Relationships between Self-efficacy, Depression, Anxiety and Quality of Life among Patients with Chronic Obstructive Pulmonary Disease*

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Abstract

Purpose: To examine the relationships between self-efficacy, depression, anxiety, and quality of life (QOL) in patients with Chronic Obstructive Pulmonary Disease (COPD).

Design: Descriptive correlational design.

Methods: Sample was 115 COPD patients who were treated at Hai Duong General Hospital, Hai Duong City, Vietnam. Data were collected with 5 questionnaires including demographic data, COPD Self-efficacy Scale (CSES), patient health questionnaire 9 (PHQ-9) to measure depression, generalized anxiety disorder 7-item (GAD-7), and a clinical COPD questionnaire (CCQ) to measure quality of life. Data were analyzed using descriptive statistics and Spearman's Rho correlation.

Main findings: The findings revealed self-efficacy was positively correlated with quality of life ($r_s = .586$, $p < .05$). Depression and anxiety were negatively correlated quality of life ($r_s = -.279$, and $-.506$, $p < .05$).

Conclusion and recommendations: The results showed that self-efficacy significantly increased QOL, but depression and anxiety significantly reduced QOL among COPD patients. Therefore, nurses should consider to create pulmonary rehabilitation program using these variables to improve QOL in COPD patients.

Keywords: COPD, quality of life, self-efficacy, depression, anxiety

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ความสัมพันธ์ระหว่างสมรรถนะแห่งตน ภาวะซึมเศร้า ความวิตกกังวล และคุณภาพชีวิตในผู้ป่วยโรคปอดอุดกั้นเรื้อรัง*

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บทคัดย่อ

วัตถุประสงค์: ศึกษาความสัมพันธ์ระหว่างสมรรถนะแห่งตน ภาวะซึมเศร้า ความวิตกกังวล และคุณภาพชีวิตในผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

รูปแบบการวิจัย: การศึกษาเชิงพรรณนาความสัมพันธ์

วิธีดำเนินการวิจัย: กลุ่มตัวอย่างจำนวน 115 คนที่เป็นโรค COPD ที่มารับการรักษาที่โรงพยาบาล ไห เดือง จังหวัดไหเดือง ประเทศเวียดนาม เก็บรวบรวมโดยใช้แบบสอบถาม 5 ชุด ได้แก่ แบบสอบถามส่วนบุคล สมรรถนะแห่งตนของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง PHQ-9 เพื่อวัดภาวะซึมเศร้า แบบวัดความวิตกกังวลทั่วไป 7 รายการ (GAD-7) และแบบสอบ Clinical COPD Questionnaire (CCQ) เพื่อวัดคุณภาพชีวิต วิเคราะห์ โดยใช้สถิติเชิงบรรยายและวิเคราะห์ความสัมพันธ์โดยใช้สถิติ Spearman's Rho

ผลการศึกษา: ผลการวิจัยพบว่า การรับรู้สมรรถนะแห่งตนมีความสัมพันธ์ทางบวกกับคุณภาพชีวิต (r_s = .586, $p < .05$) ภาวะซึมเศร้าและความวิตกกังวลมีความสัมพันธ์ในทางลบกับคุณภาพชีวิต (r_s = - .279, และ - .506, $p < .05$)

สรุปและข้อเสนอแนะ: ผลการศึกษาแสดงให้เห็นว่า การรับรู้สมรรถนะในตนเองมีผลต่อการเพิ่มคุณภาพชีวิต แต่ในทางกลับกันภาวะซึมเศร้าและความวิตกกังวลทำให้คุณภาพชีวิตลดลง ดังนั้นพยาบาลควรพิจารณาสร้างโปรแกรมการฟื้นฟูสมรรถภาพปอด โดยคำนึงถึงตัวแปรเหล่านี้ เพื่อปรับปรุงคุณภาพชีวิตในผู้ป่วยโรคปอดอุดกั้นเรื้อรังให้ดีขึ้น

คำสำคัญ: โรคปอดอุดกั้นเรื้อรัง คุณภาพชีวิต สมรรถนะแห่งตน ภาวะซึมเศร้า ความวิตกกังวล

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Background and Significance

Chronic Obstructive Pulmonary Disease (COPD) is a common preventable and treatable disease characterized by persistent airflow limitation with exacerbations and co-morbidities contributing to overall severity of respiratory function in patients.[1]

Globally, 80 million people suffered from moderate to severe COPD with estimation of 100,000 deaths and 550,000 hospitalizations annually. COPD was the fifth leading cause of death in 2001 and has been predicted become the third leading cause of death by 2020.[2] Vijayan indicated that the prevalence of COPD differed between countries and genders. In 12 Asian countries, the prevalence of COPD was 6.3% of people over 30 years old suffering from moderate to severe COPD. In Vietnam, 6.7% of people over 30 years of age had COPD and it was the third leading cause of death and remained a major burden for the healthcare system. Lam et al. found the incidence of COPD in northern Vietnam was around 7.1%.[3-5]

Patients with COPD have to face with many chronic symptoms such as dyspnea, cough, sputum overproduction, and respiratory infections. As the disease became worse, patients will experience more fatigue, decrease appetite, and loose weight.[2] Some COPD patients feel sad and get depressed. These symptoms vary day to day and different part of the day resulted in limitation of daily living activities which will affect quality of life (QOL).[6,7] Furthermore, QOL among COPD patients is also affected by a variety of factors such as age, gender, depression, anxiety, Body Mass Index (BMI), forced expiratory volume (FEV1), self-efficacy, exercise capacity, and severity of COPD.[8]

Self-efficacy is concerned with people's beliefs in their ability to perform given attainments. A study in Korea found that nearly 40% of COPD patients belonged to the low self-efficacy group.[9] In another study by Andenæs et al.[10], self-efficacy was indicated as an important factor in predicting QOL. Patients with higher self-efficacy had significantly increased physical activity, health status, and QOL. Higher self-efficacy also decreased the psychosocial impact of the disease ($p < .05$) and should be considered in pulmonary rehabilitation.[10,11]

Depression and anxiety are common and important symptoms among patients with COPD.[12] A systematic review and meta-analysis revealed that depression was the strongest factor associated with disease-specific quality of life or health status in patients with COPD.[8] Patients who had depression and anxiety will perceive their health worsen than the general population.[13] Depression and anxiety symptoms not only impact a person's lung disease but also influence decision-making of people with end-stage disease and may have negative impact on partners and their relationships.[6,14]

The health-related quality of life model was used as the conceptual framework for this study. The theory consists of five concepts, including biological variables, symptom status, functional status, general health perceptions, and overall QOL.[15] The four concepts (biological variables, functional status, symptom status, and general health perceptions) that constitute HRQOL are organized along a causal pathway. Each concept is affected by the previous outcome, as well as individual, and environmental characteristics, except biological variables. The model also suggests that individual characteristics affect symptom status, functional status, general health perceptions, and QOL. According to this theory, QOL is the main outcome, while depression and anxiety belong to symptom status, and self-efficacy belongs to individual characteristics affecting QOL. Evidence from the review supported that there are various factors associated with QOL among patients with COPD, namely, self-efficacy, depression, and anxiety in COPD patients. The health-related quality of life theory can describe the relationships among the studied variables. It is expected that the results from this study can be utilized by nurses and other related health care

professionals to improve QOL among patients suffering with COPD.

Objective

The purpose of this study was to examine the correlations between self-efficacy, depression, anxiety, and QOL in COPD patients.

Hypotheses

1. Self-efficacy was positively correlated to QOL in COPD patients.

2. Depression and anxiety were negatively correlated to QOL in COPD patients.

Methodology

A descriptive correlational research design.

Population and Sample

Population included male and female patients, who had been diagnosed with COPD and treated at the Respiratory Department, Hai Duong General Hospital, Vietnam, during 1 August to 30 October 2016.

Sample was selected with inclusion criteria: 1) aged 18 years and older, 2) was able to communicate in Vietnamese language; patients with critical illnesses and respiratory failure were excluded.

Sample size was calculated based on G*Power analysis with the level of significance .05; power of test .9; and the effect size from moderate correlation (r = .3). The calculated sample size for correlation was 109 subjects[16], plus 5% attrition rate made the total sample to 115 subjects.

Research Instruments

Five questionnaires were used to collect data as follows:

1. Demographic data and health information included age, weight, height, marital status, education level, health information, and behavior of patients.

2. COPD Self-Efficacy Scale (CSES). The CSES was used to access the level of confidence of patients with COPD in avoiding or managing breathing difficulty in certain situations. The CSES contains 34 items divided into five factors (negative effect, intense emotional arousal, physical exertion, weather and environment, and behavioral risk factors). The CSES items were rated on 5 points Likert scale from 5 = very confident, to 1 = not at all confident. Higher scores indicated higher confidence in managing and controlling dyspnea.[17] The CSES had excellent internal consistency (Cronbach's alpha = .95), and accepted test-retest reliability (.77).

3. Generalized Anxiety Disorder 7-item (GAD-7). The Generalized Anxiety Disorder Scale was developed for screening generalized anxiety disorder according to DSM-IV diagnosis, but also functioned in screening for any anxiety disorder. The scores of all 7 items ranged from 0 (not at all) to 3 (nearly every day). The total possible score ranged from 0-21 and was categorized into the following four severity groups: minimal/no anxiety (0-4), mild (5-9), moderate (10-14), or severe (15-21).[18] The reliability of the GAD-7 was .94.

4. Patient Health Questionnaire-9 (PHQ-9).[19] The PHQ-9 was a self-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD). The PHQ-9 was a subscale of the PHQ and has proven to be a reliable and valid instrument for screening depression. The PHQ-9 includes 9 items, each item scored from 0 (not at all) to 3 (nearly every day). The total score ranged from 0 to 27 and were categorized into five groups: minimal/no depression (0-4), mild (5-9), moderate (10-14), moderate severe (15-19), and severe (20-27).[9] The internal consistency reliability, Cronbach's alpha was .89.

5. Clinical COPD Questionnaire score (CCQ).[20] The CCQ was used to measure quality of life (QOL), it contained 10 questions divided into three domains: 1) symptoms, 2) mental state, and 3) functional status. Observed symptoms were dyspnea, cough, and phlegm; mental state included questions about feeling depressed and concerning about breathing; and functional state described limitations in different activities of daily life (ADL) due to lung disease. The questions were applied to the previous week and

used a seven-point Likert scale ranged from 0 (very good health status) to 6 (extremely poor health status). Patients with higher score indicated lower health status.[20] CCQ score was divided into four groups: 1) < 1 was considered acceptable, 2) ≥ 1 but < 2 was acceptable only in patients with COPD at Stage 3 or 4; 3) ≥ 2 but < 3 was considered unstable and 4) ≥ 3 was indicative of very unstable health status.[21]

All questionnaires received permission to translate into Vietnamese language with back translation technique. The content validity was reviewed and approved by five experts. The reliability of all Vietnamese versions was test with 30 subjects who had similar inclusion criteria with the studied subjects. The Cronbach's alpha was .849 for CSES, .835 for PHQ-9, .816 for GAD-7, and .814 for CCQ, respectively.

Protection Right of Human Subjects

This study obtained ethical approval from the IRB of the Faculty of Nursing, Mahidol University (COA No.IRB-NS2016/356.0205), and the IRB of the School of Medicine and Pharmacy, Vietnam National University. Data collection process was followed the standard process suggested by the IRB. Human rights of research subjects were protected in terms of independent to make decision for participation after fully informed, confidentiality, and anonymity.

Data Collection Process

1. After receiving permission to collect data from Hai Duong General Hospital; two research assistants recruited subjects to participate in the study according to inclusion criteria. Once they agree to participate, the research assistants asked them to sign consent forms.

2. The researcher arranged a private room to interview the subjects, or let the subjects completed 5 questionnaires by themselves. Total time required for completing the questionnaires was approximately 30-45 minutes. The demographic data were collected from medical records.

Data Analysis

Data were analyzed using the computer statistical package with the significance level .05.

1. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the general characteristics and medical data of the subjects.

2. For study variables, the score of self-efficacy, anxiety, and depression were tested for normal distribution to support assumption of Pearson Product Moment Correlation and they were not normal distributed. Therefore, the Spearman's Rho correlation was used to investigate the relationships between self-efficacy, depression, anxiety, and QOL.

Findings

The findings showed demographic data of the subjects as follows: 79.13% were males; age ranged from 33-92 years with the mean of 69.57 (SD = 10.89); 93.91% were couple; mostly finished secondary school and high school (31.30% and 44.35%), and only 9.57% graduated with bachelor's degree; 72.17% were retired, while 22.61% were farmer; 56.62% had income 101-200 USD and only 3.48 % had income more than 300 USD per month.

Regarding health information of the subjects: 100% used health insurance; 66.96% were ex-smokers; body mass index (BMI) ranged from 11.7 to 27.1 with a mean of 18.56 (SD = 3.05); 54.78% were mild to severe underweight; 3.48% were overweight; 50.43% had co-morbidities in which the commonly encountered diseases were hypertension, heart disease and gastric disease (20%, 12.17% and 14.78%); 73.04% came to hospital with symptoms of cough and dyspnea; 71.30% had been treated for COPD from 1-5 years.

Self-efficacy, depression, anxiety, and QOL

The score of COPD self-efficacy scale ranged from 86 to 117 with a mean of 102.39 (SD = 7.12), indicated that the level of self-efficacy among patients with COPD in this study was moderate.

Anxiety was measured by the Generalized Anxiety Disorder 7-item (GAD-7); the score of GAD-7 ranged from 7 to 16 with a mean of 9.94 (SD = 1.74); 50.43% of subjects had mild anxiety,

47.83% had moderate anxiety, and only 1.74% had severe anxiety.

Depression was measured by the Patient Health Questionnaire-9 (PHQ-9); the score of the PHQ-9 ranged from 6 to 20 with a mean of 11.29 (SD = 2.0); the majority of subjects had moderate depression (79.13%) and only 0.87 % had severe depression.

QOL was measured by the Clinical COPD Questionnaire score (CCQ): the CCQ score ranged from 20 to 39 with a mean of 32.36 (SD = 3.58); 20% of the subjects had score ≥ 2 - < 3, which meant that health status was unstable; 80% of the subjects had score ≥ 3, which meant health status was very unstable and led to very low QOL.

Correlations between self-efficacy, depression, anxiety, and QOL

Hypotheses testing

1. Self-efficacy was positively correlated to QOL in COPD patients. The findings revealed that there was a positive correlation between self-efficacy and QOL (r_s = .586, p < .05); which supported the proposed hypothesis.

2. Depression and anxiety were negatively correlated to QOL in COPD patients. The findings revealed that depression and anxiety were negatively related to QOL (r_s = - .279, - .506, p < .05); which also supported the proposed hypothesis. (Table 1)

Table 1: Correlations between self-efficacy, depression, anxiety, and QOL

Variables	1	2	3	4
1. QOL	1.00			
2. Anxiety	- .506*	1.00		
3. Depression	- .279*	.377*	1.00	
4. Self-efficacy	.586*	- .375*	- .298*	1.00

* p < .05, Spearman's Rho Correlation

Discussion

Hypotheses 1: Self-efficacy was positively correlated to QOL in COPD patients.

The findings supported hypothesis 1; subjects with high level of self-efficacy had better QOL. This finding was consistent with previous studies[11,22] which also found the positive correlation between self-efficacy and QOL. Self-efficacy was personals' confidence in their capacity to control and cope with unpleasant symptoms from COPD resulted in reducing physiological and physical impact which finally led to better QOL. However, the mean score of self-efficacy of subjects in this study was moderate level and the mean score of CCQ was in the level of very unstable health status led to low level of QOL. This might be able to explain that more than half of subjects (54.78%) were underweight in some degrees; and 50.43% had co-morbidities with hypertension, heart disease, etc.; which led them to have low QOL; although they have moderate level of self-efficacy.

Hypotheses 2: Depression and anxiety were negatively correlated to QOL in COPD patients.

The findings supported hypothesis 2; depression was negatively correlated with QOL among patients with COPD in this study (p < .05). This meant that patients with high level of depression would have poor QOL. This finding was consistent with the study of Channareddy, Ravula and Kumar,[23] and Andenaes et al.[24]; which indicated that depression had significant correlation with QOL at baseline and after 6 and 9 months' follow-up. QOL was significantly low in people suffering from depression; and patients with severe depression had poorer QOL than patients with moderate and mild depression.[23,25]

Anxiety was also negatively correlated with QOL ($p < .05$). This meant that COPD patients with high level of anxiety would have poor QOL. This finding was consistent with previous studies which found that respiratory symptoms, physical condition, social functional status, and impairment of QOL were significantly correlated with anxiety ($p < .01$). COPD patients and caregivers with high level of depression and anxiety would have poor QOL. The QOL of COPD patients were lower than the general population.[25,26]

The findings from this study supported the hypotheses and were consistent with the HRQOL theory in that self-efficacy, depression, and anxiety influenced patients' health perception and QOL. Self-efficacy in COPD patients reflected patients' ability to avoid or manage dyspnea in certain situations such as physical exertion, weather, and environment, etc. In addition, self-efficacy was negatively correlated with depression ($r_s = - .298$, $p < .05$) and anxiety ($r_s = - .375$, $p < .05$); which meant that patients who have high level of self-efficacy would have low level of depression and anxiety. Therefore, nurses should aware the important of promoting self-efficacy in COPD patients to alleviate depression and anxiety, which will result in improving their QOL.

Conclusion including Implications

The results of this study found that self-efficacy, depression, and anxiety moderately influenced QOL among COPD patients. Nurses should provide routine assessments of patients' anxiety and depression by using the GAD-7 and PHQ-9 during patients' follow-up visit to identify level of anxiety and depression. Patients who have anxiety or depression need to be referred to specialist practitioners for proper management. In addition, nurses should assess patients' health status by using the CCQ and self-efficacy by using the CESE during patients' follow-up, which is important in arranging education programs to improve health status and patients' self-efficacy.

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