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# Vocal self-assessment instruments: adaptation to the digital format

## Instrumentos de autoavaliação vocal: adaptação para o formato digital

## Instrumentos de autoevaluación vocal: adaptación al formato digital

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***Abstract***

**Introduction:** the use of vocal self-assessment instruments is essential in the clinical training of Speech-Language Pathology students, requiring specific skills for their application and interpretation. Digital tools can facilitate this process, promoting greater familiarity with validated instruments. **Objective:** to present a digital tool developed exclusively for educational purposes, allowing the automated completion of vocal self-assessment instruments to support the teaching and training of Speech-Language Pathology students. **Description:** the tool was created in Microsoft Excel® for Microsoft 365®, using the original contents of the following instruments translated and/or validated into Brazilian Portuguese, without modifications in structure or scoring: Voice-Related Quality of Life (V-RQOL), Vocal Activity and Participation Profile (VAPP), Vocal Handicap Index-10 (VHI-10), Vocal Fatigue Index (VFI), Vocal Tract Discomfort Scale (VTDS), Vocal Symptoms Scale (VoiSS), (Voice Disability Coping Questionnaire (VDCQ), URICA-Voice, and Vocal Health and Hygiene Questionnaire (VHHQ). The tool was organized into 11 spreadsheets, divided into "General Data," "Instruments," and "Summary of Results." Automated calculations allow scores to be presented clearly, following the formulas published in the original studies. **Final considerations:** the digital tool serves as a valuable educational resource

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VSB, MML, GT: methodology; article outline.
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for developing competencies in the application and interpretation of vocal self-assessment instruments. It is not a validated version for clinical use, nor does it intend to establish psychometric equivalence with printed formats. Its use is restricted to the supervised academic environment.

**Keywords:** Self-Evaluation Programs; Speech, Language and Hearing Sciences; Digital Technology; Voice; Voice Disorders.

## *Resumo*

**Introdução:** o uso de instrumentos de autoavaliação vocal é fundamental na formação clínica de estudantes de Fonoaudiologia, exigindo habilidades específicas para sua aplicação e interpretação. Ferramentas digitais podem facilitar esse processo, promovendo maior familiaridade com instrumentos validados. **Objetivo:** apresentar uma ferramenta digital desenvolvida exclusivamente para fins didáticos, que permite o preenchimento automatizado de instrumentos de autoavaliação vocal, auxiliando no ensino e treinamento de estudantes de Fonoaudiologia. **Descrição:** a ferramenta foi elaborada no *software* Microsoft Excel® para Microsoft 365®, utilizando os conteúdos originais dos seguintes instrumentos traduzidos e/ou validados para o português brasileiro, sem modificações em estrutura ou escore: Qualidade de Vida em Voz (QVV), Perfil de Participação e Atividade Vocais (PPAV), Índice de Desvantagem Vocal 10 (IDV-10), Índice de Fadiga Vocal (IFV), Escala de Desconforto do Trato Vocal (EDTV), Escala de Sintomas Vocais (ESV), Protocolo de Estratégias de Enfrentamento na Disfonia (PEED), URICA-VOZ e Questionário de Saúde e Higiene Vocal (QSHV). A ferramenta foi organizada em 11 planilhas, divididas em "Dados gerais", "Instrumentos" e "Síntese dos resultados". A automatização dos cálculos permite que os escores sejam apresentados de forma clara, respeitando as fórmulas publicadas nos estudos originais. **Considerações finais:** a ferramenta digital constitui um recurso educacional útil para o desenvolvimento de competências na aplicação e interpretação de instrumentos de autoavaliação vocal. Não se trata de uma versão validada para uso clínico, tampouco se pretende estabelecer equivalência psicométrica com os formatos impressos. Seu uso está restrito ao ambiente acadêmico supervisionado.

**Palavras-chave:** Programas de Autoavaliação; Fonoaudiologia; Tecnologia digital; Voz; Distúrbios da Voz.

## *Resumen*

**Introducción:** el uso de instrumentos de autoevaluación vocal es fundamental en la formación clínica de los estudiantes de Fonoaudiología, ya que requiere habilidades específicas para su aplicación/interpretación. Las herramientas digitales pueden facilitar este proceso, promoviendo una mayor familiaridad con los instrumentos. **Objetivo:** presentar una herramienta digital desarrollada exclusivamente con fines didácticos, que permite el llenado automatizado de instrumentos de autoevaluación vocal, contribuyendo a la enseñanza y capacitación de los estudiantes de Fonoaudiología. **Descripción:** la herramienta fue elaborada en Microsoft Excel®, utilizando los contenidos originales de los siguientes instrumentos traducidos y/o validados al portugués de Brasil, sin modificaciones en la estructura o en la puntuación: Calidad de Vida en la Voz (V-RQOL), Perfil de Participación y Actividad Vocal (VAPP), Índice de Desventaja Vocal (VHI-10), Índice de Fatiga Vocal (VFI), Escala de Disconfort del Tracto Vocal (VTDS), Escala de Síntomas Vocales (VoiSS), *Protocolo de Estratégias de Enfrentamento na Disfonia* (VDCQ), URICA-Voice y *Questionário de Saúde e Higiene Vocal* (QSHV). La herramienta fue organizada en 11 hojas de cálculo, divididas en "Datos generales", "Instrumentos" y "Síntesis de resultados". La automatización de los cálculos permite que las puntuaciones se presenten de forma clara, respetando las fórmulas publicadas en los estudios originales. **Consideraciones finales:** la herramienta digital constituye un recurso educativo útil para el desarrollo de competencias en la aplicación e interpretación de instrumentos de autoevaluación vocal. No se trata de una versión validada para uso clínico, ni pretende establecer equivalencia psicométrica con los formatos impresos. Su uso está restringido al ámbito académico supervisado.

**Palabras clave:** Programas de Autoevaluación; Patología del Habla y Lenguaje; Tecnología Digital; Voz; Trastornos de la Voz

## Introduction

Self-assessment instruments, known as Patient Reported Outcome Measures (PROMs), are essential in clinical practice, allowing patients to report their perceptions of their voice, sensory symptoms, and other aspects. They provide valid and reliable measures to assess vocal self-perception, compare outcomes, and monitor interventions[1]. In recent years, several PROMs have been developed for voice disorders, with an emphasis on the need for brevity, ease of administration, and reliable responses[2].

Additionally, vocal self-assessment instruments enable greater consistency and uniformity in methodology, making it possible to draw meaningful comparisons with the literature when reporting treatment outcomes[3]. By encouraging self-observation and self-reflection, these instruments promote greater awareness of vocal patterns and habits that may contribute to the development of voice problems.

In this context, the digital adaptation of PROMs is primarily aimed at educational settings to support undergraduate and graduate Speech-Language Pathology (SLP) students in training for the application, interpretation, and analysis of data obtained through these instruments.

Several vocal self-assessment instruments have been developed internationally, covering different dimensions of the vocal experience. In Brazil, some of these instruments have been translated, adapted, and validated into Brazilian Portuguese, enabling their clinical and research use. Among them are those assessing voice-related quality of life, participation in activities, vocal handicap, vocal fatigue, vocal tract discomfort, vocal symptoms, coping strategies, readiness for change, and vocal health practices. For this paper, the instruments most commonly used in clinical practice and national research were selected, representing different evaluative perspectives. It is worth noting that other instruments are also available in the literature, and the selection presented here was made with representativeness and didactic purposes in mind.

The Voice-Related Quality of Life (V-RQOL), translated into Brazilian Portuguese as *Qualidade de Vida em Voz (QVV)*, was developed by Hogikyan and Sethuraman (1999)[4] and validated by Gasparini and Behlau in 2009[5]. It aims to assess the impact of voice disorders on quality of life, encompassing aspects of physical functionality and socioemotional well-being. It consists of ten items rated on a five-point Likert scale, where 1 corresponds to "never happens and is not a problem" and 5 to "always happens and is a serious problem." The total score ranges from 0 to 100, with lower values reflecting poorer quality of life; a cut-off score of 91.25 differentiates dysphonic adults from vocally healthy individuals[6]. The QVV has been widely used in studies investigating voice-related quality of life in different clinical populations[7].

The Voice Activity and Participation Profile (VAPP), known in Brazil as *Perfil de Participação e Atividades Vocais (PPAV)*, was originally developed by Ma and Yiu in 2001[8] and validated into Brazilian Portuguese by Ricarte et al. (2013)[9]. This instrument assesses the impact of voice disorders on daily activities and social participation. It is composed of 28 questions distributed across five domains: self-perception of the severity of the voice problem, effects on work, daily communication, social communication, and emotional aspects. Responses are given on a 10-cm visual analog scale or a numerical scale[10], also allowing the calculation of additional scores for activity limitation (PLA) and participation restriction (PRP). The total score can reach 280, and a cut-off score of 4.5 on the overall score differentiates dysphonic from non-dysphonic individuals[11]. The VAPP has been used in occupational impact studies, particularly with teachers[11,12].

The Voice Handicap Index-10 (VHI-10), in its 10-item version, was developed by Rosen et al. (2004)[13] and validated into Brazilian Portuguese as the Índice de Desvantagem Vocal reduzido (IDV-10) by Costa et al. (2013)[14]. This instrument evaluates the self-perception of the impact of vocal problems on quality of life, addressing functional, physical, and emotional aspects. The established cut-off score to distinguish dysphonic from healthy individuals is 7.5 points[6]. The IDV-10 is widely used in both clinical and research contexts[7].

The Vocal Fatigue Index (VFI), translated and validated as the Índice de Fadiga Vocal (IFV), was developed by Nanjundeswaran et al. in 2015[15] and validated into Brazilian Portuguese by Zambon et al. (2022)[16]. The IFV aims to identify the perception of vocal fatigue, especially in individuals with vocal complaints. It consists of 17 items distributed across four factors: vocal fatigue and limitation, vocal restriction, physical discomfort associated

with voice, and symptom recovery with rest. The total score is calculated using the formula: Total = Factor 1 + Factor 2 + Factor 3 + (12 – Factor 4). Cut-off scores are 4.50 (factor 1), 3.50 (factor 2), 1.50 (factor 3), 8.50 (factor 4), and 11.50 (total)[16]. The IFV has been applied in research involving diverse populations, such as professional voice users and patients with multiple sclerosis, confirming its clinical relevance[17,18].

The Vocal Tract Discomfort Scale (VTDS), translated into Brazilian Portuguese as *Escala de Desconforto do Trato Vocal (EDTV)*, was created by Mathieson et al. in 2009[19] and translated by Rodrigues[20]. The instrument quantifies the frequency and intensity of eight vocal tract discomfort symptoms: burning, pain, throat irritation, itching, sensitivity, tightness, dryness, and lump-in-the-throat sensation. It uses a seven-point Likert scale for both frequency and intensity of each symptom[20].

The Voice Symptom Scale (VoiSS), validated into Brazilian Portuguese as the *Escala de Sintomas Vocais (ESV)*, was developed by Deary et al. in 2003[21] and validated by Moreti et al. in 2014[22]. The VoiSS includes 30 items addressing vocal symptoms across functional, physical, and emotional domains. The scale is recognized for its validity and sensitivity, with a total score equal to or greater than 16 points being highly specific in differentiating dysphonic individuals[6,22] The VoiSS has been applied to diverse populations, including professional voice users[23] and non-professionals[24].

The Voice Disability Coping Questionnaire (VDCQ), validated into Brazilian Portuguese as the *Protocolo de Estratégias de Enfrentamento na Disfonia (PEED-27),* was developed by Epstein et al. (2009)[25] and validated by Oliveira et al. (2016)[26]. It is the only self-assessment instrument addressing coping strategies for dysphonia. It consists of 27 items exploring problem-focused and emotion-focused strategies, rated on a six-point Likert scale (0 = never; 5 = always). The total score ranges from 0 to 135 points, with mean scores of 51.8 and 23.1 reported for dysphonic and healthy individuals, respectively. The PEED-27 has been used to examine coping strategies in patients with laryngeal cancer treated with radiotherapy[27] and has shorter versions available[28].

The University of Rhode Island Change Assessment – Voice (URICA-Voice) was originally developed by McConnaughy et al. (1983)[29] and adapted into Brazilian Portuguese as URICA-Voz by Teixeira et al. (2013)[30], applying the stages-of-change model to the context of voice treatment. The instrument assesses readiness for change in dysphonic patients, organized into four stages: 1. Precontemplation (PC): the individual is not yet aware of the problem; 2. Contemplation (C): the individual seriously considers facing the problem, but no effective effort is made; 3. Action (A): change attempts are evident; and 4. Maintenance (M): absence of relapse and ongoing effort by the individual[30]. It consists of 32 items rated on a five-point Likert scale, with the readiness score calculated as (Mean C + Mean A + Mean M) – Mean PC[30]. Scores are interpreted as follows: PC: 8 or below; C: 8–11; A: 11–14; and M: ≥15[30]. The URICA-Voz has been used to identify stages of adherence to voice treatment[30].

The *Questionário de Saúde e Higiene Vocal* (QSHV), Vocal Health and Hygiene Questionnaire (free translation) was originally developed by Moreti (2025)[31]. It comprises 31 items exploring knowledge and practices related to vocal health. Each item may be considered positive, negative, or neutral for vocal health, with one point assigned for correct answers. The cut-off score is 23, above which individuals are generally considered vocally healthy[31]. The QSHV has been applied in different populations, including university professors[32] and future teachers[33].

It is important to emphasize that this digital version of PROMs was designed exclusively for educational purposes. It aims to support the learning process and is not intended for clinical use. No claim is made regarding psychometric equivalence between the scores obtained in the digital format and those from the original printed versions, as such equivalence requires robust validation studies. Therefore, this work does not propose to validate the instruments but rather to present a pedagogical tool for the training of SLP students.

## Description

This study did not require submission to the Research Ethics Committee, as it did not involve data collection with human participants. The digital tool was designed exclusively for educational purposes, aiming to train and familiarize students with vocal self-assessment instruments validated in Brazilian Portuguese.

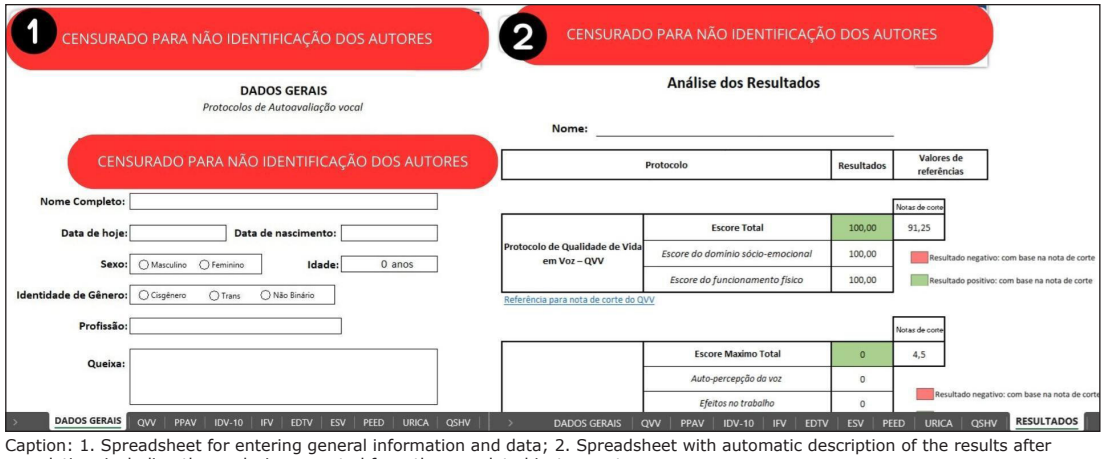
The digital adaptation of PROMs was motivated by the need to integrate students into clinical practice during the COVID-19 pandemic, using a tool with easy access and applicability in remote or hybrid teaching contexts.

Scientific validation articles of the following voice-related PROMs were accessed: V-RQOL, VAPP, VHI-10, VFI, VTDS, VoiSS, VDCQ, URICA-Voice, and QSHV. Microsoft Excel® for Microsoft 365® MSO (16.0.13426.20270) 32-bit was used, enabling the creation, development, and sharing of customized spreadsheets. It should be noted that Microsoft Excel® is not free software, which may limit the accessibility of the tool, particularly in institutions without access to the Office® package.

The development of the digital format of voice-related PROMs resulted in a functional interface tool aimed at training undergraduate and graduate Speech-Language Pathology students. The file was organized into interconnected spreadsheets, comprising the following components:

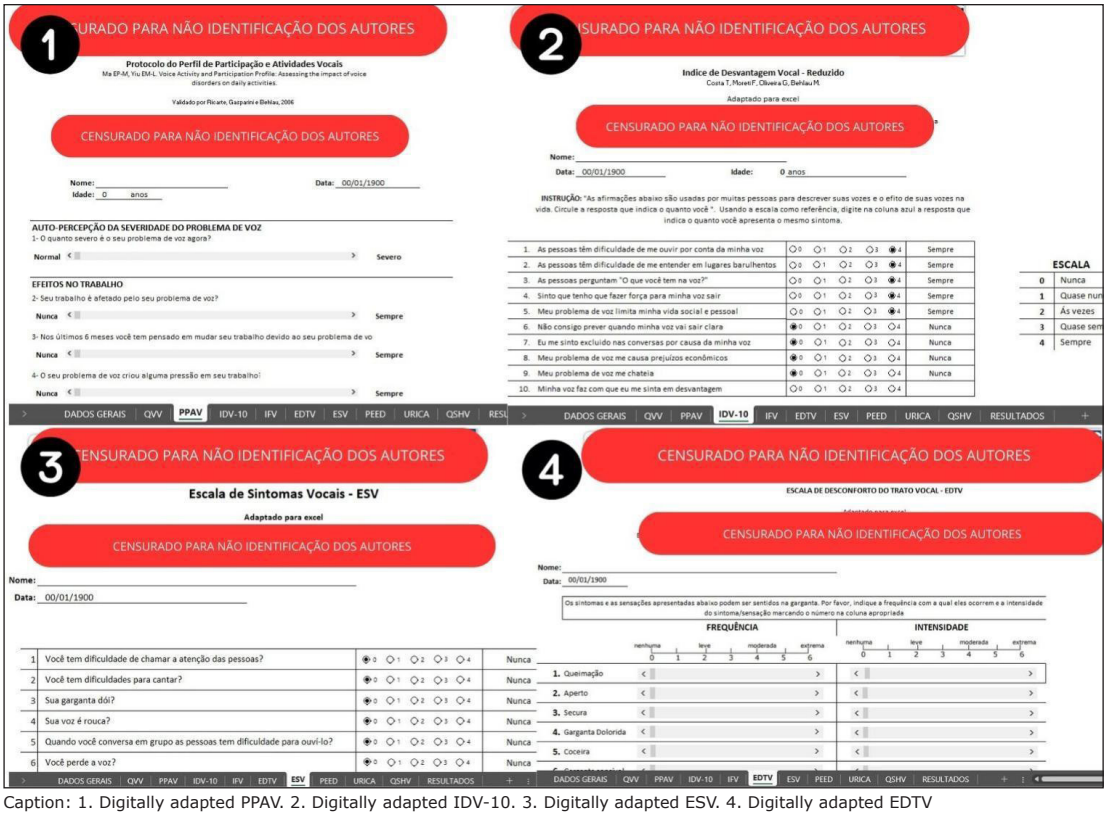
1. **General Data:** a space for entering information collected by the speech-language pathologist during anamnesis, such as patient/client name, age, profession, and vocal complaint. As in the printed version, the speech tasks to be collected are clearly described, and the date of instrument application can be recorded. This section serves an educational purpose and may be used in practical activities, clinical simulations, and voice-related courses. (Figure 1)
2. **Replication of validations and/or translations and cross-cultural adaptations of voice-related PROMs:** digital adaptation of the V-RQOL, VAPP, VHI-10, VFI, VTDS, VoiSS, VDCQ, URICA-Voice, and QSHV instruments, without modifications to their content or scoring. The validation articles of these instruments were reviewed to ensure fidelity to the original versions, preserving their structure and scoring logic. (Figure 2)
3. **Results demonstration:** data are presented on a numerical scale, without classifications such as "positive" or "negative," to preserve the methodological design of the instruments. Colors are used as a visual aid to facilitate the reading of the scores and highlight the surpassing of cut-off points when applicable. This visualization supports students in interpreting scores and facilitates classroom discussions. (Figure 2)

It is important to highlight that this tool is not authorized for public sharing of the digitized instruments, and its use is restricted to the academic environment under faculty supervision.




Caption: 1. Spreadsheet for entering general information and data; 2. Spreadsheet with automatic description of the results after completion, including the analysis generated from the completed instruments.

**Figure 1.** General Data Spreadsheet and Results Analysis Spreadsheet




Caption: 1. Digitally adapted PPAV. 2. Digitally adapted IDV-10. 3. Digitally adapted ESV. 4. Digitally adapted EDTV

**Figure 2.** Example of spreadsheets with digitally adapted vocal self-assessment instruments.

The adaptation of voice-related PROMs to a digital format proved to be a viable strategy in educational contexts. Compared to paper-based versions, the digital format enhances accessibility and agility in completion, eliminating the need for printing, physical handling, and manual transcription of data. This modality was particularly useful in large-group activities and remote teaching scenarios.

No comparative studies were conducted between the printed and digital versions. Therefore, it is not possible to claim psychometric equivalence between the two formats. This resource should be understood as a didactic tool for teaching and training, rather than as a clinical substitute for validated instruments.

The use of Microsoft Excel® for Microsoft 365® allowed the creation of a functional and accessible platform, although the requirement of licensed software represents a limitation for universal applicability. Future versions may explore open-source alternatives, thereby broadening access in public education and in institutions with budgetary restrictions.

Another relevant aspect is the flexibility that the digital format offers for remote and hybrid learning modalities that have gained prominence in the contemporary academic setting. With access to Excel® on any computer, students can complete assessments and simulations outside the classroom, ensuring continuity of learning even in situations that restrict in-person interaction, as occurred during the COVID-19 pandemic. This format also enables group exercises, with shared results for discussion and collaborative improvement.

The proposed tool is aligned with educational goals, contributing to the training of students better prepared to apply vocal assessment instruments critically and with scientific grounding. Furthermore, it promotes familiarity with fundamental concepts of self-reported outcome measurement, strengthening the integration between theory and

practice. The digitized version is available in Brazilian Portuguese for educational purposes at: https://forms.gle/wiLopYHFZ2Z2qyEj7

It is important to emphasize that, despite its potential as a learning resource, the tool should not be used for storing real patient data, as it does not meet the technical and legal requirements established by the General Data Protection Law (LGPD) and Law No. 13.787/2018[34]. In the case of clinical simulations, fictitious data must be used, and access to the file should remain restricted to the supervised academic environment.

Future versions of the tool may incorporate open-source systems as well as psychometric studies investigating equivalence between formats. However, as mentioned, these possibilities fall outside the scope of this report.

## Final considerations

The digitalization of vocal self-assessment instruments contributes to the teaching–learning process in SLP by providing students with a practical and interactive experience in the use of essential tools. The use of Microsoft Excel® allowed the creation of an accessible interface, although its limitation as proprietary software should be considered. The tool supports clinical reasoning, development of digital skills, and integration of theory and practice in face-to-face, hybrid, or remote modalities.

Furthermore, the tool encourages students' familiarization with concepts related to the measurement of subjective and objective outcomes, fostering a deeper understanding of the relationship between vocal self-assessment and the physiological and psychological processes involved in vocal production. Digital completion facilitates real-time visualization of data, allowing students to critically reflect on variables and understand indicators of vocal quality, fatigue, and discomfort, thereby strengthening the connection between theory and practice.

The use of this platform also enhances students' digital skills, preparing them to operate essential software for their professional careers. The integration of technology in the teaching of vocal assessment instruments contributes to digital literacy, equipping future speech-language pathologists to work in environments that increasingly demand familiarity with technological resources and digital platforms.

This tool serves as a didactic resource that can be adapted to different levels of education and student profiles, ranging from beginners to those engaged in clinical internships. The possibility of customizing spreadsheets and incorporating automated feedback enriches the learning process, making it more dynamic and student-centered. In turn, this contributes to the development of professionals who are more prepared and confident in applying vocal assessment instruments.

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