

The Korean Version of the Voice Symptom Scale for Patients with Thyroid Operation, and Its Use in a Validation and Reliability Study

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Summary: Objectives. The Voice Symptom Scale (VoiSS) questionnaire is a self-reported measure of voice function. Compared with previous voice-rating tools, the VoiSS focuses more on communication difficulties, pharyngeal symptoms, and psychosocial distress. This study aimed to translate the VoiSS into the Korean language, validate it, and assess its reliability.

Study Design. This is a prospective patient study utilizing questionnaires and acoustic analysis.

Methods. A recognized methodology was used to translate the questionnaires. The final Korean version was used in 31 patients scheduled for thyroidectomy between November 2013 and February 2015 for preoperative voice assessment, and at 2 weeks, 3 months, and 6 months postoperatively. The participants included had no specific vocal disorders before surgery and no vocal cord paralysis after surgery, and completed the Korean versions of the VoiSS and Voice Handicap Index (VHI), and acoustic analysis.

Results. The Korean version of the VoiSS demonstrated high internal consistency ($\alpha = 0.97$) and test-retest reliability of its subscales. There was a significant correlation between the VoiSS and VHI scores in the total thyroidectomy group at each time-point. With regard to subjective symptoms, the VoiSS appeared to be more accurate than the VHI in terms of physical and functional subscales.

Conclusions. The Korean version of the VoiSS is ready for use for the assessment of voice dysfunction in Korean patients. It is an applicable and useful supplementary tool for evaluating patients' perceptions of voice dysfunction after thyroidectomy, for identifying multiple factors affecting patients' voices, and for measuring treatment efficacy before and after therapeutic intervention.

Key Words: Acoustic analysis–Korean language–Voice disorder–Voice Handicap Index–Voice Symptom Scale.

INTRODUCTION

Voice difficulties occur in approximately 10% of the population and can have profound effects on a patient's quality of life.^{1,2} To evaluate this problem, objective tools such as acoustic analysis, aerodynamic analysis, and stroboscopy have been used widely in a clinical context. However, the efficacy of these tools is dependent on the experience of the examiner. With regard to voice problems, compared with other diseases, it is important to assess the associated symptoms subjectively during diagnosis and treatment. Various voice-related aspects should be systemically examined, including associated physical, functional, and emotional difficulties.^{1,3} Furthermore, the systematic measurement of vocal discomfort determines the efficacy of treatments and the success of treatment outcomes.¹

The diagnosis and surgical treatment of thyroid cancer are now very common in Korea.³ It has been shown that for a short period of time after such surgery, there is discomfort while vocalizing

without any obvious nerve palsy. As their interest in quality of life has increased, many patients now want accurate assessment and rapid recovery of minor voice discomfort. Questionnaires are used as important testing tools that facilitate more detailed evaluation of voice-related symptoms.^{2,3}

The Voice Handicap Index (VHI) has been widely used and accepted in clinical practice.^{4,5} It consists of 30 items in three domains: functional, physical, and emotional. Numerous previous studies have evaluated voice problems via the VHI.⁴⁻⁶ It was initially developed as a psychometrically robust voice disability and handicap inventory for patients with vocal conditions.^{4,5} However, VHI scores appear to be lower in singers and professional vocalists.^{6,7} This indicates that the VHI has some limitations with regard to detecting the difficulties experienced by patients. Most voice evaluation tools, including the VHI, are physician-derived disease-specific measures and have been used as part of the general quality of life domains.⁴⁻⁶ However, given the high interest in the voice, there is a need for a patient-focused tool for assessing it.^{1,4-7}

One such tool, the Voice Symptom Scale (VoiSS), originated as an open-ended questionnaire derived from patients with voice difficulties. It reflected many patients' complaints about voice-related factors, such as communication problems, throat infection, psychosocial distress, voice sound variability, and phlegm.^{5,6} The prototype of the VoiSS was developed in 1997, and the current complete form was established in 2003 by Deary et al.⁶ That complete 44-item questionnaire was devised after several modifications. Each item in the VoiSS is scored using a

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Conflicts of interest: None.

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5-point Likert scale, with higher numbers indicating greater impact, as determined via the following frequency-based response scale: never, occasionally, some of the time, most of the time, all of the time. All items are categorized into three subscales: functional (15 items), emotional (15 items), and physical (14 items). The total VoiSS score represents the sum of all responses and thus ranges from 44 to 220.^{5,6} The VoiSS has been recognized as having high reliability (internal consistency), and as an omnibus indicator of voice problems. It has been widely used in the care and treatment of professional voice users in Europe. However, to the best of our knowledge there have been no published reports of a validated Korean version of the VoiSS.^{5,6,8}

The objective of the current study was to assess the reliability and validity of a Korean version of the VoiSS in thyroid lobectomy (TL) and total thyroidectomy (TT) patients. In particular, we attempted to assess the strength of the VoiSS for assisting functional dysphonia patients after thyroid surgery. We also compared the VoiSS with the VHI, which has previously been used in surgery patients.^{6,7}

METHODS

Cultural adaptation of the Korean version of the VoiSS

For cross-cultural adaptation of a Korean version of the VoiSS, we translated the original English version into Korean via the following four steps, in accordance with the guidelines described by Guillemin et al^{9,10}: (1) Translation of the original English questionnaire into Korean by two bilingual Korean/English teachers. (2) Backtranslation into English by a qualified professional translator who had no knowledge of or contact with the original text but was familiar with Korean and English, to check for any discrepancies. (3) Review of all backtranslations by four bilingual (Korean/English) otolaryngologists, speech-language pathologists, and voice specialists (each with more than 5 years of experience), to determine the choice of words best suited for the specific translation based on the available information. (4) The backtranslation was forwarded to the investigators for review, and the final draft version was formatted. Through the above procedure, the final Korean version of the VoiSS was produced.^{9,10}

Content validity

Content validity was verified for cross-cultural appropriateness. It was quantified using a 5-point content validity index (CVI) by five judges (two otolaryngologists, two speech-language pathologists, and one medical doctor, along with a professional interpreter), who assessed the conceptual, semantic, and cultural equivalence of the items.^{10,11} A CVI score of below 0.8 for any given item was deemed not acceptable. The CVI judges graded the relevance of the items of the Korean version of the VoiSS derived from the original version, using the following 5-point Likert scale: 1, not at all relevant; 2, slightly relevant; 3, somewhat relevant; 4, moderately relevant; 5, extremely relevant. The CVI score for each individual item was determined based on a consensus among the five experts.^{10,11}

Reliability

The reliability analysis of the Korean version of the VoiSS was performed by analyzing the internal consistency of its items as a whole, as well as for each subscale (functional, physical, and emotional), by means of Cronbach's alpha.¹⁰

Participants

In our hospital, laryngeal endoscopy, voice analysis, and questionnaires are usually administered before and after thyroid surgery, were practical. In this study, we randomly recruited as many patients as possible from the collection of otherwise healthy patients who had both a series of tests and either TL or TT surgery. All participants provided informed consent, in accordance with the policies and procedures approved by the institutional review board of the Center for Thyroid Cancer, Dongnam Institution of Radiological and Medical Sciences (DIRAMS), Busan, South Korea.

The medical records of the participating patients were collected prospectively. Patients presenting with thyroid carcinomas and who were scheduled to undergo TL or TT from June 2013 to December 2014 were recruited for participation at the Center for Thyroid Cancer, Dongnam Institution of Radiological and Medical Sciences, Busan, South Korea. We prospectively enrolled 65 patients who had undergone operations for papillary and follicular thyroid carcinoma. Patients were initially excluded if they had vocal cord immobility, a laryngeal disease such as nodules, or polyps, or had undergone reoperation because of carcinoma recurrence. Patients were also subsequently excluded if they had postoperative glottic pathologies or had insufficient follow-up measurements. Ultimately, 31 participants yielded data preoperatively, and at 2 weeks, 3 months, and 6 months after thyroid surgery. The participants included nine men and 25 women, with a mean age of 45.8 ± 10.7 years. Of these, 13 underwent TL and ipsilateral central neck dissection; 13 underwent TT and bilateral central neck dissection; four underwent TT and bilateral central and lesional lateral neck dissection; and one underwent TL via a robotic unilateral axillo-breast approach (Table 1). The study participants had no current laryngeal pathology as determined by stroboscopy, no voice disorder as judged by the participant and the examining clinician during the study period, and no history of neck or thyroid surgery.

TABLE 1.
Patient Characteristics

| | |
|---|----------------------|
| Characteristics | |
| Mean age (years) | 45.8 |
| Sex | 6 male, 25 female |
| Extent of Surgery | |
| TL and ipsilateral central neck dissection | 13 |
| TT and bilateral central neck dissection | 13 |
| TT and bilateral central and lesional lateral neck dissection | 4 |
| TL via a robotic unilateral axillo-breast approach | 1 |

Abbreviations: TL, thyroid lobectomy; TT, total thyroidectomy.

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