

Quality of Life and Depression Indicators of Adults with Chronic Obstructive Pulmonary Disease
in an Outpatient Pulmonary Rehabilitation Program: A Descriptive Nursing Study

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May 1, 2015

Abstract

Objective: The purpose of the project is to inform nurses of the importance of pulmonary rehabilitation and the effects it can have on patients' overall quality of life and depression.

Background: Research shows that positive outcomes can be derived from pulmonary rehabilitation. The literature further supports the importance of incorporating evidenced-base strategies of pulmonary rehabilitation for improved quality of life and depression outcomes.

Method: A retrospective review of pre and post scores of the St. George's Respiratory Questionnaire (SGRQ) and Patient Health Questionnaire (PHQ-9).

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Sample Results: After pulmonary rehabilitation there was significant improvements in daily activities, $p=0.006$, improved psychosocial impact, $p=0.002$, and a decreased SGRQ total scores, $p=0.004$. However, there was no significance in symptom scores, $p=0.13$. There were improvements in depression measured by the PHQ-9, $p=0.00001$).

Conclusion: This study supports that patients who participate in pulmonary rehabilitation have improved quality of life and improved symptoms of depression. The findings also support the need for nurses to be aware of the benefits of pulmonary rehabilitation and promote continuum of care through the program for positive outcomes, and cost effectiveness.

Key Words: pulmonary rehabilitation, quality of life, depression, nursing, COPD

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Chapter I

Introduction

Chronic lung diseases are substantial causes of morbidity and mortality. Chronic obstructive pulmonary disease (COPD) is the most common lung disease (Bratas, Espnes, Rannestad, & Walstad, 2011; Busby, Reese, & Simon, 2014). In 2010, COPD was the third leading cause of death in United States (U.S.), claiming the lives of 134,676. In 2011, 12.7 million U.S. adults (aged 18 and over) were estimated to have COPD (Murphy, Xu, & Kochanek, 2013). According to the American Lung Association (ALA) (2014), a survey revealed that COPD patients say their condition limited their ability to work (51%), limited them in normal physical exertion (70%), household chores (56%), social activities (53%), sleeping (50%) and family activities (46%). Pulmonary rehabilitation (pulmonary rehab/PR) programs are an integral part of secondary prevention of lung disease associated with morbidity and mortality. The program is a multidisciplinary approach to health interventions that comprised of exercise and education designed to maximize functional capacity and self-management skills in individuals with COPD (Gronkiewicz & Borkgren-Okonek, 2004; Heslop, 2014). Pulmonary rehabilitation is an intervention aimed at improving the patient's quality of life (QOL) and depression through necessary behavioral changes. Research shows that PR also improves the patient's functional status, improves management of their symptoms, and reduces disease-related burden to healthcare systems (Busby, Reese, & Simon, 2014). Furthermore, Gronkiewicz and Borkgren-Okonek (2004) emphasized the importance of pulmonary rehab in nursing practice and the significance of

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incorporating evidence-based strategies to assist patients that are suffering from anxiety and depression. Further research is needed to fill gaps in knowledge.

Problem Identification

The National Heart, Lung, and Blood Institute (2013) characterize COPD as a progressive and irreversible disease that makes it difficult to breath. COPD includes two main conditions emphysema and chronic bronchitis. In emphysema the air sacs are damaged and in chronic bronchitis, the lining of the airways is constantly inflamed or irritated. The primary symptom associated with COPD is dyspnea, which can lead to anxiety and depression. This can contribute to decreased physical activity, leading to muscle atrophy, loss of cardiovascular fitness, and further increased of breathlessness (Busby, Reese, & Simon, 2014; Bentsen, Henriken, Wahl, Wentzel-Larsen, & Roke, 2012). The U.S. National Heart, Lung, and Blood Institute and the World Health Organization formed the Global Initiative for Chronic Obstructive Lung Disease (GOLD). The objectives of the GOLD were to increase awareness in the prevalence of the disease and recommend treatment strategies as follow: (1) prevent disease progression, (2) relieve symptoms, (3) improve exercise tolerance, (4) improve health status, (5) prevent and treat complications, (6) prevent and treat exacerbations, and (7) reduce mortality (Gronkiewicz and Borkgren-Okonek, 2004).

The Social Security Act established the hospital readmissions reduction program, which required the Centers for Medicare and Medicaid Services (CMS) to reduce payments to inpatient prospective payment system (IPPS) hospitals with excess readmissions. CMS finalized two additional readmissions measures, this included patients admitted for an acute exacerbation of COPD (Center for Medicare and Medicaid Services, 2014). Research studies have supported

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tremendous benefits can be derived from the utilization of pulmonary rehab. It also highlighted how nurses are in the position to advocate for the continuum of care through pulmonary rehabilitation, educate patients on the benefits of pulmonary rehab, and address any negative barriers or misconceptions of the program to assist with reducing admissions and readmissions (Emery, Green, & Sooyeon, 2008; Gronkiewicz and Borkgren-Okonek, 2004; Walmsley, 2014).

Purpose, Goal, and Objective

According to Tiep (2012) “rehabilitation involves change- a change in lifestyle from sedentary to active and a change from disease-centered to life-centered ” (p. 23). The purpose of the project is to inform nurses of the importance of pulmonary rehabilitation and the effects it can have on patients’ overall quality of life. The goal is to examine and evaluate the effectiveness of pulmonary rehab on patients’ QOL and depression. The objective is to explore the impact of outpatient pulmonary rehabilitation in adults diagnosed with COPD.

Chapter II

Review of Literature

The project focused on the impact of outpatient pulmonary rehabilitation programs for patients’ diagnosis with COPD. A review of the literature was conducted to examine the effectiveness of PR programs and the effects on the patient’s quality of life and depression. A Boolean search for full text, peer reviewed, and English language articles published in the years 2000-2015 was completed using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed database, PsychARTICLES, and PsychINFO. The key words used to conduct the search were: pulmonary rehabilitation, quality of life, health-related quality of life (HRQOL), readmission, lung disease, depression, and self-efficacy. Due to the limited research

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on the concepts of pulmonary rehabilitation on quality of life and pulmonary rehabilitation on depression, the literature review was expanded to include publication years 2000 to 2015.

Although the literature covers a variety of context regarding PR, this project will primarily focus on the application of pulmonary rehabilitation on QOL and depression.

Elements of Pulmonary Rehabilitation

Chronic obstructive lung disease can negatively affect the patient's physical and psychological wellbeing. Pulmonary rehabilitation can address the physical and psychological impact effects from the disease (Gronkiewicz and Borkgren-Okonek, 2004). Elements of pulmonary rehab reviewed in relation to patient outcomes include quality of life, depression and anxiety, self-efficacy and self-management.

Quality of life

Quality of life (QOL) is an intricate concept that incorporates the management of the patient's life and the affects by an illness and usually includes subjective evaluations of one's positive and negative aspects of life. Quality of life is a personal health status and encompasses a sense of wellbeing, maintenance of physical and emotional function, and the ability to participate in activities (Centers of Disease Control and Prevention, 2011).

The disabling pathology of COPD can severely affect the patient's QOL (Camp, Appleton, & Reid, 2000). Patients with COPD can benefit from changes to the disease process through pulmonary rehabilitation. Increased activity tolerance and improved psychological wellbeing can promote their quality of life (Camp, Appleton, & Reid, 2000; Lin et al., 2012). According to the quantitative and qualitative study conducted by Camp, Appleton, and Reid (2000) the Chronic Respiratory Questionnaire (CRQ) revealed physical function improved 22% ($p<0.001$) and

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emotional function improved 14% ($p<0.001$) after pulmonary rehabilitation. The physical summary score of the Short Form Health Survey-36 (SF-36) increased 14% after the rehabilitation phase ($p=0.001$). The qualitative data from the personal interviews complemented the data gained from the questionnaires. The participants from interviewed noted increased energy level, confidence and control over COPD, improved emotional wellbeing, and an improved ability to perform certain physical activities. These improvements were reflected by the improvement in both components of the CRQ and in the physical summary component of the SF-36.

Likewise, Lin et al. (2012) compared two groups of cohort's QOL before and after interventions. The study revealed that the experimental group received education and a respiratory program and the controlled group received routine education. The St. George's Respiratory Questionnaire was utilized in the study. The results of the study showed a reduction of activity in the experimental group from 63 to 56, the score for symptoms decreased from 51 to 41 ($p=0.018$), and the impact score declined from 43 to 29 ($p<0.001$), with the overall improvement score from 50 to 38 ($p<0.05$). The controlled group showed no statistical significant changes in any aspect of QOL ($p>0.05$). A respiratory training program for patients with COPD was found to relieve dyspnea, maintain lung function, increased activity tolerance, and improved the patients QOL.

Depression and Anxiety

According to Bandura (1997) "an inability to influence events and social conditions that affect life can give rise to feelings such as futility and despondency, as well as anxiety and depression" (as cited in Bentsen et al., 2012). Psychological comorbid impairments include depression and anxiety. Depression is characterized by no sense of purpose and persistent low

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mood with little or no pleasure or interest from things. Depression is more common in patients with chronic health conditions (Heslop, 2014). David (2006) explained that anxiety is an emotional state associated with fear and distressing physical symptoms, including dyspnea (as cited in Heslop, 2014). Anxiety was further associated as a predictor of frequent hospital admissions and readmissions (Heslop, 2014). Several studies had indicated higher prevalence of psychological impairments in patients with COPD (Bentsen et al., 2012; Bratas et al., 2012).

Bentsen et al. (2012) evaluated the predictive factors of depression and anxiety in patients with COPD before and up to 3 months after pulmonary rehabilitation. The Hospital Anxiety and Depression Scale surveys were utilized. The results showed a tendency of less depression and anxiety immediately after compared with immediately before the PR program, however, changes were not significant. The mean scores ranged from 4.52 to 5.06 (depression) 5.62 to 6.12 (anxiety). The females reported more significant anxiety than males HADS-A ($p=0.019$). Those with higher levels of self-efficacy reported both significantly less depression HADS-D ($p=0.005$) and anxiety HADS-A ($p=0.001$).

Notably, Bratas et al. (2012) examined the short and long-term benefits of pulmonary rehabilitation on the patients' health-related quality of life (HRQOL), depression, and anxiety. Health-related quality of life and depression improved between baseline and 4 weeks: a change of -3.6 for the SGRQ impact score ($p=0.009$), -2.8 for the SGRQ total score ($p=0.012$), a clinical relevant change of -4.0 for the SGRQ symptom score ($p=0.012$), and a reduction of -0.7 for the HADS depression score ($p=0.011$). Between 4 weeks and 6 months follow-up, all SGRQ and HADS scores declined with SGRQ impact score ($+3.5$, $p=0.016$), SGRQ total score ($+2.5$, $p=0.029$), HADS anxiety score ($+1.1$, $p=0.000$), HADS depression score ($+0.6$, $p=0.022$) and HADS total score ($+1.7$, $p=0.000$). No significant differences between baseline and 6 month

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follow-up were found, except for HADS anxiety score (+0.9, $p = 0.003$). The study also indicated patients living alone were 2.9 times more likely to maintain or improve HRQL 6 months after rehabilitation than patients living with someone (95% CI 1.1-7.8, $p = 0.039$). Bentsen et al. (2012) and Bratas et al. (2012) maintained there are benefits of pulmonary rehab on depression. The studies concluded collaborative teamwork is needed to sustain the benefits of PR. Additionally, healthcare members should be more cognizant of patient's who are at higher risk for psychological impairments and intervene appropriately.

Self-efficacy and Self-management

Self-efficacy is a psychological concept that is defined as the confidence of an individual's belief in their own capability to accomplish and attain their goals (Bandura, 1977). Self-efficacy is also a strong predictor of behavior relevant to the development and maintenance of chronic disease self-management (Garrod, Marshall, & Jones, 2008; Warwick, Gallagher, Chenoweth, & Stein-Parbury, 2010). It is the expectation that patients having their own self-efficacy because of the impact it has on their success in self-management (Bentsen et al., 2012). Self-management is taking ownership of one's own behavior or wellbeing. A vital component of chronic illness self-management is the individual's comprehension of his/her illness and the continuous involvement in his/her care (Warwick et al., 2010). Furthermore, Tiep (2012) emphasize the importance of incorporating self-management skills to assist the patients in coping with the disease and have an active approach to life. The following two studies endorsed that healthcare professionals need to promote self-management strategies and self-efficacy, an integral part of pulmonary rehab, to ensure better patient outcomes (Garrod, Marshall, & Jones, 2008; Warwick et al., 2010).

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Warwick et al. (2010) utilized a prospective, descriptive study to predict self-management and symptom monitoring. Self-management was good to very good, with worse self-management predicted by lower self-efficacy ($\beta=-0.21$), a weaker sense of coherence ($\beta= -0.03$), and no hospitalization in the past 6 months ($\beta= -0.05$). Symptom monitoring was not ideal, with more than 20% of patients not monitoring any of the key symptoms. More frequent symptom monitoring occurred among participants who were married ($\beta= 5.14$), and had more severe disease ($\beta= 0.79$).

Garrod, Marshall, and Jones (2008) hypothesized that higher self-efficacy may assist with goal attainment. The results of the study revealed baseline self-efficacy did not differ according to whether the goal was achieved or not. Relationships were apparent between COPD Self Efficacy Scale (CSES) and St George's Hospital Respiratory Questionnaire (SGRQ) ($r = -0.53$), Six-Minute Walking Distance (6MWD) ($r = 0.36$), Brief Assessment Schedule Cards (BASDEC) ($r = -0.31$), London Chest Activity of Daily Living Scale (LCADL) ($r = -0.33$) (all $p \leq 0.01$). There was a significant improvement in CSES scores pre to post rehabilitation, mean difference (95% CI) 0.27 (0.04 to 0.51). The findings of this study did not support the hypothesis.

Theoretical Framework

The guiding theoretical framework chosen for this project is Albert Bandura's (1977) Social Cognitive theory of self-efficacy. The theory emphasized the expectations of personal efficacy. Personal efficacy is derived from four principles: performance outcomes, vicarious experience, verbal persuasion, and physiological states. Performance outcomes or experiences are an essential source of self-efficacy. Experiences can influence an individuals' ability to perform a task. Vicarious experience is developed when an individual develops low or high self-efficacy through other peoples' experiences. Self-efficacy can be influenced by verbal persuasion; a

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person can be encouraged or discouraged to perform a task. Physiological state is a person experiencing sensations from their body and how they identify this emotional state influences their beliefs of efficacy.

Self-efficacy assists in determining coping behaviors, expended efforts, and sustained efforts in the face of obstacles. It also impacts the perceived stressful situation in ones' life and to cope when adversity arises. A quote by Bandura describes the effects of ones' psychosocial influences on how it affects the drive to succeed and achieve his or her goals.

Belief in one's efficacy to exercise control is a common pathway through which psychosocial influences affect health functioning. This core belief affects each of the basic processes of personal change- whether people even consider changing their health habits, whether they mobilize the motivation and perseverance needed to succeed should they do so, their ability to recover from setbacks and relapses, and how well they maintain the habit changes they have achieved (Bandura, 2004, p. 143).

Pulmonary rehabilitation programs are an evidenced-base approach to promote self-efficacy, self-management, and increase the patient's quality of life (Bentsen et al., 2012; Gronkiewicz & Borkgren-Okonek, 2004; Warwick et al., 2010). The theory of self-efficacy offers a theoretical model to assist in understanding the patient's perception of their quality of life and behavioral modifications to endorse short-term and long-term healthy and active lifestyles. It will also contribute to the understanding of a self-efficacious person and the drive to improve quality of life through the education and exercise program provided through pulmonary rehab. The theoretical framework will guide the project in evaluating the relationships between the variables. The

framework will also provide insight on QOL and depression outcomes derived from pulmonary rehabilitation.

Chapter III

Methodology and Procedure

Hypothesis

Participants with COPD in a pulmonary rehabilitation program will show significant improvement in post program scores in the St. George's Respiratory Questionnaire (SGRQ) and Patient Health Questionnaire (PHQ-9) compared to pre-program scores.

Design

This retrospective, descriptive quantitative study was utilized to evaluate the patients' quality of life and depression outcomes. Data was abstracted and disseminated on data previously collected on patients who have successfully completed the SGRQ and PHQ-9 upon entrance and completion of a 12-week pulmonary rehab program.

Sample

The goal was to review 80 charts. Recruitment of participants was not required. Data was de-identified, sensitive information identifying the patient was redacted from the chart. The inclusion criteria were: all patient records that have completed the pre and post SGRQ and PHQ-9 questionnaires. Exclusion criteria were: patients who did not complete the pulmonary rehab program, patients identified with a different lung disease, such as asthma or unstable lung disease, and patients identified as a readmission to hospital during their pulmonary rehabilitation program.

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Variables

The independent variable of this project is pulmonary rehabilitation. Pulmonary rehabilitation is defined as a “multidisciplinary and comprehensive intervention for patients with pulmonary function symptoms. These patients often have decreased daily life activities. Integrating monitored exercise, lifestyle modification, diet, and behavioral health services pulmonary rehabilitation is designed to reduce symptoms, provide an enhanced quality of life for patients and reduce health care costs by stabilizing and managing disease” (ALA, 2015). For operational purposes the pulmonary rehabilitation program is defined as the scores on the SGRQ and PHQ-9 measuring tools.

The dependent variables are quality of life, depression, and the participants’ demographics. The progression of COPD consequently affects the day-to-day functioning and impacts the patient’s quality of life that can lead to depression (Heslop, 2014). Additionally, Bandura pointed out that depressed people have different self-concepts. They hold themselves responsible for negative events in their lives and are full of self-recrimination. Depressed people tend to have lower levels of self-efficacy. Self-efficacy is a person’s belief that they are capable of influencing their situation. Repeated failure further reduces feelings of self-efficacy that leads to depression and decreased quality of life (Nemade, Reiss, & Dombeck, 2007). Bandura (2001) further emphasized, “The capacity to exercise control over the nature and quality of life is the essence of humanness” (p.1).

Quality of life was measured using the SGRQ. The domains included: a symptom score measuring the frequency and severity of respiratory symptoms, an activity score measured activities limited by breathlessness, and the impact score measured aspects of psychosocial. The

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scores ranged from 0-100 for each domain, higher scores indicated worse health. The scores for each domain were added together for a total score. A change in the score of four units is considered clinically significant. The internal reliability (α coefficients) of the domains has been found to range between 0.76 and 0.85 and the overall SGRQ Cronbach's coefficient alpha of 0.87, indicating an acceptable consistency. The content validity has been established and reported in previous studies (Bratas et al., 2011).

Depression was measured using the PHQ-9. It scored depression on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (9-CDSM-IV) criteria on a 0-3 scale. Higher scores indicate severe depression and scores >15 suggest a need for a referral to a behavioral clinician (Psychiatric Times, 1996-2015). The diagnostic validity of the 9-item PHQ-9 was established in studies involving 8 primary care and 7 obstetrical clinics. PHQ-9 scores > 10 had a sensitivity of 88% and a specificity of 88% for Major Depressive Disorder. Reliability and validity of the tool have indicated it has sound psychometric properties. Internal consistency of the PHQ-9 has been shown to be high. A study involving two different patient populations produced Cronbach alphas of 0.86 and 0.89 (American Psychological Association, 2015).

Data Collection and Analysis

The researcher requested and received approval from the Queens University of Charlotte Institutional Review Board (IRB) to conduct this project (see Appendix A). Collection of the data for this study was retrospective from charts of participants that attended an outpatient pulmonary rehabilitation program. The facility is affiliated with a tertiary hospital and is located in the southeastern part of the United States. Results from the electronic record were manually entered into a Microsoft Excel spreadsheet on a password-protected computer by the researcher utilizing

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descriptive statistics. The calculated mean for each item and factor of the SGRQ and PHQ-9 questionnaire provided a method of quantifying the quality of life and depression outcomes. Demographic data was described using percentages. The pre and post survey scores from the SGRQ and PHQ-9 were compared using a paired *t*-test to compare variables before and after pulmonary rehabilitation.

Chapter IV

Results

Demographics

Of the 80 charts reviewed, (n=49) charts were excluded from the study due to not meeting the inclusion criteria. The study sample thus included 31 participants, the majority were female (65%) and the mean age was 74. Most patients were categorized in the Global Initiative for Chronic Obstructive Lung Disease (GOLD) II, as having moderate COPD (55%), and (84%) had more than 1-4 comorbidities (see Table 1).

Outcome Measures

A paired *t*-test was conducted using the pre and post SGRG and PHQ-9 scores. The Effects of Pulmonary Rehabilitation (PR) on Quality of Life and Depression shown in Table 2 revealed the SGRG activity score (pre 59.7 vs post 54.7, $p=0.006$), SGRQ impact score (pre 40.0 vs post 32.6, $p=0.002$), and SGRQ total score (pre 44.3 vs post 40.0, $p=0.004$) improved significantly after pulmonary rehabilitation, reaching the minimum clinically difference of 4 units. However, there was not significance in the symptom score (pre 49.9 vs post 46.8, $p=0.13$). There was also statistical significance in the PHQ-9 (pre 3.9 vs 1.5, $p=0.00001$). This supports the

hypothesis that patients who participated in pulmonary rehabilitation have improved quality of life and improved symptoms of depression.

Chapter V

Discussion

Limitations

The proposed study had several limitations. First, the goal sample size was not met, of the 80 charts reviewed, there were only 31 participants that completed the pre and post SGRQ and PHQ-9. Secondly, the information was self-reported, therefore, it would be difficult to control any bias. Thirdly, this study consisted of only participants with Medicare insurance perhaps a variety of different insurance classification would yield different results. Lastly, due to the restrictions of reviewing other parts of the medical records other important data were not available, such as the frequency of readmissions due to acute exacerbations of the participant's COPD.

Results in Relation to the Literature

The literature provides evidence that pulmonary rehabilitation effectively impact the patients' quality of life (Camp, Appleton, & Reid, 2000; Lin et al., 2012) and depression outcomes (Bentsen et al., 2012; Bratas et al., 2012). Pulmonary rehabilitation offers a multidisciplinary and multifactorial approach to create an individualized plan of care. Through education and exercise the program can improve the physical and psychological wellbeing of patients with COPD (Heslop, 2014; Walmsley, 2014). The findings of this study support the hypothesis that individuals that participated in a pulmonary rehabilitation program had improved QOL and

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depression outcomes. Considering these positive outcomes within the framework of Albert Bandura's theory of Social Cognitive theory of self-efficacy, it is important to acknowledge COPD patients' perceived self-efficacy is the belief in their ability to manage their symptoms. It is evident individuals are depressed by their inefficacy to perform valued everyday activities, leading to decreased quality of life (Benston et al., 2012).

Implications for Nursing

The results from this project supports the need for nurses to be aware and educate patients and their families on the importance of the continuity and continuum of care through pulmonary rehabilitation. Nurses should also encourage self-management and address self-efficacy. The progression of COPD will evidently lead to depression and poor quality of life without appropriate interventions. The evidence-based guidelines established by Global Initiative for Chronic Obstructive Lung Disease (GOLD) was to increase awareness of the prevalence of the this disabling disease, improve patients' overall quality of life, and reduce admissions and re-admissions through self-management (Gronkiewicz & Borkgren-Okonek, 2004). As a result, nurses are able to promote secondary preventive care through PR for improved patient outcomes and cost effectiveness. Nurses working in rehabilitation settings have the opportunities to provide individualize and holistic care to improve patients' overall quality of life. Furthermore, administration is encouraged to follow-up on the programs' adherence to the recommended GOLD treatment strategies.

Implications for Further Study

This study demonstrated important improvements in the patient's QOL and depression outcomes. Although, the SGRQ symptom score was not statistically significant ($p=0.13$), the

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other scores showed positive outcomes. Further study is needed to see if a younger <65 years of age and male patient population with COPD would have the same positive effects from PR as the older and predominately female population had in this study. A larger sample size and other insurance classification are also desirable for future studies. An increase in the number of participants could have resulted in more statistical significance, perhaps on the SGRQ symptom score. Other insurance classifications would likely yield a younger patient population.

Conclusion

Chronic obstructive pulmonary disease is a condition that causes significant morbidity and mortality (Gronkiewicz & Borkgren-Okonek, 2004; Heslop, 2014). Pulmonary rehabilitation is a secondary preventive intervention aimed at improving the patients' quality and other common comorbidities associated with COPD such as depression and anxiety (Busby, Reese, & Simon, 2014; Gronkiewicz & Borkgren-Okonek, 2004; Heslop, 2014). This retrospective review of the SGRQ and PHQ-9 outcomes were statically significant. While these findings are supported by the literature, further research is still needed to enhance the benefits of pulmonary rehabilitation.

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Table 1- Baseline Characteristics of the Study Population

		(n = 31) Frequency no. (%)
Age	<65	5 (16%)
	>65	26 (84%)
	Average	74
Gender	Male	11 (35%)

[Type the date]

	Female	20 (65%)
Comorbidities	No additional diseases	2 (6%)
	1-4 additional diseases	26 (84%)
	5-8 additional diseases	3 (10%)
GOLD COPD stages	I (mild)	0 (0%)
	II (moderate)	17 (55%)
	III (severe)	12 (39%)
	IV (very severe)	2 (6%)

Chronic Obstructive Pulmonary Disease (COPD), Global Initiative for Chronic Obstructive Lung Disease, FEV₁, forced expiratory volume in 1 second. Data presented n (%); COPD I: FEV₁ ≥ 80%; COPD II: 50% ≤ FEV₁ < 80%; COPD III: 30% ≤ FEV₁ < 50%; COPD IV: FEV₁ < 30%.

Table 2- Effects of Pulmonary Rehabilitation (PR) on Quality of Life and Depression

PULMONARY REHABILITATION

<i>Variables</i>	<i>Pre-PR</i>	<i>Post-PR</i>	<i>t</i>	<i>p</i>
SGRQ scores				
Symptom	49.9	46.8	1.6	0.13
Activity	59.7	54.7	3.0	0.006 ^d
Impact	40.0	32.6	3.4	0.002 ^d
Total	44.3	40.0	3.1	0.004 ^d
PHQ-9	3.9	1.5	5.3	0.00001 ^d

SGRQ-The St. George's Respiratory Questionnaire. PHQ-9- Patient Health Questionnaire. Data presented as mean (Pre-Post PR). ^dDenotes a statistical significant differences ($p < 0.05$).

[Type the date]



April 27, 2015

Amy Lane

Presbyterian School of Nursing

RESEARCH PROTOCOL APPROVAL, IRB FILE # 4-15-PSO-00140

The Institutional Review Board reviewed your research request:

Quality of life and depression indicators of adults with chronic obstructive pulmonary disease in an outpatient pulmonary rehabilitation program: A descriptive study

Your protocol (4-23-15); Informed consent form, Focus group questions, Questionnaire; and Recruitment materials were approved for use within the facilities of Queens University of Charlotte. The Board determined your study poses minimal risk to subjects and meets the criteria for an exempt application. If you plan to use the protocol outside of Queens University of Charlotte, you may need to submit it to the IRB at that institution for approval.

This approval expires one year minus one day from date above. Before your study expires, you must submit a notice of completion or a request for extension. You are required to report any changes to the research study to the IRB for approval prior to implementation. This form can be found on the IRB site on MyQueens and should be sent to irb@queens.edu.

If we can be of further assistance, please do not hesitate to contact us. Please use the IRB file number when referencing your case.

Sincerely,

Laree Schoolmeesters

Laree Schoolmeesters, PhD, RN, CNL

Chair, IRB