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The Feasibility of Developing, Implementing, and Evaluating an Educational Intervention for Hospitalized COPD Patients.

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Abstract

Objective. Development and reinforcement of self-management skills for patients with Chronic Obstructive Pulmonary Disease (COPD) is an ongoing challenge. As the disease advances, hospitalizations increase, managing respiratory infections and medication administration become more difficult for patients. Pulmonary rehabilitation programs assist patients with mastery of self-management skills but access is limited. In 1996 less than two percent of Canadian COPD patients participated in rehabilitation programs. Hospitalization provides opportunity for interventions aimed at reinforcing self-management strategies. The following study sought to determine the feasibility of providing and evaluating an education intervention tailored to hospitalized COPD patients.

Design. Feasibility pre-test post-test method.

Setting. Three medical wards of a tertiary care teaching hospital.

Participants. Convenience sample of 20 patients admitted with COPD/COPD exacerbation.

Intervention. Participants received a maximum of three, 40 minute sessions during hospitalization. Content delivery was tailored to participants' learning needs and low self-efficacy areas. Based on Self-Efficacy Theory, teaching strategies included performance accomplishment, role modeling, and positive reinforcement.

Outcome Measures. Learning needs, descriptive and clinical data, program evaluation, COPD Self-Efficacy Scale (CSES) and Dartmouth Functional Health Status (FHS) Charts.

Results. Key learning needs included: inappropriate medication inhalation technique (n=19), lack of disease acknowledgement (n=16), no previous self-management education (n=10). Health care providers identified the need for better access to educational materials for patients and family members. FHS, in five of the nine domains, and CSES scores ($z=3.51$, $p=.004$) improved. Participants evaluated the experience as positive and recommended the intervention for other patients (n=20).

Conclusions. An educational intervention for hospitalized COPD patients can feasibly be developed, implemented and evaluated.

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CHAPTER ONE

Problem and Purpose

Introduction

Chronic illness such as COPD is often associated with difficulty in the development and maintenance of disease self-management strategies. Holroyd and Creer (1986) concluded self-management means having, or being able to obtain, the skills and resources necessary to best accommodate to chronic disease and its consequences. General behavioural areas for the self-management of COPD include managing respiratory infections, maintaining adequate nutrition, and daily maintenance of medications. Each area consists of a set of behaviours that require the mastery of many different skills. Patients may not have these skills or they may not have the ability to apply the skills.

A number of underlying factors influence performance of self-management strategies by COPD patients. Key factors among these are the severity of the illness, individual motivation, understanding of the self-management strategy and confidence or self-efficacy performing activities while avoiding breathlessness. A series of skills related to monitoring, decision making, communication, and coping are required to enable COPD patients to perform self-management behaviours. Therefore, some type of educational program or intervention may be helpful to assist patients in the development of self-management skills. Hospitalization for exacerbation of COPD and the associated fear and uncertainty may provide the impetus, motivation and opportunity for patients to develop, optimize and acquire self-management behaviours.

Organization of the Thesis

The thesis is divided into five chapters. Chapter one introduces the issues and problems that surround health education interventions and disease self-management for patients with COPD. Chapter two provides a critical review of the relevant empirical and theoretical literature. Chapter three describes the study methods. Chapter four presents the results. The final chapter discusses the study results, limitations and the implications for future research and nursing practice.

Problem

Since 1960, the steady North American increase in mortality related to COPD prompted a resurgence of study into disease management (Bailey et al., 1998; Chapman et al., 1994; Lacasse, Brooks, & Goldstein, 1999). In the United States, COPD is the fourth leading cause of death after heart disease, cancer and stroke (Bailey et al., 1998). In Canada, for the period of 1984-1993, Stokes and Lindsay (1996) reported COPD as the fourth leading cause of hospitalization for men and sixth for women, aged 65 and over. Stokes (1996) data revealed COPD as the fourth leading cause of death for elderly men and the seventh leading cause of death for women.

According to Bailey et al. (1998), in a recent United States health care initiative aimed at preventing or slowing the COPD trajectory, COPD was identified as the only major disease that was rising in prevalence and mortality. With the expanding senior population, the prevalence of those suffering from COPD will continue to increase.

The nature of COPD often involves a downward trajectory for the patient. As the disease progresses and lung function deteriorates, patients experience more frequent

exacerbations requiring hospitalization (Gibson, Wlodarczyk, Wilson, & Sprogis, 1998). The main focus of the hospital stay is to control and manage the acute exacerbation episode, and return the patient to a stable level of overall health function. During hospitalization, therapy consists of a combination of oxygen, bronchodilators, antibiotics and corticosteroids. Following the hospital stay, patient participation in pulmonary rehabilitation or physical reconditioning programs may or may not be recommended (Gibson et al., 1998). Less than two percent of patients diagnosed with COPD in Canada actually participated in pulmonary rehabilitation programs in 1996 (Brooks, Lacasse, & Goldstein, 1999).

Accessibility, availability, and patient motivation are potential limiting factors associated with attendance at pulmonary rehabilitation programs. Rehabilitation programs are often inaccessible due to referral and admission criteria, limited patient awareness of programs, long waiting lists, or deterioration of health status (Brooks et al., 1999). The postponement of rehabilitation may place COPD patients at higher risk for readmission, poor symptom control, and more rapid decline in functional health status. The provision of consistent education and self-management strategies in the hospital setting may serve as a starting or reinforcement point for many COPD patients. This may be as simple as reinforcing appropriate use of their inhaler device or identifying the early warning signs of exacerbation.

Common objectives identified in pulmonary rehabilitation programs are to improve COPD patients' symptom control and disease self-management (Burns, 1989; Dudley, Glaser, Jorgenson, & Logan, 1980; Lacasse et al., 1996; Reardon et al., 1994; Tiep, 1989). Holman and Lorig (1992) identified certain pre-conditions necessary for patients

to engage in effective self-management. Perceived self-efficacy or patients' belief about whether they can perform a certain action is one key pre-condition. Many rehabilitation and self-management strategies seek to develop and enhance perceived self-efficacy through a variety of learning and behavioural counseling experiences (Carrieri & Janson-Bjerklie, 1986; Carrieri-Kohlman, Douglas, Gormley, & Stulbarg, 1993; Devine & Pearcy, 1996; Gift, Moore, & Soeken, 1992; Kaplan, Atkins, & Reinsch, 1984; Perry, 1981; Scherer & Schmieder, 1996). Self-efficacy level potentially increases when an individual successfully performs a task and decreases when the individual fails to perform the task (Bandura, 1997).

Devine and Pearcy's (1996) meta-analysis of educational interventions for COPD supported the role of behavioural interventions in symptom control and disease self-management. The majority of studies in Devine and Pearcy's review looked at interventions provided in community or rehabilitation settings. What remains to be studied, is the benefit education and behavioural interventions for self-management skills have for COPD patients hospitalized during exacerbation of the disease.

Education is an ongoing process and requires repetition and reinforcement as the patient's condition changes. The establishment of in-hospital health education programs provides reinforcement opportunities for a group of patients known to have frequent admissions (Gibson et al., 1998). Initiating a program as a strategy to fill the gap prior to, or in some cases, as an alternative to rehabilitation may provide improvement in the functional health status and quality of life for those patients admitted to hospital for exacerbation.

Patients admitted to hospital with COPD are potentially near the end-stage of illness. As such, the effects of hypoxemia, fatigue and depression play a large role in education retention and benefit (Ruzicki, 1989). At the same time, there are a number of barriers to providing education in the hospital setting and more specifically for those with chronic illness. Clinicians working in hospital environments are very familiar with the barriers of time, patient/staff ratios, reduced staffing, and higher patient acuity. Shorter hospital stays, decreased direct patient contact time and acute exacerbation of the illness are recurrent challenges the bedside clinician is required to overcome (Ruzicki, 1989). Given these clinical realities, patient education may not be viewed by health care providers as the highest priority.

In addition, identification of learning needs and implementation of effective education strategies requires time and expertise on the part of the health educator often not available to the bedside clinician. In order to optimize the time spent in hospital, it is critical that future research help fill in some of the gaps in knowledge surrounding the feasibility and effects of providing educational and behavioural interventions to hospitalized COPD patients.

This study sought to provide a preliminary understanding of those complex issues surrounding education for COPD patients in hospital, and the role self-efficacy potentially plays in symptom control, self-management and functional health status.

Study Purpose and Objectives

The primary purpose of this study was to determine the feasibility of providing and evaluating an education program tailored to hospitalized COPD patients. The specific

study objectives were to:

1. Identify hospitalized COPD patients' self-management learning needs.
2. Develop and administer an educational intervention based on learning needs and self-efficacy concepts that can be individualized to patient needs.
3. Identify factors in the hospital setting that may promote or limit the participation of hospitalized COPD patients in an educational intervention such as time allotment for sessions, length of hospital stay and self-management strategies used during the education intervention.
4. Describe the ability of patients to complete the educational intervention evaluation tools.

Conclusion

In summary, as the number of COPD patients admitted to hospital increases an apparent lack of suitable supports and resources may become more obvious. Studies that focus on the hospitalized patient are more likely to meet the needs of, and reinforce disease self-management strategies for this patient group. Educational interventions in the hospital setting provide additional support to those COPD patients unable to participate in formal pulmonary rehabilitation programs. Development of educational interventions for hospitalized COPD patients includes determining the appropriateness and feasibility of this type of program in the hospital setting. The feasibility study serves as a necessary first step prior to the recommendation and implementation of formal programs and further research.

The next chapter provides an overview of the COPD literature. Self-Efficacy Theory (Bandura, 1997), this study's conceptual framework, is introduced and described.

CHAPTER TWO

Literature Review and Conceptual Framework

This chapter offers an overview of empirical research on the psychosocial variables and health outcome measures influencing COPD self-management. Also included are the clinical practice guidelines with specific reference to recommended rehabilitative and educational interventions. The final section presents the conceptual framework chosen to guide the study.

Literature sources from English language papers, Medline, Cumulative Index to Nursing and Allied Health Literature, PsycInfo, Cochrane Library, Educational Resources Information Center, and Dissertation Abstracts International from 1980 to 1999 were searched. Key search terms included COPD, patient education, behavioural therapy, pulmonary rehabilitation, self-efficacy and chronic illness. In addition, the researcher performed frequent literature searches using the key search terms during 1998 and 1999.

Health Care Issues in COPD

COPD is a long-term, slowly progressive and unpredictable condition, marked by alarming symptoms, time lost from work and frequent hospitalizations. Physiologically it has been characterized as an advancing and incompletely reversible airflow obstruction (Chapman et al., 1994). Lung states included within COPD are chronic bronchitis, emphysema, bronchiectasis and cystic fibrosis. Asthma may be considered part of COPD if there is a component of reversible airway obstruction (Menzies & Goldberg, 1994).

COPD patients present with varied history related to disease risk factors. Cigarette smoking is one of the most important and consistently documented risk factors for COPD (Chapman et al., 1994; Kanner, 1996). Evidence is mounting to support risk associated with air pollution, childhood infections and hereditary deficiency in alpha-1 antitrypsin (Chapman et al., 1994; Edelman, 1992; Kanner, 1996). The "Dutch Hypothesis" (Chapman et al., 1994) suggests a genetic predisposition to airway injury is required before cigarette smoking causes COPD.

The most prevalent presenting symptoms associated with COPD are breathlessness, often referred to as dyspnea, and fatigue. Carrieri-Kohlman et al. (1993) described dyspnea as a symptom frequently influenced by personal, situational, health status, and environmental factors. A number of research studies focused on symptoms such as dyspnea and fatigue as predictors of level of functioning for the COPD group (Graydon & Ross, 1995; Lee, Graydon, & Ross, 1991; Small & Graydon, 1992, 1993). These studies have consistently shown exercise tolerance and objective lung function as generally weak predictors of functional health status (Curtis, Martin, D.P., & Martin, T.R., 1997; Graydon, Ross, Webster, Goldstein, & Avendano, 1995; Kaplan, Ries, Prewitt, & Eakin, 1994; Narsavage & Weaver, 1994; Schrier, Dekker, Kaptein, & Dijkman, 1990; Traver, 1988).

Small and Graydon (1992) studied the influence of physical symptoms on functional health status and mood states. Fatigue was identified as the most significant predictor of mood. As well, the low energy level and excessive fatigue interfered with the COPD patients' ability to manage or cope with stressful situations. Graydon and Ross (1995) then used the Bronchitis-Emphysema Symptom Checklist (BESC) to subjectively

measure symptoms of fatigue, dyspnea, congestion and peripheral sensory complaints. Results indicated symptoms directly influenced functioning for COPD patients.

Psychosocial Variables Influencing COPD

A consistent theme noted in the literature was the need for further study in the areas of subjective or psychosocial variables. Of particular note was the relationship of psychosocial variables to functional health status and quality of life (Anderson, 1995; Chapman et al., 1994; Edelman et al., 1992; Fishman, 1994; Graydon et al., 1995; Leidy & Traver, 1996; Reardon et al., 1994). Lareau, Breslin, and Meed (1996) defined functional health status (FHS) as the patients' ability to perform at their normal level of function in several domains of daily living. Domains encompass physiological, psychological and sociological performance. Quality of life (QOL) reflects the COPD patients' well being and ability to deal with day to day activities (Lacasse, Wong, Guyatt, & Goldstein, 1997).

Psychosocial variables frequently discussed in the literature included uncertainty, well-being, depression, anxiety, self-efficacy, negative mood, coping and hardiness (Anderson, 1995; Gift & McCrone, 1993; Graydon & Ross, 1995; Keele-Card, Foxall, & Barron, 1993; Lee et al., 1991; Narsavage & Weaver, 1994; Small & Graydon, 1993; Zimmerman, Brown, & Bowman, 1996). Table 1 summarizes a variety of correlational results in studies assessing the relationship between psychosocial variables, QOL, FHS and physiological measurements.

The literature revealed considerable variability in FHS and QOL for COPD patients when based on physiological parameters (Anderson, 1995; Graydon & Ross, 1995;

Lacasse et al., 1997; Lee et al., 1991; Leidy & Traver, 1995; Narsavage & Weaver, 1994; Traver, 1988). When compared to physiological parameters, behavioural characteristics and psychosocial variables appeared to be better indicators of function and life quality.

Table 1

Correlations between Quality of Life or Functional Health Status and Physiological or Psychological Variables in COPD

First Author (Listed from most recent)	N	QOL or FHS instrument-Dependent Variable	Physiological Independent Variable	Psychosocial or Somatic Independent Variable
Ketelaars (1996)	126	St. George's Respiratory Questionnaire (SGRQ)	FEV1 R^2 = .23. 12 minute walk test (12MW), R^2 = .15.	Avoidance R^2 = .31*. Emotional reaction R^2 = .20*.
Anderson(1995)	126	Quality of Life Scale (QOLS)	FEV1 r = -.32 6MW r = .26*	Self-esteem r = .64* . Depression r = -.58*.
Graydon (1995)	91	Sickness Impact Profile (SIP)	FEV1 r = -.24*	Symptoms r = .54, p<.001. Mood r =.62, p<.001.
Jones (1992)	141	SGRQ	Not measured	Symptoms r = .46*.
Small (1992)	26	Profile of Mood States (POMS)	Not measured	Perceived uncertainty R = .37, p<.07. Symptoms R^2=.21, P = .02.
Weaver (1992)	104	Pulmonary Function Status Scale(PFSS)	12MW r =.67, p<.01. PFT r =.29, p<.01.	Depression r = -.40, P <.01. Self-esteem r = .41, p<.01.
Lee (1991)	30	SIP	FEV1 r =.41*	Symptoms r =.67, p<.0001. Well-being r =.60, p<.0005.

Note: * p<.05. FEV1 = Forced expiratory volume in first second.

Patient Health Outcome Measurements

Despite the importance of psychosocial variables, traditionally the most common means of assessing outcomes of health care strategies for COPD patients focus on physical measures. These include objectively measured lung function based on spirometry or lung volume measurements, exercise capacity, and blood oxygen contents. The review demonstrated a trend where investigators evaluated interventions using FHS and QOL as outcome measures. Researchers documented the inaccuracy of objective and physiological measurements for use in predicting changes in patient health outcomes (Anderson, 1995; Graydon & Ross, 1995; Lareau, et al., 1996; Leidy & Traver, 1995).

Oleson (1990) defined QOL as the subjective perception of satisfaction or happiness with life in domains of importance to the individual. COPD has the potential to affect life quality. Studies demonstrated people with COPD rate their QOL lower than those with other chronic diseases (Anderson, 1995). As such, clinically relevant outcomes for patients with COPD should reflect improvement in QOL and be a primary goal for self-management strategies.

A number of functional health status instruments have been developed that measure general health status with activity specific items. Those that appear most valid and reliable for the COPD patient are disease specific questionnaires designed to evaluate subjective reports of functional ability to participate in daily activities of life particularly impacted by pulmonary disease (Lareau et al., 1996).

Laureau et al. (1996) described instruments developed to measure FHS for patients

with COPD and emphasized the need for clinicians to understand which instruments provide the best measures of patient activity levels. The three disease specific tools recommended included St. George's Respiratory Disease Questionnaire (53 items), Pulmonary Functional Status Scale (56 items) and the Pulmonary Functional Status and Dyspnea Questionnaire (164 items). All instruments are self-administered and provide varying detail in the areas of symptoms, activity, disease impact, and self-care. Authors suggested caution in the evaluation of different but related outcomes, for example, functional ability versus symptom intensity perceived during the performance of activities. Instruments that evaluate activity levels based on reports of dyspnea may not provide adequate information concerning the performance ability of patients. In summary, Lareau et al. recommended that pulmonary specific in combination with broader measures of health status may be necessary for COPD patients depending on the investigators need.

The disease specific tools described above provide a measure of activity level, yet may not capture why the patient has variations between certain activities. COPD patients' lack of confidence resulting from previous breathlessness associated with an activity may lead to avoidance of that activity. A measurement tool geared to the why question may be a better predictor of performance activity for COPD patients. In addition, this form of measurement would be useful in tailoring educational or self-management interventions towards those particular areas of low confidence or perceived self-efficacy.

To summarize, COPD is an irreversible disease in which physical parameters such as lung function respond minimally if at all to present pharmacological treatments. As a

result, professional focus has shifted to the study and refinement of patient outcomes shown to be potentially more responsive to treatment and intervention. Responsiveness may be measured subjectively by patients through generic QOL tools or more disease specific FHS instruments. Certain psychosocial characteristics also appear to be predictive of and influence the degree of patient responsiveness to various interventions. Development of interventions for disease self-management potentially reinforce and support characteristics like overall level of confidence, motivation, coping, self-efficacy and well-being. Identification of health outcomes that are meaningful and realistic for COPD patients provides a better benchmark from which one can measure the benefit of health intervention strategies. The notion of benchmark may also serve as a measure of best practice. The following section reviews the development of best practice guidelines for COPD.

Clinical Practice Guidelines

Recommendations for therapy and interventions to improve the quality of care and life of patients also come in the form of treatment or clinical guidelines. Clinical practice guidelines (CPG) are considered concise, relevant advice that may assist health professionals in the diagnosis and management of individuals with a particular disease process (Canadian Respiratory Review Panel, 1998). Development of CPG includes the process of systematically locating, appraising and synthesizing evidence from scientific studies in order to obtain a reliable overview. The guidelines are intended to provide a benchmark for current best practice based on the strongest research evidence available. Consensus guidelines typically are based on clinical judgement and a systematic review of the literature conducted by the participants, as well as a critical reappraisal of the

recommendations of published international guidelines. Medical management strategies for COPD were primarily developed through the process of expert consensus.

Presently, four guidelines are recognized for the management of COPD. These include the consensus statements of the Canadian Respiratory Review Panel (1998) and the European Respiratory Society (1995), in addition to standards of the American Thoracic Society (1995) and British Thoracic Society (1997). Ferguson (2000), in a review of COPD guidelines, identified the common themes and recommendations despite the lack of scientific evidence supporting the guidelines. All guidelines recognized and agreed that success in the control of chronic illness and more specifically COPD begins with prevention, early disease identification and intervention by health providers (Bailey et al., 1998; Chapman et al., 1994; Petty, 1997). Despite this agreement, development and implementation of prevention and intervention strategies, remains an area that requires continued emphasis.

In addition to prevention and early intervention, a primary focus of CPG's is the pharmacological treatment for COPD. All recommended inhaled bronchodilators as first-line therapy as well as anticholinergics. The benefit of combination therapy and long-acting bronchodilators is also discussed. There is not a clear consensus on the use of inhaled corticosteroids. Clinical trials showed inconsistent benefits for the key medical treatments of bronchodilator therapy, corticosteroids, annual influenza vaccination, and theophylline. Chapman et al. (1994) described oxygen therapy as unique in COPD because there was randomized controlled trial evidence of its benefit in reducing the risk of death for selected patients. The Nocturnal Oxygen Therapy Trial (1980) demonstrated improved survival for patients with chronic hypoxemia when

oxygen was administered for at least twelve hours per day including nocturnal hours.

Key components in the non-pharmacotherapy management of COPD discussed in CPG's included pulmonary rehabilitation, education and nutrition. Recommendations frequently considered patient education a component of pulmonary rehabilitation as opposed to an independent strategy for promotion of disease self-management. The importance and promotion of pulmonary rehabilitation was consistently emphasized in literature that described various disease management strategies for COPD (Burns, 1989; Chapman et al., 1994; Dudley, et al., 1980; Emery, Leatherman, Burker, & MacIntyre, 1991; Fishman, 1994; Gort, Goldstein, Guyatt, Stubbing, & Avendanoet, 1996; Guyatt, Berman, & Townsend, 1987; Haggerty, Stockdale-Woolley, & Nair, 1991; Lacasse et al., 1996; Neiderman et al., 1991; Reardon et al., 1994; Scherer & Schmieder, 1997; Strijbos, Koeter, & Meinesz, 1990; Tiep, 1989; Votto, Bowen, Scalise, Wollschlager, & ZuWallack,1996). The National Institutes of Health defined pulmonary rehabilitation as "a multidimensional continuum of services directed to persons with pulmonary disease and their families, usually by an interdisciplinary team of specialists, with the goal of achieving and maintaining the individual's maximum level of independence and functioning in the community" (Fishman, 1994, p. 826). Despite RCT evidence and recommendations for pulmonary rehabilitation, providing comprehensive rehabilitation programs in a tertiary or acute hospital setting is not feasible. Decreasing lengths of hospital stay may be one of the key limitations.

Edelman et al. (1992) described numerous barriers that have made recommendations for prevention, early intervention, and pulmonary rehabilitation in COPD difficult to achieve. Patient barriers included the inability to achieve smoking cessation, limited

awareness of the benefits of early treatment and risk factor modifications, limited use of immunization for influenza, lack of knowledge, skills or motivation to follow management regimens. Health provider barriers included lack of knowledge regarding disease management strategies, limited referral or postponement of pulmonary rehabilitation, and limited recognition of the need to target at risk populations such as symptom free smokers.

In a systematic review of pulmonary rehabilitation research, Fishman (1994) concluded that if the essential components of an effective pulmonary rehabilitation program could be defined, it may be possible to study these essential interventions at alternative levels of care. Education could be considered an essential component. One potential alternative level of care may be during the COPD patients' hospital stay. The following section reviews and describes rehabilitation and disease self-management areas potentially suitable for the acute care hospital environment.

Rehabilitation Strategies for Individuals with COPD

Chapman et al. (1994) identified some components of rehabilitation programs that may be feasibly taught in the hospital setting. These components included breathing strategies, energy conservation techniques, and medication inhalation techniques. Chapman et al. suggested providing these forms of self-management intervention strategies outside formal rehabilitation programs may help to reduce the fear of breathlessness and improve how patients perceive and self-manage their illness on a day to day basis.

The range of self-management interventions in formal pulmonary rehabilitation

programs include various techniques for the retraining of breathing patterns which offers the patient a coping mechanism during times of acute shortness of breath. Additional instruction incorporates energy conservation, education concerning lung disease, general health habits, nutrition, medication, emergency management and assorted strategies for behaviour modification, smoking cessation and psychosocial support.

Watson et al. (1997) developed an action plan incorporating self-management strategies for COPD and found in a randomized controlled trial (n=56) that the intervention group readily adopted self-management skills. In response to deteriorating symptoms more patients in the intervention group initiated prednisone (34 versus 7%, p=.014) or antibiotic therapy (44 versus 7%, p=.002).

A randomized controlled trial of respiratory rehabilitation by Gort et al. (1996) showed statistically significant treatment effects for the six minute walk and all dimensions of the Chronic Respiratory Disease Questionnaire (CRQ): dyspnea, fatigue, emotional function and mastery. However, Gort et al. did not provide details of the intervention responsible for the treatment effect.

A meta-analysis by Lacasse et al. (1996) assessed the effect of pulmonary rehabilitation on exercise capacity and health-related quality of life (HRQL) for patients with COPD. In the 14 randomized controlled trials located from 1966 to 1995 in which rehabilitation was at least four weeks, significant improvements were found for all measured outcomes. More specifically, for two features of HRQL, dyspnea and mastery, the overall treatment effect was larger than the minimum clinically important difference (MCID). MCID is the smallest difference perceived as important by the

average patient (Lacasse et al., 1996).

Votto et al. (1996), in a secondary analysis of a short-term rehabilitation program, demonstrated comparable FHS despite the length of patient stay decreasing from 23 to 12 days. An important conclusion noted in the study results suggested that less sophisticated rehabilitation programs might be as effective as the more comprehensive programs in improving HRQL.

Despite the evidence supporting pulmonary rehabilitation as a strategy to improve COPD patients FHS, less than two percent of Canadian patients have the opportunity to participate in rehabilitation programs (Brooks et al., 1999). Optimizing the care of the remaining 98% should include further study into the areas best tailored to improving self-management for the hospitalized COPD patient. In addition, the intervention should reflect the needs of the hospitalized COPD group and target the psychosocial variables influencing behavioural change, symptom and self-management.

In addition to rehabilitation, or in some instances as an alternative to, patient education supporting self-management and control of COPD traditionally lagged behind the medical or pharmacological treatments. Recent consensus statements globally advocate a partnership approach to education, encouraging active involvement by patients and healthcare providers (Chapman et al., 1996), yet provide little detail on which educational strategies work best. To date, studies evaluating the effect of education for COPD patients have demonstrated positive results in FHS and QOL outcomes (Devine & Pearcy, 1996). The following is a review of COPD educational interventions most commonly recommended in CPG's and documented in the literature.

Educational Interventions to Increase Self-Management for COPD

A variety of educational strategies have been used in an attempt to optimize self-management for COPD. With researcher focus on QOL and FHS as outcome measures, education strategies progressed to the study of interventions more likely to impact and benefit these outcomes (Brundage, Swearengen, & Woody, 1993; Devine & Pearcy, 1996; Howard, Davies, & Roghman, 1987; Howland et al., 1986; Oberst, 1989; Perry, 1981; Ruzicki, 1989; Tougaard et al., 1992). Appendix A provides a summary of literature examining the effects of educational interventions on health and economic outcome measures for COPD patients.

In general, the literature on education strategies frequently focuses on knowledge as an outcome measure (Gilmartin, 1986; Oberst, 1989; Ruzicki, 1989; Theis & Johnson, 1995). Yet, education for the sake of knowledge alone will not necessarily help the patient manage episodes of severe fatigue or shortness of breath. When dealing with patient education, a greater emphasis needs to be placed on the behavioural changes that influence and predict health self-management and control. Redman's (1996) meta-analysis of nurse initiated general patient education strategies showed conclusively that patient education contributes significantly to positive health care outcomes.

A meta-analysis by Devine and Pearcy (1996) reviewed 65 studies from 1954-1994 measuring the effect of education, exercise and psychosocial support on function and well being for COPD patients. Studies included pulmonary rehabilitation involving large muscle exercise, education and behavioural interventions over a four to six week period, and education alone. Although limited by lack of randomized controlled trials

and small sample size, the evidence from Devine and Pearcys' meta-analysis supported the role of educational and behavioural interventions for improving the COPD patients' FHS. The fact that a majority of these studies took place in community or rehabilitation settings may limit the applicability of the results for hospitalized COPD patients and supports the need for further study.

Redman (1998) reviewed outcome measurement tools in patient education and described self-efficacy as a potent and unique predictor of important functional health outcomes. Self-efficacy is defined as the individuals' perception that they will be capable of performing a given behaviour to produce a certain outcome (Bandura, 1977). Efficacy beliefs were found to influence behaviour through the effects on behavioural choice, effort expenditure, distress response to taxing conditions, and persistence in the face of difficulties. The routine use of self-efficacy measures were found helpful in identifying individuals who, even though they are skilled, lack the confidence to undertake behaviours critical to their treatment (Redman, 1998). As well, Redman identified elements known to promote self-efficacy that may be easily incorporated into patient education interventions. These included successful accomplishment of the behaviour, positive persuasion informing the patient about his capabilities, helping the patient to accurately interpret the physical feelings that accompany performance activities, and vicarious experiences with others.

The following section provides an overview of Self-Efficacy Theory (Bandura, 1997) as it incorporates strategies into a variety of education interventions. With COPD, illness is highlighted by episodes of severe shortness of breath. As a result, patients develop a lack of confidence regarding their ability to avoid these episodes with even

basic activities of daily living. Applying self-efficacy techniques to COPD education may promote patients' confidence in their ability to perform activities of daily living without the fear of breathlessness.

Conceptual Framework

Overview

The conceptual framework selected for this study was Bandura's (1997) Self-Efficacy Theory. Bandura devoted over 20 years to the study and evolution of behavioural strategies used in many disease and health management programs. Bandura and others suggested, the application of Self-Efficacy Theory to education and self-management of COPD provided guidance to educators on techniques previously found effective in improving perceived self-efficacy and self-management for numerous health concerns (Bandura, 1997; Devins & Edwards, 1988; Hurley & Shea, 1992; Scherer & Schmieder, 1996; Zimmerman et al., 1996).

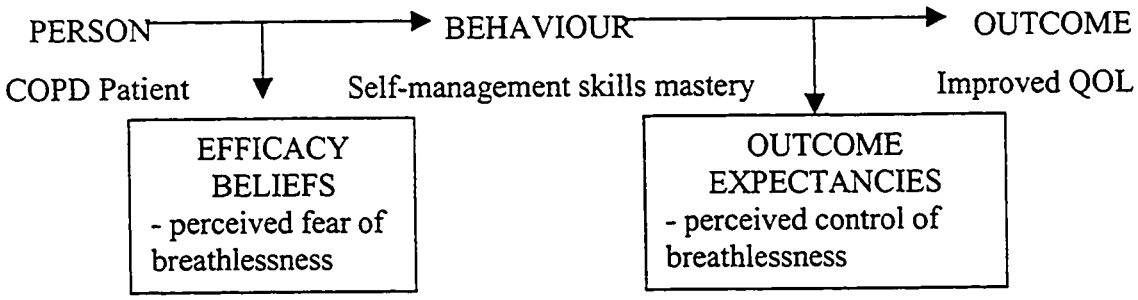


Figure 1. Proposed relationship of COPD efficacy beliefs and outcome expectancies.

Self-Efficacy Theory assumes that the strength of individuals' beliefs about their ability to produce a specific outcome determines whether or not they attempt to deal with a difficult situation. In COPD, the difficult situations are often activities of daily

living. In extension of Banduras' (1997, p. 22) depiction of the causal relationship between beliefs of personal efficacy and outcome expectations, Figure 1 demonstrates application of the COPD patient specific beliefs.

The basic assumption underlying Bandura's Theory of Self-Efficacy is one's expectation about personal-mastery and success determines whether one will engage in particular behaviours. According to Bandura (1997), knowing what to do is not enough. Individuals must also know how to do it, must want to do it and feel they will be successful. Perceived self-efficacy will determine how much effort an individual will expend on a task and how persistent that individual will be in the face of obstacles. Expectations about personal self-efficacy are based on four sources of information: performance accomplishment, vicarious experience, verbal persuasion, emotional, and physical arousal.

Performance accomplishments, or mastery of tasks through personal experiences, are thought to be the most dependable source of self-efficacy expectations. Specific behaviours can be divided into easily managed tasks that the patient can gradually proceed through to facilitate success. This success increases the likelihood of improved self-efficacy.

Vicarious experience, or modeling, is encouraged by introducing patients to people of similar functional abilities who have successfully performed a specific behaviour. Observing successful performance enhances the individual's personal expectation of their success or mastery. Vicarious experiences may include the use of videos, peer groups, tapes, books and pamphlets.

Verbal persuasion is used to convince people, through discussion, that they can

perform an activity. Positive reinforcement and encouragement are examples of verbal persuasion. Reviewing scenarios in which episodes of dyspnea may occur and working through appropriate self-management strategies are also forms of verbal persuasion. Particular to this strategy is the ability to build on past success or learn from past failure.

Emotional and physiological arousal can also influence expectations about self-efficacy. Individuals rely on psychological and physical senses to judge their abilities. Individuals perceive anxiety, fatigue, dyspnea and other symptoms as signs of physical inabilities. Breathing and stress management techniques to reduce dyspnea and anxiety demonstrated improved expectations about efficacy and performance (Scherer & Shimmel, 1996).

In a number of COPD studies, the confidence patients develop in controlling symptoms, most specifically shortness of breath, has been expressed as a level of self-efficacy (Carrieri-Kohlman et al., 1993; Kaplan et al., 1994; Scherer & Schmieder, 1996, 1997; Wigal, Creer, & Kotses, 1991; Zimmerman et al., 1996). Within these studies, Self-Efficacy Theory guides COPD self-management strategies. Despite the limited number of studies, results supported its use. Table 2 provides an overview of study results where Self-Efficacy Theory guided COPD self-management. Studies primarily consist of single group pre-post test designs, conducted in community, outpatient or rehabilitation settings. Level of self-efficacy improved or predicted outcome in all studies.

Rationale for Choice

Theoretical frameworks guiding educational strategies for adult learners may not take into account the special needs of hospitalized patients with chronic illness, or more

Table 2

COPD Studies Guided by Self-Efficacy Theory

FIRST AUTHOR	STUDY DESIGN	PURPOSE	MEASURED OUTCOME	RESULTS
Kaplan (1984)	RCT N=60	The effect of Specific expectancies (SPE) & general expectancies (GE) as mediators of change in exercise.	Walking efficacy- SPE Locus of control- GE	SPE mediate behavior changes, in support of Bandura's social learning theory.
Scherer (1997)	Single group pre post-test. N=60	The effect of attendance at rehab on changes in SE, dyspnea and exercise endurance.	COPD Self-Efficacy Scale (CSES), Dyspnea Scale, 12 minute walking distance test (12MD).	Significant improvement all outcomes, correlation CSES & 12MD ($r = .4293$, $p = .05$). Significant correlation CSES & Dyspnea ($r = .56$, $p = .01$).
Scherer (1996)	Single group pre post-test. N=29	The effect of rehab on SE expectations.	CSES, demographics.	Significant improvement pre & post program CSES ($F = 13.27$, $p < .001$).
Zimmerman (1996)	Single group pre post-test. N=10	The effect of a Nurse-directed self-management program.	a. CSES b. Dyspnea	a. Significant increase (paired t-test=7.98, $p = .001$). b. No change.
Devins (1988)	Correlational prospective longitudinal. N=45	The relationship between SE as a contributor to smoking cessation outcomes.	Smoking survey, indices of outcome and SE, motivational factors, smoking, FEV1.	Perceived SE a significant predictor of smoking self-initiated change (partial $r = -0.37$, $p = .01$).
Kaplan (1994)	Prospective, longitudinal. N=119	The validity of 4 physiological measures and SE as predictors of mortality.	a. SE expectation for walking. b. 4 physiological measures of disease severity.	SE significant univariate predictor of 5-year survival ($x^2 = 9.01$, $p = .01$).
Scherer (1996)	Case-study.	The expectations of an education program.	CSES	CSES improvement in 3 of the 5 subscales.

Note. Studies listed by rigor of design. All took place in outpatient settings. FEV1 = Forced Expiratory Volume in first second.

specifically COPD. The broad principles of andragogy deal primarily with learning styles, readiness to learn, teaching strategies and the pursuit of knowledge acquisition (Merriam & Caffarella, 1991). In a review of over 300 references mapping knowledge in chronic illness, Dluhy (1995) revealed the application of diverse theoretical frameworks. The themes included coping, physiological stressors, cultural diversity, self-care, uncertainty, and uncovering meaning in experience. The concept of self-efficacy crosses all these themes and influences the impact each has on disease self-management skill.

To better guide the clinician dealing with chronic illness an ideal theoretical framework should take into account health beliefs, behavioural changes, motivation, confidence and patients' perceptions of their illness. These concepts have been found to play a major role in predicting the effectiveness of health education strategies (Bandura, 1997; Carrieri & Janson-Bjerklie, 1986; Devine & Pearcy, 1996; Devins & Edwards, 1988; Dow & Mest, 1997; Hurley & Shea, 1992; Kaplan et al., 1994; Oberst, 1989; Redman, 1998; Scherer & Shimmel, 1996).

A meta-analysis of COPD educational research found theoretical rationales relating interventions to outcomes was notably missing (Devine & Pearcy, 1996). When cited, frameworks applied to COPD research were Lazarus and Folkman's Theory of Psychological Stress and Coping (1984) and Bandura's Theory of Self-Efficacy (1997).

Janelli, Scherer, and Schmieder (1991) applied the Theory of Psychological Stress and Coping to a study exploring the coping methods used by those with COPD. The studies main assumption stated individuals with health, energy and social support cope

more successfully in a stressful situation than those who do not have these attributes. After an outpatient education program, there was little change in the pre and post-test coping scores. These results may reflect COPD patients' lack of health, energy or social support and as such, interventions need to be focused on those attributes that can be more strongly influenced. In additional applications of the Stress and Coping Paradigm to the management of COPD, the theory was defined, but little attempt was made to demonstrate how the theory could guide practice or self-management (Graydon et al., 1995; Lee et al., 1991; Leidy, 1990).

The strength of Self-Efficacy Theory lies in its successful application in numerous self-management programs developed for individuals suffering from heart disease, stroke, diabetes and arthritis. Bandura (1997) reviewed many health prevention and promotion activities, which resulted in successful behaviour change and positive health outcomes. As reflected in Table 2, development of educational interventions based on the Theory of Self-Efficacy improved the level of confidence patients with COPD experienced with symptom and self-management. Energy conservation techniques, relaxation, and breathing exercises, are not as strenuous or taxing as the large muscle exercises of rehabilitation programs. As such, they may be more suited to the hospital setting, and can be adjusted according to the degree of disease exacerbation. In addition, identifying those areas of low self-efficacy prior to intervention strategies allows for tailoring of the educational intervention.

Limitations associated with Self-Efficacy Theory include the influence of previous life experiences on patients' confidence level. Past experience may be so powerful and have such strong meaning to patients, minimal change in self-efficacy and behaviour

results. Further study is necessary to clarify the impact of this limitation with the hospitalized COPD patient.

In addition, it has been suggested that feedback from physiological indicators, such as pain or dyspnea, have a stronger influence on efficacy beliefs when there has been little exposure to the new self-management behaviour. Toshima, Kaplan, and Ries (1990) tested the role of self-efficacy in rehabilitation of COPD patients. They concluded, physiological feedback often associated with chronically ill patients, provided a significant obstacle for influencing self-efficacy. As a result, patients continued to avoid activities in which negative physiological feedback occurred. Toshima et al. (1990) recommended that further study in more seriously ill patients was needed to clarify the role self-efficacy expectancies play in promoting and maintaining self-management health behaviours.

In summary, literature and study results support the application of Self-Efficacy Theory to guide COPD self-management strategies. COPD patients' self-limited activity based on efficacy beliefs surrounding exercise-induced dyspnea is a major area amenable to efficacy enhancing interventions. Bandura and others' research demonstrated success in numerous efficacy enhancing health promotion and maintenance behaviours. Study is needed now to demonstrate the applicability and feasibility of Self-Efficacy Theory as a guide to promoting self-management skills for hospitalized COPD patients.

Conclusion

The review of COPD literature reveals advances in thought on the use of various interventional strategies for disease control and self-management. The main focus for

all interventions is aimed at a better quality of living for COPD patients. The disease itself is irreversible, yet certain individual characteristics and perceptions allow some patients to self-manage their disease at a more functional level thereby minimizing the disabling impact of the disease on their every day life. Clinical practice guidelines emphasize the importance of rehabilitation, education and behavioural counseling. These are areas in which health care providers can actively support development of patient self-management skills. Very few interventions are aimed at the hospitalized COPD patient. Practitioners need to become aware of which interventions best support and promote self-management for hospitalized patients experiencing acute episodes.

CHAPTER THREE

Methods

This chapter describes the methods used to develop, deliver and evaluate an education intervention for hospitalized COPD patients. Research details include the design, sample, recruitment, measures and data collection procedures. The chapter provides a description of the approach used to develop, implement and individualize education interventions for COPD patients.

Research Design

The study design was a single group pre-test post-test method to determine the feasibility of providing and evaluating an education intervention administered to hospitalized COPD patients. The feasibility design is a necessary first step in describing factors in the hospital setting that may promote or limit participation of COPD patients in self-management education sessions. Feasibility studies, often referred to as pilot studies, can provide valuable information on optimal participant sources, recruitment techniques, and yield estimates (Friedman, Furberg, & DeMets, 1996). As well, the feasibility study design is useful in answering specific questions on intervention acceptability, degree of completion, and potential outcome measures important prior to implementation of a hospital wide COPD education program or large scale experimental study.

Setting and Sample

The setting of this study was three medical wards in a tertiary care teaching hospital. Preliminary data gathered from study wards, revealed a target population of 99 COPD patients admitted over a one-year period from 1996-1997 (Appendix B). Average

monthly admission was five patients. Sampling of the target population was by convenience method.

Study inclusion criteria were: (a) primary or secondary admission diagnosis of COPD/COPD exacerbation, chronic bronchitis, bronchiectasis, emphysema, COPD with asthma, or COPD with pneumonia; (b) able to give informed consent; (c) English speaking and literate; (d) male or female, aged 45 or over. Exclusion criterion was: severe exacerbation or complications preventing participation or continued participation in the study, including admission to ICU, or other co-morbid illness.

Sample size was based on the feasibility constraints of recruiting patients with a chronic illness. Sexton (1983) while examining methodological issues in chronic illness research identified sample size and slow recruitment as a consequence of conditions peculiar to COPD. The study sample size was dependant on these conditions which included the ability to recruit COPD patients in an acute care setting, severity of illness, declining length of stay, attrition and refusal rates. Considering the data collection period of four months, admission rates, and the descriptive nature of the study a sample size of 20 was chosen.

Education Intervention Development Based on Self-Efficacy Concepts

Consensus guidelines identified certain areas as key components influencing control of COPD (British Thoracic Society, 1997; Chapman, et al., 1994). These components were included in a community based COPD program offered by the Ontario Lung Association (OLA). From the guidelines and OLA program, 12 content areas were identified as important for COPD patients' self-management and symptom control. The areas were linked with self-efficacy enhancing strategies as listed in Table 3. Education

sessions were to be tailored to target areas participants' identified as learning needs.

Table 3.

Self-Efficacy Theory Strategies and Education Session

SE Theory Elements	Session 1.	Session 2 & 3.
Performance Accomplishments (guided mastery)	1. Self-knowledge structures. Discussed patients own successes and failures. Patient indicated goals in relation to participating in sessions, with specific emphasis on smoking cessation strategies when appropriate. 2. Enactive mastery experiences. Skills reviewed and practiced in step-wise method. Included inhaler-device, effective coughing, pursed-lipped and diaphragmatic breathing.	Skill steps review and practice. ------>
Vicarious Experiences (observation, role modeling)	1. Demonstration by Clinician.	-------> When available fellow patient performed activity.
Verbal Persuasion (information, positive reinforcement)	1. Information booklet, referral to smoking cessation programs available in the community. 2. Recommendations for annual influenza vaccinations. 3. Positive reinforcement of skills. All efforts encouraged and praised.	Review session. ------> ------>
Emotional and Physical Arousal (early symptom recognition)	1. Identified early warning symptoms, use of a diary. 2. Focused on situations that were stress provoking and provided stress management techniques, relaxation exercises. 3. Introduced peak flow monitoring when appropriate.	Self-monitoring, identify symptoms, diary. ------> ------>

Throughout the hospital education sessions, emphasis was to be placed on applying principles of Self-Efficacy Theory in order to improve patients' confidence with breathing strategies, inhaled medication techniques, and energy conservation practices.

A key technique to be used was guided mastery. Participants would be taught to divide tasks into small components. As small efforts become successful, then more difficult tasks can be attempted with greater confidence.

Data Collection

Instruments

Data collection included information on participants' learning needs (Appendix C), demographic, clinical and education intervention delivery data (Appendix D), content and format participant evaluation (Appendix E), the COPD Self-Efficacy Scale (CSES) (Appendix F), and the Dartmouth Functional Health Status (FHS) Charts (Appendix G) as potential outcome measures.

Learning needs. The learning needs checklist consisted of 12 disease self-management content areas based on CPG recommendations and current literature. Participants identified three areas of particular interest to them. Areas identified allowed for tailoring of education sessions to participant specific needs.

Demographic, clinical and education intervention delivery data. These tools provided information on participant status and educational session completion. The delivery data tracked items such as date and time of session, length of each session, content area covered, barriers or supports noted during sessions, number of sessions completed by participants, and reason for premature withdrawal from session. The investigator designed these data collection forms. Records were completed at the end of each education session.

Program acceptability and evaluation. Program evaluation consisted of a participant evaluation form focusing on acceptability and satisfaction with the content and delivery

of the intervention. At the final session participants completed program evaluations consisting of questions regarding adequacy of session length, content, and methodology. The investigator also designed this form. If discharged before the final session, participants completed evaluations during telephone follow-up.

The CSES and Dartmouth FHS Charts administered four weeks post intervention served as potential evaluation and outcome measurements. Within this study the intent was to determine participants ability to complete these tools, and the appropriateness of use for hospitalized COPD patients.

Level of self-efficacy. Self-Efficacy was evaluated as a potential program outcome measurement pre and four weeks post intervention. The CSES (Wigal, et al., 1991) measured participants level of self-efficacy. The CSES is a 34-item list of activities that are rated according to the level of confidence a patient with COPD has in managing the activity without breathing difficulty. Scores range from one to five, with one representing 100 percent or very confident with managing and five representing zero percent or not at all confident. The scale can be used to assess changes in self-efficacy during activities of daily living and to identify areas of poor self-efficacy. Wigal et al. (1991) suggested the CSES be used to identify low self-efficacy areas. Presently, no other tool exists that measures self-efficacy in the COPD population. These low self-efficacy areas can then be targeted for improvement, as well as represent a potential measure of disease impact. The CSES has good test-retest reliability ($r = .77$), as well as excellent internal consistency (Cronbach's alpha = .95) (Wigal, et al., 1991).

Functional health status. The Dartmouth FHS Chart System was used to measure FHS as a potential outcome measure pre and four weeks post intervention. The charts

measure physical, social and role functioning, emotional status and overall health. There are a total of nine charts: three focus on specific dimensions of function, two relate to symptoms or feelings, three are concerned with perceptions and one is a health covariate. The charts are similar to Snellen Charts used to quickly measure visual acuity. Each chart consists of a simple title, a straightforward question referring to patient status over the past four weeks, and five response choices. Each response is illustrated by a drawing that depicts a level of functioning or well being along a five-point ordinal scale. One represents optimal functioning and five represents poor function. Extensive reliability (range of r = .78-.98) and validity (average correlation between charts and longer sets of questions measuring same dimension was .62) testing conducted on over 2000 patients by the Dartmouth COOP Project demonstrated strong indication for use in diverse clinical settings (Nelson, et al., 1988).

Data Collection Procedures

The research design and data collection time lines are presented in Table 4.

Table 4

Single Group Pre-test Post-test: Education Intervention and Data Collection Times

0 Pre-test	X Education Intervention	O Post-test
T1 Demographics clinical data, CSES, Dartmouth FHS charts, Learning needs checklist.	T2 Session 1. T3 Session 2. T4 Session 3. Program delivery and acceptability evaluation.	T5 Telephone interview at 4 weeks post discharge, CSES and Dartmouth FHS charts. Program evaluation if not completed at T4.

All available health professionals and clerical staff participated in two information

sessions held on the study wards. Information sheets were posted on the medical wards. Respirologists, Staff Physicians and Senior Residents assigned to medicine received notification of the study. An information meeting was held with the Clinical Service Managers and Clinical Nurse Educator to introduce the study and discuss recruitment strategies.

The study wards were assessed on a daily basis for eligible participants. The Nurse Medical Team Coordinator identified potential eligible participants, and upon briefly describing the study asked if the patient would be interested in speaking to the research assistant. Upon patient approval, the research assistant explained the study procedures and obtained informed consent.

Pre-test. Participant demographic and clinical data were collected during initial assessment. Data collection on participants' learning needs, self-efficacy and functional health status occurred within 48 hours of hospital admission.

Education intervention implementation. Education sessions provided participants with individual interventions tailored to areas identified by the participant and clinician as important for symptom and self-management. Education intervention sessions included use of a model of the normal bronchial tube and the inflamed and constricted bronchial tube, aerochamber with picture comparing medication deposition with and without use, and placebo medication inhaler device used by the participant. A handout copy of Living With COPD (Salisbury et al., 1998), a Lung Association publication, was given to all participants at the first session and referred to throughout teaching as a visual guide to content covered in the sessions.

Post-test. Upon discharge from hospital participants were supplied with the CSES

and Dartmouth FHS Charts to take home for post- test by telephone interview. A clinician contacted participants approximately four weeks after discharge. At this time, the participants completed the measurement scales. In addition, participants were supplied with a stamped, self-addressed envelope with which to return the instruments in the event of a missed follow-up telephone call.

Data Analysis

Frequency distributions and univariate descriptive statistics (ie. median, mode, and standard deviations) were conducted to illustrate the demographic characteristics of the patient sample. Gender, education, and marital status were described as a function of the total sample. The median and range were used to report age. Narrative and descriptive analyses of the program delivery evaluation results were performed to demonstrate acceptability and feasibility of the intervention in the hospital setting. The change in self-efficacy and functional health status pre-discharge and post-discharge in the study group was compared. As usual distribution properties may not be met with a sample size of 20, the median scores and non-parametric procedure Wilcoxon matched pairs signed-rank test was used to analyze comparisons and trends in addition to supplementing the descriptive results.

Total CSES scores for each participant were calculated by adding scores in each subscale, dividing by the total number of answered items and multiplying by number of items in the subscale. The total score for each participant in each subscale accounted for the number of not applicable items by pro-rating had they been answered. Median scores were calculated for each subscale with a percentage reflecting participants' level of self-confidence managing breathing difficulty in those situations.

Clinical relevance of the change in scores on the CSES and Dartmouth Charts has not been previously documented. In this study, comparison with previous HRQL measures in which the clinical impact is already known was made, in order to determine clinical relevance of score changes. Jaeschke, Singer, and Guyatt (1991) presented data suggesting that small, medium, or large effects correspond to changes of about .5, 1.0, and > 1.0 units per question for instruments that present response options on seven-point scales. When converted to percentages these changes are equivalent to seven, 14 and greater then 14 percent change. In their study, bronchodilator use resulted in small, but clinically important, improvements in fatigue, dyspnea, and emotional functioning in COPD patients. Lacasse et al. (1996) described the chronic respiratory questionnaire (CRQ) as the most frequently used HRQL outcome measure in a meta-analysis of pulmonary rehabilitation. In the CRQ seven-point scale the authors selected the minimum clinically important difference (MCID) to be .5 units or a seven percent change.

The CSES and Dartmouth Charts are five point scales, and as such, application of the MCID of seven percent is equivalent to .35 units and .7 units for a 14 percent change. As no other comparison is available, the criterion used by Jaeschke et al. (1991) was used to interpret the clinically significant change in scores for this study.

All data were entered into the Statistical Package for the Social Sciences (SPSS-PC) version 6.1 database in order to facilitate data analysis using the same package. Quantitative data were coded numerically and entered on to the data file using the editor program of SPSS. A complete verification of the data entry was performed by visually comparing the numbers printed on the data file printout with the data from the original

questionnaire. Statistical analysis was computed on microcomputer using the SPSS PC statistical package. A biostatistician reviewed and verified the statistical analysis.

Ethical Considerations

Potential study participants were assured that their decision to enroll in the study would in no way affect the care they received in hospital. Participants were informed they could withdraw from the study at any time for any reason. Participants were assured all information collected during the study would be kept confidential and used only for the purpose of study analysis. The use of a coding procedure ensured that identifying information was not attached to any of the data collected. The identifying code numbers with corresponding names were kept in a locked file with the researcher. Data were analyzed without the ability of the investigator to identify specific participants. Informed written consent was received from all participants (Appendix H).

Ethical approval for the study was received from the Hospital Research Ethics Committee. Permission was sought and received to use the CSES (Appendix I) and Dartmouth FHS Charts (Appendix J).

Conclusion

In summary, the pre-test post-test design was chosen to determine the feasibility and participant acceptability of providing an educational intervention tailored to hospitalized COPD patients. The patient sample consisted of patients admitted with COPD/COPD exacerbation to any of three medical wards in a tertiary care institution. Education sessions focused on learning needs participants identified during the pre-test phase as well as areas identified by the clinician. Throughout the education sessions, self-efficacy theory guided the intervention strategies in support of methods that may

improve level of confidence with disease self-management. Potential outcome measurements evaluated for use in this study consisted of the CSES and Dartmouth FHS instruments. In addition, participants provided a written evaluation of the program. Data analysis provided descriptive results. As well, a review of the CSES and FHS instruments provided a potential means of determining the acceptability of these instruments for use with COPD patients in this setting. The next chapter presents the results of the feasibility study.

CHAPTER FOUR

Results

This chapter presents the study results of the feasibility of delivering and evaluating an educational intervention for hospitalized COPD patients. Accrual and completion status, as well as a description of the demographic and clinical characteristics of participants constitutes the first section. Results of participants' learning needs assessment and intervention delivery status follow. Factors are identified that promoted or limited COPD patients' participation. The final section includes the program evaluation of the education sessions including participant acceptability and ability to complete potential outcome measures. In addition, descriptive and statistical results of outcome measures are completed.

Accrual and Completion Status

Participants were recruited into the study from December 7th, 1998 to April 5th, 1999. The accrual and completion rates are shown in Figure 2. Of 67 COPD patients admitted and reviewed by the Nurse Medical Team Coordinator, 37 or 55% met eligibility criteria. Of the 37 patients approached to participate in the study, 27 or 73% agreed and of the 27, 20 or 74% completed all or a portion of the education sessions along with the pre and post intervention questionnaires.

Ineligibility of patients related to cognitive impairments such as memory deficit, confusion, previous strokes (n=24), and language barriers (n=2). Three patients were discharged before the first education session, despite consenting to participate. Reasons for patient refusal to participate included statements such as: "Too old", "Involved in too many studies", "I'm going to die anyway", "I've been taking this stuff for years, I

think I'll pass", "Too many things going on in my life, I know all I need to know about this, the damage is done now."

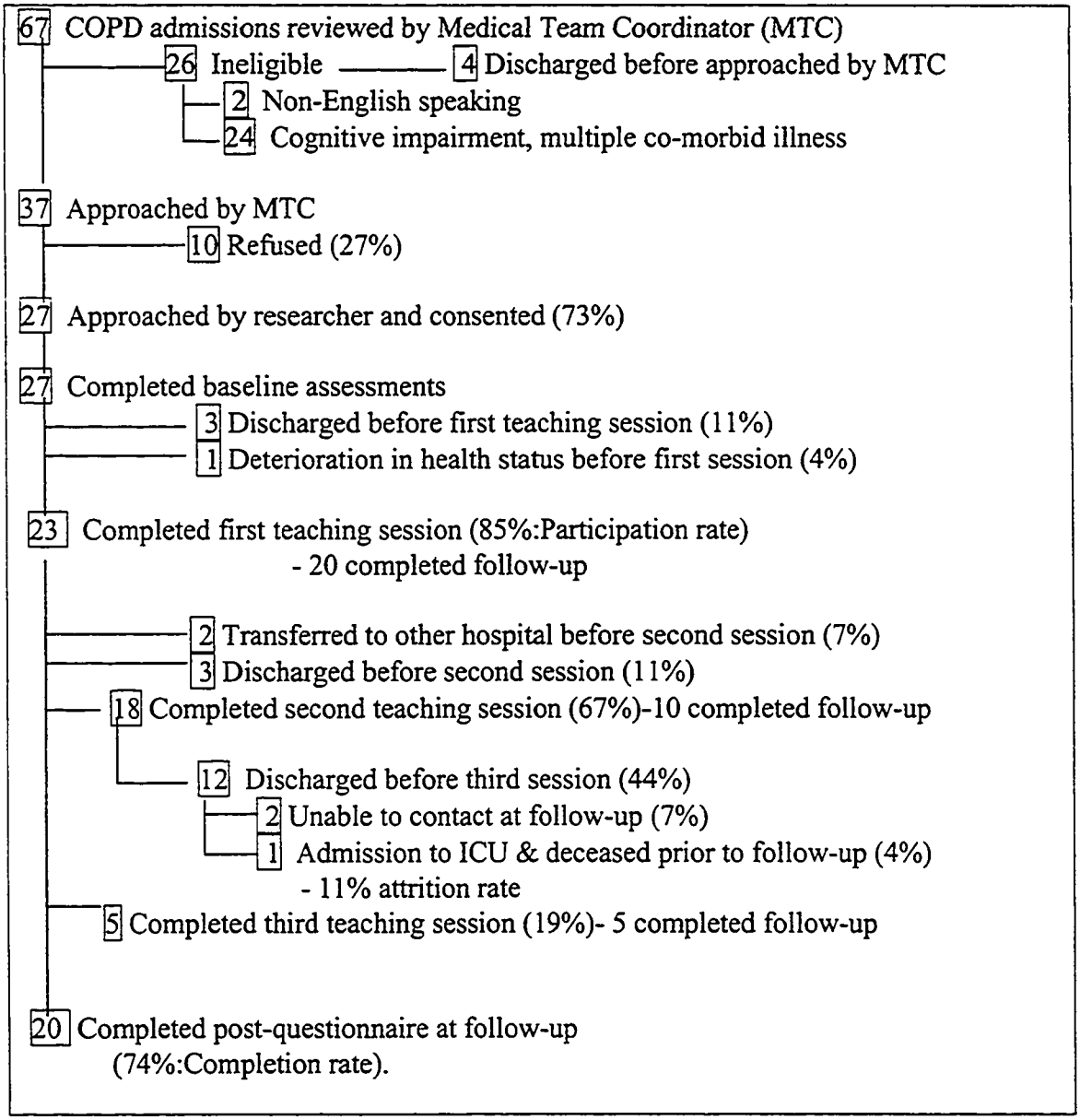


Figure 2. Accrual and completion rates.

Discharge from hospital was the main reason for inability to complete all three sessions. Two participants were transferred to hospitals closer to their homes after one session. Participant withdrawal from the study related to change in condition (N=1) or inability to contact at follow-up (N=2). One participant was admitted to ICU and died one month later. Two participants were lost at follow-up due to change of address.

Demographic and Clinical Data Findings

The demographic and clinical findings of participants are shown in Table 5. Of the participants who completed the post-questionnaire, there were an equal number of men and women, with the typical participant being 70 years of age, married, English speaking, with an education ranging from some grade school to a university degree.

Previous participation in education about lung disease and management was primarily through discussion with health care professionals. Two participants completed pulmonary rehabilitation within the last five years. Three participants attended the Breathe Easy Program at the Lung Association. Of the 23 participants who completed baseline data, five were unsure of the name of their lung disease.

Clinically, the typical participant was admitted with a diagnosis of COPD exacerbation and pneumonia. Two participants were diagnosed with Lung cancer, but were not under active treatment at this time.

Pulmonary function tests were available from baseline data for 13 of the 23 participants. Values ranged from .35 to 1.24 for forced expiratory volume in one second (FEV1), mean .76 litres; .82 – 3.51, with a mean of 1.71 litres for forced vital capacity (FVC) and 30 to 73% for FEV1/FVC ratio, with a mean of 48.5%. These values represent moderate to severe obstruction.

Table 5

Demographic and Clinical Data N=20

Variable		Variable	
Male Female	10 10	Hospital admissions in last year:	Md=1 Range=0-15
Age (Range 49-82)	Md=70.5	Length of Stay (LOS):	
<55	1	Less than 5 days	7
55-75	16	5 to 10 days	7
>75	3	Greater than 10 days	6
Living Environment:^		Influenza Vaccination	18
Lives alone	7		
With significant other	13		
Marital Status		Smoking History:	
Single	1	Smoker	12
Married, common-law	10	Ex-Smoker	6
Widowed	9	Never Smoked	2
Patient identified name of Lung Disease:**		Admitting Diagnosis:**	
COPD	4	COPD	5
Emphysema	8	Emphysema	1
Bronchiectasis	2	Bronchiectasis	2
Asthma	3	COPD exacerbation	9
Unsure	5	Pneumonia	8
		Respiratory distress	1
Education:		Chronic Bronchitis	1
Less than grade 9	9	Asthma	1
Some High School	3	Lung Cancer	2
High School Diploma	4	Respiratory Infection	1
Post Secondary	4		
Past Education on Disease:*		No. Education Sessions (1, 2, 3) completed related to LOS:	1 2 3
None	10		
Breathe Easy Program	3	< 5 days (N=7)	2 5
Pulmonary Rehabilitation in last 5 years:	2	5-10 days (N=7)	3 3 1
		> 10 days (N=6)	2 4
Self-learning	3		
Discussion	9		

* May have participated in more than one type of previous education.

^ Two patients received home care services.** May have more than one diagnosis.

Smoking history from baseline data for the 20 completed participants included 12 smokers, six non-smokers, and two never smoked. Three of the 12 smokers became non-smokers at hospital stay and remained so at the four-week follow-up. None of the former smokers resumed smoking by the four-week follow-up. Three of the 23 admitted participants were already on home oxygen and another two were initiated on home oxygen therapy at this hospital stay. As a result, five of the 20 completed participants were on home oxygen at four-week follow-up. Influenza vaccination was routinely received by 21 of the 23 admitted participants, and 18 of the 20 completed participants.

Self-Management Learning Needs Assessment

The learning needs' checklist included 12 choices from which participants identified three they considered most important to the self-management of their lung disease. From the 20 participants the most frequently identified needs included lung disease and your medications (n=17), breathing exercises (n=17), coping (n=7), oxygen therapy (n=7), nutrition (n=6) and stress and lung disease (n=6). Areas participants identified least often included energy conservation (n=4), travel and lung disease (n=3), exercise (n=2), environmental issues and lung disease (n=2), sexuality and lung disease (n=1), and community resources (n=1).

Education Intervention Delivery Status

Allotment Time

On average sessions lasted 40 minutes. Of the 20 completed participants, all received at least one session, 15 received two sessions and five received three sessions. Number of sessions received was reflected in the length of participants' hospital stay. Despite the acute nature of participants' hospital admission, none of the education sessions

required cancellation or postponement due to other medical, nursing or interdisciplinary procedures. Sessions took place between 09h30 and 11h30, or 13h00 and 16h00. Based on the completion and participation status the intervention was feasibly administered to the 20 hospitalized participants.

Existing Participant Self-Management Strategies

When assessed for medication inhaler use, inhalation technique was performed incorrectly by 19 of the 20 participants. Errors included, insufficient inspiratory force with the turbuhaler (n=3), no exhalation prior to use (n=19), not holding breath for at least ten seconds after inhalation (n=18), not waiting at least 30 seconds between puffs (n=18), inaccurate doseage monitoring of device therefore using empty device (n=20), no aerochamber with corticosteroid metered dose inhaler (n=18), inappropriate insertion of device into aerochamber (n=2).

The majority of participants had minimal knowledge about their lung disease. Three of the 20 participants, two of whom had previous enrolment in pulmonary rehabilitation, knew the early warning signs for exacerbation, rationale for corticosteroids versus bronchodilator therapy, energy conservation and techniques such as pursed lipped, diaphragmatic breathing and controlled coughing. Of the 20 participants, 16 associated their present hospital admission with the beginning of their lung disease. Participants comments regarding their lung disease included "I quit smoking many years ago, why did this happen now?", "Nobody told me I had emphysema", "Will this type of thing likely happen again?", "I'm supposed to be on oxygen at home, but I try and keep away from it, I don't want to become addicted to it."

Hospital Environment: Influential Factors

During the sessions family members were present for six of the participants. Family members provided skill mastery reinforcement for participants, particularly inhaler technique. In two instances family members also used inhalers and received reinforcement of their own technique. Sessions clarified any participant and family misconceptions regarding COPD, medications, and self-management strategies. The coping strategies participants described during episodes of dyspnea, such as staying quiet, deep breathing, relaxing thoughts and denial were expanded on by family members. Family input provided a broader reference point from which participant specific interventions were developed.

All participants received a copy of Living with COPD. At the second session family members of two participants had taken the booklet home. Throughout the study, staff members on the participating medical wards frequently requested literature for themselves or family members. During the four week follow-up a participant transferred to another hospital stated that the nurses asked where they could get more copies for their hospital. Health care personnel were not present during education sessions. The identified barrier to education during these sessions was the lack of available and accessible patient and staff educational material.

Two participants at discharge had no inhaler medication prescribed and one participant had incorrect medications. The medical resident was contacted and adjustments in prescriptions made. The three participants unable to use turbuhalers due to poor inspiratory force were changed to a more appropriate device after discussion with the medical resident.

Education Intervention Acceptability

Table 6 presents the participants' program evaluation results.

Table 6

Program Acceptability Evaluation (N=20)

Criterion	Frequency
1. Amount of information.	
Less than I needed	1
About the right amount	18
More than I needed	1
2. Length of sessions.	
Too long	1
About right	18
Should have been longer	1
3. Helpful in improving confidence at managing symptoms at home.	*
Very helpful	7
Somewhat helpful	9
A little helpful	3
Not helpful	0
4. Recommend education program to others.	
Would definitely recommend	20
Would not recommend	0
5. Helpful in improving skills.	
Very helpful	13
Somewhat helpful	5
A little helpful	2
Not helpful	0

* Missing data for this item on one evaluation form.

The intervention was viewed favorably by the participants. All participants were satisfied with the length and amount of information provided during sessions. Seven of the participants found the intervention very helpful in improving their confidence at managing symptoms at home, while nine indicated that it was somewhat helpful and three a little helpful. All participants who completed the evaluation (n=20) would

definitely recommend the education intervention to others. Most participants felt the intervention was very helpful in improving skills (n=13), while five found it somewhat helpful and two a little helpful.

When asked what participants liked most about the education sessions, participants frequently commented they found the sessions informative and helpful in improving their delivery of medications. One participant wished this form of intervention was available during the initial diagnosis about five years ago.

Another participant felt skeptical at first, and stated "I couldn't quite see how it was going to help anybody including me." By completion this participant found the program very helpful. Additional comments included "Anything I can do to help myself and others with COPD is time well spent", " I think you should try and bring this project to people in hospital", "I wasn't nervous, I could talk to you freely" and "Very valuable in self-help."

When asked what participants liked least, one identified the question on sexuality in the self-efficacy tool as too personal and stated "I didn't know how to answer it." One participant stated some of the material was old hat, but should be useful to first time learners. This individual wrote "I believe that I am exceptional in that I have paid close attention to asthma programs in the past and have devoted a great deal of time to the subject. Accordingly some of the points were old hat but others very useful, correct use of spacers etc."

Potential Outcome Tools: Analysis and Evaluation

Acceptability of CSES for Hospitalized COPD Patients

Data collected during administration of the CSES included time required for tool

completion and participant concerns with regards to answering the various items. In the pre-questionnaire administration for the 23 admitted participants an average of 30 minutes was required for completion. For three participants questionnaire completion took place prior to the following education session. Participants frequently required explanation of the nature of level of confidence as described in the CSES and its relationship to their disease self-management. The post-questionnaire administration for the 20 completed participants took on average 15 minutes.

Items consistently scored as not applicable to participants included: when I drink alcoholic beverages (pre n=12, post n=17), when I feel sexually inadequate (pre n=16, post n=20), when I begin to feel someone is out to get me (pre n=16, post n=15), when I yell or scream (pre n=14, post n=18), when I exercise in a poorly ventilated room (pre n=12, post n=16) and when I overeat (pre n=11, post n=15). Participants commented these items were not applicable as they did not experience these feelings or perform the activity.

Level of Self-Efficacy Before and After Intervention

The median scores for levels of self-efficacy before and after the intervention are presented in Table 7. Items are listed in the subscales of negative affect, intense emotional arousal, physical exertion, weather/environment, and behavioural risk factors.

Median scores and percent of self-confidence level managing breathing difficulty for each subscale before and after the intervention are presented in Table 8. The median total score in self-confidence managing breathing difficulty, significantly ($z = 3.51$, $p = .0004$) improved from 98.6 or 53% to 59.4 or 82%.

Table 7

Pre and Post CSES Median Scores (Range High SE = 1 Low SE =5) N=20

CSES Item	Subscale Item Negative Affect	Median Score Pre (N/A)	Post (N/A)
23.	When I feel detached from everyone.	2 (7)	2 (11)
27.	When I feel down or depressed.	1 (9)	1 (2)
20.	When I feel helpless.	3.5 (8)	2 (9)
32.	When there are problems in the home.	1.5 (6)	2 (1)
24.	When I experience anxiety.	3 (7)	2 (3)
33.	When I feel incompetent.	3 (9)*	2 (11)
31.	When I experience the loss.	2.5 (6)	2 (8)*
21.	When I drink alcoholic beverages.	1.5 (12)	2 (17)
11.	When I feel sexually inadequate.	4 (16)*	(20)
6.	When I deny I have respiratory difficulties.	4 (7)	1 (6)
16.	When I am lying in bed.	2 (0)	1 (1)
12.	When I am frustrated.	2 (4)*	1 (1)*
	Intense Emotional Arousal		
4.	When I experience emotional stress.	3 (1)	2 (2)
10.	When I feel distressed about my life.	2 (5)	2 (2)
8.	When I become angry.	3 (9)	1 (5)
14.	When I feel that someone is out to get me.	2.5 (16)	2 (15)*
30.	When I am afraid.	4 (12)	2 (10)
18.	When I laugh a lot.	2 (1)	1 (2)**
15.	When I yell or scream.	3 (14)	1.5 (18)
1.	When I become too tired.	3	3
	Physical Exertion		
5.	When I go up stairs too fast.	4 (5)	2 (11)
13.	When I lift heavy objects.	4 (6)	3 (15)
9.	When I exercise or physically exert myself.	2.5 (2)	2 (2)
34.	When I hurry or rush around.	3.5 (8)	2 (6)
29.	When I exercise in a room poorly ventilated.	4 (12)	2 (16)
	Weather/Environment		
22.	When I get an infection.	3 (2)	2
17.	During very hot or very cold weather.	3 **	2 (7)
25.	When I am around pollution.	4 (8)	2 (15)
2.	When there is humidity in the air.	4 (1)	2 (4)
7.	When I am around cigarette smoke.	2 (5)	2 (15)
3.	When I go into cold from a warm place.	3.5	2 (4)
	Behavioural Risk Factors		
26.	When I overeat.	4 (11)	2 (15)
19.	When I do not follow a proper diet.	2 (8)	2 (11)
28.	When I breathe improperly.	3.5 (2)	2 (1)

N/A = Not applicable. * One response missing, ** Two responses missing.

Improvements were most pronounced in the subscales of physical exertion and weather/environment with an absolute increase of 30 and 29% respectively in level of confidence. A 25% increase was noted in the subscales of intense emotional arousal and behavioural risk factors. Negative affect level of confidence increased by 21% after the intervention. Changes were statistically significant in all subscales as noted in Table 8. The MCID of greater than 14% supported the clinical significance in score changes.

Table 8

CSES Subscale Median Score (Md) and Self-Confidence Level (%) N=20

CSES Subscale (R = Score Range)	**Prior to Intervention**		**Post Intervention**		**Z-score : Wilcoxon matched-pairs signed-ranks test**	
	Md	**%**	**Md**	**%**		
Negative Affect R=12-60	30	63	20	84	z=3.28	p=.001
Intense Emotional Arousal R=8-40	21	60	13	85	z =2.99	p =.003
Physical Exertion R=5-25	16	45	10	75	z =3.05	p =.002
Weather/Environment R=6-30	19	46	12	75	z =2.43	p =.015
Behavioral Risk Factors R=3-15	9	50	6	75	z =3.21	p =.001
Median Total Score (R=34-170)	99	53	59	82	z =3.51	p =.0004

Note: Range of scores for each item is 1 (100% confident managing breathing difficulty in that situation) to 5 (0% confident).

The distribution of self-efficacy or level of self-confidence percentage before and after the education intervention is shown in Figure 3. There were improvements in level of self-efficacy in all five subscales after the intervention due to the substantial reductions in the number of low self-efficacy scores. Particular items where a change was noted included increases in level of confidence with managing breathing difficulty during emotional stress, with an infection, when hurrying, and when feeling down.

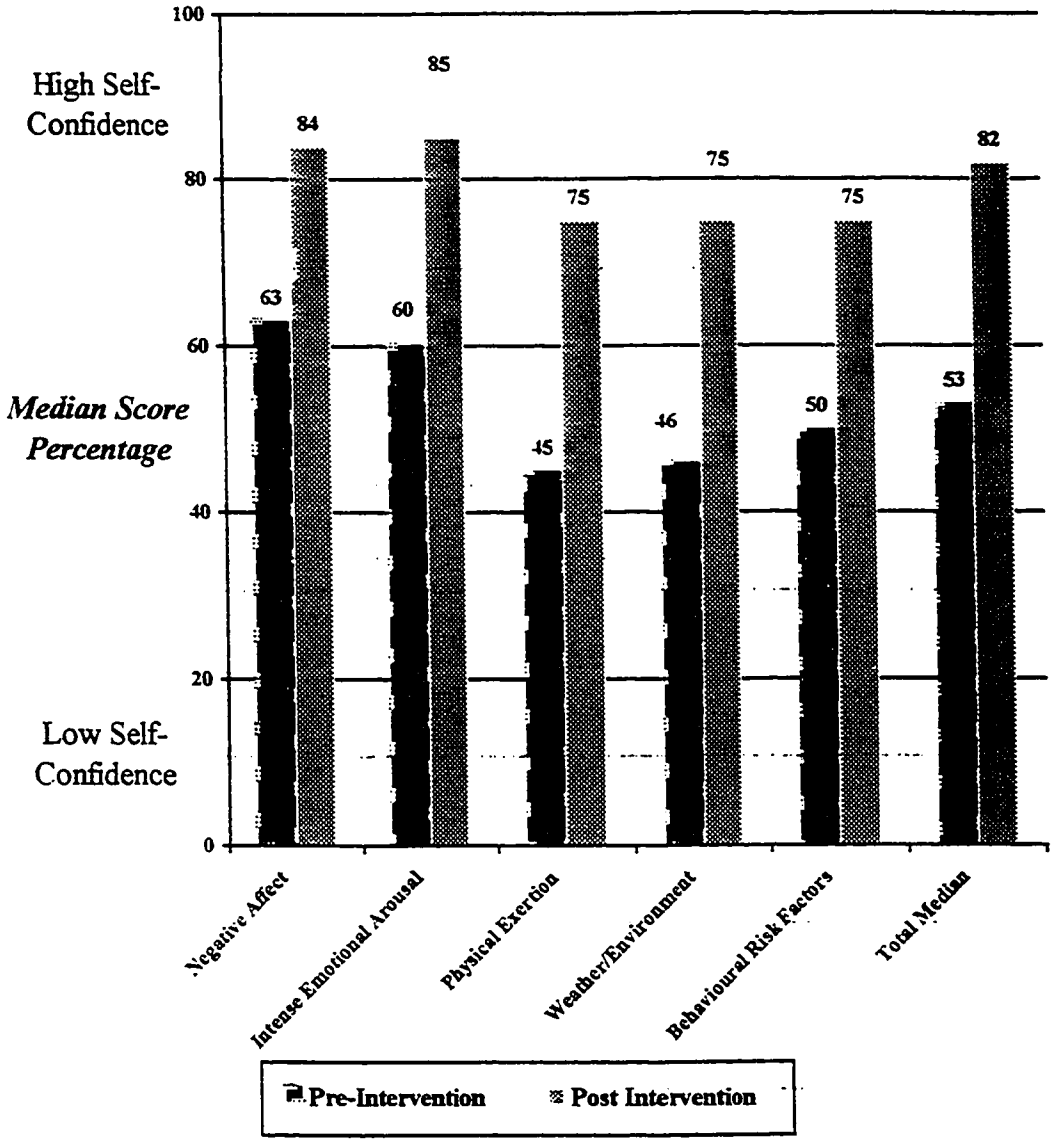


Figure 3. Change in self-confidence median score-percentage pre and post intervention. (N=20)

Acceptability of Dartmouth Charts

The average time for participant completion of the Dartmouth FHS Charts was five minutes. Participants found the charts easy to read and quick to answer. Participants had no difficulty understanding the concept being measured. From the pre and post data there was one missing response related to the overall health chart questionnaire.

FHS Before and After Intervention

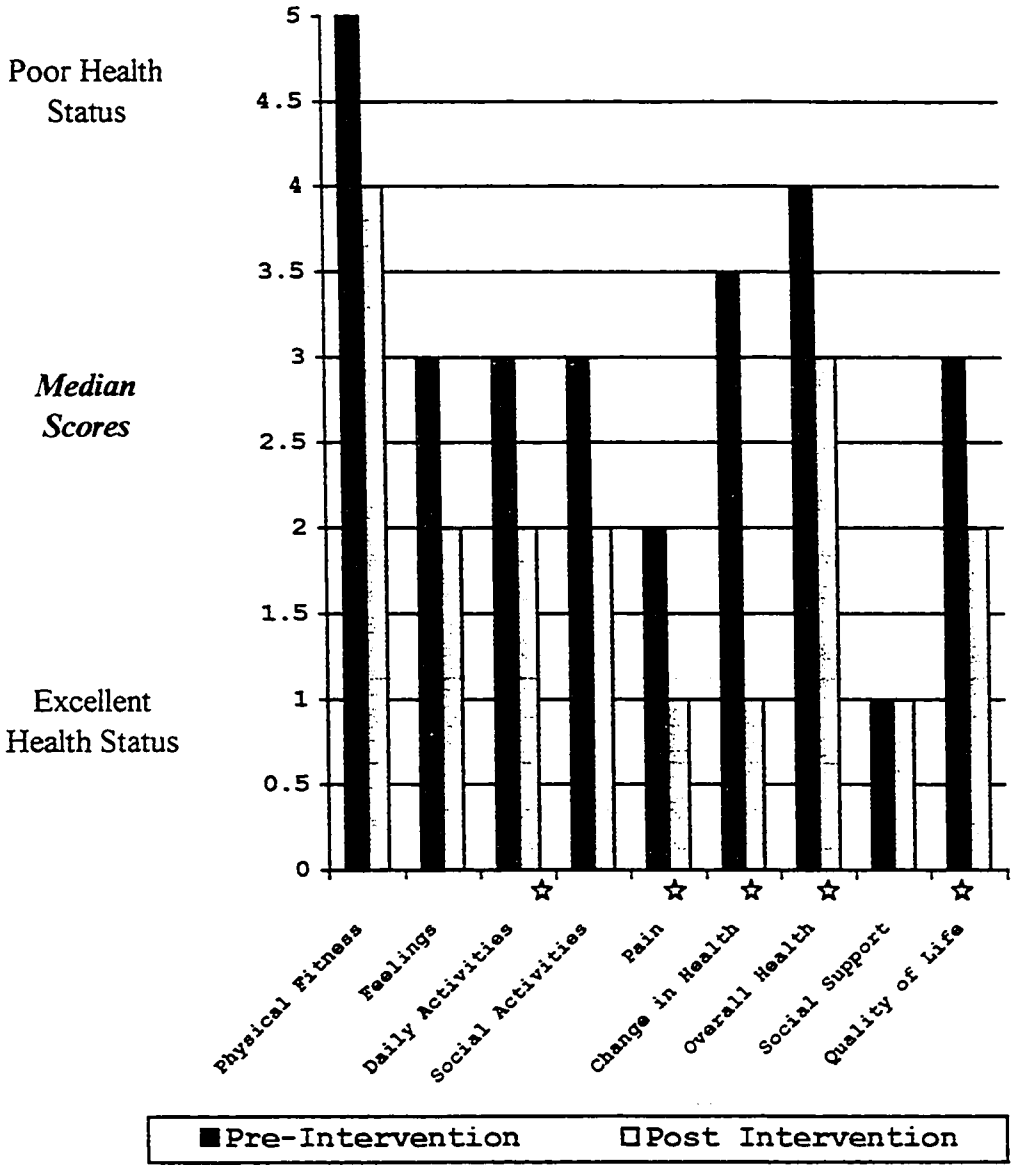
Response frequencies to the Dartmouth FHS Charts are shown in Appendix K. Statistical results are shown in Table 9 and Figure 4 shows change in scores. There was a statistically significant change in FHS for five of the nine charts. Improvements were noted in all charts except social support. A 20% relative change in score occurred in all charts except social support. The most pronounced statistical change occurred in change in health status ($z=3.66$, $p= .00$). Changes in scores were related to the decrease in number of poor functional status responses. The clinical relevance to these changes are considered significant as the MCID is greater then the 14 percent chosen for this study.

Table 9

Dartmouth FHS Statistical Results N=20

Chart	Median Scores (Range 1-5) Pre	Post	Z-score: Wilcoxon Matched-Pairs Signed- Ranks Test	
Physical Fitness	5.00	4.00	z =.513	p=.608
Feelings	3.00	2.00	z=1.25	p=.211
Daily Activities	3.00	2.00	z=1.98	p=.048**
Social Activities	3.00	2.00	z=1.72	p=.086
Pain	2.00	1.00	z=2.02	p=.043**
Change in Health	3.50	1.00	z=3.66	p=.000**
Overall Health^	4.00	3.00	z=2.20	p=.028**
Social Support	1.00	1.00	z=.548	p=.584
Quality of Life	3.00	2.00	z=2.10	p=.036**

** Statistically significant change post intervention $p < .05$. ^ One response missing.



☆ Statistically significant change post intervention $p < .05$.

Figure 4. Pattern of change in Functional Health Status pre and post intervention. (N=20)

Conclusion

The primary purpose of this study was to determine the feasibility of providing and evaluating an educational intervention to hospitalized COPD patients. The study results demonstrated an educational intervention on disease self-management for hospitalized COPD patients could be feasibly developed, implemented and evaluated. Participants identified learning needs, which then guided the main focus of the education sessions. Self-efficacy concepts and theory provided direction for strategies to optimize participants' confidence with symptom control and self-management. The intervention was acceptable to and was recommended by all participants for use with other COPD patients. In a group of 37 patients approached to participate in the study, 20 received at least one education session and completed the pre and post intervention questionnaires. Potential outcome measurement tools revealed improvements in level of self-efficacy ($z=3.51$, $p=.0004$) and functional health status in five of the nine subscales. Participants had minimal difficulty with completion of the Dartmouth Charts. Limitations associated with the CSES in relation to the number of not applicable responses may have influenced results. The following chapter provides a discussion and interpretation of the study results.

CHAPTER FIVE

Discussion

This chapter begins with an interpretation of the findings followed by study limitations. The chapter concludes with study implications for future research and nursing practice.

Interpretation of Findings

Sample Characteristics

The median age of the participants in this study was 70.5, which is consistent with the documented age range of patients diagnosed with COPD (Lacasse et al., 1999). From 1994 to 1995, prevalence rates in Canada revealed 59% of those with COPD fell with in the age range of 55 to 74. The remaining 41% were greater than or equal to 75 years of age (Lacasse et al., 1999). The equal proportion of male to female participants differs slightly from prevalence data reported by Lacasse et al. (1999), in which 55% were male and 45% female.

Learning Needs Assessment

Results of the learning need's assessment demonstrated participants' most common areas of interest were medications, breathing exercises and coping strategies. Participants frequently underutilized their medications or employed ineffective inhaler dosing techniques. Participants presumably did not know they were using inhalers incorrectly, yet still recognized a need to learn more and optimize their existing strategies. The inadequate inhaler technique demonstrated by participants is consistent with studies that also reveal medication adherence is limited among patients (Dolce et al., 1991). Study results supported the need for emphasis in the area of medication

adherence and administration for participants in order to reinforce self-management and symptom control.

In the treatment of COPD, inhalers have become one of the principal methods for effectively administering medication. The effect of the medication depends largely on the patient's inhaler technique. Studies have reported percentages of inadequate inhalation technique as high as 89% (Ilse van Beerendonk, Mesters, Mudde, & Tan, 1998). Of the 20 study participants, 19 or 95% demonstrated inadequate inhalation technique. This particular content area is one easily addressed by all health care providers, yet consistently appeared to be overlooked or misunderstood.

The results of the CSES questionnaire prior to the intervention demonstrated particularly low levels of perceived self-efficacy for controlling breathlessness during times of physical exertion, environmental stress and in the presence of behavioural risk factors. Learning needs identified by participants, fell into the above categories. Appropriate use of medications, breathing exercises and coping strategies would provide participants with a means to increase self-efficacy during the situations perceived as fearful. Breathing exercises and coping techniques are areas identified as feasibly taught in the hospital setting (Chapman et al, 1994). Participants CSES scores post intervention showed improvement in controlling breathlessness during these situations, supporting the benefit of focusing on those areas in most need.

Participants' smoking history is in keeping with evidence supporting cigarette smoking as the most important cause of COPD. Of the 20 participants in this study, 18 had a history of smoking. Only one participant identified smoking cessation as an area of interest. Despite the fact smoking cessation is the only known strategy to prevent

worsening lung disease, studies repeatedly demonstrate the ineffectiveness or perhaps unacceptability of most smoking cessation programs. Relapse rates usually exceed 80% after one year (Canadian Thoracic Workshop Group, 1992). Limited interest by participants may reflect the need to avoid sensitive issues surrounding past attempts to quit. The three smokers who became non-smokers during hospitalization stated they were 90% confident in their ability to remain non-smokers in the next year. Studies support the predictive nature of level of confidence in future success of the behaviour (Bandura, 1997). These three participants remained non-smokers at the four-week follow-up. The remaining nine participants who did not quit stated they did not have confidence in their ability to quit after hospitalization and they continued to smoke at the four week follow-up. Once again, the topic of smoking cessation and referral to existing programs can provide patients with improved awareness of existing support systems. As well, each mention of smoking cessation as a way to slow the disease process and prevent further damage may bring the patient one step closer to contemplating quitting. Reinforcement by all health care providers delivering a consistent message may increase the chances of success. Not discussing or mentioning smoking may often be taken by the patient to suggest approval or lack of importance by the health care professional.

Education Intervention Delivery Results

The majority of participants received two education sessions reflecting the brief hospital stay. Despite this limitation, participants were satisfied with the length and number of sessions provided. The majority of participants had minimal previous experience with education on their lung disease and the results observed may be related to their existing level of knowledge. Yet, those participants who had previous learning

experiences rated and supported the intervention as strongly as other participants.

Participants' viewed the provision of the educational booklet, in support of verbal information, favorably. Results are consistent with studies that show reinforcement of verbal information with written material may enhance patients' comprehension (Redman, 1996).

Potential for Level of Self-Efficacy as an Outcome Measure

There was statistically significant and clinically relevant improvement in all subscales of self-efficacy supporting the use of this outcome measure for evaluating effectiveness of the intervention. The result is consistent with other studies showing self-efficacy theory and concepts, as a guide to interventions for disease self-management, improve patients' confidence (Bandura, 1997). Yet, considering the number of not applicable responses and explanations required during administration, further study with the CSES is indicated.

Clinical importance is reflected in participants' statements with regards to identifying early warning signs, avoiding delay in contacting family physician with early warning signs, identifying and avoiding exacerbation triggers. Having had the opportunity to experience self-management behaviours in their home environment participants' improvements in self-efficacy are now reinforced through real life experience. As such, the intervention supports clinically relevant changes under normal as opposed to efficacious situations.

Earlier studies measuring quality of life assessed the MCID score by simply asking the patients whether they felt that the intervention or treatment was beneficial (Jones & Lasserson, 1994). As noted in the study data analysis section, the MCID taken as a

change of 14% reflects a clinically significant change. All subscale scores showed a change of greater than 14%. The assumption of increases in self-efficacy as clinically relevant for participants may only truly be determined through further research which asks specifically how important and predictive the level of self-efficacy is to the patient.

It is difficult to conclusively state changes were related to the intervention due to the lack of a control group. Increases in self-efficacy may also be related to other information and support the participant accessed during their hospital stay. As well, participants' sensitization to the questions in the pretest, through the process of maturation, may have influenced their post-test responses.

Potential for Functional Health Status as an Outcome Measure

There was statistically significant improvement in functional health status for five of the nine domains. The FHS instrument represents a more generic measure of health status as opposed to the disease specific CSES tool. Generic measures are used generally as a means of assessing global impact of illness on quality of life. As such, there may be under emphasis of the impact of certain disease specific characteristics. For example, in COPD relief of dyspnea is very much a disease specific focus of disease management.

Social support, feelings, physical fitness and social activities did not show a statistically significant change in the post questionnaire. Yet, results for all domains except social support, are considered clinically significant, as the change in chart scores were greater than the MCID of 14% chosen for this study.

A major intent of this feasibility study was to determine the ability of participants to use this particular questionnaire as a potential outcome measure. Participants found no

difficulty with the completion of the FHS tool.

Study Limitations

The main purpose of this study was to determine the feasibility of providing an education intervention. As such, a control group may not be warranted and therefore not be considered a limitation of the study. Albeit uncontrolled evidence, study results provide the foundation for further research using a method in which the intervention is compared to standard practice.

Problems with the internal validity of the study include the effects of co-intervention and the effect of testing. Co-intervention could limit internal validity because participants may be accessing information and support in addition to the education intervention that could in turn impact the outcomes of self-efficacy and functional health status. A pre-test may also threaten internal validity due to the effect of previous exposure on post-test results. In addition, validity may be impacted by the influence of the clinician on participant responses. The educational intervention was implemented by one clinician, as such an inadvertent bias may have influenced results. Yet, in order to develop, implement and evaluate the intervention the clinician required a level of expertise with strategies supporting COPD disease self-management. The use of one clinician provided consistency of content, format and implementation strategies.

The identification of learning needs may be limited by the participants' lack of pre-existing knowledge regarding the presence of disease. Of the 20 participants, 16 associated their present hospitalization with the beginning of their lung disease, as such participants may not feel the need to learn or change. Until patients begin to recognize the need to learn it may be more difficult for patients in an acute care setting to identify

areas in which change may improve self-management. Although, despite a limitation from the participants' perspective, it reinforced the benefit of a clinician identifying the area of disease recognition and acceptance as perhaps the first learning need for those in this category.

The major limitation associated with the use of the CSES questionnaire was the number of not applicable responses by participants. Despite the questionnaires' disease specific intent, responses may reflect the inappropriateness of the tool in identifying situations or activities representative of the hospitalized COPD patient. As noted in study results, items were identified as not applicable because participants stated they did not experience that situation, or perform the activity. Telephone follow-up served as a potential limitation with the CSES as participants identified five more items as not applicable in the post questionnaire.

Despite the above limitations and in lieu of a randomized controlled trial, the primary objective of this study was met with the feasibility design. Results provided the descriptive information necessary to determine the practicality of providing educational interventions to hospitalized COPD patients. The primary study objective was to determine the feasibility of providing and evaluating an educational intervention tailored to hospitalized COPD patients. Not withstanding the study limitations, the value or relevance of results does not change in terms of their importance in meeting the study objectives.

Implications for Research

The educational intervention requires further evaluation using a randomized controlled design with a larger sample size, to overcome and minimize the threats to

internal and external validity. With a larger sample size, inferences could be made about demographic and clinical factors that influence patient participation and outcome variables. In addition, the larger study may provide more valid and reliable testing of the CSES and Dartmouth FHS Charts with this specific patient population.

Specific implications for future use of the CSES indicate the need to re-examine the importance of certain items. Removing the not applicable items may improve administration of the tool in the hospital setting. Then further psychometric testing would be required. Previous studies using the CSES did not make mention of this limitation when reporting their results. In this study the hospitalized COPD participants were generally more acutely ill than in those intervention studies previously using the CSES tool. Further research with the CSES tool in the hospitalized setting may be required to determine the validity and reliability of the tool as an outcome measurement for hospitalized COPD patients.

Other important research to be done with this population is to look at the role family plays in supporting and perhaps augmenting the intervention provided in hospital. In many instances family members are actively involved in care at home. Evaluating the impact of educational interventions with family may be an area that further supports self-management for COPD patients. Not all study participants had family members present during sessions. The sample size was too small to demonstrate the influence of family support, but as observed by the researcher, family presence provided motivation and reinforcement for participants.

Hospitalized COPD patients meet the criteria for a group who may benefit from case management (Gibson, et al., 1994). These criteria include chronic illness or catastrophic

event, history of frequent admissions or use of emergency services, and decreased coping capacity (Gibson et al., 1994). Evaluating the role of an Advanced Practice Nurse (APN) for case management of COPD patients compared to standard care or the education intervention alone may provide further evidence supporting the use of APNs to improve patient outcomes. In extension of this study, the value of home follow-up visits compared to telephone follow-up as an additional support system could be evaluated. A more formal link to home care, including continuation of the educational intervention in the home setting could also serve as a model in which to extend study results. Considering the implications for patient readmission, follow-up and continuity of care become major areas requiring further study in order to determine which model of care provides patients with the best opportunity for improved health status. A cost-benefit analysis needs to be conducted to provide further guidance in terms of economic outcomes.

An important implication of study results is the recognition of the obstacles of conducting research with this population. The obstacles experienced in this study were similar to those identified in the COPD literature (Lacasse et al., 1997). The major barrier in this study was the acuity of illness at admission and associated unstable nature of the disease at end-stage. Issues related to studying the effects of the intervention are heavily impacted by the ability to recruit and retain participants. Follow-up is potentially one area of research directly affected by the unstable nature of COPD. Further research with a repeat follow-up period of six months and one year would provide valuable information on the long-term evaluative aspects of educational interventions in the hospital setting.

Implications for Nursing Practice

The feasibility study demonstrated that it is possible to develop, implement and evaluate an intervention geared to the specific disease self-management needs of the hospitalized COPD patient. The Advanced Practice Nurse can provide the expertise necessary to assess patients' level of skill and disease self-management. Advanced Practice Nurses have the knowledge to design, test and evaluate interventions tailored to patient needs. Following this, the APN can provide clinical advice on solving problems, have input into strategies that improve patient care and help incorporate use of the intervention by clinical nurses. These opportunities may assist the staff in developing skill in decision making about appropriate interventions for COPD and other high risk patients.

The dissemination of best practice guidelines to the staff nurse provides the opportunity for further professional growth and advances their own level of skill and expertise with the COPD population. Nurses may then become more empowered to lobby and advocate for changes supportive of best practice with other high risk patient groups.

The medical wards at the time of this study were experiencing a shortage of resident coverage. The shortage may explain the incident of a participant being discharged with inappropriate medication regimes. Yet, this trend may be occurring more frequently across many health care settings. Advanced Practice Nursing has often grown out of need during health-care crises (Hamric, Spross, & Hanson, 1996). Nurses provide an important communication link as patient advocates particularly during times of restructuring. What may be reflective in this particular situation is a potential need for

an APN at the nurse-patient interface to provide expertise with interventional support, counseling and resources for those patients in higher risk groups.

An interesting finding, not systematically documented, was frequent requests by staff for learning and resource materials. The apparent need for further health provider access to educational materials became obvious throughout the study. The question becomes how to improve access and dissemination of COPD education materials to caregivers in order to optimize care. Implications for the nurse include the need to be aware of what resources are available to patients and themselves. If these resources are not available nurses need to lobby administrators to provide them.

Advanced preparation and clinical expertise inherent in the APN role are attributes not necessarily available to the patient through the bedside nurse. In addition, physicians have not traditionally implemented patient education and disease self-management strategies. The existing health care systems may not allow nurses or physicians sufficient time to develop, implement and evaluate educational interventions for the more complex patient groups. The APN as a common link can guide and support this process in collaboration with administrators, nurses, physicians, and the interdisciplinary care team to better optimize time available to staff and patients. In addition, the APN may play a key role in setting up the system such that educational interventions may be implemented by a variety of health care providers including family members. An important implication here becomes the continued involvement of all health care providers in lobbying for administrative support of such programs.

Conclusion

In keeping with the objectives of the study, results provide a basis on which to

develop appropriate educational interventions for hospitalized COPD patients. Using the principles of Self-Efficacy Theory, interventions were clearly described with a rationale supporting application. Results supported Self-Efficacy Theory as a guide to developing self-management strategies. The feasibility study was necessary prior to a full-randomized controlled trial, as the acceptability and descriptive analysis provided an indication of the educational interventions applicability for COPD patients in the acute care setting.

The outcomes described how patients with COPD, admitted in an acute care setting responded to an educational intervention guided by Self-Efficacy Theory. Results revealed participant acceptance and satisfaction with the educational intervention and identified important patient learning needs surrounding medication administration and disease acknowledgement. Level of self-efficacy and FHS increased in the post questionnaire, supporting use of these as potential outcome measures. The feasibility study demonstrated that, an educational intervention guided by Self-Efficacy Theory could be provided and evaluated with COPD patients in a hospital setting.

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Appendix A
Studies on Effects of Educational Interventions for COPD Patients

Appendix A. Studies on Effects of Educational Interventions for COPD Patients

First Author	Study	N	Setting	Intervention	Outcome Measure	Results
Devine (1996)	MA	65 studies	Combined tertiary, primary care, and home.	Education, exercise and/or psychosocial support. N=28 rehabilitation N=21 education alone	a. Psychological b. Endurance c. Oxygen uptake d. Functional status. e. Dyspnea. f. Pulmonary function. g. Psychomotor skills. h. Adherence. i. Health care use.	Rehabilitation – statistically significant improvement. Education alone & relaxation – statistically significant improvement.
Watson (1997)	RCT	56	Primary care.	Action plan from practice nurse versus usual care from GP.	a. quality of life. b. pulmonary function. c. self-management behavior.	No change in a or b. Significant change in c. In response to deteriorating symptoms patients initiated prednisone(p=.014), and antibiotics(p=.002).
Tougaard (1992)	RCT	82	Tertiary care	PHP versus SHP.	Health service use 1 year pre and post admission.	Health service use on average Kr15,298(p=.05) per patient per year less in the PHP.
Howard (1987)	Single group pre, post-test.	115	Tertiary care	Effectiveness of a structured COPD ed. Program.	Health service use 13 months pre and post.	19%(p=.05) decline in number of admissions. Hospital days reduced 54 to 47. Community days increased 178 to 225.

Note. Tougaard and Howard not included in meta-analysis. MA = Meta-analysis. PHP = Personalized hospital practice, SHP = Standard hospital practice.

Appendix B
COPD Cases Admitted April 1995-March 1996

COPD CASES
APRIL 1995 - MARCH 1996

	MAIN DIAGNOSIS			COMORBID DIAGNOSIS		
	CASES	DAYS	ALOS	CASES	DAYS	ALOS
OBSTRUCTIVE CHONIC BRONCHITIS NO ACUTE EXACERBATION	8	471	58.88	9	138	15.33
OBSTRUCTIVE CHONIC BRONCHITIS WITH ACUTE EXACERBATION	69	560	8.12	60	1033	17.22
EMPHYSEMATOUS BLEB	2	23	11.50	14	144	10.29
EMPHYSEMA NEC	22	269	12.23	29	362	12.48
CHRONIC OBSTRUCTIVE ASTHMA NO STATUS ASTHMATICUS	13	119	9.15	14	421	30.07
CHRONIC OBSTRUCTIVE ASTHMA WITH STATUS ASTHMATICUS	0	0	0.00	1	1	1.00
BRONCHIECTASIS	31	193	6.23	23	363	15.78
ALLERGIC ALVEOLITIS	0	0	0.00	1	2	2.00
CHRONIC OBSTRUCTIVE PULMONARY DISEASES UNSPECIFIED	60	696	11.60	115	2742	23.84
TOTALS	*205*	*2331*	*11.37*	*266*	*5206*	*19.57*

Appendix C
Learning Needs Checklist

Learning Needs Checklist

The following topics make up areas important in improving self-management of your lung disease. In order to cover those areas that are important to you, please check three that would be of particular interest:

- ☐ Your Lung Disease and Medications.
- ☐ Breathing Exercises.
- ☐ Energy Conservation.
- ☐ Exercise.
- ☐ Nutrition.
- ☐ Coping.
- ☐ Oxygen Therapy.
- ☐ Travel and Lung Disease.
- ☐ Stress and Lung Disease.
- ☐ Sexuality and Lung Disease.
- ☐ Environmental Issues and Lung Disease.
- ☐ Community Resources.

An area of concern about your lung disease not listed:_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix D
Demographic, Clinical and Program Delivery Data

Demographic Data: From Patient

ID # _____

1. Gender: (check one box)
   - ☐ Female (1)
   - ☐ Male (2)

2. Age: _____ years.

3. Marital Status:
   - ☐ Married, common law (1)
   - ☐ Single (2)
   - ☐ Widowed (3)
   - ☐ Divorced/Separated (4)

4. Language most frequently spoken:
   - ☐ English (1)
   - ☐ French (2)
   - ☐ Italian (3)
   - ☐ Chinese(4)
   - ☐ German (5)
   - ☐ Other: please specify _____ (6)

5. Highest grade or level of education completed?
   - ☐ less than grade 9 (1)
   - ☐ some high school (2)
   - ☐ high school diploma (3)
   - ☐ trade certificate / diploma (4)
   - ☐ some coilege (5)
   - ☐ college diploma / degree (6)
   - ☐ some university (7)
   - ☐ university degree (8)

6. Previous participation in education about lung disease.
   - ☐ Breathe Easy Program at the Lung association this year.(1)
   - ☐ Pulmonary Rehabilitation Program this year.(2)
   - ☐ Pulmonary Rehabilitation Program in last 5 years.(3)
   - ☐ Self-learning: includes reading pamphlets, books, videos.(4)
   - ☐ Discussion with health care professionals: includes physicians, nurses, respiratory therapists, physiotherapists.(5)

7. What is the name of your lung disease?
   - ☐ COPD(1) ☐ Chronic Bronchitis(2) ☐ Emphysema(3) ☐ Bronchiectasis(4)
   - ☐ Asthma(5) ☐ Unsure(6)

8. Living environment: ☐ lives alone (1) ☐ lives with significant other (2) ☐ home care services(3) ☐ nursing home(4) ☐ seniors residence (5) ☐ other , specify _____(6)

Clinical Data: From Patient Chart

1. Admitting diagnosis: ☐ COPD(1) ☐Chronic Bronchitis(2) ☐ Emphysema(3) ☐ Bronchiectasis(4) ☐Asthma(5) ☐ COPD with exacerbation (6) ☐ pnemonia (7) ☐ respiratory distress (8) ☐ other, specify:_____ (9)

2. Date of last admission for COPD: ____*____*____ (m.d.y)

3. Number of admissions to this hospital in last year: _____

4. Length of time between admissions: ☐average < 2 weeks (1) ☐ average 2 weeks to 1month (2) ☐ average > 1month to 3 months (3) ☐ average > 3 months to 6 months (4) ☐ average > 6months (5)

5. Smoking history: ☐ ex-smoker (1) ☐ smoker(2) ☐never smoked(3)

6. Most recent Pulmonary function tests if available: FVC_____ FEV1_____ FEV1 %_____ date_____

7. Influenza vaccination in last year: ☐ yes (1) ☐ no (2)

Program Delivery data:

	Education Session 1	Education Session 2	Education Session 3
Date			
Start time			
Completion time			
Content covered			
Barriers to session			
Supports to session			
Reason for premature withdrawal (if appropriate)			

Appendix E
Program Evaluation Form

Program Evaluation Form

1. How would you rate the **amount** of information covered in the one on one sessions? Please check ☐ one.

- ☐ Less information than I needed.
- ☐ About the right amount of information.
- ☐ More information than I needed.

2. How would you rate the **length** of the one on one sessions with the nurse? Please check ☐ one.

- ☐ Too long.
- ☐ About right.
- ☐ Should have been longer.

3. How **helpful** was this program in improving your **confidence** at managing and controlling your symptoms at home?

- ☐ Very helpful.
- ☐ Somewhat helpful.
- ☐ A little helpful.
- ☐ Not helpful.

4. Would you **recommend** this educational program to other people who are admitted to hospital with complications of their lung disease?

- ☐ Would definitely recommend it.
- ☐ Would definitely **not** recommend it.

5. How **helpful** were the teaching materials used in **improving** your understanding of how to perform certain skills, for example use of inhaler device or breathing exercises.

- ☐ Very helpful
- ☐ Somewhat helpful
- ☐ A little helpful
- ☐ Not helpful

Your thoughts and comments on the education sessions.

1. What did you like **most** about the program?

2. What did you like **least** about the program?

3. Do you have any other comments you wish to share with us about your participation in this program?

Appendix F
The COPD Self-Efficacy Scale

The COPD Self-Efficacy Scale: Read each numbered item below, and determine how confident you are that you could manage breathing difficulty or avoid breathing difficulty in that situation.

Item	Use the following scale as a basis for your answer ⇒⇒⇒⇒⇒	a) Very confident. (100% of the time, I can manage)	b) Pretty confident. (75% of the time, I can manage)	c) Somewhat confident. (50% of the time, I can manage)	d) Not very confident. (25% of the time, I can manage)	e) Not at all confident. (0% of the time, I can manage)	Not applicable
1.	When I become too tired.						
2.	When there is humidity in the air.						
3.	When I go into cold weather from a warm place.						
4.	When I experience emotional stress or become upset.						
5.	When I go up stairs too fast.						
6.	When I try to deny that I have respiratory difficulties.						
7.	When I am around cigarette smoke.						
8.	When I become angry.						
9.	When I exercise or physically exert myself.						

Item	Use the following scale as a basis for your answer ⇒⇒⇒⇒⇒	a) Very confident. (100% of the time, I can manage)	b) Pretty confident. (75% of the time, I can manage)	c) Somewhat confident. (50% of the time, I can manage)	d) Not very confident. (25% of the time, I can manage)	e) Not at all confident. (0% of the time, I can manage)	Not applicable
10.	When I feel distressed about my life.						
11.	When I feel sexually inadequate or impotent.						
12.	When I am frustrated.						
13.	When I lift heavy objects.						
14.	When I begin to feel that someone is out to get me.						
15.	When I yell or scream.						
16.	When I am lying in bed.						
17.	During very hot or very cold weather.						
18.	When I laugh a lot.						
19	When I do not follow a proper diet.						
20.	When I feel helpless.						
21.	When I drink alcoholic beverages.						
22.	When I get an infection (throat,sinus,colds, the flu,etc.)						

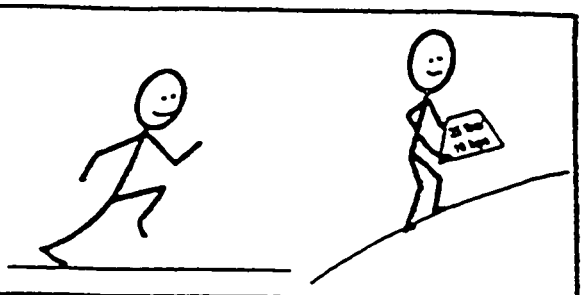
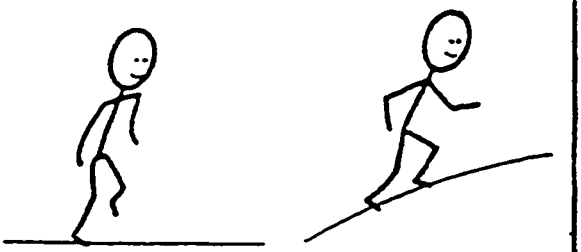
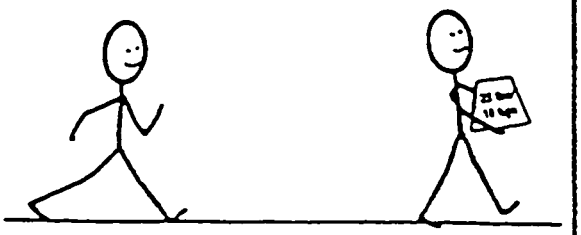
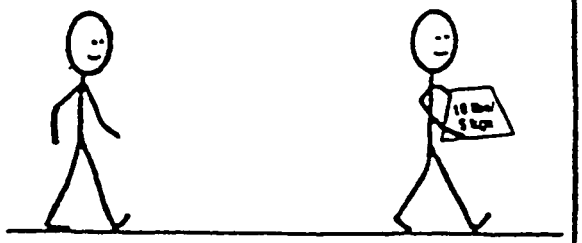
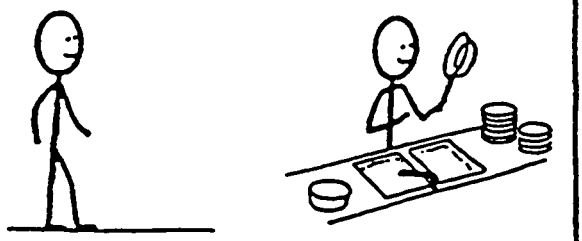
Item	Use the following scale as a basis for your answer ⇒⇒⇒⇒⇒	a) Very confident. (100% of the time, I can manage)	b) Pretty confident. (75% of the time, I can manage)	c) Somewhat confident. (50% of the time, I can manage)	d) Not very confident. (25% of the time, I can manage)	e) Not at all confident. (0% of the time, I can manage)	Not applicable
23.	When I feel detached from everyone and everything.						
24.	When I experience anxiety.						
25.	When I am around pollution.						
26.	When I overeat.						
27.	When I feel down or depressed.						
28.	When I breathe improperly.						
29.	When I exercise in a room that is poorly ventilated.						
30.	When I am afraid.						
31.	When I experience the loss of a valued object or a loved one.						
32.	When there are problems in the home.						
33.	When I feel incompetent.						
34.	When I hurry or rush around.						

The COPD Self-Efficacy Scale (Wigal, Creer, and Kotses, 1991)

Appendix G
The Dartmouth COOP Function Charts

PHYSICAL FITNESS

During the past 4 weeks . . .
What was the hardest physical activity you could do for at least 2 minutes ?

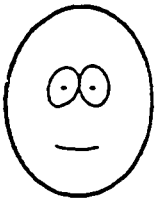
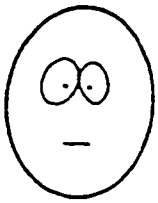
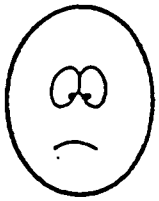
Very heavy, (for example) •Run, fast pace •Carry a heavy load upstairs or uphill (25 lbs/10 kgs)		1
Heavy, (for example) •Jog, slow pace •Climb stairs or a hill moderate pace		2
Moderate, (for example) •Walk, medium pace •Carry a heavy load level ground (25 lbs/10 kgs)		3
Light, (for example) •Walk, medium pace •Carry light load on level ground (10 lbs/5kgs)		4
Very light, (for example) •Walk, slow pace •Wash dishes		5

SUPPORT PROVIDED BY THE HENRY J. KAISER FAMILY FOUNDATION

FEELINGS

During the past 4 weeks . . .

How much have you been bothered by emotional problems such as feeling anxious, depressed, irritable or downhearted and blue ?

Not at all		1
Slightly		2
Moderately		3
Quite a bit		4
Extremely		5

DAILY ACTIVITIES

During the past 4 weeks . . .

How much difficulty have you had doing your usual activities or task, both inside and outside the house because of your physical and emotional health ?

No difficulty at all		1
A little bit of difficulty		2
Some difficulty		3
Much difficulty		4
Could not do		5

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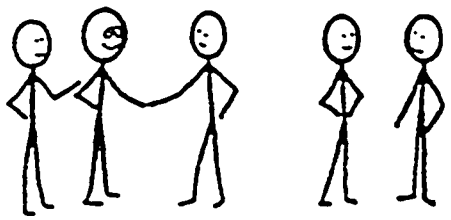
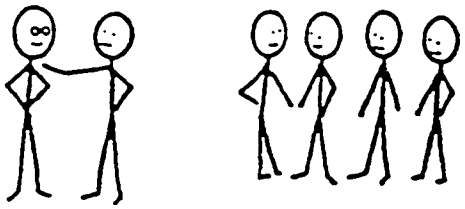
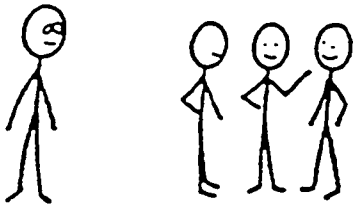
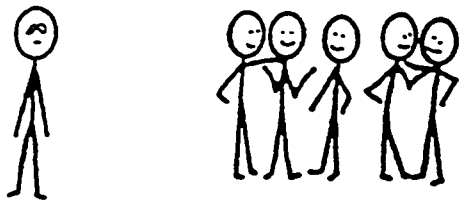
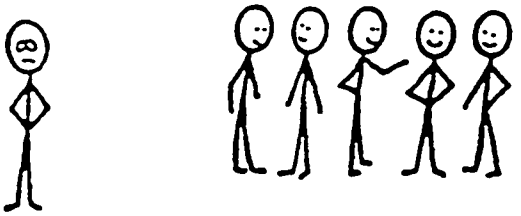
SOCIAL ACTIVITIES

During the past 4 weeks . . .

Has your physical and emotional health limited your social activities with family, friends, neighbors or groups ?

Not at all		1
Slightly		2
Moderately		3
Quite a bit		4
Extremely		5

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PAIN

During the past 4 weeks . . .
How much bodily pain have you generally had ?

No pain		1
Very mild pain		2
Mild pain		3
Moderate pain		4
Severe pain		5

CHANGE IN HEALTH

How would you rate your overall health now compared to 4 weeks ago ?

Much better	▲▲ ++	1
A little better	▲ +	2
About the same	◀▶ =	3
A little worse	▼ −	4
Much worse	▼▼ −−	5

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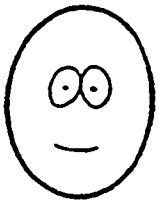
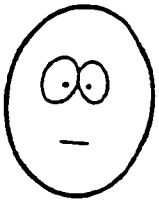
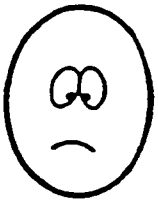
OVERALL HEALTH

During the past 4 weeks . . .
How would you rate your health in general ?

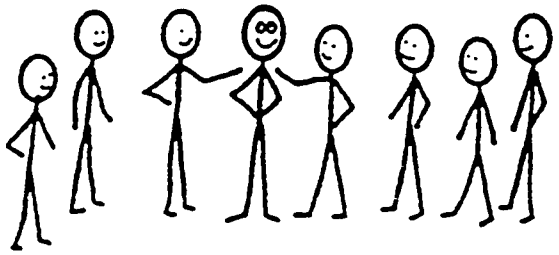
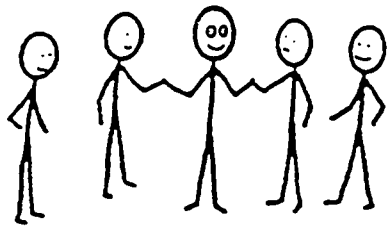
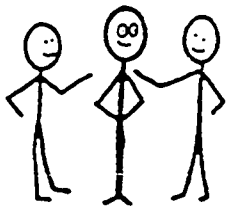
Excellent		1
Very good		2
Good		3
Fair		4
Poor		5

SOCIAL SUPPORT

During the past 4 weeks . . .

Was someone available to help you if you needed and wanted help? For example if you

- — felt very nervous, lonely, or blue
- — got sick and had to stay in bed
- — needed someone to talk to
- — needed help with daily chores
- — needed help just taking care of yourself

Yes, as much as I wanted		1
Yes, quite a bit		2
Yes, some		3
Yes, a little		4
No, not at all		5

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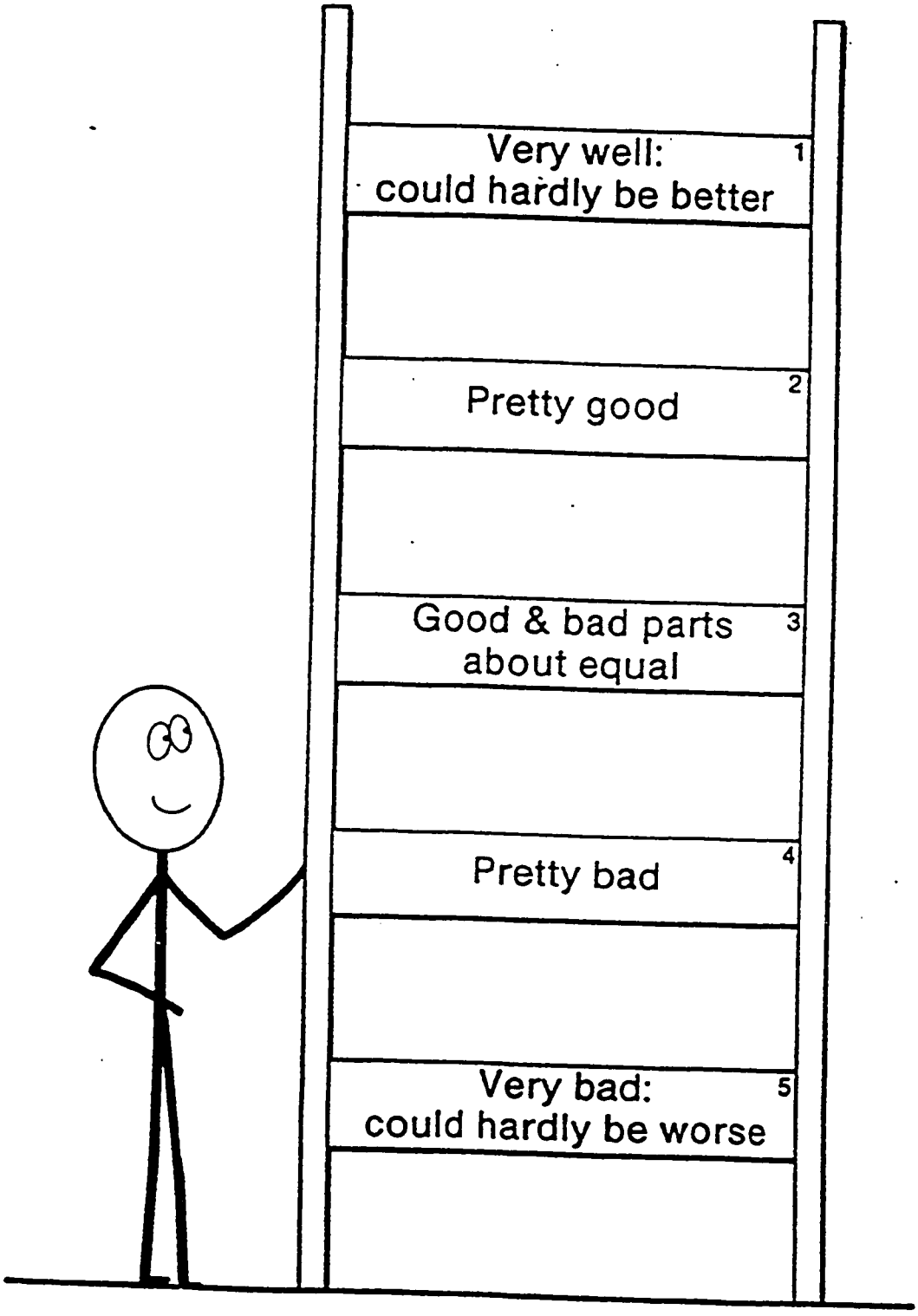
QUALITY OF LIFE

How have things been going for you during the past 4 weeks?



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Appendix H
Patient Consent Form

Patient Consent

Study:

A Feasibility Study: Providing a Chronic Obstructive Pulmonary Disease Inpatient Education Strategy.

Principal Investigator: Janice Bissonnette RN, BScN, CCCN(C), MScN (candidate)
Co-Investigators:
Dr. J. Logan RN, PhD, Associate Professor, Faculty of Nursing, University of Ottawa.
Barb Davies RN, PhD (candidate), Associate Professor, Faculty of Nursing, University of Ottawa.
Dr. I. Graham PhD, Clinical Researcher, CEU, Loeb Research Institute, Ottawa Hospital

Purpose:

The purpose of this study is to determine the feasibility of providing and evaluating an educational program to patients admitted with lung disease such as yours, Chronic Obstructive Pulmonary Disease. The education program will attempt to improve your confidence with self-management of your disease. The knowledge gained from this study will help health professionals develop and provide educational programs that will support and guide future patients admitted with this lung disease. As a person who is familiar with the effect your lung disease has on your life, we are asking for your participation in this education program. Your opinion on how the program is presented will help us to improve it.

Procedures:

Your participation involves:

- completion of questionnaires on your confidence at managing your symptoms, and overall health or well-being. This may take about 15 minutes.
- completion of a check list which tells us which areas of concern you would like to know more about. This may take about 5 minutes.
- participation in three, 45 minute one on one sessions with a nurse who will provide information and guidance to help you develop some ways to manage your lung disease.
- completion of a questionnaire to comment on the usefulness of this education program to you. This may take about 5 minutes.
- four weeks after discharge, the nurse will call you at home to answer any questions about your management and repeat the questionnaires on your confidence and overall health. This conversation may last about 20 minutes.

Only the researchers will see your questionnaire and all information will be kept in a locked filing cabinet when not in the researcher's possession.

Risks and Benefits:

There are no known risks of participating in this study. Shortness of breath may be experienced during self-care activities if practiced during the session. Part of the purpose of the sessions is to help you better manage these episodes. The nurse will provide constant supervision of activities during these activities and will be familiar with your particular limits prior to the sessions. If you find the sessions upsetting, arrangements can be made for you to see your physician, nurse or family member, if you wish. The possible benefit of the study is to know that your participation may some day help others who wish to improve self-management of their lung disease. You may learn more about your lung disease and feel more confident with self-management strategies helpful in controlling symptoms.

Rights of the Participant:

You are not obliged to participate in the study and can withdraw from the study at any time without any change in the care you receive. Participation in this education program is in addition to any support and information you will receive from the physicians, nurses, physiotherapists, and respiratory therapists in the hospital. If you choose not to participate in this study you will receive support and information in the usual fashion. The information collected during this study will be kept confidential. A code number will be used to identify the information so your name will not appear on any documents. If the results of the study are published, no personal identifying data will appear in the published work.

Consent:

I have read the above information and understand this consent form. I have also had the opportunity to ask questions and have them answered to my satisfaction. I agree to participate in this study.

Name: _____

Date: _____

Witness: _____

You will receive a copy of this consent. If you have any questions about this study, you can telephone the nurse investigator or her supervisor.

Janice Bissonnette RN, Master of Science in Nursing Candidate,
University of Ottawa
Telephone: 443-3910

or

Dr. Jo Logan, RN, PhD, Associate Professor, Faculty of Nursing,
University of Ottawa
Telephone: 562-5800 extension 8415

(Valid until November, 1999)

Appendix I
Permission to Use CSES

From: "Joan K. Wigal" <wigal@oak.cats.ohiou.edu>
To: WPDOMAIN.OCH-POST(jbissonnette)
Date: 4/17/98 1:08pm
Subject: COPD Scale

Hello Janice,

You definitely have my permission to use the COPD Self-Efficacy Scale; good luck in your research!

Joan Wigal

Joan K. Wigal, Ph.D.
Manager, Customer Support Services
Computer Services
Ohio University
Athens, OH 45701
(740) 593-1023
WIGAL@OHIOU.EDU

Appendix J
Permission to use Dartmouth COOP Charts

The COOP Project

A Primary Care Research Network

April 16, 1998

Janice Bissonette
Ottawa Civic Hospital
1st Floor, Patterson Education Center
1053 Carling Avenue
Ottawa Ontario CANADA K1Y 4EN

Dear Janice Bissonette:

Thank you for inquiring about the Dartmouth COOP Project Functional Assessment Charts. Enclosed please find the Charts and an information packet as well as a Chart Request Information Form. It would be helpful to us if you would complete and return this form. We continue to improve the Charts based on feedback from people using them in clinical and research settings. Your permission to use the COOP charts specifically excludes the right to distribute, reproduce or share the Charts in any form for commercial purposes or sale. Permission is granted to use the COOP Charts for research only.

The reliability and validity of the Charts has been extensively tested and several important manuscripts summarizing the results are enclosed in this packet.

The Charts are meant to be a measure that can be used to screen or monitor function and health-related quality of life. They are a tool that may be self- or clinically-administered. Instruction sheets for both modes of administration are provided. You will see that the Charts are very user-friendly and most patients can easily complete them without assistance.

To defray administrative and processing costs we do ask for $20.00. Please make a check payable to the *Dartmouth COOP Project*. If you have any questions, please do not hesitate to contact me. Thank you for your interest and I look forward to talking further with you.

Sincerely,

Deborah J. Johnson

DEBORAH J. JOHNSON
Executive Director

Enclosures

In Affiliation with The Department of Community and Family Medicine
Dartmouth Medical School, 7265 Butler Building, Hanover, NH 03755-3862
Office: (603) 650-1220 Fax: (603) 650-1331

Appendix K
Responses to Items on Dartmouth Functional Health Charts

Appendix K

Responses to Items on Dartmouth Functional Health Charts

	Frequency	Of	Response	N=20	
Scale Chart	**1 Excellent**	**2**	**3**	**4**	**5 Poor**
Physical Fitness	Very heavy	Heavy	Moderate	Light	Very light
Pre	0	0	2	6	12
Post	0	0	2	9	9
Feelings	Not at all bothered	Slightly	Moderately	Quite a bit	Extremely
Pre	4	5	5	1	5
Post	8	4	3	3	2
Daily Activities	No difficulty	A little difficulty	Some difficulty	Much difficulty	Could not do
Pre	3	3	5	6	3
Post	7	3	4	3	3
Social Activities	Not at all Limited	Slightly	Moderately	Quite a bit	Extremely
Pre	4	3	5	6	2
Post	8	4	2	3	3
Pain	No pain	Very mild pain	Mild pain	Moderate pain	Severe pain
Pre	6	4	3	4	3
Post	12	2	5	0	1
Change in Health	Much better	A little better	About the same	A little worse	Much worse
Pre	1	5	4	7	3
Post	10	9	0	0	1
Overall Health	Excellent	Very good	Good	Fair	Poor
Pre*	1	3	3	5	7
Post	0	6	6	6	2
Social Support	Yes, all I wanted	Yes, quite a bit	Yes, some	Yes, a little	No, not at all
Pre	10	6	2	2	0
Post	14	3	3	0	0
Quality of Life	Very well	Pretty good	Good and bad parts	Pretty bad	Very bad
Pre	0	7	10	2	1
Post	4	9	5	1	1

* One response missing.