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Acceptance of Illness Associates with Better Quality of Life in Patients with Nonmalignant Pulmonary Diseases

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Abstract

Chronic nonmalignant pulmonary diseases impose a heavy burden on patients, generate health-care costs, and contribute to poor health-related quality of life. It has been found that a wide range of factors negatively affects quality of life, but the role of acceptance of illness needs to be further investigated. The aim of the study was to evaluate the relationship between acceptance of illness and quality of life in patients with chronic nonmalignant pulmonary diseases. The study encompassed 200 patients of the mean age 58 ± 16 years who were mainly diagnosed with asthma (n = 72; 36%), COPD (n = 52; 26%), and obstructive sleep apnea (n = 38; 19%). The patients answered the Acceptance of Illness Scale (AIS) and the St. George's Respiratory Questionnaire (SGRQ). Sociodemographical and clinical data were collected. The level of acceptance of illness significantly associated with each of the SGRQ domains. The greater the acceptance of illness, the lowest was the SGRQ score. The mean total score of SGRQ was 44.6 ± 24.9 and that of AIS was 26.1 ± 8.2. Higher AIS scores significantly associated with lower SGRQ scores, i.e., with better quality of life ($p < 0.001$ for each domain). We conclude that in patients with chronic nonmalignant pulmonary diseases, acceptance of illness plays an important role and is closely related to the general level of quality of life. Interventions aimed at improving acceptance of illness may be considered to improve quality of life.

Keywords

Acceptance of illness · Asthma · Obstructive sleep apnea · Pulmonary diseases · Quality of life

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1 Introduction

Chronic nonmalignant pulmonary diseases impose a heavy burden on patients, their caregivers, and the health-care system in terms of their impact on

the economic condition and quality of life (Lewis et al. 2016). The review performed by Bahadori et al. (2009) showed that asthma is associated with high health-care costs which include hospitalizations and medications as well as work and school loss. Similar to asthma, severe stages of chronic obstructive pulmonary disease (COPD) generate high costs due to hospitalizations and medications, while a mild stage of COPD is associated with productivity loss due to sick leave and early retirement (Jansson et al. 2013). Tarasiuk and Reuveni (2013) reported that obstructive sleep apnea is associated with increased medical costs as well. Further, the sickest tertile of patients consume 65–82% of all medical expenses. Increased medical costs in chronic pulmonary diseases limit patient employability and substantially worsen their financial condition. Economic consequences of the disease along with pulmonary symptoms impair the health state and translate into poor health-related quality of life (Srivastava et al. 2015).

The assessment of health-related quality of life is important for patients with chronic pulmonary diseases as poor quality of life is associated with poor outcomes (Wang and Bourbeau 2005; Domingo-Salvany et al. 2002). Literature reports confirm that there is a wide range of factors that negatively affect quality of life. They include smoking, quality of inhaled air, increased body weight, exacerbations and hospitalizations, advanced stage of the disease, older age, and comorbidities, e.g., cardiovascular diseases, depression, anxiety, or upper respiratory tract infections (Nakao et al. 2018; Sundh et al. 2017; Yoo et al. 2016). Factors that increase quality of life include higher education, knowledge about self-management of exacerbations, health-promoting physical activity, and better symptom control (Uchmanowicz et al. 2016; Gonzalez-Barcala et al. 2012). The relationship between the acceptance of illness and quality of life has not been established, although some studies address this problem among patients suffering from other than chronic pulmonary diseases. Therefore, the aim of this study was to evaluate the level of acceptance of illness and quality of life in patients with nonmalignant pulmonary diseases and to determine the relationship between the acceptance of illness and quality of life in this group of patients.

2 Methods

Two hundred patients were enrolled into the study. All the patients underwent treatment for a chronic pulmonary disease between January 2017 and October 2017 at the Department of Pulmonology and Lung Cancer of Wroclaw Medical University in Wroclaw, Poland. They were asked to fill out the Acceptance of Illness Scale (AIL), in the Polish adaptation by Jurczyński (2009), and the St. George's Respiratory Questionnaire (SGRQ). The sociodemographical and clinical data also were collected. The AIS instrument assesses limitations caused by the illness, lack of independence, self-perceived feeling of being dependent on others, and changes in self-esteem (Felton et al. 2001; Felton and Revenson 1984). Overall, the scale assesses the degree of acceptance of illness, with the higher score pointing to better acceptance. The scale contains eight statements followed by a 5-choice Likert-type rating. The respondent indicates the level of agreement in the following way, 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, and 5 = strongly disagree, with a sum ranging from 8 to 40 points. A score of $\leq$18 denotes the lack of illness acceptance, and $\geq$ 30 denotes a high level of illness acceptance. The Polish version of AIS has a high Cronbach's reliability of $\alpha = 0.82$ (Rogon et al. 2017).

The SGRQ questionnaire is a self-administered, disease-specific instrument, commonly used for the evaluation of quality of life, including overall health, daily life, and perceived well-being of patients with obstructive airway diseases (Jones et al. 1991). There are 50 items divided into three components (symptoms, 8 items; activity, 16 items; and impacts, 26 items), which are scored separately. Scores range from 0 (no impairment) to 100 (maximum impairment) (Jones et al. 1992). The questionnaire validation performed for the British patients with bronchiectasis shows a high intra-class correlation for the short-term

repeatability. The correlation coefficients are 0.93 for the symptoms, 0.98 for the activity, 0.94 for the impacts, and 0.97 for the total score. Cronbach's reliability is $\alpha = 0.90$ for the symptoms, 0.89 for the activity, and 0.92 for the impacts (Wilson et al. 1997). The SGRQ has also been validated among the Polish patients with bronchial asthma, with Cronbach's reliability of $\alpha = 0.75$ for the total score and all subscale scores (Kuzniar et al. 1999).

Quantitative data from questionnaires were expressed as means ±SD and range and medians and interquartile range (IQR). Categorical data were expressed in counts and percentages. Data distribution was checked with the Shapiro-Wilk test. Spearman's rank correlation coefficient was used to assess the correlation between the domains of health status and the illness acceptance. The R free software v3.4.2 was used for all analyses.

Table 1 Characteristics of the patients investigated ($n = 200$)

Variable		*n*	%
Gender	Men	102	51.0
	Women	93	46.5
	Missing data	5	2.5
Place of residence	City	123	61.5
	Rural area	75	37.5
	Missing data	2	1.0
Education	Primary	33	16.5
	Vocational	52	26.0
	Secondary	56	28.0
	University	59	29.5
Work activity	Employed	77	38.5
	Unemployed	19	9.5
	Pensioner	102	51.0
	Missing data	2	1.0
Smoking status	Current smokers	55	27.5
	Never-smokers	69	34.5
	Past smokers	76	38.0

3 Results

The analysis was based on questionnaires collected from all 200 patients of the mean age of 58 ± 16. The patients' diagnoses were chronic obstructive or restrictive airway diseases, including asthma (n = 72; 36%), COPD ($n = 52$; 26%), and obstructive sleep apnea ($n = 38$; 19%). Pneumonia or bronchitis of various etiologies was diagnosed in 17 (8.5%) patients. Additionally, there were patients with obstructive pulmonary symptoms in the course of treatment of a cancer disease ($n = 10$; 5%), interstitial lung disease ($n = 6$; 3%), and bronchiectasis ($n = 5$; 2.5%). The majority of the patients lived in the urban area and were employed. Only did about one-third of the patients belong to never-smokers. The characteristics of the study population are summarized in Table 1.

The mean score of AIS was 26.1 ± 8.0 and that of SGRQ was 44.6 ± 24.9 (Table 2). The level of illness acceptance associated significantly with each SGRQ domain. The greater the acceptance, the lower was the SGRQ score, i.e., the better quality of life. The strongest association occurred between the level of illness acceptance, on the one side, and the overall SGRQ score and the impact on life quality score, on the other side. Coefficients of the relationships are shown in Table 3.

4 Discussion

In the present study performed in patients with chronic pulmonary diseases, the overall quality of life measured with a disease-specific questionnaire is low. Patients scored an average of 44 out of the 100 points possible. The level of illness acceptance was moderate, an average of 26 out of the 40 points. We also found a significant association between the level of illness acceptance and quality of life, indicating that the acceptance of illness plays a key role in maintaining a reasonable quality of life, and as such, the level of illness acceptance may contribute to medical outcome.

It has been shown that patients with chronic diseases have reduced or moderate acceptance of illness. A study of Kupcewicz and Abramowicz (2015), which encompassed patients with COPD, has identified the following determinants of illness acceptance: the presence of comorbidities, time from the diagnosis, gender, age, hospitalization rate, and social and work status. Another

Table 2 Results of the St. George's respiratory questionnaire and the acceptance of illness scale

scale	n	mean ± sd	range	median	IQR
AIS	200	26.1 ± 8.2	8.0–40.0	27.0	19.8–32.0
SGRQ					
Total score	198	44.6 ± 24.9	0–96.5	41.8	26.3–61.8
Symptoms	198	53.0 ± 25.3	0–97.6	54.9	34.7–73.3
Activity	200	51.8 ± 29.4	0–100.0	53.5	29.6–72.8
Impacts	200	37.7 ± 25.9	0–95.8	34.9	17.5–57.2

SGRQ St. George's Respiratory Questionnaire, *AIS* Acceptance of Illness Scale, *IQR* interquartile range

Table 3 Associations between the scores of Acceptance of Illness Questionnaire and St. George's Respiratory Questionnaire domains

	SGRQ			
AIS	Total score	Symptoms	Activity	Impact
	−0.708∗	−0.549∗	−0.646∗	−0.712∗

SGRQ St. George's Respiratory Questionnaire, *AIS* Acceptance of Illness Scale; $*p < 0.001$

study comparing patients with diabetes reveals that illness acceptance worsens over time, possibly with disease progression (Rogon et al. 2017). In that study, no gender-related difference in illness acceptance has been noticed in patients up to 65 years of age. The lack of illness acceptance is reported by 54.1% and 54.5% of men and women, respectively, but the number of patients who cannot accept the disease increases over time considerably. The peak increases, however, differ. They amount to 14.7% for men and to 33.7% in women, the latter being significant ($p < 0.05$).

The association between illness acceptance and quality of life has been evaluated in a few studies among patients with other chronic diseases which pose a significant burden on patients. Denys et al. (2015) have examined a group of 105 patients with osteoarthritis of the hip and knee. They find that a higher level of quality of life, as measured with SF-36 questionnaire, associates with a greater illness acceptance. Additionally, quality of life is higher in patients who have a better pain control. Riedl et al. (2015) have investigated quality of life in patients with a different degree of acceptance of chronic tinnitus. That study shows that patients with moderate-to-high acceptance of tinnitus have significantly higher quality of life and lower psychological distress than those with low-to-mild acceptance of tinnitus. Another study in 111 patients of the stoma clinic performed by Zhang et al. (2013) has revealed similar associations. In patients who had undergone colostomy at least 1 month before answering questionnaires, general health and quality of life were significantly associated with the acceptance of disability and all of its dimensions. In yet another study conducted by Obieglo et al. (2016) in a group of 100 patients with chronic heart failure, illness acceptance is an independent predictor of quality of life as measured with the Nottingham Health Profile. The authors conclude that greater acceptance of the diagnosis of chronic heart failure is associated with greater quality of life.

Only have a few studies addressed the population of patients with pulmonary diseases which seems to be insufficient to confirm the association between quality of life and acceptance of illness in general. Jankowska-Polanska et al. (2016) have investigated the effect of illness acceptance on quality of life in 105 patients with COPD. The authors show that in patients who scored ≥29 points on the Acceptance of Illness Scale, they have a significantly higher general level of quality of life and all of its domains. The study carried out by Polanski et al. (2018) in 257 patients with lung cancer shows that the diagnosis of small cell lung cancer is associated with a lower level of quality of life and illness acceptance in comparison to non-small cell lung cancer. It is worth noting that health status of patients with small-cell lung cancer is significantly worse than that of patients with non-small cell lung cancer. The results of the present study are in line with those previous reports that included patients with lung

diseases as well as with other chronic diseases. We confirmed the presence of an association between quality of life and illness acceptance.

In previous studies, it has been shown that the determinants of quality of life and illness acceptance also include the severity of symptoms, disease progression, psychological distress, and the type of disease (Polanski et al. 2018; Denys et al. 2015; Riedl et al. 2015). Therefore, an inherent aptitude concerning the disease control, which involves the education of patients on how to cope with exacerbations or how to properly use medications and devices such as inhalers, can help improve the patients' quality of live (Uchmanowicz et al. 2016; Virchow et al. 2015).

In conclusion, in patients with chronic pulmonary diseases, acceptance of illness plays an important role and is closely related to the general level of quality of life. Interventions aimed at improving acceptance of illness may be considered as also improving quality of life. The ability to exercise control over disease symptoms helps improve both acceptance of illness and quality of life.

Conflicts of Interests The authors declared no conflicts of interest in relation to this article.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the Bioethics Committee of Wroclaw Medical University in Poland (permit 32/2017).

Informed Consent Written informed consent was obtained from all individual participants included in the study.

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