

QUALITY OF LIFE AND VOICE IN CHRONIC PULMONARY DISEASE

Qualidade de vida em voz na doença pulmonar crônica

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ABSTRACT

Purpose: to analyze the quality of life related to voice self-reported by individuals with Chronic Pulmonary Disease. **Methods:** cross, exploratory and quantitative study with information obtained from the application of one questionnaire quality of life in voice users an integrated physiotherapy clinic in a university hospital in the interior of Rio Grande do Sul, in the period from March to November 2012. **Results:** participated in 19 subjects, 12 (63.20%) were males and 7 (36.80%) were females. On the age group, 14 (73.70%) were adults and five (26.30%) elderly, a statistically significant difference. As for the Chronic Pulmonary Disease to ten (52.60%) had bronchiectasis, six (31.60%) had Chronic Obstructive Pulmonary Disease and three (15.80%) asthma. The average of the questionnaire Voice in Quality of Life Total was 85.8 ± 5.8 points. There was no statistical difference between the three domains of questionnaire Voice in Quality of Life and the sex, age and medical diagnosis. **Conclusion:** percentage predominance of males and adult-aged age group was statistically significant and last medical diagnosis of bronchiectasis. The average questionnaire Voice in Quality of Life Total was 85.8 ± 5.8 points. There were no statistical significance in the comparison of questionnaire Voice in Quality of Life domains with the sex, age and lung disease. This can be explained by the development of communication strategies in order to minimize the effects of the Chronic Pulmonary Disease on voice. We suggest the completion of other studies addressing the same theme, but with larger samples to check the statistical significance of the variables studied.

KEYWORDS: Voice; Quality of Life; Pulmonary Disease, Chronic Obstructive; Bronchiectasis; Asthma

■ INTRODUCTION

Chronic lung disease is characterized by the presence of respiratory diseases in the airways, which can affect other structures besides the lungs and is associated with morbidity and mortality, with significant interference with quality of life ¹. The main chronic lung disease (CLD) stand out from asthma, respiratory allergies, occupational lung disease, bronchiectasis, pulmonary hypertension and the most commonly found, chronic obstructive pulmonary disease (COPD) ².

Some lung diseases present as a symptom, dyspnea, which is a respiratory alteration and

is associated with decreased quality of life of individuals, being progressive to the extent of the disease grievance ^{3,4}. Authors point out that in the manifestation of this symptom suggests a commitment of approximately 50% of lung capacity (LC) ⁵, which may influence negatively in communication due to use of LC in voice production.

The vocal production can be altered in subjects with lung diseases since the reduction of LC may decrease other measures such as vital capacity and maximum phonation time, essential for proper vocal production ⁶⁻⁸. This fact occurs because the pulmonary disorders cause changes in the air stream, which results in a destabilization of the aerodynamic forces of the lungs and the larynx myoelastic, which interferes with the transmission of speech and increases the number of pauses in

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speech, reflecting negatively on the communication⁷, requiring adequate speech evaluation of the voice.

The voice evaluation aims to determine the vocal behavior and identify possible factors that may cause or aggravate the vocal and/or laryngeal changes. This procedure is essential so it can make the diagnosis by correlating the data and subsequently the appropriate therapeutic intervention⁷.

There are many ways to measure the voice changes called dysphonia, however, currently it has taken into consideration the impact that these ways generate on quality of life, which is defined as the perception that the individuals have in relation to their position in life, in the context of culture and value system, and in relation to their goals, expectations, standards and concerns⁹.

In Brazil, to date, three protocols have been validated for this purpose: Voice-Related Quality of Life (V-RQOL), Voice Activity and Participation Profile (VAPP), and the Voice Handicap Index (VHI),¹⁰. In particular, the use of the questionnaire of quality of life and voice is seen as a non-invasive tool that can detect and quantify the real commitment due to vocal changes in subjects' lives^{7,10-13}.

V-RQOL is an easy application protocol because it is composed of 10 questions covering physical and socio-emotional factors as well as being self-evaluation and sensitive to individual perceptions, this protocol is validated in Brazil^{7,10-12}. Still, applying of it helps in understanding the real impact on quality of life that the disease causes in personal, social and professional relationships¹⁴.

Studies are found in the literature using V-RQOL protocol in Parkinson's disease, dysphonia abducting¹⁵, spasmodic dysphonia¹⁶ in teachers^{14,17}, choristers¹⁸, elderly^{19,20} and patients after resection of laryngeal tumors T1 and T2²¹. However, there are no studies that used the protocol in subjects with a medical diagnosis of CPD.

Given the above, this study aimed to analyze the quality of life related to self-reported voice by individuals with CPD.

METHODS

It is a cross-sectional, exploratory, quantitative study, with information obtained from a questionnaire of quality of life and voice with users of an integrated physiotherapy clinic at a university hospital in the interior of *Rio Grande do Sul*, from March to November 2012.

This study was approved by the Ethics Committee of *Universidade Federal de Santa Maria* (23081.014977 / 2011-18) and CAAE (Certificate of Presentation for Ethical Consideration) 0302.0.243.000-11 and all individuals previously

signed the Consent and Informed (IC), authorizing the use of data from assessments on scientific research, since maintained secrecy about the identity.

The inclusion criteria for participation in the survey were: signing the consent form, medical diagnosis of any chronic lung disease, being in physical therapy care in that service without treatment time limit and having age above 18 years. Exclusion criteria were adopted not completing the inclusion criteria and subjects who had neurological history or have been submitted to surgery in the head and neck region.

The ages of the subjects were classified into age groups according to the health descriptors²². Thus, the following ages were used: adults middle age (19-64 years) and elderly (over 65 years).

From the application of the inclusion and exclusion criteria, 19 subjects were selected.

The procedure carried out was the self-assessment of the impact of dysphonia by applying V-RQOL questionnaire. It was applied individually and the questions were read to the participants to enable a better understanding of them and avoid possible embarrassment for those subjects who did not know how to read or else, they had some difficulty related to visual acuity.

V-RQOL questionnaire consists of 10 questions covering physical area (six questions) and socio-emotional area (four questions)^{7,10,23}. The responses were marked with reference to the scale ranging from 1 to 5, being considered as the severity of the problem and the frequency of occurrence for the response.

The responses analysis results of the total score calculation and for each area. To calculate the scores, we used the standard algorithm, which can vary from 0 to 100, so that the closer to 100, considered as suggestive of a better quality of life and close to zero as a poorer quality of life.

After data tabulation, there was a descriptive analysis of data, and statistical analysis using the Mann-Whitney U-test, test the equality of two proportions and the Kruskal-Wallis test. The significance level was 5%.

RESULTS

The study included 19 subjects, 12 (63.20%) were males and 7 (36.80%) were females. As regards the age group, 14 (73.70%) were adults and 5 (26.30%) elderly, with a statistically significant difference.

As for the medical diagnosis presented by the subjects 10 (52.60%) were bronchiectasis, 6 (31.60%) of COPD and 3 (15.80%) of asthma,

however, these values were not statistically significant.

Table 1 shows the complete descriptive analysis of three areas of V-RQOL. It can be seen that the three areas variability is low because the coefficient of variation (CV) is less than 50%, demonstrating that the data are homogeneous. The V-RQOL average was 85.8 ± 5.8 points.

Table 2 shows the comparison regarding genre in the areas of V-RQOL, it was not found statistical significance.

Table 3 shows the comparison of V-RQOL areas with variable age, it was not found statistical significance.

Table 4 illustrates the comparison of medical diagnosis with areas of V-RQOL, without statistical significance.

Table 1 – Complete Descriptive of the Questionnaire Areas

V-RQOL	Total	Socio-emotional	Physical Functioning
Average	85,8	93,3	79,7
Median	88	100	87,5
Standard Deviation	12,9	11,2	18,1
QOL	15%	12%	23%

Legend: CV = coefficient of variation
V-RQOL = Quality of life related to voice

Table 2 – Compares the genre in Questionnaire Areas

Genre		Average	Median	Standard Deviation	CI	P-value
Total	Female	87,7	90	7,7	5,7	0,932
	Male	84,6	88	15,4	8,7	
Socio-emotional	Female	94,7	100	11,6	8,6	0,525
	Male	92,4	100	11,4	6,5	
Physical functioning	Female	83,1	84	6,6	4,9	0,733
	Male	77,7	88	22,4	12,6	

CI = confidence interval; V-RQOL = Quality of Life related to Voice
Mann-Whitney Test

Table 3 – Compares the Age Questionnaire Areas

	Age	Average	Median	Standard Deviation	CI	P-value
Total	Adult	86,8	91,25	12,5	6,6	0,428
	Elderly	82,8	88	14,9	13,1	
Socio-emotional	Adult	95,6	100	8,9	4,6	0,133
	Elderly	86,6	88	15,3	13,4	
Physical functioning	Adult	79,4	85,75	18,7	9,8	0,709
	Elderly	80,4	88	18,3	16,0	

CI = confidence interval; V-RQOL = Quality of Life related to Voice
Mann-Whitney Test

Table 4 – Compares the Diagnostic in Questionnaire Areas

	Diagnosis	Average	Median	Standard Deviation	CI	P-value
Total	Asthma	94,3	95	6,0	6,8	0,207
	Bronchiectasis	87,6	89	8,3	5,2	
	COPD	78,5	88	18,6	14,9	
Socio-emotional	Asthma	96,0	100	6,9	7,8	0,565
	Bronchiectasis	95,1	100	10,0	6,2	
	COPD	88,8	94	14,8	11,8	
Physical functioning	Asthma	93,3	92	6,1	6,9	0,159
	Bronchiectasis	80,2	82	13,1	8,1	
	COPD	72,0	84	25,9	20,7	

V-RQOL = Quality of Life related to Voice; COPD = Chronic Obstructive Pulmonary Disease
Kruskal-Wallis Test

■ DISCUSSION

The study included 19 subjects of both genres percentage predominance of males and adult age group, being the last one statistically significant.

Regarding gender, it is characteristic of each CPD has a prevalence in particular gender, and bronchiectasis predominates more female ^{24,25}, COPD is prevalent in males ^{26,27} and asthma among women ²⁸⁻³⁰. These results go against what the literature refers, for although the sample is composed of CPD found more in females, the genre was not that prevailed.

As for the age group the findings of this study are in literature meeting since the CPD affect more adult subjects ²⁸⁻³⁰.

Of medical diagnoses presented by the subjects were percentage predominance of bronchiectasis, followed by CPD and asthma. CPD may result in losses on other important functions such as voice, since they affect the respiratory system and compromise the airflow, which actively participates in vocal production, and when compromised, it can change some aspects of speech such as intensity, volume and voice quality ^{6,31}.

Bronchiectasis is a CPD that causes change in ventilatory mechanics, such as loss of respiratory muscle strength, changes in lung volume and capacity, as a result of abnormal and irreversible dilatation of the bronchi, as a result of the destruction of the walls of the airways due to constant infections and inflammation ^{25,32}. According to some authors it is presented by different etiologies and may be suppurative and obstructive character ³³.

COPD is characterized by a respiratory illness that causes chronic airflow obstruction. Among the causal factors include the inhalation of particles or gases, smoking, occupational dust, and chemical

irritants and socio-economic conditions ^{5,26}. The airflow obstruction in COPD this may lead to lack of coordination of breathing and phonation, making a difficult oral communication of the individual ²⁷.

The search of Cassiani et al. (2013) ²⁷ found that the Maximum Times of Phonation (MTP) of subjects with COPD was significantly lower compared to individuals without the disease, thus, they suggested that subjects require many air charging for the maintenance and at the end of the frase during conversation.

Asthma is a chronic inflammatory disease of the airways in the presence of wheezing, breathlessness, chest tightness and coughing, and these symptoms occur at night or early morning and they are a generalised and variable consequence of airflow intrapulmonary obstruction ²⁸.

Authors show concern about their treatment and influence on V-RQOL in general, as concern that despite the disease have effective treatment, there are a number of negative consequences for the individual affected due to poor control of the disease and lack of self-management guidelines ²⁹. This can be evidenced in the study of these same authors found that to only 9.3% of asthmatic participants had controlled asthma.

In face of the impairment of pulmonary function presented by CPD is possible that the vocal production can be affected and the communication generally change the quality of life, so there is a need to identify the perception of the subjects through the application of quality of life questionnaires related to voice. Some authors emphasize that assess quality of life related to voice not only contributes to the establishment of therapeutic efficacy measures but also assists in the development of new interventions for patients with vocal alterations ³⁴.

Spina et al. (2009) ³⁵ related quality of life and voice to the professional activity and concluded that the degree of dysphonia was related to worsening in the quality of life regardless of profession, justifying the use of the protocol in individuals who do not use their voice as an instrument of work but as a way to establish communication on a day-to-day, in this case in individuals with CPD.

The work of Ugulino, Oliveira, Behlau (2012) ¹³ examined the relation between the evaluation of the speech therapist and the self-perception of the impact of dysphonia by patients. The authors found that there was a strong correlation but not direct between the perception of professional and patient, being justified by the patient not only analyzing the vocal disorder but the physical, social and emotional restrictions.

The application protocols that examine the perception of the presence of dysphonia in the quality of life of the subjects complements clinical evaluation of speech therapist because elucidates important information about the impact of the change in the various sectors of life of the patient, and assists in expanding the clinical view of professional and broader understanding of the problem ¹³.

In the descriptive complete analysis of the three areas of V-RQOL (Table 1), it may be observed that the three areas the variability was low, and the average of V-RQOL Total was 85.8 (\pm 5.8 points). This score was lower than that reported for individuals with healthy voices that is 98.0, however, is still within what is considered normal is 66.0 ²³. The lowest score was found in the physical area (79.7 points), that among the questions are: difficulty in speaking loud or being heard in noisy environments, the air goes fast and ones need to breathe many times while talking and this fact can be explained by respiratory compromise found in CPD. However, this value is as expected which is up 62.7 for subjects with healthy voices.

No studies were found in the literature which has related areas of V-RQOL protocol with CPD. What can be verified is using this with other populations with or without underlying pathology associated as in the work of Fabricio, Kasama, Martinez (2010) ³⁶, the authors investigated the V-RQOL of university professors and found that most teachers had good quality of life related to voice, evaluated by the V-RQOL.

Also Tutya et al. (2011) ¹⁴ conducted research with teachers and found lower values of the scores related to the physical area, that is, poor quality of life, probably by the questions posed in this area reflect the difficulties faced by this population. In Oliveira, Augusti, Smith's work (2013) ³⁷, which was conducted with subjects who underwent surgery

due to cancer in the head and neck region was also demonstrated lower values in scores related to the physical area, since after removing laryngeal structures the vocal production got hampered, affecting QOL of subjects.

In search of Behlau, Hogikyan and Gasparini (2007) ³⁸ and Ugulino, Oliveira, Behlau (2012) ¹³, the authors found that individuals with vocal complaints had lower V-RQOL scores when compared to individuals without vocal complaints, evidence of the importance of considering the negative impact of vocal disorders on quality of life of the subjects. These findings suggest that independent of causal factor, whether by incorrect use of the voice, structural resection or CPD presence, the voice may find itself compromised and reflect negatively on quality of life.

In comparison regarding genre in the area of V-RQOL (Table 2) did not present statistical difference between the female and male, which suggests that the involvement of QOL related to voice occurs regardless of genre, although the lowest values were found male, probably because they represent the highest percentage of the sample. In working of Tutya et al. (2011) ¹⁴ which was applied V-RQOL in teachers of both genres, it was found that the greatest loss of QOL related to voice found in females, and the authors justify this finding by the percentage prevalence be more than female teachers.

In the comparison of V-RQOL areas with the variable age, most of the study participants were in middle-age adult age range 19-64 years (Table 3), with no statistical significance, that is, for this study, advancing age has not improved or worsened the issue of QOL related to vocal production. However, the literature states that the natural aging result of the interaction of several biological, functional, psychological and social aspects, it is with the voice ¹⁹.

Grillo, Penteado (2005) ³⁹ applied the V-RQOL with 120 teachers aged between 23 and 65 and found that 49.2% of the subjects face difficulties to speak strong in noisy environment, pneumophonic incoordination (air goes fast leading to the need to breathe several times while talking) and instability of vocal quality.

In contrast, the work of Gampel, Karsch, Ferreira (2010) ¹⁹ conducted with old teachers and not teachers it was found that the values of V-RQOL scores showed statistically significant correlation with the chronological age of the subjects, so that the older is the age, better it was the Total V-RQOL score.

Despite physiological changes occur of vocal production during the aging process and these

influence roughly the QOL related to voice ⁷, when there is some underlying pathology associated, in this case the CPD, QOL may find itself changed by the oral communication commitment ²⁷. In CPD presence presenting as characteristic airflow obstruction, individuals have limited ventilatory capacity with consequent increased of respiratory rate, which may compromise communication ²⁷.

Table 4 shows the comparison of the medical diagnosis with V-RQOL areas, no statistical significance was verified. No studies were found in literature that have applied V-RQOL questionnaire in subjects with CPD to verify the influence of QOL related to voice, which is what this work proposes, hampering the discussion of this finding.

A fact confirmed in the work of Cassiani et al. (2013) ²⁷, the lack of studies in the literature that

debated the dynamics phonation and the glottal competence in COPD.

It is possible that the subjects of this sample have developed communication strategies in order to minimize the effects of the CPD or, the small sample size was not sufficient to demonstrate statistical significance.

■ CONCLUSION

This work was percentage predominance of males and adult-aged age. As for the medical diagnosis, the bronchiectasis was the predominant lung disease. In the analysis of the three areas of V-RQOL variability was low, and the average of Total V-RQOL was 85.8 ± 5.8 points, showing no negative impact on quality of life.

RESUMO

Objetivo: analisar a qualidade de vida relacionada à voz autorreferida por indivíduos com doença pulmonar crônica. **Métodos:** estudo transversal, exploratório, quantitativo, com informações obtidas a partir da aplicação de questionário de qualidade de vida em voz em usuários de um ambulatório de fisioterapia integrado em hospital universitário no interior do Rio Grande do Sul, no período de março a novembro de 2012. **Resultados:** participaram 19 sujeitos, 12 (63,20%) do sexo masculino e 7 (36,80%) do sexo feminino. Sobre a faixa etária, 14 (73,70%) eram adultos e cinco (26,30%) idosos, sendo essa diferença estatisticamente significativa. Quanto à doença pulmonar crônica, dez (52,60%) tinham bronquiectasia, seis (31,60%) doença pulmonar obstrutiva crônica e três (15,80%) asma. A média do questionário Qualidade de Vida em Voz Total foi de $85,8 \pm 5,8$ pontos. Não houve diferença estatística entre os três domínios do questionário e as variáveis sexo, idade e diagnóstico médico. **Conclusão:** predomínio percentual do sexo masculino e faixa etária adulta-meia idade, sendo essa última estatisticamente significativa e diagnóstico médico de bronquiectasia. A média do questionário total foi de $85,8 \pm 5,8$ pontos. Não foram encontradas significância estatística na comparação do domínios do questionário com as variáveis sexo, idade e doença pulmonar. Tal fato pode ser explicado pela elaboração de estratégias de comunicação como forma de minimizar os efeitos da doença pulmonar na produção vocal. Sugere-se a realização de outras pesquisas abordando o mesmo tema, porém com amostras maiores a fim de verificar a significância estatística das variáveis estudadas.

DESCRIPTORIOS: Voz; Qualidade de Vida; Doença Pulmonar Obstrutiva Crônica; Bronquiectasia; Asma

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