Adaptation and Validation of the Kannada Singing Voice Handicap Index-10

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Summary: Objective: The aim of the present study was to adapt and validate the English version of the Singing Voice Handicap Index-10 (SVHI-10) into Kannada language.
Study Design: Cross-sectional Comparitive study design.
Methods: The English version of SVHI-10 was translated into Kannada using standard procedure. A total of 115 singers participated in the study, including 90 singers with no voice problems (control group) and 25 singers with voice problems. The internal consistency, test-retest reliability, clinical validity, and cutoff points were calculated.
Results: Kannada SVHI-10 has excellent internal consistency and test-retest reliability. The singers with voice problems scored significantly higher than the singers with no voice problems ($t = -14.67$, $df = 113$, $P < 0.001$). The optimal cutoff point of the SVHI-10 was 9.5 with a sensitivity of 96% and specificity of 84%.
Conclusion: The Kannada SVHI-10 is a reliable and clinically valid tool to assess the self-reported singing voice handicap among singers. It can also be used as a quick screening tool for distinguishing singers with and without voice problems as per client's perception.
Key Words: Quality of life−Voice−Self-reported questionnaire−Kannada−SVHI-10.

INTRODUCTION

Voice is important for verbal mode of communication and acts as a medium of expression for speech as well as emotions. The clinical evaluation of voice requires a comprehensive approach comprising laryngeal imaging, acoustic analysis, auditory perceptual rating, aerodynamic measures, and self-reported outcome measures. In recent years, studies have emphasized on the importance to include self-reported questionnaires that help to gauge the patient perception toward their voice.[1,2] These questionnaires enable the patients to have a good understanding of their perceived degree of disorder and the impact of voice change on their overall quality of life. Short version questionnaires can be used for screening and quick identification of individuals with voice problems from those without. The self-reported questionnaires help to assess overall quality of life or impact on specific domains such as physical, social, psychological, and economic aspects.[3]

Two approaches are available for assessing quality of life: (1) generic tools for overall quality of life assessment which need not necessarily be voice specific and (2) questionnaires specific to voice-related quality of life. Several psychometrically valid self-reported questionnaires are available for use in individuals with voice problems. The Voice Handicap Index[4] has been developed and translated into several languages for assessing the perceived voice handicap.

Singers are considered vocal athletes and have specific demands from their voice. They are able to identify even a slight deviation in their voice quality as it affects them to a greater extent than the general population. Keeping this view in mind, some self-reported questionnaires have been developed specifically for singers. These include Singing Voice Handicap Index (SVHI),[5] SVHI-10,[6] and Evaluation of Ability to Sing Easily[7] in English, and the Modern Singing Voice Handicap Index and Classical Singing Voice Handicap Index in Italian[8] and Brazilian Portuguese.[9,10] The SVHI helps to self-assess the singing voice under several domains such as physical, social, emotional, and economic. It is a psychometrically valid questionnaire and can successfully identify specific singing problems. It has been found to be sensitive to treatment outcomes as well as to assess clinical changes. It has high internal consistency and test-retest reliability.[6,11] It has been successfully adapted and validated in other languages such as German,[12] Korean,[13] Italian,[14] Kannada,[15] Spanish,[16] Portuguese,[17] and Turkish.[18] The Kannada SVHI has been found to be a clinically valid and reliable tool for self-reported assessment in Indian classical singers.[15]

The SVHI-10 is a shortened valuable version that helps to assess the self-perceived handicap leading to reduced patient burden and saving time. As it consists of only 10 questions, it can be easily used clinically as well as for screening purposes.[6] A recent study using SVHI-10 emphasized on the importance of using a questionnaire that focuses on singing voice as singers may have specific complaints relating only to their singing voice.[19]

Indian music has a rich blend of aesthetics, philosophy, culture, psychology, and spirituality. There are two main forms of Indian classical music: Hindustani classical, also known as north Indian music, and Carnatic classical, also known as south Indian music. The Kannada version of SVHI was found to be a useful and clinically valid tool for use among Indian classical singers.[15] Kannada is one of the

classical and Dravidian languages, spoken in the southern state of Karnataka. It ranks 32 among the top 100 languages spoken in the world.[20]

Presently, there is a need to make available different psychometrically valid self-reported tools that can be used to assess voice problems among Indian singers. Thus, a requirement was felt to adapt and validate the English SVHI-10 into Kannada language. The present study was carried out to translate and validate the English SVHI-10 into Kannada language, which can be used as self-assessment tool for assessing or screening singing voice handicap.

METHOD

A cross-sectional comparative study design was used for developing and validating the Kannada version of SVHI-10.

Development of the Kannada version of SVHI-10

The original author was contacted and permission was obtained to translate and validate the SVHI-10 into Kannada language. The questionnaire was translated using the standard parallel back-translation procedure.[21,22] The procedure used was similar to that used for Kannada SVHI.[15] The original English SVHI-10 was provided to five proficient translators for translation into Kannada. These translated Kannada versions were provided to five other proficient speakers for back translation into English. The translated Kannada versions were compared and compiled together to formulate a final Kannada language version of the questionnaire. This final version was provided to a speech language pathologist and a professional translator; both were proficient in both English and Kannada languages. They were asked to assess the linguistic validity of the questionnaire. No deletion or alterations were done in the structure of the questionnaire. The developed Kannada version of SVHI-10 was provided to 10 singers to assess their familiarity with the content and their overall understanding. All the singers were able to understand and follow the questionnaire and reported familiarity with the content. In this manner, the Kannada SVHI-10 was developed. The Kannada SVHI-10, which is similar to the original version, consists of 10 items that are to be rated by the singer on a five-point rating scale. The rating scale is from 0 (for never) to 4 (for always). The total scores range from 0 to 40 and higher scores indicate a higher self-perceived singing voice handicap.

Participants

The validation of the Kannada SVHI-10 was conducted on 115 Indian classical singers. These singers were divided into two groups based on presence or absence of voice problems. Group I comprised 90 singers with no complaint of voice problems. These singers were rated as having a normal voice quality based on auditory perceptual rating using Grade, Roughness, Breathiness, Asthenia and Strain (GRBAS

TABLE 1.
Details of Voice Problem of Singers in Group II

Voice Problem and Pathology	Number
Laryngitis	5
Early nodular changes	3
Edematous vocal folds	3
Nodules	3
Polyp	2
Phonatory gap	2
Tonsillitis	2
Voice changes due to hormonal imbalance	2
Reinke's edema	1
Sulcus vocalis	1
Laryngopharyngeal reflux (LPR)	1

rating scale). Group II comprised 25 singers with voice problems. These singers were rated as having dysphonia based on auditory perceptual rating using GRBAS. The details of the voice problems of these singers are shown in Table 1.

Administration of the questionnaire

The singers were asked detailed history related to demographic details (age and gender), years of singing training, and specific complaints of the singing voice. Auditory perceptual evaluation using GRBAS rating scale was carried out. The singers in Group I were rated to have normal voice quality, whereas the singers in Group II were rated to have dysphonic voices. Further, the presence of laryngeal pathology was confirmed using laryngeal examination. The singers in both groups were administered the Kannada SVHI-10. No assistance or clarifications were provided while rating. To assess the test-retest reliability, 25% of the singers were re-tested using the same questionnaire after 7–10 days. This interval was followed to ensure that the singers did not recollect their previous responses.

Analysis

The continuous variables were summarized using descriptive statistics. Internal consistency or homogeneity of the questionnaire was assessed using Cronbach alpha coefficient and item-to-total correlation. Pearson product moment correlation was used to assess the test-retest reliability. The total scores obtained for both the groups were compared using independent sample t test. The receiver operating curve (ROC), specificity and sensitivity analysis with area under the curve values, as well as cutoff points or Kannada SVHI-10 were also calculated. All statistical analyses were carried out using *SPSS Statistics 15.0* (SPSS Inc., South East Asia, Bangalore, India).

RESULTS

The study consisted of 115 singers, of which 90 were in Group I (control group) and 25 were in Group II. It took

the singers about 5−7 minutes to read the questionnaire and mark their answers without assistance.

Demographic characteristics

Group I comprised 90 singers with no voice problems. Among them 16 (17.8%) were men and 74 (82.2%) were women. The mean of age of the singers was 31.08 (±11.40) years (range 18−55 years). Group II comprised 25 singers with voice problems. Among them 7 (28%) were men and 18 (72%) were women. The mean age of the singers was 34.56 (±11.41) years (range 19−55 years). The singers in both the groups were trained Indian classical singers with a training of more than a minimum of 7 years.

Internal consistency

Internal consistency or homogeneity of the questionnaire was assessed using Cronbach α coefficient; α closer to 1 is indicative of excellent internal consistency. An excellent internal consistency was noted for the Kannada SVHI-10 ($\alpha = 0.91$). The item-to-total correlation ranged from 0.59 to 0.74, which was suggestive of high correlation.

Test-retest reliability

The Kannada SVHI-10 was re-administered on 28 (25%) singers. Pearson product moment correlation was used for assessing the test-retest reliability. A strong positive correlation was found between the test and retest findings, which was statistically significant (r = 0.97, n = 28, $P < 0.001$). This is indicative of Kannada SVHI-10 having test-retest reliability.

Clinical validity

The mean scores of singers in Group I were 5.88 (±3.39), range 0−14, and in Group II were 19.60 (±11.41), range 5 −33. Independent sample t test was used to compare the mean scores obtained by both the groups. The singers with voice problems scored significantly higher compared with those without a voice problem ($t = -14.67$, df = 113, $P < 0.001$).

Sensitivity and specificity

ROC test was used to define the cutoff point, specificity, and sensitivity for Kannada SVHI-10. As seen in Figure 1, the area under curve of the SVHI-10 was 0.97 (95% confidence interval: 0.92−1.00, $P < 0.001$). The optimal cutoff point of the SVHI-10 was 9.5 with a sensitivity of 96% and specificity of 84%.

DISCUSSION

Studies on singers have highlighted the multifold voice problems that can be exhibited by this population. A recent systematic review estimated the prevalence of self-reported voice disorders among singers. The overall career prevalence of self-reported dysphonia among singers was found
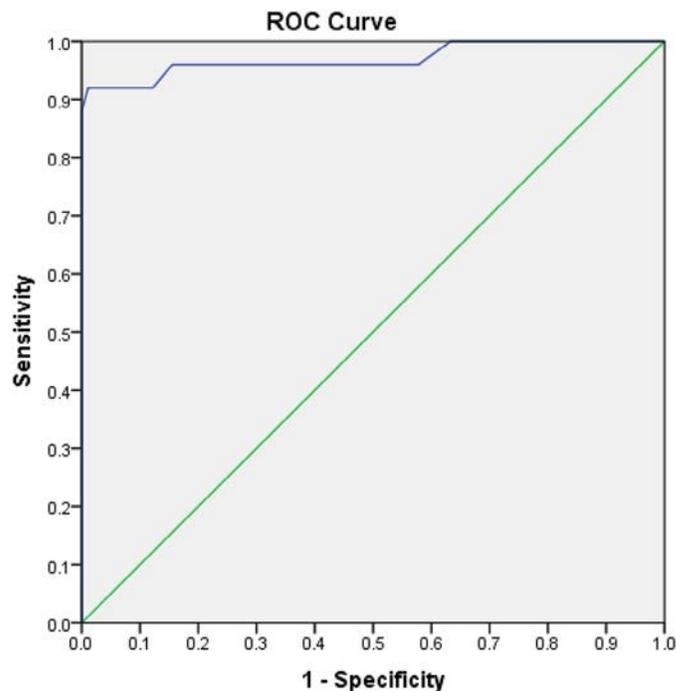

FIGURE 1. Receiver operating characteristic curve for SVHI-10.

to be 46.09%. Singing students were identified to have a lesser prevalence compared with singing teachers, classical, and nonclassical singers. Further, traditional music, popular music, and singing teachers had significantly higher prevalence of voice disorders. The review concluded that irrespective of their singing style or skills, the singers would report voice disorders.[23] Compared with other professional voice users, singers place a lot of importance toward subtle changes in their voice. Some of these singers are professionally expected to have a good and pleasing voice quality. The self-reported questionnaires enable a thorough understanding of the self-perceived voice problems and help not just in assessing but also in planning treatment goals. Thus, the present study was carried out with an aim to translate and validate the Kannada SVHI-10. The translation and adaptation was carried out using standard parallel back-translation procedure.

A total of 115 singers participated in the study, of which 90 had no voice problems while 25 had voice problems. The mean age of the singers for Group I and II was 31 years and 34 years, respectively. The internal consistency, test-retest reliability, clinical validity, and sensitivity and specificity with cutoff scores were tested. The present study showed that the Kannada SVHI-10 had excellent internal consistency, test-retest reliability, and clinical validity. The Cronbach alpha coefficient was 0.91, which was suggestive of excellent internal consistency. This finding is comparable with the English version of SVHI-10, which has a Cronbach alpha coefficient of 0.94.[6] Further, Kannada SVHI-10 had excellent test-retest reliability. The original version has also reported good test-retest reliability.[6] The singers with voice problems scored significantly higher compared

with the singers with no voice problems. Thus, the Kannada SVHI-10 is a reliable and clinically valid tool for use among singers.

ROC curve analysis was carried out to ascertain the sensitivity and specificity and cutoff scores for the Kannada SVHI. The ROC curve analysis provides a graphical plot of the diagnostic ability of any evaluation tool. The sensitivity (true positive rate) is plotted against the specificity (false positive rate). The ROC curve has a crucial role in testing the diagnostic ability of a test to distinguish between clinical population and control group, comparing diagnostic accuracy of two evaluation tools, as well as estimating the cutoff values. The area under the curve acts as a combined measure for sensitivity and specificity and helps to describe the diagnostic validity.[24]

Thus, the Kannada SVHI-10 and Kannada SVHI can be used as effective self-reported measurement tools in comprehensive clinical evaluation of voice in singers. More specifically, the SVHI-10 can be used as a quick screening tool. There is a need to study the treatment outcomes using Kannada SVHI and Kannada SVHI-10. Further, there is a need to translate and adapt similar questionnaires for effective use in this population.

CONCLUSION

The Kannada SVHI-10 is a valid, reliable, and sensitive self-reported tool for assessing singing voice handicap. The singers with voice problems scored significantly higher compared with those with no voice problems on the Kannada SVHI-10. It is recommended that the Kannada SVHI-10 should be incorporated into the clinical voice evaluation for singers. Further, it can be also used as a screening tool for identifying singers with dysphonia and specific singing voice complaints. Thus, there is a need to employ such quick assessment tools not only as a screening tool but also to measure treatment outcomes in patients with dysphonia.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at doi:10.1016/j.jvoice.2018.02.005.

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