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# EXPLORING BIOPSYCHOSOCIAL (BPS) FACETS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) IN PATIENTS IN AN ACUTE INPATIENT PHYSICAL REHABILITATION FACILITY (IRF)

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EXPLORING BIOPSYCHOSOCIAL (BPS) FACETS OF CHRONIC OBSTRUCTIVE  
PULMONARY DISEASE (COPD) IN PATIENTS IN AN ACUTE INPATIENT  
PHYSICAL REHABILITATION FACILITY (IRF)

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DISSERTATION

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A dissertation submitted in partial fulfillment of the  
requirements for the degree of Doctor of Philosophy in the  
College of Education  
at the University of Kentucky

By  
Ronnetta Williams

Lexington, Kentucky

Director: Dr. Rory Remer, Professor of Counseling Psychology

Lexington, Kentucky

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## ABSTRACT OF DISSERTATION

### EXPLORING BIOPSYCHOSOCIAL (BPS) FACETS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) IN PATIENTS IN AN ACUTE INPATIENT PHYSICAL REHABILITATION FACILITY (IRF)

From a BPS perspective, COPD and other chronic diseases may have a significant negative impact on those living with them and may be associated with higher rates of depression and anxiety and lower levels of health-related quality of life (HRQOL). Certain factors, such as spirituality, may influence the negative impact of chronic disease on the relationship between mood and functional independence and HRQOL. Also, gender may influence the relationship between mood, spirituality, and HRQOL for men and women living with chronic diseases. The current study included 136 patients undergoing physical rehabilitation at an IRF. Anxiety, depression, spirituality, HRQOL, and functional independence were evaluated for all. Mediation models were tested to determine the impact of spirituality on the relationships between mood and HRQOL and functional independence, and moderation models were tested to evaluate the impact of gender on the relationships between mood, spirituality, functional independence, and HRQOL. The current study yielded some inconclusive results but did evidence that COPD patients in acute inpatient physical rehabilitation facilities (IRF) have higher levels of anxiety than patients without COPD and also revealed that men with COPD have better HRQOL than do women with COPD. Spirituality was found to partially mediate the relationship between depression and HRQOL in IRF patients with COPD, but gender did not appear to moderate the relationships between mood, spirituality, functional independence, or HRQOL in IRF patients. As few studies on IRF patients with chronic diseases exist, continuing to evaluate patients in IRFs is important to enhance our BPS understanding of chronic disease.

**KEYWORDS:** Chronic Obstructive Pulmonary Disease (COPD),  
Biopsychosocial (BPS), Health-Related Quality of Life  
(HRQOL), Functional Independence, Gender

Ronnetta Williams  
Student's Signature

September 25<sup>th</sup>, 2013  
Date

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## Dedication

I dedicate my dissertation and career to my sister, Rachel Dillion, who inspired me to become the woman I am today. She had a vivacious spirit and unwavering love for others, and I carry her in my heart every moment of every day. And to my mother, Patty Williams, who always encouraged and believed in me. Thank you for instilling within me the drive to succeed and a desire to be independent. I also dedicate my work and give special thanks to my wonderful husband, Ari Korpelainen, who lovingly and patiently supported and encouraged me to persevere to the end. Your kindness, generosity, optimism and love nourish me endlessly. With you, my life is infinitely richer. Thank you. I love you.

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## **Chapter One: Introduction and Literature Review**

More than 130 million Americans are living with a chronic medical illness (Sarafino & Smith, 2011). Chronic disease, at the core, is a biomedical factor that also impacts individuals at social, spiritual, and psychological levels (chronic disease, chronic conditions, and chronic illness are terms that will be used interchangeably throughout the current document). Chronic diseases have been conceptualized as conditions that last for indefinite periods of time and are characterized as health conditions least likely to have a cure (Martz & Livneh, 2007). Such diseases may reveal themselves over time and present with symptoms that individuals may not always recognize until the illness has advanced. In addition to hereditary factors, chronic illnesses may result from certain personal choices such as a sedentary lifestyle, poor diet, and substance use or abuse.

The Centers for Disease Control and Prevention (CDC, 2013) identify chronic diseases such as heart disease, cancer, and chronic lower respiratory diseases as being the leading causes of death and disability in the United States. The CDC also recognizes that chronic diseases cause 7 out of 10 deaths in Americans annually. Chronic conditions, according to the CDC and American Psychological Association, pose major limitations for those living with them; limitations may be physical, emotional, and social in nature (Dorlen, 2013). Coping with a chronic disease may be emotionally overwhelming and frightening, potentially impacting quality of life (QOL). Without adequate support and treatment, individuals with chronic illnesses may experience life-altering debilitation.

The chronic disease of focus in the current study is chronic obstructive pulmonary disease (COPD). COPD is a progressive lung condition and is medically characterized by the production of excess sputum, restricted airflow to and from the lungs, and a chronic cough. Many researchers and healthcare professionals recognize COPD as a

medical condition; COPD, however, also impacts individuals socially, psychologically, and spiritually (Burker, Evon, Sedway, & Egan, 2004; Wagena, Arrindell, Wouters, & Van Schayck, 2005). The focus of the current study is on evaluating the relationship between COPD, mood, spirituality, health-related quality of life (HRQOL), and overall function in men and women in an acute physical rehabilitation program, which is essential to guide treatment and develop a comprehensive understanding of the disease process. Knowledge gained from the current study may illustrate the different ways patients experience COPD in a particular type of healthcare setting. Capturing the nature of the relationship between these biopsychosocial (BPS) facets (biological, psychological, sociological, and spiritual) while patients are undergoing inpatient physical rehabilitative treatment is important to determining whether focusing interventions during this point of disease recovery and treatment is beneficial and may further highlight the advantages of such treatment programs.

### **Statement of the Problem**

Current literature on COPD is vast and focuses on aspects of the disease such as the biological disease process, emotional experience, physical impact, and treatment. Most researchers recognize the fact that COPD greatly impacts various aspects of life such as mood, physical function, and social involvement (Aydin & Ulussahin, 2001; Brenes, 2003; Craig & Van Nutta, 1983; Dahlen & Jansen, 2002; Felker et al., 2001; Kim et al., 2000; Kunik et al., 2005; McSweeny, Grant, Heaton, Adams, & Timms, 1982; Prigatano, Wright, & Levin, 1984; Schrier, Dekker, Kaptein, & Dijkman, 1990; Yohannes, Baldwin, & Connolly, 2000) and have evaluated the patient experience of COPD in community, acute medical, or outpatient settings (Cully et al., 2006; Ferrer et

al., 1997; Kunik et al., 2005; Ng et al., 2007; Osman, Godden, Friend, Legge, & Douglas, 1997; Stage, Middleboe, & Pisinger, 2005; Yohannes, Roomi, Baldwin, & Connolly, 1998; Yohannes et al., 2000). Little research, however, has been conducted on the BPS facets of COPD in individuals in acute inpatient rehabilitation facilities (IRFs), and thus, we know very little about the BPS experiences of those with COPD who are engaged in acute inpatient physical rehabilitation programs. The purpose of the current study is to further enhance our understanding of the relationship between BPS facets of COPD and inpatient pulmonary rehabilitation.

### **Purpose of the Current Study**

In the current study, I use the BPS model to examine the relationship between depression, anxiety, spirituality, health related quality of life (HRQOL), functional independence, and gender in patients in an IRF. The BPS model will be more fully explained in the literature review section but is essentially a framework that emphasizes the importance of the interplay between biological, psychological, and sociological factors in the human experience of illness and disease process. Research on the relationship between the previously mentioned variables and IRF patients may aid us in comprehending the emotional process that those living with chronic diseases face and may also add to the knowledge of the disease process itself. By conceptualizing these relationships using the BPS model, we may be able to treat patients appropriately by providing emotional support and, ultimately, assist individuals living with chronic diseases, and specifically COPD, in developing adaptive tools and strategies to cope and improve HRQOL and functional independence throughout the disease process. Furthermore, we may foster health professionals' understanding of the BPS complexities

of chronic diseases, thereby illustrating the importance of psychological intervention during the rehabilitation phase of treatment and attain the goal of improving HRQOL and functional independence for those living with chronic diseases and conditions. As such, several research questions were evaluated in the current study to explore the connections between the aforementioned factors.

### **Research Questions**

The current study addressed the following research questions:

1. How are individuals with COPD in acute IRFs different than IRF patients without COPD in terms of mood, functional independence, and spirituality?
2. How does the HRQOL of women with COPD in acute IRFs differ in comparison to HRQOL of men with COPD in acute IRFs?
3. What is the role of spirituality? Several specific questions are contained within the broader question, including:
  - a. Does spirituality mediate the relationship between anxiety and HRQOL in IRF patients with COPD?
  - b. Does spirituality mediate the relationship between depression and HRQOL in IRF patients with COPD?
  - c. Does spirituality mediate the relationship between anxiety and functional independence in IRF patients? And,
  - d. Does spirituality mediate the relationship between depression and functional independence in IRF patients?
4. What is the impact of gender? Several specific questions are contained within the broader question, including:



- a. Does gender moderate the relationship between anxiety and functional independence in IRF patients with COPD?
- b. Does Gender moderate the relationship between depression and functional independence in IRF patients with COPD?
- c. Does gender moderate the relationship between spirituality and functional independence in IRF patients with COPD?
- d. Does gender moderate the relationship between anxiety and HRQOL in IRF patients with COPD?
- e. Does gender moderate the relationship between depression and HRQOL in IRF patients with COPD?
- f. Does gender moderate the relationship between spirituality and HRQOL in IRF patients with COPD?
- g. Does gender moderate the relationship between anxiety and functional independence in IRF patients?
- h. Does gender moderate the relationship between depression and functional independence in IRF patients? And,
- i. Does gender moderate the relationship between spirituality and functional independence in IRF patients?

A literature review of the aforementioned constructs under investigation in this study follows to provide the current state of research in the area of COPD and the context for the current study.

## **Literature Review**

In the following review, I explore the current state of the literature on QOL, HRQOL, depression, anxiety, gender, spirituality, and functional independence with respect to chronic disease in general and specifically COPD, as these factors have been deemed important when conceptualizing the BPS experience patients have of the disease process. Researchers have focused on patients' experiences in a variety of settings (Aydin & Ulussahin, 2001; Brenes, 2003; Cully et al., 2006; Garrido et al., 2006; Gift & Cahill, 1990; Gift, Plaut, & Jacox, 1986; Hill, Geist, Goldstein, & Lacasse, 2008; McSweeney et al., 1982; Prigatano et al., 1984; Schrier et al., 1990). Research on patients in acute inpatient pulmonary rehabilitation programs, however, is limited. As such, I also describe pulmonary rehabilitation and offer a rationale for why focusing BPS treatment at this stage of disease treatment may be beneficial.

**Chronic obstructive pulmonary disease.** Approximately 210 million people worldwide have COPD. Though often unrecognized as a leading health concern by the general public when compared to ailments such as cancer and heart disease, COPD is currently recognized as the fourth leading cause of death in the United States (Pauwels, Buist, Calverley, Jenkins, & Hurd, 2001) and is predicted to become the third leading cause of death worldwide by the year 2030 (World Health Organization [WHO], 2013).

COPD is a combination of two other chronic conditions, chronic bronchitis and emphysema. Chronic inflammation of the bronchial tubes leads to a diagnosis of bronchitis. The chronic inflammation causes a chronic cough along with excess mucous production. With emphysema, lung tissue and alveoli are damaged, leaving air trapped in the lungs. Dyspnea results from the chronic inflammation of the bronchial tubes as well

as the trapped air in the lungs. Chronic symptoms of bronchitis and emphysema often lead to a diagnosis of COPD (Pauwels & Rabe, 2004).

Though the etiology of COPD may vary, the disease is most often associated with a long-term history of cigarette smoking but may also be attributed to long-term exposure to environmental irritants such as industrial dust, chemical fumes, air pollution, or smoke. Most smokers develop respiratory problems as a result of COPD, with approximately 50% of smokers developing respiratory symptoms of COPD. According to researchers, 45% of smokers between the ages of 46-77 years will develop COPD at some point in their lives (Marsh, Aldington, Shirtcliffe, Weatherall, & Beasley, 2006). COPD may also result from hereditary factors or other types of chronic lung infections such as pneumonia. Viral infections, as well as impairments in lung growth while in utero and childhood may put an individual at increased risk for developing COPD (Pauwels et al., 2001). Diagnosis of COPD is made by obtaining a detailed medical history and conducting lung function tests in addition to a physical examination that includes a chest X-ray. Such physical symptoms lead to a variety of complications.

COPD often significantly impacts physical, social, and psychological functioning and may lead to diminished HRQOL. Symptoms of COPD can range from mild to life-threatening. Those living with COPD often experience severe limitations in physical activity because of decreased lung capacity and related shortness of breath. As a result, individuals with the disease experience decreased ability to perform simple activities of daily living such as vacuuming and laundry, as well as personal tasks such as grooming and eating. Climbing even a minimal number of stairs may also become exhausting. As the disease progresses, those living with COPD are prone to exacerbations in which

symptom severity increases significantly and often leads to frequent hospitalizations, thereby considerably amplifying the social and psychological burden of the disease (Pauwels & Rabe, 2004). Following exacerbations and acute hospitalizations, individuals with COPD may be admitted to pulmonary rehabilitation programs for further treatment. Ideally, in a rehabilitation setting, an individual's physical, psychological, and social aspects of health are addressed in an attempt to improve HRQOL. One aspect of health typically addressed is mood, specifically depression related to the disease process.

**Depression and COPD.** Depression is a multi-faceted Axis I psychological mood disorder. The American Psychiatric Association (2000) classifies depression as a mood disorder in which dysphoria and anhedonia are the overall prominent features. Included under the umbrella of mood disorders are depressive disorders: major depressive disorder, dysthymic disorder, and depressive disorder not otherwise specified. Each of these disorders centers on the identification of a depressed mood. Diagnosis with one of the subtypes depends upon the duration of symptoms as well as the type and number of clinical features present. Clinical symptoms of depressed mood may include appetite changes and sleep dysregulation, decreased energy or fatigue, low self-esteem, poor concentration or difficulty making decisions, and feelings of hopelessness. In addition to these symptoms, a diagnosis of major depression is made when an individual experiences depressed mood most of the day, nearly every day, decreased pleasure in activities, weight changes, psychomotor agitation, and recurrent thoughts of death. The main characteristic of a depression diagnosis is that the symptoms cause marked distress in the areas of social, emotional, physical, and occupational functioning. Major depressive disorder is a leading cause of disability. Researchers estimate that by 2020,

the number of years lost to death and disability from depression will be surpassed only by those due to heart disease (Kerr & Kerr, 2001). Researchers have also discovered that depression may lead to impaired QOL (Coulehan, Schulberg, Block, Madonia, & Rodriguez, 1997; Cully et al., 2006; van Manen et al., 2002; Yohannes et al., 1998).

A number of determinants of depression exist, including biological, cognitive, developmental and personality factors, comorbid disorders, and psychological stressors (Beck & Alford, 2009). Biological factors, such as cerebral and immune system dysfunction, combine with cognitive factors (maladaptive schemata) to influence depressive related changes in mood (Beck & Alford, 2009). Additionally, early developmental trauma and/or maltreatment and comorbid disorders including anxiety and substance abuse have been found to increase vulnerability to depression. Individuals with personality disorders and increased exposure to psychological stressors have higher rates of depression when compared to the general public. As noted, many factors contribute to depression (Beck & Alford, 2009). Depression can be a severely debilitating disorder, psychologically, physically, and socially, especially for those with chronic diseases such as COPD (Hill et al., 2008; Ormel et al., 1998).

Researchers across numerous studies have evaluated the relationship between COPD and depression in an attempt to enhance understanding of the psychological impact of the disease and have discovered that close to half of those living with COPD experience symptoms of depression (Aydin & Ulussahin, 2001; Brenes, 2003; Dahlen & Jansen, 2002; Felker et al., 2000; Kunik et al., 2005; Yohannes et al., 2000). Depression also appears to impact physical and social functioning in patients with COPD (Ng et al., 2007), which illustrates the fact that one's experience of COPD is not solely medical in

nature. Researchers have found that individuals with COPD who also endorse symptoms of depression (Kim et al., 2000) tend to experience physical symptom exacerbation (Cully et al., 2006), social isolation (Hill et al., 2008), persistent smoking, longer hospital lengths of stay (Ng et al., 2007), and earlier mortality (Stage et al., 2005) when compared to those without comorbid COPD and mood disturbance. While research on the rehabilitation patient experience has historically been limited, other research has focused on those individuals with COPD who are in acute care (Ng et al., 2007), outpatient, or community settings (Yohannes et al., 1998). Patients in these types of healthcare settings endorse moderate (Yohannes et al., 2000) to severe levels (Lacasse, Rousseau, & Maltais, 2001) of depression. Exploring the COPD patient's experience of depression in the acute IRF setting is important to obtain a complete conceptualization of the disease process and determine whether treatment of depression in the acute inpatient rehabilitation setting is warranted. In addition to symptoms of depression, COPD patients also appear to endorse symptoms of anxiety at higher rates than other patients and the general population.

**Anxiety and COPD.** The National Institutes of Mental Health (NIMH, 2012) recognizes anxiety disorders as a group of mental health disorders that include generalized anxiety, panic disorder, obsessive-compulsive disorder, post-traumatic stress disorder, social anxiety disorder, and specific phobias. The current manuscript will focus on DSM-IV-TR (2000) clinical symptoms of generalized anxiety which include restlessness or feeling keyed up or on edge, being easily fatigued, difficulty concentrating or mind going blank, irritability, muscle tension, and sleep disturbance as well as some symptoms of panic, as symptoms of panic may mimic symptoms of COPD and vice versa. Symptoms of panic occur within a discrete period of time and may lead to intense

fear or discomfort. Panic symptoms include palpitations and/or accelerated heart rate, sweating, trembling or shaking, sensations of shortness of breath or smothering, feeling of choking, chest pain or discomfort, nausea or abdominal distress, feeling dizzy, unsteady, lightheaded or faint, feelings of derealization or depersonalization, fear of losing control or going insane, sense of impending death, paresthesias, chills, or hot flashes. As with depression, diagnosis of an Axis I anxiety disorder is also dependent upon the number of and length of time clinical symptoms are experienced and/or endorsed by an individual and whether the presence of symptoms cause marked distress in the areas of social, emotional, physical, and occupational functioning (American Psychiatric Association, 2000).

Anxiety may serve to exacerbate disease symptoms in those with chronic diseases, increase the burden of disease, and may even be a risk factor for physical illness (Clarke & Currie, 2009). Symptoms of anxiety may lead to increased and even excessive use of medication, increased lengths of hospital stay, more frequent hospitalizations, inadequate coping, and diminished engagement in rehabilitation programs (Agle & Baum, 1977). As well, anxiety appears to have a significant impact on individuals living with COPD.

Researchers have discovered that individuals with COPD are three times more likely to have generalized anxiety and symptoms of panic than the general public (Brenes, 2003; Hill et al., 2008). COPD patients also experience anxiety at greater rates than individuals with other health conditions such as heart disease and cancer (Kvaal, Macijauskiene, Engedal, & Laake, 2001). In addition to being disabled by a progressive lung disease, patients with COPD are further limited physically by symptoms of anxiety

(Aydin & Ulusahin, 2001) and endorse physiological symptoms of anxiety similar to somatic complaints of COPD including shortness of breath, fatigue, sweating, heart palpitations, and tachycardia. Anxiety related to COPD often exacerbates problems with dyspnea (Gift & Cahill, 1990; Gift, Plaut, & Jacox, 1986), forced vital capacity (Borak, Chodosowska, Matuszewski, & Zielinski, 1998), and chest discomfort (Kellner, Samet, & Pathak, 1992). Symptoms of anxiety also lead to increased hospitalizations in patients with COPD (Yohannes et al., 2000) and social isolation, which can severely limit QOL (Hill et al., 2008).

**QOL, HRQOL, and COPD.** QOL and HRQOL are concepts that have been reviewed extensively in the medical and social sciences literature. While the concepts are related, important differences have been delineated. To better understand these concepts, each will be broken down into separate areas within this literature review, beginning with a review of QOL.

The definition of QOL has been influenced by individual and societal perspectives, as well as a number of theoretical models, which can be applied to the concept (Felce & Perry, 1995). Since World War II, the notion of QOL has been a major focus in the social sciences and medical literature. Initially, the idea of QOL referred to material goods such as houses, cars, and expendable income. American president Dwight D. Eisenhower recognized general QOL as incorporating the attainment of education, concern for the individual, economic stability and growth, welfare, and health. As society became increasingly unstable, QOL began to take on a more individualistic focus, emphasizing personal care, freedom, and leisure and indicating the “good life” (Campbell, 1981; Farquhar, 1995). During the post-war years, QOL was increasingly



defined in objective and measurable terms, emphasizing the value of consumer goods such as number of households with telephones or cars, as well as social statistics such as divorce rates (Farquhar, 1995). The subjective nature of QOL came into vogue again after the post-war years and as a result of the realization that the objective ideas of QOL and the subjective experience of life quality are not mutually exclusive. Since then, exploration of QOL by researchers in the social sciences and medical literature has been extensive.

Many definitions have been ascribed to the term QOL within the social sciences and medical literature. Liu (1976) recognized the vast nature of the conceptualization of the term and purported that QOL should express the ideas that individuals find important. The expression has been used to reference general aspects of life as well as specific facets of health. QOL has been conceived as being related to the conditions of life as well as the experiences of life on both individual and societal levels (McCall, 1975). Some authors view QOL in similar but overall different ways, recognizing the importance of similar components but viewing QOL from objective and subjective perspectives. The concept of QOL has been termed as multifaceted, encompassing individual aspects of behavior, cognition, and emotion related to career, family, and society, emphasizing the subjective and individual components of QOL (Dalkey & Roark, 1973; Tarter, Erb, Biller Switala, & Van Thiel, 1988; Young & Longman, 1983). Shaw (1977) developed an objective formula to determine QOL:  $QL = NE \times (H + S)$ , where QL is QOL, NE is natural endowment, H is the factors provided to the individual by home and family, and S is the contributions of society. Hornquist (1982) broadened the concept of QOL by

stressing the importance of fulfillment of satisfaction in the areas of physical, psychological, social, activity, structural, and material needs.

In contrast to the subjective view, the more objective notion of QOL factors in socioeconomic status (Meeberg, 1993). Hollandsworth (1988) supported the idea that QOL is a contribution of quantity of life rather than simply quality. The more widely accepted definition of QOL is one that incorporates all aspects addressed. “QOL is viewed as either subjective, objective, or both, and is conceptualized as either unidimensional or multidimensional” (Meeberg, 1993, p. 33). Fundamentally, QOL is multidimensional; because the concept is subjective, the patient or individual perspective is given utmost importance. The multidimensional nature of QOL is holistic and requires investigation in a number of areas of well-being including physical, emotional, and social functioning (Cella, 1994). Overall, QOL appears to contain four attributes: general life satisfaction, adequate mental capacity with which to evaluate one’s life, acceptable state of health in terms of physical, mental, social, and emotional quality, and objectively adequate living conditions (Meeberg, 1993). Comprehensively, and for the purpose of this study, QOL is conceived as the individual’s evaluation of “physical functioning, self-maintenance, usual activities, social functioning, sexual functioning and intimacy, psychological well-being and distress, cognitive functioning, pain and discomfort, energy/fatigue, sleep, self-esteem, sense of mastery, perceived health, and life satisfaction” (Kane, 2003, p. 30).

HRQOL is a construct related to QOL and is determined by the extent to which one’s health status influences the physical, emotional, and social factors of well-being. The concept of HRQOL is the value assigned to life when considering impairments,

disability, and social opportunities affected by disease and illness as well as disease management and treatment (Kane, 2003). Guyatt, Feeny, and Patrick (1993) recognized that while many clinicians consider HRQOL to be related to illness and disease, other aspects of life such as income, freedom, and quality of one's environment may be impacted when health is compromised. Some believe that parceling out the effects of changing environment of social life, career, family, and aging on QOL and health may be impossible (Hunt, 1997). The most agreed upon domains of HRQOL are "physical health and functioning, emotional health, cognitive functioning, role performance and work productivity, sexual functioning, and life satisfaction" (Kane, 2003, p. 30), which are also factors potentially impacted by COPD.

Living with a chronic disease may be burdensome and impair HRQOL (Schlenk et al., 1997). Researchers have discovered that those with COPD specifically experience a reduction in HRQOL (Garrido et al., 2006) secondary to impairments in physical performance, lack of adequate coping skills (Ketelaars et al., 1996), and medical complications that lead to physical symptoms such as fatigue and dyspnea. These physical symptoms, disease exacerbations, frequent hospitalizations, as well as nebulizer treatment and oxygen therapy negatively affect HRQOL in COPD patients (Mahler & Mackowiak, 1995; Osman et al, 1997; Seemungal et al., 1998). Some treatment modalities such as oxygen therapy, however, may actually serve to improve HRQOL of those living with COPD by alleviating the burden of dyspnea (Okubadejo, Paul, Jones, & Wedzicha, 1996) and decreasing social isolation. Those in acute IRF settings are taught to effectively utilize and manage oxygen therapy to improve physical function. Therefore, one could reason that patients in IRF settings may have better HRQOL than

those in other healthcare settings; thus, one aspect of the current study is to better understand the relationship between COPD and HRQOL in patients in IRF settings. The focus of treatment in IRF settings is functional independence.

**Functional independence and COPD.** In the current study, functional independence is conceptualized as an individual's ability to perform activities of daily living safely and autonomously and incorporates an individual's physical, cognitive, and psychological abilities with respect to medical illness (Uniform Data System for Medical Rehabilitation, 2012). In the current study, the Functional Independence Measure (FIM) scale is used to measure functional independence. Specifically, the scale addresses various domains of function including self-care, sphincters, mobility, communication, psychosocial, and cognition. The self-care domain includes eating, grooming, bathing/showering, upper body dressing, lower body dressing, and toileting. The sphincters domain includes bowel and bladder management. The mobility domain includes transfers to the bed, chair, wheelchair, toilet, and tub/shower as well as locomotion (walking, wheelchair and stairs). Communication includes auditory and visual expression and comprehension. Psychosocial includes social interaction, and the cognition domain includes problem solving and memory. Assessing functional independence in those with chronic disease is important to determine how the disease process impacts an individual's overall engagement in life and his or her ability to perform adequately. Any impairment in function may serve to negatively impact HRQOL and negatively influence mood in those with chronic diseases (Uniform Data System for Medical Rehabilitation, 2012), especially in patients with COPD.

In addition to emotional impairment, those living with COPD also experience physical disability (Hill et al., 2008). Shortness of breath has been reported by patients as being one of the most troubling and debilitating symptoms of COPD, severely limiting function and ability (Hajiro et al., 1998). Those with severe dyspnea often have to use treatments such as oxygen therapy and nebulizers. Individuals with COPD may also often need long-term oxygen therapy to maintain satisfactory oxygen levels even at rest. Debilitating physical and psychological symptoms of COPD negatively impact functional status of individuals with the disease (Aydin & Ulusahin, 2001; Felker et al., 2001; Ng et al., 2007). In other words, COPD patients with psychological and physical impairments are also likely to have diminished levels of functional independence as physical debility may also lead to impairments in psychological well-being.

**Spirituality, religion, impact on health, and COPD.** Spirituality and religion are concepts that have become more frequently addressed in the medical literature in the past 30 years. The area of spirituality has had a surge in interest, because many believe spirituality and religion strongly impact both physical and mental health, either positively or negatively (Cotton, Levine, Fitzpatric, Dold & Targ, 1999; Crawford, Handal, & Wiener, 1989; Daaleman & VandeCreek, 2000; Ellison, Gray, & Glass, 1989; Gurin, Veroff, & Fields, 1960; Fitchett, Rybarczyk, DeMarco, & Nicholas, 1999; Idler, 1987; Johnson & Mullins, 1989; Markides, 1983; Pollner, 1989; Poloma & Pendleton, 1989; Sloan, Bagiella, & Powell, 1999; Steinitz, 1980; Witter, Stock, Okun, & Haring, 1985). The meanings of the terms religion and spirituality are often debated. Many use the terms interchangeably. Some choose to use the word “spirituality” to describe all aspects of religion such as “beliefs, practices, and ethical teachings of specific religious bodies

and traditions” (Cohen, Wheeler, Scott, & The Anglican Working Group in Bioethics, 2001, p. 31) including service and worship of a god or belief in a supernatural power (Lauver, 2000). Others consider spirituality to be indicative of well-being, meaning, belief, hope (Sinclair, Pereira, & Raffin, 2006), life, significance, purpose, direction, and healing (Cohen et al., 2001) and regard religion as one of many types of spiritual expression. For the current study, discussion of both terms, as well as discourse about the connection between spirituality, religion, and COPD, will follow.

***Definition of spirituality.*** Many definitions encountered during a review of the literature explain spirituality as being an internal (Johnstone, 2007) rather than an external system. Spirituality transcends one’s physical existence (Kaye & Raghavan, 2002; Miller & Thoresen, 2003; Musick, Traphagen, Koenig, & Larson, 2000) and emphasizes an existential component of belief systems and meaning and purpose in life. The term is considered an umbrella concept that encompasses faith, attitudes, personal views, and behaviors (Reed, 1987), regardless of one’s affiliation with organized religion (Muldoon & King, 1995; Tanyi, 2002). Spirituality, within this framework, extends beyond reality (Molzahn, 2007), guides life and offers a meaning of death (Como, 2007), and focuses on creativity and spirit (Mitroff & Denton, 1999; Zinnbauer, Pargament, & Scott, 1999). Many researchers consider spirituality to be inherent in all individuals (Miller, 1995) and view it as the essential domain of life (Connelly & Light, 2003). Spirituality is the very essence of our being and allows us to instill meaning into and become aware of who we are; “it shapes our life journey” (Dossey, Keegan, & Guzzetta, 2000, p. 91). Many people express being spiritual without being involved in specific

religious activities (Musgrave, Allen, & Allen, 2002). Spirituality can also be considered private, whereas religion is public (Miller & Thoresen, 2003).

***Definition of religion.*** In contrast to spirituality, religion describes a more organized, society-based field of faith (Thoresen & Harris, 2002). Someone who considers himself or herself to be religious may identify with organized groups such as Catholic, Christian, Buddhist, Hindu, Mormon, Jehovah's Witness, and Jewish, Methodist, Baptist, and Protestant, for example. Religion, in this sense, may be related to church involvement and other religious practices, as well as identification with a particular denomination of faith (Burker et al., 2004). Religion usually characterizes a community of people who base belief on a certain deity (e.g., God or Allah) (Astrow, Puchalski, & Sulmasy, 2001). Individuals often look to religion to provide them with guidelines for living (Spilka, Hood, Hunsberger, & Gorsuch, 2003). "Religion is recognized as an external experience of formal expression with associated systems of worship, traditions, practices, doctrines, beliefs, moral codes, and accompanying dogmas that represent specific ideologies shared by a faith-based group," (Johnstone, 2007, p.1154).

The current study focused on the relationship between both religion and spirituality or spiritual well-being on adult health and offers a review of these concepts in the social sciences and medical literature. Evaluating the impact of spirituality on health, and specifically one's experience of COPD, is important when treating people living with chronic diseases; spirituality may serve to positively influence one's experience of COPD, thereby diminishing the overall negative impact of the disease.

The relationship between spirituality and health has begun to receive increasing attention in the medical and social sciences literature. Some have emphasized the influence spirituality has on a variety of health outcomes, both physical and mental. Many researchers have discovered a positive impact of religious affiliation on psychological health and well-being (Crawford, Handal, & Wiener, 1989; Ellison et al, 1989; Gurin et al, 1960; Idler, 1987; Johnson & Mullins, 1989; Markides, 1983; Pollner, 1989; Poloma & Pendleton, 1989; Steinitz, 1980; Witter et al, 1985). Along the same lines, researchers have discovered a link between the more general, all-encompassing spirituality and depression, finding that those who identify themselves as spiritual display fewer symptoms of depression than those who do not consider themselves to be spiritual (Bussing, Matthiessen, & Ostermann, 2005; McClain, Rosenfield, & Breitbart, 2003; Nelson, Rosenfeld, Breitbart, & Galietta, 2002).

Shaw et al. (2007) conducted a study exploring the impact of religiosity in women with breast cancer. The women in the group were part of a computer support group. The researchers found that those women who used more words related to religion displayed fewer negative emotions, better perceived health self-efficacy, and improved functional well-being in comparison to those women who used fewer words related to religion. Additionally, religion has been found to impact mental illness and substance abuse (George, Larson, Koenig, & McCullough, 2000). Many researchers have determined that religious affiliation and involvement may reduce the prevalence of such psychological diagnoses anxiety disorders (Koenig, Ford, George, Blazer & Meador, 1993; Koenig, George, Blazer, Pritchett, & Meador, 1993) and depression (Koenig, Hays, George, & Blazer, 1997). Twelve-step programs such as Alcoholics Anonymous strongly



emphasize a religious component of recovery from addiction. Other researchers have determined that religious affiliation, in fact, does alleviate symptoms of addictive disorders, such as substance abuse and dependence (Amoateng & Bahr, 1986; Amodeo, Kurtz, & Cutter, 1992; Gorsuch, 1993; Koenig, George, Meador, Blazer & Ford, 1994). On the other hand, others have not found a correlation between increased spirituality and increased psychological well-being (Cotton et al., 1999; Daaleman & VandeCreek, 2000; Sloan et al, 1999).

Identification with spirituality may mediate the effects of several medical illnesses. Tuck, Alleyne, and Thinganjana (2006) conducted a study in which they examined the link between spirituality and stress management in healthy adults. The participants attended a spiritual growth group that focused on topics such as “the meaning and importance of spirituality and religion, expression of spirituality to others, creative expression of spirituality, infusion of knowledge and spirituality, multisensory experience and spiritual awareness, and forgiveness and spiritual well-being” (p. 247). The researchers measured stress, spiritual perspectives, and spiritual well-being in addition to examining the meaning and importance of spirituality. Results indicated that participation in a spiritual growth group was effective in reducing stress in terms of feelings of discomfort, changes in behavior such as body language, speech, and actions, and physical responses such as muscle tension, increased heart rate, and fatigue.

To determine the impact of spirituality on health, Sears, Rodrigue, Green, Fauerbach, and Mills (1997) studied heart transplant recipients. In the study, the researchers assessed the participants’ religious orientation, religious coping, and anxiety prior to surgery and then again after surgery. The researchers evaluated HRQOL using

the Short Form-36 Health survey, which measures physical functioning, mental health, and general health. Generally, the researchers found that those patients who had poorer religious coping strategies prior to heart transplant surgery experienced lower QOL, as well as poorer mental and general health than those with better religious coping strategies.

Recognizing the importance of spirituality may also mediate the effects of certain acute, chronic, or terminal illnesses (Tuck et al., 2006). Those with chronic illnesses, who participate in more religious activities, have been found to have fewer hospitalizations, shorter hospital lengths of stay (Koenig & Larson, 1998), and lower rates of mortality (Strawbridge et al., 1998) when compared to those with chronic illnesses who participate in fewer religious activities. Mediator models in mental and physical health studies have suggested “a direct positive influence of religiousness on psychological well-being, optimism, perceived social support, and meaning in life, which in turn would positively affect psychiatric symptoms like depression or substance abuse behaviors” (Giaquinto, Sarno, Dall’Armi, & Spiridigliozzi, 2010, p. 329). As well, researchers have discovered that the risk of death is lower in individuals who attend religious services weekly, and patients with medical disabilities who utilize spiritual coping appear to have lower levels of discomfort associated with the disease, higher levels of adjustment, and better quality of life when compared to patients who do not utilize spiritual coping (Giaquinto et al., 2010).

Harvey and Silverman (2007) conducted a study on the mediating effects of prayer, a specific religious activity that leads one to feel a deeper spiritual connection with God, among elderly African American and White individuals and found that prayer

served to mediate the relationship between self-management and acceptance of chronic illness. Specifically, the researchers discovered that by utilizing prayer regularly, elderly African American and White individuals with chronic disease were better able to accept, and thus manage the chronic illnesses. Harvey (2006) also conducted a study on the mediating effects of prayer on the relationship between acceptance of chronic illness and chronic disease self-management among older African American women and found similar results. The use of prayer as a coping mechanism appears to mediate the relationship between chronic disease self-management and acceptance of the disease, allowing individuals to accept and better manage the effects of the condition.

Religiosity has also been found to have a mediating effect on pain (Kaczorowski, 1989; Landis, 1996; O'Brien, 1982). Attendance at religious functions has also been associated with lower blood pressure (Koenig et al., 1998), better immune system function (Koenig et al., 1997), and improved coping and self-efficacy (Koenig, George, & Titus, 2004; Larson, Swyers, & McCullough, 1998; Ventura et al., 2007). Additionally, religiosity may promote better recovery from illness, including faster recovery and reduced mortality after major surgeries (Harris, Dew, & Lee, 1995; Oxman, Freeman, & Manheimer, 1995). In addition to recovery from surgery and decreased mortality, spirituality/religion may mediate the effects of chronic illness and disability (Lapane, Lasater, Allan, & Carleton, 1997). Other researchers have discovered a paradoxical effect and assert that those with higher church affiliation actually have more cardiac disease risk factors when compared to church members with lower church affiliation (Lapane et al, 1997). Based on the differential findings of these studies, the

need for continued work is apparent to further understand the influence of religion and/or spirituality on health outcomes for individuals with chronic illnesses such as COPD.

Some researchers have focused on the spirituality and religiosity of individuals with COPD (Burker et al., 2004; Idler & Kasl, 1992). Patients with COPD who are also involved in religious activities may suffer less from depression, anxiety, and physical disability when compared to those who do not spend time participating in religious activities. As well, those COPD patients who consider disease to be a punishment from God also appear to have higher levels of depression and psychosocial disability (Burker et al., 2004). Researchers have also discovered that active attendance in church services and participation within the church congregation are related to improved physical function and performance in daily activities of self-care among people with COPD (Idler & Kasl, 1992).

In addition to outward displays of religiosity, private religion appears to be a protective factor against secondary disability in people living with COPD (Burker et al., 2004). Other researchers have found the opposite to be true for individuals without COPD and purport that in terms of health, religion does not provide protection from recovery from or adjustment to illness or disability (Fitchett et al, 1999). The contrasting results of these studies on people with COPD and people without COPD and the fact that few studies on religion/spirituality in individuals with COPD exist indicate a need to further study religion/spirituality and disability in the IRF population.

**Gender, health, and COPD.** Like depression, anxiety, HRQOL, and spirituality/religion, gender is also characterized as a biological, psychological, and social factor in the current study. The American Psychiatric Association (2000) recognizes that

women are at higher risk of developing depressive disorders during life than are men. COPD has historically been considered a disease that impacts mostly men, as men have higher rates of smoking and are more likely to have occupations that expose them to environmental irritants commonly associated with lung disease than are women (Chapman & Pye, 2001). As a result, men are more likely to be diagnosed with COPD (Silverman et al., 2000) when compared to women.

Studies on gender differences in health are numerous, and the risk factors for a variety of illnesses differ for men and women (Baum & Grunberg, 1991). A few studies have been selected to illustrate gender differences in this area.

In industrialized nations, the life expectancy for men is lower than for women. Women, however, have been found to report more health problems, utilize more medications, and report more disability than do men (Macintyre, 1993). Women also self-evaluate their health as poorer and endorse more chronic symptoms than do men (Sweeting, 1994). Men appear to report lower rates of illness in comparison to women (Miles, 1991). As women age, they are more likely to experience decreased mobility and difficulty executing self-care tasks in comparison to men. At the same time, however, women are less likely to assess their health as poor (Arber & Cooper, 1999), regardless of the finding that women report more health problems than do men. The fact that gender differences exist in a variety of health conditions lends support for the study of gender differences in IRF patients, specifically those with COPD.

Women with COPD display greater shortness of breath, more exacerbations, lower capacity for walking long distances, poorer QOL (de Torres et al., 2005; DiMarco et al., 2006), and more symptoms of depression in comparison to men with COPD

(DiMarco et al., 2006; Martinez et al., 2007), while men appear to be diagnosed with COPD more often than do women (Silverman et al., 2000). As well, women tend to endorse higher perceived shortness of breath and suffer more from all aspects of COPD when compared to men. As a result, women with COPD may have higher levels of depression and anxiety, poorer HRQOL, and endorse more physical disease symptoms such as perceived dyspnea when compared to men with COPD (Wagena et al., 2005). As more women are being diagnosed with COPD (Silverman et al., 2000), the number of women dying from COPD is increasing (Chavannes et al., 2005). As well, researchers have noted that gender does not moderate the relationship between COPD and depression (Zhang, Ho, Cheung, Fu, & Mak, 2011) or the relationship between COPD and anxiety (Holm, Bowler, Make, & Wamboldt, 2009) in the community and hospitals.

Researchers in the medical field have noted that gender moderates relationships between a variety of constructs. Research on coronary artery disease (CAD) revealed that gender moderates the relationship between anxiety and patient disposition; specifically, female patients who have anxiety and undergo a coronary artery bypass graft for CAD appear to have longer hospital lengths of stay than do male patients with anxiety who undergo the same surgical procedure (Dao, Voelkel, Presley, Doss, Huddleston, & Gopaldas, 2012). Researchers have also explored the impact of gender on relationship between emotional response and disability in chronic pain patients and have found that in patients with high levels of depression, women appear to experience greater disability than do men. Also, male patients with chronic pain and higher levels of depression tend to use more medications than do women with chronic pain and higher levels of depression. Researchers have not found gender to moderate the relationship between

anxiety and disability (Keogh, McCracken, & Eccleston, 2006). Regarding COPD, researchers have discovered that gender moderates the effects of exercise therapy on HRQOL among COPD patients; specifically, men experience greater HRQOL after extended exercise therapy in comparison to women (Foy, Rejeski, Berry, Zaccaro, & Woodard, 2001). The experiences of both men and women with in IRFs should be evaluated while in rehabilitation settings to determine whether gender moderates the effects of certain BPS factors on the experience of chronic disease, specifically COPD. Information obtained may indicate that men and women participating in acute physical rehabilitation programs have different experiences than do patients in other healthcare settings; additionally, gender may moderate the relationships between certain variables in IRF patients. Such information could indicate that IRF programs significantly influence, either negatively or positively, the BPS experience of men and women.

**Acute inpatient physical rehabilitation.** Because no cure exists for chronic illnesses, the medical community has emphasized the importance of disease management and improved HRQOL by preventing further physical decline (Foy et al, 2001). As such, the benefits of acute inpatient physical rehabilitation programs are well documented. Patients with COPD may experience limited social interaction secondary to their physiological dependence upon oxygen therapy, decreased exercise tolerance, general physical decline, related dyspnea, and diminished psychological health (Ek & Ternstedt, 2008; Habraken, Pols, Bindels, & Willems, 2008; Skillbeck et al., 1998). Researchers have discovered that participating in recovery programs that offer treatment in various settings, including outpatients and primary care facilities, may improve QOL (Goldstein, Gort, Avendano, Stubbing & Guyatt, 1994; Wijkstra et al., 1995), HRQOL, functional

capacity (Lacasse et al., 1996; Stewart et al., 2001), and physiological health (Reis, Kaplan, Limberg, & Prewitt, 1995), reduce shortness of breath (Wijkstra et al., 1996), and improve mood (Penedo & Dahn, 2005). A paucity of studies, however, has been conducted on COPD patients in acute inpatient physical rehabilitation settings (Bowen, Thrall, ZuWallack, & Votto, 1999). Therefore, evaluating the relationship between the BPS facets of COPD of those in acute IRF settings may provide insight into the impact of inpatient physical rehabilitation, and thus, help identify the most appropriate point of intervention.

A comprehensive pulmonary rehabilitation program emphasizes a multidisciplinary therapeutic approach. In such a setting, individuals practice activities of daily living such as grooming, bathing, and eating as well as physical activities such as walking or utilizing assistive devices such as a walker or wheelchair. Physical rehabilitation programs assist patients in improving strength and stamina, as well as in developing compensatory strategies for disease management. The rationale behind participation in a physical rehabilitation program is to increase overall functional independence, thereby improving HRQOL by addressing physical, social, medical, and psychological aspects of the disease (Hill et al., 2008). A holistic and BPS approach to acute inpatient pulmonary rehabilitation stresses emotional, physical, and social aspects of treatment. A BPS intervention during this phase of recovery is pertinent to improvement in overall functional capacity.

**The biopsychosocial model.** Several theoretical models of illness exist in healthcare. The BPS model is widely accepted and was developed in response to what



many believed were shortcomings of the medical model. Lazare (1973) recognized that the medical model is a model where:

it is supposed that there eventually will be found a specific cause related to the functional anatomy of the brain. The physician using the medical model concerns himself with etiology, pathogenesis, signs and symptoms, differential diagnosis, treatment and prognosis. Knowing the syndrome or disease determines the treatment. (p. 346)

Others consider the medical model to be rigid and reductionist (McLaren, 1998) and believe it fails to adequately address mental and behavioral health concerns (Johnson, 2013). Johnson (2013) recognizes apparent consequences of the dual paradigms as evidenced by the fact that healthcare providers are divided; physicians treat physical health ailments as psychologists treat cognitive, emotional, and behavioral health concerns. As the current healthcare system moves more toward a patient-centered approach rather than one driven solely by physicians and medicine, focus on the BPS model becomes increasingly important. Such a paradigm shift is especially salient for the field of psychology, as the BPS model embraces the treatment of mental health problems more so than does the medical model (Johnson, 2013).

The BPS model, with foundations in general systems theory, takes into account the person, the environment, and the person's disease to provide a holistic conceptualization of illness and direct a patient-centered clinical method (Butler, Evans, Greaves, & Simpson, 2004). George Engel, an early proponent of the BPS model, recognized that the medical model falls short in contributing to understanding of disease and when treating the whole person by focusing solely on biological factors, failing to

emphasize the importance of concomitant social, cultural, and psychological aspects of disease, and specifically by ignoring the individual's personal experience. Thus, Engel proposed a more complete conceptualization of illness to include not only biological but also psychological, sociological, and cultural facets of the person's experience and termed the model the BPS model (in Caplain, McCartney, & Sisti, 2004). To attain an overall and complete understanding of one's health, the impact of physical disease as well as cultural, social, and psychological factors must be assessed (Engel, 1980). In so doing, healthcare providers "must also take into account the patient, the social context in which he lives, and the complementary system devised by society to deal with the disruptive effects of illness, that is, the physician's role and the health care system" (Engel, 1980, p. 45). Engel believed that psychological changes might have as much impact on the disease process as do biochemical alterations on a person's experience of illness. While a person presents with certain physiological symptoms, the subjective interpretation and experience of those symptoms is as important as the biochemical etiology. The overarching goal of the BPS model is to affirm the patient's experience (Butler et al., 2004). According to the BPS model, treatment of any illness can be greatly impacted by psychosocial factors unique to the individual. Some, however, have a contrasting view of the BPS model.

Though much of contemporary psychology espouses the BPS model (Ghaemi, 2009), others believe the model to be deficient when applied to individual treatment. Critics of the BPS model view the approach as simply one of eclectic freedom that allows clinicians to treat patients as they prefer without rationale for the prioritized direction or focus. Critics also suggest that while the overarching goal of the BPS model is to treat

the individual rather than the disorder, clinicians often impose their own beliefs on the patients they treat (Ghaemi, 2009). Such a course may lead treatment providers to attempt to piece together unrelated biological, psychological, and sociological data with little cohesion (McLaren, 1998). Others have called into question the predictive power of the model and have questioned the rationale to attempt to discover a biological outcome by way of a psychological predictor or vice versa (McLaren, 1998; Weiner, 2008). Despite the shortcomings of the BPS model, one cannot ignore the positive contributions of the BPS model to the field of healthcare or the idea that utilization of the model in healthcare settings has led to advances in disease treatment when focusing on the individual experience of illness (Weiner, 2008).

Researchers have found “an ever-growing scientific literature demonstrating the heuristic value of this model in developing more effective assessment and treatment methods for [certain] disorders, as well as guiding greater cutting-edge research on their etiologies and potential prevention techniques” (Gatchel & Turk, 2008, p. 2831). The model has been found sufficient when applied to a variety of conditions including chronic pain (Waddell, 1987), youth obesity (Goetz & Caron, 1999), HIV/AIDS (Orsulic-Jeras, Shepherd, & Britton, 2003), and substance abuse (Fisher & Harrison, 1999) to name only a few. A more complete understanding of COPD through a BPS framework may allow for more appropriate, effective, and successful treatment.

***BPS model and COPD.*** Because COPD is typically viewed exclusively as a medical condition, treatment of the condition has historically been guided by the medical model (Lox & Freehill, 1999). Since the 1970’s, however, the medical model has been deemed insufficient when treating those with COPD as healthcare providers came to

more fully recognize the physical, social, and psychological impact of the disease (Lox & Freehill, 1999). In combination with biological and physical factors, COPD also leads to decreased social and psychological functioning and may lead to diminished overall HRQOL. As such, the BPS model is superior to the medical model when treating mood conditions in individuals with COPD; therefore, the current study uses the BPS model to facilitate understanding of the relationship between BPS facets and COPD treatment and outcomes in an IRF setting. As mentioned, the BPS factors evaluated in the current study are: depression, anxiety, HRQOL, functional independence, spirituality, and gender. Following is a review of those factors within the BPS framework.

***BPS model and depression.*** As previously stated, the BPS model takes into account both the person and the person's disease to provide a holistic conceptualization of illness in terms of biological, psychological, and social factors. The BPS model of depression recognizes the biochemical, social, psychological, and subjective factors that coalesce to provide a holistic view of the mood disorder (Engel, 1980). Treatment of depression depends not only on the expertise of the healthcare provider but also on the individual and his or her subjective experience.

Lewinsohn, Hoberman, and Hautzinger (1985) suggest that unhappiness may have foundations in a number of areas related to the BPS model. In addition to the belief that depression results from biochemical alterations in neurotransmitters located in the brain, Lewinsohn and colleagues (1985) proposed that depression may arise from one's personal appraisal of social interactions with the environment as well as a lack of response-contingent reinforcement. The lack of response-contingent reinforcement leads individuals to reward their own dysfunctional behaviors resulting from lack of self-

control, insufficient self-monitoring, and distorted evaluations. Such patterns reinforce and sustain feelings of unhappiness and negative cognitions. Those with regular interpersonal interactions with others and evaluate such interpersonal relationships as satisfactory and fulfilling may be happier than those who have irregular and unsatisfactory or unfulfilling interpersonal interactions. In short, dysfunctional cognitions lead individuals to overreact emotionally to situations encountered in the environment. Certain emotional reactions to chronic disease are normal. Therefore, understanding extreme and maladaptive emotional responses to chronic diseases such as COPD in terms of the BPS model may allow healthcare professionals to provide their patients with more holistic treatment; specifically, identifying and understanding the mediators between depression and COPD within a BPS framework may prove useful when treating those coping with both conditions.

Individuals with chronic diseases such as COPD are impacted not only physically but also culturally, socially, and psychologically. Increasing physical and functional impairments lead individuals living with such debilitating diseases into a different culture, one of disability. The recognition of being disabled often leads to depression, anxiety, and an overall decrease in HRQOL. Such extreme changes in one's way of life may serve to perpetuate and reinforce social isolation, thereby keeping those with chronic illness in a state of unhappiness. Applying the BPS model may prove useful when evaluating the impact of COPD on other aspects of psychological health as well, specifically anxiety.

***BPS model and anxiety.*** Barlow (2002) suggested that anxiety has BPS underpinnings. The biological basis of anxiety begins with a discussion of the nervous

system. The nervous system informs the body of threat and then takes subsequent appropriate actions based on the level of threat. While fear is the body's reaction to danger, anxiety, or the mind's response to the stimulus, is the anticipation of such danger. Once the mind perceives a stimulus as a threat, the fear response is activated, and the body reacts accordingly. The subsequent biological reactions involve several nervous system components, such as the limbic system, the autonomic nervous system, the cardiovascular and respiratory systems and the excretory, digestive, and endocrine systems. The process does not begin, however, until the individual encounters a trigger and assigns value of threat to that trigger; the value assigned to the stimulus is an individual process and arises from the individual's personal interpretation, or cognitive appraisal of the stimulus. Upon encountering danger, an individual must then determine whether he or she has the ability to control the related stress; the determination of control is also based on the individual's interpretation or perception. If an individual believes he or she can manage the stress, anxiety is diffused; however, if an individual does not believe he or she can manage the stress of an anxiety-inducing situation, anxiety may escalate (Barlow, 2002).

Many psychologists, including Barlow (2002) believe that the development of our perception of control is influenced by social experiences from childhood and social learning theory. Barlow purports that we learn ways to think and behave by observing those around us. Our perception of control and learned thoughts and behaviors are then strengthened by experiences we continue to have throughout our lives; such experiences may include exposure to and interaction within family dynamics, significant life stressors, and exposure to traumatic events.

The body's physiological response to fear-inducing stimuli follows the interpretation of stimuli; such interpretation arises from the thoughts, beliefs, and perceptions (our psychological makeup) we develop while interacting with the social environment. As well, depending upon personality characteristics, psychological well-being, and biological makeup, certain individuals have more of a genetic vulnerability to experience anxiety while interacting within their environments. Once the biological and psychological vulnerabilities are solidified, individuals then learn socially to focus anxiety on certain objects or situations, thereby strengthening the triggers. The social environments also include role models that significantly influence preexisting vulnerabilities and thus, influence individual interpretations of triggers (Jacofsky, Santos, Khemlani-Patel, & Neziroglu, 2010).

Recognizing the connection between COPD and anxiety from a BPS perspective is important for healthcare professionals and may enhance and strengthen understanding of COPD, as well as the patient's experience of the disease. Applying a BPS framework to anxiety is critical, especially when treating men and women with COPD, as many of the symptoms of both COPD and anxiety are similar and may severely limit and negatively impact overall HRQOL.

***BPS model and HRQOL.*** The notion that medical conditions impact a person's existence and overall QOL is clear (Levenstein, 2004). HRQOL and the tenets of the BPS model are related. As mentioned, HRQOL takes into account physical and emotional health as well as one's social role. The core concepts of the BPS model incorporate the same ideas (Levenstein, 2004):

It makes sense nonetheless to hope that improvement in mood and in coping strategies could have a moderating influence on patients' level of concern by decreasing their engagement with their disease, and could bring overall improvement in their health-related quality of life. (p. 2)

Essentially, the hope is that enhancements in mood, social interaction, and disease self-management will also improve HRQOL. For those with chronic conditions, psychological vulnerabilities, and impaired coping, the disease process may be intensified and HRQOL lowered (Levenstein, 2004). Psychological interventions may serve to enhance and preserve HRQOL by minimizing the negative physical, social, and psychological impact of diseases (Ryan & Carr, 2010) such as COPD. In addition to the aforementioned factors, many who espouse the BPS model also recognize the influence of the chronic disease process and experience on functional independence.

***BPS model and functional independence.*** Conceptualizing functional status from a BPS perspective makes sense when considering chronic illness. Chronic illnesses likely impact an individual's whole experience of existence, which includes biological, psychological, and social experiences. One could conjecture that those who are more functionally independent also have better HRQOL when compared to those with less functional independence. As well, WHO has adopted the BPS model and incorporated the model into the International Classification of Functioning, Disability and Health (ICF). WHO's ICF model is a widely accepted framework for disability and rehabilitation and recognizes that daily functioning is a dynamic interaction "between the individual's health condition and related factors that include both personal/psychological and social/occupation factors. Understanding and preventing incapacity requires a



framework that addresses all the physical, psychological, and social factors involved in human illness and disability" (Heads of Workers' Compensation Authorities, Heads of Compulsory Third Party Biopsychosocial Injury Management, p. 2, 2011). In a study comparing those with lung disease, Gore and colleagues (2000) examined the differences between those with COPD and those with lung cancer and discovered that the patients with COPD fared worse in terms of overall physical ability and capacity to adequately complete activities of daily living. Such findings are important when considering the overall experience of the COPD patient and illustrate a need to conduct more research on acute IRF patients with COPD. Some researchers espouse the idea that the overall experience of a person is influenced by spirituality; thus a discussion of spirituality within the BPS framework follows.

***BPS model and spirituality.*** Many scholars now propose expanding the BPS model to include spirituality and suggest changing the name to the biopsychosocial-spiritual model (Collins, 2007; Culliford, 2011; Sulmasy, 2002). Many recognize the importance and impact of spirituality on psychological, social, and physical well-being and emphasize including spirituality to fully understand the person (Sulmasy, 2002) and one's experience of chronic illness:

Everyone, according to this model, has a spiritual history. For many persons, this spiritual history unfolds within the context of an explicit religious tradition. But, regardless of how it has unfolded, this spiritual history helps shape who each patient is as a whole person, and when life-threatening illness strikes, it strikes each person in his or her totality. This

totality includes not simply the biological, psychological, and social aspects of the person, but also the spiritual aspects of the whole person as well. This biopsychosocial-spiritual model is not a "dualism" in which a "soul" accidentally inhabits a body. Rather, in this model, the biological, the psychological, the social, and the spiritual are only distinct dimensions of the person, and no one aspect can be disaggregated from the whole. Each aspect can be affected differently by a person's history and illness, and each aspect can interact and affect other aspects of the person. (p. 27)

Essentially, Sulmasy (2002) purports that spirituality plays a key role in the development of a person as a being, influences that person's entire life, and one's gestalt is comprised of biological, psychological, spiritual, and social factors. People coping with chronic illnesses are likely impacted in all those dimensions. Sulmasy's view of spirituality as an integral component of a person's development is important to consider when exploring a person's experience of chronic disease.

***BPS model and gender.*** Gender identity develops as a direct result of a complex interaction between biological, social, and psychological factors. For the purposes of the current manuscript and study, a basic view of gender identity will be explored, as the literature on this topic is extensive. Sex, as referred to the physical structure of one's body, is primarily biologically determined. The American Medical Association Manual of Style (Iverson et al., 1998) connotes that sex is the biological characteristics of males and females (and may have a major impact on the ways individuals express themselves and interact within their environments. Gender identity, or one's experience of sex or concept of what being male or female means, is greatly influenced by the interaction

between biology, psychology and environment (WHO, n.d.). Even as we age, our experience of the meaning behind being male or female evolves as a result of our social and psychological experiences (Committee on Understanding the Biology of Sex and Gender Differences, Board on Health Sciences Policy, 2001).

Such experiences vary between men and women, and the differences have long been a focus in social sciences and medical literature. The 2001 US Institute of Medicine report indicated the existence of gender differences with respect to the experience of major diseases and response to therapy. Healthcare professionals have identified gender differences in conditions such as autoimmune, metabolic, and cardiovascular diseases, certain types of cancer and movement disorders, as well as psychological disorders. Evaluating gender differences in COPD, specifically in an acute IRF, is important for healthcare professionals to understand the differences in ways men and women experience COPD, as well as co-morbid conditions and response to treatment. Examining BPS differences between men and women participating in an inpatient pulmonary rehabilitation program may aid health professionals in understanding the patient's experience of COPD.

***BPS model and pulmonary rehabilitation.*** Pulmonary rehabilitation programs are typically multidisciplinary in nature. The overall goal of such programs is to provide comprehensive treatment of physical and psychosocial aspects of pulmonary disease (Fischer et al., 2009). Successful completion of a pulmonary rehabilitation program may serve to enhance HRQOL of men and women living with COPD by promoting sufficient disease self-management (Bourbeau, 2009). Conducting further research on individuals

participating in an acute inpatient pulmonary rehabilitation program may bolster our understanding of the patient's BPS experience of COPD.

The BPS model is founded in general systems theory. The model was developed to compensate for shortcomings of the medical model and focuses on a holistic conceptualization of a person's life experiences. A person's overall experience is comprised of a variety of factors, which include biological, psychological, sociological, and spiritual dimensions (Barlow, 2002; Jacofsky et al., 2010; Sulmasy, 2002; WHO, n.d.), which blend together to create one's HRQOL (Lewinsohn et al., 1985). The development of a chronic illness such as COPD may serve to negatively influence a person's HRQOL (Levenstein, 2004; Lox & Freehill, 1999). Based on the BPS model, participation in a comprehensive and multidisciplinary pulmonary rehabilitation program may be expected to alleviate the negative impact of COPD (Bourbeau, 2009; Fischer et al., 2009).

### **The Current Study**

COPD is a chronic lung disease that is predicted to become the third leading cause of death worldwide by 2030. Researchers have discovered that men and women living with COPD often experience impairments in mood, functional status, biophysical and social function, and HRQOL. Endorsement of spiritual beliefs as well as participation in pulmonary rehabilitation programs that promote holistic treatment based on the BPS model may serve as protective factors against the deleterious effects of the disease. Though many researchers recognize the tremendous negative impact of COPD, few have examined the BPS facets of the disease in individuals in acute IRF settings.

In the current study, I use the BPS model to examine the relationships between depression, anxiety, spirituality, HRQOL, functional independence, and gender among IRF patients as well as COPD patients in an IRF. Results of the study will foster a deeper understanding of the BPS complexities of chronic diseases such as COPD and supplement the current literature. Enhancing our knowledge of chronic diseases such as COPD may ultimately guide us in improving treatment and ultimately improving HRQOL and overall functional independence for those coping with such debilitating diseases. As such, several research questions were employed in the current study to explore the connections between the aforementioned factors and are listed as follows:

1. How are individuals with COPD in acute IRFs different than IRF patients without COPD in terms of mood, functional independence, and spirituality?
2. How does the HRQOL of women with COPD in acute IRFs differ in comparison to HRQOL of men with COPD in acute IRFs?
3. What is the role of spirituality? Several specific questions are contained within the broader question, including:
  - a. Does spirituality mediate the relationship between anxiety and HRQOL in IRF patients with COPD?
  - b. Does spirituality mediate the relationship between depression and HRQOL in IRF patients with COPD?
  - c. Does spirituality mediate the relationship between anxiety and functional independence in IRF patients? And
  - d. Does spirituality mediate the relationship between depression and functional independence in IRF patients?

4. What is the impact of gender? Several specific questions are contained within the broader question, including:
- a. Does gender moderate the relationship between anxiety and functional independence in IRF patients with COPD?
  - b. Does Gender moderate the relationship between depression and functional independence in IRF patients with COPD?
  - c. Does gender moderate the relationship between spirituality and functional independence in IRF patients with COPD?
  - d. Does gender moderate the relationship between anxiety and HRQOL in IRF patients with COPD?
  - e. Does gender moderate the relationship between depression and HRQOL in IRF patients with COPD?
  - f. Does gender moderate the relationship between spirituality and HRQOL in IRF patients with COPD?
  - g. Does gender moderate the relationship between anxiety and functional independence in IRF patients?
  - h. Does gender moderate the relationship between depression and functional independence in IRF patients? And
  - i. Does gender moderate the relationship between spirituality and functional independence in IRF patients?

The research hypotheses employed to address the research questions are as follows:

**Hypothesis 1.** IRF patients with COPD differ in terms of levels of depression when compared to IRF patients without COPD ( $H_0: \mu_{\text{COPD}} = \mu_{\text{nonCOPD}}$ ;  $H_1: \mu_{\text{COPD}} \neq \mu_{\text{nonCOPD}}$ ).

**Hypothesis 2.** IRF patients with COPD differ in terms of levels of anxiety when compared to IRF patients without COPD ( $H_0: \mu_{\text{COPD}} = \mu_{\text{nonCOPD}}$ ;  $H_1: \mu_{\text{COPD}} \neq \mu_{\text{nonCOPD}}$ ).

**Hypothesis 3.** IRF patients with COPD differ in terms of level of functional independence when compared to IRF patients without COPD ( $H_0: \mu_{\text{COPD}} = \mu_{\text{nonCOPD}}$ ;  $H_1: \mu_{\text{COPD}} \neq \mu_{\text{nonCOPD}}$ ).

**Hypothesis 4.** IRF patients with COPD differ in terms of level of spirituality when compared to IRF patients without COPD ( $H_0: \mu_{\text{COPD}} = \mu_{\text{nonCOPD}}$ ;  $H_1: \mu_{\text{COPD}} \neq \mu_{\text{nonCOPD}}$ ).

**Hypothesis 5.** Women with COPD differ in terms of HRQOL in comparison to men with COPD ( $H_0: \mu_{\text{womenCOPD}} = \mu_{\text{menCOPD}}$ ;  $H_1: \mu_{\text{womenCOPD}} \neq \mu_{\text{menCOPD}}$ ).

**Hypothesis 6.** Spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD.

**Hypothesis 7.** Spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD.

**Hypothesis 8.** Spirituality mediates the relationship between anxiety and functional independence in IRF patients.

**Hypothesis 9.** Spirituality mediates the relationship between depression and functional independence in IRF patients.

**Hypothesis 10.** Gender moderates the relationship between anxiety and HRQOL in IRF patients with COPD.

**Hypothesis 11.** Gender moderates the relationship between depression and HRQOL in IRF patients with COPD.

**Hypothesis 12.** Gender moderates the relationship between spirituality and HRQOL in IRF patients with COPD.

**Hypothesis 13.** Gender moderates the relationship between anxiety and functional independence in IRF patients with COPD.

**Hypothesis 14.** Gender moderates the relationship between depression and functional independence in IRF patients with COPD.

**Hypothesis 15.** Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.

**Hypothesis 16.** Gender moderates the relationship between anxiety and functional independence in IRF patients.

**Hypothesis 17.** Gender moderates the relationship between depression and functional independence in IRF patients.

**Hypothesis 18.** Gender moderates the relationship between spirituality and functional independence in IRF patients.

**Operational definitions.** The variables under examination in the current dissertation are (a) diagnosis of COPD, (b) level of depression, (c) level of anxiety, (d) level of functional independence, (e) level of spirituality, (f) level of HRQOL in those with COPD, and (g) gender. Operational definitions for the constructs are

- diagnosis of COPD as listed in the patient's medical chart; a score of 0 indicates no diagnosis of COPD, while a score of 1 indicates a diagnosis of COPD.
- level of depression defined as score of 0-30 on the GDS, with lower scores indicating lower levels of depression;
- level of anxiety defined by score of 0-63 on the BAI, with lower scores indicating lower levels of anxiety;



- level of spirituality defined by a score of 0-92 on the FACIT-Sp, with lower scores indicating lower levels of spirituality;
- level of functional independence defined as a score of 0-126 on FIM, with lower scores indicating lower levels of independence;
- HRQOL defined by a score of 0-140 on the CRQ, with higher scores indicating higher levels of HRQOL; and
- gender as indicated by one's identification as either male or female; male was coded as 0, and female was coded as 1.

## Chapter Two: Method

In the following section, I describe the sample, study procedure, instruments, research and statistical hypotheses, study design, and materials used in the current study.

### Sample

Sample data were collected from men and women who were admitted to the pulmonary unit of an acute IRF in Central Kentucky. Prior diagnosis of depression and/or anxiety was not a requirement for participation in the study. All individuals who were admitted to the pulmonary unit at the IRF were included in the sample to allow for a comparison between those with COPD and those with no diagnosis of COPD. The entire sample was comprised of 136 patients. Fifty-five patients had COPD (40.4%); the remaining 81 patients (59.6%) in the sample had a variety of other diagnoses such as orthopedic injuries related to falls, cardiac diseases, were post-surgery patients (knee/hip replacements, spinal surgeries, limb amputations), and had no diagnosis of COPD or other lung disease. Admission to the pulmonary unit for those without lung disease was sometimes necessary in cases of decreased bed availability on other facility units.

In the total sample, 93.4% of respondents identified themselves as Caucasian; the remaining patients (6.6%) identified themselves as African American. In the total sample, 92 patients were female (67.6%), and the mean age was 69.6 years. Of those with COPD ( $n = 55$ ), 96.4% were Caucasian, and 3.6% were African American. In the COPD group, 74.5% were female, and 25.5% were male. The average age of those in the COPD sample was 68.93 years; the youngest patient with COPD was 46 years old. In the non-COPD group ( $n = 81$ ), 63% were female; 37% were male. Also in the non-COPD group, 91.4% were Caucasian, and 8.6% were African American. The average age of the

non-COPD group was 70.1 years. Sample characteristics for the COPD group are listed in Table 1, sample characteristics for the non-COPD group are listed in Table 2, and sample characteristics for the IRF group (COPD and non-COPD patients combined), are listed in Table 3.

Table 1

*Sample Characteristics of the COPD Group (n=55)*

Characteristic	<i>n</i>	%
Age category (years)		
<40	0	0.0
40-49	3	7.3
50-59	8	12.7
60-69	17	30.9
70-79	20	36.4
80-89	7	12.7
>89	0	0.0
Gender		
Male	14	25.5
Female	41	74.5
Race/ethnic group		
Caucasian	53	96.4
African American	2	3.6

Table 2

*Sample Characteristics of the non-COPD Group (n=81)*

Characteristic	<i>n</i>	%
Age category (years)		
<40	4	4.9
40-49	3	3.7

Table 2 (continued)

50-59	9	13.6
60-69	18	21.0
70-79	23	28.4
80-89	18	22.2
>89	5	6.2
Gender		
Male	30	37.0
Female	51	63.0
Race/ethnic group		
Caucasian	74	91.4
African American	7	8.6

Table 3

*Sample Characteristics of the IRF Group (n = 136)*

Characteristic	<i>n</i>	%
Age category (years)		
<40	4	2.9
40-49	6	4.4
50-59	18	13.2
60-69	35	25.7
70-79	43	31.7
80-89	25	18.4
>89	5	3.7
Gender		
Male	44	32.4
Female	92	67.6
Race/ethnic group		
Caucasian	127	93.4
African American	9	6.6

## **Procedure**

The current study was approved on June 12, 2012 by the Institutional Review Board at the University of Kentucky and the Cardinal Hill Rehabilitation Hospital Research Committee, and the following procedures were employed. Original data collected between the years of 2008 and 2009 were used in the study; thus, the information in the current study is part of an archival dataset. Informed consent for participation was obtained prior to the collection of data as part of the hospital admission process and prior to the primary investigator's receipt of the dataset (see Appendix B). Data were in a Statistical Package for the Social Sciences (SPSS) database upon the primary investigator's receipt. Each participant's information was de-identified and entered into SPSS prior to the primary investigator's receipt of the dataset.

At the time of the original data collection, all new patients with all diagnoses who were admitted to the inpatient pulmonary rehabilitation program at the hospital were solicited for participation. Participants were in naturally occurring groups and either had a diagnosis of COPD or no diagnosis of COPD; thus, random assignment of participants to groups was not appropriate. All participants completed the BAI, GDS, and FACIT-Sp to assess for anxiety, depression, and spirituality, respectively. All patients' levels of functional independence were evaluated using the FIM tool. Patients with COPD also completed the CRQ to assess HRQOL. Individuals identified themselves as either male or female. All patients were administered a variety of measures for the current study.

## **Instrumentation**

Five measures were utilized in the study to measure BPS facets under investigation. These measures included the Beck Anxiety Inventory (BAI), Chronic

Respiratory Questionnaire (CRQ; assessed in the COPD group only), Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp), Functional Independence Measure (FIM), and Geriatric Depression Scale (GDS). These five measures are described in more detail in the following sections. The BAI, CRQ, FACIT-Sp, and FIM are copyrighted measures, and thus, are not reproduced in this manuscript. The GDS is in the public domain and is included in the appendices.

**Anxiety.** The BAI is a 21-item multiple-choice self-report inventory that is used to assess anxiety severity. The measure has been utilized in a number of studies and has strong psychometric properties. In their study used to evaluate the psychometric properties of the BAI, Beck, Epstein, Brown, and Steer (1988) sampled psychiatric outpatients ( $n = 1086$ ) from a center for cognitive therapy in Philadelphia, Pennsylvania. The final subsample of the sample used ( $n = 160$ ) was comprised of individuals with “major depressive disorder ( $n = 40$ ), dysthymic disorder and atypical depression ( $n = 11$ ), panic disorder ( $n = 45$ ), generalized anxiety disorder ( $n = 18$ ), agoraphobia with panic attacks ( $n = 18$ ), social and simple phobia ( $n = 12$ ), and miscellaneous nonanxiety, nondepression disorders such as academic problems and adjustment disorders ( $n = 16$ )” (p. 894). No other demographic information on the sample was provided. Extensive validation studies of the BAI were conducted on this group of individuals.

The developers of the BAI used an initial item pool of 86 items to measure anxiety as part of the new BAI measure. The items included were taken from the Anxiety Checklist (ACL), Physician’s Desk Reference (PDR) Checklist, and the Situational Anxiety Checklist (SAC), all developed by Aaron T. Beck. The items from the ACL evaluated severity of anxiety in depressed patients, reflecting somatic, affective,

and cognitive symptoms characteristic of anxiety but not depression. The PDR Checklist was included to serve as a control on item selection. The SAC was used to evaluate the specificity of the anxiety symptoms. In the clinical evaluation of the participants, the researchers used the Structured Clinical Interview for DSM-III (SCID) to aid in diagnosis. The criterion measures used were the Hamilton Rating Scales for Anxiety and Depression, the Beck Depression Inventory (BDI), the Hopelessness Scale (HS), and the Cognition Checklist (CCL) (Beck et al., 1988).

Because of the similarity between items, 20 of the initial items were removed from the item pool. Principal factor analyses led to the removal of an additional 19 items. After further reliability and validity tests, the final item pool remained at 21 items. Each item describes a common symptom of anxiety and asks the respondent to evaluate symptom severity over the past seven days, including the current day. The response scale is a 4-point scale, 0 (*not at all*) to 3 (*severely-I could barely stand it*). The items are summed to arrive at a final score (0-63) (Beck et al., 1988).

The researchers tested the reliability of the scale, performed factor analyses, and evaluated the convergent and discriminant validity of the final scale. The final results of the evaluation of the BAI revealed that the test has high internal consistency and test-retest reliability and good concurrent and discriminant validity. The final scale had a high internal consistency ( $\alpha = .92$ ) and item-total correlations ranging from .30 to .71 (median = .60). The test-retest correlation between intake and one week was .75. After performing an iterated principal factor analysis, the researchers found that the first factor was comprised of somatic symptoms, while the second factor was comprised of subjective anxiety and panic symptoms.

Finally, the researchers tested the ability of the BAI to discriminate between three diagnostic groups. The first group was comprised of individuals with anxiety but no secondary depression and depression without secondary anxiety. The second group included individuals diagnosed with either depression or anxiety (no secondary diagnoses were specified). Finally, the third comparison group included individuals who had been diagnosed with a primary or secondary anxiety disorder and depressed patients with no anxiety. The control group had neither depression nor anxiety. One-way analysis of variance tests revealed that the mean BAI score was higher in the anxious group in comparison to the depressed and control groups. The correlations of the BAI with the Hamilton scale for anxiety and the Hamilton scale for depression were .51 and .25, respectively. The correlation of the BAI and BDI was .48. Finally, the BAI was correlated with CCL-A (anxiety) and the CCL-D (depression). The correlations were .51 and .22, respectively. The BAI was also not correlated with the HS ( $r = .15$ ). Based on this evaluation, the BAI appears to be a valid and reliable measure of anxiety symptom severity. Cronbach's alpha for BAI scores in the current study was .90.

**Health-related quality of life.** The CRQ is a 20-item disease-specific measure of HRQOL that has been used frequently to measure HRQOL in patients suffering from COPD. As such, this scale was only administered to participants with COPD. Items are scored on a 7-point Likert-type scale and measure four domains including dyspnea, fatigue, emotional functioning, and disease mastery; higher scores indicate higher levels of HRQOL. The total score indicates better HRQOL. Items measuring fatigue, emotion, and mastery have been found to be highly internally consistent ( $\alpha = .71-.88$ ). Test-retest



reliability is also high ( $p > .90$ ). The test has been shown to be related to the Symptom Checklist-90 (SCL-90) (Wijkstra et al., 1994).

Rutten-van Mólken, Roos, and Van Noord (1999) conducted a validity study comparing the CRQ to the St. George's Respiratory Questionnaire (SGRQ), another disease-specific measure of HRQOL for those with lung disease. Their study included 144 patients with moderate to severe COPD and evaluated the patients prior to and after 12 weeks of treatment. The researchers found that the CRQ had good internal validity ( $\alpha = .84$ ) and determined that the SGRQ and CRQ could be used interchangeably to measure HRQOL in patients with lung disease. Cronbach's alpha for CRQ scores in the current study was .85 (COPD group only).

**Spirituality.** The FACIT-Sp is a 23-item measurement tool designed to assess aspects of spirituality such as meaning in life, harmony, and a sense of strength and comfort from one's faith, all of which are deemed components of HRQOL in individuals with chronic illnesses. Peterman, Fitchett, Brady, Hernandez, and Cella (2002) conducted validation and reliability studies on the FACIT-Sp using 1,617 participants (53% female and 47% male), most of who had been diagnosed with cancer (83.1%). Three ethnicities were represented; 31.1% were African American, 44.4% were Latino, and 24.5% were European American. Most (59.1%) spoke English as a preferred language. No other demographic data was presented. Participants in the study by Peterman and colleagues completed the following measures: Functional Assessment of Cancer Therapy-General (FACT-G), Functional Assessment of Chronic Illness Therapy-Spirituality Well-Being Scale (FACIT-Sp), Marlowe-Crowne Social Desirability Scale (MCSDS), and the Profile of Mood States– Short Form (POMS-SF). The authors

determined that the reliability of the total scale was good ( $\alpha = .81-.88$ ), indicating good internal consistency. Also, the researchers were able to establish convergent validity, determining that the FACIT-Sp was related to measures of organizational religious activities (ORA), non-organizational religious activities (NORA), and the Spiritual Beliefs Inventory (SBI). They determined that the FACIT-Sp was moderately correlated with NORA and SBI ( $r = .31$  and  $.48$ , respectively;  $p < .0005$ ), indicating that the FACIT-Sp is a reliable and moderately valid tool that may be used to assess spirituality in individuals with chronic illnesses. They also found moderate to strong correlations between the FACIT-Sp score and QOL (measured by the total FACT-G). The Meaning/Peace ( $r = .62$ ) and Faith ( $r = .34$ ) subscales of the FACIT-Sp ( $r = .58$ ) and the FACT-G were positively correlated. The low relationship between the FACIT-Sp and a measure of depression illustrates divergent validity ( $r = -.54$ ), as do the weak associations of the FACIT-Sp and a social desirability scale ( $r = .27$ ).

Peterman and colleagues (2002) also conducted another study in which they compared the FACIT-Sp with the SBI. They found that faith subscale of the FACIT-Sp was correlated with the SBI total score ( $r = .75$ ,  $p < .005$ ), the SBI Beliefs subscale ( $r = .74$ ,  $p < .005$ ). Based on these findings, the FACIT-Sp is psychometrically sound.

Cronbach's alpha for FACIT-Sp scores in the current study was .86.

**Functional independence.** FIM is an 18-item measurement tool designed to evaluate level of functional independence. The FIM scale assesses level of cognitive and physical functional independence, indicates level of disability or burden of care, and is comprised of 18 items in self-care, sphincters, mobility, communication, psychosocial, and cognitive domains. Self-care items include eating, grooming, bathing/showering,

upper body dressing, lower body dressing, and toileting. Sphincter items include bowel and bladder management. Mobility items include bed/chair/wheelchair transfers, toilet transfers, bathtub/shower transfers, walking/wheelchair locomotion, and stair locomotion. Cognitive items include comprehension, expression, problem solving, social interaction, and memory. Scores on each item range from 0 to 7 and are based on level of independence in managing the various items included in the FIM. A score of 1 on a scale indicates total dependence while a score of 7 on a scale indicates complete independence. A score of 0 indicates the item was not completed.

FIM is a widely used tool in rehabilitation facilities; an estimated 60% of rehabilitation hospitals in the United States utilize the tool (Stineman et al., 1996). FIM has been extensively researched, used with pulmonary populations (Pasqua et al., 2009), and is considered to be psychometrically sound. The study conducted by Pasqua and collaborators (2009) involved a cross-sectional analysis of patient records, utilizing factor analysis and techniques of multi-trait scaling to verify the summative properties of the motor and cognitive dimensions of the FIM and to study the statistical properties of admission FIM scores. In a study of 93,829 patients discharged from freestanding rehabilitation hospitals, Stineman and colleagues (1996) found item internal consistency to be 96.6% and item discriminant validity to be 100%. Also, the researchers found reliability coefficients for each impairment category ranged from .86 to .97. These findings indicate that the FIM is a good measure of functional independence in patients with a variety of health conditions. Cronbach's alpha for FIM scores in the current study was .96.

**Depression.** The GDS (see Appendix A) is a public domain, 30-item questionnaire in which participants are asked to respond yes or no to questions about depressive symptoms, according to how they have felt over the past week. To protect against response sets, some of the items on the GDS are reverse scored. The scale was first developed by Yesavage and colleagues (1983) to demonstrate the applicability of depression scales in the elderly population. The developers chose a pool of 100 participants who were shown to be more depressed than the normal population to determine the items to include in the measure.

A number of validation studies have been completed on the GDS. One such study included two groups of participants ( $n = 40$  and  $n = 60$ ). The first group had no psychiatric symptoms. The second group was undergoing treatment for depression. The latter group was further separated into two groups in terms of mild and severe depression based on a predetermined set of criteria. All participants underwent a clinical interview and were administered the Hamilton Rating Scale for Depression (HRS-D), the Zung Self-Rating Depression Scale (SDS), and the GDS. Results for internal consistency, reliability, and validity were presented. The correlation with the total score was .56, suggesting that the GDS does, in fact, measure depression. In terms of inter-item correlations, the mean intercorrelation for the GDS was .36; the alpha coefficient for the GDS was .94. Both values indicate high internal consistency. The split-half reliability reported was .94, and the test-retest reliability was .85. In terms of validity, the researchers conducted an analysis of variance and found that the test accurately discriminated between groups of people who were either not depressed or were mildly or severely depressed. Convergent validity was also found between the HRS-D and the

SDS. The correlations between the HRS-D and the SDS and the GDS were .84 and .83, respectively (Yesavage et al., 1983).

Jongenelis and colleagues (2005) conducted a study on the accuracy of the GDS. The researchers evaluated elderly nursing home inhabitants from the Netherlands. They found that the GDS had 96.3% sensitivity for major depression and 85.1% for minor depression with 69.1% specificity. Dunn and Sacco (1989) also conducted a validation study on the GDS in which they examined 439 community-dwelling older adults in Pinellas County, Florida. The researchers determined that the alpha for the GDS was .91, indicating good internal validity.

The GDS has been widely used as a depression-screening tool for those living with COPD (Almagro et al., 2002; Kim et al., 2000; Peruzza et al., 2003). Several researchers have also utilized the GDS with older adults in medical settings. Lyness and colleagues (1997) found the GDS yielded a sensitivity of 100% and a specificity of 84% in adults 60 years or older who were attending primary care facilities. Olin, Schneider, Eaton, Zemansky, and Pollock (1992) also found the GDS to be sensitive (100%) and specific (96%) in detecting depression in older adults in outpatient settings. Additionally, Rapp, Parisi, Walsh, and Wallace (1988) conducted a study on men and found the GDS to be one of the most useful tools in detecting depression in the medically-ill elderly in terms of reliability (.92), validity, and efficiency, with sensitivity and specificity values of 70% and 89%, respectively. Parmelee, Lawton, and Katz (1989) also found that the GDS is a good measure for detecting depression in men and women in long-term care facilities. Based on this evidence, using the GDS with men and women with COPD in an acute IRF setting would be appropriate and efficient. Cronbach's alpha for GDS scores

in the current study was .70. The Cronbach coefficient alpha calculations for the study measures are listed in Table 4.

Table 4

*Cronbach Coefficient Alpha Calculations for Study Measures*

Measure	Alpha	Number of Items
GDS	0.70	30
BAI	0.90	21
FIM	0.96	18
CRQ	0.85	20
FACIT-Sp	0.86	12

**Study Design**

The current study employed a cross-sectional design and use of archival data. Cross-sectional studies are common in social sciences and survey research; such designs are less prone to control effects (Cohen, Manion, & Morrison, 2007). The goal of researchers conducting cross-sectional studies is to describe a pattern of relation between variables. Another advantage to cross-sectional designs is that these designs are carried out in natural settings and allow for the use of probability samples; thus, utilizing a cross-sectional study design allows researchers to make broad statistical inferences and generalize findings to real-life situations. As well, the current study was exploratory in nature, as few studies on COPD patients in IRF settings exist in the literature.

Table 5

*Summary Table of Research Hypotheses, Statistical Hypotheses, Instrumentation, and Analyses*

Research Hypothesis	Statistical Hypothesis	Instrumentation	Analyses
1. IRF patients with COPD differ in terms of levels of depression when compared to IRF patients without COPD.	$H_0: \mu_{\text{nonCOPD}} = \mu_{\text{nonCOPD}}$ $H_1: \mu_{\text{nonCOPD}} \neq \mu_{\text{nonCOPD}}$	GDS	Independent samples t-test
2. IRF patients with COPD differ in terms of levels of anxiety when compared to IRF patients without COPD.	$H_0: \mu_{\text{nonCOPD}} = \mu_{\text{nonCOPD}}$ $H_1: \mu_{\text{nonCOPD}} \neq \mu_{\text{nonCOPD}}$	BAI	Independent samples t-test
3. IRF patients with COPD differ in terms of level of functional independence when compared to IRF patients without COPD.	$H_0: \mu_{\text{nonCOPD}} = \mu_{\text{nonCOPD}}$ $H_1: \mu_{\text{nonCOPD}} \neq \mu_{\text{nonCOPD}}$	FIM	Independent samples t-test
4. IRF patients with COPD differ in terms of level of spirituality when compared to IRF patients without COPD.	$H_0: \mu_{\text{nonCOPD}} = \mu_{\text{nonCOPD}}$ $H_1: \mu_{\text{nonCOPD}} \neq \mu_{\text{nonCOPD}}$	FACIT-Sp	Independent samples t-test
5. Women with COPD in an IRF differ in terms of HRQOL in comparison to men with COPD in an IRF.	$H_0: \mu_{\text{womenCOPD}} = \mu_{\text{menCOPD}}$ $H_1: \mu_{\text{womenCOPD}} \neq \mu_{\text{menCOPD}}$	CRQ	Independent samples t-test
6. Spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD.		BAI CRQ FACIT-Sp	Mediation; indirect macro
7. Spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD.		CRQ GDS FACIT-Sp	Mediation; indirect macro

Table 5 (continued)

8. Spirituality mediates the relationship between anxiety and functional independence in IRF patients.	BAI FACIT-Sp FIM	Mediation; indirect macro
9. Spirituality mediates the relationship between depression and functional independence in IRF patients.	GDS FACIT-Sp FIM	Mediation; indirect macro
10. Gender moderates the relationship between anxiety and HRQOL in IRF patients with COPD.	BAI CRQ	Moderation; hierarchical regression
11. Gender moderates the relationship between depression and HRQOL in IRF patients with COPD.	CRQ GDS	Moderation; hierarchical regression
12. Gender moderates the relationship between spirituality and HRQOL in IRF patients with COPD.	CRQ FACIT-Sp	Moderation; hierarchical regression
13. Gender moderates the relationship between anxiety and functional independence in IRF patients with COPD.	BAI FIM	Moderation; hierarchical regression
14. Gender moderates the relationship between depression and functional independence in IRF patients with COPD.	GDS FIM	Moderation; hierarchical regression
15. Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.	FACIT-Sp FIM	Moderation; hierarchical regression
16. Gender moderates the relationship between anxiety and functional independence in IRF patients.	BAI FIM	Moderation; hierarchical regression
17. Gender moderates the relationship between depression and functional independence in IRF patients.	GDS FIM	Moderation; hierarchical regression



Table 5 (continued)

18. Gender moderates the relationship between spirituality and functional independence in IRF patients.	FACIT-Sp FIM	Moderation; hierarchical regression
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Note. COPD = chronic obstructive pulmonary disease, GDS = Geriatric Depression Scale, BAI = Beck Anxiety Inventory, FIM = Functional Independence Measure, FACIT-Sp = Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being subscale, HRQOL = health-related quality of life, CRQ = Chronic Respiratory Questionnaire

## Chapter Three: Results

The purpose of the current study was to gain a more complete understanding of the BPS relationship between COPD, depression, anxiety, spirituality, HRQOL, functional independence, and gender in IRF patients with COPD. Results of the empirical analyses performed on the data are presented in this chapter. The analyses and results are presented in the following sections: descriptive statistics and correlation coefficients; analyses; and a summary of key findings.

### Research Hypotheses

Several research and statistical hypotheses were tested within the current study and are listed below.

**Hypothesis 1.** IRF patients with COPD differ in terms of levels of depression when compared to IRF patients without COPD.

**Hypothesis 2.** IRF patients with COPD differ in terms of levels of anxiety when compared to IRF patients without COPD.

**Hypothesis 3.** IRF patients with COPD differ in terms of level of functional independence when compared to IRF patients without COPD.

**Hypothesis 4.** IRF patients with COPD differ in terms of level of spirituality when compared to IRF patients without COPD.

**Hypothesis 5.** Women with COPD in an IRF differ in terms of HRQOL in comparison to men with COPD in an IRF.

**Hypothesis 6.** Spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD.

**Hypothesis 7.** Spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD.

**Hypothesis 8.** Spirituality mediates the relationship between anxiety and functional independence in IRF patients.

**Hypothesis 9.** Spirituality mediates the relationship between depression and functional independence in IRF patients.

**Hypothesis 10.** Gender moderates the relationship between anxiety and HRQOL in IRF patients with COPD.

**Hypothesis 11.** Gender moderates the relationship between depression and HRQOL in IRF patients with COPD.

**Hypothesis 12.** Gender moderates the relationship between spirituality and HRQOL in IRF patients with COPD.

**Hypothesis 13.** Gender moderates the relationship between anxiety and functional independence in IRF patients with COPD.

**Hypothesis 14.** Gender moderates the relationship between depression and functional independence in IRF patients with COPD.

**Hypothesis 15.** Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.

**Hypothesis 16.** Gender moderates the relationship between anxiety and functional independence in IRF patients.

**Hypothesis 17.** Gender moderates the relationship between depression and functional independence in IRF patients.

**Hypothesis 18.** Gender moderates the relationship between spirituality and functional independence in IRF patients.

### Data Analyses

**Preliminary analyses.** Descriptive statistics for the study variables in the COPD sample are presented in Table 6, and descriptive statistics for the study variables in the IRF sample are presented in Table 7. Descriptive statistics for the study variables in the non-COPD sample are presented in Table 8. Pearson product-moment intercorrelations were conducted to determine the strength of the relationships between the variables. The Pearson product-moment intercorrelations for the variables in the COPD sample in the current study are presented in Table 9. The Pearson product-moment intercorrelations for the variables in the IRF sample in the current study are presented in Table 10. The Pearson product-moment intercorrelations for the variables in the non-COPD sample in the current study are presented in Table 11.

Table 6

*Descriptive Statistics for Study Variables in the COPD Sample (n = 55)*

Variable	Mean	SD	Kurtosis	Skewness	Range
Depression	12.38	3.19	.58	.34	0-30
Anxiety	12.23	11.22	-1.08	-.11	0-63
Functional Independence	76.87	23.20	-1.24	.12	0-126
HRQOL	100.10	25.22	-.60	.19	0-140
Spirituality	76.35	15.50	-.87	1.06	0-92

Note. HRQOL = health-related quality of life

Table 7

*Descriptive Statistics for Study Variables in the IRF Sample (n = 136)*

Variable	Mean	SD	Kurtosis	Skewness	Range
Depression	12.66	3.64	.17	.65	0-30
Anxiety	10.32	10.65	-.87	.15	0-63
Functional Independence	75.30	23.63	-.12	.13	0-126
Spirituality	74.97	14.87	.11	.90	0-48

Table 8

*Descriptive Statistics for Study Variables in the Non-COPD Sample (n = 81)*

Variable	Mean	SD	Kurtosis	Skewness	Range
Depression	12.15	2.52	-.29	.36	0-30
Anxiety	7.41	7.44	-.53	.31	0-63
Functional Independence	74.21	24.01	-1.21	.13	0-126
Spirituality	73.97	14.43	-.22	.82	0-48

Table 9

*Pearson Product-Moment Correlation Coefficients for the Study Variables in the*

*COPD Sample (n = 55)*

Variable	1	2	3	4	5	6	7	8
1. HRQOL	1							
2. Anxiety	-.60**	1						
3. Depression	-.49**	.34**	1					
4. Functional Independence	.12	-.08	-.22*	1				
5. Spirituality	.48**	-.29**	-.41**	.12	1			
6. Gender	-.31	.10	-.06	-.08	.24	1		
7. Age	.13	-.31	-.30	-.10	.14	-.06	1	
8. Ethnicity	.20	-.08	-.16	-.21	.07	-.11	.13	1

Note. HRQOL = health-related quality of life; Hypotheses were two-tailed.

Note. \*\* $p < .01$ , \* $p < .05$

Table 10

*Pearson Product-Moment Correlation Coefficients for the Study Variables in the IRF*

*Sample (n = 136)*

Variable	1	2	3	4	5	6	7
1. Anxiety	1						
2. Depression	.34**	1					
3. Functional Independence	.08	-.22*	1				
4. Spirituality	-.29**	-.41**	.12	1			
5. Gender	.12	-.04	-.08	-.15	1		
6. Age	-.26	-.17	.00	.18	-.11	1	
7. Ethnicity	-.08	-.15	-.00	.16	-.07	-.05	1

Note. Hypotheses were two-tailed.

Note. \*\* $p < .01$ , \* $p < .05$

Table 11

*Pearson Product-Moment Correlation Coefficients for the Study Variables in the Non-COPD Sample (n = 81)*

Variable	1	2	3	4	5	6	7
1. Anxiety	1						
2. Depression	.34**	1					
3. Functional Independence	-.08	-.22*	1				
4. Spirituality	-.29**	-.41**	.12	1			
5. Gender	.10	-.06	-.08	.24	1		
6. Age	-.25	-.10	.05	.21	-.12	1	
7. Ethnicity	-.06	-.14	.10	.22	-.04	-.11	1

Note. Hypotheses were two-tailed.

Note. \*\* $p < .01$ , \* $p < .05$

A power analysis to determine appropriate sample size was also conducted prior to completing any further data analysis. The analysis was completed using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Results from the analysis indicated that for a small effect size ( $d = .20$ ), a total sample size of  $n = 651$  per group was needed for the  $t$ -tests. For medium ( $d = .50$ ) and large effect sizes ( $d = .80$ ), sample sizes of  $n = 105$  and  $n = 42$  per group were needed for two-tailed  $t$ -tests. For one-tailed  $t$ -tests, a power analysis revealed that for small effect size ( $d = .20$ ), a total sample size of  $n = 542$  per group was needed for the  $t$ -tests. For medium ( $d = .50$ ) and large effect sizes ( $d = .80$ ), sample sizes of  $n = 88$  and  $n = 35$  per group were needed. Other power analyses indicated that for a small effect size ( $f^2 = .02$ ), a sample size of  $n = 776$  was needed. For medium ( $f^2 = .15$ ) and large effect sizes ( $f^2 = .35$ ), sample sizes of  $n = 107$  and  $n = 48$  were needed, respectively for the regression analyses (mediation and moderation). Since the effect sizes in the current study were small at best, power analyses indicated that power was

compromised by insufficient sample sizes. Further preliminary analyses were conducted to determine whether age, ( $t(134) = .48, p = .63$ ), gender ( $X_2(1, N = 136) = 2.01, p = .22$ ), or ethnicity ( $X_2(1, N = 136) = .64, p = .42$ ) between the COPD and non-COPD groups created potential confounds. Based on results obtained, neither age, gender, nor ethnicity is a confounding variable. The COPD group was comprised of more women than was the non-COPD group. Given the disproportionate number of women in the COPD group, bivariate correlations were also conducted to determine whether gender had an effect on the outcome variables. Based on results obtained, gender did not have a significant effect on any of the outcome variables in the study (depression, anxiety, functional independence, HRQOL, or spirituality). Results are presented in Tables 9, 10, and 11.

**Primary analyses.** Independent samples *t*-tests, mediation, and moderation analyses were employed in the current study. Results from these analyses are described in the following sections.

**Independent samples *t*-test.** In the current study, independent samples *t*-tests were used to explore (a) differences in levels of depression in individuals with COPD and those without COPD, (b) differences in levels of anxiety in individuals with COPD and those without COPD, (c) differences in levels of functional independence in those with COPD and those without COPD, and (d) differences in levels of HRQOL in men and women with COPD. Regarding depression, no significant differences between the COPD ( $M = 12.38, SD = 3.19$ ) and non-COPD ( $M = 12.15, SD = 2.52$ ) groups were found;  $t(119) = -.433, p = .67$ ; thus, Hypothesis 1, which stated that patients with COPD differ in terms of levels of depression when compared to patients without COPD, was not supported. For anxiety, a significant difference between the COPD ( $M = 12.23, SD =$



11.22) and non-COPD ( $M = 7.41$ ,  $SD = 7.44$ ) groups was found;  $t(124) = -2.90$ ,  $p = .004$ . As such, Hypothesis 2, which stated that patients with COPD differ in terms of levels of anxiety when compared to patients without COPD, was supported; patients with COPD endorsed higher levels of anxiety than did patients without COPD. Regarding functional independence, no significant differences were found between the COPD ( $M = 76.87$ ,  $SD = 23.20$ ) and non-COPD ( $M = 74.21$ ,  $SD = 24.01$ ) groups;  $t(130) = -.64$ ,  $p = .53$ .

Therefore, the Hypothesis 3, which stated that patients with COPD differ in terms of level of functional independence when compared to patients without COPD, was not supported. Also, when considering levels of spirituality, a significant difference was not found between the COPD ( $M = 76.35$ ,  $SD = 15.50$ ) and non-COPD groups ( $M = 73.97$ ,  $SD = 14.43$ );  $t(107) = -.08$ ,  $p = .41$ . These results indicate that the Hypothesis 4, which stated that patients with COPD differ in terms of levels of spirituality when compared to patients without COPD, was not supported.

An independent samples  $t$ -test was also conducted to compare levels of HRQOL between men and women with COPD. The dataset was split such that only individuals with COPD were included in the analysis. A significant difference was found between men ( $M = 112.5$ ,  $SD = 22.75$ ) and women ( $M = 95.42$ ,  $SD = 24.78$ );  $t(49) = 2.25$ ,  $p = .03$ ; specifically, women with COPD have lower levels of HRQOL than do men with COPD. These results suggest that Hypothesis 5 that stated that men and women with COPD differ in terms of levels of HRQOL was supported.

A review of the literature provided a rationale for utilizing directional hypotheses. The current study, however, implemented a more conservative approach and examined only non-directional hypotheses. Statistical analyses of the current study indicate that

using directional hypotheses would have also produced nonsignificant results due to the size of the  $p$ -values obtained.

**Mediation.** A mediation model is used when the analytical goal is to identify and explain the underlying process of an observed relationship between an independent and dependent variable by including a third or mediator variable. Mediation establishes how or why one variable predicts or causes an outcome variable (Frazier, Tix, & Barron, 2004) and explains the relationship between the predictor and an outcome (Baron & Kenny, 1986). Essentially, a mediator is the mechanism through which a predictor influences an outcome variable (Baron & Kenny, 1986). A mediation model is often chosen when a strong relationship between a predictor and an outcome variable already exists. In the current dissertation, the goal was to utilize mediation to explore the following in individuals with COPD in an acute inpatient physical rehabilitation facility and in all individuals in an acute inpatient physical rehabilitation facility: (a) whether spirituality mediates the relationship between anxiety and HRQOL in patients with COPD, (b) whether the spirituality mediates the relationship between depression and HRQOL in patients with COPD, (c) whether spirituality mediates the relationship between anxiety and functional independence in IRF patients, and (d) whether spirituality mediates the relationship between depression and functional independence in IRF patients.

Statistically significant relationships must exist between all variables to conduct mediation analyses (Baron & Kenny, 1986). Pearson-product moment correlations for both groups (COPD and IRF) are listed in Tables 9 and 10, respectively. Those results indicate that spirituality was significantly negatively correlated with depression ( $r = -.41$ ,

$p < .01$ ) and anxiety ( $r = .29, p < .01$ ) and positively correlated with HRQOL ( $r = .48, p < .01$ ) in the COPD sample. The results from these bivariate correlations suggest that (a) as spirituality increases, depression decreases in IRF patients with COPD, (b) as spirituality increases, anxiety decreases in IRF patients with COPD, and (c) as spirituality increases, HRQOL increases in IRF patients with COPD. Correlations between spirituality, anxiety, depression, and functional independence were not statistically significant in the IRF patient group. Therefore, mediation analyses were conducted for hypotheses 6 and 7 but not conducted for hypotheses 8 and 9.

The mediation macro developed by Preacher and Hayes (2008) was used to compute the direct and indirect path coefficients of depression and HRQOL in IRF patients with COPD as mediated by spirituality using normalized values. These path coefficients refer to the unstandardized regression weights in the relation of the independent and dependent variable. The independent variable (depression) had a significant direct path to the mediator (spirituality,  $B = -1.13$ ). The mediator (spirituality) also had a significant direct path to the dependent variable (HRQOL,  $B = 7.91$ ). Additionally, depression was found to have a significant indirect effect on HRQOL as mediated through spirituality ( $B = -26.35$ ). After including spirituality in the model, the relation of depression to HRQOL remained significant, indicating that the relationship between depression and HRQOL was not fully mediated by spirituality. Further examination of the model revealed partial mediation as indicated by the reduction in the path coefficient ( $B = -26.35$  to  $B = -17.45$ ). The total model was significant ( $F = 11.75, p = .001$ ) and accounted for 40% of the variance in HRQOL. To further examine the significance of the indirect effects, guidelines proposed by Shrout and Bolger (2002)

were followed, and 1,000 bootstrap samples using the Preacher and Hayes (2008) indirect mediation macro were created. Across all 1,000 samples, 95% confidence intervals were computed for the upper and lower potential limits of these indirect effects. Shrout and Bolger (2002) recommend exploration of the confidence intervals (CI) to determine the significance of the indirect effects. If zero is not included in the range of confidence intervals, the indirect effect is said to be significant at the  $p = .05$  level. Results showed that spirituality (SE = 4.76, CI = -22.22, -2.72) does not, in fact, fully mediate the link between depression and HRQOL in COPD patients. Therefore, hypothesis 7 that stated spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD was partially supported, as results revealed that spirituality partially mediates the relationship between depression and HRQOL in IRF patients with COPD. Table 12 presents the bootstrap results for the mediation of spirituality in the link between depression and HRQOL in COPD patients.

Table 12

*Testing Mediator Effects of Spirituality on the Relationship between Depression and HRQOL in IRF Patients with COPD*

Depression (IV) to Spirituality (Mediator) (a path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Spirituality	-1.13	.34	3.29	.00
Direct Effects of Spirituality (Mediator) on HRQOL (DV) (b path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Spirituality	7.91	3.11	2.54	.02
Total Effect of Depression (IV) on HRQOL (DV) (c path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Depression	-26.35	6.85	-3.85	.00
Direct Effect of Depression (IV) on HRQOL (DV) (c' path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Depression	-17.45	7.28	-2.40	.02

Note. HRQOL = health-related quality of life

The mediation macro developed by Preacher and Hayes (2008) was also used to compute the direct and indirect path coefficients of anxiety and HRQOL in IRF patients with COPD as mediated by spirituality using normalized values. These path coefficients refer to the regression weights in the relation of the independent and dependent variable. The independent variable (anxiety) had a significant direct path to the mediator (spirituality,  $B = -.33$ ). The mediator (spirituality) did not have a significant direct path to the dependent variable (HRQOL,  $B = 3.90$ ). Additionally, anxiety was found to have a significant indirect effect on HRQOL as mediated through spirituality ( $B = -7.74$ ). After including spirituality in the model, the relation of anxiety to HRQOL remained significant ( $B = -6.46$ ). The total model was significant ( $F = 11.35, p = .0002$ ) and

accounted for 39% of the variance in HRQOL. To further examine the significance of the indirect effects, guidelines proposed by Shrout and Bolger (2002) were followed, and 1,000 bootstrap samples using the Preacher and Hayes (2008) indirect mediation macro were created. Across all 1,000 samples, 95% confidence intervals were computed for the upper and lower potential limits of these indirect effects. Shrout and Bolger (2002) recommend exploration of the confidence intervals (CI) to determine the significance of the indirect effects. If zero is included in the range of confidence intervals, the indirect effect is said to be nonsignificant at the  $p = .05$  level. Results showed that spirituality (SE = 1.04, CI = -3.33, .85) does not mediate the link between anxiety and HRQOL in COPD patients. Therefore, hypothesis 6 that stated spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD was not supported. Table 11 presents the bootstrap results for the mediation of spirituality in the link between anxiety and HRQOL in COPD patients.

Table 13

*Testing Mediator Effects of Spirituality on the Relationship between Anxiety and HRQOL  
in IRF Patients with COPD*

Anxiety (IV) to Spirituality (Mediator) (a path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Spirituality	-.33	.11	3.07	.00
Direct Effects of Spirituality (Mediator) on HRQOL (DV) (b path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Spirituality	.390	2.67	1.46	.15
Total Effect of Anxiety (IV) on HRQOL (DV) (c path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Anxiety	-7.74	1.73	-4.46	.00
Direct Effect of Anxiety (IV) on HRQOL (DV) (c' path)				
	Coefficient	SE	<i>t</i>	<i>p</i>
Anxiety	-6.46	1.92	-3.37	.00

Note. HRQOL = health-related quality of life

**Moderation.** Moderation analysis addresses “when or for whom a predictor is more strongly related to an outcome,” and a moderator variable serves to “alter the direction or strength of the relation between a predictor and an outcome... a moderator effect is nothing more than an interaction whereby the effect of one variable depends on the level of another.” (Frazier et al, 2004, p. 116). As well, moderation analyses may be used when used when the relationship between predictors and outcomes are weak or inconsistent. Baron and Kenny (1986) explain, “it is desirable that the moderator variable be uncorrelated with both the predictor and the criterion (the dependent variable) to provide a clearly interpretable interaction term” (p. 1174). In moderation analyses, ensuring adequate power is important and depends upon several factors (Frazier et al,

2004). Statistical power in the current study was enhanced by choosing reliable outcome variables, ensuring adequate sample sizes, and reliance on theory and information from the literature when planning analyses.

In the current study, several moderation analyses were utilized to evaluate the influence of gender in IRF patients. Specifically, moderation analyses were conducted to determine whether gender moderates the relationship between anxiety and HRQOL, the relationship between depression and HRQOL, and the relationship between spirituality and HRQOL in patients with COPD. Additionally, moderation analyses were conducted to evaluate the impact of gender on the relationship between anxiety and functional independence, the relationship between depression and functional independence, and the relationship between spirituality and functional independence in patients with COPD. Finally, further moderation analyses were conducted to examine the impact of gender on the relationship between anxiety and functional independence, the relationship between depression and functional independence, and the relationship between spirituality and functional independence in IRF patients. The goal of the moderation analyses was to determine whether the effect of anxiety, depression, or spirituality on HRQOL in COPD patients was dependent upon gender. Similarly, another goal of moderation analysis was to explore whether the relationship between anxiety, depression, or spirituality on functional independence in COPD patients was dependent upon gender. A final goal of moderation analysis was to determine whether the effect of anxiety, depression, or spirituality on functional independence in IRF patients was dependent upon gender.

Preliminary analyses (bivariate correlations) were conducted to examine the strength of the relationship between gender, anxiety, and HRQOL; gender, depression,



and HRQOL; and gender, spirituality, and HRQOL in IRF patients with COPD. Analyses were also conducted to examine the strength of the relationship between gender, anxiety, and functional independence; gender, depression and functional independence; and gender, spirituality, and functional independence in COPD patients. Final preliminary analyses were conducted to examine the strength of the relationship between gender, anxiety, and functional independence; gender, depression, and functional independence; and gender, spirituality, and functional independence in IRF patients. The preliminary analyses were conducted as “moderator effects are best detected when the relation between the predictor and outcome is substantial. However, moderators often are examined when there are unexpectedly weak relations between a predictor and outcome” (Frazier et al, 2004, p. 118).

In accordance with Aiken and West’s (1991) suggestions for moderation analysis, further preliminary analyses were conducted, and the predictor (anxiety, depression, and spirituality) and moderation (gender) variables were standardized. Standardizing variables may be preferable to centering variables, because standardizing variables leads to easier interpretation of the effects of the predictor and moderator variables (Frazier et al, 2004). Preliminary inspection of the data checked assumptions underlying regression analysis including issues of normality, linearity, and homoscedasticity. Examination of scatterplot matrixes revealed that assumptions of normality and homoscedasticity were met. The Durbin-Watson statistic assessed independence and revealed normal values at 2.0, which is acceptable according to Field (2009). Variance inflation factors (VIF) were assessed, revealing no values over 3, therefore, indicating no issues of multicollinearity. Potential influential outliers within the data were analyzed (Bollen & Jackman, 1990).

No data points had a Mahalanobis distance greater than 21.47 (Stevens, 2002) or a Cook D value greater than 1.

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which anxiety and gender predict HRQOL in COPD patients. The analysis also explored a possible interaction between anxiety and gender to determine whether gender moderated the relationship between anxiety and HRQOL in COPD patients. Initially, an interaction term between anxiety and gender was created. Standardized predictor variables (anxiety and gender) were entered in step 1, and HRQOL was entered as the dependent variable. Results revealed that anxiety and gender explain 43% of the variance in HRQOL in COPD patients. After entry of the interaction term of gender\*anxiety at step 2, the total variance explained by the model as a whole was 46%,  $R^2$  change = .03,  $F$  change (1, 44) = 1.78,  $p = .19$ . Hypothesis 10 stated that gender moderates the relationship between anxiety and HRQOL in COPD patients. Results from the current study indicate that gender does not moderate the relationship between anxiety and HRQOL in IRF patients with COPD. Results from the hierarchical regression analysis for anxiety, gender, and HRQOL in COPD patients are presented in Table 14.

Table 14

*Summary of Hierarchical Regression Analysis for Anxiety, Gender, and HRQOL in IRF*

*Patients with COPD (n = 55)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Step 1	Anxiety	-14.09	2.71	-.59	-5.21	.00	
	Gender	-7.19	3.03	-.27	-2.38	.32	.43
Step 2	Anxiety	-14.58	2.71	-.61	-5.39	.00	
	Gender	-7.55	3.01	-.28	-2.51	.31	
	Gender*Anxiety	3.82	2.86	.15	1.34	.34	.46

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which depression and gender predict HRQOL in COPD patients. The analysis also explored a possible interaction between depression and gender to determine whether gender moderated the relationship between depression and HRQOL in COPD patients. Initially, an interaction term between depression and gender was created. Standardized predictor variables (depression and gender) were entered in step 1, and HRQOL was entered as the dependent variable. Results revealed that depression and gender explain 35% of the variance in HRQOL in COPD patients. After entry of the interaction term of gender\*depression at step 2, the total variance explained by the model as a whole was 37%,  $R^2$  change = .02,  $F$  change (1, 43) = 1.52,  $p = .22$ .

Hypothesis 11 stated that gender moderates the relationship between depression and HRQOL in COPD patients. Results from the current study indicate that gender does not moderate the relationship between depression and HRQOL in COPD patients in an IRF.

Results from the hierarchical regression analysis for depression, gender, and HRQOL in COPD patients are presented in Table 15.

Table 15

*Summary of Hierarchical Regression Analysis for Depression, Gender, and HRQOL in IRF Patients with COPD (n = 55)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Step 1	Depression	-11.83	2.85	-.51	-4.14	.00	
	Gender	-8.71	3.28	-.32	-2.65	.30	.35
Step 2	Depression	-11.90	2.84	-.51	-4.19	.00	
	Gender	-8.88	3.27	-.33	-2.72	.32	
	Gender*Depression	3.54	2.87	.15	1.24	.22	.37

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which spirituality and gender predict HRQOL in COPD patients. The analysis also explored a possible interaction between spirituality and gender to determine whether gender moderated the relationship between spirituality and HRQOL in COPD patients. Initially, an interaction term between spirituality and gender was created. Standardized predictor variables (spirituality and gender) were entered in step 1, and HRQOL was entered as the dependent variable. Results revealed that spirituality and gender explain 27% of the variance in HRQOL in COPD patients. After entry of the interaction term of gender\*spirituality at step 2, the total variance explained by the model as a whole was 27%, *R* squared change = .00, *F* change (1, 37) = .05, *p* = .83. Hypothesis 12 stated that gender moderates the relationship between spirituality and HRQOL in COPD patients. Results from the current study indicate that gender does not moderate the

relationship between spirituality and HRQOL in COPD patients in an IRF. Results from the hierarchical regression analysis for spirituality, gender, and HRQOL in COPD patients are presented in Table 16.

Table 16

*Summary of Hierarchical Regression Analysis for Spirituality, Gender, and HRQOL in IRF Patients with COPD (n = 55)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Step 1	Spirituality	11.22	3.73	.43	3.01	.01	
	Gender	-5.23	3.87	-.19	-1.35	.20	.27
Step 2	Spirituality	11.90	4.95	.46	2.40	.02	
	Gender	-4.64	4.80	-.17	-.97	.34	
	Gender*Spirituality	-1.35	6.33	-.04	-.21	.83	.27

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which anxiety and gender predict functional independence in COPD patients. The analysis also explored a possible interaction between anxiety and gender to determine whether gender moderated the relationship between anxiety and functional independence in COPD patients. Initially, an interaction term between anxiety and gender was created. Standardized predictor variables (anxiety and gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that anxiety and gender explain 1% of the variance in functional independence in COPD patients. After entry of the interaction term of anxiety\*gender at step 2, the total variance explained by the model as a whole was 8%, R squared change =

.07,  $F$  change (1, 47) = 3.44,  $p$  = .07. Hypothesis 13 stated that gender moderates the relationship between anxiety and functional independence in COPD patients. Results from the current study indicate that gender does not moderate the relationship between anxiety and functional independence in COPD patients in an IRF. Results from the hierarchical regression analysis for anxiety, gender, and functional independence in COPD patients are presented in Table 17.

Table 17

*Summary of Hierarchical Regression Analysis for Anxiety, Gender, and Functional Independence in IRF Patients with COPD (n = 55)*

	Variable	$B$	$SEB$	$\beta$	$t$	$p$	$R^2$
Step 1	Anxiety	-.05	.29	-.03	-.18	.86	
	Gender	.19	.32	.09	.61	.55	.01
Step 2	Anxiety	-.02	.28	-.01	-.07	.95	
	Gender	.25	.31	.11	.79	.44	
	Gender*Anxiety	-.55	.30	-.26	-1.85	.50	.08

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which depression and gender predict functional independence in COPD patients. The analysis also explored a possible interaction between depression and gender to determine whether gender moderated the relationship between depression and functional independence in COPD patients. Initially, an interaction term between depression and gender was created. Standardized predictor variables (depression and gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that depression and gender explain 2% of the variance in

functional independence in COPD patients. After entry of the interaction term of gender\*depression at step 2, the total variance explained by the model as a whole was 8%,  $R^2$  change = .06,  $F$  change (1, 46) = 2.85,  $p$  = .10. Hypothesis 14 stated that gender moderates the relationship between depression and functional independence in COPD patients. Results from the current study indicate that gender does not moderate the relationship between depression and functional independence in COPD patients in an IRF. Results from the hierarchical regression analysis for depression, gender, and functional independence in COPD patients are presented in Table 18.

Table 18

*Summary of Hierarchical Regression Analysis for Depression, Gender, and Functional Independence in IRF Patients with COPD (n = 55)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	$R^2$
Step 1	Depression	-.24	.28	-.12	-.86	.40	
	Gender	.20	.32	.09	.62	.54	.02
Step 2	Depression	-.25	.27	-.13	-.91	.37	
	Gender	.22	.32	.10	.71	.48	
	Gender*Depression	-.47	.28	-.24	-1.69	.20	.08

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which spirituality and gender predict functional independence in COPD patients. The analysis also explored a possible interaction between spirituality and gender to determine whether gender moderated the relationship between spirituality and functional independence in COPD patients. Initially, an interaction term between spirituality and gender was created. Standardized predictor variables (spirituality and

gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that spirituality and gender explain 1% of the variance in functional independence in COPD patients. After entry of the interaction term of gender\*spirituality at step 2, the total variance explained by the model as a whole was 4%,  $R^2$  change = .03,  $F$  change (1, 39) = 1.34,  $p = .25$ . Hypothesis 15 stated that gender moderates the relationship between spirituality and functional independence in COPD patients. Results from the current study indicate that gender does not moderate the relationship between spirituality and functional independence in COPD patients in an IRF. Results from the hierarchical regression analysis for spirituality, gender, and functional independence in COPD patients are presented in Table 19.

Table 19

*Summary of Hierarchical Regression Analysis for Spirituality, Gender, and Functional Independence in IRF Patients with COPD (n = 55)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	$R^2$
Step 1	Spirituality	.006	.35	.003	.02	.99	
	Gender	.19	.36	.09	.09	.60	.01
Step 2	Spirituality	.34	.46	.16	.16	.47	
	Gender	-.10	.44	-.05	-.05	.82	
	Gender*Spirituality	-.68	.58	.58	-.26	.25	.04

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which anxiety and gender predict functional independence in IRF patients. The analysis also explored a possible interaction between anxiety and gender to determine whether gender moderated the relationship between anxiety and functional



independence in IRF patients. Initially, an interaction term between anxiety and gender was created. Standardized predictor variables (anxiety and gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that anxiety and gender explain 1% of the variance in functional independence in COPD patients. After entry of the interaction term of gender\*anxiety at step 2, the total variance explained by the model as a whole was 2%,  $R^2$  change = .01,  $F$  change (1,120) = 1.34,  $p = .24$ . Hypothesis 16 stated that gender moderates the relationship between anxiety and functional independence in IRF patients. Results from the current study indicate that gender does not moderate the relationship between anxiety and functional independence in IRF patients in an IRF. Results from the hierarchical regression analysis for anxiety, gender, and functional independence in IRF patients are presented in Table 20.

Table 20

*Summary of Hierarchical Regression Analysis for Anxiety, Gender, and Functional Independence in IRF Patients (n = 136)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	$R^2$
Step 1	Anxiety	-.18	.19	-.09	-.98	.33	
	Gender	-.17	.19	-.08	-.92	.36	.01
Step 2	Anxiety	-.19	.19	-.09	-1.02	.31	
	Gender	-.19	.19	-.09	-1.02	.31	
	Gender*Anxiety	.22	.19	.11	1.18	.24	.02

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which depression and gender predict functional independence in IRF patients. The analysis also explored a possible interaction between depression and gender to determine whether gender moderated the relationship between depression and functional independence in IRF patients. Initially, an interaction term between depression and gender was created. Standardized predictor variables (depression and gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that depression and gender explain 23% of the variance in functional independence in COPD patients. After entry of the interaction term of gender\*depression at step 2, the total variance explained by the model as a whole was 24%,  $R^2$  change = .01,  $F$  change (1,115) = .58,  $p = .45$ . Hypothesis 17 stated that gender moderates the relationship between depression and functional independence in IRF patients. Results from the current study indicate that gender does not moderate the relationship between depression and functional independence in IRF patients in an IRF. Results from the hierarchical regression analysis for depression, gender, and functional independence in IRF patients are presented in Table 21.

Table 21

*Summary of Hierarchical Regression Analysis for Depression, Gender, and Functional Independence in IRF Patients (n = 136)*

	Variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Step 1	Depression	-.44	.19	-.21	-2.36	.40	
	Gender	-.13	.19	-.06	-.69	.54	.23
Step 2	Depression	-.46	.19	-.22	-2.42	.37	
	Gender	-.12	.19	-.06	-.65	.48	
	Gender*Depression	.15	.20	.07	.76	.45	.24

Hierarchical regression analysis (Aiken & West, 1991) was conducted to determine the extent to which spirituality and gender predict functional independence in IRF patients. The analysis also explored a possible interaction between spirituality and gender to determine whether gender moderated the relationship between spirituality and functional independence in IRF patients. Initially, an interaction term between spirituality and gender was created. Standardized predictor variables (spirituality and gender) were entered in step 1, and functional independence was entered as the dependent variable. Results revealed that spirituality and gender explain 16% of the variance in functional independence in COPD patients. After entry of the interaction term of gender\*spirituality at step 2, the total variance explained by the model as a whole was 17%,  $R$  squared change = .01,  $F$  change (1, 99) = .03,  $p$  = .85. Hypothesis 18 stated that gender moderates the relationship between spirituality and functional independence in IRF patients. Results from the current study indicate that gender does not moderate the relationship between spirituality and functional independence in IRF patients in an IRF.

Results from the hierarchical regression analysis for spirituality, gender, and functional independence in IRF patients are presented in Table 22.

Table 22

*Summary of Hierarchical Regression Analysis for Spirituality, Gender, and Functional Independence in IRF Patients (n = 136)*

	Variable	<i>B</i>	<i>SEB</i>	B	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Step 1	Spirituality	.31	.21	.15	1.48	.14	
	Gender	-.23	.21	-.11	-1.09	.28	.16
Step 2	Spirituality	.30	.22	.15	1.36	.18	
	Gender	-.22	.22	-.11	-1.0	.32	
	Gender*Spirituality	.05	.25	-.02	-.19	.85	.17

### Summary of Key Findings

Several hypotheses were generated for the purpose of the current study and included

- IRF patients with COPD differ in terms of levels of depression when compared to IRF patients without COPD.
- IRF patients with COPD differ in terms of levels of anxiety when compared to IRF patients without COPD.
- IRF patients with COPD differ in terms of level of functional independence when compared to IRF patients without COPD.
- IRF patients with COPD differ in terms of level of spirituality when compared to IRF patients without COPD.

- Women with COPD in an IRF differ in terms of HRQOL in comparison to men with COPD in an IRF.
- Spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD.
- Spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD.
- Spirituality mediates the relationship between anxiety and functional independence in IRF patients.
- Spirituality mediates the relationship between depression and functional independence in IRF patients.
- Gender moderates the relationship between anxiety and HRQOL in IRF patients with COPD.
- Gender moderates the relationship between depression and HRQOL in IRF patients with COPD.
- Gender moderates the relationship between spirituality and HRQOL in IRF patients with COPD.
- Gender moderates the relationship between anxiety and functional independence in IRF patients with COPD.
- Gender moderates the relationship between depression and functional independence in IRF patients with COPD.
- Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.

- Gender moderates the relationship between anxiety and functional independence in IRF patients.
- Gender moderates the relationship between depression and functional independence in IRF patients with COPD.
- Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.

Key findings suggest that few differences between patients with COPD and patients without COPD are apparent while both groups are participating in an IRF. Specifically, patients with COPD and patients without COPD do not appear to differ with respect to levels of depression, spirituality, and functional independence. Results also indicate, however, that patients with COPD differ from non-COPD patients with respect to levels of anxiety; specifically, patients with COPD tended to endorse significantly higher levels of anxiety than did non-COPD patients. Additionally, results from statistical analyses in the current study indicate that men and women with COPD endorse different levels of HRQOL; specifically, men with COPD appear to endorse higher levels of quality of life when compared to women with COPD.

Mediation findings of the current study also indicate that spirituality partially mediates the relationship between depression and HRQOL in IRF patients with COPD but does not mediate the relationship between anxiety and HRQOL in IRF patients with COPD. As previously mentioned, secondary to non-significant correlations between variables, mediation models were not tested to determine whether spirituality mediates the relationships between anxiety and functional independence and depression and functional independence in IRF patients. No moderation models tested in the current

study were found to be significant. Specifically, gender does not moderate the relationships between anxiety and HRQOL, depression and HRQOL, or spirituality and HRQOL in IRF patients with COPD. Also, gender does not moderate the relationships between anxiety and functional independence, depression and functional independence, or spirituality and functional independence in IRF patients with COPD. Finally, gender does not moderate the relationships between anxiety and functional independence, depression and functional independence, or spirituality and functional independence in IRF patients. A summary of the findings follows in Table 23.

Table 23

*Alternative Hypotheses and Results*

Alternative Hypothesis	Results
1. IRF patients with COPD differ in terms of levels of depression when compared to IRF patients without COPD.	Unsupported
2. IRF patients with COPD differ in terms of levels of anxiety when compared to IRF patients without COPD.	Supported
3. IRF patients with COPD differ in terms of level of functional independence when compared to patients without COPD.	Unsupported
4. IRF patients with COPD differ in terms of level of spirituality when compared to IRF patients without COPD.	Unsupported
5. Women with COPD in an IRF differ in terms of HRQOL in comparison to men with COPD in an IRF.	Supported
6. Spirituality mediates the relationship between anxiety and HRQOL in IRF patients with COPD.	Unsupported
7. Spirituality mediates the relationship between depression and HRQOL in IRF patients with COPD.	Partially supported
8. Spirituality mediates the relationship between anxiety and functional independence in IRF patients.	Not tested secondary to nonsignificant correlations between variables

Table 23 (continued)

9. Spirituality mediates the relationship between depression and functional independence in IRF patients.	Not tested secondary to nonsignificant correlations between variables
10. Gender moderates the relationship between anxiety and HRQOL in IRF patients with COPD.	Unsupported
11. Gender moderates the relationship between depression and HRQOL in IRF patients with COPD.	Unsupported
12. Gender moderates the relationship between spirituality and HRQOL in IRF patients with COPD.	Unsupported
13. Gender moderates the relationship between anxiety and functional independence in IRF patients with COPD.	Unsupported
14. Gender moderates the relationship between depression and functional independence in IRF patients with COPD.	Unsupported
15. Gender moderates the relationship between spirituality and functional independence in IRF patients with COPD.	Unsupported
16. Gender moderates the relationship between anxiety and functional independence in IRF patients.	Unsupported
17. Gender moderates the relationship between depression and functional independence in IRF patients.	Unsupported
18. Gender moderates the relationship between spirituality and functional independence in IRF patients.	Unsupported

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## Chapter Four: Discussion

The purpose of the current study was to investigate the BPS facets of individuals receiving treatment for COPD in an acute IRF in Central Kentucky and to evaluate the differences between COPD and non-COPD patients in an IRF. The overall goal of the study was multifold. The research questions used to guide this study were as follows:

1. How are individuals with COPD in acute IRFs different than IRF patients without COPD in terms of mood, functional independence, and spirituality?
2. How does the HRQOL of women with COPD in acute IRFs differ in comparison to HRQOL of men with COPD in acute IRFs?
3. What is the role of spirituality? Several specific questions are contained within the broader question, including:
  - a. Does spirituality mediate the relationship between anxiety and HRQOL in IRF patients with COPD?
  - b. Does spirituality mediate the relationship between depression and HRQOL in IRF patients with COPD?
  - c. Does spirituality mediate the relationship between anxiety and functional independence in IRF patients? And
  - d. Does spirituality mediate the relationship between depression and functional independence in IRF patients?
4. What is the impact of gender? Several specific questions are contained within the broader question, including:
  - a. Does gender moderate the relationship between anxiety and functional independence in IRF patients with COPD?

- b. Does Gender moderate the relationship between depression and functional independence in IRF patients with COPD?
- c. Does gender moderate the relationship between spirituality and functional independence in IRF patients with COPD?
- d. Does gender moderate the relationship between anxiety and HRQOL in IRF patients with COPD?
- e. Does gender moderate the relationship between depression and HRQOL in IRF patients with COPD?
- f. Does gender moderate the relationship between spirituality and HRQOL in IRF patients with COPD?
- g. Does gender moderate the relationship between anxiety and functional independence in IRF patients?
- h. Does gender moderate the relationship between depression and functional independence in IRF patients? And
- i. Does gender moderate the relationship between spirituality and functional independence in IRF patients?

A discussion of the results from these research questions is presented in this chapter.

### **Differences in Depression, Anxiety, Functional Independence, Spirituality, and HRQOL**

Quantitative findings from the current dissertation suggest that individuals with COPD do not differ in terms of levels of depression when compared to those without COPD (Hypothesis 1). This finding is inconsistent with other studies that revealed individuals with COPD endorse more depressive symptoms than do those without COPD

(e.g., Yohannes et al., 1998). One reason for such a discrepancy might be due to the methodology of the current study. Researchers have discovered that inpatient physical rehabilitation patients often experience symptoms of depression at the beginning of treatment, and symptoms tend to wane closer to discharge from the healthcare facility (Lieberman et al., 1999), which could be partially due to opportunity for social engagement during treatment as well as direct access to biomedical disease treatment. Results of the current study may be limited since data were not gathered at one specific point in time during admission but rather at various points (admission, midway through treatment, and immediately prior to discharge) in time during the patient's hospital stay. Another reason for such a discrepancy might be related to the setting in which the data were collected. Though other researchers have determined that COPD patients are typically more depressed than patients with other health conditions (e.g., Yohannes et al., 1998), most similar studies have been conducted in settings other than IRFs (e.g., Ng et al., 2007; Stage et al., 2005; Yohannes et al., 2000). Therefore, comparisons between the results of the current study and the results from other studies on BPS facets of chronic disease are limited.

Quantitative findings of the current study also revealed that individuals with COPD differ in terms of levels of anxiety when compared to those without COPD in acute IRFs; specifically, those with COPD have higher rates of anxiety when compared to those without COPD (Hypothesis 2). This finding is consistent with findings from other studies which indicate that patients with COPD experience higher rates of anxiety when compared to those in the general public (e.g., Brenes, 2003) and studies that suggest that those with COPD have higher levels of anxiety when compared to individuals with other

health conditions (e.g., Kvaal et al., 2001). As discussed throughout the current study, COPD is a very challenging disease to manage from a BPS perspective. Many physiological symptoms of COPD mimic those of anxiety, particularly panic. The BAI was utilized to evaluate anxiety in the current study. Researchers have determined that though the measure was developed as a tool to assess generalized anxiety, the BAI more effectively measures symptoms of panic (Cox, Cohen, Direnfeld, & Swinson, 1996; Leyfer, Ruberg, & Woodruff-Borden, 2006). Findings in the current study that suggest patients with COPD endorse higher anxiety than patients without COPD may be a result of the use of the BAI and the idea that many physiological symptoms of COPD mimic panic symptoms.

Additionally, findings in the current dissertation suggest that individuals with and without COPD do not differ in terms of levels of functional independence (Hypothesis 3). Such a result may be contrary to findings of other researchers who suggest that pulmonary rehabilitation serves to decrease disease symptoms and improves health status (Paz-Diaz, Montes de Oca, Lopez, & Celli, 2007). The negative physical impact of COPD may have been less for the patients in the study, as they were all already participating in a physical rehabilitation program at the time of the data collection. The patients in the current study may have already built physical strength and lung stamina and learned to effectively manage the limitations of the disease at the time of the assessment, which may improve self-efficacy, reduce stress, and increase emotional well-being (Bandura, 2010).

Also, results from the current study indicate that patients with and without COPD do not differ in terms of levels of spirituality (Hypothesis 4). No studies on the

differences between COPD patients and non-COPD patients regarding levels of spirituality were found in the review of the literature. Previous research does, however, indicate that endorsement of spirituality and/or participation in religious activities may be a protective factor against depression, anxiety, and physical disability in patients with COPD (e.g., Burker et al., 2004; Idler & Kasl, 1992), which suggests a BPS effect. In contrast, patients with COPD may endorse higher levels of depression and psychosocial disability if these patients conceptualize disease as being a punishment from God (e.g., Burker et al., 2004) and may not provide protection from illness and/or disability (e.g., Fitchett et al., 1999). As such, results from the current study indicate the average level of spirituality endorsed for both groups was moderately high; thus, the majority of patients in the sample appear to consider themselves to be spiritual. Such results may suggest that patients in the hospital may differ in terms of levels of spirituality endorsed when compared to individuals who are not hospitalized and/or seeking medical care. Koenig, George, and Titus (2004) obtained similar results in a study that suggested religious activities, attitudes, and spiritual experiences are prevalent in hospitalized patients.

Finally, quantitative findings do indicate significant differences in levels of HRQOL in men and women with COPD in an acute IRF setting (Hypothesis 5). Specifically, men with COPD appear to have higher levels of HRQOL than do women with COPD. This finding was consistent with other studies that revealed differences in HRQOL in men and women with COPD. Other researchers have determined that though both men and women with COPD experience significant psychological distress as a result of having the disease, women appear to suffer more psychologically from the effects of COPD and have lower levels of HRQOL in comparison to men (e.g., de Torres et al.,

2005; DiMarco et al., 2006; Wagena et al., 2005). One reason for the observed differences in HRQOL between men and women with COPD is that women appear to have a longer course of illness than do men and thus, suffer the effects of the disease longer. As well, women have also been reported to have more disease exacerbations when compared to men (de Torres et al., 2005). Such findings support the idea that chronic disease does not simply have a biological impact on individuals living with them but rather affects individuals psychologically as well.

Another reason for the observed differences in HRQOL between men and women with COPD may also be rooted in biology. Researchers recognize that women and men react differently to stress, with women secreting higher levels of stress hormones than do men when exposed to stressors. Also, women appear to report more negative emotions (sadness, fear, anxiety) in comparison to men. Finally, from a sociological perspective, men have historically been expected to display adequate emotional control and autonomy while women have been encouraged to utilize linguistic expression and emphasize intimacy (Lee, 2005). As such, women may be more likely than men to report discomfort or unease, whether emotional, social, or physical. These ideas combined lend further BPS evidence for the finding that women with COPD tend to have lower levels of quality of life when compared to men with COPD.

Research in the current study was conducted in an acute IRF setting. Findings of the study in terms of differences between men and women with and without COPD in depression, anxiety, functional independence, spirituality, and HRQOL varied in comparison to previous research and are as follows:

1. Patients with COPD do not differ in levels of depression, functional independence, or spirituality when compared to those without COPD.
2. COPD patients differ in terms of levels of anxiety when compared to non-COPD patients; COPD patients have higher levels of anxiety when compared to those without COPD.
3. Men and women with COPD have different levels of HRQOL; men with COPD appear to have higher levels of HRQOL than do women with the disease.

### **Spirituality as a Mediating Variable**

Another purpose of the current study on BPS facets of chronic disease involved mediation. Specifically, the goal was to determine whether the degree of spirituality mediates the relationships between anxiety and HRQOL and depression and HRQOL in IRF patients with COPD as well as the relationships between anxiety and functional independence and depression and functional independence in IRF patients. Quantitative findings of the current study revealed spirituality does not mediate the relationship between anxiety and HRQOL in IRF patients with COPD (Hypothesis 6). Regarding depression and HRQOL, results indicated a significant negative relationship between depression and HRQOL in IRF patients with COPD, suggesting that as depression decreases, HRQOL increases, or vice versa. Further exploration of spirituality as a mediator in the relationship between depression and HRQOL in IRF patients with COPD revealed that spirituality partially explains the relationship between depression and HRQOL in IRF patients with COPD. As such, IRF patients with COPD and lower levels of depression may have higher HRQOL partially due to higher levels of spirituality (Hypothesis 7). These results are consistent with findings from other researchers (e.g.,

Giaquinto et al., 2010) who identified a significant relationship between mood and psychological well-being and recognized that this relationship may be directly influenced by spirituality. The idea that spirituality is the essence of being and allows us to instill meaning into and become aware of who we are; “it shapes our life journey” (e.g., Dossey et al, 2000, p. 91) may be one reason behind the findings of the current study. Based on this premise, those who espouse spiritual ideology may also be able to derive positive meaning from disease, which may foster acceptance and, in turn, serve to positively influence the relationship between mood and HRQOL for those living with chronic illnesses.

As mentioned, to conduct mediation analyses, bivariate correlations between the variables should be significant to continue with the analyses. The relationships between spirituality, depression, and functional independence were nonsignificant in the IRF sample. Therefore, mediation analyses to test whether spirituality mediates the relationship between anxiety and functional independence and the relationship between depression and functional independence in IRF patients were not conducted (Hypotheses 8 and 9). Such a result is in contrast with findings that suggest depression and anxiety are positively correlated (e.g., Cully et al., 2006; Ryu, Chun, Lee, & Chang, 2010) but consistent with studies that were unable to find a correlation between depression and spirituality (Mystakidou, Tsilika, Parpa, Smyrnioti, & Vlahos, 2007) in patients with chronic disease. The nonsignificant correlation may have been a product of the healthcare setting in the current study. Some researchers have found that inpatient care is superior to outpatient care in terms of achieving better clinical outcomes (Anderson, Needleman, Gatter, Andrews, & Scarola, 1988; Helewa, Bombardier, Goldsmith,



Menchions, & Smythe, 1989; Vliet Vlieland, Breedveld, & Hazes, 1997), which may suggest an added benefit of more focused biomedical treatment, opportunity for social engagement and thus, reduced negative emotional impact of chronic disease.

Additionally, researchers have found that patients who have undergone inpatient physical rehabilitation have a greater sense of personal control over their conditions when compared to those who have not participated in inpatient physical rehabilitation programs (Tate & Forchheimer, 2004). Also, patients who are undergoing similar treatment in the same facility may identify with others in the cohort and benefit from having developed a sense of community and belongingness (Chipuer & Pretty, 1999; Hill, 1996; McMillan & Chavis, 1986), indicating that social aspects of physical rehabilitation programs may provide an advantage for those living with chronic diseases. These results provide continued support for the endorsement of the BPS model when treating chronic diseases. As mentioned, a variety of reasons may have played a role in the inconclusive results of the current study. Findings of the current study when evaluating spirituality as a mediator are as follows:

1. Spirituality partially mediates the relationship between depression and HRQOL in IRF patients with COPD.
2. Spirituality does not mediate the relationship between anxiety and HRQOL in IRF patients with COPD.

### **Gender as a Moderating Variable**

The final goal of the current study was to explore the impact of gender (a biological, social, and psychological factor) on IRF patients. Specifically, the goal was to determine whether gender moderates the relationships between anxiety and HRQOL,

depression and HRQOL, and spirituality and HRQOL in IRF patients with COPD. Also, a purpose of the current study was to determine whether gender moderates the relationships between anxiety and functional independence, depression and functional independence, and spirituality and functional independence in IRF patients with COPD. The final purpose of the study was to determine whether gender moderates the relationships anxiety and functional independence, depression and functional independence, and spirituality and functional independence in IRF patients. Results revealed that gender does not moderate any of the aforementioned relationships (Hypotheses 10-18).

A review of the literature found that results on the moderating impact of gender are mixed. The results of the current study regarding gender are consistent with findings from some researchers, which showed that gender does not moderate the relationship between mood and disability (e.g., Keogh et al, 2006) but inconsistent with other researchers who found that gender does in fact moderate the relationship between mood and functional independence as measured by recovery from medical procedures (e.g., Dao et al, 2012). No existing studies on the impact of gender on the relationship between spirituality and HRQOL or spirituality and functional independence were found in the literature.

With regard to COPD specifically, researchers have realized the BPS impact of the disease and have found that more women than men die from COPD each year (CDC, 2012), and women tend to endorse and discuss more depressive, anxiety, and physical symptoms than do men (e.g., Craske, 2003; Fischer, 1993; Kroenke & Spitzer, 1998). This finding may be a primary reason that the sample was primarily comprised of

females, which could have also impacted the results of the research questions that evaluated the BPS influence of gender. Again, such findings may be a result of the methodology and the time during admission to the IRF at which data were collected. While undergoing rehabilitation, depressive symptoms appear to wane (Lieberman et al., 1999). The same may be true for symptoms of anxiety, as one aspect of pulmonary rehabilitation is to foster self-management of the disease and another may be a product of the social environment inherent in inpatient physical rehabilitation programs. For those with COPD and anxiety, learning to manage the symptoms of COPD may have a BPS impact and, thus, may also serve to alleviate the physiological symptoms of anxiety. Regarding the influence of gender in IRF patients, results were as follows:

1. Gender does not moderate the relationship between anxiety and HRQOL in IRF patients with COPD.
2. Gender does not moderate the relationship between depression and HRQOL in IRF patients with COPD.
3. Gender does not moderate the relationship between spirituality and HRQOL in IRF patients with COPD.
4. Gender does not moderate the relationship between anxiety and functional independence in IRF patients with COPD.
5. Gender does not moderate the relationship between depression and functional independence in IRF patients with COPD.
6. Gender does not moderate the relationship between spirituality and functional independence in IRF patients with COPD.

7. Gender does not moderate the relationship between anxiety and functional independence in IRF patients.
8. Gender does not moderate the relationship between depression and functional independence in IRF patients.
9. Gender does not moderate the relationship between spirituality and functional independence in IRF patients.

### **Limitations**

A variety of limitations of the current study are evident and are discussed in the following section.

**Sample limitations.** Several limitations of the study exist and should be considered when interpreting the findings and generalizing results to the larger population. Many limitations may be related to the characteristics of the study sample. While most of the research questions focused on the COPD section of the sample, another goal was to evaluate the differences between the COPD and non-COPD participants as well as the IRF group in its entirety. Though technically adequate for the statistical analyses employed in the study, the COPD sample was comprised of 55 patients. A larger sample size may better ensure representative distribution of the population and be representative of other patients with COPD in acute IRF settings. A higher number of patients without COPD were included in the sample ( $n = 81$ ) and may have skewed the results of the study.

Most individuals included in the sample were Caucasian, which indicates a potential culture bias. While health disparities primarily impact minority groups (Straub, 2002), the CDC (2012) recognizes that more Caucasian individuals die from COPD when

compared to non-Caucasian individuals. According to The Office on Women's Health (2009), Kentuckians have some of the highest rates of death due to chronic disease when compared to the rest of the nation. Statistics from the CDC indicate that while 6.3% of Americans report having COPD, approximately 9% of Kentuckians report having the disease. Also according to the CDC, southern states appear to account for the highest prevalence of self-reported and physician-diagnosed COPD. The entire sample was comprised of Kentucky residents, which could indicate that people in Kentucky might be different in terms of their experience of COPD when compared to non-Kentucky residents with COPD.

Also regarding the sample, limited demographic information was originally collected as part of the dataset and available to the primary investigator. Such sparse demographic data may have limited the scope of potential analyses and thus determination of trends and other meaningful relationships among variables and other data. Other data points were not included in the original database, because such data points were not included in the original analysis proposal. Despite the limitations in the original proposal, including demographic data such as education, marital status, and so forth, might have led to richer understanding of the sample.

The fact that patients with a variety of conditions were included in the non-COPD sample may have also influenced answers provided on questionnaires. For example, a patient with a hip replacement may respond very differently to questions about spirituality than would a patient with heart disease or a limb amputation. Finally, those in the sample were all undergoing physical rehabilitation in an acute IRF, which limits

generalizability to patients in other healthcare settings and in the community. In addition to sampling limitations, methodology limitations also existed in the current study.

**Methodology limitations.** Some methodology limitations are apparent in the current study. As mentioned, the study design was cross-sectional and exploratory in nature. Limitations of the use of cross-sectional design include inadequate control of extrinsic and intrinsic factors secondary to lack of randomization, which may reduce internal validity. As well, cross-sectional designs do not employ control of independent variables and thus do not allow researchers to make valid causal inferences. As with cross-sectional study design, limitations in analysis are also apparent.

Generally, independent samples *t*-test analyses are limited in that the analyses test differences between two groups only and are used to examine only the effects of one independent variable on one dependent variable. Such is not an issue in the current study, as the study sample was comprised of only two groups, and the analyses included only one independent and one dependent variable each. Therefore, the independent samples *t*-test was deemed to be the most appropriate analysis to conduct to examine group differences in the current study.

Also, all individuals included in the study were solicited for participation while in the hospital and participated on a voluntary basis. Those who agreed to participate in the study may have been different than those who were unwilling to participate. For example, patients who might have endorsed more symptoms of depression and/or anxiety may have declined to participate, and patients who do not consider themselves to be spiritual and/or religious at all may have also declined to participate. No information was collected from the patients who declined to participate. Though offered the choice to opt

out of the study with no adverse consequences, some individuals may have felt coerced to participate. As well, the study was cross-sectional and exploratory; thus, sample selection was not random. As a result, outside influences may have skewed the results of the study, and the cross-sectional design makes establishing causality among study variables impossible.

Additionally, data were collected from patients in an acute IRF setting in central Kentucky only, which limits generalizability to COPD patients in other types of settings, especially in programs that provide less opportunity for social engagement, and in other geographic locations. Collecting data in one type of setting limits comparisons to other types of settings as well; for example, one cannot conjecture that COPD patients in acute IRFs have the same BPS experience as COPD patients in acute care facilities. Also, data may have been collected at various points during the patient's admission to the facility. Such limits in methodology may have skewed results obtained from the current study. For example, after learning to adequately manage COPD through exercise and education as well as having the opportunity for social engagement with others with similar experiences, a COPD patient may endorse fewer symptoms of depression and/or anxiety than when the patient first arrives at the facility. As mentioned, researchers have discovered a variety of physical, social, and psychological benefits to participating in physical rehabilitation programs (e.g., Paz-Diaz et al., 2007). All patients in the current study were enrolled in a pulmonary rehabilitation program and were solicited for participation in the study at various points during their hospital stay. Soliciting participation upon admission, prior to undergoing any treatment, may have yielded different results.

Another limitation of the study is that no information was collected on multiple admissions. As mentioned, researchers have discovered that patients with COPD have frequent hospital readmissions secondary to symptom exacerbations and, thus, experience related psychosocial distress (Cao et al., 2006). Researchers have discovered lasting benefits of rehabilitation programs and have found that resulting improvements may be maintained for at least 12 months (Yohannes, Doherty, Bundy, & Yalfani, 2010). As such, those patients who have undergone pulmonary rehabilitation in the past may benefit more and/or quicker than those who have not participated in such treatment, which may suggest that rehabilitation patients also benefit psychologically from social aspects of such programs. Conversely, individuals with frequent admissions are likely to have worse disease severity than those without frequent admissions (e.g., Cao et al., 2006).

**Instrumentation limitations.** Though deemed psychometrically sound, the instruments utilized in the current study have some limitations. The GDS is considered a Gold Standard Rating Scale screening tool for depression (Cusin, Yang, Yeung, & Fava, 2010) but does not substitute for a thorough diagnostic interview. Use of a screener only is not appropriate for diagnosis of a disorder but may be helpful when determining whether an individual is experiencing symptoms of the disorder. Additionally, the GDS does not assess for suicidal ideation (Greenberg, 2012), which may be one indicator of depression severity.

As with the GDS, the BAI was also developed as a screening tool for anxiety and is not a substitute for a clinical interview. Research indicates that the BAI does not effectively assess the cognitive symptoms of anxiety (Wetherell & Gatz, 2005) and “is better used as a tool for assessing panic disorder than any other anxiety disorder” (Cox et



al., 1996; Leyfer et al., 2006), which may limit the construct validity of the tool. The utility of the BAI with an older population may be even further limited as older adults typically experience less autonomic arousal when compared to younger individuals (Lau, Edelstein, & Larkin, 2001). As a result, a patient with panic disorder who elevates the BAI may be considered more anxious than a patient without panic-related anxiety (e.g., Leyfer et al., 2006). Additionally, Wetherell and Gatz (2005) discovered that symptoms of anxiety are significantly positively correlated with the number of self-reported medical conditions in older adults, suggesting that the BAI may overestimate anxiety symptoms in a medically ill sample. Especially with a lung disease such as COPD, which leads to shortness of breath, elevations on the BAI may be reflective of somatic symptoms of the disease rather than true anxiety.

Related to emotional distress is the concept of HRQOL. The measure used to evaluate HRQOL in the current study was the CRQ. The CRQ is the only measure utilized in the study that was normed using a COPD population. Because the other measures have not been normed using individuals with lung disease, utilizing the measures to assess those with lung disease may yield different results. According to Glaab, Vogelmeier, and Buhl (2010), the CRQ is limited in that the tool “is less suitable for inter-individual comparisons, as it mirrors individual physical limitations. The questionnaire is not interchangeable with other disease-specific instruments and has not yet been shown to be responsive to long-term disease progression” (p. 6).

Another instrument limitation is related to FIM, which is a measure used to evaluate functional independence. Glenny and Stolee (2009) indicate that though typically utilized with older adult populations, few, if any, studies evaluate the

psychometric properties of the tool with older adults; in the current study, part of the sample was comprised of older adults. The researchers also propose that FIM items may not be appropriate for use with patients in different impairment groups, which suggests that the utility of FIM when used with COPD patients may be limited.

Limitations may also exist with the FACIT-Sp. One complication of using a measure of spiritual well-being, however, is illustrated by Johnson and colleagues (2011). The researchers found that asking about spirituality may increase emotional distress in individuals who have had previous negative religious experiences. Additionally, Peterman and colleagues (2002) found that the FACIT-Sp is limited in a number of ways. First, demographic differences may skew the results of the FACIT-Sp; thus, the authors recommend controlling for factors such as gender and age. As well, the researchers recognize that the total scale and subscale scores differ regarding ceiling effects. Only total scale scores were utilized in the current study. Also, the FACIT-Sp may not adequately address all aspects of spirituality, as many people have varying conceptualizations of spirituality. The researchers specifically noted that the FACIT-Sp does not address factors such as forgiveness, generosity, or love. Other researchers have reiterated the idea that the FACIT-Sp is not a measure of only spirituality but also addresses spiritual support, which could limit the utility of the measure when the goal is to evaluate spirituality in the true sense (e.g., McClain et al., 2003).

Also, no specific tool was used to assess the social experience of COPD patients in an acute IRF setting; rather, the social component of the BPS model was addressed through the evaluation of other factors such as mood and HRQOL. To wholly evaluate the patient's BPS understanding of COPD, incorporating a specific measure on social

interaction and/or other social factors may prove useful. Though other researchers have demonstrated the study measures to be psychometrically sound, the measures are structured and objective and do not allow for patients to expound upon their answers; thus, such quantitative measures may not have captured the whole experience of the patient. Also, self-report measures pose some limits as well.

Most tools utilized in the study were self-report measures. Paulhus and Vazire (as cited in Robins, Fraley, Krueger, 2009) stated several disadvantages of using self-report measures exist and include “anchoring effects, primacy and recency effects, time pressure, and consistency motivation” (p. 229) as well as credibility of the person completing the measure, self-deception, self-knowledge, and/or self-awareness constraints, the patient’s memory of his or her experience, use of face-to-face interview format, impression management, inaccuracies in information provided, self-consciousness of the interviewee, impression management, transference, modeling, socially desirable responding, acquiescent responding, and extreme responding. As well, responses to survey portions of the assessment may have been affected by interviewer rapport, respondent anonymity, and psychological and social differences between the interviewer and respondent (Gergen & Back, 1966). Some cultural limitations of self-report measures also exist, and African Americans may respond differently to questions than do Caucasian patients due to concerns such as cultural mistrust (Terrell, Taylor, Menzise, & Barrett, 2009). Barr, Herbstman, Speizer, and Camargo (2002) determined, however, that self-report measures are appropriate for use when evaluating those with respiratory diseases. The findings and limitations of the current dissertation have implications for future research and practice.

## **Implications of Findings for Future Research and Practice**

While many researchers have discovered that patients with COPD appear to be different than patients without COPD, the current study revealed that IRF patients with COPD patients in fact differ from IRF patients without COPD patients in minor ways when both groups are participating in an IRF program. As such, the results have implications for both counseling psychology clinical practice and future research in the area of the BPS experience of chronic disease, COPD, and inpatient physical rehabilitation.

**Anxiety.** Some results from the current study echo previous findings of other researchers and support the idea that IRF patients with COPD are more anxious than IRF patients without COPD or people in the general public, at least when evaluated using the BAI. In terms of clinical practice, utilizing empirically validated treatments, such as cognitive-behavioral therapy (CBT) techniques, may serve to alleviate the symptoms of anxiety experienced by patients with COPD. Other interventions may include relaxation and stress inoculation training. Implementing a psychoeducation component to treatment, either in group or individual format, may also serve to mitigate the symptoms of anxiety as well as assist IRF patients in differentiating between the biomedical symptoms of COPD and the symptoms of anxiety, as both are very similar. Counseling psychologists may also focus interventions on mindfulness and acceptance of chronic disease.

As previously mentioned, the BAI appears to assess symptoms of panic rather than generalized anxiety, and panic symptoms can mimic symptoms of COPD and vice versa. Incorporating a measure that more fully assesses symptoms of generalized anxiety

may further contribute to our understanding of anxiety in the COPD patient. Future research may focus on specifically parceling out the differences between the physiological versus psychological symptoms of COPD by utilizing a variety of tools designed to measure cognitive, physical, and emotional aspects of anxiety.

**Gender and HRQOL.** As well and in congruence with findings of other researchers, the current study supports the idea that women with COPD tend to endorse lower levels of HRQOL than do men with COPD while participating in treatment in an IRF. As such, clinicians may take care to implement interventions specifically geared to the BPS experiences of women with chronic diseases, educating women on disease self-management as well as CBT strategies to minimize the biomedical, social, and psychological impact of chronic disease. Incorporating CBT strategies and promoting adequate disease self-management may increase self-efficacy and may be used to encourage increased physical activity, which may positively influence HRQOL. Additionally, educating women on gender differences with respect to chronic diseases may serve to enhance women's understanding of the overall BPS impact of chronic disease symptoms. One approach to further educate women on the BPS experience of chronic illnesses may be to hold women only treatment groups in the IRF setting. Also, regarding future research, further examining inpatient gender differences may be advantageous to clinicians, as males in inpatient physical rehabilitation settings may be different than typical males or males in other types of healthcare settings. The sample in the current study was comprised primarily of female participants. As such, the typical male may not have been well represented in the sample.

As well, incorporating information on the ways men and women communicate and express themselves may further elucidate the differences between the two groups; for example, men and women may express discomfort in a variety of ways and in contrast to one another. Understanding such differences prior to conducting another study may assist researchers in selecting the most appropriate methodological tools and procedures. A review of the literature revealed a deficiency in the number of BPS studies on the moderating effects of gender on the relationship between COPD and depression or COPD and anxiety. Further research of this type may also serve to supplement our understanding of gender and COPD.

**Spirituality, mood, and HRQOL.** Results of the current study show that patients with COPD seem to have minor differences when compared to those without COPD with respect to levels of spirituality, a finding that suggests those with progressive and irreversible lung disease do not tend to rely on spiritual forms of coping any more or less than do those with other types of medical conditions. Results from the current study do, however, indicate that spirituality may partially mediate the relationship between depression and HRQOL in patients with COPD; specifically, higher levels of depression may lead to lower levels of HRQOL and vice versa in IRF patients with COPD. Also, IRF patients with COPD who endorse higher levels of spirituality may experience less of an impact of depressive symptoms on HRQOL. Conversely, IRF patients with COPD who also endorse low levels of spirituality may experience a greater impact of depressive symptoms on HRQOL. Treatment may include incorporating spiritually focused interventions for COPD patients in an IRF. Such interventions may include offering chaplain services or treatment groups focused on spiritual content, as well as educating

patients about the impact of spirituality on the experience of chronic disease. From a counseling psychology perspective, an existential treatment approach may prove beneficial when working with IRF patients with COPD. Encouraging IRF patients with COPD to discuss the impact spirituality has had on their own disease processes may also be advantageous and positively influence HRQOL by alleviating symptoms of depression. Also, since some researchers have determined that the FACIT-Sp does not adequately assess spirituality, utilizing another measure to more fully address this factor may further supplement the literature.

**Nonsignificant findings.** Specifically and maybe surprisingly, COPD patients are actually not significantly different than non-COPD patients in terms of levels of depression or functional independence, which suggests that participating in an IRF program may minimize or reduce the BPS differences between the two groups or enhance certain aspects of the BPS experience for those living with chronic conditions. Likewise, the COPD patient's level of functional independence does not seem to impact his or her HRQOL, at least when the COPD patient is involved in inpatient physical rehabilitation. Furthermore, being male or female does not appear to make a difference with respect to mood in patients with COPD. Essentially, much of the current literature suggests that COPD patients are significantly more impaired from a BPS perspective when compared to those without COPD; the current study declares otherwise, and the results indicate that COPD and non-COPD patients may be more alike than previously considered, at least while in an IRF. To supplement the literature on COPD and to further elucidate why IRF patients with COPD differ from IRF patients without COPD in minor ways, future research may focus on resilience and denial to determine whether IRF patients are

resilient to the effects of chronic illnesses or whether they are in denial about the severity and BPS impact of their health conditions.

**Culture.** Future research in the area of COPD may benefit from incorporating a more prominent cultural piece. As mentioned, the interviewer was female and Caucasian, and the database included only Caucasian and African American patients. Conducting a more culturally sensitive study and including a variety of interviewers may elicit different results. Also regarding culture, expanding the research to a multitude of geographic areas is ideal to be able to generalize results to multiple cultural groups.

**System interventions.** At the macro level, counseling psychologists in the IRF setting may further benefit patients by also educating treatment providers on the BPS manifestation of COPD and chronic disease in general, especially the experience of the IRF patient. Teaching healthcare providers about the unique needs of IRF patients may serve to encourage those typically trained in the medical model to implement more holistic and BPS focused treatment interventions. The overall impact may positively impact HRQOL of those living with chronic conditions and further enhance benefits gained while patients are in an IRF.

**IRF settings.** One major rationale for completing the current study was to supplement the current BPS literature on COPD and to provide further insight into the acute pulmonary rehabilitation patient's BPS disease experience. Literature on the BPS experience of COPD patients in acute physical rehabilitation is scant. As such, conducting more research in this type of setting will serve to foster our understanding of the COPD patient's BPS experience throughout the disease process and in a variety of settings and determine whether trends exist. Also, by completing research in this area,



we may come to better understand the benefits of acute inpatient physical rehabilitation and the related impact on the psychological, social, and physical experience of the COPD patient; as well, we may then compare patients in acute IRFs to those in other healthcare venues such as acute care, outpatient, and community settings.

**Method.** Based on the findings and limitations of the current study, using a more structured method when gathering data may serve to elicit different results. Future researchers may benefit from collecting data at more specific time intervals throughout the COPD patient's IRF admission. Conducting interviews at admission, halfway through the patient's hospital stay, and at discharge may capture a more complete representation of the COPD patient's experience.

Also based on the limitations of the current study, researchers may benefit from gathering information on the BPS experiences of IRF patients with other conditions to determine whether COPD patients fare worse psychologically, socially, and physically. To elicit further understanding of the BPS differences between men and women with COPD, researchers may benefit from utilizing a variety of tools to assess BPS factors. Also, choosing measures that assess cognitive, physiological, and affective symptoms of depression and anxiety may serve to more fully understand the different experiences of men and women with COPD.

## **Conclusions**

Overall, the current study has yielded several conclusions. The effect of chronic disease is far-reaching and impacts individuals on a BPS level. Coping with such diseases may prove difficult for those living with them. COPD is one type of severely debilitating chronic disease and is growing in prevalence in the United States. The fact

that individuals with COPD often also experience depression, anxiety, and diminished HRQOL has been well established by research guided by the BPS paradigm. The identification of spirituality as a protective factor when considering mood, HRQOL, and physical independence has also been recognized in the literature. Few BPS studies on patients with COPD in acute IRF settings, however, have been conducted. The purpose of the current study was to further enhance our understanding of the relationship between BPS facets of chronic disease and inpatient rehabilitation with specific focus on patients with COPD. Because aspects of the current study were inconclusive, continued evaluation of patients in acute IRF programs is essential to enhance our understanding of the patient's BPS experience of the chronic disease process.

## Appendix A: Geriatric Depression Scale (GDS)

1. Are you basically satisfied with your life? yes/no
2. Have you dropped many of your activities and interests? yes/no
3. Do you feel that your life is empty? yes/no
4. Do you often get bored? yes/no
5. Are you hopeful about the future? yes/no
6. Are you bothered by thoughts you can't get out of your head? yes/no
7. Are you in good spirits most of the time? yes/no
8. Are you afraid that something bad is going to happen to you? yes/no
9. Do you feel happy most of the time? yes/no
10. Do you often feel helpless? yes/no
11. Do you often get restless and fidgety? yes/no
12. Do you prefer to stay at home, rather than going out and doing new things? yes/no
13. Do you frequently worry about the future? yes/no
14. Do you feel you have more problems with memory than most? yes/no
15. Do you think it is wonderful to be alive now? yes/no
16. Do you often feel downhearted and blue? yes/no
17. Do you feel pretty worthless the way you are now? yes/no
18. Do you worry a lot about the past? yes/no
19. Do you find life very exciting? yes/no
20. Is it hard for you to get started on new projects? yes/no
21. Do you feel full of energy? yes/no
22. Do you feel that your situation is hopeless? yes/no
23. Do you think that most people are better off than you are? yes/no
24. Do you frequently get upset over little things? yes/no
25. Do you frequently feel like crying? yes/no
26. Do you have trouble concentrating? yes/no
27. Do you enjoy getting up in the morning? yes/no
28. Do you prefer to avoid social gatherings? yes/no
29. Is it easy for you to make decisions? yes/no
30. Is your mind as clear as it used to be? yes/no

**Appendix B: Informed Consent**

**Cardinal Hill Rehabilitation Hospital**

**Adult Inpatient Admission Consent Form**

**Patient Name:** \_\_\_\_\_

**Consent to Treatment:**

I understand my admission to Cardinal Hill and my treatment at Cardinal Hill is indicated because of my condition. I consent to receiving care from Cardinal Hill. I voluntarily authorize and consent to the customary examinations, tests, procedures and emergency treatment performed on patients in my condition by hospitals/healthcare centers and to the medical treatment ordered by my physician(s).

I consent to be tested for HIV (the virus that causes AIDS) or any other blood-borne infectious disease, for diagnosis or other purposes directly related to medical treatment if so ordered by my physician(s). If a health care worker is exposed to my blood or body fluids, Cardinal Hill may at its cost test my blood for any infectious disease. Cardinal Hill shall maintain confidentiality to the extent provided by applicable law: a) the fact that a blood test is ordered and, b) the results of such tests.

**Treatment with Controlled Substances and Consent to Release KASPER Report:**

Federal and state laws regulate controlled substances (narcotics/drugs) that may be abused. These laws require, under certain circumstances, that a computerized list of prescribed narcotics that you may be taking (also known as a KASPER report) be obtained from each of your prescribing healthcare providers. Kentucky law requires that you consent to treatment with these drugs before you can receive them. Some illnesses and injuries can result in pain. Some drugs can make the pain more tolerable. Some other drugs can increase focus and reduce hyperactivity. Use of these drugs can cause nausea, sleepiness, drowsiness, vomiting, constipation, sleeplessness, loss of appetite, agitation, aggravation of depression, dry mouth, confusion, slower breathing, and loss of coordination making it unsafe to drive or operate machinery. These drugs can result in physical dependence or addiction (meaning that abrupt stopping may lead to withdrawal symptoms), psychological dependence or addiction (meaning that abrupt stopping may cause you to crave the drug), tolerance (meaning you need more drugs to get the same effect) and addiction (meaning you may develop problems based on genetic or other factors). I consent to allow a listing of prescribed narcotics and drugs to be obtained from each of my healthcare providers in accordance with state law.

**Consent for Photographs:**

I consent to allow the staff to photograph me including documentation of my clinical condition upon and during my admission, including taking photographs, video or other likenesses of me.

**Disclosure of Health Information and Assignment of Benefits:**

I authorize Cardinal Hill to release a summary of my care to any medical institution or physician responsible for the care subsequent to my discharge from Cardinal Hill.

I authorize payment of my insurance benefits to Cardinal Hill and the Physicians named on my insurance claim form. I further authorize release of information required by any third-party payer regarding any care made relating to me. A copy of this form can be used in place of the original. I understand that I am financially responsible for charges not paid by my insurance company within 30 days after billing.

For an in consideration of hospital services provided, I or my representative assign and direct payment of my hospital bill from any amount due to me on my behalf from any person, corporation, insurance carrier, or from any settlement of judgment in any civil action.

**Medicare Patients Only:**

I certify that the information I have given in applying for payment under Title XVIII of the Social Security Act is correct. I authorize any holder of medical or other information about me to release that information to the Social Security Administration, the Medicare Program or their intermediaries or carriers. I request that payment of authorized benefits be made on my behalf.

**Consent to Physician Status as Independent Contractors:**

I understand that physicians (i.e. surgeons, physiatrists, radiologists, pathologists, etc.) who may render care or services may not be employees or agents of Cardinal Hill. I understand I will be billed separately for the services of all physicians. These charges are established by the physicians.

The undersigned agrees that the provisions regarding the release of information and assignment of benefits stated in the previous section shall apply to the hospital, and to such professionals and suppliers of services, or any of them, and their claims for payment. The undersigned further agrees that the execution of this document does not in any way imply that Cardinal Hill neither is responsible nor assumes any liability arising for the activities of any such professionals or suppliers of services.

I understand that this facility does not employ all healthcare professionals including but not limited to physicians, residents, interns or certified registered nurse practitioners with whom I may come in contact either directly or indirectly. I acknowledge that these healthcare providers as well as my outside private physician are independent contractors who have been granted the privilege of using this facility for the management and treatment of patients. It is recognized that some of these healthcare providers as well as my outside private physician are independent contractors who are not agents of Cardinal Hill. Since these independent contractors are not agents of Cardinal Hill it is agreed that Cardinal Hill is not liable for their acts under the laws of the Commonwealth of Kentucky.

**Waiver of Liability for Loss of Personal Articles:**

I understand that Cardinal Hill maintains a safe for cash and valuables. I understand that Cardinal Hill will not be responsible for the loss of any cash, credit cards, personal items, valuables, etc., that are taken to my room.

**Inpatients Only:**

**Authorization for Leaving the Hospital Premises:**

It is understood that patients may leave the hospital in accordance with the rules and regulations and that any violation thereof may result in discharge. It is further understood that the hospital is not responsible or liable for accidents or illnesses occurring while the patient is absent from its campus.

If a patient is not of legal age (18 years), cross out and initial any item (A) through (C) which is not authorized:

A. \_\_\_\_\_ Patient may leave the hospital if accompanied by an authorized staff member.

B. \_\_\_\_\_ Patient may leave the hospital if accompanied by an authorized adult member of the family.

C. \_\_\_\_\_ Patient may leave the hospital if accompanied by other adults listed below:

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**Advance Directive:** (Cornea/Tissue Donor, Durable Power of Attorney, Living Will, Health Care Surrogate Declaration)

\_\_\_\_\_ I have given a copy of my Advance Directive to the Admission Clerk at Cardinal Hill. This Advance Directive will govern my course of care in as much as is possible under state and federal law.

\_\_\_\_\_ I have an Advance Directive but do not have a copy with me at this time. The directive cannot govern my course of care at Cardinal Hill until a copy for the medical record is provided and reviewed by an attending physician. However, I understand that it is still my right to make decisions regarding my course of treatment.

\_\_\_\_\_ I do not have an Advance Directive but I understand that it is my right to make decisions regarding my course of treatment, including the executing Advance Directives. I have been given information on how to obtain an Advance Directive.

\_\_\_\_\_ A copy of my Advance Directive is on file from my previous admission. I verify that it is still in effect as written at that time. I understand that I may be asked to provide an additional copy of the directive. This directive will govern my care, in as much as is possible under state and federal law.

**Consent for Future Contact:**

I consent to be placed on the Cardinal Hill mailing list to receive information about educational resources, services, programs and fundraising efforts.

\_\_\_\_\_  
Date: Signature of Patient or person authorized to sign on behalf of  
patient

\_\_\_\_\_  
Date: Witness

## **An Important Message From Medicare About Your Rights**

### **As a Hospital Inpatient, You Have The Right To:**

- Receive Medicare covered services. This includes medically necessary hospital services and services you may need after you are discharged, if ordered by your doctor. You have a right to know about these services, who will pay for them, and where you can get them.
- Be involved in any decisions about your hospital stay, and know who will pay for it.
- Report any concerns you have about the quality of care you receive to the Quality Improvement Organization (QIO) listed here: Health Care Excel, Incorporated, 800-288-1499 or TTY: 877-486-2048

### **Your Medical Discharge Rights**

**Planning For Your Discharge:** During your hospital stay, the hospital staff will be working with you to prepare for your safe discharge and arrange for services you may need after you leave the hospital. When you no longer need inpatient hospital care, your doctor or the hospital staff will inform you of your planned discharge date.

### **If you think you are being discharged too soon:**

- You can talk to the hospital staff, your doctor and your managed care plan (if you belong to one) about your concerns.
- You also have the right to an appeal, this is, a review of your case by a Quality Improvement Organization (QIO). The QIO is an outside reviewer hired by Medicare to look at your case to decide whether you are ready to leave the hospital.
  - o If you want an appeal, you must contact the QIO no later than your planned discharge date and before you leave the hospital.
  - o If you do this, you will not have to pay for the services you receive during the appeal (except for charges like copays and deductibles).
- If you do not appeal, but decide to stay in the hospital past your planned discharge date, you may have to pay for any services you receive after that date.
- Step by step instructions for calling the QIO and filing an appeal are on page 2.

To speak with someone at the hospital about this notice, call Paula Epperson at 859-254-5701 or Teresa Davis at 859-376-7132.



**Please sign and date here to show you received this notice and understand your rights.**

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Signature of Patient or Representative

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Date/Time

## Steps To Appeal Your Discharge

- **Step 1:** You must contact the QIO no later than your planned discharge date and before you leave the hospital. If you do this, you will not have to pay for the services you receive during the appeal (except for charges like copays and deductibles).
  - o Here is the contact information for the QIO:  
  
Health Care Excel, Incorporated, 800-288-1499 or TTY: 877-486-2048
  - o You can file a request for an appeal any day of the week. Once you speak to someone or leave a message, your appeal has begun.
  - o Ask the hospital if you need help contacting the QIO.
  - o The name of the hospital is:  
Cardinal Hill Rehabilitation Hospital  
Provider ID Number: 183026
- **Step 2:** You will receive a detailed notice from the hospital or your Medicare Advantage or other Medicare managed care plan (if you belong to one) that explains the reasons they think you are ready to be discharged.
- **Step 3:** The QIO will ask for your opinion. You or your representative need to be available to speak with the QIO, if requested. You or your representative may give the QIO a written statement, but you are not required to do so.
- **Step 4:** The QIO will review your medical records and other important information about your case.
- **Step 5:** The QIO will notify you of its decision within 1 day after it receives all necessary information.
  - o If the QIO finds that you are not ready to be discharged, Medicare will continue to cover your hospital services.
  - o If the QIO finds you are ready to be discharged, Medicare will continue to cover your services until noon of the day after the QIO notifies you of its decision.

## If You Miss The Deadline To Appeal, You Have Other Appeal Rights:

- You can still ask the QIO or your plan (if you belong to one) for a review of your case.

- o If you have Original Medicare: Call the QIO listed above.
- o If you belong to a Medicare Advantage Plan or other Medicare managed care plan: Call your plan.
- If you stay in the hospital, the hospital may charge you for any services you receive after your planned discharge date.

For more information, call 1-800-MEDICARE (1-800-633-4227), or TTY: 1-877-486-2048.

**Additional Information:**

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0692. The time required to complete this information collection is estimated to average 15 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to: CMS, 7500 Security Boulevard, Attn: PRA Reports Clearance Officer, Mail Stop C4-26-05, Baltimore, Maryland 21244-1850.

**Acknowledgement of Receipt of Notice of Privacy Practices**

**Patient Name:** \_\_\_\_\_

By signing below, I acknowledge that I have received a copy of the Notice of Privacy Practices of Cardinal Hill Healthcare System.

\_\_\_\_\_  
Signature of Patient or Legal Representative

\_\_\_\_\_  
Name of Patient or Legal Representative Print

\_\_\_\_\_  
Description of Legal Representative's Authority

\_\_\_\_\_ Date

CHHS 10-097 032703

## **Cardinal Hill Rehabilitation IRF**

### **Inpatient Bill of Rights**

These rights can be exercised on the patient's behalf by a designated representative, surrogate or proxy decision maker if the patient lacks decision making capacity, is legally incompetent or is a minor.

1. The patient has the right to considerate and respectful care. The patient has the right to receive care in a safe setting, free from abuse or harassment. The patient has the right to be free from restraints or seclusion imposed as a means of coercion, discipline, convenience or retaliation by staff.
2. The patient has the right to have a family member or physician of his/her choosing notified of his/her admission to the hospital. The patient has the right to be informed of visiting policies, including those setting forth any clinically necessary or reasonable restriction or limitation the hospital may need to place on such rights and the reasons for those restrictions/limitations.
3. The patients has the right to obtain from the physician and other direct care givers complete, current information concerning diagnosis, treatment and prognosis in terms the patient can reasonably be expected to understand. When it is not medically advisable to give such information to the patient, the information should be made available to the appropriate person on the patient's behalf. The patient has the right to know by name the physicians, nurses and others responsible for coordinating his/her care, as well as when those involved are students, residents or other trainees. The patient has the right to know that a physician is not on the premises 24 hours a day / 7 days a week but that a physician is available by phone or pager 24 hours a day / 7 days a week.
4. The patient has the right to receive from his/her physician information necessary to give informed consent prior to the start of any procedure and/or treatment. Except in emergencies, such information or for informed consent should include (but not necessarily be limited to) the specific procedure and/or treatment as well as the medically significant alternatives for care or treatment. The patient has the right to know the name of the person responsible for the procedure and/or treatment. The patient has the right to refuse such action. In case of such refusal, the patient is entitled to other appropriate care and services that the hospital provides.
5. The patient has the right to have an advance directive (such as a living will, health care proxy or durable power of attorney for health care) concerning treatment or designating a surrogate decision maker with the expectation that the hospital will

honor the intent of that directive to the extent permitted by law and hospital policy.

6. The patient has the right to privacy concerning his/her own medical care program. Case discussions, consultation, examination, and treatment are confidential and should be conducted discreetly. Those not directly involved in the patient's care must have the permission of the patient to be present.
7. The patient has the right to expect that all communications and records pertaining to his/her care should be treated as confidential by the hospital, except in cases such as suspected abuse and public health hazards when reporting is permitted or required by law. The patient has the right to expect that the hospital will emphasize the confidentiality of this information when it releases to it any other parties entitled to review information in these records.
8. The patient has the right to review the records pertaining to his/her medical care and the right to access this information and to have the information explained or interpreted as necessary, except when restricted by law. Hospital Policy will be followed as it applies to release of information.
9. The patient has the right to participate in the development and implementation of his/her plan of care, discharge plan and pain management plan. The patient has the right to expect that within its capacity a hospital must make reasonable response to his/her request for services. The hospital must provide evaluation, service, and/or referrals indicated by the urgency of the case. When medically appropriate and legally permissible a patient may be transferred to another facility only after he/she has received complete information and explanation concerning the need for and alternatives to such a transfer. The institution to which the patient is to be transferred must first have accepted the patient for transfer.
10. The patient has the right to ask and be informed of the existence of business relationships among the hospital, educational institutions, other health care providers or payors that may influence the patient's treatment and care.
11. The patient has the right to be advised if the hospital proposes to engage in or perform human experimentation affecting his/her care or treatment. The patient has the right to refuse to participate in such research projects and, if so, is entitled to the most effective care that the hospital can otherwise provide.
12. The patient has the right to expect reasonable continuity of care. He/she has the right to know in advance what appointment times and physicians are available and where. The patient has the right to expect that the hospital will provide a mechanism whereby he/she is informed by his/her physician, or a delegate of the

physician, of the patient's continuing health care requirements following discharge. The patient has the right to be informed by physicians and other caregivers of available and realistic patient care options when the provided level of hospital care is no longer appropriate.

13. The patient has the right to be informed of hospital policies and practices that relate to patient care, treatment and responsibilities. The patient has the right to be informed of available resources for resolving disputes, grievances and conflicts such as Care Managers. The patient has the right to examine and receive an explanation of his/her bill regardless of sources of payment.

## **Patient Assessment Instrument Consent**

Medicare requires rehabilitation hospitals to complete a designated evaluate called a “Patient Assessment Instrument” (PAI) on all Medicare patients at admission and discharge. This assessment requires the clinical treatment team to assess your functional skills in a variety of areas in order to document improvements made during the inpatient rehabilitation program. While the PAI is required only by Medicare, the clinical treatment team at Cardinal Hill Rehabilitation Hospital will use the PAI for all patients in order to assure consistency.

Medicare requires that you be informed of 5 specific rights concerning the Patient Assessment Instrument. Your signature indicates that you have been informed of these rights, which are as follows:

1. I understand that the PAI is used to collect data pertaining to my diagnosis, medical condition(s) and functional abilities. This information contained on the PAI at admission and discharge, determines the payment that Cardinal Hill Rehabilitation Hospital will receive for the care provided to me.
2. I understand I have the right to expect that the information collected on the PAI will remain confidential and secure.
3. I understand that the data on the PAI will not be released to others except for legitimate purposes allowed by the Federal Privacy Act and Federal and State Regulations.
4. I understand that I have the right to refuse to answer PAI data questions.
5. I understand that I have the right to see, review, and request changes on the PAI.

I understand the Patient Bill of Rights reviewed with me and I understand that I need to contact my Care Manager if I have any questions concerning these rights.

I understand the Patient Assessment Instrument rights reviewed with me.

I understand that refusal to answer PAI questions may result in the inability of the treatment team to collect the information needed for the PAI, which is required in order for Medicare to pay Cardinal Hill for my rehabilitation program.

I have been informed and understand that, if I have a concern or a grievance, I need to discuss it with my Care Manager, respective Program Manager or Risk Management Officer of the facility. If my concern/grievance is not resolved to my satisfaction, I may contact any of the entities below:





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## Vita

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#### Education

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Education Specialist in Counseling Psychology, December 2006

University of Kentucky, Lexington, Kentucky, 2001-2003  
Master of Science in Counseling Psychology, May 2003

University of Kentucky, Lexington, Kentucky, 1996-2001  
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#### Professional Clinical Experience (Supervised)

**United States Department of Veterans Affairs, North Florida/South Georgia  
Veteran's Health System**, Gainesville, FL, psychology intern, July 2, 2012 – June 28,  
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#### Mental Health Clinic

Minor Rotation; 12 months

#### Posttraumatic Stress Disorder

Major Rotation; 4 months

#### Neuropsychology

Major Rotation; 4 months

#### Substance Abuse

Major Rotation; 4 months

#### Cardinal Hill Rehabilitation Hospital

Lexington, KY, 2007-2012

Licensed Psychological Associate under supervision

#### Cardinal Hill Rehabilitation Hospital

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Psychology practicum student

#### University of Kentucky Healthcare

University Hospital; Department of Neurology, Lexington, KY, 2005-2006

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#### Catholic Social Services Bureau

Lexington, KY, 2002-2003 academic year



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### **Teaching Experience**

#### **University of Kentucky**

College of Education; Department of Educational, School, and Counseling Psychology, Lexington, KY, 2003-2004, 2005-2006, 2006-2007, & 2007-2008 academic years; 2005, 2006, and 2008 summer intersessions

Teaching assistant

### **Scholastic Honors and Awards**

T.T Jones Memorial Scholarship, 2000; Dean's List, 1999-2001; Golden Key National Honors Society Member, initiated 2000; Academic Excellence Scholarship, 2002