



## Determinant of Voice Handicap Index Degree as Dysphonia Patients' Quality of Life Indicator

Muhammad Yusuf<sup>1</sup>, Anna Mailasari Kusuma Dewi<sup>1</sup>, Kanthi Yunika<sup>1</sup>, Willy Yusmawan<sup>1</sup>, Farokah<sup>2</sup>, Rery Budiarti<sup>2</sup>, Muyassaroh<sup>2</sup>✉

<sup>1</sup>Universitas Diponegoro, Indonesia

<sup>2</sup>RSUP Dr Kariadi Semarang, Indonesia

### Article Info

Article History:  
Submitted 25 October 2020  
Accepted 22 February 2021  
Published 31 April 2021

Keywords:  
Risk factors, Dysphonia,  
Voice Handicap Index

DOI  
<https://doi.org/10.15294/jhe.v6i1.42118>

### Abstract

**Background:** Dysphonia will interfere with communication which will have an impact on social life such as depression, disrupt activities, work and can affect the quality of life. Dysphonia risk factors such as age, sex, duration of illness and etiology will affect the course of it. The purpose of this study was to identify risk factors for with the degree of Voice Handicap Index (VHI) as an indicator of dysphonia patients.

**Methods:** Analytical descriptive study with cross-sectional design in dysphonia patients, the sample was determined as many as 62 who met the inclusion criteria. Quality of life was assessed by the VHI questionnaire. VHI degrees are classified into mild and moderate-severe. Data analysis using chi-square test and multivariate logistic regression.

**Results:** Thirty-two (51.6%) subjects were women. Mean age was 47.26 +12.2. The most common causes of dysphonia (85.5%) were due to organic disorders and laryngopharyngeal reflux (LPR) is the most common cause (37.1%) of all organic dysphonia disorders. Analysis of risk factors for age, gender, etiology of dysphonia and duration of illness with VHI degree were  $p = 0.282$ ,  $p = 0.76$ ,  $p = 0.067$ ,  $p = 0.001$ , respectively. Duration of illness  $\geq 2$  weeks has a 38.3x risk to severity VHI compared to  $< 2$  weeks.

**Conclusion:** The duration of illness is a determinan related to of the degree of VHI that quality of life indicator in dysphonia patients.

### How to Cited

Yusuf, M., Dewi, A. M. K., Yunika, K., Yusmawan, W., Farokah, Budiarti, R., and Muyassaroh. (2021). Determinant of Voice Handicap Index Degree as Dysphonia Patients' Quality of Life Indicator. *JHE (Journal of Health Education)*, 6(1), 34-38

✉ Correspondence Address:  
Email: [muyastht@gmail.com](mailto:muyastht@gmail.com)

## INTRODUCTION

Dysphonia is a general term for any voice disorder caused by abnormalities in the phonation organs, especially the larynx, both organic and functional (Upadhya et al. 2020). Cross-sectional analysis of data from a nationally representative US medical claims database in 2001 revealed the prevalence of dysphonia become 0.98% (536,943 patients with dysphonia per 55,000,000 patients) in the treated patient population, (Stachler et al. 2018). Based on the medical record data of ENT (Ears, Nose, Throat) clinics in 2018, it was found that dysphonia patients who came to the ENT clinic of Dr. Kariadi Semarang Hospital were 0.02% (the average was 18 of 920 patients per month), at RSU Dr. Soesilo Slawi were 0.01% (the average was 5 of 375 patients per month) with various causes and varying ages. Women, old age, smokers, people with allergies and excessive voice users such as rockers are a group that is vulnerable to dysphonia. (Rameshkumar & Rosmi 2016), (Aremu et al. 2018).

The causes of dysphonia were vary, including inflammatory processes, neoplasms, laryngeal muscle paralysis, which can also be caused by functional causes that are often related to the patient's psychological condition (Martins et al. 2016). Prolonged stress can cause acid reflux. This condition can cause soft acid reflux to the larynx and injure the vocal cords causing dysphonia (Da Silva et al. 2014), (Todd Schneider et al. 2016). Dysphonia can be an early sign of a serious disease process of the larynx, especially if the process is chronically progressive in elderly patients. The existence of a voice disorder or dysphonia will especially interfere with a communication process that will have a negative impact on social life such as depression, disruption in activities and work, and will affect the quality of life, (Kiakojoury et al. 2014), (Toding et al. 2019).

The handicap due to sound disturbance affects environmental adaptation and involvement in various situations (Lu et al. 2017). To find out this handicap can be assessed with various instruments, which is the Voice Handicap Index (VHI), (Alanazi et al. 2018). VHI is widely used because it has a strong reliability value between the VHI score and the patient's self-assessment of the severity of

voice disorders (Seifpanahi et al. 2015). Mostly ENT doctors in Indonesia have not routinely used this measuring device in patients with voice disorders or for post-therapy evaluation. Quality of life for dysphonia patients based on risk factors (age, sex, etiology and duration of illness) has never been assessed in Indonesia. This study aims to identify the determinants of the degree of VHI as a determinant of the quality of life of patients with dysphonia.

## METHOD

Analytical descriptive study with cross-sectional design in dysphonia patients aged  $\geq 18$  years. The sample was determined as many as 62. Patients with moderate laryngeal malignancy or had not undergone chemoradiation were excluded. All samples asked to complete the VHI questionnaire. The VHI questionnaire assesses the quality of life of people with dysphonia consisting of functional aspects (the patient's ability to communicate in different conditions from his usual voice), physical aspects (patient perceptions during vocalization), and emotional aspects (emotional influences that cause voice disorders). A five-point Likert-type scale for each items (from 0 = never to 4 = always), (Seifpanahi et al. 2015). The research was conducted at General Hospital dr. Kariadi and dr. Soeselo Slawi from July to December 2019. The research sample was taken by consecutive sampling. The independent variables include: age, sex, duration of illness, etiology of dysphonia. The dependent variable was the degree of VHI. Assessment of the degree of VHI was considered mild if the VHI score is 0-14, moderate if the value is 15-48, (Seipelt et al. 2020). Analysis of risk factors for age, sex, etiology and duration of illness on the degree of VHI with the chi-square test, risk factors that reached  $p < 0.25$  were analyzed using multi-variate logistic regression to determine the dominant risk factors that could affect the degree of VHI.

## RESULTS AND DISCUSSION

There were more women than men from sixty-two patients. The Age distribution were 20-77 years, with the age's mean were  $47.26 \pm 12.2$ . Most of the dysphonia etiology was due to organic disorders (85.5%). Most cases

of LPR (37.1%) followed by laryngeal mass (25.8%), laryngitis (22.6%).

Table 1. Research subjects characteristic (n = 62)

Variables	F	%
Age		
< 60	53	85,5
≥ 60	9	14,5
Sex		
Male	30	48,4
Female	32	51,6
Etiology		
Organic	53	85,5
Functional	9	14,5
Duration of Illness		
<2 weeks	29	46,8
≥ 2 weeks	33	53,2
VHI Degree		
Mild	26	41,9
Moderate-severe	36	58,1

Table 2. Association of risk factors to the VHI Degree

Variable	VHI Degree				P	RP	IK 95%
	Mild		Moderate-severe				
	N	%	N	%			
Age							
< 60	24	92,3	29	80,6	0,282	2,897	0,550 – 15,263
≥ 60	2	7,7	7	19,4			
Sex							
Male	12	46,2	18	50	0,765	0,857	0,312 – 2,355
Female	14	53,8	18	50			
Etiology							
Organic	25	96,2	28	77,8	0,067	7,143	0,834 – 27,537
Functional	1	3,8	8	22,2			
Duration of illness							
<2 weeks	23	88,5	6	16,7	<0,001*	38,333	8,652 – 169,843
≥2 weeks	3	11,5	30	83,3			

\* Significant (p < 0,05);

Table 3. Multivariate Analysis Regression Logistics

Variable	P	RP	IK 95%
Etiology	0,526	2,386	0,163 – 34,967
Duration of illness	0,000*	38,333	8,652 – 169,843

\* Significant (p < 0,05)

The results showed that women (51.6%) were more than men (48.4%). Gender was not associated to the degree of VHI (p = 0.282). These results were similar to previous studies which reported that women have a higher risk of voice disorders than men, it explained in the results of this study that women were more sensitive to changes in perceived voice. In addition there are structural gender differences in the anatomy of the larynx. Women have shorter vocal folds than men (so that the fundamental frequency of speaking is higher), (Hunter et al. 2011), (Korn et al. 2018).

Most age groups in this study were obtained at age <60 years (85.5%). The most cases found in this study were dysphonia due to organic disorders (85.5%). Most cases were due to LPR (37.1%). These results were similar with previous studies that obtained LPR occurred at <60 years of age, (Lechien et al. 2017). Different to the Zumsteg study, which obtained the highest percentage of dysphonia sufferers in the > 60 years age group, this study found the most etiology due to the mass of the larynx. The laryngeal period is usually more common in elderly patients (Zumsteg et al. 2016). In this study, dysphonia due to laryngeal mass was excluded. Results Statistical analysis did not find an association between age and the degree of VHI (p = 0.282).

The etiology of dysphonia in this study was grouped into two, namely organic (LPR, laryngeal mass, laryngitis, post-thyroidectomy trauma) and functional (parese plika vocalis). Organic etiology (85.5%) was more than functional etiology (14.5%). Statistical analysis did not reveal an association between etiology and the degree of VHI in dysphonia patients (p = 0.027). (Table 2). The results showed that LPR was the most common etiology of organic dysphonia, this is consistent with previous studies which reported that organic dysphonia is the most common cause of voice disorders (Kiakojoury et al. 2014). LPR is a chronic disease with variety of features, so it is necessary to provide appropriate symptomatic management until LPR is diagnosed (Postma & Fritz 2018). Anti-reflux drugs that have been widely used in the treatment of LPR are the Proton Pump Inhibitor (PPI) class, such as omeprazole,

lansoprazole and the like, (Postma & Fritz 2018). The etiology of the laryngeal mass is the second most common etiology in any research. Laryngeal mass as a cause of disruption of the vocal fold movement (Rameshkumar & Rosmi 2016). The findings of this study are different from those of Rameshkumar and Romi in 2016 which found that laryngeal malignancy was the most common finding. More than 50% of patients with hoarseness were caused by benign vocal cord lesions. This difference was due to the different criteria for the samples taken in each study. One study reported that about 45% of dysphonia sufferers with abnormalities such as nodules, polyps or polypoids. According to this study, patients with vocal cord nodules were associated with risk factors for a history of excessive voice use, patients with a history of smoking and alcohol consumption (Rameshkumar & Rosmi 2016). Most benign lesions of the vocal cords are caused by trauma due to vocal cord vibration or what is called phonotrauma and several other things that are also causes of vocal cord irritation, (De Vasconcelos et al. 2019).

In this study, the duration of illness  $\geq 2$  weeks was found to be more (53.2%) than the sample with duration of illness  $< 2$  weeks. Statistical analysis found that the duration of illness was related to the degree of VHI in dysphonia patients ( $p < 0.001$ ). Multivariate analysis of etiology ( $p = 0.526$ ) and duration of illness ( $p < 0.000$ ) revealed that the duration of illness was related to the degree of VHI (table 3).

Acute dysphonia has a sudden onset and usually resolves on its own. If a patient has symptoms of dysphonia for more than 2 weeks, the condition classified as chronic pain and also takes longer to treat and can be caused by environmental factors such as a long history of smoking, inhalation of cigarette smoke or polluted air (e.g. chemical gases), irritation from asthma inhalers, vocal abuse (for example, prolonged use of vocals at abnormal loudness or sound), or esophageal / gastrointestinal reflux. Continuous vocal abuse results in the increase in the strength of the adducts of the vocal folds with increased contact and friction between the intersecting points. The contact area between

the plica then becomes swollen and will cause complaints of dysphonia, (Reiter et al. 2015), (Jetté 2016). The findings of this study showed that patients who had dysphonia for more than 2 weeks has degree of VHI 38.3 times severer than patients who had dysphonia for less than 2 weeks. This can be used as educational material to get early treatment of dysphonia and prevention of the more severe effects of dysphony.

## CONCLUSION

The duration of illness was a determinant of the degree of VHI that determines the quality of life in patients with dysphonia.

## REFERENCES

- Alanazi, R. et al., 2018. Association between voice handicap index and reflux symptom index a cross-sectional study of undiagnosed general and teacher cohorts in Saudi Arabia. *Sultan Qaboos University Medical Journal*, 18(3), pp.e350–e354.
- Aremu, S.K. et al., 2018. Diagnosis and Management of Hoarseness in Developing Country. *Open Science Journal*, 3(2), pp.1–10.
- Hunter, E.J., Tanner, K. & Smith, M.E., 2011. Gender differences affecting vocal health of women in vocally demanding careers. *Logopedics Phoniatrics Vocology*, 36(3), pp.128–136.
- Jetté, M., 2016. Toward an Understanding of the Pathophysiology of Chronic Laryngitis. *Perspectives of the ASHA Special Interest Groups*, 1(3), pp.14–25.
- Kiakojoury, K. et al., 2014. Etiologies of Dysphonia in Patients Referred to ENT Clinics Based on Videolaryngoscopy, 26(76).
- Korn, G.P. et al., 2018. Vocal symptoms and associated risk factors between male and female university teachers. *International Archives of Otorhinolaryngology*, 22(3), pp.271–279.
- Lechien, J.R. et al., 2017. Impact of age on laryngopharyngeal reflux disease presentation: a multi-center prospective study. *European Archives of Oto-Rhino-Laryngology*, 274(10), pp.3687–3696.
- Lu, D. et al., 2017. A Comparative Study of the VHI-10 and the V-RQOL for Quality of Life Among Chinese Teachers With and Without Voice Disorders. *Journal of Voice*, 31(4), pp.509.e1–509.e6.
- Martins, R.H.G. et al., 2016. Voice Disorders: Etiology and Diagnosis. *Journal of Voice*,

- 30(6), pp.761.e1–761.e9.
- Postma, G. & Fritz, M.A., 2018. Dysphonia and Laryngopharyngeal Reflux. , pp.185–192.
- Rameshkumar, E. & Rosmi, T., 2016. Prevalence of age, gender and pathological conditions of vocal cords leading to hoarseness of voice in a tertiary care hospital. *International Journal of Advances in Medicine*, 3(2), pp.345–348.
- Reiter, R. et al., 2015. Hoarseness—Causes and Treatments. *Deutsches Arzteblatt International*, 112(19), pp.329–337.
- Seifpanahi, S. et al., 2015. Translated versions of voice handicap index (Vhi)-30 across languages: A systematic review. *Iranian Journal of Public Health*, 44(4), pp.458–469.
- Seipelt, M. et al., 2020. Monitoring the Outcome of Phonosurgery and Vocal Exercises with Established and New Diagnostic Tools. *BioMed Research International*, 2020.
- Da Silva, C.E.D., Niedermeier, B.T. & Portinho, F., 2014. Reflux laryngitis: Correlation between the symptoms findings and indirect laryngoscopy. *International Archives of Otorhinolaryngology*, 19(3), pp.234–237.
- Stachler, R.J. et al., 2018. Clinical Practice Guideline: Hoarseness (Dysphonia) (Update), Todd Schneider, G., Vaezi, M.F. & Francis, D.O., 2016. Reflux and Voice Disorders: Have We Established Causality? *Current Otorhinolaryngology Reports*, 4(3), pp.157–167.
- Toding, R.A., AmsyarAkil, M. & Punagi, A.Q., 2019. Relationship between type of dysphonia and quality of life based on voice handicap index. *Indian Journal of Public Health Research and Development*, 10(8), pp.1287–1291.
- Upadhya, I.B., Patel, D.C. & Rao, K.R., 2020. Hoarseness of voice-prospective study: etiology, evaluation and treatment. *International Journal of Otorhinolaryngology and Head and Neck Surgery*, 6(4), p.740.
- De Vasconcelos, D., De Oliveira Camargo Gomes, A. & De Araújo, C.M.T., 2019. Vocal fold polyps: Literature review. *International Archives of Otorhinolaryngology*, 23(1), pp.116–124.
- Zumsteg, Z.S. et al., 2016. Incidence of oropharyngeal cancer among elderly patients in the United States. *JAMA Oncology*, 2(12), pp.1617–1623.