The Vocal Cord Dysfunction Questionnaire: Validity and Reliability of the Persian Version

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Summary: Objectives. The aim of this study was to develop, validate, and assess the reliability of the Persian version of Vocal Cord Dysfunction Questionnaire ($VCDQ_P$).

Study Design. The study design was cross-sectional or cultural survey.

Materials and Methods. Forty-four patients with vocal fold dysfunction (VFD) and 40 healthy volunteers were recruited for the study. To assess the content validity, the prefinal questions were given to 15 experts to comment on its essential. Ten patients with VFD rated the importance of $VCDQ_P$ in detecting face validity. Eighteen of the patients with VFD completed the VCDQ 1 week later for test-retest reliability. To detect absolute reliability, standard error of measurement and smallest detected change were calculated. Concurrent validity was assessed by completing the Persian Chronic Obstructive Pulmonary Disease (COPD) Assessment Test (CAT) by 34 patients with VFD. Discriminant validity was measured from 34 participants. The VCDQ was further validated by administering the questionnaire to 40 healthy volunteers. Validation of the VCDQ as a treatment outcome tool was conducted in 18 patients with VFD using pre- and posttreatment scores.

Results. The internal consistency was confirmed (Cronbach $\alpha = 0.78$). The test-retest reliability was excellent (intraclass correlation coefficient = 0.97). The standard error of measurement and smallest detected change values were acceptable (0.39 and 1.08, respectively). There was a significant correlation between the $VCDQ_P$ and the CAT total scores ($P < 0.05$). Discriminative validity was significantly different. The VCDQ scores in patients with VFD before and after treatment was significantly different ($P < 0.001$).

Conclusions. The VCDQ was cross-culturally adapted to Persian and demonstrated to be a valid and reliable self-administered questionnaire in Persian-speaking population.

Key Words: Vocal fold dysfunction–Asthma–Questionnaire–Self-report assessment–Validity and reliability.

INTRODUCTION

Vocal fold dysfunction, henceforth termed VFD, is recognized as reversed vocal fold motion syndrome, which is frequently considered as a disorder in typical adduction of the vocal folds, mainly during inspiration. It is a respiratory condition characterized by laryngeal airflow limitation.[1] In the literature, the term "vocal cord dysfunction" was used for this disease. However, as the term of fold is a more suitable alternative to the cord, the term VFD is used throughout the present paper. The precise prevalence of this syndrome has not been reported so far. It was estimated by Morris that the comorbidity of COPD and VFD is 12%, but it has a greater incidence among women.[2,3,8] The most prominent symptoms of the VFD consist of coughing, dysphonia, dyspnea, and throat tension, which are regularly inattentive at relaxation and are usually serious after particular irritations.[4–6] The exact reason for the VFD is mysterious.[7,8] Psychosocial features have been detected to be responsible for it as well.[9,10] Differential diagnosis of VFD is necessary to rule out similar clinical conditions, including diseases of the upper respiratory tract, vagus or recurrent laryngeal nerve injuries, laryngeal edema, and asthma.[11–13] Mostly, a diagnosis of VFD is typically made by immunologists, allergists, and otolaryngologists through a thorough medical history, detection of irregular vocal fold motion during videolaryngoscopy, pulmonary function tests, and a treadmill stress test to produce VFD symptoms.[1,9,14] Because of the similarity of symptoms between VFD and asthma, the former is often misdiagnosed and can result in unnecessary pharmaceutical treatment of asthma.[15,16] The failure in identification can lead to increased medication treatment of asthma.[17,18] Laryngoscopic evidence (when the patient is symptomatic) is one of the golden standards for diagnosis of VFD[9]; however, patients are not always symptomatic during laryngoscopy and present with normal physiology. Spirometry test is difficult because of its complex executive maneuvers so it is not recommended for children younger than 7 years old.[19] Therefore, there is a general lack of fast and effective tools to evaluate, monitor, and detect treatment efficacy for patients with VFD.

One of the most well-structured questionnaires for self-reported assessment and screening for VFD is the Vocal Fold Dysfunction Questionnaire (VFDQ), which originally, termed "vocal cord dysfunction questionnaire," was suggested by Fowler et al.[18] The VFDQ is a valid and responsive instrument suitable to determine changes of the symptoms in patients with VFD. It also helps to detect the symptoms, which are important to patients and could offer future therapy cues.[1,9] Noticeable correlation between the VFDQ and other highly used standardized evaluation approaches, such as St. George's Respiratory

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Questionnaire,[20] shows the scientific value of this questionnaire.[18] Moreover, the VFDQ can be used as a tool to detect responsiveness after speech rehabilitation.[18] This questionnaire is consists of 12 items related to the most marked symptoms of the patients with VFD. The patients should answer each item based on the Likert scale.[18] There are several author-made questionnaires, which had been designed to evaluate vocal fold dysfunction symptom severity. However, their psychometric properties had not been detected.[21,22] The VFDQ was the latest self-reported questionnaire, which can be used to investigate VFD symptoms and responsiveness to treatment. It is a validated and reliable standard questionnaire, which had been performed in Britain.[18] It should be noted that there is another valid and reliable questionnaire, known as Dyspnea Index (DI) which was designed by Gartner-Schmidt, to evaluate the severity of dyspnea symptom relating to upper airway. However, DI differs from VFDQ in terms of target symptoms and population.[23] Because available instruments such as videolaryngoscopy and spirometry, which assess the severity or changes in the symptoms of VFD, are costly, time-consuming, and sometimes invasive, the VFDQ is the only tool that allows monitoring of the symptoms with less time and cost. In contrast, treatment protocol for VFD suggests a multidimensional approach, which considers different etiologies and treatment including speech and language therapy. The speech therapy that includes laryngeal relaxation and breathing exercises is recommended as the main treatment particularly for chronic VFD.[15–18] With the aim of validating a questionnaire for monitoring treatment response, the researchers aimed to adapt and evaluate validity and reliability of the Persian version of VFDQ questionnaire.

MATERIALS AND METHODS

The study protocol was approved by the Institutional Review Board, School of Rehabilitation, and the Ethics Committee of Tehran University of Medical Sciences. The ethical code was IR.TUMS.VCR.1395.204. Assessing validity and reliability of the VFDQ was conducted in two phases: translation and cross-cultural adaptation, as well as validity, reliability, and performance investigations.

Stage 1: Translation and cross-cultural adaptation procedure

Translation and cultural adaptation of the English version of the VFDQ into Persian language has been accomplished using the forward and backward translation procedure, as mentioned in Kristjansson guideline for translating and adapting measurement.[24] Before translating the VFDQ, permission was obtained from the VFDQ developer, Stefan Fowler. Initially, a bilingual English translator and a speech and language pathologist (SLP), whose native language was Persian, were asked to translate the original English version of the VFDQ into Persian. Except SLP, the other translator was not aware of the objective of the study. Then, a group of experts including the two translators, an experienced methodologist expert in the field of instruments validation, and two SLPs reviewed the translated version and finally developed a Persian version of the VFDQ ($VFDQ_P$). The consensus version was backtranslated into English by two independent bilingual translators, who were blinded to the study and had no prior knowledge of the VFDQ. The aim of this stage was to find meaning errors and concept deficits.[24] To finalize the adaptation procedure, considering the original English questionnaire, as well as forward-backward translations, the expert committee produced a prefinal version of the $VFDQ_P$. To assess content validity, the prefinal questions were given to 15 experts, consisting of 3 ear, nose, and throat specialist (ENTs), 3 immunologists, and 9 SLPs, and asked them to comment about essential of $VFDQ_P$ using Likert scale. The final Persian version of the VFDQ was established according to the comments of experts. To investigate face validity, the final version of $VFDQ_P$ was given to 10 patients that have been diagnosed with VFD and were asked to rate the importance of each question using the Likert scale (1 = not important, 5 = strongly important). If an item was unnecessary, it would be removed. All items were approved by all patients.

Stage 2: Validity and reliability investigation

Participants and procedure

The clinical data were gathered from 34 patients with VFD (11 male and 23 female), with a mean age of 37.08 ± 10.8 years (range 18–60 years). This sample size was based on the criteria proposed by Terwee et al.[25] The patients were randomly selected from those who attended the allergy and immunology clinics of Ghaem and Imam Reza hospitals in Mashhad, Iran. The allergist and ENT diagnosed all participants with VFD based on the videolaryngoscopy and spirometry examination. To evaluate the concurrent validity, all patients that participated in the study completed both the $VFDQ_P$ and the Persian version of Chronic Obstructive Pulmonary Disease (COPD) Assessment Test (CAT^1).[26] Furthermore, 40 healthy volunteers (22 men and 18 women) with no voice disorder and no breathing problem were asked to complete the $VFDQ_P$ to assess the discriminative validity. Their healthiness was confirmed by the videolaryngoscopy examination, spirometry test, and perceptual voice evaluation. The mean age of the participants in the healthy group was 37.87 ± 10.6 years, with the age range of 18–60 years. To measure the test-retest reliability, 18 patients completed the VFDQ with an interval of 1 week. To assess VFDQ performance to speech and language therapy, we compared the VFDQ score before and after voice therapy in the same 18 patients. Treatment was provided to patients for 5 weeks (two sessions per week) by focusing on breathing techniques by an SLP (H.G.). It should be considered that all participants were able to read and write. All patients and healthy participants signed the written informed consent form before the study was initiated.

Statistical analysis

Content validity index (CVI) and content validity ratio (CVR) were calculated to determine content validity.[27] According to Waltz and Bausell,[28] if the mean of CVI is higher than 79%, content validity is confirmed. In accordance with Lawshe, because the number of specialists was 15, the CVR which is higher than 49% will be accepted.[29] To determine the face validity, 10 patients with VFD were asked to rate the importance of each question based on the Likert scale (1 = not important, 5 = strongly important). The face validity of $VFDQ_P$ was detected by computing impact score (IS) (IS = Frequency % × Importance [score 4 or