

Voice Handicap Index check pre and post vocal intervention in patients with dysphonia

Índice de Desvantagem Vocal pré e pós-intervenção vocal em pacientes disfônicos

Isadora de Oliveira Lemos¹, Daniel Lucas Picanço Marchand¹, Mauriceia Cassol²

ABSTRACT

Purpose: Characterize and measure the voice self-perception of patients pre and post speech therapy treatment using the *Índice de Desvantagem Vocal* (IDV) protocol, adapted from the Voice Handicap Index (VHI) protocol. **Methods:** This is a cross-sectional study using a database of patients seen in a speech therapy service. **Results:** The sample comprised 23 patients, 16 (69.6%) of whom female and seven (30.4%) male. The mean age was 58 years and the mean therapy duration was three months with 11 sessions. Among the types of dysphonia found, organic was the most frequent (47.8%) followed by functional (30.7%) and organic-functional (21.7%). The protocol's total score median decreased prior to intervention compared to the post-intervention period, which means a lower voice handicap. Moreover, 80% of the protocol's questions significantly differed when compared pre and post speech therapy. **Conclusion:** A difference was found in voice perception after speech therapy intervention, indicated by lower scores in the IDV items. The findings show the importance of using the IDV protocol in clinical practice to help the speech therapist target the treatment and understand the voice behavior of dysphonic patients. Further research is suggested given the instrument's efficacy.

Keywords: Voice; Dysphonia; Protocols; Voice disorders; Speech therapy

RESUMO

Objetivo: Caracterizar e mensurar a autopercepção vocal de pacientes pré e pós-tratamento fonoaudiológico, por meio do protocolo de Índice de Desvantagem Vocal (IDV). **Métodos:** Trata-se de um estudo transversal, com utilização do banco de dados de pacientes atendidos em um setor de Fonoaudiologia. **Resultados:** A amostra foi composta por 23 pacientes, sendo 16 (69,6%) do gênero feminino e sete (30,4%) do gênero masculino. A média de idade foi de 58 anos, a média do tempo de terapia foi de três meses e o número de sessões foi de 11 atendimentos. Dentre os tipos de disfonia encontrados, a orgânica foi a mais frequente (47,8%), seguida da funcional (30,7%) e da organofuncional (21,7%). A mediana do escore total do protocolo apresentou diminuição no período pré-intervenção, em relação ao período pós-intervenção, significando menor desvantagem vocal. Além disso, 80% das questões do protocolo apresentaram diferença significativa, quando comparadas pré e pós-fonoterapia da voz. **Conclusão:** Houve diferença na percepção da voz após a intervenção fonoaudiológica, indicada por meio da redução dos escores nos itens do IDV. Os achados demonstraram a importância do uso do protocolo IDV na prática clínica, auxiliando o profissional fonoaudiólogo no direcionamento do tratamento e no entendimento do comportamento vocal de pacientes disfônicos. Sugere-se futuras pesquisas, tendo em vista a eficácia do instrumento.

Descritores: Voz; Disfonia; Protocolos; Distúrbios da voz; Fonoterapia

Study carried out in the Speech Therapy Course, Universidade Federal de Ciências da Saúde de Porto Alegre – UFCSPA, Porto Alegre (RS), Brazil.

(1) Graduate Program in Rehabilitation Sciences (Master's Degree), Universidade Federal de Ciências da Saúde de Porto Alegre – UFCSPA, Porto Alegre (RS), Brazil. (2) Speech Therapy Department and Graduate Program in Rehabilitation Sciences (Master's Degree), Universidade Federal de Ciências da Saúde de Porto Alegre – UFCSPA, Porto Alegre (RS), Brazil.

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Correspondence address: Isadora de Oliveira Lemos. R. Roque Calage 590/403, Passo da Areia, Porto Alegre (RS), Brazil, CEP: 91350-090. E-mail: isadoradelemos@gmail.com

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INTRODUCTION

According to the World Health Organization (WHO), the concept of quality of life is not restricted to being free of diseases. This definition is broad and subjective, comprehending aspects related to the population's health, culture, and socioeconomic conditions⁽¹⁾.

Voice is one of the aspects that reflect an individual's personal characteristics and is important in communication and expression since, through it, the speaker is able to convey information, emotions, and feelings. Besides revealing mood, the voice can evidence the individual's physical condition⁽²⁾.

Dysphonia occurs when there is a lack of harmony in the sound produced by the voice and when there is excessive effort and discomfort by the speaker when communicating⁽³⁾. Overall, the individual's expressions, in all social realms, are manifested through the voice. Hence, the impact of dysphonia may worsen the patient's professional and emotional issues by restricting his or her social life and may set off depression and anxiety settings⁽⁴⁾.

One of the classifications of dysphonia in the literature most commonly used in clinical practice describes organic dysphonia as voice disorders caused by changes in the vocal-fold mucosa; functional dysphonia as the one related to improper voice use and vocal behavior disorders; and organic-functional dysphonia as originating from a functional basis, but having secondary lesions⁽⁵⁾.

The patient's perception regarding dysphonia does not always match the results of the auditory-perceptual and acoustic analyses or the laryngeal imaging findings that identify the existing pathology. Self-perception of vocal changes, as in any other specific health issue, is a factor that is difficult to measure and highly relevant to the speech therapy intervention process⁽⁶⁾.

The measurement of the patient's voice-change setting must comprise functional, social, and emotional aspects. Several protocols have been developed to assess the quality of life of dysphonic individuals. These instruments help the professional target therapy by prioritizing relevant aspects in the self-perception reports and performing the individual prognosis of the patient⁽⁷⁾. Among these instruments are the Voice-Related Quality of Life (V-RQOL)⁽⁸⁾, Vocal Activity and Participation Profile (VAPP)⁽⁹⁾, and Voice Handicap Index (VHI).

The VHI has been translated and adapted to Brazilian Portuguese and was called *Índice de Desvantagem Vocal* (IDV), which was validated in 2009. This instrument assesses the impact of dysphonia on the social, emotional, and physical contexts and on the individual's daily activities and is widely employed in clinical practice and scientific research⁽¹⁰⁾.

The present study aimed to characterize and measure the voice self-perception of patients pre and post speech therapy treatment using the IDV protocol.

METHODS

This is a cross-sectional study approved by the Committee of Research Ethics of the *Universidade Federal de Ciências da Saúde de Porto Alegre* (UFCSPA) under protocol 075/05. The sample consisted of patients seen at the Voice Outpatient Clinic of the Federal Healthcare System in an otorhinolaryngology unit of a hospital complex. The patients seen by this unit were informed about the use of their data in research and invited to sign the term of free and informed consent.

The inclusion criteria were: being over 18 years old; having undergone an otorhinolaryngologic examination with medical diagnostic; having dysphonia complaint, and adhering to the speech therapy program. Patients who did not adhere to the treatment and, thus, did not conclude all steps proposed in the study were excluded. The sample consisted of adult male and female subjects between 40 and 73 years old, whose mean age was 58 years old. Initially, 24 patients were included, however, one patient was excluded for being under 18 years old.

Of the 23 subjects, there were more females (69.6%) than males (30.4%). On average, the patients had 11 speech therapy sessions over three months. As for the diagnostic, a prevalence of organic dysphonia (47.8%) was found, followed by functional dysphonia (30.7%) and organic-functional dysphonia (21.7%).

Table 1. Sample characterization

Variables	n=23
Sex – n (%)	
Female	16 (69.6)
Male	7 (30.4)
Age (years) - mean±SD	58.7±8.6
No. of therapy sessions – mean±SD	11.4±4.1
Time of therapy (months) – mean±SD	3.3±1.1
Type of dysphonia – n (%)	
Organic	11 (47.8)
Functional	7 (30.4)
Organic-functional	5 (21.7)

The database was analyzed using clinical protocols from the years of 2012 and 2013 applied by interns from the Speech Therapy Course from UFCSPA. The self-perception protocol used to analyze the data was the *Índice de Desvantagem Vocal* (IDV), the Brazilian version of the Voice Handicap Index (VHI), which aims to map the handicap of dysphonic individuals. IDV consists of 30 questions in three domains: physical (F), organic (O), and emotional (E). The scores are calculated by a simple sum and range from zero to 120 points. The higher the value, the greater the voice handicap. The statements vary on a five-point scale in which zero means “never” and four means “always.”

The data were compared in the periods pre and post speech therapy treatment. In the statistical analysis, the continuous

variables were described as means and standard deviation or median and interquartile range. The categorical variables were described as absolute and relative frequencies.

Wilcoxon's test was used to assess the differences between the scores before and after the speech therapy intervention, while McNemar's test was employed to compare the IDV prevalences. Spearman's correlation coefficient (r_s) was used to associate the age and number of therapy sessions with the IDV scores. A 5% ($p \leq 0.05$) significance level was adopted and the analyses were carried out in the software SPSS version 18.0.

RESULTS

Lower voice-perception scores were found after the speech

therapy intervention in nearly all IDV items, except for six questions. Of those, three are in the emotional domain, two are in the physical domain, and one, in the organic domain. Thus, an improvement was found in 80% of the questions asked ($n=24$).

As for the overall score, the median prior to the speech therapy intervention was 58 points ($P25=41$; $P75=80$) and, after the intervention, it dropped to 28 points ($P25=11$; $P75=47$), which was significantly different ($p < 0.001$).

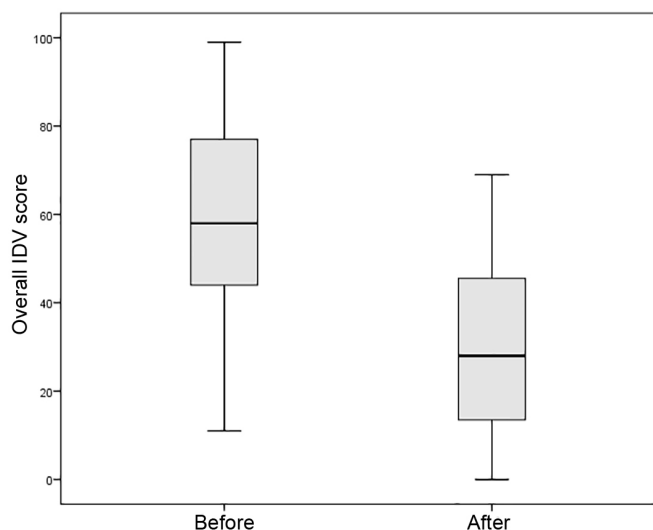
The improvement in voice perception was not associated with patient age ($r_s=0.093$; $p=0.705$) or with the number of therapy sessions ($r_s=-0.079$; $p=0.747$).

No difference was found between the prevalences of the IDV protocol before and after the intervention ($p=0.317$).

Table 2. Comparison between the questions in the *Índice de Desvantagem Vocal* protocol before and after treatment

Questions	Sub-scale	Before	After	p-value
		Mean (P25-P75)	Mean (P25-P75)	
1. My voice makes it difficult for people to hear me.	Physical	2 (1 – 3)	2 (0 – 2)	0.156
2. I run out of air when I talk.	Organic	2 (0 – 2)	1 (0 – 2)	0.233
3. People have difficulty understanding me in a (...)	Physical	3 (2 – 4)	2 (0 – 2)	0.005*
4. The sound of my voice varies throughout the day.	Organic	2 (2 – 4)	2 (1 – 2)	0.013*
5. My family has difficulty hearing me when I call (...)	Physical	2 (2 – 3)	0 (0 – 2)	0.003*
6. I use the phone less often than I would like.	Physical	2 (0 – 3)	0 (0 – 2)	0.010*
7. I'm tense when talking with others because of (...)	Emotional	2 (0 – 4)	1 (0 – 2)	0.011*
8. I tend to avoid groups of people because of my (...)	Physical	2 (0 – 4)	0 (0 – 1)	0.005*
9. People seem irritated with my voice.	Emotional	0 (0 – 2)	0 (0 – 2)	0.680
10. People ask, "What's wrong with your voice?"	Organic	3 (2 – 4)	1 (0 – 2)	0.001*
11. I speak with friends, neighbors, or relatives (...)	Physical	1 (0 – 3)	0 (0 – 1)	0.013*
12. People ask me to repeat myself when (...)	Physical	2 (0 – 3)	2 (0 – 2)	0.029*
13. My voice sounds creaky and dry.	Organic	4 (2 – 4)	2 (2 – 3)	0.007*
14. I feel as though I have to strain to produce voice.	Organic	3 (1 – 4)	2 (0 – 2)	0.006*
15. I find other people don't understand my voice (...)	Emotional	2 (1 – 4)	0 (0 – 2)	<0.001*
16. My voice difficulties restrict my personal and (...)	Physical	2 (0 – 4)	0 (0 – 0)	0.001*
17. The clarity of my voice is unpredictable.	Organic	4 (2 – 4)	2 (0 – 3)	0.011*
18. I try to change my voice to sound different.	Organic	3 (0 – 4)	2 (0 – 2)	0.050*
19. I feel left out of conversations because of my (...)	Physical	0 (0 – 2)	0 (0 – 0)	0.037*
20. I use a great deal of effort to speak.	Organic	2 (1 – 3)	0 (0 – 2)	0.005*
21. My voice is worse in the evening.	Organic	0,5 (0 – 4)	0 (0 – 2)	0.040*
22. My voice problem causes me to lose income.	Physical	0 (0 – 3)	0 (0 – 0)	0.067
23. My voice problem upsets me.	Emotional	3 (2 – 4)	0 (0 – 2)	0.002*
24. I am less outgoing because of my voice problem.	Emotional	2 (0 – 4)	0 (0 – 2)	0.086
25. My voice makes me feel handicapped.	Emotional	2 (0 – 4)	0 (0 – 2)	0.014*
26. My voice "gives out" on me in the middle of (...)	Organic	3 (2 – 4)	2 (0 – 2)	0.001*
27. I feel annoyed when people ask me to repeat.	Emotional	2 (0 – 2)	0 (0 – 1)	0.010*
28. I feel embarrassed when people ask me to repeat.	Emotional	1 (0 – 2)	0 (0 – 2)	0.176
29. My voice makes me feel incompetent.	Emotional	2 (0 – 3)	0 (0 – 0)	0.018*
30. I'm ashamed of my voice problem.	Emotional	0 (0 – 1)	0 (0 – 0)	0.026*

*Significant values ($p \leq 0.05$) – Wilcoxon test



The line within the box represents the median. The box's lower and upper limits represent percentiles 25 and 75, respectively. The lower and upper error bars represent the minimum and maximum values in the sample.

Figure 1. Assessment of the overall *Índice de Desvantagem Vocal* before and after intervention

However, a higher score was found for the organic domain (52.2%) followed by the physical (26.1%) and emotional (21.7%) domains in the period prior to the speech therapy intervention. After the therapy sessions, the organic domain maintained the highest score (52.2%), although a change was observed regarding the pre-intervention period since the emotional domain had a higher score than the questions about the physical domain (30.4% and 17.4%, respectively).

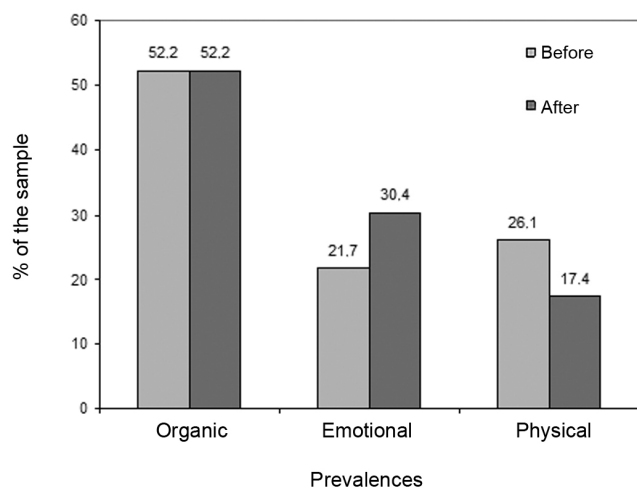


Figure 2. Percentage of the sample regarding the prevalences of the IDV protocol before and after the intervention

DISCUSSION

The age group found in this study matches the results of other scientific findings. A similar research carried out in 2012 found that subjects between 25 and 45 years old have maximum vocal efficiency and that, from 45 years old onwards, they are

more prone to developing voice disorders, particularly in the organic realm⁽¹¹⁾.

In the present research, most subjects were female. A study carried out in 2010 found that women are more susceptible to vocal-fold lesions due to their frequent poor use of voice, to socio-emotional issues, and hormonal changes. Moreover, this prevalence is also because women seek medical services more often than men⁽¹¹⁾.

The sample's profile consisted of patients that did not use their voices professionally. The impact of vocal changes was not evident in these subjects since they did not use their voices at work. The patient who uses his or her voice professionally will have a more critical perception of any voice issue since it impacts, more than daily activities, their work tool⁽¹²⁻¹⁴⁾.

According to the patient profile, the therapeutic approach can be broadened so that all voice-related dimensions are contemplated. The therapy programs used focused on corporal, respiratory, and phonation methods, the facilitating-sound method, and phonation-articulatory and speech organs. That contributes to a full rehabilitation pivoting around the patients' vocal, emotional, and functional needs to improve voice quality and muscle fitting and reduce anxiety and depression symptoms^(15,16).

Organic dysphonia was the most common setting, which is related to the profile of the patients seen at the otorhinolaryngology service. According to this condition, the patients with organic vocal-fold lesions are more commonly diagnosed. In addition, the speech therapy sector deals with pre- and post-surgery cases and the limitations are directly related to the changes in the vocal-fold mucosa in the post-operative and those associated with diseases such as allergic rhinitis or gastroesophageal reflux (GERD).

Of the 30 questions in the IDV instrument spanning the organic, physical, and emotional domains, only six did not have a significant difference when compared to the responses in the periods before and after the speech therapy intervention. Of those six, three belonged to the emotional domain, two to the physical domain, and only one, to the organic domain. Besides the changes found in the protocol questions, the score was lower in 80% of the items. In the overall IDV score, a difference was observed between the results before and after the speech therapy. The overall score median prior to the intervention was 58 points, while, after the sessions, it dropped to 28 points. These findings may be related to the better voice perception by the patients after the therapy sessions, besides the improvement in communication, which was observed in the subjects that underwent the speech therapy intervention. It can be seen that the IDV instrument allows measuring the evolution of dysphonia and the effects of voice therapy, besides targeting the therapeutic decisions according to the patients' self-perception of their voices and restrictions in quality of life⁽¹⁷⁾.

The organic realm of the IDV prevailed both before and after the speech therapy intervention. Prior to the therapy, a higher

score was found for the physical domain than for the emotional domain. However, after the speech therapy intervention, the emotional domain scored higher. This result is explained by these subjects becoming more aware, during the therapeutic process, of the influence of the emotional factors on their physical well-being. The same result was also found in another research from 2001 on 199 patients between 18 and 82 years old seen in an otorhinolaryngology clinic. The physical scale had scores lower than the equivalent scores in the organic and emotional scales⁽¹⁸⁾. Similar results were also found in studies on voice professionals^(19,20). In the emotional realm, the items “My voice problem upsets me” and “I find other people don’t understand my voice problem” had the greatest statistical difference before and after intervention. This reflects the benefits of therapy regarding the patients’ self-esteem and self-confidence, which leads to better sociability and quality of life⁽²¹⁾.

In the physical realm, the items “My family has difficulty hearing me when I call them throughout the house” and “People have difficulty understanding me in a noisy room” stood out for their positive change between the pre- and post-therapy periods. This change is associated to the therapeutic approach of becoming aware of healthy vocal habits, besides the improvements in voice quality and voice projection, which enable better use of voice⁽²²⁾.

As for the organic scale, the items that underwent the greatest significant change during therapy were “People ask, ‘What’s wrong with your voice?’” and “My voice ‘gives out’ on me in the middle of speaking.” These changes are related to speech therapy, which focused on proper and efficient glottal closure, proper muscle fitting, reduction in phonation effort, and better body awareness, which then allows the voice to improve as a whole⁽²³⁾.

In the present study, the IDV instrument proved effective to measure and characterize the patients’ perception regarding the impact of dysphonia on the social, emotional, and physical domains. A recent research compared the protocols Voice-Related Quality of Life (V-RQOL), Voice Handicap Index (VHI), which is the original version of the IDV protocol, VHI 10, Vocal Performance Questionnaire (VPQ), and Voice Symptom Scale (VoiSS). The VHI and VoiSS protocols were found to have higher sensitivity and specificity to measure voice self-perception⁽²⁴⁾.

Studies related to the consequences of dysphonia on quality of life of dysphonic patients are often being published in several countries⁽²⁵⁻²⁷⁾. The impact the individuals with voice issues suffer in several areas of their lives is evident. Therefore, it is key that protocols to measure these impacts be widely used scientifically and clinically to more specifically approach emotional and functional aspects⁽²⁸⁻³⁰⁾.

CONCLUSION

A difference was found in the self-perception of voice after

the speech therapy intervention, as well as positive changes in the physical, emotional, and organic aspects. Measuring the patients’ self-perception of voice before and after speech therapy treatment using the IDV protocol contributes to the clinical practice, which allows the interventions to be targeted. Furthermore, the results of these analyses may lay basis for future scientific research.

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