systems Corp., Tokyo, Japan). Participants were then divided into two groups based on the examination outcomes: one group with voice disorders and another group without voice disorders.

Statistical analysis

All data were collected using EpiData and imported into *SPSS Statistics* 21.0 (SPSS, Inc., Chicago, IL). Means and standard deviations (SDs) were generated for continuous variables, and frequencies were calculated for categorical variables. The distribution of the measurement data was tested for normality with the Kolmogorov-Smirnov one-sample test; when the distribution of the measurements was not normal, the differences between subgroups were compared using nonparametric Mann-Whitney *U* tests. To assess the correlation between the VHI-10 and the

V-RQOL, Spearman correlation coefficients were performed. Statistical significance was set at $P < 0.05$ for all tests.

RESULTS

A total of 864 teachers with a mean age of 40.97 ± 8.56 years (range, 22–59 years) were included in this study (569 women, 295 men; female-to-male ratio = 1.92:1). There were 455 (52.66%) teachers with voice disorders compared with 409 (47.33%) teachers without voice disorders. No significant difference was found in age between the two groups ($P > 0.05$). The average age of the group with voice disorders, which included 122 men (26.81%) and 333 women (73.18%), was 41.39 ± 8.38 years (range, 20–58 years). The diagnoses in the group were as follows: chronic laryngitis ($n = 218$), polyps and nodules ($n = 182$), sulcus vocalis ($n = 25$), Reinke edema of the vocal cords ($n = 13$), vocal cord cysts ($n = 6$), vocal cord leukoplakia ($n = 6$), and vocal cord paralysis ($n = 5$). The average age of the group without voice disorders, which included 162 men and 247 women, was 40.53 ± 8.74 years (range, 22–55 years).

Self-reported symptoms

The symptoms self-reported by teachers with voice disorders are shown in [Table 1](#). Hoarseness, weak voice, and tired voice were the most frequently reported voice symptoms, whereas globus pharyngis was the most frequently reported throat symptom.

Comparison of the VHI-10 and the V-RQOL scores

The means and SDs of scores from the VHI-10 and the V-RQOL for teachers with and without voice disorders and for female and male teachers with voice disorders are shown in [Tables 2 and 3](#). As expected, teachers with voice disorders had significantly different total and subscale scores on the VHI-10 and the V-RQOL

TABLE 2.
Statistical Measures of VHI-10 and V-RQOL Scores Among Teachers With and Without Voice Disorders

	Group With Voice Disorders (n = 455)		Group Without Voice Disorders (n = 409)	
	Mean ± SD		Mean ± SD	Z P
VHI-10 Functional	5.84 ± 3.61		4.62 ± 3.41	-4.98 0.00
VHI-10 Physical	5.83 ± 2.88		4.32 ± 2.51	-7.66 0.00
VHI-10 Emotional	2.19 ± 1.81		1.63 ± 1.67	-4.78 0.00
VHI-10 Total	13.84 ± 7.33		10.24 ± 6.93	-6.54 0.00
V-RQOL	76.71 ± 21.72		83.37 ± 19.37	-5.37 0.00

Abbreviations: SD, standard deviation; VHI-10, Voice Handicap Index-10; V-RQOL, Voice-Related Quality of Life Measure.

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