



الأكاديمية الجزائرية لعلوم أمراض الحساسية
Académie Algérienne d'Allergologie

Disponible en ligne sur

ASJP
Algerian Scientific Journal Platform

<https://www.asjp.cerist.dz/en/PresentationRevue/588>



ARTICLE ORIGINAL

Quality of life for COPD

Nadia Fettal ^{a,*}

^aDepartment of pneumology, Sidi belabbes, Algeria

KEYWORDS

CAT questionnaire

COPD

Dyspnea

Quality of life

Abstract

Introduction : pulmonary disease is a public health problem. It is disabling, responsible for a profound deterioration in the state of health of the COPD patient.

Methods : This is a prospective observational study of a cohort of patients with COPD diagnosed and evaluated in four stages according to the GOLD criteria. The quality of life was apprehended using the CAT questionnaire translated into dialectal Arabic and completed by the patient in a stable state. The aim of this work is to evaluate the quality of life of COPD patients and its correlation with the severity of the disease, the frequency of exacerbations and the presence of co morbidities.

Results : These are 135 COPD patients, divided into 5% stage I, 64.4% II, 26.7% III and 3.7% stage IV. The CAT score varies from 7 to 37 with an average of 16.42 ± 6 . In univariate analysis, the CAT score is closely correlated with age (DS: $p : 0.000$), the stage of dyspnea evaluated by the Mmrc scale ($p:000$), FEV % ($P:001$), BODE index ($p:0.000$) and exacerbation frequency ($p:0.000$). dyspnoea, the BODE index and the frequency of exacerbations.

Conclusion : The quality of life of patients with COPD is impaired even at an early stage of the disease. A deterioration in the quality of life is correlated with dyspnoea and the frequency of exacerbations and with the BODE index.

© 2023 Revue Algérienne d'Allergologie et d'Immunologie Clinique. All rights reserved

* Auteur correspondant :

Adresse e-mail :fettaln@yahoo.fr

Introduction

The WHO[1] has defined quality of life as an individual's subjective perception of their own life situation. It is assessed in the cultural context and value systems in which one lives and in relation to one's own goals expectations and concerns. The quality of life is the result of the sole assessment by the person concerned, even if it does not correspond to the reality of the performance that can be observed. A healthy quality of life means physical and mental well-being.

Chronic obstructive pulmonary disease is a general pathology with a respiratory starting point [2] although it is accepted that the severity of COPD is determined by the respiratory components such as FEV according to GOLD [3]. However, this functional parameter does not allow to assess the disease in its entirety; anxiety, depression, exercise intolerance, fatigue and nutritional status [4, 5] All these composites of often degraded quality of life are not taken into account by the GOLD classification.

The evaluation of quality of life is a parameter which makes it possible to express the patient's feelings about their handicap secondary to their respiratory pathology and this in multidimensional aspects. There are tools allowing the assessment of quality of life which are validated, some are specific to COPD such as the questionnaire St Georges SGRQ, VQ11, Chronic Respiratory Disease questionnaire CRDQ, COPD Assessment Test CAT, Visual Simplified Respiratory questionnaire VSRQ) and other generics which are intended for chronic conditions in general[1]

Our study aims to evaluate the quality of life of COPD patients at different stages of severity and to identify the factors determining its deterioration.

Patients and methods

This is an epidemiological, descriptive and prospective study involving a cohort of subjects with COPD diagnosed and evaluated in four severity stages according to the GOLD criteria[3]. During 36 months of follow-up, dyspnea was assessed according to the Mmrc[6] scale, body mass index (BMI) and frequency of exacerbations per year. We proposed a threshold of 3 exacerbations per year. Which characterizes a frequent exacerbator, referring to the literature [7]. We calculated the BODE index based on FEV1, BMI, dyspnea and the 6-minute walk test[8]. All our patients benefited from therapeutic care, in addition to anti-flu vaccination, an appropriate treatment is prescribed depending on of each severity stage according to the SPLF recommendations. However, respiratory rehabilitation was not available due to a lack of structures adapted to our level. To assess quality of life, we chose the self-questionnaire CAT (COPD Assessment Test)[9], validated, simple and including 8 items relating to dyspnea, cough, expectoration and quality of sleep. item is scored on the scale of 0 -5 and the total score is calculated from the sum of the item scores. The questionnaire was translated into dialect Arabic and completed by each COPD patient in stable condition after prior consent. We defined a mild impact for a score of 0 to 10, a moderate impact between 11 and 20 and a severe impact beyond of 20.

Data analysis

Data entry was carried out using SPSS 21 software. The description of the variables

was carried out by the mean \pm standard deviation (normal distributions) or the median (interquartile range) for the quantitative variables and by the number and the percentage (%) for the qualitative variables.) The comparison of the quantitative variables according to groups is made with the non-parametric test of Kruskal wallis. A multivariate analysis was also carried out the threshold of statistical significance for all the tests was set at 0.05 for univariate tests and 0.01 for multivariate analysis.

Results

One hundred and thirty-five COPD subjects were collected in this study, an average age of 61 years with a clear male predominance. Smoking is present in more than 95% of cases with an average cumulative tobacco consumption of 50P/Y. The patients left according to GOLD, in COPD stage I (7 cases), stage II (86), stage III (37) and stage IV (5). Clinically, fifty-six percent of cases are malnourished, 79% of COPD are dyspneic including 47% at stage 2 on the MRC scale. The comorbidities recorded during follow-up are 64% with dominant cardiovascular manifestations followed by diabetes. The epidemiological and clinical characteristics appear in [table 1](#)

Table 1 : Epidemiological and functional characteristics of the cohort

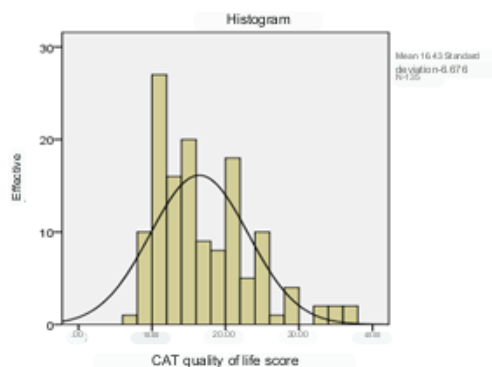
Average age (years)	61 \pm 9
Man Woman	03/132
Smoking status	
Smoking	66(48.9%)
Former smoker	66(48.9%)
Non-smoker	03(2.2%)
Average BMI (kg/m2)	22.1 \pm 3.7
Dyspnea (Mmrc)	1.8 \pm 0.7
Average post-BD FEV (%)	58.25 \pm 15.29
Average post-BD FEV1 (L)	1.78 \pm 0.62
Average TM6(m)	366 \pm 107
Average BODE index	2.78 \pm 1
Cormorbidity factors	64(47%)
Average frequency of exacerbations	2.41 \pm 1

Values are expressed as mean \pm confidence interval. FEV post BD: maximum expiratory volume per second post bronchodilator, BMI; body mass index, WT6: the 6-minute walk test, Mmrc: Modified Medical Reaserch, Council

The average CAT score calculated in our patients is 16 \pm 6 with variations from 7 to 37

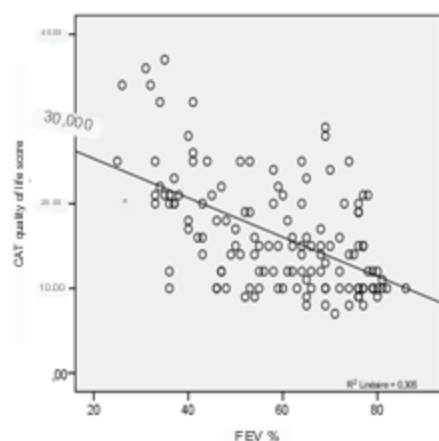
(figure1). 23% had a mild impact, 43% a moderate impact and 34% a severe impact, in other words more than half of the COPD patients suffered from a deterioration in their general condition.

Figure 1 : distribution of the CAT score in the study population



CAT scores increase progressively with the GOLD severity stages with a significant difference between the four stages ($p < 0.000$) according to the analysis of variance of the CAT scores (table 2). Just as the cloud points representing the scores of each patient approach the linear regression line showing the close relationship between the CAT score and the FEV1% post bronchodilator. (figure 2)

Figure2 : scatter plot between FEV % and CAT score



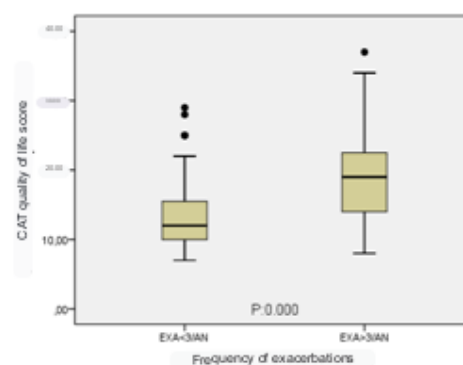
With regard to dyspnea and the BODE index, similarly, an increase in the CAT score with the different stages of dyspnea as well as the

BODE quartiles with always a significant difference between the groups (table 2).

We assessed quality of life in COPD with more than 3 exacerbations (group 1) and those with fewer (group 2). We observed that median CAT scores are distinct between the two groups 1, it is higher in frequent exacerbators with a significant difference ($P:0.000$) (figure:3).

Figure 3: Box plots show the distribution of the CAT score according to the frequency of exacerbations.

The black dots represent the patients whose CAT score is higher than the mean and the black bars represent the medians.



There is an increase in the CAT score with the number of cormobidités in the COPD subject. Thus a high score >20 is recorded in subjects with more than 3 associated pathologies (figure 4).

Figure 4: The distribution of the CAT score according to the number of cormobidités

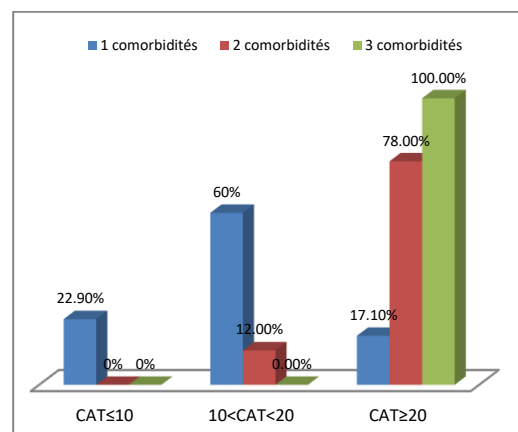


Table 2: CAT score according to GOLD stages, dyspnea stages and BODE quartile

					Kruskal Wallis	P
CAT score	12.59±4.6	16.19±4.9	25.09±6.7	27±2.8		
Dyspnea (mMRC)	0-1	2	3	4	50.48	0.000
CAT score	10.28±0.9	14.63±5.2	20.51±7.3	25.6±6	32.96	0.000
GOLD stadiums	I	II	III	IV		

CAT score	13.64±5	16.85±4.7	19.1±7.2	27.42±6.3		
BODE Index	0-2	3-4	5-6	7-10	40.67	0.000

Mmrc: Modified Medical Reaserch, Council

A very close relationship is observed between the CAT score and the dyspnea scale ($r^2:0.58, p<0.0001$) and the FEV1 (L) ($r^2:-0.47, p<0.0001$). correlation with the frequency of exacerbations, the number of comorbidities ($r^2:0.47$,

$p<0.0001$) and the BODE index. On the other hand, this correlation is weak with the walking test ($r^2:0.34, P<0.000$) and non-existent with the BMI (table 3).

In multivariate analysis, dyspnea ($p: 0.000$), frequency of exacerbations ($p: 0.001$), BODE index ($p: 0.001$) were the only factors linked to quality of life (table 4)

Discussion

Our population is mainly composed of patients with moderate to severe COPD, which explains why the average CAT score is high (16). It seems that the quality

Table 3: the coefficient r^2 characterizing the CAT score with the parameter

	r^2	p-value
FEV (%)	-0.44	0.000
FEV(L)	-0.47	0.000
Dyspnea (Mmrc)	0.58	0.000
6mn(m) walk test	0.34	0.000
BMI(kg/m2)	-0.09	0.28
BODE Index	0.45	0.000
Frequency of exacerbations	0.46	0.000
Age	0.26	0.002
Number of comorbidities per patient	0.46	0.000

FEV : maximum expiratory volume per second post bronchodilator, BMI; body mass index, WT6: the 6-minute walk test, Mmrc: Modified Medical Reaserch, Council

Table 3: Multivariate analysis of the CAT score on a series of 135 COPD

Settings		Coefficient β	Error Standard	T	P	95% CI	P<0.01
Constant		7.65	1.07	7.10	0.000	[5.52,9.78]	
Dyspnea (Mmrc)		4.95	0.55	8.98	0.000	[3.8,6.04]	**
BODE index		2.26	0.67	3.35	0.001	[0.9,3.6]	**
Frequency of exacerbations	of	3.02	0.89	3.38	0.001	[1.25,4.7]	**
Number of cormobidities	of	1.24	0.56	2.21	0.02	[0.13,2.35]	NS
6MN(m) walk test		1.95	0.77	-2.5	0.01	[-3.48,-0.42]	NS
Age		0.00		0.11	0.91		NS
FEV(%)		0.20		-1.97	0.05		NS

NS: not significant, **p<0.01 very significant, CI confidence interval, Mmrc: Modified Medical Research, Council, FEV1; forced expiratory volume per second

life of our patients is already altered at a moderate stage of the disease. A similar study, using the same questionnaire, carried out in 400 COPD subjects, all stages combined, found an average score of 15[10].

CAT scores are better in young COPD compared to older COPD, also demonstrated by Tsiliagiani and coll [11] and Martin and coll[12] using other questionnaires.

The impact of respiratory function on quality of life was assessed by FEV1(L), FEV1 post bronchodilator%. These were negatively correlated with quality of life scores in a significant way. There is also an increase in the CAT score with the GOLD severity stages. According to the literature, the results relating to the functional parameters are controversial, the correlation being similar[13], weak[14] or even better[15] to that observed with other tools quality of life assessment such as the Saint George score. In multivariate analysis, FEV1 is not, however, a significant determinant of the CAT score in the group of patients studied. Unlike bronchial obstruction, pulmonary distension has a greater impact on quality of life through the link between the VR/CPT ratio and quality of life indices [16,17] This link is related to dyspnea which is secondary to pulmonary distension, a well-known mechanism of COPD. The 6-minute walk test was significantly associated with the CAT score but in multivariate analysis, it was not

related to quality of life. Contrary to what was observed in the study by Coteand coll [18] using the Saint George score, the T6M was more closely correlated than the other composites of the BODE index. functional components of quality of life, often reduced in COPD subjects compared to that of healthy subjects. COPD patients underestimate the time spent in a sitting position and overestimate their time walking around [19]. They walk less but also more slowly. This decrease in exercise capacity is the result of a double respiratory and peripheral muscular component [20].

The evolution of COPD, whatever the stage of severity, is marked by exacerbation which worsens the patient's pre-existing dyspnea. It is well accepted that exacerbations have a negative impact in the short and medium term on all areas of quality. of life, attested by a study by Bourbeau and coll [21], which showed that all quality of life parameters are altered from the onset of the exacerbation and persist 15 days later. Spencer and coll [22] showed, during a 6-month prospective study, that the recovery time of the quality of life scores assessed by the Saint Georges questionnaire is only gradual over 6 months. occurrence of another episode of exacerbation, these scores corrected only very slowly. So much so that at the 6th month, these patients still did not regain their baseline values, unlike patients who have had only one exacerbation, thus very

high CAT scores are observed in our frequent exacerbators of COPD. According to the multivariate analysis, exacerbations are a determining factor in the deterioration of the quality of life.

Dyspnea, the main complaint of COPD subjects, is better correlated with quality of life than other objective functional parameters [15, 23,24] also reported by the CAT questionnaire, the level of dyspnea assessed by the Mmrc scale is associated with the score CAT with a significant difference. Such a link appears logical because dyspnea is the dominant element among the items in the questionnaire where all aspects of dyspnea are explored. In COPD, due to the alteration of respiratory mechanics and the pulmonary distension which sometimes exists even at rest, responsible for the increase in the respiratory load on the respiratory muscles already altered. This imbalance constitutes the source of dyspnea significant leading to anxiety in the patient who reduces his physical activities and all efforts by thus becoming sedentary. The patient then enters a spiral of muscular deconditioning, itself generating a peripheral type of dyspnea.[20]

In our series, the BODE index is closely linked to quality of life compared to the other parameters that compose it (FEV1, BMI,t6m) except dyspnea which remains the main and specific factor in the evaluation of quality. This was also shown by Marchand and coll[25] with the same questionnaire as well as Lin and coll[24] and Medinas Amoros[26] using the Saint George questionnaire.

Although the nutritional status of the COPD subject is a predictor of mortality and one of the BODE composites, our study did not find a relationship between BMI and quality of life like the majority of studies that have found it. have evaluated. [25,24.27.28]. Contrasting with others [29].

The present study demonstrated that COPD patients who had three or more associated pathologies had a poorer quality of life than those who presented only one or two. In univariate analysis, the CAT score is correlated with the number of cormobidities associated with COPD. This is consistent with the results of Perez and coll [30]. In multivariate analysis, the number of cormobidities do not represent a factor in the alteration of the quality of life. Similarly,

the team of Marchand and coll [25] did not demonstrate a link between the Charlson score and the CAT sore.

Conflict of Interest: None declared.

Conclusion

The CAT questionnaire is an effective, simple, fast reproducible tool that we recommend to use during consultations to assess quality of life.

The quality of life of patients with COPD is impaired even at an early stage of the disease. A deterioration in quality of life is mainly correlated with dyspnea, the frequency of exacerbations and the BODE index. Given the negative impact of dyspnea on quality of life, we emphasize the importance of respiratory rehabilitation, the role of which is undeniable in the overall management of COPD. Its beneficial effect has already been demonstrated in numerous trials.

Bibliography

- 1-N.Roche et al Quality of life and COPD page V Flammarion
- 2-Rabe KF et al. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. GOLD Executive Summary. Am J Crit Care med 2007;176:532-55
- 4-Curtis JR, Martin DP, Martin TR. Patient-assessed health outcomes in chronic lung disease: what are they, how do they help us, and where do we go from here? Am J Respir Crit Care Med 1997;156:1032-9.
- 5-Schols AM, Broekhuizen R, Weling-Scheepers CA, Wouters EF. Body composition and mortality in chronic obstructive pulmonary disease. Am J Clin Nutr. 2005;82:53-9.
- 6- Bestall JC, Paul JA et al. sefulness of the Medical Research Council (MRC) dyspnoea scale as a measure of disability in patients with chronic obstructive pulmonary disease. Thorax. 1999; 54 (7): 581-586. (mMRC).
- 7-Donaldson GC, Seemungal TA, Bhowmik A, Wedzicha JA: Relationship between exacerbation frequency and lung function decline in chronic obstructive pulmonary disease. Chest 2002; 57: 847-52

- 8-Celli.BR,Cote.CG,Marin.JM et al.The body-mass index,airflow obstructionndyspnea and exercise capacity index in COPD.N Engl JMed 2004;350:1005-12
- 9- Jones PW, Harding G, Berry P, et al. Development and first validation of the COPD Assessment Test. Eur Respir J 2009;34:648—5410
- 10-Oussedik.F et al.The impact of exacerbations on respiratory function.Rev Mal Respir jan 2016(33).183-184
- 11-TSiligiani.I,Kocks.J,Tzanakis.N, Siafakos.N, Van Der Moler.T.Factors that influence disease specific,quality of life or health status in patients with COPD.A review and meta analysis of Pearson correlations. Prim.Care Respir J 2011?21/257-68
- 12-Martín.A, Rodríguez-González Moro.JM, Izquierdo.JL, Gobartt.E, de Lucas.P; VICE Study Group.. Int J Chron Obstruct Pulmon Dis . 2008;3(4):683-92.
- 13-Ferrer M, Alonso J, Morera J, et al. Chronic obstructive pulmonary disease stage and health-related quality of life. Ann Intern Med 1997;127:1072—9
- 14-Jones PW. Health status measurement in chronic obstructive pulmonary disease. Thorax 2001;56:880—7.
- 15- de Torres JP, Casanova C, Hernandez C, et al. Gender associated differences in determinants of quality of life in patients with COPD: a case series study. Health Qual Life Outcomes 2006;4:72.
- 16-Taka H, Koic N, Mits T, et al. Comparison of discriminative properties among disease-specific questionnaires for measuring health-related quality of life in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1998;157:785—90
- 17-Haruna A, Oga T, Muro S, et al. Relationship between peripheral airway function and patient-reported outcomes in COPD: a cross-sectional study. BMC Pulm Med 2010; 10:10.
- 18-Cote.C,Marin.J,Casanova.C,Pinto-Plata.V,Celli.B: Relationship between the multivariable disease severity index BODE and the health related quality of life in patients with COPD. Am J Respir Crit Care Med 2004; 169: A605
- 19- Pitta.F, Troosters.T, Spruit.MA, Decramer.M, Gosselink.R. Activity monitoring for assessment of physical activities in daily life in patients with chronic obstructive pulmonary disease Arch Phys Med Rehabil 2005; 86: 1979-1985
- 20-Couillard.A.Prognostic factors in COPD: the head, legs and breathing.Rev Mal Respir 2011,28;174-186
- 21-Bourbeau.J, Ford.G, Zackon.F et al. Impact of patients health status following early identification of COPD exacerbations. Eur Respir J 2007;30;907-13
- 15-Spencer S, Jones PW. for the GLOBE Study Group. Time course of recovery of health status following an infectious exacerbation of chronic bronchitis. Thorax 2003;58:589-93 .
- 22-Spencer.S,Calverly.PM,Burger.PS et al.Impact of preventing exacerbations on deterioration of health status in COPD Eur Respir J2004,23:698-702
- 23- Hajiro T, Nishimura K, Jones PW, et al. A novel, short, and simple questionnaire to measure health-related quality of life in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1999;159:1874—8
- 24-Lin YX, Xu WN, Liang LR, et al. The cross-sectional and longitudinal association of the BODE index with quality of life in patients with chronic obstructive pulmonary disease. Chin Med J (Engl) 2009;122:2939—44
- 25-Marchand.E,Maury .G.Evaluation of the COPD assessment Test (CAT) in stable COPD.Rev Mal Respir 2012(29),391-397.
- 26-Medinas Amoros M, Mas-Tous C, Renom-Sotorra F, et al. Healthrelated quality of life is associated with COPD severity: a comparison between the GOLD staging and the BODE index. Chron Respir Dis 2009;6:75—80.
- 27- Gray-Donald K, Gibbons L, Shapiro SH, et al. Effect of nutritional status on exercise performance in patients with chronic obstructive pulmonary disease. Am Rev Respir Dis 1989;140:1544—8.

28- Ischaki E, Papatheodorou G, Gaki E, et al. Body mass and fatfree mass indices in COPD: relation with variables expressing disease severity. Chest 2007;132:164—9

29-Katsura H, Yamada K, Kida K. Both generic and disease specific health-related quality of life are deteriorated in patients with underweight COPD. Respir Med 2005;99:624—30

30-Perez.T,Serrier.P,Prisk.C,Mahdad.A COPD and quality of life.Rev Mal Respir 2013(30),22-3