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## The Role of Social Support in Anxiety for Persons with COPD

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### Abstract

**Objective**—This study examined the contribution of perceived social support to the presence of anxiety in persons with Chronic Obstructive Pulmonary Disease (COPD).

**Methods**—A cross-sectional survey sample of 452 persons with COPD (61.3% female; 53.5% older than 65; 70.8% without a college degree or higher educational achievement, and 54.8% with household income of \$40,000 or less) completed a telephone survey. Measures included the Anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A), 5 social support subscales from the Positive and Negative Social Exchanges (PANSE) Scale, a COPD Severity Score (CSS; a weighted algorithmic combination of symptoms and the need for various COPD medical interventions), and the Geriatric Depression Scale, Short Form (GDS-SF). Zero order correlations and a series of multiple regression analyses were calculated.

**Results**—Multiple regression analysis revealed that the receipt of instrumental support, feeling let down by the failure of others to provide needed help, and unsympathetic or insensitive behavior from others each positively predicted a higher level of patient anxiety in COPD patients, after controlling for demographic variables, smoking status, comorbid depression (GDS) and severity of illness (CSS). Additionally, the control variable of depression was the strongest predictor of anxiety, suggesting a high degree of co-morbidity in this sample.

**Conclusion**—Anxiety and depression are serious co-morbid mental health concerns for persons with COPD. It is important to examine both positive and negative aspects of perceived social support for COPD patients and how they may impact or interact with these mental health concerns.

### Keywords

Adult; COPD; Depression; Psychological factors; Respiratory disease; Social support

### Introduction

Chronic Obstructive Pulmonary Disease (COPD) is characterized by dyspnea (breathlessness), coughing, the production of sputum, and often irreversible impairment in lung functioning and has significant implications for both morbidity and mortality [1–2]. In the United States, COPD mortality rates doubled between 1970 and 2002 and of the five leading causes of death, only COPD has shown mortality increases since 1970 [3]. It is

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expected to become the third leading cause of death in the United States by 2020 [3]. Both physical and psychological morbidity are pronounced in this disease, and COPD is associated with extensive functional limitations, multiple co-morbidities, and reduction in quality of life [1,4,5].

Research suggests that COPD may also be related to serious psychological morbidity in the form of anxiety and depression [6]. Anxiety disorders occur more frequently in COPD patients than in the general public [7], however, documented prevalence estimates of anxiety symptoms have varied greatly (from 6%–74%) as a function of study sites, methodologies, and diagnostic instruments [8–10]. Anxiety in persons with COPD has important implications for physical health, and has been found to be related to poorer health outcomes and a higher risk of disease worsening over time [11]. Depression is also common [10,12,13]. Anxiety and depression have been observed to be associated with breathlessness and other illness-related challenges to patients' quality-of-life [14–16]. There is strong evidence that persons with COPD who have comorbid anxiety or depression are at risk for worse health outcomes, greater functional impairment, and greater risk of disease exacerbation than those who do not [11,17–19]. Despite their high comorbidity and relationship to both disability [20] and poorer quality of life [21], anxiety and depression appear to be underdiagnosed and ineffectively managed in the clinical care of COPD patients [6,12, 22]. Furthermore, the well-established comorbidity of depression and anxiety, both in the general population [23] and in COPD specifically [12,20,24] suggests the need to examine the role of both of these psychological factors in COPD outcomes.

There is strong evidence suggesting that psychosocial resources, in the form of social support, may play an important role in managing and slowing the progression of a variety of chronic degenerative diseases [25, 26]. A central element of social support is social interactions (also referred to as social exchanges [27]) which are the interpersonal exchanges we have with others that are meaningful to us in some way. In this paper we use social exchanges, social interactions, and social support interchangeably. Research has demonstrated that the perceived receipt of social support is associated with better mental health in other chronic illness such as rheumatic disease [28]. In persons with COPD, receiving positive social support is associated with reduced hospitalizations and fewer acute disease exacerbations [29], better health status [30], and better health promotion and disease management behaviors such as smoking cessation [31] and engaging in physical exercise [32]. For example, there is also evidence that the number of people in the COPD patient's social support network has important implications for health outcomes [33]. The perceived quality of social support is likely relevant as well; and, as Revenson (1991) has noted, social support can have both negative and positive aspects [34]. A limited amount of research, however, has addressed the potential roles of *both* positive and negative aspects of social support in understanding the experience of anxiety among patients with COPD. Indeed research suggests that for older adults, negative interactions with others may actually be more influential than positive interactions [35, 36], however, it is often overlooked in research on older adults in general [37]. In a cohort of COPD patients anxiety and depression were both inversely associated with positive social support, while negative aspects of social support (i.e. negative social interactions) were associated with increased levels of depression and anxiety [38]. Research on these issues, while still in its early stages, has important potential implications. For example, if increased positive social support is found to be related to reduced anxiety, and negative social support related to increased anxiety, therapeutic interventions to increase positive and reduce negative social support for COPD patients might ultimately reduce their anxiety and improve their health outcomes.

The goal of the present study is to examine the contribution of various forms of both negative and positive perceived social support to the experience of anxiety in a cohort of

older adults reporting a physician's diagnosis of COPD. Specifically, this research addresses the degree to which positive and negative aspects of social support differentially affect anxiety in COPD patients, controlling for potential covariates including demographic characteristics, smoking status, illness severity, and patient depression.

## Method

### Subjects

The present analysis utilizes data from a population-based cohort of U.S. adults with obstructive airway disease. Subjects were initially identified by random digit dialing (RDD) and invited to participate if they were aged 55–75 years at the time of recruitment and reported having received a physician's diagnosis of asthma, chronic bronchitis, emphysema or COPD. The initial sample was recruited with random digit dialing of residents in the 48 contiguous states and was comprised of 383 adults aged 55 to 75 years reporting a physician's diagnosis of COPD. Supplemental recruitment was also done via random digit dialing, but was geographically limited to residents of Northern California, and comprised 70% of the final sample reported on here (total  $n=452$ ). Sampling methods for this cohort are described previously [39,40]

### Procedure

Structured telephone interviews were conducted by trained telephone survey interviewers using computer-assisted telephone interviewing (CATI) software. Subjects were asked about demographic characteristics, utilization of health care, medication use, respiratory symptoms, use of supplemental oxygen, symptoms and experience of anxiety, symptoms of depression, and availability and quality of social interactions. This study was approved by the University of California, San Francisco's Committee on Human Research.

### Measures

**Anxiety**—The Anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A) is a 7-item self-report measure of one's experience, over the past week, of anxiety symptoms, including feeling tense, frightened, restless, panicked, and unable to relax [41]. This scale is recommended as a screening tool for anxiety in COPD patients [6,42] and is commonly used in COPD research [7,43,44,45]. The possible score range is 0 to 21. Internal consistency of the HADS Anxiety subscale in this study was high (Cronbach's  $\alpha=.83$ ).

**Depression**—Depressive symptoms were measured with the 15-item Geriatric Depression Scale, Short Form (GDS-SF), a brief self-report questionnaire [46]. The GDS, from which the GDS-SF is derived, is particularly appropriate for an older COPD sample because it addresses the non-somatic symptoms of depression, thus minimizing confounding by illness severity, comorbidities, or sequelae of the natural processes of aging, such as fatigue [47]. This measure has been recommended as an appropriate screening measure for depressive symptoms in COPD patients [6] and has been found to be sensitive to detect diagnosis of Major Depressive Disorder in this population [48]. The possible score range is 0–15 with higher scores indicating greater levels of depression. Internal consistency of items on the GDS-SF was high (Cronbach's  $\alpha=.86$ ) for this cohort.

**Illness severity**—Illness severity was assessed with the COPD Severity Score (CSS) [49]. This scale was developed using subjects from an earlier wave of data collection, and has also been validated with other cohorts of COPD patients not related to this sample [50,51]. This self-report measure uses a weighted algorithmic combination of several aspects of disease severity including recent symptoms, systemic corticosteroid use, other COPD medication use, previous hospitalization or intubation, and home oxygen use. The possible

score range is 0 to 35, with higher scores indicating greater illness severity. A Cronbach's alpha coefficient of 0.80 has been reported for this scale [49].

**Social support**—The following subscales of the Positive and Negative Social Exchanges (PANSE) scale [35] were utilized: instrumental support, emotional support, companionship, failure to provide needed help, and unsympathetic or insensitive behavior. This scale was developed for use with older adults and addresses several aspects of both positive (p) and negative (n) domains of social exchanges [27,35]. These subscales were looked at individually in order to assess the unique contributions of each type of social support to anxiety. Positive social exchanges were measured with the following subscales: instrumental support (others do things for you, provide aid, and help with something when you needed assistance) ( $\alpha=.80$ ), emotional support (others are considerate towards you, cheer you up, and discuss concerns with you) (Cronbach's  $\alpha= .64$  in this cohort), and companionship (others provided companionship, do social/recreational activities, and include you in activities) ( $\alpha=.80$ ). Two subscales of negative social exchanges were also measured: failure to provide needed help (others do not help you when you need them, rely on you more than you would like/ask you for “too much help”, and let you down when you needed them), ( $\alpha=.67$ ), and unsympathetic or insensitive behavior (others exclude you from valued activities, forget/ignore you, do not spend enough time with you) ( $\alpha=.81$ ). The possible score range for each subscale is 0–4, with higher scores indicating greater experience of that type of social support in interactions with others over the past month.

**Covariates**—Several variables were also included as covariates. Demographic characteristics include: age (<66 vs. 66), education (high school graduation only vs. higher educational achievement), and annual household income (under \$40,000 vs. \$40,000). Smoking status (never or former smoker vs. current smoker) was also included in modeling with the former two categories treated as indicator variables relative to currently smoking.

### Statistical Analyses

All analyses were completed using SPSS, version 19.0. Descriptive statistics and bivariate correlations were calculated. Several multiple regression analyses were computed in order to assess which aspects of social support best predicted anxiety in COPD patients when controlling for the following covariates: patient demographics, smoking status, comorbid depression, and illness severity. First, five multiple regression models were fit, in order to determine the behavior of each social support variable in the presence of the covariates, but independent of the other forms of social support. An additional regression analysis predicting anxiety was fit with all five social support subscales entered simultaneously. Only demographic variables with significant zero-order correlations with anxiety were included; thus, covariates in regression models were age, education, income, smoking status, illness severity, and depressive symptom score. Collinearity among predictors was also considered.

### Results

Most subjects were female (61.3%), older than 65 (53.5%), and without a college degree (70.8%); they had a median annual household income of \$40,000 or less (54.8%). Basic statistics for all measures, including sociodemographic characteristics of participants, are reported in Table 1.

Bivariate Pearson regression coefficients were calculated in order to assess for relationships among variables and are reported in Table 2. The three positive forms of social support (Instrumental Support, Emotional Support, and Companionship) were highly correlated, with Pearson correlations ranging from .33 to .51. The two negative subscales (Failure to

Help, and Unsympathetic/Insensitive Behavior) were highly correlated with each other at .65, suggesting a high degree of intercorrelation for negative social support. Positive social support subscales and negative social support scales were consistently inversely correlated, such that greater levels of positive forms of social support were associated with lower levels of negative social support and vice versa, with coefficients ranging from  $-.11$  to  $-.46$ . Anxiety was significantly associated with depressive symptom scores ( $r = .63$ ). Although several predictor variables had high intercorrelations, examination of the Tolerance value and Variance Inflation Factor (VIF) indicated that predictors were not collinear.

Results from all regression analyses are presented in Table 3. In the five separate regression models (covariates plus one social support subscale at a time), only instrumental support ( $B=.47, p<.01$ ), unsympathetic support ( $B=.88, p<.001$ ), and failure to provide needed help ( $B=.98, p<.001$ ) were significant predictors of anxiety. In other words, for an approximately one unit increase in a participant's score on failure to provide help subscale (indicating a greater perceived failure of someone to provide them with needed help), there was a corresponding one unit increase in anxiety. These findings were consistent for the analysis that included all covariate variables and all five social support predictors entered simultaneously. For this analysis, the overall model was significant [ $F(11, 418) = 34.9, p<.001, R^2_{adj}=.47$ ]. Even after additionally controlling for all social support variables, these three types of social support remained as significant predictors of higher anxiety: higher instrumental support ( $B=.56, p<.05$ ), more unsympathetic/insensitive behavior by others ( $B=.49, p<.05$ ), and the greater tendency by the social network to fail to provide needed help ( $B=.68, p<.05$ ). Thus, findings for social support variables were robust across models with all five social support variables having the same relationship to anxiety independently as they did when entered simultaneously with covariates. Depression was the strongest predictor of patient anxiety in each model (e.g.,  $B=.54, p>.001$  in the combined model). Disease severity did not add uniquely to the prediction of variance in patient anxiety ( $B=-.01, p>.05$ ) after including depression and controlling for age, education, income, and smoking status. Patient smoking status ( $B=.00, p>.05$ ), companionship ( $B=-.16, p>.05$ ) and emotional support ( $B=.03, p>.05$ ) were not significant predictors of anxiety despite their significant zero-order correlations with patient anxiety.

## Discussion

In this study positive and negative social support, defined here as positive and negative social interactions, with others were highly significant predictors of the presence of anxiety in persons with COPD, even after controlling for covariates including disease status, and depression. With no collinearity among social support scales and even when controlling for patients' sociodemographic characteristics, smoking behavior, depression, and severity of illness, three social support scales emerged as significantly related to anxiety. This suggests the central importance of distinct aspects of social support for a broad range of persons with COPD. Both positive and negative aspects of social support emerged as significant and independent predictors of patient anxiety. Two negative aspects of social support- the perceived use of insensitive and unsympathetic responses by social network members, and the perceived tendency of the support network to "let them down" when needed - were associated with greater anxiety in COPD patients. This finding was consistent with other published reports on anxiety and social support in COPD patients [38]. These effects were maintained even after controlling for illness severity and depression. One interpretation would suggest that the perception of unsympathetic and insensitive responses from others and the perception that others let the patient down might contribute to fears of social rejection and isolation, creating sources of anxiety beyond the challenges of severe disease and depression.

One other social support scale predicted anxiety in the present study. Instrumental support, which involves receiving aid or assistance from others, had a positive relationship to anxiety. In patients recovering from myocardial infarction, however, availability of this kind of tangible support was found to be strongly associated with fewer depressive symptoms [52]. In this study, practical support from others may have simply been needed more acutely by more anxious patients who may have had concomitant breathlessness. It is possible, of course, that practical help received from others increased patients' anxiety by making salient their needs and dependence on others. Other factors like the type of relationship (i.e. spouse/partner, friend, extended family, coworker) and quality of the relationship, neither of which were measured here, may also influence how the support or interaction is received by the COPD patient. For example, interactions where tangible support is received from a colleague may increase a COPD patient's anxiety while receiving this kind of tangible support from a partner may actually be comforting, thereby reducing anxiety. The quality of the relationship may also influence the experience of the interaction. In a study of pregnant women, women who rated their partners as more effective at providing needed support reported reduced anxiety in pregnancy [53]. Additionally personal factors such as personality structure, cultural values, and sex may influence how social support is received [37].

Depression was the strongest independent predictor of anxiety in this study, which is consistent with other findings on the high comorbidity of depression and anxiety in the general public [54] and in COPD specifically [21]. The nature of the relationship between depression and anxiety in chronic lung disease remains unclear. Future research should look to theoretical models (such as the tripartite model [55]) to examine symptom overlap between anxiety, depression, and obstructive lung disease (breathlessness, etc.).

The perceived receipt of emotional support and companionship was not found to be related to anxiety in this study. These findings are consistent with earlier research showing that unsupportive or negative social interactions (such as unsympathetic responses and being let-down, measured here) can actually be even more harmful than positive social interactions can be helpful. Research on older adults offers a growing body of evidence for this "negativity effect" [35,36,37]. In geriatric populations, negative interactions are more strongly negatively associated with psychological well-being than positive interactions are positively associated with psychological well-being [35]. In other research, higher levels of stable negative social exchanges predicted lower self-rated health, greater functional limitations, and more health problems over two years (even after controlling for potential confounding variables including initial health and sociodemographic variables) [56]. Another longitudinal study on relationships among older adults suggests that while positive social interactions tend to have an immediate and positive effect on an individual's feelings and predict positive emotional affect, it is *negative* social interactions that have longer lasting effects on both positive and negative emotional affect [27].

The present study is cross-sectional, and these correlational data present challenges to causal interpretations of the findings. While others' insensitivity and failure to help may cause patient anxiety, for example, it is equally plausible that patient anxiety drives others to be insensitive and unsympathetic, and causes them to fail to be helpful when they are really needed. It is also possible that increased levels of anxiety cause patients to have increased sensitivity to possible rejection, raising their self-reports of problematic social interactions. Likewise, a positive relationship between anxiety and instrumental support, usually considered a type of positive social support, may suggest that having others provide aid and assistance increases rather than decreases anxiety. On the other hand, greater anxiety might cause an individual to require more instrumental assistance from others, perhaps because of the increased breathlessness that can accompany anxiety.

This research utilized a large sample of patients with COPD. Patients' functional limitations can make it difficult and expensive to include them in cohort studies, but in the present work, telephone survey methodologies were used. While telephone surveys have their own limitations [57], the present approach allowed the administration of reliable and well-validated psychological measures in the study of patients with serious and limiting disease. Additionally, not all subjects were at the same stage in their diagnosis: it may be that newly diagnosed COPD patients are more susceptible to the effects of positive or negative social support. Further, the measures (including anxiety, depression, and social support) involve self-report rather than clinical assessment and/or observational/collateral reports; social support was assessed in terms of patients' perceptions of support over the previous month. While such limitations are common to research in this area in general [14], future work should offer additional methodologies to expand beyond self-report. Finally, because of its cross-sectional nature, this research offers limited causal inference, and would be strengthened with a future longitudinal component. The role of negative social support as a determinant of both mental health and other health outcomes is a fertile area of research in COPD patients, and more research is needed on these mental health outcomes for COPD patients. The present research underscores the importance of examining and understanding the complex role of social support in coping with chronic disease. As Revenson et al. (1991) noted, individuals in a patient's social network are unlikely to be wholly positive or negative in their contribution to the patient: those who engage in positive social exchanges with the patient might also engage in some negative social interactions, and it is the *balance* of these that matters [34].

Future research should address the role of patients' experience of illness and their functional status in contributing to their emotional health and disease adjustment. The relative effects of positive and negative aspects of perceived social support and the causal pathway by which people develop anxiety in COPD are also fertile areas for future research. Additionally, future research should examine the impact of social exchanges from various sources, i.e. from spouses/partners, friends, extended family, or coworkers, and other factors that make the COPD patient vulnerable to negative social exchanges [37]. Despite methodological limitations, these findings offer support for a focus on the interplay of anxiety, social support and morbidity/disease severity in the design of future interventions to improve health, functional status, and emotional health in those with COPD. If the role of social support in patient anxiety continues to be supported in future research, therapeutic interventions should be designed to improve positive, and to reduce negative, social exchanges, toward the goal of decreasing COPD patients' emotional distress and improving their health related quality of life.

The present study suggests several take-away points for researchers and practitioners working with COPD patients. The first is that anxiety and depressive symptoms are highly comorbid for older adults with COPD and evidence of one should suggest a consideration of the other. The second point is that positive and negative forms of social support are associated with anxiety in COPD patients. The final is that both positive *and* negative interactions with others should be considered in the COPD patient's experience.

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**Table 1**

## Participant characteristics (N=452)

	<i>M ± SD</i>	<i>N (%)</i>
Age		
55–60		85 (18.8%)
61–65		123 (27.2%)
66+		242 (53.5%)
Female (%)		277 (61.3%)
Without a college degree or higher (%)		320 (70.8%)
Married or with partner (%)		258 (57.1%)
Household Income of \$40,000 or less		235 (54.8%)
Smoking Status		
Currently smoking		97 (21.5%)
Ever smoked		250 (55.3%)
Never smoked		105 (23.2%)
Geriatric Depression Scale	3.39 ± 3.36	
GDS score > 5		96 (21.2%)
HADS Anxiety Subscale	4.56 ± 3.7	
Possible anxiety (score of 7–10)		71 (16%)
Clinically significant anxiety (score of 11)		29 (6.5%)
COPD Severity Score	7.48 ± 6.32	
Social Support		
Companionship	2.68 ± .82	
Emotional Support	2.55 ± .79	
Failure to Provide Help	.80 ± .79	
Unsympathetic/Insensitive Beh.	.69 ± .83	
Instrumental Support	2.11 ± 1	

Table 2

Bivariate Pearson correlations of dependent and independent variables

	HADS	GDS	COPD Severity Score	Instrumental Support	Emotional Support	Companion-ship	Failure to Help
GDS	.63**	-					
COPD Severity Score	.27**	.44**	-				
Instrumental Support	.17**	.10*	.16*	-			
Emotional Support	-.03	-.11	.05	.51**	-		
Companion-ship	-.31**	-.43**	-.12*	.33**	.48**	-	
Failure to Help	.39**	.28**	.10*	-.01	-.11*	-.26**	-
Unsympathetic/Insensitive Beh.	.45**	.43**	.14**	-.08	-.19**	-.46**	.65**

Note. Abbreviations: HADS= Anxiety subscale of the Hospital Anxiety and Depression Scale; GDS= Geriatric Depression Scale- Short Form.

\* p<0.05 level (2-tailed)

\*\* p<.01 (2-tailed)

**Table 3**

Hierarchical regression model: predicting anxiety

Model		B
1	Instrumental Support	.47**
2	Emotional Support	.19
3	Companionship	-.13
4	Unsympathetic Support	.88***
5	Failure to Help	.98***
6	Instrumental Support	.56**
	Emotional Support	.03
	Companionship	-.16
	Unsympathetic Support	.49*
	Failure to Help	.68**

\*  
p<.05,\*\*  
p<.01,\*\*\*  
p>.001

Models 1–5: One social support scale was entered per model. Covariates were respondent age, education, income, smoking status, depression, and illness severity.

Model 6: Combined model: All social support scales entered into a single regression model. Covariates were respondent age, education, income, smoking status, depression, and illness severity.