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Associations between symptoms, functioning, and perceptions of mastery with global self-rated health in patients with COPD: A cross-sectional study

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Abstract

Background—Self-rated health has been shown to be a significant predictor of mortality. However, there is limited knowledge on what factors contribute to the global perception of self-rated health in patients with chronic obstructive pulmonary disease (COPD).

Objective—To describe the associations between physical and psychological symptoms, physical and mental health functioning, and perceptions of mastery with concurrent and longitudinal global self-rated health in patients with COPD and to determine if gender modifies these relationships.

Design—Cross-sectional analysis of data from a longitudinal clinical trial

Setting—University medical center in the United States

Participants—115 patients with moderate to severe COPD

Methods—Global self-rated health was measured using one question from the Medical Outcomes Study, SF-36 which states “In general, would you say your health is: excellent, very good, good, fair, or poor”. Physical and psychological symptoms were measured with the Shortness of Breath Questionnaire, Chronic Respiratory Questionnaire (CRQ), and Center for Epidemiologic Studies Depression Scale (CESD); the SF-36 was used to measure physical and mental health functioning;

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HQN participated in the design and implementation of the study, conducted the data analyses, drafted, and revised the manuscript
DDC participated in the drafting and revision of the manuscript

GCK conceived of the original study, participated in its design and implementation, drafted and revised the manuscript

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Competing interests:

The authors declare that they have no competing interests

mastery was measured by a sub-scale of the CRQ. The BODE Index, a multidimensional disease severity grading system was also included. Stepwise logistic regression analyses were performed.

Results—In cross-sectional analyses, only disease severity as measured by the BODE Index was associated with GSRH [Odds Ratio, 1.52; 95% confidence interval, CI (1.08, 2.15)]. Stratified analyses by gender showed that the association between the BODE index and GSRH held up for men, but not for women. Higher perception of symptom control was associated with positive health ratings in women. Subjects with less fatigue at baseline had a lower risk of reporting poor health 12 months later, [OR 0.84; 95%CI (0.72, 0.98)].

Conclusions—For patients with COPD, ratings of global health were mostly influenced by measures that reflect their physical state, e.g. disease severity and fatigue. While additional work is needed to better understand gender differences in factors that contribute to GSRH, therapeutic nursing interventions might place greater focus on symptom management if the goal is to improve patients' perceptions of their global health.

Keywords

Global self-rated health; perceived health; health related quality of life; COPD; symptoms

What is known about the topic?

- Ratings of global health are associated with mortality in diverse clinical and community populations
- Global self-rated health is one dimension of the overall assessment of health related quality of life

What this paper adds:

- Ratings of global health for patients with COPD were mostly influenced by their disease severity and level of fatigue
- Depressed mood was not associated with ratings of global health
- There are potential gender differences in the factors that shape ratings of global health suggesting that interventions to improve overall perceived health may need to be gender-tailored

Introduction

A simple, single item self-report of global health has been found to be an independent predictor of mortality in a number of epidemiological studies with diverse international community samples. People who report poor health have two to three times the risk of dying compared to those who report good or better health (Idler & Benyamini, 1997). This association persists even with multivariate adjustments for potential confounders such as major medical, behavioral, and psychological risk factors (Idler & Benyamini, 1997; Idler & Kasl, 1991; Idler, Kasl, & Lemke, 1990; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982; Wolinsky & Johnson, 1992). Patients with coronary disease with poor global health ratings have almost four times the risk of coronary-related mortality compared to those with good health ratings even after controlling for other relevant factors (Bosworth et al., 1999). The prognostic power of global self-rated health (GSRH) has also been reported in patients with various cancers (Osoba, 1999; Shadbolt, Barresi, & Craft, 2002) and a large primary care clinical population (DeSalvo, Fan, McDonnell, & Fihn, 2005).

Given the consistent relationship between GSRH and mortality, we reasoned that it is important to identify potentially modifiable factors that shape individual perceptions of global health. Although health related quality of life (HRQL) has been studied extensively in patients with chronic obstructive pulmonary disease (COPD), little attention has been given to examining the associations between clinically relevant and possibly, modifiable patient-reported outcomes and this single question about GSRH. Patients with COPD experience a high symptomatic burden and functional disability compared to other chronic conditions (Rennard et al., 2002; Walke, Gallo, Tinetti, & Fried, 2004). With the exception of smoking cessation, current medical therapies do not modify the progression of COPD and offer only partial symptomatic relief to patients. Thus, the personal, social, and economic impact of COPD is considerable (Global Initiative for Chronic Obstructive Lung Disease (GOLD), 2006; Sullivan, Ramsey, & Lee, 2000). It is projected that within the next decade, COPD will replace stroke as the third cause of death in the US and in 2000, the death rate for women surpassed that of men (Jemal, Ward, Hao, & Thun, 2005). Unlike many leading causes of death and disability, COPD is projected to increase in much of the world as smoking prevalence rises and the population ages (GOLD, 2006). Given the projected international burden of COPD in the coming decades and the limited medical therapies available to patients, it is imperative that nurses participate in developing the knowledge and evidence base to better support patients in their day-to-day management of the illness and overall health. A greater understanding of the factors that influence patients' global perceptions of health may help nurses to more effectively design and tailor nursing interventions to specific patient needs.

Purpose

The goal of this paper is to describe the extent to which physical and psychological symptoms, physical and mental functioning, and perceptions of mastery contribute to concurrent and longitudinal global self-rated health in patients with COPD and to determine if gender modifies these relationships.

Methods

The data used for this paper are from a randomized clinical trial (RCT) comparing three treatments for dyspnea self-management in patients with COPD and were obtained from 1995 to 2000. The methods have been reported in-depth elsewhere (Carrieri-Kohlman et al., 2005; Stulbarg et al., 2002) and are therefore described briefly in this paper. Baseline (n=115) and 12 month (n=94) data from subjects with moderate to severe COPD were included in this analysis. The study protocol was approved by the institutional committee on human research and each patient gave informed written consent.

Subjects

Subjects with stable disease were recruited through advertisements and referrals from numerous sources, including physicians' offices, general medicine and chest clinics at a university medical center, and Better Breathers support groups of the American Lung Association. Entry criteria included the following: age ≥ 40 , confirmation of diagnosis of moderate to severe COPD (i.e., forced expired volume in one second [FEV₁] < 60% of predicted or ratio of FEV₁ to forced vital capacity [FVC] FEV₁/FVC < 60%) with clinical stability for at least one month, no participation in any formal exercise training or pulmonary rehabilitation for at least one year, absence of other active symptomatic diseases which would interfere with exercise and ability to complete exercise tests.

Procedures

Baseline evaluation was performed on three days within two weeks. During the first visit, subjects performed screening spirometry and up to three six-minute walk tests (6MW). They also, completed a battery of questionnaires about their physical and psychological symptoms, physical and mental health functioning, and perception of mastery of their COPD. Subjects who met the clinical and pulmonary function criteria returned to undergo measurement of lung volumes and diffusing capacity as well as additional exercise testing. Subjects were then randomly assigned to one of three 12-month interventions, Dyspnea Self-Management Program (DSMP), DSMP + Exposure, or DSMP + Training. The basic DSMP included three components: individual education and demonstration of dyspnea self-management strategies, a tailored home walking prescription, and exercise self-monitoring using a pedometer and exercise log. DSMP + Exposure subjects received the DSMP and a total of 4 nurse-supervised treadmill exercise sessions, once every other week for 2 months. The goal of the exercise sessions was steady state symptom-limited exercise consisting of continuous walking for as long as 30 minutes at a level equivalent to the workload that subjects were tested at during the endurance treadmill test. DSMP + Training subjects received the DSMP and 24 nurse-supervised treadmill exercise sessions 3 times per week over 2 months. The exercise sessions were identical to those received by the DSMP + Exposure. Subjects returned to the medical center for testing again at 12 months and repeated the same testing procedures (spirometry, questionnaires, and six minute walk tests) as baseline.

Measurements

Global Self-Rated Health—(GSRH) was measured using one question from the Medical Outcomes Study Short-Form 36 (SF-36) instrument. The question asks respondents: “In general, would you say your health is: excellent, very good, good, fair, or poor”. The SF-36 is a valid and reliable measure of HRQL in both general and specific medical populations, including patients with COPD (Mahler & Mackowiak, 1995; Ware & Sherbourne, 1992).

Physical Symptoms—The Shortness of Breath Questionnaire (SOBQ) was used to measure dyspnea severity with activities of daily living (ADL) (Eakin, Resnikoff, Prewitt, Ries, & Kaplan, 1998). It includes 24 items, 21 of which relate to dyspnea during ADL of different intensity and 3 related to limitations imposed by dyspnea. Higher scores indicate maximal dyspnea or unable to do because of dyspnea. If subjects did not perform an activity, they were asked to estimate the degree of dyspnea the activity provoked. The Medical Research Council (MRC) dyspnea is a single item that measures the level of activity that provokes dyspnea (Bestall et al., 1999). The interviewer-administered Chronic Respiratory Questionnaire (CRQ) was also used to measure dyspnea severity based on five activities specific to the subject (Guyatt, Berman, Townsend, Pugsley, & Chambers, 1987). The CRQ was also used to measure the frequency and severity of fatigue. For both dyspnea and fatigue, higher scores indicate less severe symptoms. Extensive data on reliability and validity of the CRQ have been published (Guyatt, King, Feeny, Stubbing, & Goldstein, 1999; Wijkstra et al., 1994).

Psychological Symptoms—The Center for Epidemiological Studies Depression Scale (CESD) is a 20-item self-administered instrument that was developed to identify individuals at high risk for depression and has been widely used across multiple clinical populations. Higher scores indicate greater depressed mood (Radloff, 1977).

Physical and Mental Health Functioning—The SF-36 has 36 questions that relate to nine distinct components of overall health and two composite measures of self-reported physical and mental functioning. For the two composite measures, higher scores reflect better health. The six minute walk test (6MW) was used to measure physical performance. Two tests were performed approximately 30 minutes apart on the same day in a hospital corridor (Guyatt

et al., 1985). If the two walk distances did not agree within 10%, a third walk was performed. The longest walk was used for this analysis.

Mastery—Mastery was measured using a 4-item subscale of the CRQ. The questions asked for subjects' perception of their ability to control their "breathing problems" and how "confident and sure that you [they] could deal with your [their] illness".

Disease Severity—Subjects performed spirometry 15–30 min after 2 puffs of albuterol administered via spacer (Aerochamber; Monaghan: Plattsburg, NY). Spirometry (FEV₁% predicted and FEV₁/FVC) was performed using a 10 L water-seal spirometer (Collins Medical; Braintree, MA) according to American Thoracic Society criteria (1987). Baseline lung volumes (helium dilution method), maximum voluntary ventilation (MVV), and single-breath diffusion capacity for carbon monoxide (D_LCO), residual volume over total lung capacity (RV/TLC) were measured using a body plethysmograph (Collins Plus Body Plethysmography System; Collins Medical, Braintree, MA). Predicted normal values were calculated for spirometry (Crapo & Morris, 1981; Knudson, Slatin, Lebowitz, & Burrows, 1976), lung volumes (Crapo, Morris, Clayton, & Nixon, 1982) and diffusing capacity (Crapo & Morris, 1981).

A multidimensional measure of disease severity (BODE Index) was calculated for each subject using a previously described empirical model based on a summary score of body mass index (BMI), airway obstruction, dyspnea, and exercise performance during the 6MW (Celli et al., 2004). Subjects were assigned scores ranging from 0 to 3 according to threshold levels of FEV₁% predicted (obstruction), score on the MRC dyspnea scale, and distance walked in 6 minutes (exercise). For body mass index, subjects were assigned a value of 0 if their BMI was greater than 21 kg/m² and a value of 1 if BMI was less than this threshold. The BODE index ranges from 0 to 10 with higher scores indicating worse health.

Statistical Analysis

In accordance with previous studies, global self-rated health (GSRH) was dichotomized and coded 0 for subjects who reported at least good or better health or 1 for subjects who reported fair or poor health (herein referred to as good or poor health), respectively (Idler & Benyamini, 1997). Differences in the sample characteristics between subjects who rated their health as good or poor were tested using chi-square for categorical variables or t-tests for continuous variables. Pearson's correlations were used to determine the associations between the independent variables (physical and psychological symptoms, physical and mental health functioning, and mastery). Only those variables that were significant in the univariate analyses and did not exhibit high collinearity were included in the stepwise multivariate logistic regression models with GSRH as the dependent variable. For instances where covariates were conceptually similar, we included the measure that had an established clinical threshold of change in the regression models. The first model included age, gender and disease severity (BODE Index). The second model included variables from model 1 and symptoms (SOBQ Dyspnea, CRQ Fatigue, and CESD Depressed Mood). The final model included models 1 and 2 as well as CRQ Mastery and SF-36 Physical Component. Effect modification was assessed with stratified analyses by gender. The final model was repeated with 94 subjects who had complete data with additional adjustments for baseline GSRH and treatment group to determine longitudinal associations with GSRH at 12 months. All statistical procedures were performed with Stata 9.0 (Stata Corporation, College Station, TX).

Results

This sample (n=115) of patients with moderate to severe COPD was primarily Caucasian (85%) and well-educated with 69% having at least some college education. Table 1 shows the sample

characteristics according to GSRH. While there were no significant differences in pulmonary function between subjects who reported good and poor health, those with poor health had higher BODE scores (+1.2 points, $p<.001$). Subjects who reported poor health were significantly younger, had more severe dyspnea, fatigue, and depressed mood, had worse physical and mental functioning and covered less distance on the six minute walk test, and had lower confidence in their ability to manage their COPD compared to subjects who reported good health (all, $p\leq.05$). The differences between groups in depressed mood (≥ 16 : high depression risk) and confidence for managing COPD (>2.0 points) met accepted benchmarks for clinical significance (Radloff, 1977; Guyatt et al., 1999).

A correlation matrix of the independent variables that had significant univariate associations with GSRH is presented in Table 2. The correlations among these variables were generally in the small to moderate range, but as theoretically expected was higher between CESD depressed mood and the SF-36 mental component ($r=-.69$). Dyspnea with ADL measured by the SOBQ had a moderate correlation with the BODE index ($r=.51$) and the SF-36 physical component ($r=-.54$). The SF-36 mental health component was excluded from the regression models due to its high collinearity with the CESD. CRQ Dyspnea was excluded because of the marginal differences in the univariate analysis between subjects who reported poor and good health. Finally, the six minute walk test was not included since the scores were already integrated in the BODE index.

Adjusted Cross-Sectional Associations

Results from the stepwise multivariate logistic regression analysis are shown in Table 3. Across all three models, subjects with higher BODE scores, a composite measure of disease severity, had significantly greater risk of rating their health as poor compared to those with lower scores (Odds Ratio, OR, 1.52 to 1.62, $p<.05$). In the second model, subjects with less fatigue had a 12% lower risk of perceiving poor health, [OR 0.88 (95% Confidence Interval, CI, 0.79, 0.99)]. The independent effect of fatigue on GSRH was attenuated in the final model that included mastery and physical functioning. Dyspnea, depressed mood, physical functioning, and mastery were not significantly associated with GSRH in the final model for all subjects. Effect modification by gender was best depicted in this final model. For women, greater perception of mastery was significantly associated with good health [OR 0.83 (95%CI, 0.70, 0.98)]. In contrast, it was disease severity measured with the BODE index that was strongly associated with poor health in men [OR 2.53(95%CI, 1.40, 4.58)].

Adjusted Longitudinal Associations

With the exception of a trend towards a difference in 6MW distance [$n=21$: 1269 ± 361 vs. $n=94$: 1421 ± 303 feet, $p=.06$], there were no significant differences in baseline demographic characteristics, disease severity, symptoms, functioning, or mastery between subjects who were included in the longitudinal model and those who had missing data or were lost to follow-up. Additional adjustments for baseline GSRH and treatment group assignment were included in the longitudinal model (Table 3). Baseline fatigue was the only significant predictor of GSRH at 12 months. Subjects who reported less fatigue at baseline had a lower risk of reporting poor GSRH at the end of the study [OR 0.84 (95%CI, 0.72, 0.98)]. None of the other independent variables measured at baseline were predictive of GSRH at 12 months.

Discussion

Since an individual's perception of his or her health is associated with survival, the main objective of this paper was to examine what potentially modifiable factors influenced COPD patients' ratings of their global health (GSRH). The main findings are that although disease severity was associated with greater risks of poor health ratings in men, it was the perception

of mastery over the disease that shaped women's ratings of their global health. While dyspnea, a hallmark symptom of COPD, did not show significant associations with GSRH, baseline fatigue was an independent contributor to longitudinal global health ratings.

Classification of disease severity in COPD has traditionally been based on a single criterion of airflow obstruction, the FEV1 or the percent predicted FEV1. Only recently did Celli and colleagues introduce the BODE index, an integrated multi-dimensional disease staging system that captures both pulmonary and systemic effects of COPD (Celli et al., 2004). It is therefore not surprising that as a composite measure, the BODE index emerged as the main factor associated with patients' ratings of their health in the cross-sectional model. In this study, BODE scores for subjects who reported their health as poor was 1.2 points higher compared to those with good health. Based on published predictive models, the risk of a patient dying from respiratory causes over a 52-month period was 62% higher for every one unit increase in the BODE score (Celli et al., 2004). If indeed certain factors associated with the patient's perception of their health can be changed or modulated in some way, the potential to reduce morbidity and mortality can be enormous.

While the smaller sample sizes in the stratified analysis with gender may be a limitation, it is important to note that it was women's perceived confidence in their ability to cope with their symptoms and disease, not disease severity itself that influenced their global rating of health. The original validation study of the BODE index did not report the gender distribution though it might be presumed that the sample was primarily comprised of men (Celli et al., 2004). Studies that followed this publication also tested the index as a predictor of improvements from pulmonary rehabilitation (Cote & Celli, 2005) and future hospitalization for COPD (Ong, Earnest, & Lu, 2005) based on samples of primarily men (90–95%); therefore, there is limited information on the performance of the BODE in women. Our findings suggest that perhaps the individual components included in this particular index may be less relevant in shaping women's ratings of their health than in men.

Gender differences in the determinants of general health perception were shown in a recent study that compared men and women with COPD matched on the severity of airflow obstruction (de Torres et al., 2006). In that study, women were younger, yet they had worse ratings on a disease-specific HRQL instrument. Furthermore, a large percentage of the variance in HRQL scores (87%) for the male subjects was explained by variables that are included in the BODE index, e.g. distance covered on a six minute walk, co-morbidities, lung hyperinflation, and dyspnea impact as measured by the MRC. In contrast, of the eight mostly physiologic factors included in the analytic model, only dyspnea impact was a significant predictor of HRQL for women. In other clinical populations, correlates of GSRH also differ between men and women where the ability to engage in household ADL significantly influenced women's, but not men's health perceptions (Prager, Walter-Ginzburg, Blumstein, & Modan, 1999; Wolinsky & Johnson, 1992). Aside from the few studies mentioned above, gender differences in disease presentation and response to treatment have not been well studied in this population (Han et al., 2007). Thus, it will be important that future prospective studies examine and confirm if there are indeed gender differences in physiological or psychosocial variables that shape global perception of health in patients with COPD. A better understanding of these potential gender differences will help in the design of more gendered or individually tailored therapeutic nursing interventions.

The finding that baseline fatigue was significantly associated with a person's rating of their health a year later was surprising since previous studies reported that at least in older adults, perceptions of current health are informed by people's current states (Benyamini, Leventhal, & Leventhal, 2003). This observation suggests that perceptions of fatigue by patients with COPD is likely durable and has a notable impact on future self-rated health. Fatigue may be

the culminated response to other symptoms, such as dyspnea and be perceived by patients as the most distressful. If dyspnea increases the work of breathing and requires greater energy, it presumably will lead to greater fatigue and therefore, influence the person's perception of their health. Although the correlation coefficient between dyspnea and fatigue was only .41 in this study, other studies have reported a strong relationship between the two sensations, with some patients not being able to distinguish between the two symptoms (Janson-Bjerkelie, Kohlman-Carrieri, & Hudes, 1986; Kapella, Larson, Patel, Covey, & Berry, 2006). Interestingly, a recent study of symptom clusters in patients with advanced chronic diseases showed that worse dyspnea was associated with poor health ratings even after adjusting for the effects of six other symptoms including fatigue (Walke, Byers, Gallo, Endrass, & Fried, 2007). This sample was different from ours since it was comprised of patients who had advanced COPD, congestive heart failure, and cancer, therefore, they were living with a very high symptom burden and requiring assistance with their instrumental activities of daily living. It is likely that with more severe disease, dyspnea becomes unrelenting and may have a greater influence on the patient's global health perception. Thus, depending on patient disease severity, either fatigue or dyspnea still assumes a central role in shaping GSRH for patients with COPD. Nurses may engage or refer patients to evidence-based rehabilitation or palliative care interventions to alleviate these symptoms as one possible strategy to positively impact their global health perceptions (Ries et al., 2007; Rocker, Sinuff, Horton, & Hernandez, 2007).

The association between depression and ratings of global health has been inconsistent in the literature. One survey of healthy individuals between the ages of 15 and 90 showed that physical health contributed a significant amount of variance to GSRH (55%) while emotional, social, and spiritual health had no effect on these ratings (Ratner, Johnson, & Jeffery, 1998). In contrast, another study of community dwelling older adults showed a strong predictive relationship between depressive symptoms and greater declines in the person's rating of their health (OR 1.47) even after controlling for major demographic, medical, and behavioral risk factors (B. Han, 2002).

Depression is common in patients with COPD with prevalence rates ranging from 25% to 74% depending on the method of evaluation (van Ede, Yzermans, & Brouwer, 1999; van Manen et al., 2002). In this study, subjects who rated their health as poor had high scores on the CESD suggestive of clinical symptoms of depression. Those who rated their health as good had favorable CESD scores that were slightly higher (11 points) than that of a healthy nationally representative adult population (9 points) (Eaton & Kessler, 1981). However, depressed mood was not significantly associated with the perception of global health in the adjusted models. The true impact of depressed mood on the rating of global health is still not certain and may differ depending on the individual patient; however it is one factor that nurses should assess and target with cognitive-behavioral interventions or referral if the patient reports poor health.

For older adults, the "functional/vitality core" which includes the ability to be physically active and "to do what one wants to do" is associated with GSRH (Benyamini, Leventhal, & Leventhal, 2003). The capacity to perform daily activities after hospital discharge was moderately related to the perception of positive health ($r=.42$) (Covinsky et al., 1999). This finding was supported in another study where mobility limitations were associated with worse health ratings (Gama et al., 2000). In contrast to these univariate analyses, our multivariate models showed that self-reported physical functioning made only marginal contributions to the rating of global health.

Factors that shape an individual's GSRH over their life course or illness trajectory are not static (Fayers & Sprangers, 2002). Global self-ratings of health tend to largely reflect those health problems and illnesses that are of immediate salience (Benyamini, Leventhal, & Leventhal, 2003). Age groups also differ in the referents used to rate GSRH. Older subjects were more

inclined to think about health problems in contrast to younger subjects whose reference was risky health behaviors (Krause & Jay, 1994). Ethnic background also shapes an individual's global health ratings (Agyemang, Denktas, Bruijnzeels, & Foets, 2006). Altogether, GSRH captures perceptions of health using "criteria that are as broad and inclusive as the responding individual chooses to make them" (Idler & Benyamini, 1997) which can make within and cross-study comparisons all the more difficult.

There are several limitations to this study. The single item measure of GSRH may be more prone to measurement error. However, two reports actually showed that test-retest reliability for this single item compared favorably to an overall health perception scale comprised of 5 items (Kempen, 1992; Kempen, Miedema, van den Bos, & Ormel, 1998). We did not include a comprehensive battery of covariates, e.g. spirituality, social support, valued activities of daily living, that could be related to global health perception (Wilson & Cleary, 1995) since the study was based on an existing data set. We were most interested in factors of high salience to this clinical population and that are potentially modifiable with cognitive-behavioral interventions. However, we acknowledge that complex interactions exist among the multiple dimensions contributing to self-rated health and that our model explained only a small portion of the variance in GSRH. The data used were mostly cross-sectional in nature and therefore the findings are vulnerable to the effects of reverse causality though it is unlikely that GSRH is responsible for ratings of symptoms or mastery. Estimates from the longitudinal model and gender stratified analyses may not be reliable given the relatively small sample for the number of covariates. There is considerable variability in the importance of certain factors that people ascribe to when they rate their global health. These relationships change over time with adaptation to and fluctuations in illness that we did not fully capture in our analyses (Schwartz & Sprangers, 2000).

Conclusion

Ratings of global health by patients with COPD were for the most part, influenced by measures that reflect their overall physical state, e.g. disease severity and fatigue. While additional qualitative work will need to be conducted to understand the influential factors and gender differences that contribute to global self-rated health, therapeutic interventions should focus on reducing fatigue if the goal is to improve patients' health perceptions. Since global self-rated health is a simple measure and can be easily implemented in clinical practice, it will be worthwhile to examine this measure further for its ability to predict future exacerbations and survival in patients with COPD. With the caveat that this study is of a cross-sectional nature, the overall findings demonstrate the need for nurses to better understand the individual factors that shape ratings of global health in patients with COPD in order to appropriately tailor nursing interventions.

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Table 1
Baseline Sample Characteristics by Global Self-Rated Health*

	Good or Better (n=68)	Fair/Poor (n=47)	p value
Age	66.9 ± 7.9	63.6 ± 8.4	.04
Female (%)	51%	57%	.53
Race/Ethnicity			.13
Caucasians	58 (85%)	40 (85%)	
Non-Caucasians	10 (15%)	7 (15%)	
Living Situation			.47
Live with others	35 (51%)	21 (45%)	
Live alone	33 (49%)	26 (55%)	
Annual Income			.61
<\$40,000	44 (66%)	33 (70%)	
≥\$40,000	23 (36%)	14 (30%)	
Smoking status (pack years)	58.7 ± 36.4	54.6 ± 30.7	.54
Ever attended pulmonary rehabilitation	14 (21%)	8 (17%)	.63
Current oxygen use	5 (7%)	10 (21%)	.03
Body Mass Index	25.9 ± 5.2	26.0 ± 4.6	.93
Disease Severity			
FEV1 (% predicted)	46.7 ± 15.1	41.7 ± 13.3	.07
FEV1/FVC	43.1 ± 12.2	40.0 ± 9.9	.14
MVV (% predicted)	42.8 ± 15.1	39.4 ± 14.7	.23
RV/TLC, %	54.6 ± 9.8	53.2 ± 9.8	.45
DLCO ml/min (% predicted)	66.4 ± 21.1	60.9 ± 18.4	.14
BODE Index (↑0–10)	3.7 ± 1.8	4.9 ± 1.5	<.001
Physical and Psychological Symptoms			
SOBQ Dyspnea (↑0–120)	50.0 ± 16.4	59.1 ± 17.9	.007
CRQ Dyspnea (5–35↑)	16.9 ± 5.0	15.1 ± 4.6	.05
MRC Dyspnea (↑0–4)	1.4 ± 1.1	2.0 ± 1.3	.01
CRQ Fatigue (4–28↑)	16.2 ± 4.8	13.4 ± 4.1	.001
CESD Depressed Mood (↑0–60)	11.7 ± 8.4	16.5 ± 9.2	.001
Physical and Mental Health Functioning			
SF-36 Physical Component (0–100↑)	34.5 ± 8.1	29.2 ± 8.2	<.001
Six Minute Walk Distance (feet)	1437.3 ± 291.5	1316.4 ± 349.8	.05
SF-36 Mental Component (0–100↑)	52.1 ± 10.5	46.5 ± 11.0	.008
CRQ Mastery (4–28↑)	20.0 ± 4.7	16.7 ± 4.7	<.001

* Values are presented as means ± SD unless otherwise noted; ↑ indicates better health

Abbreviations: FEV1, forced expiratory volume in 1 second; FVC, forced vital capacity; MVV, maximal voluntary ventilation; RV/TLC, residual volume/total lung capacity; DLCO, diffusing lung capacity; MRC, Medical Research Council dyspnea scale; SOBQ, shortness of breath questionnaire; CRQ, Chronic Respiratory Questionnaire; SF-36, Medical Outcomes Study Short Form-36; CESD, Center for Epidemiological Studies Depression Scale; BODE, body mass index, obstruction, dyspnea, and exercise

Table 2

Correlations Matrix (n=115)

	1	2	3	4	5	6	7	8	9
1. SOBQ Dyspnea	1.00								
2. CRQ Dyspnea	-0.36	1.00							
3. CRQ Fatigue	-0.41	0.32	1.00						
4. CESD Depressed Mood	0.38	-0.22	-0.45	1.00					
5. SF-36 Physical Component	-0.54	0.30	0.40	-0.14	1.00				
6. Six Minute Walk Distance	-0.48	0.22	0.35	-0.20	0.39	1.00			
7. SF-36 Mental Component	-0.23	0.22	0.48	-0.69	-0.20	0.10	1.00		
8. CRQ Mastery	-0.34	0.41	0.44	-0.30	0.21	0.27	0.40	1.00	
9. BODE Index	0.51	-0.32	-0.16	0.20	-0.44	-0.57	-0.12	-0.17	1.00

* See Table 1 for abbreviations; p<.05 for all r values ≥ (+/-0.20)

Table 3
Multivariate Adjusted Analysis on Global Self-Rated Health

	All (n=115) Odds Ratio (95%CI)	Women (n=62) Odds Ratio (95%CI)	Men (n=53) Odds Ratio (95%CI)
Concurrent Associations: Baseline Self-Rated Health			
Model 1			
Age	0.97 (0.92, 1.02)	0.97 (0.91, 1.04)	0.96 (0.89, 1.03)
Gender		--	--
Men (Reference)	1.0		
Women	1.65 (0.72, 3.77)		
BODE Index	1.57 (1.21, 2.03) [†]	1.39 (1.01, 1.92) [*]	1.91 (1.18, 3.08) [†]
Model 2: Model 1 +			
Age	0.96 (0.91, 1.01)	0.95 (0.88, 1.02)	0.94 (0.86, 1.02)
Gender		--	--
Men (Reference)	1.0		
Women	1.95 (0.77, 4.94)		
BODE Index	1.62 (1.14, 2.29) [†]	1.39 (0.89, 2.17)	2.66 (1.46, 4.86) [†]
SOBQ Dyspnea	0.98 (0.95, 1.02)	0.98 (0.92, 1.03)	0.97 (0.92, 1.03)
CRQ Fatigue	0.88 (0.79, 0.99) [*]	0.90 (0.79, 1.02)	0.78 (0.63, 0.98) [*]
CESD Depressed Mood	1.04 (0.98, 1.09)	1.06 (0.98, 1.16)	1.00 (0.94, 1.07)
Model 3: Model 1 + 2 +			
Age	0.97 (0.92, 1.03)	0.95 (0.87, 1.04)	0.95 (0.87, 1.04)
Gender	0.55 (0.21, 1.42)	--	--
Men (Reference)	1.0		
Women	1.83 (0.70, 4.76)		
BODE Index	1.52 (1.08, 2.15) [*]	1.22 (0.75, 2.00)	2.53 (1.40, 4.58) [†]
SOBQ Dyspnea	0.97 (0.94, 1.01)	0.95 (0.88, 1.03)	0.96 (0.91, 1.02)
CRQ Fatigue	0.94 (0.83, 1.07)	0.97 (0.83, 1.12)	0.81 (0.63, 1.04)
CESD Depressed Mood	1.05 (0.99, 1.11)	1.08 (0.98, 1.19)	1.01 (0.95, 1.09)
CRQ Mastery	0.91 (0.82, 1.00)	0.83 (0.70, 0.98) [*]	1.01 (0.88, 1.15)
SF-36 Physical Comp. Score	0.94 (0.88, 1.00)	0.90 (0.81, 1.00)	0.95 (0.86, 1.05)
Longitudinal Associations: 12-Month Self-Rated Health			
	All (n=94) Odds Ratio (95% CI)		
Age	0.98 (0.90, 1.06)		
Gender			
Men (Reference)	1.0		
Women	.79 (.25, 2.5)		
BODE Index	1.12 (0.80, 1.56)		
SOBQ Dyspnea	1.01 (0.96, 1.07)		
CRQ Fatigue	0.84 (0.72, 0.98) [*]		
CESD Depressed Mood	1.00 (0.93, 1.07)		
CRQ Mastery	1.00 (0.89, 1.12)		
SF-36 Physical Comp. Score	0.96 (0.87, 1.06)		

	All (n=115) Odds Ratio (95%CI)	Women (n=62) Odds Ratio (95%CI)	Men (n=53) Odds Ratio (95%CI)
Baseline Self-Rated Health	4.02 (1.22, 13.24) [*]		
Treatment Group			
DSMP (Reference)	1.0		
DSMP+ Exposure	1.27 (0.39, 4.18)		
DSMP+ Training	1.19 (0.32, 4.34)		

*
p<.05

[†]
p<.01

Lower odds of poor health OR <1.00; Higher odds of poor health OR>1.00; For the continuous variables (age, BODE index, SOBQ dyspnea, CRQ Fatigue, CESD, CRQ Mastery, and SF-36 Physical Composite Score), the OR is associated with a one unit increase in each variable, e.g. BODE Index results in the final model 1.52 (1.08, 2.15) would be interpreted as, for every one unit increase in the BODE index, there is a 52% increase in the odds that a patient with COPD will report poor health.

See Table 1 for abbreviations.