

# Determinants of quality of life in the course of chronic obstructive pulmonary disease among patients in their residential environment

## Determinanty jakości życia w przebiegu przewlekłej obturacyjnej choroby płuc u pacjentów w środowisku zamieszkania

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### Abstract

**Introduction.** The course of chronic obstructive pulmonary disease (COPD) as well as its accompanying symptoms depreciate the lives of patients in physical, mental and social dimension leading to a limitation of their roles in the social and professional context. **The aim of the study.** The assessment of quality of life in patients with COPD who remain under the outpatient care of a specialist clinic. **Material and methods.** The study comprised 103 patients with COPD treated in the Clinic of Tuberculosis and Lung Diseases of Medical Centre in Ostrowiec. Data was collected by means of the analysis of medical records and diagnostic survey involving standardised questionnaire of St. George Hospital (SGRQ). **Results.** Overall quality of life assessment (QoL) in patients with COPD was rated at the average level of  $44.1 \pm 14.2$  with the median of 41.8. The highest QoL was scored in the Impact on Life subscale with the average result of  $33.6 \pm 17.4$  and the median of 30.8. The average result in the Activity subscale was placed at the level of  $46.7 \pm 15.9$  with the median of 41.7. The area Activity included the scope of physical activity and the constraints imposed by dyspnoea. The lowest result of QoL was found in the Symptoms area with the average result of  $73.2 \pm 12.3$  and the median of 74.7. **Conclusions.** The most common symptom of COPD was dyspnoea, which considerably determined the patients' quality of lives. A higher level of education among patients had a positive influence on the perception of their quality of life. Patients who had been smoking for a long period of time and had been often hospitalised perceived their quality of lives to be worse. (Gerontol Pol 2018; 26; 177-181)

**Key words:** COPD, chronic obstructive pulmonary disease, dyspnoea, quality of life

### Streszczenie

**Wstęp.** Przebieg Przewlekłej Obturacyjnej Choroby Płuc (POChP) jak również towarzyszące jej objawy deprecjonują życie pacjentów w wymiarze fizycznym, psychicznym oraz społecznym, prowadząc do ograniczania pełnionych dotychczas ról społecznych i zawodowych. **Cel pracy.** Ocena jakości życia chorych z POChP objętych opieką ambulatoryjną w poradni specjalistycznej. **Materiał i metody.** Badaniem objęto 103 pacjentów z POChP leczonych w Poradni Gruźlicy i Chorób Płuc Ostrowieckiego Centrum Medycznego. W badaniu zastosowano metodę analizy dokumentacji medycznej oraz sondażu diagnostycznego z wykorzystaniem standaryzowanego Kwestionariusza Szpitala Świętego Jerzego (SGRQ). **Wyniki.** Globalna ocena jakości życia (QoL) życia chorych z POChP uzyskała średni wynik  $44,1 \pm 14,2$  z medianą 41,8. Najwyższą QoL pacjenci uzyskali w podskali Wpływ na życie, gdzie średnia wyników była równa  $33,6 \pm 17,4$  z medianą 30,8. W podskali Aktywność średni wynik kształtował się na poziomie  $46,7 \pm 15,9$  z medianą 41,7. Obszar ten obejmował zakres aktywności fizycznej i ograniczenia wynikające z występowania duszności. Najniższą QoL dotyczyła podskali Objawy ze średnią wyników  $73,2 \pm 12,3$  i medianą 74,7. **Wnioski.** Najczęstszym objawem POChP była duszność, która w znacznym stopniu determinowała jakość życia pacjentów. Wyższy poziom wykształcenia badanych pacjentów wiązał się istotnie z

*lepszą oceną własnej jakości życia. Wzrost liczby lat palenia i ilości hospitalizacji w ciągu roku wiązał się z pogorszeniem jakości życia badanych chorych. (Gerontol Pol 2018; 26; 177-181)*

**Słowa kluczowe:** POC<sub>h</sub>P, Przewlekła obturacyjna choroba płuc, duszność, jakość życia

## Introduction

The epidemiological data published in 2013 by European Respiratory Society (ERS) and European Lung Foundation (ELF) in the European Lung White Book report shows that the Chronic Obstructive Pulmonary Disease (COPD) population reaches about 23 million people, comprising 5 – 10% of adults aged over 40. The cases occur mostly among men rather than women.

Taking people over 70 into consideration, the frequency of occurrence is 20% among men and 15% among women. It is estimated that 0.25 million Europeans died in 2008 due to COPD (2.5% of total deaths in Europe). In the analysed period, COPD was the fourth course of deaths following ischaemic heart disease (2.4 million deaths; 24.7%), cerebral vascular diseases (1.4 million deaths; 14.0%) as well as larynx, lung and bronchi cancer (0.38 million deaths; 3.9%). It is estimated that mortality due to COPD will increase in the upcoming decades and is likely to reach the level of 32% of total deaths in Europe in 2030 [1].

Main ethiological factors of COPD are as follows: heavy smoking, passive smoking, exposure to air pollution in everyday life and work environment, respiratory infections in the early childhood, recurrent bronchial-pulmonary infections, bronchial hyperresponsiveness, genetic factors as well as low socio-economic and educational status, malnutrition and no access to proper healthcare. Additionally, frequency of COPD's occurrence increases with age [1-3].

According to the Polish Lung Foundation, COPD is a commonly occurring, chronic disease which yields to prophylaxis and therapy easily. It can be characterised by restricted air flow through lower respiratory tracts. As a result of harmful influence of gases and dusts, the symptom usually progresses and results in excessive inflammatory response in the bronchi and lungs. The occurrence of exacerbations in COPD and coexistent diseases have an impact on the course of illness among individual cases [3]. The increasing restriction of airflow is usually connected with the abnormal inflammatory reaction in the lung to the effects of noxious particles and gases. It may result in chronic inflammation, bronchiolitis obstruction or emphysema. The disease is diagnosed with the use of medical interview, physical examination and a chest X-ray. Additional medical examinations which help determine possible complications may include

blood gasometry, ECG and echocardiography [3]. Currently, patients are classified to a particular category of severity of COPD in accordance with latest GOLD 2017 guidelines [4].

Typical symptoms of the disease are: long-lasting cough, sputum coughing, dyspnoea (intensifies by physical effort), anorexia, weight loss, symptoms of circulatory failure and chronic anoxia. The assessment of COPD symptoms intensity is carried out with the use of the modified British Medical Research Council (MRC) dyspnoea scale and COPD Assessment Test (CAT) [3,5].

Chronic Obstructive Pulmonary Disease results in numerous physical, psychological and social implications. Due to lengthening the time and staging of illness, patients may experience elevated levels of anxiety and mental stress, underestimated self-esteem and lack of faith in the effectiveness of treatment. Furthermore, the gradual withdrawal of social life and increased risk of depression may become a matter of serious concern [6,7].

## The aim of the study

The aim of the study was the assessment of quality of life among patients with COPD who remain under care of a specialist clinic.

## Material and methods

The study comprised 103 patients with COPD treated in the Clinic of Tuberculosis and Lung Diseases situated in the Ostrowiec county. The requirements for the inclusion to the study group were as follows: patients remaining under care of a specialist clinic, aged 60 or over, diagnosed with COPD and health condition allowing them to fill in the questionnaire. Patients who were unable to participate in the study consciously or suffered from other clinically relevant respiratory diseases included asthma, mucoviscidosis and alpha-1-antitrypsin deficiency had to be excluded from the study. Individuals, included in the examination suffered from COPD that ranged from moderate to severe (GOLD 2,3 B,D). Data was collected by means of the St. George Hospital standardised questionnaire (SGRQ) [8,9], which analyses the influence of respiratory diseases on patients' everyday activeness. The questionnaire includes 50 questions divi-

ded into three subscales: *S* – symptoms, *A* – activity and *I* – impact. A specified number of points is attributed to specific answers. The number of acquired points provides the basis for estimating the quality of lives (QoL), which looks as follows: 0-33 points – high QoL, 34-65 points – moderate QoL, 66-100 points – low QoL. The authorisation to use the SGRQ questionnaire was obtained from the author Professor Paul Jones. The resulting figures were subject to qualitative and quantitative analyses. Non-parametric statistical test (chi square test) was employed to conduct the statistical analysis of the data.

## Results

The age range of patients was 60-88 years, whereas the average age was estimated at 68.4 years. The majority of the study subjects (56.3%,  $n = 58$ ) were patients aged 60-79. The studied group was comprised of two subgroups: women and men, which accounted for 50.5% ( $n = 52$ ) and 49.5% ( $n = 51$ ) respectively. Taking residence into consideration, the country domicile was indicated by 57.3% ( $n = 59$ ) of patients whereas the remaining group (42.7%,  $n = 44$ ) reported a city as their place of abode. The most numerous group of patients (54.3%,  $n = 56$ ) had attained vocational education. Elementary and secondary education was indicated by 29.2% ( $n = 30$ ) and 16.5% ( $n = 17$ ) of patients respectively. Nearly two out of three of patients (69.9%;  $n = 72$ ) said there were smokers.

The following table shows the results for patients with COPD in the SGRQ scope.

As table I shows, the overall quality of life (QoL) assessment of patients with COPD was rated at the average level of  $44.1 \pm 14.2$  (median - 41.8, the scope of evaluation 0 -100). The highest QoL was scored in the *Impact on Life* subscale with the average result of  $33.6 \pm 17.4$  and a median of 30.8. It was classified as a high quality life. The participants of the research had to evaluate the following factors: everyday activities including bathing and dressing, social functioning (social live, sense of disability connected with a limitation of one's physical fitness), working life.

The average result in the *Activity* subscale was placed at the level of  $46.7 \pm 15.9$  with a median of 41.7 and classifies as moderate quality of life. The *Activity* area included the scope of physical activity and the constraints imposed by the dyspnoea.

The lowest QoL result was found in the *Symptoms* area with the average result of  $73.2 \pm 12.3$  and a median of 74.7. It was classified as low a quality of life. The aforementioned subscales were analysed: spasmodic coughs, discharge coughing, wheezing, breathlessness and duration of the attacks. None of the patients did undertake their self-assessment of symptoms' aggravation of, which would have given an opportunity to allocate the outcomes to a high quality of life. Nevertheless, 75.5% of the results were situated in the low quality of life scope range, whereas 24.3% – in the moderate quality of life. The relevant data is shown in table II.

As it is shown in table II, 50.4% of patients reported suffering from dyspnoea most days of the week. Another common symptom was cough and sputum coughing experienced by 42.7 and 35.9% of patients respectively. Frequent wheezing attacks occurred in 33.9% of the su-

**Table I. General assessment of quality of lives in the group of patients analyzed measured in the SGRQ scope**

SGRQ subscales	M	ME	Min	Max	Percentile 10	Percentile 90	SD
Symptoms	73.2	74.7	34.1	97.4	57.9	86.1	12.3
Activity	46.7	41.7	17.1	85.8	29.3	71.3	15.9
Impact	33.6	30.8	7.5	81.3	15.1	54.1	17.4
Overall/global	44.1	41.8	21.2	81.6	27.8	65.5	14.2

M – modal, Me – median, Min – minimum, Max – maximum, SD – standard deviation

**Table II. Frequency of respiration difficulties among patients during the last four weeks preceding their study entry**

Syndromes experienced during the last 4 weeks preceding the study entry	Most days a week		Several days a week		Several days a month		Only during a respiratory infection		Never occurring		overall
	n	%	n	%	n	%	n	%	n	%	
Severe breathlessness	6	5.8	12	11.6	35	33.9	48	46.6	2	1.9	103
Wheezing attacks	35	33.9	39	37.8	15	14.5	9	8.7	5	4.8	103
dyspnoea	52	50.4	35	33.9	10	9.7	4	3.8	2	1.9	103
Discharge/sputum coughing	37	35.9	55	53.3	8	7.7	2	1.9	1	0.9	103
cough	44	42.7	54	52.4	2	1.9	2	1.9	1	0.9	103

rveyed people. 46.6% of the patients suffered from severe breathlessness during respiratory infections, whereas 33.9% of them only several days a month. Symptoms experienced by almost half of the surveyed several days during a week were sputum coughing (53.3%) and cough (52.4%). A low percentage of patients indicated no symptoms.

Further consideration involved the influence of independent variables such as: sex, age, frequency of hospital treatment, educational background, residence and the duration of tobacco smoking on the level of general quality of life measured through the SGRQ scope. Additionally, Ch2 test was used in the statistical analysis. According to the findings, factors such as: sex, age and patients' domicile were of no significant statistical importance for the noticeable, overall quality of life. However, there is a correlation between the quality of patients' lives and their educational background ( $\chi^2 = 22.98$ ;  $p < 0.05$ ), the duration of their tobacco smoking ( $\chi^2 = 24.23$ ;  $p < 0.05$ ) and the frequency of hospitalisations throughout a year ( $\chi^2 = 29.39$ ;  $p < 0.05$ ). Patients who completed their tertiary education were habitual smokers for a shorter time and they were hospitalized much less frequently, consequently they indicated higher quality of life levels.

## Discussion

Chronic Obstructive Pulmonary Disease (COPD) is a respiratory disorder responsible for high mortality and disability. In contrast to young people, those aged 65 and over are more likely to be affected by the illness and have a high tendency to symptoms' incidence and higher degree of disabilities [1,10]. The general result of COPD patients' quality of life self-assessment reached the average level of 44.1. A similar outcome was obtained in the study conducted by Pawłowicz, Doboszyńska (55.7) [11] and Kupcewicz & Abramowicz (61.4) [7]. In the present study, patients pointed out the most strenuous symptoms which deteriorate their everyday lives. These were as follows: dyspnoea (50.4%), cough (42.7%), sputum coughing (35.9%) and wheezing attacks (35.9%). In the study carried out by Kupcewicz & Abramowicz [7], 52% of the patients reported respiratory problems connected with wheezing attacks as the main problem occurring throughout their day. Other symptoms like dyspnoea, cough and sputum coughing were experienced more frequently than in our own studies and were suffered by 67%, 54% and 38% of the patients respectively. The study conducted by Martin et al. [12] demonstrated an improvement in the FEV1 index value of (forced expiratory volume corresponding to the volume of exha-

led air during the first second of forced expiratory) as the clinical factor which determine, on a great scale, better quality of life and a lower risk of exacerbation among the COPD patients.

Non-pharmaceutical interventions such as: stopping smoking, increased physical activity, pulmonary rehabilitation and a proper diet, which limits the risk of malnutrition and albumen deficiency have a significant impact on improving the quality of life and decreases a risk of hospitalisation. It is recommended that all the drug-free interventions should be included in the educational programme of patients with COPD [10]. Recommendations of coaching interventions concerning health can be also found in specialist literature. It can contribute to the compliance with treatment recommendations and the self-efficacy improvement thus having a beneficial impact on patients' quality of life when suffering from the Chronic Obstructive Pulmonary Disease [13]. Research conducted by Olek et al. [14] points to the link between higher level of the illness acceptance and a better assessment of COPD patients' quality of life.

As the current research indicated, socio-demographic factors such as: age, sex and patients' residence have no significant influence on the evaluation of their quality of life. Low educational background, long-term tobacco smoking and higher a number of hospitalisations throughout the year stated to influence negatively COPD patients' quality of life. The studies of other authors confirmed the adverse impact of factors such as: heavy smoking, age, residence, duration of a disease and a number of hospitalisations [1,7,15].

## Conclusions

1. Dyspnoea, cough and sputum coughing which occur most days of the week are the most common COPD symptoms of in patients.
2. Apart from educational background, the analysed socio-demographic variables were of no statistical importance for the overall assessment of COPD patients' quality of life.
3. Deterioration of COPD patients' quality of life results from a growing number of hospitalisations throughout the year and the duration of their smoking habit.
4. Respiratory problems determine patients' lives to a considerable extent, limiting their mobility and evoking a sense of disability.

Conflict of interests  
None



## References

1. Gałązka-Sobotka M (red.). Przewlekła obturacyjna choroba płuc – analiza kosztów ekonomicznych i społecznych. Warszawa: Uczelnia Łazarskiego; Warszawa 2014.
2. Niewiadomska E, Kowalska M. Obturacyjna choroba płuc – sytuacja epidemiologiczna w województwie śląskim. *Przeegl Epidemiol* 2017;71(2):237-50.
3. Śliwiński P, Górecka D, Jassem E, Pierzchała. W: Zalecenia Polskiego Towarzystwa Chorób Płuc dotyczące rozpoznawania i leczenia przewlekłej obturacyjnej choroby płuc. *Pneumonol Alergol Pol.* 2014;82 (3):232-8.
4. Klasyfikacja GOLD 2017 źródło: <http://goldcopd.org/gold-2017-global-strategy-diagnosis-management-prevention-copd/>.
5. Jassem E. Chory na przewlekłą obturacyjną chorobę płuc (POChP) w opiece lekarza rodzinnego. *Pneumonol Alergol Pol.* 2014;82(supl. 2):11-21.
6. Blakemore A, Dickens C, Guthrie E, et al. Depression and anxiety predict health-related quality of life in chronic obstructive pulmonary disease: systematic review and meta-analysis. *Int J Chron Obstruct Pulmon Dis.* 2014;9:501-12. doi: 10.2147/COPD.S58136. eCollection 2014.
7. Kupcewicz E, Abramowicz A. Ocena jakości życia chorych z przewlekłą obturacyjną chorobą płuc. *Hygeia Public Health.* 2014;49(4):805-12.
8. Kuźniar T, Patkowski J, Liebhart J, et al. Ocena polskiej wersji Kwestionariusza Szpitala św. Jerzego u chorych na astmę oskrzelową. *Pneumonol Alergol Pol.* 1999;67:497-503.
9. Jones PW, Quirk FH, Baveystock CM. The St George's Respiratory Questionnaire. *Respir Med.* 1991;85(Suppl B):25-31.
10. Guilleminault L, Rolland Y, Didier A. Characteristics of non-pharmacological interventions in the elderly with COPD. Smoking cessation, pulmonary rehabilitation, nutritional management and patient education. *Rev Mal Respir.* 2018 Jun 21. pii: S0761-8425(18)30156-6. doi: 10.1016/j.rmr.2017.12.004.
11. Pawłowska KB, Doboszyńska A. Ocena jakości życia chorych na przewlekłą obturacyjną chorobę płuc w zależności od stopnia zaawansowania choroby według GOLD. *Probl Pielęg.* 2017;25(3):168-73.
12. Martin AL, Marvel J, Fahrback K, et al. The association of lung function and St. George's respiratory questionnaire with exacerbations in COPD: a systematic literature review and regression analysis. *Respir Res.* 2016 Apr 16;17:40. doi: 10.1186/s12931-016-0356-1.
13. Tülüce D, Kutlutürkan S. The effect of health coaching on treatment adherence, self-efficacy, and quality of life in patients with chronic obstructive pulmonary disease. *Int J Nurs Pract.* 2018 May 16:e12661. doi: 10.1111/ijn.12661.
14. Olek D, Uchmanowicz I, Chudiak A, Jankowska-Polańska B. Wpływ akceptacji choroby na jakość życia chorych w przewlekłej obturacyjnej chorobie płuc. *Probl Pielęg.* 2014;22(4):471-6.
15. Bartoszek AB, Kocka KH, Dejneka J, et al. Społeczno-demograficzne zróżnicowanie wybranych czynników ryzyka u pacjentów z chorobami układu oddechowego. *Stud Med.* 2017;33(1):31-9.