

Impact of social support and self-efficacy on functioning in depressed older adults with chronic obstructive pulmonary disease

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Objective: The objective of this study was to examine the association between social support, self-efficacy, and functioning among a sample of depressed older adults with chronic obstructive pulmonary disease (COPD).

Methods: Participants were recruited immediately following admission to an acute pulmonary rehabilitation unit of a rehabilitation hospital. One hundred and fifty-six subjects completed assessments of depression, functioning, social support, and self-efficacy at admission to the rehabilitation unit. Regression analyses were conducted to evaluate the impact of different aspects of social support and self-efficacy on overall functioning at admission.

Results: Controlling for depression, COPD severity, and age, subjective social support ($p = 0.05$) and self-efficacy ($p < 0.01$) were associated with overall functioning.

Conclusion: The perception of social support as well as self-efficacy are important constructs related to overall functioning among depressed older adults with COPD. Attention to these psychosocial variables in health management interventions may help maintain or improve the overall functioning of depressed COPD patients.

Keywords: COPD, depression, social support, self-efficacy, functioning

Introduction

Chronic obstructive pulmonary disease (COPD), refers to a group of diseases that cause airflow limitation and respiration-related problems. It includes emphysema, chronic bronchitis, and in some cases asthma. COPD is a leading cause of death, illness, and disability in the United States. COPD afflicts approximately 17% of men and 13% of women and is a major contributor to disability (ACCP/AACVPR 1997). In 2000, 119,000 deaths, 726,000 hospitalizations, and 1.5 million hospital emergency room visits were caused by COPD (CDCP 2007). COPD is a disabling illness with a deteriorating course that requires the implementation of a structured and demanding treatment regimen, and significant effort and tenacity on the part of patients. Treatment options usually include a combination of medication, oxygen therapy, and lifestyle changes including smoking cessation. There is no cure for COPD. Treatments are designed to slow decline, decrease disability, and maintain level of overall functioning.

Depression and its associated symptoms of anhedonia, helplessness, and hopelessness can further compromise an individual's participation in the treatment regimen required of COPD patients. Depression is the most common psychiatric disorder in adults with COPD. More than 25% of persons with COPD have depressive disorders (Borson et al 1998). In our own sample of adults with COPD who are admitted for pulmonary rehabilitation, 27% of those adults meet criteria for major depression (Alexopoulos and Latoussakis 2004).

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Depression worsens the outcomes of many medical disorders and increases the risk for falls (Sheeran et al 2004), suicide (Alexopoulos et al 2002; Blazer 2003), and nonsuicide mortality (Bruce and Leaf 1989; Bruce et al 1994; Gallo et al 2007). Comorbid depressive symptoms in patients with COPD have been found to be associated with poorer survival, longer hospitalization stay, increased symptom burden, and poorer physical and social functioning (Ng et al 2007).

Among individuals with depression, a number of psychosocial factors can further affect adjustment to COPD and adherence to the complex medical regimens designed to slow decline, decrease disability, and maintain level of functioning. These factors include level of social support and self-efficacy, or one's perception in their ability to overcome specific challenges (Smith et al 2000; Airlie et al 2001).

There is a large body of evidence that documents the benefits of social support in patient recovery of both minor and major depression (Alexopoulos et al 1996; Hybel et al 2005; Nasser et al 2005; Lyness et al 2006) and improved health-promoting behaviors (Cohen 1988). Social support may contribute to a sense of acceptance that leads to an increase in self-esteem through the stability, predictability, and control that it provides (Cohen and Syme 1985; Rutter 1987). Self-efficacy has also been found to affect mental well-being and functioning through the individuals' belief in his or her ability to overcome specific challenges (Bandura 1997). There is evidence that self-efficacy plays an important role in improving exercise adherence in the COPD population (Davis et al 2006). Among various groups of chronically ill individuals, psychosocial factors including social support and self-efficacy have been found to affect overall functioning (Uchino et al 1996).

In this article, we investigate the impact of different dimensions of social support and self-efficacy on the overall functioning of depressed patients with COPD. We hypothesize that the benefits of both social support and self-efficacy will be evident regardless of age, depression severity, and physical health. In addition, we hypothesize that subjective social support will be a stronger predictor of overall functioning than other more objective dimensions of social support. We further examine whether the relationships of social support, self-efficacy, and overall functioning are moderated by age and severity of COPD.

Methods

Participants were consecutively admitted patients to the acute pulmonary rehabilitation unit of the Burke Rehabilitation Hospital, a university-affiliated hospital, and were recruited April 2002 to September 2007.

Participants who had the diagnosis of COPD, met Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for unipolar major depressive disorder (MDD), and had a score of 17 or greater on the 24-item Hamilton Depression Rating Scale (HAM-D) were invited to take part in the study. The study received full review and approval from the Institutional Review Board of Weill Medical College of Cornell University and Burke Rehabilitation Hospital. All study participants provided signed informed consent.

Assessments

Depression symptoms, overall functioning, medical burden, pulmonary functioning, self-efficacy, and social support were assessed within 1–2 days of admission to the acute pulmonary rehabilitation unit of the Burke Rehabilitation Hospital. Assessments were administered by college graduates and masters-level research assistants who were trained and supervised by a study psychologist.

Depression symptoms were measured by the 24-item Hamilton Depression Rating Scale (HDRS) (Hamilton 1960). Based on joint independent ratings of 23 subjects the inter-rater reliability of assessors was 0.81 for the HDRS. Reliability was monitored regularly to prevent drift. The Duke Social Support Inventory (DSSI) was used to measure four dimensions of social support: network size, social interaction frequency, instrumental support, and subjective support (George et al 1989). Social network is defined as the number of individuals in the respondent's network. Social interaction is a measure of the frequency of the respondent's interaction with members of the support network. Instrumental support measures the tangible services that the respondent receives from network members. Subjective social support measures the respondent's perceptions of his/her inclusion as a valued and useful member of a social network; whether the network would provide help and support if needed; and general satisfaction with the quantity and quality of social support available. Self-efficacy was assessed using the Liverpoole Self-Efficacy Scale, an 11-item scale consisting of two domains: 1) control or sense of mastery; and 2) personal agency or ability to achieve desired outcomes (Airlie et al 2001).

Functioning was assessed with the 12-item World Health Organization Disability Assessment Schedule II (WHODAS II) (Epping-Jordan and Üstün 2000). The WHODAS II form is compatible with the international classification system of disability, is cross-culturally applicable, and treats all disorders at parity when determining level of

overall functioning. The WHODAS II assess functioning in six domains: 1) understanding and communicating, 2) getting around, 3) self-care, 4) getting along with others, 5) household and work activities, and 6) participation in society in addition to overall functioning as defined by the total WHODAS II score. Medical burden was quantified with the Charlson Comorbidity Index (CCI) (Charlson et al 1987). Functional status was assessed using the Pulmonary Functional Status and Dyspnea Questionnaire (PFSDQM), which measures dyspnea, fatigue, and changes in activities associated with key activities of interest in patients with pulmonary disease (Lareau et al 1998).

Analysis

The relationships between predictor variables (social support and self-efficacy) and the outcome of overall functioning variable (as defined by the WHODAS II total score) were first considered using linear regression analyses. Overall functioning is a continuous outcome variable ranging from 22 to 59 where lower scores indicate better overall functioning. A regression analysis was conducted for all independent variables that were significantly related to overall functioning. Age, severity of COPD as defined by pulmonary functioning, and depression severity were used as control variables in the final regression analysis. In supplementary analyses, we used a median split to dichotomize overall functioning to indicate better versus poorer overall functioning. This analysis was conducted to describe the clinical impact of the findings. Additional analyses were conducted to examine interaction effects of depression severity, age, and severity of COPD with significant predictor variables in order to test moderation effects.

Results

Two hundred twenty-four subjects met study criteria and were approached to take part in the study. One hundred and fifty-six subjects (69.6%) completed data for baseline assessment. Of those who did not participate 44% refused participation, 25% were too medically ill to participate, and 31% were excluded for either cognitive impairment or other psychiatric illnesses. The one hundred and fifty-six subjects who completed baseline ranged in age from 51–92 (mean = 71.3, SD, 8.7), with 75% being ≥ 65 years of age. The mean HDRS score at baseline was 24.7 (SD = 3.8), indicating that many participants had moderate to severe depression. Sixty-seven percent were female. Their mean education was 13.2 years (SD = 3.2); 87.9% were white; 3.9% were of Hispanic decent, and 37.8% were married (Table 1).

Table 1 Demographic and clinical characteristics of the total sample

	M	SD	%
Hamilton Depression Rating Scale	24.7	3.8	
Subjective social support	18.4	2.5	
Social network size	4.7	4.2	
Instrumental social support	9.0	2.3	
WHODAS total score	37.4	6.5	
Self-efficacy	14.5	2.5	
Dyspnea total	156.4	54.9	
Gender			
Male			32.7
Female			67.3
Current marital status			
Married			37.8
Widowed, separated, or divorced			51.9
Single			10.3
Race			
Caucasian			96.2
Black/African American			3.8
Education			
High school graduate or less			52.6
Some college			18.8
College graduate			28.6

Relationship between predictor variables and overall functioning

In preliminary regression models, social network size ($p < 0.005$), instrumental support ($p < 0.006$), and subjective social support ($p < 0.001$) predicted overall functioning as defined by the total WHODAS II score. Social interaction frequency was not significantly related to overall functioning. Higher scores on the control domain of self-efficacy ($p < 0.003$) predicted overall functioning. Depression as indicated by higher scores on the HDRS ($p < 0.001$) was also found to be related to overall functioning. Subsequent analysis adding self-efficacy and social support variables while controlling for age, COPD severity as indicated by pulmonary functioning, and depression severity found both subjective support and the control domain of self-efficacy to independently predict overall functioning (Table 2). In a supplementary analysis using a binary outcome of overall functioning, the results were replicated. Greater subjective social support (OR = 0.93, $p = 0.014$) and greater self-efficacy (OR = 0.79, $p = 0.022$) were independently associated with better overall functioning.

Table 2 Cross-sectional model of psychosocial variables and overall functioning

Variables	Unstandardized coefficients		t	Sig.
	B	Std. error		
Age	-0.051	0.053	-0.948	0.346
Pulmonary function - Dyspnea	0.009	0.009	0.985	0.327
Depression severity (HDRS score)	0.509	0.122	4.175	0.000
Self-efficacy	-0.533	0.197	-2.700	0.008
Social network size	-0.194	0.109	-1.785	0.077
Subjective social support	-0.371	0.187	-1.982	0.050
Instrumental social support	-0.046	0.216	-0.212	0.833

Note: Dependent variable: Overall functioning (WHODAS total).

To determine whether the predictive power of subjective support and self-efficacy to overall functioning varied according to severity of depression, severity of COPD, or age, we added interaction terms in separate models. No interactions were significant, indicating that both subjective social support and self-efficacy predicted overall functioning regardless of level of depression severity, severity of COPD, and age at initial assessment.

Discussion

The principal finding of this study is that subjective social support, self-efficacy, and depression were related to overall functioning in elderly depressed COPD patients. Both subjective social support and self-efficacy were independently related to overall functioning even in the context of severe medical illness and depression. While our current findings are consistent with research indicating that social support predicts objective health outcomes and disability, even after controlling for demographic variables and COPD (House et al 1988; Kiecolt-Glaser et al 1991), few studies have investigated these relationships in the context COPD and depression. It is striking that among this patient population with severe medical illnesses and comorbid depression, the psychosocial factors of social support and self-efficacy remain related to overall functioning.

A possible explanation for the benefits of subjective social support is that the belief concerning the quality of one's relationships (Lakey and Cassidy 1990), rather than the size of the social network or the amount of information provided by the social network affects outcome. Social support may be related to well-being by providing a sense of predictability and stability in one's life situation (Cohen and Wills 1985).

Additionally, subjective social support may play a role in improving adherence to the often grueling medical regimen faced by COPD patients.

Self-efficacy theory maintains that an individual's sense of personal control and mastery plays an important role in improving overall functioning as well as other aspects of illness management (McCathie et al 2002). This theory is supported by our current findings that indicate the significant role of self-efficacy in overall functioning in a COPD population after controlling for age, illness severity, and depression. Kohler and colleagues (2002) also indicated that in their sample of COPD patients, individuals with low perceived self-efficacy were more limited in functioning than those with equally severe disease but who had higher perceived self-efficacy for carrying out activities.

It is well supported in the literature that the course of disability parallels the course of depression (Von Korff et al 1992; Ormel et al 1993), such that depression and disability interact with each other in a variety of ways creating a spiraling relationship (Bruce 2002). Effective treatment of depression has been found to significantly improve physical functioning in a sample of older adults with major depressive disorder (Callahan et al 2005). Additionally, among an inpatient COPD population the interaction of baseline disability and severity of depression was significantly associated with change in disability at discharge (Alexopoulos et al 2006).

Attention to subjective social support and self-efficacy in health management interventions may help improve or maintain the overall functioning of depressed COPD patients. The relationship between social support and self-efficacy in health management is further supported by the stress-buffering model of social support which, in which the beneficial mechanisms of social support include (a) increasing feelings of self-esteem; (b) increasing control over one's environment; (b) providing information; (c) exerting social norms that encourage adaptive behaviors; and (d) providing tangible aid and resources (Wills 1985; Dinges and Joos 1988). Enhancing social support and self-efficacy has been shown to correlate with improved health-related adherence and quality of life among individuals with chronic medical illnesses (Aalto et al 1997; Simoni et al 2006). Additionally, those with low sense of control and limited social support have been found to be less likely to engage in healthy behaviors (Cardarelli et al 2007).

Our results must be considered in the context of the study limitations. This is a cross sectional study; therefore we are unable to examine predictive qualities of the psychosocial factors and depression on overall functioning. The study

also did not include a comparison group, which would allow us to determine the impact of psychosocial factors among nondepressed individuals or individuals not admitted to pulmonary rehabilitation hospital.

Additionally, the study does not provide a causal pathway between the key predictors of social support, self-efficacy, and depression with functioning. Thus, we are not clear on how these factors affect outcome. Finally, the study also suffered from the limitations of all self-report studies in that the participants' responses may have been influenced by social desirability.

Conclusion

In summary, the current findings indicate that subjective social support, self-efficacy, and depression affect overall functioning among an older adult COPD population. The results also highlight the importance of subjective social support and self-efficacy in the context of improving health management and adherence to the demanding treatment regimen endured by COPD patients in order to maintain or improve overall functioning.

From both the research and clinical perspective, these findings provide strong evidence that interventions targeted at social support, fostering self-efficacy and reducing depression may improve and maintain overall functioning among this chronically ill population. Further research may examine the predictive nature of social support and self-efficacy on the improvement and maintenance of overall functioning, and the causal pathway between these variables.

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