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Coping and Quality of Life in Patients Awaiting Lung Transplantation

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Abstract

Objective—Patients with end-stage lung disease experience significant decrements in quality of life (QOL). Although coping strategies are related to QOL in patients with end-stage lung disease, the extent to which specific native lung disease moderates this relationship is unknown.

Methods—We investigated the relationship between coping, native lung disease, and QOL among 187 patients awaiting lung transplantation, including 139 patients with chronic obstructive pulmonary disease (COPD) and 48 patients with cystic fibrosis (CF). Participants completed a psychosocial battery assessing psychological QOL, physical QOL, and coping strategies.

Results—For both COPD and CF patients, higher levels of Active Coping ($P < .0001$) and lower levels of Disengagement ($P < .0001$) were associated with better psychological QOL. For physical QOL, we observed a native disease by coping interaction ($P = .01$) such that Active Coping was associated with better physical QOL in patients with COPD but not in patients with CF.

Conclusion—The relationship between coping and QOL may vary as a function of native lung disease. In order to develop effective interventions to help patients cope successfully with end stage lung disease, patients' native disease may need to be considered.

Keywords

cystic fibrosis; chronic obstructive pulmonary disease; coping; lung transplant; quality of life

Introduction

Lung transplantation can be the only remaining treatment option for patients with end-stage lung disease, but it is not without considerable risk. Transplant recipients face high rates of

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infection, graft rejection, and mortality following transplantation [1] and, despite improvements in surgical techniques, 5-year survival remains below 50% [2,3]. Because of the limited survival following transplant and the taxing nature of the transplantation process, quality of life (QOL) considerations have become increasingly important when weighing the benefits and risks of transplantation [4–6]. Much of the QOL literature has focused on the substantial decrements in QOL that are experienced by patients with end-stage lung disease, including impairments in both the physical and mental health QOL domains [7–14]. Furthermore, elevated rates of psychiatric illness in lung transplant candidates have been well-documented [11,15–17].

Accordingly, the strategies that lung transplant candidates use to cope with these many challenges have important implications for their well-being. The association between coping and QOL has been described in other solid organ transplant candidates [15] and in a variety of other disease groups [16,18]. In lung patients, avoidance coping, characterized by thoughts and/or actions to minimize the experience of a stressor [19], has been associated with poorer global QOL and work performance [20,21], as well as higher levels of depression, pain, and psychological distress [21], although negative findings also have been reported [22]. In contrast, active coping, characterized by an active engagement in dealing with stressful events, has been associated with better QOL [19]. Understanding the relationship between coping and QOL may be particularly important because certain coping strategies, particularly avoidance coping, have been associated with increased psychiatric illness [23–25] and noncompliance [26] following transplantation.

Consideration of the impact of native disease may be important in understanding the relationship of coping and QOL because of the distinct pathophysiologies and demographic characteristics associated with different lung diseases [27]. These differences are particularly evident when comparing cystic fibrosis (CF) and chronic obstructive pulmonary disease (COPD), which represent two of the most common conditions necessitating lung transplantation [3]. COPD is diagnosed in adulthood and smoking has been identified as a causal agent in 75–85% of all cases [28]. In contrast, CF is an autosomal recessive genetic disorder that is typically diagnosed in the first year of life. Accordingly, it is not surprising that there are important psychosocial differences, including differences in QOL, between CF and COPD patients awaiting transplantation [13].

Despite the clinical and psychosocial differences between these disease groups, the influence that native disease has on the coping and QOL relation remains unclear. Native disease could have an important moderating effect on the relationship between coping and QOL, which would have major implications for psychosocial intervention and clinical management strategies between native disease classifications. Although individually-tailored psychosocial interventions among lung transplant candidates have gained recent attention [29], the more fundamental question of whether coping strategies may be differentially effective for different types of lung patients has not yet been examined. Similarly, despite native disease differences in coping and QOL, no studies, to our knowledge, have systematically examined whether native disease may moderate the coping and QOL relationship. Therefore, the purpose of the present study was to examine a) the relation between coping and QOL and b) to determine whether this relation is affected by the nature of the lung disease.

Methods

Patients

Patient selection and exclusion criteria have been previously described [30]. Briefly, patients listed for lung transplantation at Duke University Medical Center and Washington

University between September, 2000 and August, 2004 were initially contacted to be part of the larger clinical trial, known as the INSPIRE study [30]. Patients were listed for lung transplant if they were 18 or older, had an expected survival of two years or less without transplant, and had no other significant extrapulmonary organ dysfunction. Patients also had to demonstrate an absence of substance abuse or active psychiatric disease, adequate social support, and adequate nutritional and exercise status. One hundred eighty seven patients with end-stage lung disease (139 with COPD and 48 with CF) were selected from the initial trial sample based on a primary diagnosis of COPD or CF. Patients with other forms of lung disease were excluded from the current analysis. All participating patients provided written informed consent approved by their respective Institutional Review Boards.

Procedures

Participants completed standard pre-transplant clinical assessments, including measures of exercise tolerance and pulmonary gas exchange. Additionally, participants completed a battery of self-report psychometric measures designed to evaluate coping strategies as well as both psychosocial and physical components of QOL.

Exercise Tolerance and Pulmonary Gas Exchange

Exercise tolerance was determined using the Six-Minute Walk test, a standard procedure in which patients are asked to walk as far as possible on a measured course within a 6-minute time limit. An experienced physical therapist provided patients with enough oxygen to maintain saturations of 90% or greater, but no additional encouragement was provided. Arterial blood analysis was performed during pulmonary clinic visits and was used to determine partial pressures of carbon dioxide and oxygen gas ($p\text{CO}_2$ and $p\text{O}_2$).

Measurements of Psychological QOL

A comprehensive psychological test battery was used to assess a broad range of both psychosocial and somatic/physical components of QOL. The following measures were selected because of their relevance for patients with advanced lung disease and established reliability and validity:

Short Form-36 Health Survey- mental health component score (SF-36 Psychological). The mental health component score from the SF-36 is a self-report measure that assesses health-related psychological QOL, with higher scores indicating better psychological QOL [31]. Test-retest reliability has generally been found to exceed .90 [32].

Pulmonary-specific quality of life scale- psychological functioning component (PQLS Psychological). The PQLS is a disease-specific measure of QOL designed for use among individuals with chronic lung conditions. Lower scores indicate better pulmonary-specific QOL [33]. The PQLS has good convergent validity (-0.74) with the SF-36 and has high internal consistency (0.87).

Beck Depression Inventory II (BDI). The BDI is a 21-item self-report questionnaire that assesses cognitive, affective, and somatic symptoms associated with depression. The items consist of statements that are scored on a range of 0 to 3, depending upon symptom severity, with higher scores indicating greater depressive symptoms [34]. A meta-analysis of the BDI's internal consistency estimates yielded a mean coefficient alpha of 0.86 for psychiatric patients.

Spielberger State and Trait Anxiety Inventory (STAI). The STAI is a 40-item self-report questionnaire assessing both state (S-STAI) and trait (T-STAI) levels of anxiety. Higher scores indicate higher levels of anxiety [35]. Alpha coefficients range from .83 to .92 for both inventories, indicating high internal consistency. Test-retest correlations

for the Trait scale are high (.73 to .86), while those of the State scale are lower (.16 to .54), which would be expected.

General Health Questionnaire (GHQ). The GHQ is a 60-item scale that assesses the presence of non-psychotic psychiatric disorders. This instrument is designed to evaluate symptoms of emotional distress, with higher scores indicating greater negative affect [36]. The GHQ has been used to document the effectiveness of stress management interventions for cardiac patients and has been shown to be sensitive to changes in stress levels [37].

Perceived Stress Scale (PSS). The PSS is a 14-item scale that evaluates the belief that life events are unpredictable and uncontrollable and, therefore, more stressful. Higher scores indicate greater levels of perceived stress [38]. Cronbach's alpha reliability was .78 in a national survey. Patterns of correlations with other psychological scales, health measures, and health habits provide strong evidence for its construct validity.

Perceived Social Support Scale (PSSS). The PSSS consists of 12 items assessing perceived social support from family, friends, and significant others. Higher scores indicate greater overall perceived support [39]. The coefficient alpha for the total scale has been reported to be .88 with a test-retest reliability of .85 across an interval of 2 to 3 months.

Measurements of Physical QOL

Short Form-36 Health Survey- physical functioning component score (SF-36 Physical). The physical functioning component score from the SF-36 is a self-report measure that assesses health-related physical QOL, with higher scores indicating better physical QOL [31]. A test-retest reliability of .89 has been reported across an interval of 2 weeks [40].

Pulmonary-specific quality of life scale- physical functioning component (PQLS-Physical). The PQLS is a disease-specific measure of QOL designed for use among individuals with chronic lung conditions. Lower scores indicate better pulmonary-specific QOL [33]. The PQLS has good convergent validity (-0.74) with the SF-36 and has high internal consistency (0.87).

UCSD Shortness of Breath Questionnaire (SOBQ). The SOBQ is a 24-item scale that assesses the occurrence of shortness of breath on a 6 point scale (0 to 5) during 21 ADLs associated with varying levels of exertion. Higher scores indicate greater overall shortness of breath [41]. The UCSD SOBQ has been shown to correlate significantly with a variety of measures including FEV₁ ($r = -0.445$, $p < 0.01$), 6 Minute Walk distance ($r = -0.669$, $p < 0.001$), and perceived breathlessness ($r = 0.474$, $p < 0.001$), supporting the instrument's validity. The UCSD SOBQ has been shown to have excellent internal consistency.

Measurements of Coping

COPE Inventory (COPE). The COPE is a 60-item questionnaire that assesses the strategies that people use to cope with difficult or stressful life events. Participants are scored on each of the following 15 subscales: positive reinterpretation and growth, mental disengagement, focus on and venting of emotions, use of instrumental social support, active coping, denial, religious coping, humor, behavioral disengagement, restraint, use of emotional social support, substance use, acceptance, suppression of competing activities, and planning. Higher scores indicating more frequent usage of the corresponding coping strategy [42,43]. Higher subscale scores indicate greater use of that

coping strategy. Test-retest correlations of the COPE Inventory indicate that coping tendencies are relatively stable (.45 to .92).

Statistical Analyses

All statistical analyses were conducted using SAS statistical software version 9.1 (SAS Institute, Inc., Cary, NC). Differences in background and demographic factors between native disease classifications were examined using 1-way analysis of variance (ANOVA) for continuous variables and χ^2 tests for categorical variables. In order to minimize the number of hypothesis tests, we preceded our primary analyses by performing a data reduction on the COPE inventory subscales. This was carried out using a principal components analysis with varimax rotation, the results of which are reported below in greater detail. The factor solution was interpreted based on Eigenvalues, a scree plot, a criterion of .40 as the minimum acceptable loading, and substantive interpretability. The principle components results yielded two composite variables which were labeled *Active Coping* and *Disengagement*. A second analysis examined native disease differences on mean levels of the two COPING composites. For this analysis, we used a MANCOVA in which the Active Coping and Disengagement composites were the joint dependent variables and native disease was the predictor.

Finally, in our primary analyses, we examined whether coping and native disease were related to the QOL variables. To this end we estimated two separate MANCOVA models: one in which Psychological QOL variables (PQLS-Psychological, SF-36 Psychological QOL, BDI, S-STAI, T-STAI, PSS, PSSS, and GHQ) served as the outcome and one in which Physical QOL variables (SF-36 Physical, PQLS-Physical, and SOBQ) served as the outcome. The predictors in each of these QOL models were native disease, Active Coping, and Disengagement. We then tested the moderation hypotheses by adding the Active Coping by native disease and Disengagement by native disease interaction terms simultaneously to the models. Each of the primary MANCOVA models included the following adjustment covariates, selected a priori: annual income (0 = under \$15,000, 1 = \$15,000 – \$29,999, 2 = \$30,000 – \$44,999, 3 = \$45,000–\$59,999, 4 = \$60,000 – \$74,999, 5 = above \$75,000); current use of psychiatric medication (0 = no, 1 = yes); education (0 = under 6 years, 1 = 7–9 years, 2 = 10–11 years, 3 = 12 years, 4 = 13–15 years, 5 = college degree, 6 = graduate or professional degree); ethnicity (0 = Caucasian, 1 = African-American, Native-American, Hispanic, Asian/Pacific Islander); current or previous psychological treatment (0 = no, 1 = yes); gender (0 = male, 1 = female); and six minute walk test (continuous). In all MANCOVAs, we first interpreted the multivariate test and, if significant, we examined the univariate ANCOVAs for each of the individual dependent variables.

Results

Patient Characteristics

Table 1 displays the background characteristics of the sample. The mean age of the sample was 50.4 (SD = 13.1) years and the majority of participants were Caucasian (92.5%) and female (56.6%).

Principal Components Analysis

Based on the Eigenvalues and scree test, we identified a plausible two component solution, which we labeled *Active Coping* and *Disengagement*. Table 2 shows the loadings for each component. With two exceptions, the Active Coping loadings were .70; loadings for the Disengagement component score ranged from .40 to .57.

Native Disease Differences in Coping

MANCOVA results showed that CF and COPD patients did not differ in their use of Active Coping or Disengagement (Wilks' lambda = 0.98, $P = .22$). Examination of the composite measures of coping showed that CF and COPD patients did not differ on either Active Coping (CF Mean = $-.92$, SD = 8.12; COPD Mean = $.10$, SD = 11.45) or Disengagement (CF Mean = $.80$, SD = 4.83; COPD Mean = $.01$, SD = 6.73).

Relation of Quality of Life to Coping and Native Disease

Psychological QOL—The multivariate results showed that higher levels of Active Coping were related to better Psychological QOL (Wilks' lambda = 0.75, $p = .0001$), while higher levels of Disengagement were related to poorer levels of Psychological QOL (Wilks' lambda = 0.57, $P = .0001$). Figure 1 shows the relation between Psychological QOL and Active Coping and Figure 2 shows the relation between Psychological QOL and Disengagement.

The unstandardized linear model coefficients from the univariate models for each of the dependent Psychological QOL variables are shown in the upper portion of Table 3. Higher levels of Active Coping were associated with better scores on all Psychological QOL subtests. In contrast, higher levels of Disengagement were associated with poorer Psychological QOL on all subtests, except for the PSSS. With respect to native disease differences, CF patients demonstrated higher Psychological QOL compared to COPD patients (Wilks' lambda = 0.87, $P = .005$) (Table 4). Specifically, CF patients demonstrated lower levels of anxiety and better PQLS-psychological QOL compared to COPD patients, whereas there were no differences between CF and COPD patients on the BDI, SF36-Psychological, STAI-T, PSS, PSSS, and GHQ scales.

Physical QOL—The multivariate analysis revealed that Active Coping was not significantly related to Physical QOL as a main effect (Wilks' lambda = 0.97, $P = .221$). The multivariate effect for Disengagement, however, was statistically significant (Wilks' lambda = 0.93, $P = .007$). Finally, CF and COPD patients differed significantly in Physical QOL (Wilks' lambda = 0.89, $P = .0005$). The linear model coefficients from the univariate models for the three individual Physical QOL variables are shown in the lower portion of Table 3. Consistent with the multivariate tests, none of the individual Physical QOL variables was related to Active Coping. Disengagement, however, was associated with worse SOBQ scores. Native disease was related to all three measures of Physical QOL, with CF patients reporting better QOL than COPD patients.

Interaction between Native Disease and Coping—The Active Coping by native disease interaction term was significant for Physical QOL (Wilks' Lambda = 0.85, $P = .01$), indicating that the relation between Active Coping and Physical QOL depended on native disease category. Figure 3 displays the observed Active Coping score plotted against the model fitted values of a Physical QOL composite score for CF and COPD patients, suggesting that the association between Active Coping and Physical QOL was greater for COPD patients compared to CF patients. Specifically, among COPD patients, Active Coping was associated with better SOBQ, PQLS, and SF36-Physical. In contrast, Active Coping was not significantly associated with Physical QOL among CF patients.

Discussion

The primary goal of the present study was to examine the relationship of coping to QOL, and to evaluate whether this relationship was moderated by native disease. Results showed that higher levels of Active Coping and lower levels of Disengagement were associated with

better psychological QOL. However, Active Coping was associated with better physical QOL only among patients with COPD and was not associated with better physical QOL among patients with CF.

We found that higher levels of Active Coping and lower levels of Disengagement were associated with better psychological QOL. Specifically, Active Coping was associated with lower levels of depression, state and trait anxiety, stress, pulmonary-specific psychological QOL, and general well-being, as well as higher levels of social support. Disengagement, in contrast, was associated with higher levels of depression, state and trait anxiety, stress, pulmonary-specific psychological QOL, and general well-being. Our finding that higher levels of Active Coping and lower levels of Disengagement are associated with better psychological QOL is consistent with previous research among patients awaiting lung transplant [20,21], as well as other solid organ transplant candidates [15] and other chronic disease groups [18,44,45]. For example, a pilot study from our group [46] found that teaching Active Coping skills was associated with better QOL during the pre-transplant period. Similarly, Burkner and colleagues [15] found that lung transplant candidates with higher levels of Disengagement experienced impaired QOL on a variety of outcome measures, including anxiety, depression, and overall disability.

In contrast to our Psychological QOL findings, we found that higher levels of Active Coping were associated with better Physical QOL only among COPD patients. Specifically, COPD patients who reported greater Active Coping exhibited better SOBQ, PQLS, and SF36-Physical. The finding that Active Coping was not related to better physical QOL in CF patients was unexpected and suggests that, for a subset of lung transplant candidates, psychosocial functioning such as coping may influence QOL through different mechanisms. This finding also suggests that native disease differences in Active Coping may be clinically meaningful insofar as for every standard deviation increase in Active Coping, COPD patients exhibited a 4.7 point decrease in SOBQ scores, indicating less breathing difficulty, whereas CF patients exhibited a 5.2 point increase in SOBQ scores, suggesting greater shortness-of-breath. Although the magnitude of these effects may seem relatively small, a 5-point change on the SOBQ has shown to be associated with clinically meaningful differences in pulmonary function among patients with COPD [47]. This finding may be particularly important because coping has been identified as a psychosocial risk factor that may be modifiable with treatment [48].

The relationship between coping and QOL has gained increasing importance because coping has been identified as a psychosocial risk factor amenable to intervention in lung transplant candidates [46]. In our recent interventional trial of 328 lung transplant candidates [30], we found that a 12-week coping skills training intervention delivered over the telephone was associated with higher QOL. Given the prognostic association between QOL and medical outcomes such as compliance, organ rejection, and mortality [49,50] in solid organ transplant populations, interventions that improve coping ability may have important implications for post-transplant outcomes. Our findings indicate that such interventions may benefit from the additional consideration of native disease classification. For example, it may be appropriate to continue teaching Active Coping skills in interventions targeting COPD patients, while other alternatives may need to be explored in order to optimize patient care among individuals with CF.

This study had several limitations: the cross-sectional design prevents an analysis of the causal relationship between coping and QOL. Coping strategies can be both a cause and consequence of poor quality of life. It is unclear from the current study whether CF and COPD patients would respond differentially to a coping intervention, which focuses on active methods of coping. Second, the label selected for the Disengagement factor may not

appear entirely appropriate because the Disengagement factor includes the venting of negative emotions subscale. Intuitively, it would not seem that venting of emotions is consistent with a disengagement strategy. Finally, because age is confounded with native disease—patients with CF are younger and patients with COPD are older—it is possible that the coping and QOL differences observed were the result of age and/or developmental differences and not characteristics of the native disease, per se. For example, in addition to peer relationships, the relationships that CF patients have with their parents may influence the effects of Active Coping [51]. Because CF patients require a complex and demanding medical regimen, they must rely upon their parents to manage their treatment throughout their childhood and adolescence. This may influence the parent-child relationship with respect to gaining and exercising independence among CF patients. For example, when the time comes for children with CF to transition to adult CF care, parents' most salient concern is their child's ability to manage his or her condition independently, while CF patients themselves do not report significant concern in this area [52]. Transplantation requires heavy reliance on a caregiver once again and, because CF patients are younger and less likely to be married, they may be more likely than COPD patients to name a parent as their primary caregiver. It is possible that the necessity of continuing to rely on a parent for instrumental and emotional social support during the transplantation process, when most CF patients are already well into adulthood, causes some degree of distress that was not accounted for by the psychosocial measures used in the present study.

It is also possible that the observed differences in the relationship between coping and physical QOL are due to the fact that CF is an inherited disorder that is likely viewed as an uncontrollable stressor, whereas the vast majority of COPD cases are linked to the controllable risk factor of smoking. Because problem-focused (i.e. active) coping strategies can be more effective when stressors are controllable versus uncontrollable [53], Active Coping may confer physical QOL benefits for COPD patients but not for CF patients. Due to the relatively early diagnosis of CF, it is possible that coping strategies may have less relevance for CF patients given the chronicity of this disease's progression. Alternatively, it is possible that physical differences in the end-stage disease characteristics may influence the effectiveness of active coping strategies. CF patients exhibit much higher rates of bone fractures [54] and pain [55] compared with other end stage lung patients, for example, and it is possible that active coping behaviors may be associated with exacerbation of these physical symptoms. It is less likely that the current results are explained by differences in psychological QOL given the scarcity of differences found in our study (Table 3) as well as existing QOL literature in this population [13].

In summary, results of this study indicate that coping is related to psychological QOL and that the relationship between coping and physical QOL in patients awaiting lung transplantation is moderated by native lung disease. These findings may have important implications for the management of patients with end-stage lung disease (ESLD), who comprise a pathophysiologically and demographically heterogeneous population. Specifically, psychosocial interventions among patients with ESLD may benefit from selecting treatment targets specific to native disease classifications. Future studies should investigate the relationship between coping, native disease, and QOL prospectively in order to determine their causal relationship and identify additional opportunities for intervention.

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Active Coping and Psychological QOL

$$r = .42, P < .0001$$

Figure 1.

The Active Coping factor was comprised of the planning, suppression of competing activities, seeking emotional social support, seeking instrumental social support, positive reinterpretation and growth, and active coping subscales from the COPE Inventory. In the plot above, a unit-weighted composite measure of psychological QOL was created by standardizing and summing scores from the GHQ, PSSS, PSS, T-STAI, S-STAI, BDI, SF-36 Psychological QOL, and PQLS Psychological QOL for each individual. Scores were adjusted for income, psychiatric medication usage, education, race, current or previous psychological treatment, and six minute walk test.

Disengagement and Psychological QOL

$$r = -.52, P < .0001$$

Figure 2.

The Disengagement factor was comprised of the mental disengagement, behavioral disengagement, venting of negative emotions, and denial subscales from the COPE inventory. In the plot above, a unit-weighted composite measure of psychological QOL was created by standardizing and summing scores from the GHQ, PSSS, PSS, T-STAI, S-STAI, BDI, SF-36 Psychological QOL, and PQLS Psychological QOL for each individual. Scores were adjusted for income, psychiatric medication usage, education, race, current or previous psychological treatment, and six minute walk test.

Active Coping and Physical QOL

Figure 3.

The Active Coping factor was comprised of the planning, suppression of competing activities, seeking emotional social support, seeking instrumental social support, positive reinterpretation and growth, and active coping subscales from the COPE inventory. In the plot above, a unit-weighted composite measure of physical QOL was created by standardizing and summing scores from the SOBQ, PQLS Physical QOL, and the SF-36 Physical QOL for each individual. Scores were adjusted for income, psychiatric medication usage, education, race, current or previous psychological treatment, and six minute walk test.

Table I

Patient Characteristics

Variable	CF (N=48)	COPD (N=139)	Total (N=187)
Age (years), <i>mean (SE)</i>	30.9 (8.7)	57.2 (5.1)	50.4 (0.96) *
Male, <i>N (%)</i>	16 (33.3)	67 (48.2)	83 (44.4)
Caucasian, <i>N (%)</i>	45 (93.8)	128 (92.1)	173 (92.5)
Education > HS, <i>N (%)</i>	38 (79.2)	69 (49.6)	107 (57.2) *
Annual Income > \$60K, <i>N (%)</i>	7 (16.3)	26 (19.7)	33 (18.9)
pO ₂ [†] (mm Hg), <i>mean (SE)</i>	63 (12)	62 (12)	63 (0.70)
pCO ₂ [†] (mm Hg), <i>mean (SE)</i>	41 (7)	46 (10.2)	44.0 (0.60) *
FEV ₁ [†] (L), <i>mean (SE)</i>	0.85 (0.275)	0.58 (0.22)	0.62 (0.02) *
6 minute walk [†] (ft), <i>mean (SE)</i>	1350 (389.5)	950 (400)	1022 (27.0) *
Married, <i>N (%)</i>	17 (35.4)	98 (70.5)	115 (61.5) *
On O ₂ , <i>N (%)</i>	2 (4.6)	15 (11.4)	17 (9.7)

* CF significantly different than COPD at p .01. pO₂ = partial pressure of oxygen; pCO₂ = partial pressure of carbon dioxide; FEV₁= forced expiratory volume in 1 second.

[†] Values given as median (interquartile range).

Table II

Factor Loadings for COPE Subscales

COPE Subscale	Active Coping	Disengagement
Planning	.74 *	-.20
Active	.71 *	-.08
Seeking Instrumental	.71 *	.15
Growth	.70 *	.00
Seeking Emotional	.63 *	.28
Suppressing	.50 *	.13
Acceptance	.38	.11
Restraint	.36	.13
Humor	.29	.20
Religion	.21	.11
Behavioral Disengagement	-.36	.57 *
Mental Disengagement	-.33	.40 *
Denial	.23	.52 *
Venting	.04	.47 *
Substance Abuse	-.19	.26

* Loadings (≥ 0.40) are denoted with an asterisk.

Table III

Coping, Native Disease, and QOL: Unstandardized linear regression weights.

Outcome	Predictor variable		
	Active Coping	Disengagement	Native Disease
<i>Psychological QOL</i>			
BDI [†]	−0.53 **	1.43 **	1.44
SF36-PSY	0.34 **	−0.92 **	0.35
PQLS-PSY [†]	−0.05 **	0.16 **	0.33 *
STAI-S [†]	−0.65 **	2.36 **	4.43 *
STAI-T [†]	−0.79 **	2.39 **	0.89
Stress [†]	−0.66 **	1.68 **	−0.28
Social Support	0.97 **	−0.28	0.43
GHQ [†]	−1.46 **	4.73 **	−5.21
<i>Physical QOL</i>			
SOBQ [†]	−0.61	1.30 *	15.15 **
PQLS-PHYS [†]	−0.02	0.01	0.50 **
SF36-PHYS	0.07	−0.01	−3.03 **

[†]Higher scores correspond to lower QOL.

Note. Each row represents a separate linear model with the dependent variable shown in the first column and the predictors in the remaining columns.

Adjusted for income, psychiatric medication, education, race, current or previous psychological treatment, and six minute walk test.

* P .05

** P .01

Table IV

Native Disease and QOL.

Outcome	CF	COPD	Total
<i>Psychological QOL</i>			
BDI [†]	11.0 (6.5)	12.2 (8.1)	11.9 (7.7)
SF36-PSY	23.4 (4.0)	23.4 (4.6)	23.4 (4.4)
PQLS-PSY [†]	2.2 (0.8)	2.5 (.9)	2.5 (0.9) [*]
STAI-S [†]	35.0 (8.8)	38.1 (12.4)	37.3 (11.7)
STAI-T [†]	37.8 (8.5)	38.1 (10.9)	38.0 (10.3)
Stress [†]	20.8 (7.2)	20.1 (8.5)	20.3 (8.2)
Social Support	72.7 (11.8)	72.7 (12.4)	72.7 (11.9)
GHQ [†]	51.9 (20.8)	47.5 (23.3)	48.6 (22.7)
<i>Physical QOL</i>			
SOBQ [†]	49.2 (19.2)	71.3 (18.2)	65.6 (20.8) ^{**}
PQLS-PHYS [†]	3.8 (0.9)	4.3 (0.9)	4.2 (0.9) ^{**}
SF36-PHYS	18.5 (4.8)	14.0 (3.4)	15.2 (4.2) ^{**}

[†] Higher scores correspond to lower QOL.

^{*} P .05

^{**} P .01