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QUALITY OF LIFE IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN SLOVAKIA

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Abstract: *Aims and objectives. The goal of this study was to determine the impact of symptoms on the individual dimensions of the quality of life in patients with chronic obstructive pulmonary disease (COPD).*

Background. The presence of symptoms or the fear of them in patients with COPD affects their physical and social activities. Actively combatting the disease depletes physical, emotional, and financial resources and affects the ability of the patient to overcome other life situations.

Methods. The sample consisted of 80 respondents with COPD, Stage II, as per GOLD classification. The average age of respondents was 62.9 years. The research was conducted using the Short Form Quality of Life Questionnaire (SF-36) and St. George's Respiratory Questionnaire (SGRQ).

Results. Results of the SF-36 questionnaire indicated that the health-related quality of life was mostly limited: general health, physical functioning, vitality, and mental health. Next to the worsening of symptoms such as cough and dyspnoea, patients reported a worsening of the following dimensions: general health, physical functioning, bodily pain, vitality, social functioning, and mental health. A strong linear relationship was observed between the symptoms and the dimension limitation of emotional problems.

Relevance for clinical practice. The aim of a COPD comprehensive therapy should be to reduce its symptoms, preventing the loss of performance, improving daily activities, and in general improving the patient's quality of life.

Key words: *Chronic obstructive pulmonary disease, quality of life, respiratory physiotherapy.*

INTRODUCTION

Lung diseases currently represent a serious problem worldwide for their high prevalence, morbidity and mortality, as well as a negative impact on the patient's quality of life. They have a strongly ascending prevalence. Chronic obstructive pulmonary disease (COPD) is currently the most common chronic lung disease and presents a serious medical, economic, and social problem for the human population.

COPD affects 210 million people the world over. It is a disease of civilization from which about three million people worldwide die annually. It is a global health problem and the increasingly fourth-leading cause of death among diseases worldwide. The World Health Organization (WHO) predicts that by 2030, the disease will reach third place (WHO, 2007; Drugdová, 2011). According to a pneumological statement of the NCHI (2012), in Slovakia alone, around 42,000 people have been recorded as having asthma and nearly 53,000 people as having COPD (GOLD 2007, 2011).

According to the ATS/ERS (2013), pulmonary rehabilitation is a multidisciplinary and comprehensive form of intervention for patients with chronic lung disease in which symptoms predominate and often limit daily activities. It is part of an individual patient's treatment and is designed to optimize their functional status, improve their participation in physical and social activities, improve the quality of life, and reduce health care costs through stabilizing or reversing systemic manifestations of the disease (Spruit, 2013).

Chronic obstructive pulmonary disease (COPD) is a disease defined as an airway passage obstruction that is not fully reversible. Bronchial obstruction is progressive and is associated with the abnormal inflammatory response of lungs to noxious particles or gases (GOLD 2007, GOLD 2011, 2013, Rabe et al. 2007). This disease is now one of the leading causes of chronic morbidity and mortality (Raherison & Girodet 2009). It is characterized as a progressive disease and a highly irreversible obstruction associated with dyspnoea (Celli 2008). Patients suffering from COPD face a condition of existence defined by performance impairment in everyday activities and reliance on long-term oxygen therapy (Niewoehner 2010), with limited functional ability and a significant psychosocial burden. Research suggests that patients with COPD have a high incidence of anxiety and depression, which has a significant negative impact on their morbidity and quality of life (Ng et al. 2007).

Given the complexity of clinical conditions and comorbidities, the treatment of COPD is complex and multidisciplinary. The therapy of mild to moderate COPD is based on the elimination of risk factors. An important part of complex COPD treatment according to the GOLD criteria is pulmonary rehabilitation, which is indicated from COPD, Stage 2. It focuses on the range of extra-pulmonary problems that cannot be adequately addressed through medical therapy (GOLD 2013, Kubincová et al. 2011).

According to the definition of the WHO (2001, 2007), *quality of life* means how one perceives his/her position in life in the context of the culture he/she lives in and in relation to his/her goals, expectations, lifestyle, and interests. Physical health, psychological condition, level of independence, social relationships, and the ecological characteristics of the environment affect the above-defined individual quality of life. Since the second half of the twentieth century, the concept of quality of life has been emerging and explored in various scientific disciplines. The material aspects of society's life as a whole stood at the centre of focus from the very beginning, but later we can observe a gradually strengthening movement towards non-materialistic aspects and a shift to the subjective perception and assessment of the quality of life in individuals (WHO 2007). The most frequently used generic questionnaire is the Short Form 36 Health Questionnaire (SF-36). This instrument was generally used for measuring health status and health-related QOL. Thanks to its high informative, value this questionnaire is often used to assess personal health condition in various fields of medicine (Řehulková 2008).

Quality of life is the important result of the measurement of pulmonary rehabilitation.

The quality of life of 166 patients with COPD was examined at the Pulmonary Department in Prague. The researchers compared patients receiving long-term home oxygen therapy treatment for severe COPD with a group of healthy respondents. The standardized questionnaire SF-36 was used to evaluate the results. The researchers assessed the quality of life in the following areas: physical activity, general feeling of health, vitality, and social activity. The average age of patients in the first group was 62.5 years. The greatest differences were reported in the assessment of physical activity and limitations in patients with COPD treated with home oxygen therapy (22.8 and 9.8) compared to healthy respondents (94.1 and 86.4). The quality of life varied primarily in the area of physical activity, the general feeling of health and social activity ($p<0.001$). The examinations were supplemented with spirometry tests and the correlation revealed that low values of the questionnaire scores were also accompanied by low FEV 1 values in the group of patients with COPD treated with home oxygen therapy, while the scores were high in the group of healthy individuals (Vondra & Malý 2003).

In his study, Leupoldt (2008) examined 210 patients with COPD and investigated the effects of intensive 3-week outpatient pulmonary rehabilitation aimed at training lung capacity, dyspnoea and improving the quality of life. The examinations were carried out before and after pulmonary rehabilitation and were aimed at evaluating physical activity with a 6-minute walking test (6MWT); dyspnoea was measured after the 6MWT on the Borg effort scale and, quality of life was observed by means of the SF-36 test. The results indicated an improvement in the 6MWT (+39 m, $p < 0.001$) after the treatment and at the same time reduced dyspnoea with the 6MWT (-0.5, $p < 0.001$). The improvement in all SF-36 dimensions reflects a better quality of life after treatment ($p < 0.001$).

Fritzsche (2013) points out in his study that depression and other related negatives in the course of a disease are highly prevalent comorbidities in patients with COPD. These factors significantly contribute to the social and economic burden on patients. The quality of life in patients with COPD is influenced not only by symptoms, but also by comorbidities, the severity of the disease, and other impacts that have to be further examined and evaluated.

Female patients with COPD experience significantly more psychological distress than male patients, which can be explained by the wrongly understood control of symptoms, especially dyspnoea. Dyspnoea, in combination with little activity, poor physical condition, and functional impairment, contributes to the development of anxiety and depression (Coventry ,2011; Di Marco,2006).

According to Qaseem et al. (2011), psychosocial interventions for patients should include an assessment of disability, expert advice, as well as patient and family education. In addition, psychological support can ease the adjustment process by supporting adaptive thinking and behaviour – coping strategies that help patients to reduce their negative emotions, which can improve compliance with rehabilitation programs. Psychological support helps in overcoming addictions, especially smoking.

TheA study by Maurer (2008) shows that the quality of life in patients with respiratory diseases is further aggravated by comorbidities including depression, depressive symptoms, and anxiety. The researchers found that depressive symptoms were more common with COPD than with coronary heart disease, stroke, diabetes mellitus, arthritis, or hypertension. Forty percent of patients showed at least three symptoms of depression. Another study determined that the risk of depression is 2.5 times higher in patients with severe COPD than in a control group of patients without COPD or with bronchial asthma. The authors concluded that there is an increased risk of depression in patients with severe COPD, and the results highlight the importance of reducing symptoms and improving the physical functioning of patients with COPD.

AIMS AND METHODS

The main goal of the research was to determine the impact of the symptoms of COPD on the quality of life in patients with the disease.

The research sample consisted of 80 respondents aged 40 to 88 years. The average age of our respondents was 61.9 years, SD ± 15.0. Both genders were represented in the sample, with 38 men (48%) and 42 women (52%).

Sixty-three respondents (49.2%) were nonsmokers. In the past, 49 (38.3%) respondents were smokers, and 16 (12.5%) respondents also smoked during the treatment. In the past respondents had smoked minimally 3 and maximally 80 cigarettes per day, with an average of 19 cigarettes a day. Currently smoking respondents smoked at least 5 and at most 20 cigarettes per day, with a daily average of 7.8 cigarettes.

All respondents were patients with COPD being treated at lung clinics in Bardejov, in the Slovak Republic. The study was conducted between September 2011 and March 2012.

The research data were processed using the method of descriptive statistics, Pearson's correlation coefficient, regression analysis, and the t-test.

We used standardised questionnaires as our research method to assess the quality of life in patients suffering from COPD: the SF-36 quality-of-life questionnaire and the SGRQ questionnaire; we wanted to prove that symptoms affect the quality of life in patients with COPD.

The SF-36 is a multi-purpose, short-form health survey with only 36 questions. It yields an eight-scale profile of functional-health and well-being scores as well as psychometrically-based physical and mental health summary measures and a preference-based health utility index. It is a generic measure, as opposed to one that targets a specific age, disease, or treatment group. Accordingly, the SF-36 has proven useful in surveys of general and specific populations, comparing the relative burden of diseases, and in differentiating the health benefits produced by a wide range of different treatments. Overall physical health clusters the following areas: physical activity, physical activity limitation ("role – physical"), physical pain, and general health assessment. Overall mental health aggregates the following areas: vitality, social activity, limitation by emotional problems ("role – emotional") and mental health. A score ranging from 0 to 100, on which a higher score indicating a more favourable condition can be determined for each dimension (Ware, 2001, 2004).

Saint George's Respiratory Questionnaire (SGRQ) has been designed to measure the quality of life in patients with COPD. The questionnaire consists of two parts. The first part examines symptoms in patients for the last preceding period, and the second part examines the current condition of a patient, his/her activities, and impacts (activities) of the disease. Three components are assessed under this questionnaire. The first component, the symptoms score, shows the frequency and severity of respiratory problems, such as coughing, dyspnoea, the number and severity of spasms. The activity score relates to activities limited by dyspnoea. The score of the impact shows those aspects associated with social functioning and psychological disorder resulting from respiratory disease. The total score is calculated in the last step to sum up the impacts of the disease on the overall health of patients. Each answer is assigned a number ranging from 0 to 100, with 100 being the worst possible health condition and 0 being the best condition. The worst possible score for symptoms is 662.5; for activity 1209.1; for impacts (effects) of the disease 2117.8 and the worst total score is 3989.4 The score is 100 times the "Summed weights from positive items in the questionnaire" divided by the "sum of weights for all items in the questionnaire" (Jones 2009).

RESULTS AND DISCUSSION

Patients with chronic obstructive pulmonary disease have a slightly reduced quality of life in the following dimensions: role – physical, bodily pain, role – emotional and social functioning. In areas such as general health, physical functioning, mental health and vitality, patients rated their quality of life as lower than average (tab.1).

Table 1. *SF-36 – descriptive data*

SF-36 questionnaire dimensions	arithmetic mean	standard deviation (±)
General Health	39.85	21.42
Physical Functioning	44.625	29.23
Role – Physical	80.147	43.09
Bodily Pain	55.687	23.14
Vitality	38.625	19.29
Social Functioning	52.187	30.925
Role – emotional	53.333	44.878
Mental Health	48.40	23.673

In the evaluation of quality of life using the SGRQ, a reduced quality of life was found in all three dimensions: symptoms, activity and impacts (tab. 2).

Table 2.*SGRQ – descriptive data*

SF-36 questionnaire dimensions	arithmetic mean	standard deviation (±)
Symptoms	53.8	20.6
Activity	66.79	18.06
Impacts	53.86	21.18
Total	57.8	22.11

Table 3 shows correlations between quality of life in patients with COPD measured by the SF-36 questionnaire and symptoms dimension from the SGRQ questionnaire, regardless of gender.

A strong correlation was observed between the dimensions "role – emotional" (i.e., limitation by emotional problems) and "symptoms" – $r = -0.709$, ($p<0.005$), as well as between the dimension entitled "role – physical" (i.e., physical activity limitation) and "symptoms" – $r = -0.676$ ($p<0.005$).

Moderate correlations were found between symptoms and bodily pain ($r = -0.586$), vitality ($r = -0.572$), social functioning ($r = -0.435$) and mental health ($r = -0.487$), with $p < 0.005$.

Since the SF-36 questionnaire covers the values from 0 to 100 with a higher score indicating a more favourable condition, we can confirm that individual dimensions such as general health ($r = -0.632$), physical functioning ($r = -0.650$), $p<0.05$, as well as all other individual dimensions, worsened with the increasing symptom score.

The results of regression analysis show that the variables are linearly dependent: *the symptoms do affect the quality of life of patients with COPD* ($p<0.05$).

The absolute value of the correlation coefficient for general health is $r = 0.63$, for physical functioning $r = 0.58$, for role – physical $r = 0.35$, for bodily pain $r = 0.72$, for vitality $r = 0.68$, for social functioning $r = 0.62$, for role – emotional $r = 0.47$ and for mental health $r = 0.68$.

The coefficient of determination $r^2 = 0.53$ shows that 53% of the variability of symptoms is in linear relations with bodily pain, 47% with vitality, and 46% with mental health (see Table 4).

Table 3. *Correlations between COPD symptoms and SF-36 questionnaire dimensions*

SF-36 questionnaire dimensions	Correlation coefficient	Statistical significance
	Symptoms	**p value**
General Health	-0.632	0.000
Physical Functioning	-0.650	0.000
Role – Physical	-0.676	0.000
Bodily Pain	-0.586	0.000
Vitality	-0.572	0.000
Social Functioning	-0.435	0.000
Role – emotional	-0.709	0.000
Mental Health	-0.487	0.000

Table 4. *Regression analysis – the predictor is Symptoms, and the criteria are dimensions of the SF-36 questionnaire*

SF-36 questionnaire dimensions	Multi R	R Square	p value
General Health	0.63	0.39	0.000
Physical Functioning	0.58	0.34	0.000
Role – Physical	0.35	0.12	0.000
Bodily Pain	0.72	0.53	0.000
Vitality	0.68	0.47	0.000
Social Functioning	0.62	0.38	0.000
Role – emotional	0.47	0.22	0.000
Mental Health	0.68	0.46	0.000

Table 5. *Gender differences in SGRQ domains*

SGRQ questionnaire	Gender	N	arithmetic mean	t	p value
Symptoms	Man	38	54.69	0.370	0.712
	Woman	42	52.97		
Activity	Man	38	69.12	0.099	0.275
	Woman	42	64.68		
Impacts	Man	38	57.79	1.147	0.255
	Woman	42	50.31		

For evaluating gender comparisons with SGRQ domains, we processed the results using the statistical t-test for two independent samples.

Table 5 shows the gender comparison with the following domains: symptoms, activity, and impacts. It demonstrates that the value of statistical significance is p > 0.05, so we do not observe a statistically significant difference between the genders. The statistical significance value for symptoms is represented by 0.712, activity by 0.275, and for impacts by 0.255. The standard deviations are also slightly different.

CONCLUSION

The quality of life in patients with COPD may be adversely affected by a number of different signs and airway obstruction symptoms. The presence of symptoms or fear of them in patients with COPD causes the impairment of physical activities or social situations from which they would otherwise have derived pleasure. The results of the SF-36 questionnaire indicated that the health-related quality of life was mostly limited with respect to general health, physical functioning, vitality and mental health. By the worsening of symptoms such as cough and dyspnoea, the patients reported a worsening of the general health, physical functioning, bodily pain, vitality, social functioning and mental health. A strong linear relationship was observed between the symptoms and the dimension entitled role – emotional (i.e., limitation by emotional problems). A survey of patients found that they focus on feeling unwell, their ability to perform everyday activities and on the emotional consequences of the disease. Doctors, on the other hand, focus on physical functions and measuring clinical symptoms. For many people with COPD, experience in caring includes a reactive approach to physical symptoms and acute exacerbations. This often leads to the neglect of psychosocial problems and inappropriate management strategies. It is essential that healthcare professionals understand and address these psychological aspects of the disease so that patients and carriers can be supported to live with their disease.

A limitation of the study was the absence of a control group and the examination of present comorbidities in patients suffering from COPD.

The author(s) declare that they have no conflict of interests.

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KVALITETA ŽIVOTA OSOBA S KRONIČNOM OPSTRUKTIVNOM PLUĆNOM BOLEŠĆU

Sažetak: *Cilj istraživanja bio je utvrditi utjecaj simptoma na individualne dimenzije kvalitete života u bolesnika s kroničnom opstruktivnom plućnom bolešću (KOPB).*

Prisutnost simptoma ili strah od njih kod osoba koje boluju od KOPB-a utječe na njihove fizičke i socijalne aktivnosti. Aktivno suprotstavljanje bolesti umanjuje fizičke, emocionalne i financijske resurse osobe i utječe na pacijentovu sposobnost prevladavanja drugih životnih situacija.

Uzorak ispitanika u ovom istraživanju sastojao se od 80 osoba s KOPB-om, II stupanj po GOLD klasifikaciji. Prosječna dob ispitanika bila je 62.9 godina. Ispitivanje je provedeno primjenom kratke forme Upitnika o kvaliteti života SF-36 te upitnika SGRQ.

Rezultati ispitanika na upitniku SF-36 pokazali su da je uslijed bolesti kvaliteta njihova života bila smanjena – sniženi rezultati bili su prisutni na dimenzijama općeg zdravlja, fizičkog funkcioniranja, vitalnosti i mentalnog zdravlja. S pogoršanjem simptoma bolesti, poput kašlja i dispneje, ispitanici su iskazali pogoršanje u odnosu na sljedeće dimenzije: opće zdravlje, fizičko funkcioniranje, tjelesna bol, vitalnost, socijalno funkcioniranje i mentalno zdravlje. Snažna linearna povezanost pokazala se između simptoma bolesti i ograničenja koja osoba trpi uslijed emocionalnih problema.

Cilj sveobuhvatne terapije KOPB-a trebao bi biti ublažavanje simptoma, sprječavanje gubitka kompetencija, pospješivanje dnevnih aktivnosti i opće poboljšanje kvalitete života osoba koje boluju od ove kronične bolesti.

Ključne riječi: *Kronični opstruktivni bronhitis, kvaliteta života, respiratorna fizioterapija*