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Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Nursing

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ABSTRACT

Background: Chronic obstructive pulmonary disease (COPD) affects over 2.5 million individuals Canada wide and is the leading cause of hospitalization in Canada among chronic diseases with an 18% hospital readmission rate. The high cost of emergency room visits, hospitalizations, and readmissions for COPD tells a story of need; the need for education of patients. Collaborative self-management (CSM) is a process whereby the individual patient and nurse work together to improve health. The integration of CSM in COPD care has shown evidence for reduced exacerbations, hospitalizations and readmissions. Little is known about the level of knowledge and self-efficacy of hospital-based nurses to promote and facilitate CSM during hospitalization of COPD patients.

Purpose: The aim of this study was to determine the effect of an educational program for nurses on their knowledge and self-efficacy for preparing patients for discharge, patients knowledge of COPD and readiness for discharge and the COPD 30-day rate of readmission to hospital. The program integrated Bandura's social cognitive theory and the CSM approach to COPD care.

Method: A three-phase, two group, pretest-post-test, quasi-experimental, research study was conducted. In Phase I, hospital-based nurse participants working on two Medicine units were assigned to either the intervention group who attended an interventional education program or the control group who viewed a videotape of COPD patient experiences. In Phase II, patients admitted to hospital were invited to participate by completing study questionnaires. In Phase III, the rate of 30-day readmission to hospital was obtained from decision support in the study site.

Results: Results of this study showed that nurses who attended the education intervention reported higher COPD knowledge scores and higher self-efficacy scores than control group nurses. Patients admitted to the intervention unit had higher knowledge of COPD and readiness for discharge home when compared to patients admitted to the control unit; however, no reduction in the COPD 30-day readmission rate was observed.

Conclusions: Findings suggest that providing the hospital-based nurse with education related to COPD and framed by the social cognitive theory increases nurse knowledge and self-efficacy for providing discharge care to patients with COPD. Based on the concept of CSM the nurse may be the influencing factor for changing behaviour of COPD patients and provide nurses, hospital administration and policy makers with evidence to support ongoing development of CSM programs within this setting.

Keywords: collaborative self-management, self-efficacy, COPD, hospital, education, nurse, readmission

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CHAPTER ONE: BACKGROUND AND SIGNIFICANCE

Background

Chronic obstructive pulmonary disease (COPD) is a complex, preventable, and treatable respiratory illness that causes progressive symptoms and significant functional decline for individuals (Jonkman et al., 2016; O'Donnell et al., 2008). There is no cure for COPD as the damage to the lungs is irreversible (Bryan & Navaneelan, 2015). COPD is primarily caused by long term exposure to airway irritants most often from cigarette smoking (Bryan & Navaneelan, 2015; O'Donnell et al., 2008). Reported COPD prevalence data varies due to under diagnosis and under recognition; however, the prevalence of COPD in Canada is estimated to be 12 percent and is expected to increase as a result of the aging population and smoking (Evans, Chen, Camp, Bowie, & McRae, 2014). Although the Centre for Disease Control and Prevention (2018) reported that cigarette smoking among American adults is the lowest ever recorded, and Statistics Canada also report a decline in the smoking rate (Janz, 2012), this has not been reflected in the decline in death among individuals with COPD (Bryan & Navaneelan, 2015). In 2011 COPD was responsible for 4.4% of all deaths in Canada (Bryan & Navaneelan, 2015). Currently, COPD is the 3rd leading cause of death in the United States and the 4th leading cause of death in Canada and in the world (Crighton, Ragette, Luo, To, & Gershon, 2015). It is projected that COPD will be the third leading cause of death in Canada by 2020 (Dang-Tan, Ismaila, Zhang, Zarotsky, & Bernauer, 2015).

Currently 2.5 million Canadians are known to have COPD (Gershon, Guan, Victor, Goldstein, & To, 2013) and they are estimated to make use of one fifth to one third of all health services (Crighton et al., 2015). Although COPD is considered an

Ambulatory Care Sensitive Condition (ACSC), meaning that it could be managed in primary care, it holds the highest per capita age-standardized hospitalization rate (Canadian Institute for Health Information (CIHI, 2008). Chronic obstructive pulmonary disease is currently the leading cause of hospitalization and readmission in Canada (Benady, 2010). The issue of unplanned hospital readmissions has been gaining the attention of researchers and policy makers as the numbers of patients returning to hospital within 30 days of discharge have increased (CIHI, 2008). The fact that 18% of patients of patients discharged from hospital after an index COPD admission are readmitted within 30 days of discharge adds a significant burden to the health care system and accounts for a total cost of 1.5 billion dollars annually (CIHI, 2012). However, significant gaps in current COPD inpatient care impact length of stay and are associated with adverse events (Choi, Day, & Etchells, 2004). Although, "to date no intervention has been shown to be effective" (Feemster & Au, 2014, p. 636), strategies to mitigate the issue of readmission to hospital have been proposed to include improving discharge planning and discharge care during hospitalization (Feemster & Au, 2014; Health Quality Ontario (HQO), 2015; Monette, 2012). Health Quality Ontario and the Ministry of Health and Long-Term Care (MOHLTC) (2015) proposed that identifying key transition points along the hospital continuum of care while providing safe quality care could produce a reduction in the hospital COPD 30-day readmission rate.

Hospitals are in the business of providing acute care but the business model in hospitals can at times be confusing as it may seem there are two business models working simultaneously, a diagnostic model and a value-added process model (Christensen, Grossman, & Hwang, 2009). The diagnostic model provides patients with knowledge of the cause of the problem, and the process model organizes care to be effective, affordable,

convenient or value-added for both the patient and the institution (Christensen et al., 2009). In the example of an exacerbation of COPD the value-added process model benefits patients and caregivers by providing standardized education to patients on discharge essentially integrating a collaborative model of care through the nurse-client therapeutic relationship (College of Nurses of Ontario (CNO), 2006). With this example, it is proposed that the standardization of hospital discharge information could give nurses the ability to make improvements in care or respond to patient care issues effectively providing consistency in care and the patient experience (Graban, 2016; Health Quality Ontario, 2013). Reducing costs associated with hospital-based COPD health care is a priority (Feemster & Au, 2014); however, the profound economic impact of COPD on healthcare resources is only a fraction of the COPD story as patients who are readmitted have been shown to have a higher mortality rate than those that do not (Chan et al., 2011) and the risk of mortality remains high even post discharge (Ping, Lee, & Lim, 2005).

Chronic Obstructive Pulmonary Disease

The Global Initiative for Chronic Obstructive Lung Disease (GOLD; 2017) defines COPD as a "common, prevalent and treatable disease characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases" (p. 6). The most common and most debilitating symptom in COPD is dyspnea (O`Donnell et al., 2008; Steindal et al., 2018), which increases with disease progression (Bentsen, Langeland & Holm, 2012). The complexity of managing COPD is related to the heterogeneity of patient presentations both clinically and functionally (Kruis et al., 2013). Managing stable COPD is challenged by the presence of co-morbid illness, medical uncertainty, patient anxiety, social context, and progressive disease trajectory

(Korpershoek, Verboort, Nijssen, Trappenburg, & Schuurmans, 2016; Risor et al., 2013). Barriers to self-care of stable COPD patients include, increased anxiety (Korpershoek et al., 2016), fatigue, lack of knowledge and depression (Cicutto & Brooks, 2006), a lack of information related to non-drug components such as the need for regular exercise, smoking cessation and monitoring for changes in symptoms (Hyland, Jones & Hanney, 2006), advancing age (Brandt, 2013; Falk et al., 2013) and structural issues related to transportation, finances, or communication (Jerant, von Friederichs-Fitzwater, & Moore, 2005).

The burden of COPD is also an issue, as the disease is frequently associated with muscle weakness, lung cancer, cachexia, heart disease and muscle wasting (Decramer, Janssens, & Miravitles, 2012; GOLD, 2017), osteoporosis and an increased fall risk with potential for hip and vertebral fractures (Janssens et al., 2013), and pain-related interference in activity (Dang-Tan et al., 2015). Environmental and behavioural issues such as smoking, and physical inactivity also limit function and quality of life (Decramer et al., 2012; GOLD, 2017. A vicious cycle is developed as reduced quality of life impacts function and is associated with increasing the frequency of exacerbations, while increased exacerbations accelerate the decline of lung function and in turn increases the rate of mortality (Marcos et al., 2017; Seemungal et al., 1998).

Exacerbations of COPD

Acute exacerbations of COPD or unstable COPD are defined as "a sustained worsening of dyspnea, cough or sputum production leading to an increase in the use of maintenance medications and / or supplementation with additional medication" (O'Donnell et al., 2008, p. 6). Exacerbations of COPD reduce physical activity, cause functional impairment, reduce quality of life, and increase the rate of lung function

decline and the risk of death (Gershon et al., 2013; Hurst et al., 2010; Lenferink et al., 2015; O'Donnell et al., 2008). Exacerbations become more common with advanced disease and can be categorized as: mild, requiring primary care management; moderate, requiring emergency department assessment or admission; and severe, requiring intensive care unit management (HQO & MOHLTC, 2013).

Bailey (2001) in her qualitative review of the experience of exacerbation reported that patients described the experience of COPD exacerbation as being, "in the shadow of death" (p. 325). Given the increased rate of decline and risk of death associated with COPD exacerbations (MacIntyre & Huang, 2008), optimal care would be to prevent and manage exacerbations, which therefore is key to self-managed care. Kessler et al. (2006) examined patients with COPD to determine their level of understanding of an exacerbation and identified that although exacerbations severely impacted individuals, overall individuals poorly understood the terminology. Patients want knowledge on how to survive an exacerbation (Carlson, Ivnik, Dierkhising, O'Bryne, & Vickers, 2006; Scott, Baltzar, Dajczman, & Wolkove, 2011). This is due in part to the dyspnea and fear that provide incentive to adopt self-management strategies and integration of the interventions needed to self-manage (Cicutto & Brooks, 2006; Cicutto, Brooks, & Henderson, 2004). Determining goals of care for patients with COPD may actually stimulate behavioural change and improve clinical outcomes (Panos, Krywkowski-Mohn, Sherman, & Lach, 2013). The goal may not be to improve health per se, such as increasing lung function or reducing the need for oxygen, but actually to prevent illness, hospitalization, mechanical ventilation or death. Therefore, involvement in the process of collaborative self-management (CSM) enhances the confidence of the patient, promotes the individual to manage their care in concert with health care professionals, is grounded equally by

theoretical and practical concepts such as, principles of partnership, behavioural integration and knowledge transfer and is also focused on the reduction of exacerbations and risk (Bourbeau et al., 2013; Young et al., 2015).

Collaborative Self-Management

The treatment of COPD relies heavily on self-management or self-care (Blackstock, ZuWallack, Nici, & Lareau, 2016; Bourbeau & Saad, 2012; Jolly et al., 2016). Self-management consists of interventions ranging from providing written information to participation in a comprehensive program with support, exercise and exacerbation management (Effing et al., 2016). This heterogeneity within the literature of self-management prompted the development of a consensus definition of a self-management intervention. Using a Delphi technique an international panel of COPD experts defined a self-management intervention as, "structured but personalized and often multi-component, with goals of motivating, engaging and supporting the patients to positively adapt their health behaviour(s) and develop skills to better manage their disease" (Effing et al., 2016, p. 50).

The definition of self-management refers to skilled behaviours and a variety of specific tasks that individuals do each day to manage their condition (Disler, Gallagher, & Davidson, 2012; Kasikci & Alberto, 2006). Self-management also refers to the collaboration between the individual and the health care team with a shared goal of promoting self-efficacy (Blackstock et al., 2016). Self-management is defined as "an individual's ability to manage symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition" (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002, p. 178).

Collaborative self-management has been defined as a coordinated health care communication and intervention system (Rice, Bourbeau, MacDonald, & Wilt, 2014**)**. For CSM to be effective there must be a level of intense engagement on the part of the individual and a process of communication; the individual's level of engagement would be synonymous with their level of responsibility and the process of communication would primarily involve health care professionals (Bourbeau et al., 2003). Successful self-management has been shown to require patient / provider partnership resulting in the patient taking some form of action (Rice et al., 2014). Participation in the process of CSM empowers individuals, ensures that the interventions and care requirements are tailored to the individual, and produces an effective relationship that is mutually beneficial for both the health care provider and the patient (Dowling, Murphy, Cooney, & Casey, 2011; Estes, 2008; Fromer, 2011). Targeting behaviour change should be the initial focus of any self-management program (Bourbeau & Saad, 2012) as the behaviour of the patient is a critical part of the self-management process (Benzo, Kirsch, Dulohery, & Abascal-Bolado, 2016). The objective of CSM is for the individual to manage their chronic illness, every day (Rice et al., 2014). The purpose of a program of self-management is to teach skills and help individuals gain confidence with their chronic illness management (Bourbeau & Nault, 2007; Kaptein et al., 2008; Lawn, McMillan, & Pulvirenti, 2011; Lorig, & Holman, 2003). Skills in self-management, such as problem solving, utilization of resources and decision making contribute to improved management of symptoms and enhanced self-efficacy and are associated with reduced hospitalization, and reduced healthcare costs (Bourbeau et al., 2006; Kaptein, Fischer, & Scharloo, 2014; Lenferink et al., 2015). The cornerstone of self-management of COPD is the ability to recognize and appropriately treat an exacerbation (Blackstock et al., 2016; Korpershoek et al., 2016).

Collaborative self-management is a very comprehensive and dynamic process (Estes, 2008). The term collaborative self-management has been suggested in the literature because it "embodies the concept of patient decision making with the assistance of the health care provider" (Make, 1994, p. 577) and can translate to preserving patient autonomy or the right to choose (Monninkhof et al., 2004). The potential measurable outcomes of a COPD CSM program of health care include reduced mortality, morbidity, respiratory symptoms, and functional changes, and increased quality of life, and effective utilization of resources and health-related behaviours (Make, 1994). In a practical sense, there are many gaps in collaborative self-management of COPD including, lack of information, support, and access, and lack of the ability to recognize symptoms, or underestimation of the meaning of the changes in symptoms or implications to function (Lundell et al., 2017). Focusing on how to link health care providers with patients and make COPD collaborative self-management a value-added component of health care should be a priority for stakeholders. Transitioning from a patient education model of information delivery to a model based on a collaborative connection between the patient and the nurse could be the influencing factor for behavioural change (Blackstock et al., 2016).

The role of the nurse. The role of the acute care, bedside nurse is paramount as the issue of patients learning to self-manage is context driven and nurses are uniquely positioned to significantly support patients during hospitalization and with discharge planning (Nosbusch, Weiss, & Bobay, 2011). A review by Nosbusch et al. (2011) found that discharge planning lacked structure and standardization of process resulting in random and uncoordinated care. The researchers noted that factors such as role confusion, insufficient knowledge, time or experience may play a significant part in the

lack of coordination (Nosbusch et al., 2011). Findings of a study examining the view of the nurse on patient self-management (Been-Dahmen, Dwarswaard, Hazes, van Staa, & Ista, 2015) found that nurses approached self-management from three views: medical adherence, monitoring symptoms and integrating illness into daily life. The researchers noted that the level of support patients received from the nurse depended on which of the three views that the nurse held resulting in a lack of consistency in psychosocial support.

An international survey of hospital-based nurses by Aiken et al. (2001) established that delivery of trays and cleaning rooms occurred more frequently by nurses than did teaching patients. At the same time, it has also been suggested that comprehensive care including medication and self-management should be the gold standard for patients with COPD in order to reduce exacerbations and need for hospitalization (Benady, 2010; Khdour, Hawwa, Kidney, Smyth, & McElnay, 2009). Ideally, this education would be provided to the patient by the bedside, hospital-based nurse (CNO, 2006). Of the hospital-based nurses in the U.S. and Canada surveyed by Nosbusch et al. (2011), only one in three nurses were confident that patients were prepared to manage their own care post discharge, suggesting a critical flaw in the design of care and support of nurses. Nurses' confidence to deliver education specific to patients hospitalized with COPD is not known, as such there remains a need to prepare nurses to support patients health promotion practices (Laschinger, McWilliam, & Weston, 1999) and to assess the influence of education on nurse self-efficacy for providing discharge care. Supporting the bedside nurse with education in a format that increases nurse self-efficacy for teaching patients and standardizing the process of discharge planning by nurses at the bedside, based on components of collaborative self-management, could provide the necessary

structure to facilitate improvements in discharge care and may result in nurse, patient, organizational and system level benefits.

"Self-efficacy, or self-confidence in performing tasks associated with a particular behaviour, is important because higher levels of self-efficacy are associated with greater involvement in an activity" (Spence-Laschinger, & Tresolini, 1999, p. 409). As such, personal self-efficacy serves as both a guide and a motivator and, "is rooted in the core belief that one has the power to produce desired effects; otherwise one has little incentive to act or to persevere in the face of difficulties" (Bandura & Locke, 2003, p. 87).

Theoretical Framework

The theoretical foundation for this study is the social cognitive theory (SCT) (Bandura, 1989). Bandura, Adams, and Beyer (1977) focused on the ability of humans to be self-directed and regulate behaviour which is referred to as human agency. One of the main tenets of SCT is human agency or agentic perspective, which is a central construct of SCT (Bandura, 2012). Self-efficacy aligns human motivation with expectations of outcome (Zimmerman, 2000). Human motivation is a cognitive process, as such change is mediated by a cognitive process which plays a role in acquiring and retaining new patterns of behaviour (Bandura, 1977). Perceived self-efficacy can directly influence participation in activities both through expectation of success and perseverance in coping once an activity has been initiated (Bandura et al., 1977). According to Bandura if one believes one can, then one can (Hackett & Betz, 1981); however, the issue is not whether one can do certain activities occasionally but whether one has the efficacy to get oneself to do them regularly in the face of different types of impediments (Bandura, 2012, p. 16). An efficacy expectation is acquired through exploration and processing of four sources of efficacy: emotion and physiological arousal; verbal persuasion; vicarious experiences or

symbolic role modeling; and performance accomplishments or mastery experiences (Bandura, 2012). Stressful situations can elicit emotional arousal which impacts perceived self-efficacy (Bandura, & Adams, 1977). Individuals are more likely to perceive success when they are not tense or emotionally agitated (Bandura, 1977). Verbal persuasion can create an, "enduring sense of personal efficacy" (Bandura, 1977, p. 198). If a person is socially persuaded that they possess capabilities to master challenging situations, and provided with aids for action, they are more likely to generate greater effort to succeed (Bandura et al., 1977). Vicarious experience is obtained through observation of another, who is perceived as similar, attempting a particular behaviour (Bandura, 2012). "Modeling and persuasive modes of influence are especially informative because they raise and lower self-efficacy independently of performance" (Bandura, 2012, p. 11). Mastery experiences, provide opportunity to increase skills and belief in self and is the strongest predictor of self-efficacy as past success can raise self-efficacy while being unsuccessful tends to lower self-efficacy (Bandura, 2012).

Perceived self-efficacy is the belief in one's ability to accomplish a particular task and plays a role in human self-development, adaptation, and change (Bandura, 2012). The level of belief in one's own capability to perform a task also impacts the amount of effort that will be put forward into attempting, or completing the task (Bandura et al., 1977). Although, it can be posited that performing one task well could translate into increased participation in future tasks, the SCT is based on measuring capability to perform one task at one time; it is not interested in generalities. This is the critical linkage between SCT and the role of the hospital-based nurse for participating in a standardized process of discharge care for a specific patient population.

Efficacy expectations differ in level, strength and generality (Bandura, 1977). The level of difficulty of a task may be either small or great and the strength of the efficacy expectation will predict either perseverance through challenges or even continuing at all. The generality of the efficacy expectation refers to transferability of the efficacy expectation from an individual task specific to an overall population such as patients with COPD (Bandura, 1977). These three properties of level, strength and generality can be measured when the self-efficacy questionnaire items are specific, have varying levels of difficulty and are captured through a scale (Zimmerman, 2000). A valid measure of self-efficacy has predictive ability for familiar and precise tasks and focuses exclusively on expectations of an individual to perform the specific task (Zimmerman, 2000). An individual with a high level of self-efficacy will attempt even a difficult task, while an individual with low self-efficacy will avoid a task (Bandura, 1977).

Albert Bandura (1989) posited that individuals exercise control through a self-system which includes the ability to learn from others, symbolize, regulate behaviour, plan alternatives and engage in self-reflection. In this system, it is the self-reflection capacity that is most "uniquely human" and from which people evaluate and change their behaviour (Pajares, 1996, p. 4). The information used to gauge a sense of efficacy is processed and interpreted by the individual, which plays a significant role in the final self-efficacy determination (Bandura, 2012).

Summary

The challenge for hospital-based nurses to integrate preparation of the patient for discharge into the provision of care is two-fold. First, having the required knowledge of COPD care based on CSM to prepare patients hospitalized with COPD for discharge and secondly, structuring the information for the patient with the goal of facilitating a change

in patient behaviour after discharge from hospital. This discharge education when based on the components of CSM frames the nurse-client patient encounter and engages the patient and practitioner to collaboratively manage COPD.

If patients are to be collaborative managers of their own health and take a substantial responsibility for monitoring illness, and responding appropriately to changes, it seems prudent to build a program founded on evidence-informed COPD-specific knowledge and provide that program to nurses who can translate the evidence into clinical practice. The hospital setting can be unfamiliar and stressful (Whitehead, 2001). Partnering with patients hospitalized with COPD in the development of a program of CSM demonstrates integration of the patient's perceived needs and may reduce the stress of the hospitalized patient as well as facilitate the adoption of the concepts by the patient.

This thesis builds and tests an integrated collaborative self-management model of care providing patients hospitalized with COPD the information they need to be skilled collaborative care managers which places the needs of the patient in the beginning, middle and end of the development of an individualized plan of care. This study proposes a focused approach translating information developed by HQO and MOH LTC (2015) into a program of education specifically designed for hospital-based nurses and their patients with COPD. Redesigning self-management education to include the patient's perspective and engaging the hospital nurse may provide the necessary change that can impact the cycle of exacerbation, admission and readmission for many patients (Blackstock et al., 2016).

CHAPTER TWO: REVIEW OF THE LITERATURE

Chapter Two presents the literature supporting the development of a program of education for hospital-based nurses related specifically to components of collaborative self-management in patients with COPD in two parts. Part A includes a narrative of the literature examining components of collaborative self-management in patients with COPD as well as a discussion of the theoretical foundation for the thesis. Bandura's social cognitive theory (Bandura, 1977) is an important foundation for the adoption of behaviours as it aligns with the agentic perspective and human motivation. In Part B, a scoping review is provided that synthesizes the literature related to the structure and characteristics of programs for patients currently hospitalized with COPD with attention to the application of collaborative management strategies, the role of the hospital-based nurse and the challenges for both nurses and patients with COPD as they apply to the hospital setting.

Part A: Collaborative Self-Management and Theoretical Framework

Components of Collaborative Self-Management for COPD

Chronic obstructive pulmonary disease is an incurable respiratory disorder (Make, 2003). COPD is disabling and characterized by repetitive exacerbations, which result in higher use of health resources (Bourbeau & Saad, 2012; Gershon et al., 2013). The Global Initiative for Chronic Obstructive Lung Disease (GOLD; 2017) guidelines for COPD report that COPD is now the third leading cause of death in the United States and the fourth leading cause of death globally. Management of COPD places a great economic burden on the provision of healthcare worldwide (Gershon et al., 2013; Zwerink et al., 2014). Collaborative self-management is thought to be the ideal management strategy for COPD (Bourbeau et al., 2003; Make, 1994); however, significant gaps exist within the literature that impacts the ability of the evidence to

translate to clinical practice. A systematic review of the literature of self-management in patients with COPD examined whether interventions in self-management led to improved health outcomes and reduced healthcare utilisation (Zwerink et al., 2014). Initially no changes were noted for COPD patients managed within programs integrating CSM (Effing et al., 2007); however, in 2014 programs did show promise (Zwerink et al., 2014). When describing programs of self-management for patients with COPD the significant variation in program content and characteristics, duration, staff training, coverage, delivery and timing within the literature presents multiple challenges to providers when attempting to translate evidence to practice (Jonsdottir et al., 2015; Jordan et al., 2015).

The GOLD criteria identifies four components of self-management in COPD including, i) assessment, diagnosis and ongoing monitoring; ii) reduce risk factors; iii) managing stable COPD; and iv) managing exacerbations of COPD (Rabe et al., 2007). These differ slightly from the five key components of collaborative self-management which include: the development of an individual patient / practitioner partnership, therapeutic goals shared mutually by the individual patient / practitioner, instruction of the individual patient by the practitioner**,** monitoring of the collaborative self-management plan, and willingness for each of the stakeholders to participate with involvement of the family if necessary (Make, 1994). Stakeholders, for example would include patients hospitalized with COPD, physicians, nurses and health care providers working within the hospital setting, the community that the hospital serves, policy makers, and funding bodies (Graban, 2016). Although, the focus is on the hospital-based nurse for the provision of discharge information for patients with COPD, a chronic illness, the literature on the application of components of CSM during hospitalization and on the role of the nurse is scant and inconsistent, perhaps due in part, because the hospital setting is focused primarily on acute care.

Individual patient/practitioner partnership. Partnership describes the relationship between the healthcare provider and patient and acknowledges the role of the patient in making medical decisions and planning care (Boubeau & Bartlett, 2007). Although patients with COPD need to self-manage their chronic, complex respiratory disease, this can be accomplished in partnership with health care providers. An individualized, severity-based management plan can be developed in partnership with healthcare providers which can include elements of medication use, awareness of resources, recognition of exacerbation symptoms and issues related to end-of-life care (O'Donnell et al., 2008). This partnership between the health care provider and the individual patient requires counselling, education, assessment and acting as a liaison at times between practitioners (Bunker et al., 2012). Collaborative self-management of chronic illness requires a sharing of power; however, this sharing of control between practitioner and patient requires patients to have a high level of responsibility (Mazzuca, 1982). Collaboratively, the stakeholders, patient and practitioner, are seen as experts, as such, the patient is seen to be accepting of responsibility for care as an equal participant (Bodenheimer, Lorig, Holman, & Grumback, 2002). Shared control between practitioner and patient focuses on a shared vision of health and thus provides the foundation for shared management or partnership to promote control and freedom to direct care (Dowling et al., 2011). Lawn and Schoo (2010) in their examination of the literature on self-management programs concluded that self-management programs fail due to lack of commitment, knowledge, skills and continuity. The researchers concluded that the benefits of self-management programs are communicated when the staff partner with the patient while integrating the views and skill level of the patients. Partnership recognizes the active participation of the patient in determining that the management plan meets their

needs and confirms the role of the patient as an active participant (Bourbeau & Bartlett, 2007). Ideally, the outcomes would be a marriage of expertise, shared knowledge and respect.

Therapeutic goals shared mutually. The CSM plan is constructed as a tool for the patient to implement, adopt and integrate and is supported by ongoing monitoring and partnership with practitioners. Therapeutic goals include slowing the rate of lung function decline, reducing the severity and frequency of exacerbations, prompt treatment of exacerbations, improving dyspnea, health status, and function and finally reducing mortality (O'Donnell et al., 2008). Therefore, the goals of therapy would be to at least maintain current function and if able, to impact the path of this chronic disease to support improved quality of life and function. Goal attainment would be possible through patients' adherence to therapy, and recognition of changes in behaviour, which as the wording suggests reflects the perception of a patient's active role in self-management (Bourbeau & Bartlett, 2007). Such goals could also potentially impact the economics of health care delivery. Hospital goals and patient goals would appear to be similar with patients acting in partnership with primary care providers to improve overall health and reduce risks for exacerbations, ultimately reducing the need for urgent, acute assessment in hospital, admission to hospital or readmission.

Instruction. Individuals with COPD may be unaware that they have the disease because they have not been diagnosed (Boot et al., 2005) or know little about their disease (Robinson, 2010). This lack of knowledge or awareness may be related to the gradual onset and slow progress of the disease (Robinson, 2010), confusion with the aging process (Messenger, 2012; Robinson, 2010), the fact that the disease affects an

older age demographic (Jonsdottir et al., 2015) or the effects of hypoxia which may accompany the disease (Messenger, 2012).

Inherent in the care patients provide for themselves is an understanding of the information required to change from the construct of reactive care to proactive care (Glasgow et al., 2005). This involves challenges for the individual, as the term self-care places emphasis on the 'self' in the care paradigm. This can be understood in multiple ways, including, placing the 'self' at the centre of care, as in patient-centered care and placing full responsibility on the 'self' for assessment, monitoring, treating and assessing response to treatment. Self-management implies that individuals have skills to maintain physical, social and emotional function (Disler et al., 2012). The specific targeting of educational components designed to assist patients to manage chronic illness is paramount to creating skilled collaborative chronic diseases managers but is not enough to make change (Bourbeau et al., 2013; Effing, 2014). The first systematic review of the literature on self-management education for chronic illness completed in 2004, found that the methodology for conducting and reporting trials was suboptimal, there was significant heterogeneity within the literature, and evidence of publication bias (Warsi, Wang, LaValley, Avorn, & Solomon). The authors suggested further trials to clarify the factors involved in patient education (Warsi et al., 2004). Since that time, further review of the literature indicates that patients with COPD would benefit from nurse-led management (Sridhar, Taylor, Dawson, Roberts & Partridge, 2008); patient-centered care (Haughney, et al., 2005); prevention of exacerbations (Spencer, Calverley, Burge, & Jones, 2004); post discharge follow up (Roche et al., 2008), written education (Gallefoss, 2004) and education targeted to modifying behaviour (Oancea, Fira-Miadinescu, Timar, & Tudorache, 2015).

Although, Bourbeau et al. (2013) identify that education is critical to the development and ongoing participation in a CSM plan, inherent in the plan is the ability of the individual to understand the information and make decisions based on the knowledge and skills obtained. This suggests that the benefit of CSM is that the education is provided in partnership, is tailored to the individual learning needs and abilities, and is also monitored and evaluated as required. In the hospital setting, instruction can be tailored to specific patient needs such as, new medications and post discharge care; however, linking hospital management of patients with COPD with post discharge care is exceptionally challenging as the transition to community care is not always completed (Messenger, 2012).

Monitoring. Providing education and support to individuals to assist them to manage chronic illness can create a complicated, intense, long-term relationship between patients and care providers (Forbes & While, 2008). Although the hospital-based nurse cannot provide a long-term relationship, the nurse providing care enters into a therapeutic relationship that builds trust within the foundation of a nurse-client relationship (CNO, 2006). This model of patient-centered care translates to a relationship based on the five components of a nurse-client relationship: trust, respect, professional intimacy, empathy and power; regardless of the context or length of the interaction these components are ever present (CNO, 2006, p. 3). The long-term monitoring provides ongoing evaluation and counselling to maximize individual health and support patients to increase in confidence with making decisions (Albrecht et al., 2016; Bourbeau et al., 2013; Jain et al., 2014). Ongoing monitoring in primary care improves the partnership with primary care and reduces the burden on the emergency room for this primary care manageable chronic illness (Bellamy & Smith, 2007), therefore, education, during hospitalization, focused on post discharge care supports ongoing monitoring in the community.

Willingness of stakeholders and involvement of family. Inherent in the development of a self-management program is the ability to integrate change and accept self-management support (Jonsdottir, 2013). It has been suggested that success in collaboratively managing patients with COPD requires two areas of focus, patient learning through education and patients acting on what they have learned through behaviour modification, with experts in COPD providing the education (Nici, Bently, ZuWallack, & Gross, 2014). Effects of behavioural modification can be evaluated by analyzing adherence, measuring self-control and self-medication ability and by measuring outcomes such as, morbidity, quality of life, exacerbations and hospitalizations (Worth & Dhein, 2004). Fundamental to the success of such a concept is the issue of patient responsibility for monitoring a complex illness with multiple interacting components and a variable pattern of symptoms making self-management a complex process requiring skill, knowledge and support (Trappenburg et al., 2013). The difficulty in translating CSM to individuals lies in the preparation of the individual's capacity to self-manage during times of stable COPD as well as during the exacerbations. The uncertain trajectory of COPD also places a great burden on family caregivers with care providers reporting that they felt unprepared to monitor and respond to changes while providing emotional support and caregiving tasks (Boyle, 2009). The goal of care framed by theoretical concepts is to build patient confidence in making behavioural changes (Bourbeau et al., 2013). Behavioural modification and patient responsibility infer the presence of an individual's capacity to make decisions regarding care which is further protected by the principle of patient autonomy (Entwistle, Carter, Cribb, & McCaffery, 2010) and which is validated by structures within supportive theoretical frameworks; therefore, a critical gap in the success of such programs simply may be a lack of capacity (Bandura, 1977).

Theoretical Framework

Several studies support how changes in patient behaviour for the adoption of CSM strategies have been guided by Social Cognitive Theory (Bandura, 1977) linking patient knowledge to increased confidence in the ability to self-manage (Abedi, Salimi, Feizi, & Safari, 2013; Kara & Asti, 2004; Lorig & Holman, 2003; Make, 1994). Based on the ability of SCT to translate the adoption of behaviours for improved collaborative management, it can be theorized that self-efficacy is a key component aligning human motivation with expectations of outcomes and can therefore also be applied to the role of the hospital-based nurse preparing patients for discharge (Zimmerman, 2000).

Key to the SCT (Bandura, 2001) is that people are both producers and products of their environment, and as such, people exist in an agentic state where they are not just reactive but have the ability to make choices. Bandura (2001) highlighted this intrinsic agentic perspective through the development of self-efficacy as the foundation for human motivation in that when people believe they can accomplish something they are incentivized to persevere through challenges to continue acting. This agentic perspective is key to the adoption of CSM behaviours as people are pro-active, self-organizing and self-reflective. Patient education provided during hospitalization would promote the understanding of the chronic disease by the patient and increase awareness both of symptoms and of the benefits of responding to changes in symptoms. Using this construct, self-management would actually translate as the ability to recognize symptoms, interpret and respond to the information and evaluate the management of the response. Application of this process creates multiple challenges for individuals with COPD as the variation in daily symptoms makes distinguishing between baseline symptoms and exacerbation difficult (Brandt, 2013). Secondly, maintaining the right to choose therapy encased within this construct requires a fundamental capacity to understand the alternate

outcomes even including, not choosing therapy, or delaying therapy (Bailey, 2001; Bourbeau, 2008; Chandra, Cutler, & Song, 2012; Kessler et al., 2011). This is the pivotal checkmate move reinforcing that the key to managing this chronic illness is changing behaviour and is therefore linked exclusively to the agentic perspective.

The Challenge for Nurses

The role of the nurse as patient educator is paramount. Studies have shown a reduction in exacerbations, emergency room visits and hospitalizations for patients with COPD who have received self-management education and training by nurses (Dajczman et al., 2013; Gallefoss & Bakke, 2000) suggesting that the benefit of the education may also be the development of a nurse-client therapeutic relationship (CNO, 2006). Based on this description, teaching patients during acute care hospitalization requires more than the education material; it is imprinting a shared vision of health and setting the stage for translation of this vision post discharge.

Programs of education for patients with COPD require highly skilled health care support (Bourbeau et al., 2013; Jain et al., 2014). The challenge for the hospital-based nurse is that, "the educational demand of these patients is often too great" (Kilgore, 2010, p. 435). Providers of education require preparation and knowledge and nurses report a lack of appropriate tools to support patients with COPD (Verbrugge, deBoer & Georges, 2013). Verbrugge et al. (2013) in their review of strategies nurses implement to promote self-management in patients with COPD found that nurses self-reported that they, "had not been given sufficient guidance to achieve effective self-management among COPD patients" (p. 2788). Osterlund, Klang, Larsson, Ehrenberg and Fossum (2009) reported a similar concern in their examination of communication and education related to self-management of COPD. The researchers found that nurses' emphasized education regarding smoking cessation as opposed to the development of an individual-based

management plan which the researchers suggest may be a reflection of the level of knowledge and confidence of the nurse as patient educator (Osterlund et al., 2009). Inconsistencies are apparent in the literature supporting the role and preparation of the nurse as patient-educator (Sridhar et al., 2008). Nurses as patient educators promote self-management through providing information that is practical and addresses daily management as well as information that helps patients to solve problems and recognize and respond to changes (Brandt, 2013). Multiple challenges have been identified in the literature for care providers in providing evidence-based care to stable, complex, respiratory patients including, lack of time, lack of resources, knowledge deficits, lack of ability to evaluate programs, and finally, lack of ability to change behaviour of patients (Rice et al., 2014).

The Challenge for Patients

Patients report a lack of information to assist with disease management (Barnett, 2005). Scott et al. (2011) surveyed patients with COPD to examine their level of understanding knowledge and of illness. The researchers determined that patients lacked information on self-management; some even after attending formal rehabilitation and concluded the greatest challenge in health care may actually be educating patients to be good self-managers. Carlson et al. (2006) in their study of perceived learning needs for patients with COPD asked both patients with COPD and their care providers what educational needs patients had related to COPD. Using a survey of five categories listing 40 education topics, the researchers asked patients with COPD to rate their level of interest in learning about a topic on a five-point Likert scale. Similarly, the providers were asked to rate on a Likert scale how important they perceived the same topics to be rated. Patients identified nearly every topic as a learning need with an emphasis on surviving an exacerbation and maintaining physical ability, whereas, providers identified

mechanical issues of managing COPD such as inhaler technique, symptom control and medication adherence as priority learning needs (Carlson et al., 2006). The researchers suggest that the emphasis on survival education noted by the patients related to the fact that even when patients are acutely ill they are in need of education (Carlson et al., 2006).

Hospital-based COPD Management

Unstable COPD is challenging to manage, as COPD can mimic serious life-threatening illnesses such as heart failure, pulmonary embolus or pneumothorax, as well as have similar symptoms to lung cancer, pluritis and pneumonia, notwithstanding how the exacerbation can cause increased anxiety and fear for patients increasing the urgency and need for care (Bourbeau et al., 2013). In 2004, Spencer et al. reported what appeared to be an inverse association between health status and exacerbations in patients with COPD. Currently, it is understood that exacerbations of COPD place individuals at risk for experiencing further exacerbations; it is a cycle that repeats infinitely, placing the hospitalized patient at high risk for exacerbations, morbidity and mortality (Bourbeau et al., 2013). Although readmission risk reduction is difficult to demonstrate in populations of community dwelling, low-risk patients with COPD, greater emphasis on the high-risk, hospitalized patient, is integral to optimizing scant economic resources, which inherently confirms the hospital position as central to solution development (Burke & Coleman, 2013; Seemungal & Wedzicha, 2006). The issue of seeking urgent care for a flare of a chronic illness places the hospital service at the center of the development of solutions with the immediate need to reduce readmission to hospital after discharge and the long-term goal of building capacity for collaborative self-management within the system of health care. The hospital stay is a, “valuable time for involving patients in management of their disease” (Lainscak et al., 2013, p. 450.2e2).

Collaborative self-management has been studied extensively in community-based outpatient clinics with patients with COPD yet little is known about the role of the hospital based nurse in providing education to patients with COPD on discharge through a model of CSM (Benzo et al., 2016; Bourbeau et al., 2003; Bucknall et al., 2012). Chronic obstructive pulmonary disease has the highest rate of admission for any chronic illness in Canada (Benady, 2010) and nurses within the hospital provide care to patients during hospitalization.

The goal for health care providers is to prepare patients to be effective self-care managers. However, a number of challenges remain when developing new programs as the evidence is inconsistent regarding the mechanics, utility and effectiveness of self-management programs (Newman, Steed, & Mulligan, 2009). Addressing these challenges requires a review of the current programs of collaborative self-management for patients with COPD with emphasis on the hospital setting noting data gaps in both the needs of the patients and of the delivery of programs. Nurses play a valuable role in the management of COPD in acute care (Robinson, 2010) therefore, what is needed is to investigate how programs are conceptualized so that they can be reproduced and integrated into the current role of the nurse (Jonsdottir et al., 2015). Although the focus throughout the literature has been that CSM for patients with COPD is an effective model for improving health and function, and improvements in hospital discharge care can reduce readmission to hospital, it can be argued that a convergence of the two is required.

Part B: A Scoping Review of Intervention Studies

Introduction

Hospitalization provides an opportunity for nurses to motivate patients toward self-care and prepare them for discharge (Lainscak et al., 2013). The key challenge for the development of hospital-based programs of COPD care guided by collaborative self-management (CSM) may be that the concept lacks the ability to translate seamlessly into an acute-care hospital setting, due in part to the significant variation in the fundamental structure of these programs, including their content, coverage, delivery and timing (Jordan et al., 2015). The need exists to examine how CSM can be applied to the delivery of care for patients hospitalized with COPD and to identify practical information related to implementation and indicators of success.

Self-management interventions were defined by Jolly et al. (2016) as interventions that involve collaboration between the patient and the health care profession with the goal of the patient acquiring knowledge and skills to manage their disease. In their systematic review and meta-analysis, Jolly et al. (2016) explored components and interventions of self-management to facilitate program delivery and the effect of the program on hospital admission and quality of life for patients with COPD. Similarly, a Cochrane review of self-management in patients with COPD examined if interventions in self-management led to improved health outcomes and reduced healthcare utilisation (Zwerink et al., 2014). Ospina et al. (2017) in their systematic review of discharge bundles for patients with COPD found that discharge care bundles, a small structured set of evidence-based practices, did not improve mortality or quality of life but did result in a reduction of readmissions to hospital. The review presented here is similar in that self-management and collaborative self-management were considered but differs in that this review focuses

on the hospital setting, the role of the hospital-based nurse and how components of collaborative self-management are integrated into the hospital setting. This review aimed to examine how programs of collaborative self-management for patients hospitalized with acute exacerbation of COPD are operationalized within the hospital setting through exploration of the characteristics of programs specifically with a focus on the role of the hospital-based nurse within the programs for preparing the patient with COPD for discharge home. Since this scoping review includes the existing literature on hospital-based programs of CSM for patients hospitalized with COPD, results may be helpful for health care practitioners, administrators and policy makers.

Methods

A scoping review is useful for mapping literature in a field of interest, such as COPD, that has not been extensively studied (Levac et al., 2010). A key strength of scoping reviews is that they provide a rigorous and transparent method for charting areas of research (Arksey & O'Malley, 2005, p. 8). Arksey and O'Malley's (2005) framework for scoping reviews guided this exploration of the concept to gather, chart, summarize and disseminate the existing literature and identify any research gaps. Arksey and O'Malley's (2005) framework has six stages which are described in the following sections.

1) Identify the research question. The delivery of health care based on collaborative self-management for individual patients admitted to hospital with COPD is the topic of interest**.** Formation of the research question for this scoping study initially addressed the broader topic of CSM (Arksey & O'Malley, 2005). However, to reduce confusion regarding study inclusion, the research question: "What are the characteristics of programs based on collaborative self-management for patients currently hospitalized

with exacerbation COPD" was combined with an articulated scope of inquiry (Levac, Colquhoun, & O'Brien, 2010). The additional scope focuses primarily on the role of the hospital-based nurse, "What is the role of the hospital-based nurse within the model of collaborative self-management for patients hospitalized with exacerbation COPD?"

2) Identifying relevant literature. Studies selected for review included primary research using interventions that implemented a model of CSM for patients hospitalized with COPD, published in peer-reviewed journals, studies in English, and studies identifying the recruitment of patients during hospitalization for Acute Exacerbations of COPD (AECOPD). Exclusion criteria for this review included studies examining pulmonary rehabilitation as the focus of management, settings of outpatient, primary care, home care or home-based management programs and systematic reviews, meta-analyses, editorials and commentaries.

Databases searched included CINAHL, Embase, Medline, and Scopus. Search terms included collaborative self-management in combination with chronic obstructive pulmonary disease, COPD, hospital, hospitalization, and mesh terms related to the key search terms included, self-care and obstructive lung disease. Initial review of the four databases identified 1276 articles using the search criteria and design. Duplication resulted in 590 articles. Review of the key words, titles and abstracts resulted in 110 articles being included for further assessment. After comparison with the inclusion and exclusion criteria 87 articles were excluded. A full text review resulted in a total of eight articles to be included in this review (Figure 1).

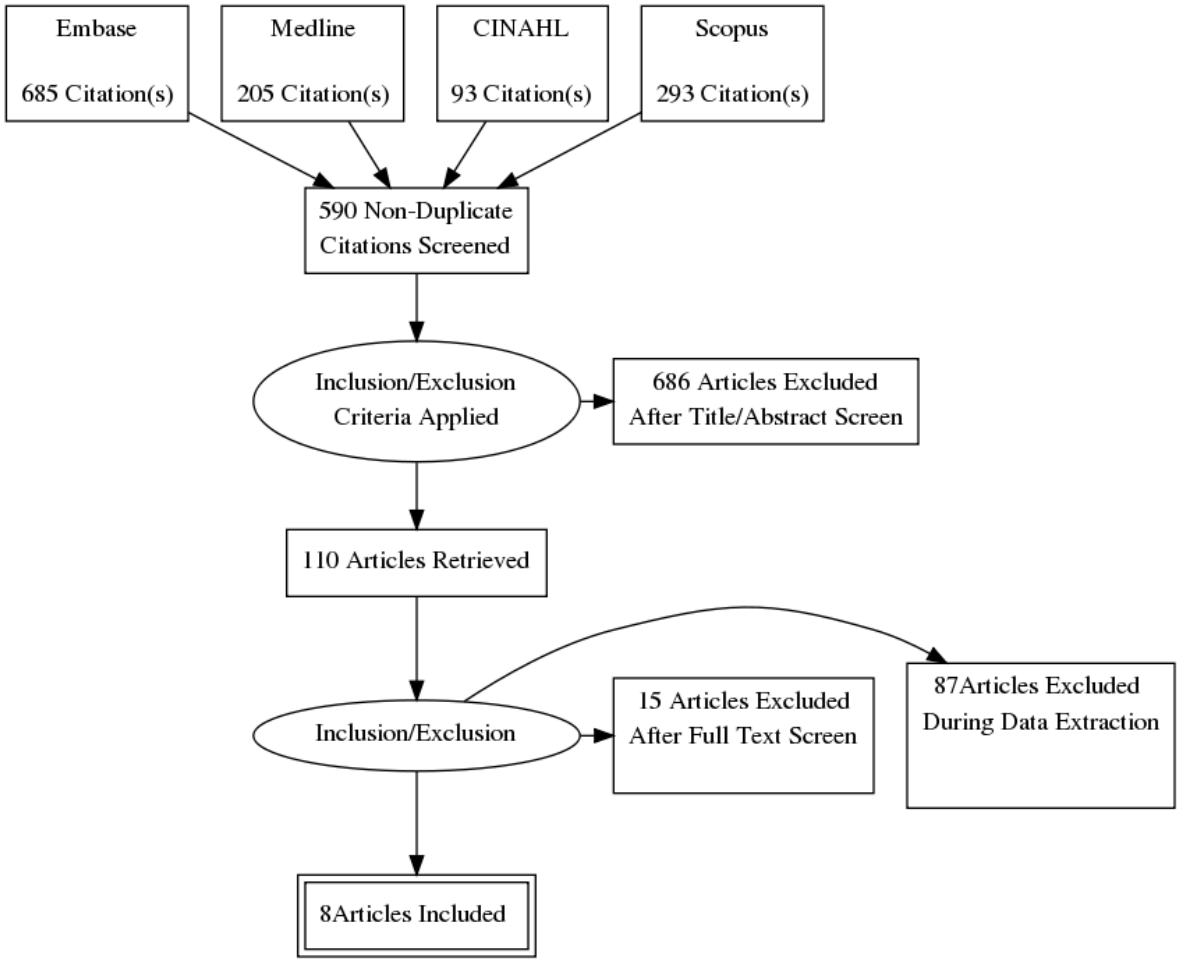


Figure 1. *Scoping Review Flow Diagram*

3) Study selection. One author reviewed and selected the articles based on the inclusion criteria in consultation with the research team.

4) Charting the data. Data were extracted from the selected articles and summarized using a data charting form that included the following categories: first author, year of publication, country, type of study, characteristics of the program, role of the nurse within the program, and evaluation outcomes.

5) Collating, summarizing and reporting the data. The data charting form provided the basis for the development of tables and enabled the identification of similarities and differences in the studies. The extracted data were summarized and

presented in table format and through narrative. Studies were further analyzed for the incorporation of the components of collaborative self-management including aspects of partnership, goal setting, components of education, monitoring and willingness to participate (Make, 1994). The role of the hospital-based nurse outlined within the studies was compared and summarized.

Results of the Review

Review of the final eight primary studies identified hospital-based programs integrating collaborative self-management for patients currently hospitalized with COPD (Table 1). Three articles described studies that were randomized controlled trials, one article was a quasi-experimental design and four articles described studies which were program evaluations.

Table 1 provides a summary of the main characteristics of the studies. Studies provide a global view of hospital-based COPD programs with representation from Spain (Abad-Corpa et al., 2012), Hong Kong (Wong et al., 2016), United Kingdom (Hopkinson et al., 2012; Mathews, Tooley, & Lindsey-Halls, 2013), Ireland (Lawlor et al., 2009), Slovenia (Lainscak et al., 2013) and the United States (Aboumatar et al., 2018; Jennings et al., 2015). A total of 2,546 patients were included in the analysis of the eight studies. The study population included patients currently hospitalized with COPD with sample sizes ranging from 94 to 956 participants. Mean age of participants ranged from 67.9 to 78.5 years of age. Severity of lung disease is noted in less than half of the studies (Jennings et al., 2015; Lainscak et al., 2013; Lawlor et al., 2009) and smoking status of patients was identified in three studies (Hopkinson et al., 2012; Jennings et al., 2015; Lainscak et al., 2013).

Consecutive sampling occurred in more than half of the studies (Abad-Corpa et al., 2012; Hopkinson et al., 2012; Lawlor et al., 2009; Mathews et al., 2013; Wong et al., 2016) while randomization to the intervention occurred in three studies (Aboumatar et al., 2018; Jennings et al., 2015; Lainscak et al., 2013).

Patient population criteria. The patient population within the literature varied with specific criteria for enrolment identified in six studies. Confirmed diagnosis of COPD and of exacerbation COPD was noted in two studies (Jennings et al., 2015; Mathews et al., 2013). Mathews et al. (2013) included all patients with uncomplicated AECOPD and Hopkinson et al. (2012) piloted a care bundle to 94 patients admitted to the respiratory ward with COPD. Exclusion criteria, when stated, was similar with living outside of the geographical area (n = 4), complex comorbidities including cognitive impairment and active oncology or palliation (n = 6). Less frequent exclusion criteria included nursing home residence (n = 2), length of stay longer than four days (n = 1), intensive care during admission (n = 1), lack of social support (n = 1), and homelessness (n = 1).

Interventions during hospitalization. Significant heterogeneity was noted within the literature for hospital-based programs. As well, interventions within the programs were provided during the hospitalization period with some studies continuing after discharge. Within the literature interventions included a hospital discharge planning protocol for patients with exacerbation of COPD (Abad-Corpa et al. 2012), a discharge program (Wong et al., 2016), a pre-discharge bundle (Jennings et al. 2015) an intervention with transition support (Aboumatar et al., 2018), the implementation of a COPD care bundle (Hopkinson et al., 2012; Matthews et al., 2013), a discharge

coordinator intervention, (Lainscak et al., 2013), and a specialized respiratory outreach program (Lawlor et al., 2009).

Hopkinson et al. (2012) described the care bundle as consisting of patient education and referrals. Jennings et al. (2015) identified that the pre-discharge bundle intervention consisted of one visit prior to discharge which included multiple focused assessments and discussion of risks for exacerbation and review of inhaler technique. Lainscak et al. (2013) randomized patients, admitted to a specialized pulmonary hospital, with COPD to a discharge coordinator intervention which consisted of an additional assessment of the patient's situation and homecare needs. Aba-Corpa et al. (2012) designed an intervention that included daily visits during hospitalization to educate the patient and the carer about the disease, identify issues that may arise on discharge and refer patients to other professionals. Lawlor et al. (2009) described how patients in the specialized program were provided with a clinical assessment, education, chest physiotherapy, and a home exercise program. Aboumatar et al. (2018) described key features of the intervention such as facilitated access to community programs and individual self-management support. Wong et al. (2016) implemented a discharge program which consisted of health education related to medications, inhaler technique and a booklet on COPD as well as weekly home visits completed by primary care with a physical assessment and medication monitoring.

Matthews et al. (2013) implemented a quality improvement plan that included review by the specialist nurse, confirmation of the diagnosis of COPD by spirometry criteria, education, scheduled follow up with primary care, completion of a patient checklist and a prescription for oral steroids and antibiotics.

Table 1

Descriptive Information for each Study Included in the Scoping Review

Author / Country	**Method**	**N**	**Sample**	**Characteristics**	**CSM**	**Outcomes**	**Role of Nurse**	**Hospital Nurse**	**Post Discharge (M)**	**Statistically Significant**
Abad-Corpa 2012 Spain	QE/C	143	AECOPD	Health education Individual care plan Information to PCP	P E G M W	QOL-Knowledge READM Satisfaction	Coordinating nurse visits daily in hospital Liaise with community	Collaborate for Discharge planning	HV with PCP TC weeks 2,6,12,24	N
Aboumatar 2018 US	RCT	203	AECOPD	Education Individualized care plan	P E M W	ED READM QOL	COPD nurse Prepare patients for discharge Facilitate access to community programs	Not identified	Scheduled TC	Y
Hopkinson 2012 UK	PE	94	AECOPD	Program bundle consists of Education Offer of referrals to SC, PR Written information	P E G M W	30-day READM	Respiratory clinical nurse specialist assess in hospital, provide education, complete referrals and follow up TC	Education to hospital nurses to promote nurse confidence	TC follow up	**N**
Jennings 2015 **US**	RCT	172	AECOPD	Pre discharge assessment and education Offer of referrals for SC, MH, GI as indicated by assessments	P E G M W	30-day READM ED ADM	Member of research team not identified	Usual care for control group	TC 48 hrs post discharge	N Trial stopped early
Lainscak 2013 Slovenia	RCT	253	AECOPD	Assessment of patient situation and homecare needs with patient and caregiver	P G W	Time to H M Days alive HRQOL	Member of research team not identified	Not identified	Communication to PCP from H	Y
Lawlor 2009 Ireland	PE	246	AECOPD	Respiratory Outreach Service	M W	ED visits H	Outreach Nurse visits	Not identified	HV, TC Unscheduled Access available	Y
Matthews 2013 UK	PE	469	AECOPD	Program bundle consists of Education Offer of referral to SC, PR, support group Patient checklist AP	E G M W	30-day READM	Respiratory Nurse Specialist	N	PCP FU scheduled by nurse pre discharge	**N**
Wong 2016 Hong Kong	PE	956	AECOPD	Emergency Medical Ward Discharge education assessment Referral	E G M W	Early D/C H LOS Cost	Case nurse Provide education	N	HV weekly	**N**

Method: RCT- randomized controlled trial; PE- program evaluation; QE/C- Quasi-experimental with control group
Outcomes: H-Hospitalization, ED – Emergency Department, READM- Readmission, HRQOL- Health Related Quality of Life, LOS- Length of stay, M-Mortality
Characteristics: AP- Action Plan, SC-smoking cessation, MI-Motivational Interviewing, HV-Home Visit, TC-Telephone Call, D/C-Discharge, PCP-Primary Care Provider
P-Partnership; E- Education; G- Goals; M-Monitoring; W-Willingness

During hospitalization referrals and assessments for patients admitted with COPD included referrals to a support group (Mathews et al., 2013), for smoking cessation (Hopkinson et al., 2012; Jennings et al., 2015; Mathews et al., 2013), and pulmonary rehabilitation (Hopkinson et al., 2012; Mathews et al., 2013). One study completed assessments for depression and gastroesophageal reflux disease during hospitalization (Jennings et al., 2015) and another completed an assessment of the home situation and homecare needs (Lainscak et al., 2013).

Review of the patient with primary care also occurred during hospitalization (Abad-Corpa et al., 2012), with sharing of information directly with primary care (Lainscak et al., 2013) and scheduling of primary care visits post discharge during hospitalization (Mathews et al., 2013; Wong et al., 2016).

Interventions with post-discharge care. Review of the literature on interventions for patients admitted with COPD identify that six studies integrated post discharge care as part of the program intervention. Within the intervention, studies described follow up care which ranged from one follow up phone call (Hopkinson et al., 2012) to multiple contacts (Lainscak et al., 2013). Telephone follow up with the patient was completed in six studies; however, the timing of the telephone follow up was varied within the literature. Jennings et al. (2015) completed one telephone call at 48 hours while Abad-Corpa et al. (2012) included four follow up phone calls to occur on a schedule for up to six months. Aboumatar et al. (2018) also scheduled phone calls to occur at one week, one month, three months and six months. Lainscak et al. (2013) completed a follow up telephone call within 48 hours, and at 30 and 90 days post discharge. Goals of the phone call follow up varied within the literature with reinforcement of the items in the bundle (Jennings et al.,

2015), assess additional needs and survival status (Lainscak et al., 2013) and determine if the patient had required emergency room visits or hospitalization (Aboumatar et al., 2018).

Home visits were completed in four studies. The goal of the home visit was to complete a patient assessment (Lainscak et al., 2013) or provide consideration of adjustment of treatment (Lawlor et al., 2009). As part of the program, Wong et al. (2016) arranged for primary care to complete the home visits. The timing of home visits varied within the literature. Aba-Corpa et al. (2012) completed one home visit within 72 hours, Lainscak et al. (2013) completed home visits at 10 days and at 180 days post discharge and Lawlor et al. (2009) arranged for a home visit the day after discharge and at 14 days, as well, patients were seen in follow up at a clinic at six weeks and 90 days for review.

Ongoing care continued after discharge, as patients were able to trigger an unscheduled visit for review post discharge (Lawlor et al., 2009), or implement a plan of antibiotics and oral steroid (Mathews et al., 2013). Lawlor et al. (2009) identified that patients were provided with a prescription but did not describe the content of the prescription and Aboumatar et al. (2018) identified that patients were provided with a non-pharmacological action plan.

Outcomes measured. Within the literature, the most commonly measured outcome was emergency room visits or readmission to hospital (n = 8). Other utilization measures included length of hospital stay (n = 1), days alive and out of hospital (n = 1), and mortality (n = 2). Health related quality of life and satisfaction was measured in three studies and knowledge was measured in one study.

Of the eight studies reviewed, three studies demonstrated a reduction in readmission rates with the implementation of the intervention (Aboumatar et al., 2018;

Lawlor et al., 2009; Lainscak et al., 2013). Aboumatar et al. (2018) noted that reduction in readmission rates was related to a combination of connecting with the patient, providing ongoing follow up and individualizing the program. Lawlor et al. (2009) identified that the program was successful for reducing emergency department visits and hospitalization by 48% with a 62% reduction noted within a specialized cohort of 60 patients who received intense self-management education compared to pre-program activity. Lainscak et al. (2013) reported that enrolment was stopped at 253 participants completing only 83% of the calculated sample size required for statistical analysis, the researchers noted that despite that limitation the study showed a reduction in the primary end point, readmission, for participants within the intervention.

Abad-Corpa et al. (2012) demonstrated a significant difference in quality of life indicators for patients surveyed; however, the researchers noted a loss of statistical power as the sample size calculated was not met and no statistically significant difference was noted in the readmission rate. Wong et al. (2016) reported no significant difference in the discharge rate and length of stay between groups; however, the authors note that the additional costs of the program was less than the cost of hospitalization for patients with COPD. Although Hopkinson et al. (2012) noted a downward trend in readmission, which was not statistically significant, they were encouraged by the increase in COPD awareness. Similarly, Matthews et al. (2013) noted a reduction in readmission rates with a subsequent reduction in health care costs. Jennings et al. (2015) identified that the primary composite end point was to achieve a ten percent difference in the readmission rate between the two groups, intervention and control; however, the trial was stopped after three years and before the full sample size was obtained as the readmission rate was noted to be 22.78% in the intervention group and 19.35% in the control group.

Education. Education was provided to patients during hospitalization in all eight studies. In Table 2 the length of sessions and education content of hospital-based COPD programs are presented. Although specific medication review was only identified in five studies (Abad-Corpa, et al., 2012; Jennings et al., 2015; Lainscak et al., 2013; Lawlor et al., 2009; Wong et al., 2016) the review of inhaler technique was identified in all articles.

Table 2

Educational Content of Programs

Author	Length of session	In-Hospital education	AECOPD management	Disease	Medication	Use of Oxygen	Non-pharmacological Education	Inhaler Technique	Written
Abad-Corpa et al., 2012		Y		√	√	√	√- diet, breathing exercise, hygiene	√	
Aboumatar et al., 2018		Y	√				√- Breathing exercises, energy conservation, smoking cessation	√	
Hopkinson et al., 2012		Y						√	√
Jennings et al., 2015	1 hour	Y	√	√	√		√- smoking cessation	√	
Lainscak et al., 2013		Y		√	√			√	
Lawlor et al., 2009		N	√	√	√		√	√	
Matthews et al., 2013		Y	√					√	√
Wong et al., 2015		Y		√	√			√	√

Topics of education varied and included knowledge of the disease (Abad-Corpa et al., 2012; Jennings et al., 2015; Lainscak et al., 2013; Lawlor et al., 2009; Wong et al., 2016), instructions on non-pharmacological treatment such as smoking cessation (Aboumatar et al., 2018; Jennings et al., 2015; Lawlor et al., 2009), breathing exercises (Abad-Corpa et al., 2012; Aboumatar et al., 2018) and use of supplemental oxygen (Abad-Corpa et al., 2012).

Patients were provided with written information on COPD in three studies (Hopkinson et al., 2012; Mathews et al., 2013; Wong et al., 2016), and information related to management of an exacerbation was provided in four studies (Aboumatar et al., 2018; Jennings et al., 2015; Lawlor et al., 2006; Mathews et al., 2013). The length of the education sessions provided to the patient was described in one study with one hour of education at discharge (Jennings et al., 2015).

Key Aspects of Collaborative Self-management

Although not explicit, interventional studies of self-management integrated components of collaborative self-management into the structure of the hospital-based programs. Within the literature collaborative self-management programs providing education and self-management support included hospital-based programs and services such as, *Program -We-Care* (Wong et al., 2016) a supported discharge program for COPD patients providing personalized and structured self-management education, and *Respiratory Outreach Service* (Lawlor et al., 2009) a program of early discharge care and ongoing rapid-access support based on self-management for patients with COPD. The existing literature of hospital-based programs identify alignment with components of CSM including 1) individual patient practitioner partnership, 2) therapeutic goals shared mutually, 3) instruction, 4) monitoring, and 5) willingness of stakeholders and involvement of family (Make, 1994).

Individual patient/practitioner partnership. Clinician partnership within the literature of hospital-based self-management support was demonstrated through the physical composition of teams included nurse, physiotherapist, administrator and respirology support (Lawlor et al., 2009), and home visits with primary care in attendance (Abad-Corpa et al., 2012). Although not specifically identified, Abad-Corpa et al. (2012)

demonstrated partnership by identifying issues, providing information and acting as a liaison with the community provider. Similar demonstrations of partnership continued within the literature examined such as the offer of referrals for support group involvement (Matthews et al., 2013), offer of referrals for smoking cessation and pulmonary rehabilitation (Hopkinson, et al., 2012; Lainscak et al., 2013), assessment of the patient homecare needs by telephone with the aim to, "actively involve" the patient in the process of discharge (Lainscak et al., 2013, p. 450.e2) and completion of a patient checklist revealing educational gaps perceived by the patient (Matthews et al., 2013). Aboumatar et al. (2018) demonstrated partnership as the authors identified that the program was co-developed with patients with COPD and stakeholders.

Therapeutic goals shared mutually. Patient goals of management were demonstrated as noted above with referrals offered for ongoing counselling for smoking cessation or exercise and with the review of homecare needs that may impact the patient's recovery. The goals of the researchers and programs reviewed within the literature described quality of life (Abad-Corpa, et al., 2012; Lainscak et al., 2013), reduction in hospitalizations and readmissions (Abad-Corpa, et al., 2012; Hopkinson et al., 2012; Jennings et al., 2015; Matthews et al., 2013), emergency department visits (Jennings et al., 2015; Lawlor et al., 2009) and early discharge (Wong et al., 2016).

Instruction. The primary focus of the literature on CSM education was to teach self-management strategies. Studies identified the educational topics covered during sessions (Table 2) with the patient; however, several gaps in the description of content were noted. Topics of education described within the literature included emphasis on medication and inhaler technique, and non-pharmacological education such as smoking cessation, disease process, and exacerbation management. Written information was

provided to patients on discharge in less than half the studies (Hopkinson et al., 2012; Matthews et al., 2013; Wong et al., 2016).

The timing of the education sessions also differed within the literature with sessions occurring in hospital daily during hospitalization (Abad-Corpa et al., 2012), and continuing post-discharge during home visits or by telephone (Abad-Corpa et al., 2012; Lainscak et al., 2013).

Monitoring. Although inconsistencies were noted, the collaborative self-management component monitoring was demonstrated in the literature reviewed through the description of follow up. Programs initiated during the acute phase extended on discharge to include scheduled home visits and telephone follow up (Abad-Corpa et al., 2012; Aboumatar et al., 2018; Hopkinson et al., 2012; Lainscak et al., 2013; Lawlor et al., 2009) or unscheduled access for assessment at the patient's request (Lawlor et al., 2009). Wong et al. (2015) and Matthews et al. (2013) arranged community-based support and follow up; however, the hospital-based programs did not participate in providing post discharge patient care.

Willingness of stakeholders and involvement of family. Willingness of clinician stakeholder involvement was demonstrated with primary care consultation and scheduled home care visits in partnership with primary care (Abad-Corpa et al., 2012) and communication with primary care providers (Jennings et al., 2015; Lainscak et al., 2013). Nurse willingness to participate was demonstrated when nurses identified learning needs, attended education sessions and reviewed the discharge checklist with patients prior to discharge (Hopkinson et al., 2012).

Overall, the willingness of the patient to participate in programs of collaborative self-management was demonstrated by the involvement of patients as research

participants, but also through the participation of the patient during discussion of their needs post discharge (Lainscak et al., 2013), discussion of individualized referrals for smoking cessation and pulmonary rehabilitation (Hopkinson et al., 2012; Jennings et al., 2013; Matthews et al., 2012), completion of discharge checklists (Hopkinson et al., 2012; Matthews et al., 2013) and in the development of the program (Aboumatar et al., 2018). Patients also participated with access to exacerbation management included through the provision of a self-managed exacerbation treatment plan (Matthews et al., 2013), and telephone access to the team to report changes in baseline and to request consultation (Lawlor et al., 2009).

Discussion

Few studies were found that demonstrate integration of collaborative self-management in a model of hospital-based care for the patient hospitalized with COPD. Programs described varying levels of complex interventions with disease education, exacerbation management and follow up. The structure of the programs within the literature varied as programs included hospital-based care, transitional care and post discharge/ community care. As well, the characteristics of the programs including the content of the education programs, the timing, frequency, and modality of the education sessions, the composition of teams and type and schedule of follow up varied throughout the literature. Several gaps exist within the literature related to CSM, for example, while Wong et al. (2015) identified a program of multidisciplinary assessment in the Emergency Medical Ward (EMW) and awareness that patients with poor self-health management suffer from the vicious cycle of frequent exacerbations" (p. 2), the authors did not discuss in detail the content of the education program other than the medications and inhaler technique. This may suggest that knowledge of inhaler use could improve

medication adherence, and therefore control of symptoms, resulting in reduced exacerbations. Lainscak et al. (2013) described usual care such as, "routine patient education, supervised inhaler use, respiratory physiotherapy and disease-related communication" (p. 450.e1), considering that the research was completed in a specialized respiratory hospital the usual care provided many educational details.

The skill level or ability of the care provider to facilitate preparation of the patient may have a profound effect on adoption of self-management interventions by patients and be reflected in patient outcomes (Han et al., 2016). The role of the nurse within the programs, and, in particular, the description of the skill-base of the nurse was not clearly described. Lainscak et al. (2013) identified the role of discharge coordinator but did not provide information to determine if the role was nurse related.

Within the literature, programs providing education and self-management support to patients describe the role of the nurse provided within the program as opposed to the hospital-based nurse on the unit who provides clinical care to the patient admitted with COPD. The role of the nurse as the central contact for patients with COPD within the research is undefined with roles such as, case nurse (Wong et al., 2015), coordinating nurse (Abad-Corpa et al., 2012) or specialized respiratory nurse (Hopkinson et al., 2012; Matthews et al., 2013). The preparation and education of the nurse to provide specialized care was not described in the research. However, Aboumatar et al. (2018) identified how the nurse within the study had special training in how to support patients with COPD and Abad-Corpa et al. (2012) described the nurses within the study as "previously trained nurses with sufficient clinical experience" (p. 671). None of the studies provided information related to the specific role of the hospital-based nurse in providing care for patients hospitalized with COPD. One study identified a collaborative effort with

hospital nurses for planning discharge (Abad-Corpa et al., 2012), and one study described how unit nurses could make program referrals and reviewed the patient checklist on discharge to ensure it was completed (Hopkinson et al., 2012). Interventions initiated within the hospital further extend the role of the nurse to post discharge care including to transition patients from hospital to home providing outreach follow up (Lawlor et al., 2009). As such, inconsistencies persist within the literature of self-management related to the role and preparation of the hospital-based nurse to provide self-management support to complex, patients hospitalized with exacerbation COPD.

Multiple inconsistencies within the programs were noted. For example, use of supplemental oxygen by the patient was not identified as an inclusion or exclusion criteria for study participation; however, education on this topic was identified in only one study (Abad-Corpa et al., 2012) which suggests that requiring oxygen may not have been criterion for participation as their disease may have been deemed too severe.

Zwerink et al. in the 2014 Cochrane systematic review reported that outcomes improved for patients with COPD when provided through the model of self-management; however, as there was significant heterogeneity noted within the interventions the value of certain interventions was not evaluated. This is of primary importance when, as an intervention, patients are provided with an action plan of antibiotics and oral steroid to implement if needed. Although exacerbation management was discussed within the programs of education for patients, only one study provided patients with a plan of antibiotics and oral steroids for self-treatment at home; no instructions were provided for implementation of the plan and the use of the plan was not measured as an outcome (Mathews et al., 2013). Other programs described how the provision of a plan was provided to “suitable patients” (Lawlor et al., 2009, p. 56) or were provided at the

primary team's discretion (Jennings et al., 2015). Although the criteria for prescribing an action plan was not identified, limiting access of the plan to particular patients could in part reflect that patients with severe COPD or serious comorbid illnesses need to be assessed for their ability to understand and implement a plan (Han et al., 2016).

Literature on the specific mechanics of collaborative self-management is inconsistent, specifically related to which components are effective, how the hospital setting can integrate CSM to provide care, and what is required to make improvements in function and reduce economic indicators. Several questions remain. How would a program of collaborative self-management components improve management of COPD for patients hospitalized with COPD, and finally, is there a role for the hospital-based nurse to support patients with expert advice, education and counselling and if so, how would this be achieved? The heterogeneity of the components of the programs for self-management within the literature presents challenges for the adoption and translation of CSM interventions for health care providers related to structure and content of models of care delivery, but also and possibly most significantly; the preparation of the nurse. When surveying ward staff nurses in preparation for the clinical trial Hopkinson et al. (2012) identified a lack of confidence amongst nurses for providing specific self-management education to patients admitted to hospital with COPD. It may be that this incidental finding of the need to prepare nurses to support patients with discharge planning is the key to improving patient outcomes.

It is interesting to note that although the methodology of CSM programs change considerably within the literature, the outcomes tested maintain similarity, with rates of hospital admission, readmission and quality of life indicators being measured. This overlap perhaps demonstrates that the ultimate goal would be a synergy of sorts between

an individual's level of function and quality of life and the economics of providing care (Benzo et al., 2016; Bourbeau et al., 2003; Worth, & Dhein, 2004). The gap in the literature for the use of collaborative self-management for individuals hospitalized with COPD is concerning. What is needed is to reimagine health care in partnership with patients with COPD so that COPD collaborative self-management is a value-added component of their health care. The issue of CSM hinges on behavioural change and knowledge, and requires consistent, reproducible components that can be measured individually, organizationally, and economically.

To answer the research question for this scoping review an extensive range of the literature was scanned; however, a potential limitation is that papers may have been missed by searching titles, subject headings and abstracts only. Limitations of this review also include that the searches for literature were limited to English language only; therefore, it is possible that studies may have been missed for selection if they were published in languages other than English. Scoping reviews do not include critical appraisal of the literature or a formal appraisal process; therefore, the articles are presented in this review to answer the research questions related to the population of interest.

Conclusion

The aim of this scoping review was to identify how programs implementing collaborative self-management are operationalized in the hospital setting for patients admitted with acute exacerbation COPD and examine the role of the hospital-based nurse within the program. Two key issues were identified in the literature. Primarily, and of the greatest concern, is that the role of the hospital-based nurse is rarely included within the literature. Hospital-based nurses provide 24-hour care, education, medications, and

psychosocial support to patients through the development of a nurse-client therapeutic relationship (CNO, 2006). This gap within the literature related to the role of the hospital-based nurse highlights the need for the development of this role within the model of collaborative self-management which could be translated as an extension of the current nurse-client therapeutic relationship.

Secondly, the examination of the current literature of hospital-based programs for patients with COPD supports the view that integration of CSM is challenged not only by the complexity of this particular chronic illness but also by the inconsistency of the evidence on which to model programs of CSM. For example, patient selection criteria included patients with uncomplicated COPD (Mathews et al., 2013) although the term Uncomplicated was not defined. As well, Lawlor et al. (2009) identified that of the 1241 patients referred to the program, only 246 patients were accepted as patients were excluded on a, "discretionary basis" (p. 56).

Although this chronic illness causes significant dyspnea and anxiety and patients with COPD require information to be able to manage post discharge, significant gaps exist in preparing patients for discharge home from hospital. First, the view of preparing patients to manage after hospitalization is seen as an add-on to usual care as opposed to an integration of a plan of care based on the needs of the individual patient. Secondly, the literature outlines how the discharge information is provided by the program team, which could be argued that the preparation of the patient with COPD for discharge is seen as separate and outside of the role of nursing care. This lack of integration of the role of the nurse could impact patient care as information provided to patients could not be confirmed or clarified by the nurse providing direct care. Thirdly, the reviewed literature further blurs the line of what constitutes acute care as programs describe crossing from

the acute care setting to the community setting. Finally, for a chronic disease that significantly impacts the health and function of the patient, the voice of the patient in the literature is weak, as the goal of many programs is reduction of healthcare utilization. Given the high 30-day rate of readmission among this population it is prudent to conduct research into how knowledge and self-efficacy of nurses providing care can translate into increased knowledge and preparedness for discharge of patients hospitalized with COPD.

Literature Review: Summary of Part A and B

Exacerbations of COPD hasten the progress of lung function decline, cause significant distress for patients and are a significant cause of mortality and morbidity worldwide (Han et al., 2016). An inverse relationship exists as increased severe exacerbations of COPD result in a lowered rate of survival among individuals and, therefore, a significant goal of collaborative self-management is to prevent exacerbations through education and support (Viniol & Vogelmeier, 2018). "Self-management is not a single event" (Pinnock, Steed, & Jordan, 2016, p. 7) and programs of self-management are not tangible. Integration of a model of collaborative self-management when providing care for patients with COPD informed by the process of partnership includes the patient's voice through assessment, and development of goals to target skills and abilities. Literature reviewed in this chapter highlights how shared care between the patient and healthcare practitioner is essential and validates the ability of the patient to actively participate in their care not just be a recipient of care. Goals of care appear to share a similarity in that patients want information on how to prevent COPD from getting worse, how to avoid exacerbations and information related to what to do when they need help (Carlson, et al., 2006) and programs of self-management want to reduce costs of exacerbation by reducing hospital assessment and admission. The literature described

how components of collaborative self-management provide a pathway for uptake of knowledge and skills by the patient with COPD with the goal for the patient to assume increased responsibility and engage in behaviours that improve health. However, concerns are noted when large community trials with the provision of education sessions, availability of multidisciplinary staff, and scheduled follow up demonstrate positive effects and outcomes of CSM for patients with COPD (Bourbeau et al., 2003; Rice et al., 2010) while a study by Fan et al. (2012) seemingly similar in structure was terminated due to increased mortality within the intervention arm. This may reflect multiple issues including problems related to specific self-management interventions, but this also may relate to the complexity of managing this chronic disease as exacerbations cause significant breathlessness and fear. Jonkman et al. (2016) in their meta-analysis of self-management interventions aimed to determine which characteristics of COPD self-management were most effective. Results from review of the 14 randomised trials or 3282 patients identified that the duration of self-management interventions actually reduced all-cause hospitalisations in patients with COPD. Therefore, it can be argued that by initiating collaborative self-management during hospitalization, the hospital-based nurse can become central to the adoption of self-management interventions by patients with COPD.

Applying the theoretical principles of social cognitive theory, specifically the agentic perspective, into a model of care for patients hospitalized with COPD enables individuals to share control in their healthcare management and builds capacity of individuals to self-manage. ”Self-management is good medicine” (Bandura, 2004, p. 143). It may be that where the issue of behaviour change and patient responsibility intersect that the true capacity for collaborative self-management exists and that success

of programs is dependent on building the capacity of patients to self-manage through initiation of self-management during hospitalization.

Problem Statement

Results of a scoping review of the literature suggest that patients with COPD may benefit from CSM, patients hospitalized with COPD need education to reduce the risk of readmission and hospital-based nurses are able to provide COPD education. However, little is known about the level of knowledge and self-efficacy of the hospital-based nurse to provide discharge education to patients with COPD or how CSM can be implemented in the hospital setting. It is also clear that there is not enough evidence to determine which components of CSM are necessary to provide improvements in patient care; however, the risk of patients being readmitted to hospital is high enough to warrant further research (Jordan et al., 2015). The aim of this clinical study is to address this gap in the literature by providing education to nurses and examining the effect of the CSM-focused education on nurse, patient, and hospital outcomes.

Study Purpose

The study will provide hospital nurses with an educational intervention framed by the components of CSM. The purpose of this study is to evaluate the effect of an evidence-informed, educational session on nurse knowledge of COPD and self-efficacy for providing discharge care aligned with the components of collaborative self-management to patients admitted to hospital with COPD.

Hypothesis

Based on Bandura's social cognitive theory, the role of self-efficacy and a review of the current literature, the following hypothesis has been developed:

Implementation of a hospital-based education program that is targeted to hospital-based nurses and includes a standardized approach to discharge of patients hospitalized with COPD results in (a) increased nurse's knowledge of COPD and self-efficacy to provide discharge care, (b) increased patients knowledge of COPD self-management and readiness for discharge, and (c) reduced 30-day readmission rate for COPD.

Research Questions

1. Is nurse's self-reported level of self-efficacy in discharging patients from hospital related to nurse level of knowledge of COPD?
2. Are nurse demographic factors such as education, years of experience, and work status related to nurses' COPD knowledge and self-efficacy for preparing patients for discharge from hospital.

CHAPTER THREE: RESEARCH METHODS

Introduction

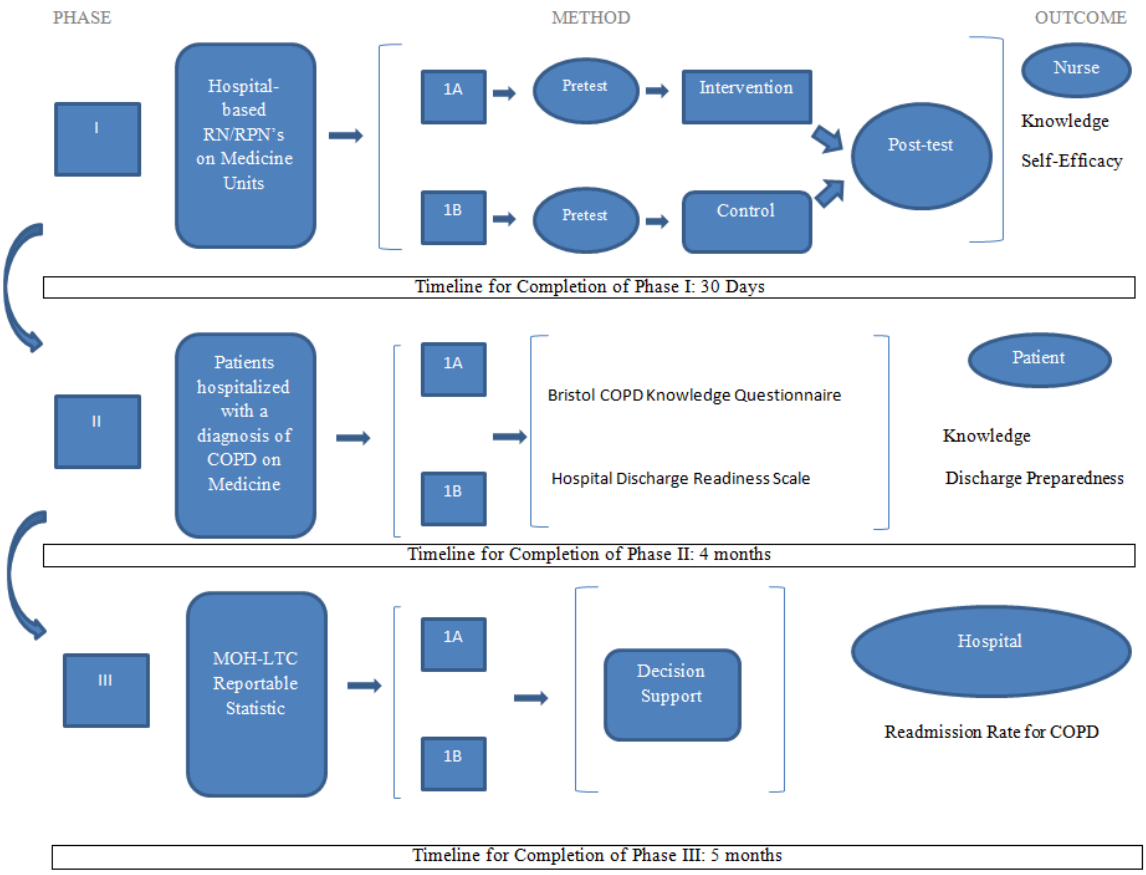
In this chapter the study design and methods that were implemented to collect the data from nurses and patients are described. Pre and post-intervention data were obtained from nurses working on hospital medicine units to evaluate nurses' level of knowledge and self-efficacy in completing the discharge planning for patients admitted with COPD. The study also collected data from patients hospitalized with COPD preparing for discharge home to evaluate the patients' knowledge and readiness to be discharged home. First, the study design, setting, sample assignment, intervention procedure and consent process are outlined. Next, the procedures used to measure the study variables are described including a review of each instrument. This chapter also includes discussion of data analysis, ethical considerations, and study limitations.

Overview of Research Plan

This interventional study (Figure 2) was completed in a phased process, where completion or near completion of one phase activated the next phase. Phase I involved evaluating the level of knowledge and self-efficacy of nurses to complete discharge planning for patients with COPD through an educational intervention session. Phase II involved conducting a survey of patients currently hospitalized with COPD to gather data to determine if there were any patient-level effects of the educational intervention delivered to the nurses. Phase III involved obtaining reportable Ministry of Health and Long-term Care (MOHLTC) statistics to determine if the intervention had any impact on the 30-day rate of COPD readmission to hospital for the study population during the study period April 2018 to August 2018.

Research Design

A pretest-post-test, two group, quasi experimental, study design (Figure 2) was used to address the study's research questions. This design enabled the researcher to measure the dependent variable before and after exposure to the independent variable and thus measure the effect of the intervention on the dependent variable (Dimitrov & Rumrill, 2003).



1A = Intervention Unit; 1B = Control Unit

Figure 2. Research Design

The advantage to the pretest-post-test design is that change occurring between testing periods can quickly be measured; however, using the same testing methods at both time points could sensitize the participants to the study material and thereby potentially

reduce external validity. To mitigate the possibility of such exposure effects with the post-testing questions, although the same items were used as in the pre-test, they were arranged differently. The quasi-experimental study design is well-suited for evaluating the effect of the program of education on nurses' knowledge and self-efficacy since the comparison group in the study is required to implement the current standard of care for COPD on the medicine unit. The effect of the education session was determined in three ways: 1) by comparing the scores between the nurse intervention groups on the pretest and post-test; 2) by measuring the level of knowledge and readiness for discharge of patients at discharge and; 3) by comparing the 30-day rate of patient readmission.

Conducting a classic randomized clinical trial was not feasible for two reasons; first the anticipated study sample was small and secondly, randomization of nurses to two different interventions across two units of medicine was impractical and it could cause confusion for patient care. Therefore, the quasi-experimental approach was the logical design to answer the research questions. Module four of the Health Quality Ontario and Ministry of Health and Long-term Care Clinical Handbook for COPD (HQO & MOHLTC, 2015) provided structure for the nurse education session and was thought to be beneficial and safe to implement (Harris et al., 2006).

Using a quasi-experimental design, the aim of this study was to evaluate the intervention without randomization of the study participants while still providing experimental control through an initial baseline comparison of the two groups (Harris et al., 2006). The hospital has two medicine units, 1A and 1B, in the same organization. The potential for cross contamination between the units was minimal as nurses on medicine are scheduled on one unit only and do not transfer between units. The entire medicine program has the same nurse manager, educators, and access to education in-

services. Nurses on the units have similar staffing ratios, patient populations, documentation and reporting procedures and are therefore comparable to one another. Nurse participants were assigned to the intervention or control group as designated by the unit they identified as working on. This provided a comparative group of study subjects causing as little disruption as possible for nurses when providing patient care to patients admitted to the hospital. Although establishing causality in this quasi-experimental study can be challenging, the addition of a comparison group of participants not exposed to the intervention provided insight into determining possible cause and effect by monitoring changes in the dependent variables (Harris et al., 2006; White & Sabarwal, 2014).

Phase I: Setting

The study took place in a small community teaching hospital. The hospital currently has 133 beds and is undergoing construction to expand to 196 beds. The date of occupation of the expansion is set for September 2019.

Nurse Study Sample

A convenience sample of nurses working on the two medicine units either full time or part time was invited to participate. For the purpose of this study, the word nurse refers to both Registered Nurse (RN) and Registered Practical Nurse (RPN). Even though the educational program and length of training for RN and RPN preparation are different, the role expectations of the two groups with respect to patient teaching are treated similarly in the study institution. Thus, RNs and RPNs were treated as equivalent in the study methods including data analysis.

Inclusion/Exclusion Criteria for Nurse Participants

Nurses were included if they worked on medicine 1A or 1B, were employed either, full time, part time or on a permanent, casual basis, were working in direct patient

care or in the capacity as clinical educator on the medicine units and provided informed consent to participate in this study. Nurses working in the role of clinical educator were included as they support nurses and actively participate in clinical practice. Nurses working in other settings within the hospital, those working on the medicine unit in management positions and those working on multiple units were excluded from participation.

Nurse Recruitment Procedures

Recruitment of nurses for the research project was initiated with posters displayed on the medicine units announcing the research project (Appendix A). To reduce the barriers for participation in clinical research and to respect the workload and the time commitment of the nurses for participating refreshments were provided during a sponsored coffee break on the medicine units once a week for one month during the month prior to study commencement (Jacobson, Warner, Fleming, & Schmidt, 2008; Miller, Johnson, Mackay, & Budz, 1997). During the coffee break the researcher provided an overview of the project, answered any questions and provided information related to participation in the research project (Appendix B). The overview of the project and the clinical relevance of the topic was discussed in hopes to promote participation in the research study (Miller et al., 1997).

The hospital was preparing to move into the newly constructed inpatient wing by providing all nursing staff with education about the new call bell system and the new patient care equipment. The clinical managers scheduled all hospital nurses to attend one, mandatory, five-hour hospital training. The mandatory hospital training sessions were scheduled to occur at the hospital once a day for eight consecutive days and all full time, part time and casual nursing staff were scheduled to attend. As a consequence each day

after nurses had completed the hospital training, we were able to recruit the nurses who worked in medicine. Nurses who consented to participate attended the intervention education session which was held once a day for seven days on the same days of the mandatory hospital training sessions but after the mandatory training was completed.

Nurse Sample Size Calculation

In determining the sample size required for this study there was sufficient rationale to hypothesize that nurses who attended the education session would have higher scores on knowledge and self-efficacy than nurses who did not attend. Using G * Power for an a priori, two-tailed, two independent group *t*-test with a power level of .80, a significance level of $a = .05$, and a medium effect size $d = .50$ the required sample size was calculated at $N = 64$ nurses per group for a total of 128 nurses (Faul, Erdfelder, Buchner, & Lang, 2009).

The effect size or the size of the difference between the two groups is an important tool in reporting effectiveness and demonstrates how well the intervention worked (Coe, 2002). The level of significance, or alpha, is commonly fixed at .05 meaning that there is less than a 5% chance of drawing a false positive conclusion (Noordzij et al., 2010).

However, there were only 102 nurses available on the two medicine units eligible for recruitment to this study. Although it was expected that all nurses would meet the inclusion criteria, potentially 10-20% of eligible participants may refuse to participate, withdraw from participating after consent or be lost to follow up (Suresh & Chandrashekara, 2012). As well, the study design was non-randomized requiring a further 20% more study participants (Suresh & Chandrashekara, 2012).

We proceeded with the available sample size knowing that only 102 nurses were available to approach for participation. Of the nurses who had just completed the hospital mandatory education session 6 nurses declined to participate and 11 nurses could not be contacted. No nurses withdrew from participation after consent. Two nurses did not complete the post-test component of the questionnaire and were therefore lost to follow up (Suresh & Chandrashekara, 2012). Of the 102 nurses available to participate, 81% of the nurses that were approached consented to participate, therefore the final sample size of nurses obtained in Phase I was 83.

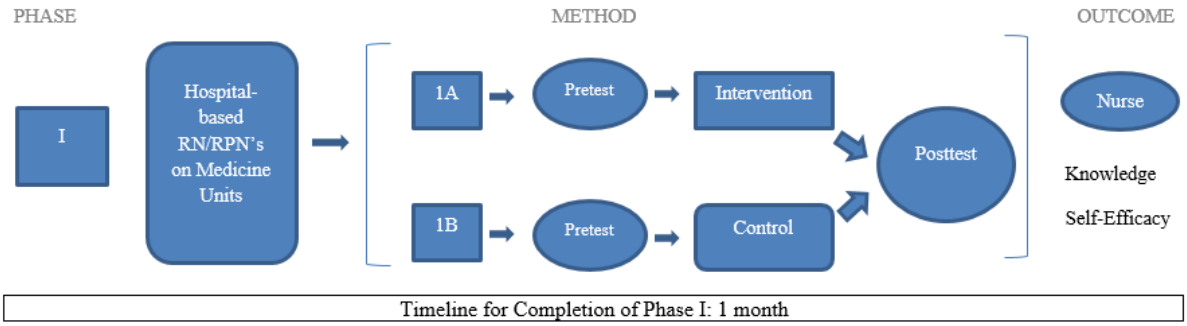


Figure 3. Phase I Study Design

Method of Nurse Intervention Assignment

All nurses consenting to participate were assigned to one of two groups, intervention or control. All nurses who identified their home unit of 1A Medicine were assigned to the intervention group. All nurses on 1B Medicine were assigned to the comparison group. The comparison group provided usual care, which included patient education, based on current clinical practice guidelines (O'Donnell et al., 2008). The identified comparison group for this quasi-experimental study was similar to the intervention group in terms of baseline characteristics as the two medicine units are separated by different floor levels within the hospital providing a geographic difference

for the formation of two groups of nurses. The units share a manager; however, the nurses on each unit are assigned to the specific unit and do not move between the units including the casual status nurses. Therefore, nurses working on 1A and 1B acted as separate groups (Figure 3). Phase I was completed during the same week as the scheduled hospital education sessions.

The Nurse Intervention

The study intervention was developed using the five components of the collaborative self-management model (Make, 1994) and was based on self-efficacy (Bandura, 1986). The self-efficacy framework guided both the delivery strategy and the key outcomes as self-efficacy was integrated into the nurse measurement tool. The components of collaborative self-management guided the content of the intervention as well as the development of the measurement tool as CSM was also integrated into the nurse appraisal inventory.

The intervention also included content from module four of the Quality Based Procedures: *Clinical handbook for chronic obstructive pulmonary disease* (QBP COPD) (Health Quality Ontario [HQO] & Ministry of Health and Long-term Care (MOHLTC; 2015) and the Canadian Thoracic Society (CTS) recommendations for management of chronic obstructive pulmonary disease in 2008 highlights for primary care (O'Donnell et al., 2008). The CTS (O'Donnell et al., 2008) provides support and recommendations for primary care management of COPD and the QBP (HQO & MOHLTC, 2015) focuses on developing a management plan which begins when the patient with COPD presents to hospital and continues through to discharge care. The QBP COPD was created as a, "compendium of the evidence-based rationale and clinical consensus driving the development of the policy framework and implementation approach for COPD patients

seen in hospitals" (HQO & MOHLTC, 2015, p. 9) and provides the basis for setting clinical standards of care provincially. The expectation is that the standards be linked to mechanisms of funding, development of care pathways, quality improvement and program development as well as performance measures (HQO & MOHLTC, 2015). The document provides a Care Pathway based on the episode of care or module and follows a patient from presentation to the emergency department through to discharge outlining the expectations of care at each module (HQO & MOHLTC, 2015). Module four lists the specific interventions and follow up information which is to be provided by the nurse to the patient by before discharge. These interventions include completing a clinical assessment and reviewing education topics such as inhaler technique, immunizations, smoking cessation and ensuring follow up post discharge as necessary with support services (HQO & MOHLTC, 2015).

Nurses assigned to the intervention group received a 90-minute interactive education session integrating the interventions of Care Module Four (HQO & MOHLTC, 2015) and the components of collaborative self-management (Make, 1994). Each day the education was provided by a member of the outpatient COPD Clinic respirology team including the researcher, and two Respirologists using teaching strategies such as a Powerpoint presentation and interactive discussion. Topics presented included pathophysiology of COPD, medication and inhaler demonstration, and review of self-management strategies and collaborative self-management components such as partnership, goal setting, education and monitoring (Appendix C). According to Bandura's theory, there are four sources of self-efficacy mastery, vicarious learning, social persuasion, and emotional support. These four sources were incorporated into the educational intervention by: 1) combining information about patients who have shared

their stories of how education has helped them to adopt collaborative self-management strategies and actively participate in their care; 2) providing opportunities for participants to role-model behaviours; 3) reviewing how physiological factors such as stress, fatigue or fear can impact the processing of self-efficacy and; 4) providing explicit feedback to individuals to enhance self-efficacy (Spence Laschinger & Tresolini, 1999).

Nurses in the control group did not attend the COPD education session. As a group, every day the nurses allocated to the control group attended a viewing of a 20-minute, non-scripted videotape of patients describing their experiences of being hospitalized with COPD. The videotape was recorded at the hospital as a teaching tool for patients as a method of offering reassurance to patients when they are hospitalized. The individuals in the videotape had provided consent for the use of the videotape as an educational resource. In the video, a patient described how afraid she was when she came to the emergency department with breathlessness. The second patient described how he kept coming to the hospital with breathlessness and was afraid because he didn't know what was happening. The patients described how smoking cessation, getting tested for lung disease and starting on medications has been helpful for managing symptoms. Each day of the seven days the number of nurse participants was similar with five to seven nurses attending the intervention session and five to six nurses attending the control group.

Phase II: Patient Participation

Phase II was the second part of this research study and included a survey of a representative sample of patients from both study arms admitted with COPD exacerbations. Patient study participation included the completion of a pre-discharge assessment tool and a COPD knowledge survey. Phase II was initiated at the completion

of the Phase I intervention sessions for nurse participants and the collection of nurse data; therefore, patient study participation commenced post nurse intervention and continued for five months (Figure 4). Patients admitted to hospital with COPD were informed of the study by their respirologist, hospitalist or nurse. When the patient identified that they wanted more information the physician or nurse contacted the researcher. The researcher approached patients who wanted further information to review the inclusion and exclusion criteria, provide more information, answer all questions and discuss potential participation. All patients who met the inclusion and exclusion criteria were invited to participate. Patients were provided with a Letter of Information inviting their participation. All questions were answered prior to participation in the study. The patients were informed that participation was voluntary, can be terminated at any time, and not participating would not affect their care during hospitalization (Appendix D). Each patient consenting to participate was provided with a $20 Tim Horton coupon as appreciation for participation and recognition of the inconvenience that participation in clinical research could cause (Jacobson et al., 2008).

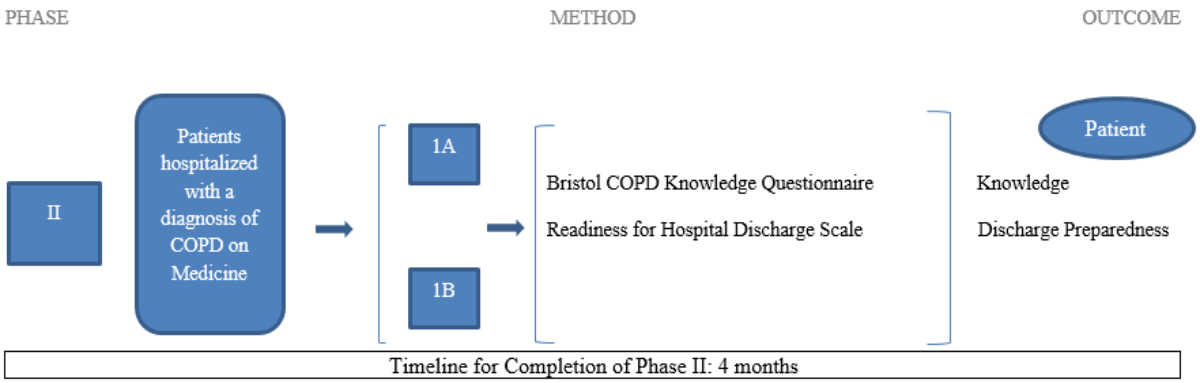


Figure 4. Phase II Study Design

A consecutive sampling procedure was used to recruit patients admitted to hospital on either medical unit with a primary diagnosis of exacerbation COPD or exacerbation of COPD. According to Mathieson (2014) consecutive sampling is very similar to convenience sampling with the exception that it seeks to include all accessible subjects within the time frame of the study to provide a strong representation of the target population. Consecutive sampling is most commonly used in clinical research providing additional rigor in that each eligible patient presenting to hospital with AECOPD is approached for participation (Mathieson, 2014). A significant consideration when implementing this type of sampling method for a study on patients hospitalized with exacerbation of COPD is to ensure that the study period extends long enough to include seasonal variation to exacerbation triggers such as influenza season (Mathieson, 2014). This type of sampling considers the budget of the study and the time constraints to sample large populations (Mathieson, 2014). Only patients who met the inclusion criteria (see below) and were admitted to one of the two medical units were eligible to participate.

Sample Size Calculation of Patient Participants

The sample size was determined a priori using G * Power for a two-tailed, two independent group *t*-test with a power level of .80, a significance level of $a = .05$, and a medium effect size $d = .50$. The required sample size was calculated at $N = 64$ patients per group for a total of 128 patients (Faul et al., 2009). In determining the sample size for this study there was sufficient rationale to hypothesize that patients admitted to the intervention unit would have higher scores on knowledge and readiness for hospital discharge than patients admitted to the unit where nurses participated as a comparison group. The medium effect size indicates a realistic difference between patient mean knowledge scores for the intervention and control units (Plichta & Kelvin, 2013).

Although it was estimated that approximately 30 patients per month would be admitted to hospital with COPD and available to participate, not all patients admitted to hospital requested information. Only patients who requested information were approached to participate. As recruitment on each unit was taking longer than expected, resources were reviewed including costs and time. Based on this review it was determined that recruitment would be stopped when 51 patients were recruited for participation in the study for each unit.

Overall, a total of 106 patients requested further information related to the study from both medicine units. Of the 106 patients that were provided with information only four patients declined participation providing a 96% response rate. Of the patients that participated completed questionnaires were received from all patients. Phase II was completed when a total of 102 patients participated by completing questionnaires and within 5 months of completion of Phase I**.**

Inclusion/Exclusion Criteria for Patient Participants

The inclusion and exclusion criteria focused on selecting patients to invite to participate that would form a representative sample. Inclusion criteria included patients that were hospitalized with a primary diagnosis of exacerbation of COPD and admitted to medicine, patients that speak and read English, were able to provide consent and had a discharge date and were preparing for discharge home from hospital. Exclusion criteria included, patients transferring to another institution such as, repatriation to another hospital, long-term care, respite, hospice or rehabilitation, patients hospitalized with other than a primary diagnosis of COPD, patients who were unable to provide consent, were cognitively impaired, have end-stage COPD, oncology diagnosis or were palliative.

Instrumentation

Nurse Demographics

Demographic information was collected from nurses including type of nurse, age, gender, number of years of nursing experience, specialized certifications, number of years within the medicine unit and highest level of education achieved.

Nurses' Pretest-Post-Test Survey

Prior to implementation of this study a pilot survey was completed. The surveys were provided to ten health care professionals including clinic physicians, outpatient nurses and staff to review the content of the survey and provide feedback. At the completion of the pilot survey comments were reviewed; the survey team provided feedback for the survey but did not request any changes in the surveys.

All nurses consenting to participate were assigned to either the intervention or the control and were provided with instructions for completing the pretest and post-test surveys (Appendix E). The individual nurse pretest and post-test surveys were completed on the same day of attendance at the educational session intervention. The pretest was completed immediately prior to the intervention session and nurses were provided with 20 minutes at the end of the intervention for completion of the post-test surveys. The control group completed the pretest immediately prior to the videotape presentation and completed the post-test in the 20 minute period following the end of the video.

Nurses' knowledge was measured using a six-question researcher developed questionnaire consisting of multiple-choice questions related to educational topics for patients developed by integrating the CTS COPD clinical practice guideline (O'Donnell et al., 2008) and the Registered Nurses Association of Ontario (RNAO) best practice guideline (2005). Scores were computed by summing items with each correct answer

scored +1 and incorrect answers scored as 0. The highest sum for the knowledge test could therefore be 6 and the lowest summed score could be zero. The answers on the questionnaire were counted for a total number of correct responses and the sum was compared between groups of nurses pre and post intervention.

The Kuder-Richardson Formula 20 (KR-20) is a measure of internal consistency reliability for questionnaires using dichotomous or binary attributes such as correct and incorrect. Although KR-20 values can range from 0.00 to 1.00 with 0.00 as none and 1.00 as perfect, higher levels can indicate higher reliability of the test to measure the outcome of study (McGahee & Ball, 2009). The results of the KR-20 analysis of the COPD Knowledge questionnaire indicate a low level of reliability pretest (.30) and a reasonable level of reliability post-test (.50).

Nurse self-efficacy for preparing patients for discharge with discharge information was measured using a 14-question, self-reported self-efficacy scale developed for this study (Bandura, 2006). As self-efficacy is concerned with the perception of capability (Bandura, 2006), efficacy beliefs can influence the course of action a nurse may take to provide information to a patient hospitalized with COPD and their level of commitment to providing the education. Self-efficacy appraisals reflect the level of difficulty that the nurse believes they can surmount because if there were no obstacles to providing education to patients then the activity would be easily performed, and all nurses would be efficacious (Bandura, 2006). The self-efficacy appraisal measured the self-efficacy of the nurse to complete the education with all COPD patients (Bandura, 2006). "Efficacy items should accurately reflect the construct" (Bandura, 2006, p. 308). To produce a predictable result for nurses' perceived self-efficacy to provide discharge education to patients hospitalized with COPD, the scale items were targeted to factors that directly relate to the

provision of educational information and structure of the education intervention (Bandura, 2006). Using the response scale, as the standard methodology for measuring self-efficacy beliefs, individuals record their belief in their ability to execute the activity by recording the strength of their efficacy belief on a scale which can include single unit intervals ranging from 0 – 10 (Bandura, 2006). Nurses were asked to rate the strength of their efficacy beliefs on a 0-10 scale ranging through varying degrees of assurance with '0' (Cannot do at all), '5' (Moderately certain can do) and 10 (Highly certain can do) (Bandura, 2006). Phrasing the items in terms of "can do" as a judgement of capability rather than "will do" which is a judgment of intention distinguishes self-efficacy conceptually and empirically from intention (Bandura, 2006). For example, nurses were asked, "how confident are you that you can teach patients about COPD medications as of now and how confident are you that you can collaborate with patients to determine an individualized management plan as of now? Scores were computed by summing items. The lowest sum for the self-efficacy scale could therefore be zero and the highest summed score could be 140. Directly aligning the self-efficacy scale to the specific patient care interventions of module four of the QBP COPD (HQO & MOH-LTC, 2015) provided a rating of specific judgement of belief that the intervention could be achieved (Bandura, 2012). The scale integrated how the efficacy beliefs could differ in generality, level and strength by organizing the questions by the CSM components (Bandura, 2006).

Reliability Testing of Nurse Self-Efficacy

A reliability analysis was completed on the 14-item, self-efficacy appraisal scale. The questionnaire included a practice item to familiarize the participant with the use of the scale (Bandura, 2006). Cronbach's alpha showed the questionnaire had acceptable

reliability: a = .92 pretest and a = .95 post-test. Most items appeared to be worthy of retaining, resulting in a decrease in the alpha if deleted. Thus, no items were deleted.

Patient Demographics

Demographic information was collected from patients including age, gender, marital status, occupation and highest level of education achieved. Information was also collected related to the identification of the medicine unit admission, length of hospital stay, number of previous hospital admissions, and number of emergency room visits for similar occurrences within 12 months if any. As no medical records were accessed, an individual participant's severity of COPD could not be assessed; however, information was collected regarding the number of self-reported hospital admissions and emergency room visits experienced within the previous 12 months.

The Bristol COPD Knowledge Questionnaire (BCKQ)

Patient data collection tools included a self-reported level of knowledge of COPD as measured by the Bristol COPD Knowledge Questionnaire (BCKQ) (White, Walker, Roberts, Kalisky, & White, 2006). The researchers report that a single score quantifies knowledge of COPD and enables the assessment of the effectiveness of education (White et al., 2006). The 65-question survey with questions arranged within 13 subscales was developed to assess the results of patient education, specifically to assess patient's knowledge of COPD including, cause, nature, symptoms, prevention, and management (See Appendix F). Each of the 13 domains consists of five items. The BCKQ is a self-reported questionnaire with questions related to self-management strategies such as medications, immunizations, and exacerbation management. Study participants can choose one of three answers ("true", "false", I don't know") (White et al., 2006). A correct answer is scored as +1 and incorrect or unknown is scored at 0. A maximum

score of 65 can be attained if all answers are correct, with higher scores indicating higher level of knowledge and the lowest score could be zero.

White et al. (2006) report that the BCKQ has been judged by healthcare professionals and patients to have good content and face validity, good internal consistency and reliability with a Cronbach's alpha of .73 and test-retest reliability and responsiveness measured after eight weeks r = .71 (White et al., 2006). The Bristol COPD Knowledge Questionnaire has been used in several recent intervention studies (Choi et al., 2014; Hill et al., 2010; Mitchell et al., 2014). The BCKQ is a two-page instrument that was estimated to take 15-20 minutes to complete. In this study the BCKQ demonstrated a Cronbach's alpha of .69 indicating an acceptable level of internal consistency for the scale with this specific sample. Evidence of construct (convergent) validity was supported by significant positive correlation (r = .40) between COPD knowledge as measured using the BCKQ and COPD treatment adherence in a study by Choi et al. (2014).

The Readiness for Hospital Discharge Scale Older Person (RHDS)

Readiness for discharge from hospital was measured by the Readiness for Hospital Discharge Scale Older Person Short Form (RHDS). Although not specific to the COPD patient, it is a validated scale to measure a patient's perceived readiness for discharge just prior to discharge (Mabire, Coffey & Weiss, 2015). The RHDS is the only available and validated scale measuring patient's perceived readiness just prior to hospital discharge and is specific to persons 65 or older (Mabire et al., 2015). The questionnaire required five to ten minutes to complete (Mabire et al., 2015). The self-reported summated rating scale (0-10) consists of anchor words ("not at all", "totally) to assist in translating the meaning of the scale to subjects (Weiss & Piacentine, 2006).

The initial version of the RHDS consisted of 23 questions and was organized into four attributes: Personal Status-the physical-emotional state immediately prior to discharge; Knowledge-the perception of having the required information to respond to common concerns post discharge; Coping Ability-the perceived self-efficacy and ability of the patient to self-manage post discharge; and Expected Support-assistance expected to be available following discharge (Weiss & Piacentine, 2006). After psychometric testing in 2006 the scale was edited to 21 questions (Weiss & Piacentine, 2006).

A three country (Switzerland, United States and Ireland) secondary analysis on data collected in 2008-2012 (n = 998) to identify the factor structure has resulted in a short-version 9-item, 3-factor structure (Mabire et al., 2015). A two-step process performed to evaluate psychometric properties included a confirmatory factor analysis and exploratory factor analysis (Mabire et al., 2015). The three factors demonstrate acceptable reliability with Factor 1- Self-care Readiness a = .89, Factor 2-Knowledge a = .72 and Factor 3-Expected Support a = .88 (Mabire et al., 2015). The authors report that the results of testing of the three factors: Knowledge, Self-care Readiness and Expected Support that the questionnaire has good internal consistency and reliability with a Cronbach's alpha of .87 (Mabire et al., 2015). Construct validity was assessed by comparison group analysis of scores on the current 9-item version to previous versions of containing 21 items (Mabire et al., 2015). Higher scores indicate high levels of readiness and lower scores indicate lower levels of readiness or lack of preparation to leave hospital and could contribute to predicting patients at risk of readmission (Mabire et al., 2015; Weiss et al., 2007; Weiss & Piacentine, 2006). Patients, who lived alone, were older, or who indicated, "not ready" for discharge had lower scores and higher readmission risk (Mabire et al., 2015). Respondents who reported that they had received education and

were more involved in their care scored higher (Mabire et al., 2015). Patients who scored higher on the RHDS Older Person Short Form were found to be less likely to be readmitted than patients with lower scores. Logistic regression analysis confirmed the RHDS to be a predictor of readmission or emergency room visits as patients with higher scores were less likely to readmit (Mabire et al., 2015). The Readiness for Hospital Discharge Scale Older Person Short Form (RHDS) is a reliable and valid measure of patients' perception of their readiness for discharge from hospital. Each of the nine items are scored on a 11-point Likert scale with an item mean score of seven or more indicating a high score (Mabire et al., 2015). The lowest summed score for the RHDS therefore could be zero and the highest summed score could be 90. For this study, using the overall score, the RHDS (Appendix F) demonstrated a Cronbach's alpha of .86 indicating a high level of internal consistency for the scale with this specific sample.

Phase III: 30-Day Readmission Rate

The 30-day readmission rate is a key metric in health care which is used to determine the risk of needing care following discharge from hospital **(**Canadian Institute for Health Information (CIHI, 2012**)**.

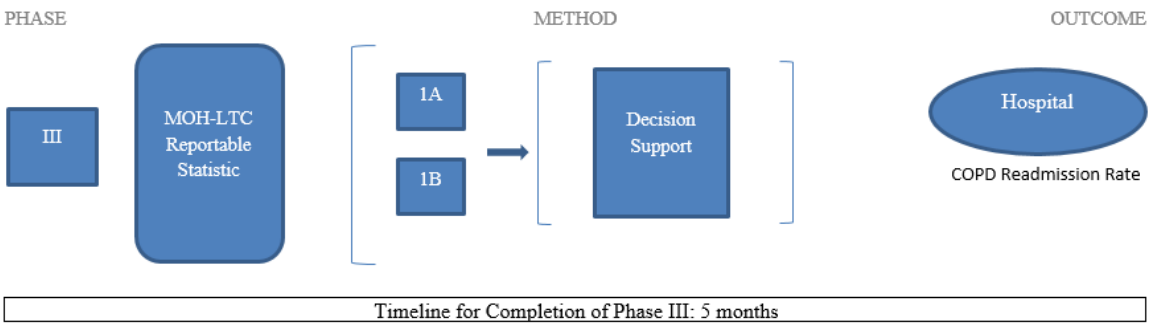


Figure 5. Phase III Study Design

Non-elective return to an acute care hospital for any cause is counted as a readmission if it occurs within 30 days of the index episode of inpatient care (CIHI, 2012). The reported 30-day medical readmission rates do not include readmission for mental illness (CIHI, 2012). Each patient hospitalization is categorized based on CIHI's Case Mix Group (CMG) methodology which aggregates data into homogenous groups (CIHI, 2012). In comparison to the 8.5% rate of all cause readmission in Canada, at 18.8% COPD ranks as the highest medical inpatient readmission CMG (CIHI, 2012). Readmissions increase the cost of providing health care and although they are thought to be triggered by certain factors such as, length of hospital stay, age, gender, comorbid illness and income, readmissions are also thought to be avoidable (CIHI, 2012). The purpose of obtaining the 30-day readmission rate is to compare the rate from similar calendar months one year previous to the current rate post intervention. The 30-day readmission rate was determined from data obtained from the hospital decision support department, as the 30-day readmission rate is a reportable MOHLTC statistic (Figure 5).

Data Management

Data integrity. Data screening and cleaning were conducted following procedures outlined by Tabachnick and Fidell (2013). Ten percent of the paper surveys were audited to ensure accuracy. The error rate was less than .1% and no further auditing was deemed necessary.

Missing data. All study subjects providing consent to participant completed the full study with no withdrawals or lost to follow up within either the nurse participant (Phase I) or patient participant (Phase II) groups. Data were screened for missing data following the recommendations of Little (1988). Screening for missing data included assessing for two types of missing data: missing completely at random (MCAR), which

refers to data that is not missing by an identifiable pattern and without influence of other data, and missing at random (MAR), which refers to missing data due to the variable itself such as reporting level of education (Kwak & Kim, 2017; Little, 1988; Schlomer, Bauman, & Card, 2010; Tabachnick & Fiddel, 2013). Ideally keeping all cases for analysis is desirable as the reduced data would reduce the sample size and therefore the statistical power; however, when participants do not respond to questions options to manage missing data must be considered (Kwak & Kim, 2017). At the completion of the data collection, data from nurse participants were individually reviewed for any missing data and to ensure the inclusion and exclusion criteria were maintained. Two nurse participant study questionnaires were found to be missing all of the information from the post-test questionnaires and were therefore excluded from the analysis as more than 50% of data were missing. One study questionnaire completed by a student nurse who was temporarily on the unit was also excluded from analysis, as it did not meet the inclusion criteria and was therefore not counted in the determination of the available number of nurses for participation, leaving a total of 83 completed cases for analysis. Little's (1988) MCAR test is the most common test for missing cases and is supported by SPSS 25.0 Missing Values Analysis (MVA). Review of the data indicated that the variable age was missing for $n = 8$ (9.6%) and years on unit was missing for $n = 10$ (12.0%) of nurse participants. Analysis of the demographic data using missing value analysis SPSS 25 ($X^2(5, N = 83), 5.350, p = .50$) indicated that as the p value was greater than .05, and therefore not significant; the demographic data were confirmed to be missing completely at random. Missing value analysis of the individual nurse pretest self-efficacy variables indicated that missing data accounted for 3.6% of the data or less than 5% overall ($X^2(106, N = 83), 110.26, p = .369$). The significance level was greater than $p = .001$ and

confirms that data were missing in a completely random pattern. Therefore data were assumed to be missing completely at random; no further missing data analysis is necessary if the MCAR is shown to be non-significant (Little, 1988),

Using the same process as with review of the nurse participant data, data from patient participants were reviewed for any missing data. Analysis of the demographic data using missing value analysis SPSS 25.0 indicated that the demographic data were not missing completely at random (X^2(13, N = 83), 28.821, p = .007). Further review of the data indicated that 18 (17.6%) of patients did not indicate if they had presented to the emergency department in the past 12 months; therefore, data were reported as N = 84.

Missing value analysis of both the RHDS and BCKQ data indicated that less than 5% of data were missing. Analysis confirmed that the BCKQ data were missing in a completely random pattern (X^2(266, N = 102), 257.365, p = .464) and no further missing data analysis was necessary. Analysis of the nine-item RHDS did not indicate any missing data; therefore, analysis was completed on all available data and no data were excluded.

Underlying data assumptions. Prior to conducting the analysis on the nurse participant data, the following assumptions were examined. For the paired *t*-test analysis there were two paired measurements such as pretest and post-test nurse and patient data, and the two measures were normally distributed or at least with 30 pairs of data were not too badly skewed (Plichta & Kelvin, 2013, p. 130). For the independent *t*-tests the grouping data were dichotomous, as in the two groups of nurses or patients; the two groups were independent of each other, as in the two separate units; and the characteristic of interest was continuous data which was normally distributed (Plichta & Kelvin, 2013). For the Pearson test of correlation to be used the two variables must be either ratio,

continuous or interval measurement scale, normally distributed, and related to each other in a linear fashion with no outliers on scatterplot (Plichta, & Kelvin, 2013). To evaluate normality of the data sample distribution scores were analyzed using skewness and kurtosis values, histograms and the Shapiro-Wilk Test (Shapiro & Wilk, 1965). Analysis indicated that the pretest knowledge data were positively skewed and not normally distributed indicating lower scores of knowledge (M = 3.63, SD = 1.09, Skewness = -.362) while post-test scores were negatively skewed, indicating higher knowledge scores (M = 5.00, SD = 1.12, skewness = -.811). Analysis of this difference using the Shapiro-Wilk Test (Shapiro & Wilk, 1965) indicated that the positive skewness of the distribution in pretest data was statistically significant (p = <.001) and the negative skewness of the post-test data was also statistically significant (p = <.001). Although the non-parametric, sign test is indicated as an alternative when the normality assumptions are violated, the *t*-test outperforms the sign test in situations where the skewness is in the direction of rejection tail for significance level (Reineke, Baggett, & Elfessi, 2003). As the distribution indicates a left skew or positive skew pretest and a right skew or negative shift post-test and therefore the shift is in the opposite direction, the *t*-test is argued to have superior power over the sign test when the shift is in the opposite direction (Reineke et al., 2003). Therefore, analysis of the data was completed using the paired samples *t*-test and the Levene's test was reported when analysis of the data identified that the homogeneity of variance assumption had been violated.

Data Analysis

Analysis was completed using Statistical Package for Social Statistics version 25.0 (IBM, IL, USA) and statistical significance was set at alpha $\leq$ .05.

Data from nurses were analyzed with descriptive statistics to describe baseline characteristics of the two groups of nurses. Means and standard deviations were used to describe continuous variables while categorical variables were described in frequency and percentages. Several correlations were examined including participant nurse age, level of education and years of experience in nursing and years of experience on the unit to determine if there is a relationship to level of knowledge and self-efficacy test scores. The chi-square test was used to compare the two groups on demographic characteristics. Independent *t*-tests were implemented to evaluate the differences in the mean of summative scores between the intervention and control group nurse participants and within group differences were analyzed using paired *t*-tests.

Data obtained from patients were analyzed for descriptive statistics to describe baseline characteristics of the patients including mean and standard deviation, age, length of stay, and number of emergency room visits and number of hospital admissions to hospital in the previous 12 months. Scores on patient questionnaires were computed by summing items of the RHDS and of the BCKQ. Independent *t*-tests calculated the difference in mean between the patients admitted to the intervention unit and patients admitted to the control unit, independent *t*-tests were used to compare the age, length of stay, previous hospital admissions and emergency room visits with the grouping variable as exposure to the nurse providing education and the dependent variable being knowledge of COPD and readiness for discharge (Plichta, & Kelvin, 2013).

Comparison of 30-day Readmission Rates

The 30-day rate of readmission for COPD is a reportable MOHLTC statistic. As a recognized outcome measure for acute care hospitals the 30-day rate of readmission to hospital provides a metric to quantify the quality of care. The 30-day rate of readmission

is calculated by dividing the number of patients admitted with COPD discharged from hospital and readmitted to hospital within 30 days by the denominator or total number of hospital COPD index discharges. The information is reported through the Discharge Abstract Database (DAD), a national database of information on all separations from acute care institutions, including deaths, sign-outs and transfers (CIHI, 2012, p. 1). To evaluate the study population for unplanned readmissions occurring within 30 days of discharge, the rate of unplanned readmissions to the hospital following the index hospitalization for COPD was obtained from the decision support department of the hospital. To determine if there was a reduction in the 30-day rate of readmission, the proportion of readmissions, which occurred during the study period, were compared to the proportion of readmissions from similar months one year previous using a chi-square statistic.

Protection of Human Rights

This research project was conducted as guided and approved by the ethical review board of the University of Western Ontario, and the Tri Hospital Research Ethics Board.

Tri Hospital Research Ethics Board (THREB) approval was obtained as well as ethics approval from the University of Western Ontario prior to commencing this research study. Eligible nurses and patients were provided with information related to participation in the research project. The consent process included a review of the study confidentiality, rights, risks and benefits of participation. Participants were informed that they could withdraw their participation at any time without concern. All participants were provided with the opportunity to ask questions prior to completing the consent process. All nurse and patient participants consenting to participate were provided with a Letter of Information outlining the purpose of the study and contact information for the

project investigator (Appendix B). Data integrity was safeguarded as the study was completed in a specified amount of time and in a fixed order with data collection from the two groups of nurses completed both prior to and immediately after the intervention for all nurses on medicine. As well, the data collection process related to patients was completed within 5 months of the intervention. All data were secured in three ways. First the hardcopy surveys were collected and kept in a locked file accessible only by key within a separately secured area which is only accessible by study personnel. Secondly two digital databases were developed. The first database holds the master list of consented nurse participants and study identification numbers. The second database contains the information related to the survey information. Both databases are held on a secure computer and password protected, accessible only to the researcher and supervisor. As a final note, all surveys collected were provided with a study project code number only. Patient participants provided implied consent by completing the questionnaires. No personal information was collected from patients. For the purpose of this study, no healthcare information was collected and no healthcare records were accessed. All information related to readmission rate was provided as aggregate numbers by decision support and all patients were approached only after they agreed to receive information related to the study.

Summary

Providing COPD self-management information to nurses to increase nurse knowledge and self-efficacy for preparing patients to manage post discharge supports the hospital-based nurse, the patient admitted with COPD and the organization. Evaluating the effect of a specialized nurse education program on these outcomes is possible through this multi-phase approach. The three-phase approach permitted the completion of the

nurse education sessions prior to recruitment of patients admitted to hospital and the pretest-post-test comparison group design offered the ability to evaluate change over time (Gliner, Morgan, & Harmon, 2003). The strength of the interventional design was further enhanced by alignment with Module four of the Quality Based Procedure for hospital management of COPD which demonstrated integration of evidence-informed practice (HQO & MOHLTC, 2015). The addition of a control group as comparison, which, although not randomized, was as similar as possible to the intervention group in baseline characteristics helped to minimize threats to internal validity (Handley, Lyles, McCulloch, & Cattamanchi, 2018).

CHAPTER FOUR: RESULTS

Introduction

The purpose of this chapter is to report the results of this three-phase clinical research study. In Phase I of the study nurses in the intervention group attended a 90-minute education intervention while nurses in the control group viewed a 20-minute video only and both groups self-reported their level of knowledge and self-efficacy for preparing patients to manage COPD after discharge from hospital. In Phase II, post-intervention data obtained from patients admitted to the two study hospital units with COPD were examined to evaluate the effectiveness of the nurse education intervention. In Phase III post-intervention data were obtained from decision support services and compared to historical data to determine if there were any differences between the 30-day rate of readmission to hospital for COPD during the same calendar period one year prior to the intervention. In this chapter the overall characteristics of the study participants in each phase and group are described and compared. Paired and independent sample *t*-tests were performed on data in Phase I with the two groups of nurse participants on the intervention and control units, and also in Phase II with patient participants admitted to the intervention and control units. All analyses were completed using the Statistical Package for Social Statistics version 25.0 (SPSS; IBM, Chicago, IL, USA) and statistical significance for the study analyses was set at $p \leq .05$. This chapter concludes with a summary of the information presented.

In this pretest-post-test, quasi-experimental, two-group intervention study, the hypothesis tested was: implementation of a hospital-based education program that includes a standardized approach to discharge preparation of patients hospitalized with COPD and targeted to direct care nurses results in (a) increased nurse knowledge and

self-efficacy to provide discharge care, (b) increased patient knowledge of COPD self-management and readiness for discharge, and (c) reduced 30-day COPD-related, readmission rate. In Phase I, Hypothesis (a) was examined by obtaining data from nurses (n = 83) of two hospital medicine units. In Phase II, Hypothesis (b) was examined by surveying the level of knowledge of COPD and readiness for discharge home from patients (n = 102) admitted to hospital with COPD on the same two medicine units. Phase III examined Hypothesis (c) for any change in the rate of 30-Day readmission for COPD from pre-intervention to post-intervention.

Phase I Results - Nurses

Phase 1 of the study took place during February and March 2018. In Phase I nurses who consented to participate were allocated to either the intervention group or to the control group by identifying which medicine unit they worked on. The intervention group of nurses attended one 90-minute education session on COPD. Nurses in the control group did not attend the COPD education session but did view a 20-minute video on patients with COPD.

Nurse Sample Characteristics

A convenience sample of 83 nurses from the two medical units consented to participate in this research. Table 3 includes a description of the demographics of the participating nurses (n = 83) overall and by study group. The College of Nurses of Ontario (CNO; 2017) report that there are 104,483 registered nurses and 48,748 registered practical nurses indicating there are 46.5% more registered nurses than registered practical nurses in Ontario. Sample demographics appear to be similar to the College of Nurses (CNO; 2017) statistics with the study sample comprising 35% more registered nurses (RN) than registered practical nurses (RPN) and males comprising 7.2% of the

entire study sample. The mean age of nurse participants (*n* = 75) was 40.40 years (*SD* = 11.82) which is about 10% lower than the average age (44.8 years) of nurses in Ontario (CNO, 2017). Nurses reported a mean of 14.90 years in nursing (*SD* = 11.72) and 10.68 years (*SD* = 10.23) of nursing on the current medicine unit. Diploma educated nurses comprised the majority of the study sample (60.2%).

Table 3

Demographics of Phase I Nurse Participant Study Sample (N = 83) Intervention (n = 43) and Control (n = 40)

			Groups		
Demographics		**Total (N = 83)**	**Intervention (n = 43)**	**Control (n = 40)**	***p***
		N (%)	***n (%)***	***n (%)***	
Gender:	Female	77 (92.8)	41 (95.3)	36 (90)	
	Male	6 (7.2)	2 (4.7)	4 (10)	.35
Credential:	RN	56 (67.5)	33 (76.7)	23 (57.5)	
	RPN	26 (31.3)	10 (23.3)	16 (40)	.08
Education:	Diploma	50 (60.2)	27 (62.8)	23 (57.5)	
	BScN	31 (37.3)	14 (32.6)	17 (42.5)	.29
	MScN	2 (2.4)	2 (4.7)		
		M(SD)	***M (SD)***	***M (SD)***	***p***
Age in years:		40.40 (11.82)	42.59 (11.73)	38.03 (11.61)	.10
Years in Nursing:		14.90 (11.72)	16.24 (11.88)	13.43 (11.51)	.28
Years on Unit:		10.68 (10.23)	12.42 (10.87)	8.34 (8.93)	.09

The sample size of 83 nurses included 43 (51.8%) nurses in the intervention group and 40 (48.2%) nurses in the control group. To test whether proportions by demographic were different in each group a X^2 test of independence with $p \leq .05$ as the criteria for significance was completed. The results indicated no significant differences in the

numbers of males and females X^2 (1, N = 83) = .88, p = .35, the numbers of RN and RPN participants X^2 (1, N = 82) = 2.98, p = .08), or the level of education of participants, X^2 (2, N = 83) = 2.51, p = .29 between the two groups.

Results of an independent samples *t*-test indicated that there were no significant differences between the two groups on age ($t_{(73)}$ = 1.69, p = .10) or years of experience in nursing ($t_{(80)}$ = 1.09, p = .28). Although the nurses in the intervention group reported more years of experience on the unit (M = 12.42, SD = 10.87) when compared to control (M = 8.34, SD = 8.93) this difference was not statistically significant ($t_{(71)}$ = .100, p = .09).

Hypothesis Testing

Implementation of a hospital-based education program that includes a standardized approach to discharge of patients hospitalized with COPD and is targeted to nurses' was hypothesized to result in nurses' increased knowledge of COPD and self-efficacy to provide discharge care. Means and standard deviations were calculated for the COPD Knowledge Questionnaire (knowledge) and the Nurse Appraisal Inventory (self-efficacy) at pretest and post-test for both the intervention and control groups nurse participants.

COPD Knowledge

Summed scores of the six-question COPD Knowledge Questionnaire obtained pre and post the education session were analyzed (Table 4). Using a paired samples *t*-test, mean pretest scores of knowledge were compared to the post-test scores of knowledge for each group. Analysis of the difference in scores for the intervention group indicated that post-test mean scores of COPD knowledge (M = 5.84, SD = .48) were higher than pretest mean scores (M = 3.47, SD = 1.12). The results of the paired samples *t*-test (Table 4)

indicated that this difference was significant ($t_{(42)} = 13.71$, $p < .001$, 95% Confidence interval [2.02, 2.72]).

Analysis of the difference in scores for the control group indicated ($t_{(39)} = 1.74$, $p = .09$, 95% Confidence interval [.49, .65]) that post-test mean scores of COPD knowledge ($M = 4.10$, $SD = .87$) were higher than pretest mean scores ($M = 3.80$, $SD = 1.04$) but not significantly.

Table 4

Results of Paired t-tests of Mean Scores of COPD Knowledge for Intervention (n = 43) and Control (n = 40) Groups Pre and Post Intervention

Outcome	Group						95% CI for Mean Difference			
	PRE			POST						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*p*
INTERVENTION										
Knowledge	3.47	1.12	43	5.84	0.48	43	2.02, 2.72	13.71	42	<.001*
CONTROL										
Knowledge	3.80	1.04	40	4.10	0.87	40	0.49, 0.65	1.74	39	.09

Two-tailed, * = $p < .05$

Hypothesis Testing: Knowledge

To test the hypothesis (a) that the intervention group was significantly different in mean COPD knowledge scores when compared to the control group, an independent samples *t*-test was performed (Table 5). There was no significant difference ($t_{(81)} = 1.41$, $p = .16$) between the groups prior to the intervention although the control group had a slightly higher knowledge score than the intervention group. Independent *t*-test analysis showed a significant increase in COPD Knowledge ($t_{(81)} = 11.11$, $p < .001$, 95%

Confidence interval [1.42, 2.05]) for nurse participants in the intervention group (*M* = 5.84, *SD* = .48) when compared to nurses in the control group (*M* = 4.10, *SD* = .87).

Table 5

Results of Independent t-tests of COPD Knowledge for Intervention (n = 43) and Control Groups (n = 40)

Outcome	Group						95% CI for Mean Difference			
	Intervention			Control						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*p*
PRE										
Knowledge	3.47	1.12	43	3.80	1.04	40	-808, .139	-1.41	81	.16
POST										
Knowledge	5.84	0.48	43	4.10	0.87	40	1.42, 2.05	11.11	81	<.001*

Two-tailed, * = $p < .05$

A Cohen's *d* effect size calculation was completed to quantify the size of the difference in mean post-test knowledge scores between the two groups, control (*n* = 40) mean post-test knowledge scores (*M* = 4.10, *SD* = .87) and intervention (*n* = 43) mean post-test knowledge scores (*M* = 5.84, *SD* = 1.04). The Cohen's *d* effect size was calculated by dividing the difference between the two groups, by the pooled standard deviation (.70). Essentially the pooled standard deviation is the average of the standard deviations of the intervention and of the control group (Coe, 2002). The resulting Cohen's *d* effect size was calculated at 2.48. The effect size (*d* = 2.48) was found to exceed Cohen's (1988) convention of a large effect (*d* = .80) and as such the magnitude of the difference exceeds 2 standard deviations. This effect size calculation provides a contextualization of the difference between groups (Coe, 2002; Sullivan & Feine, 2012).

Self-efficacy

To determine the within group difference from the pretest to post-test self-efficacy scores paired samples *t*-tests were completed (Table 6). The difference in self-efficacy scores for nurses in the intervention group from pretest (M = 80.30, SD = 19.72) to post-test (M = 114.12, SD = 10.18) self-efficacy scores was 33.82 points. The results of the paired *t*-test analysis indicated that this difference was significant ($t_{(42)} = 12.26$, $p < .001$, 95% Confidence interval [28.25, 39.38]).

Table 6

Results of Paired t-tests of Self-efficacy for Intervention (n = 43) and Control (n = 40) Groups Pre and Post Intervention

Outcome	Group						95% CI for Mean Difference			
	PRE			POST						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*p*
INTERVENTION										
Self-efficacy	80.30	19.72	43	114.12	10.18	43	28.25, 39.38	12.26	42	<.001*
CONTROL										
Self-efficacy	80.48	17.24	40	87.60	17.20	40	0.90, 13.35	230	39	.026

Two tailed, * = p <.05

However, control group nurse participants also demonstrated an increase in mean self-efficacy scores from pretest (M =80.48, SD =17.24) to post-test (M = 87.60, SD = 17.20) and this difference was also noted to be significant, using a paired samples *t*-test ($t_{(39)} = 2.30$, p = .026, Confidence interval [.90, 13.35]).

Hypothesis Testing: Self-efficacy

To test the hypothesis that the intervention group nurses were significantly different in mean self-efficacy scores when compared to the control group, independent samples *t*-test was performed (Table 7).

Table 7

Results of Independent t-tests of Self-efficacy for Intervention (n = 43) and Control (n = 40) Groups Pre and Post Intervention

Outcome	Group						95% CI for Mean Difference			
	Intervention			Control						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*p*
PRE										
Self-efficacy	80.30	19.72	43	80.48	17.24	40	-.829, 7.94	0.04	81	.97
POST										
Self-efficacy	114.12	10.18	43	87.60	17.20	40	20.26, 32.77	8.47	81	<.001*

Two tailed, * = $p < .05$

There was no significant difference between the groups prior to the intervention ($t_{(81)} = .04$, $p = .97$, 95% Confidence interval [-.829, .794]). Post intervention results of the independent *t*-test analysis showed that the intervention group reported higher self-efficacy ($M = 114.12$, $SD = 10.18$) than the control group ($M = 87.60$, $SD = 17.20$) and this difference was significant ($t_{(81)} = 8.47$, $p < .001$, 95% Confidence interval [20.26, 32.77]). Post-test self-efficacy scores in the intervention group were 26.62 points higher when compared to control.

To quantify the size of the difference in mean post-test self-efficacy scores between the two groups, a Cohen's *d* effect size calculation was completed. The Cohen's *d* effect size was calculated by dividing the difference between the two groups, control (*n*

= 40) mean post-test self-efficacy scores (*M* = 87.60, *SD* = 17.20) and intervention (*n* = 43) mean post-test self-efficacy scores (*M* = 114.12, *SD* = 10.18) by the pooled standard deviation (.14). The resulting Cohen's *d* effect size was calculated at 1.88. As the Cohen's *d* is greater than 1, the difference between the two means is larger than one standard deviation indicating a large effect size (Cohen, 1988).

In summary, results of the analysis indicated that at post-test, nurses in the intervention group reported significantly greater knowledge of COPD and self-efficacy to teach patients about COPD compared to the control group. Thus, hypothesis (a) was supported.

Additional Research Questions

Two research questions were posed and results of analyses to address those questions are reported below:

(1) Is there a relationship between nurse level of knowledge of COPD and nurse reported level of self-efficacy to prepare patients for discharge?

Table 8

Correlation Matrix for COPD Knowledge and Self-efficacy in the Intervention Group (n = 43)

Variable	1	2	3	4
1. Pre-Knowledge)	-			
2. Post-Knowledge	-.19	-		
3. Pre-Self-efficacy	-.19	-.13	-	
4. Post-Self-efficacy	-.12	-.05	.41*	-

Two-tailed correlation, * = p <.05

Analysis of the summed scores of post-test knowledge and post-test self-efficacy using Pearson correlation showed a negative but not significant association (r = - .05, n =

43, p = .73) within the intervention group. The intervention group mean scores of pretest self-efficacy correlated moderately and positively with mean post-test scores (r = .41, n = 43, p = .006; Table 8).

(2) Are nurse demographic factors such as education, years of experience, and work status related to nurses' COPD knowledge and self-efficacy for preparing patients for discharge from hospital?

Table 9

Correlation Matrix Intervention Group (N = 43)

Variable	1	2	3	4	5	6	7
1. Age	-						
2. Unit Experience (yrs)	.56*	-					
3. Nursing Experience (yrs)	.83*	.65*	-				
4. Pre-Knowledge	.05	.15	.25	-			
5. Post-Knowledge	-.32	-.15	-.23	.19	-		
6. Pre-Self-efficacy	.17	.31*	.24	-.19	-.13	-	
7. Post–Self-efficacy	.32	.15	.20	-.12	-.05	.41*	-

Two-tailed correlation, * = p <.05

Pearson correlations were computed to determine if any relationships existed among the continuously scaled demographic factors, specifically, age, years of working on the unit and years of experience in nursing and nurses' COPD knowledge and self-efficacy (pre and post-intervention; Table 9). Analysis of the data determined that years of working on the unit was positively associated with pretest self-efficacy (r = .31, n = 42, p <.044). Nurses' age negatively correlated with post-test knowledge (r = -.32, n = 39, p

= .05), and positively correlated with post-test self-efficacy scores (r = .32, n = 39, p <.05).

Phase II Results – Patients

Phase II of the study occurred between March and July 2018. Phase II was initiated after all seven nursing education intervention sessions were finished and all nurses had completed their participation in the study. Patients admitted to either one of the two study units were invited to participate. Patients who consented to participate completed the Bristol COPD Knowledge Questionnaire (BCKQ; White et al., 2006) and the Readiness for Hospital Discharge-Older Person-Short Form Questionnaire (RHDS; Mabire et al., 2015) prior to discharge home. Patient data were analyzed by independent two-tailed *t*-test to determine if there were any significant differences between the scores from patients admitted to the intervention unit (n = 51) and the control unit (n = 51).

Patient Sample Characteristics

A total of 102 patients admitted to the two medicine units consented to participate and completed two questionnaires. Review of the data revealed that 63 (61.8%) were male compared to 39 (38.2%) female participants (Table 10). Seventy-one participants (69.6%) identified as married, 11 as widowed (10.8%), 17 (16.7%) as divorced and 2 (2.0%) as single.

Responses (n = 84) to level of education indicated that 44 (43.1%) participants were high school prepared 35 (39.3%) identified as college prepared, and 5 (4.9%) identified university education. Ages of participants ranged from 46 – 89 years of age with a mean age of 69.29 years (SD = 8.92).

Table 10

Demographics of Patient Participant Sample (N=102), Intervention (n = 51) and Control (n = 51)

			Groups		
Demographics		**Total**	**Intervention**	**Control**	***p***
		N (%)	***n (%)***	***n (%)***	
Sex:	Female	39 (38.2)	20 (39.2)	19 (37.3)	
	Male	63 (61.8)	31 (60.8)	32 (62.7)	.84
Marital Status:	Married	71 (69.6)	34 (66.7)	37 (72.5)	
	Widowed	11 (10.8)	8 (15.7)	3 (5.9)	.24
	Divorced	17 (16.7)	9 (17.6)	8 (15.7)	
	Single	2 (2.0)	2 (3.9)		
Education:	High School	44 (43.1)	22 (43.1)	22 (43.1)	
	College	35 (39.3)	19 (37.3)	16 (31.4)	.82
	University	5 (4.9)	2 (3.9)	3 (5.9)	
		M(SD)	***M (SD)***	***M (SD)***	***p***
Age:		69.29 (8.92)	68.73 (10.53)	69.88 (6.92)	.52
LOS:		4.77 (1.33)	4.63 (1.09)	4.92 (1.53)	.27
ED Visits:		1.23 (0.75)	1.26 (0.95)	1.20 (0.46)	.71
Admissions:		.75 (0.83)	.68 (0.90)	.82 (0.76)	.41

The mean length of stay for the sample (*n* = 102) was 4.77 days (*SD* = 1.33) with length of stay varying widely within the group from two days to 12 days. Participants (*n* = 84) self-reported the number of emergency room visits that each participant had required within the previous 12 months which ranged from zero to four visits in total (*M* = 1.23, *SD* = .75).

Similarly, participants (*n* = 84) self-reported the number of admissions to hospital for COPD within the previous 12 months ranging from zero to three (*M* = .75, *SD* = .835). Therefore, in summary, the average patient participant was a married male, 69 years old, had high school education, had presented to the emergency department on one occasion and was admitted previously to hospital at least once within the previous 12 months, and a current hospital mean length of stay of 4.8 days.

Demographic characteristics of the patients admitted to the unit where nurses attended the education intervention and patients admitted to the unit acting as control were examined (Table 10). The mean age of a participant on the intervention unit was 68.73 (*SD* = 10.53) years and control 69.88 (*SD* = 6.92) years. Results of an independent samples *t*-test showed no significant differences between the two groups on age ($p = .52$).

Analysis using the Chi Square Test of Independence determined that there were no statistical differences in the groups by sex ($p = .84$), marital status ($p = .24$) or education ($p = .82$; Table 10).

Results of an independent samples *t*-test of continuous demographic variables indicated that there were no significant differences between the two groups in terms of the number of previous emergency department visits within the past 12 months ($p = .71$) and number of admissions to hospital within the past 12 months ($p = .41$). The difference in mean length of stay for patients on the intervention unit ($M = 4.63$, $SD = 1.09$) and patients admitted to the control unit ($M = 4.92$, $SD = 1.53$) was not statistically significant ($p = .27$).

Hypothesis Testing

Hypothesis (b) stated that implementation of a hospital-based education program that includes a standardized approach to discharge of patients with COPD that is targeted to nurses' results in increased patient knowledge of COPD self-management and readiness for discharge. To test the hypothesis that the patients admitted to the intervention unit would report increased knowledge of COPD when compared to the patients admitted to the control unit, an independent *t*-test analysis was performed (Table 11).

Table 11

Results of Independent t-tests for Intervention (n = 51) and Control Patients (n = 51)

Outcome	Group						95% CI for Mean Difference			
	Intervention			Control						
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*	*p*
Bristol COPD Knowledge Questionnaire	49.31	3.20	51	40.57	4.71	51	7.16, 10.33	10.97	100	<.001*
Readiness for Hospital Discharge	60.02	5.89	51	48.14	3.71	51	9.95, 13.82	12.20	100	<.001*

Two-tailed, * p = <.05

Results showed that patients who were admitted to the intervention unit had a higher mean score on knowledge (M = 49.31, SD = 3.20) than the control unit (M = 40.57, SD = 4.71).

Because a Levene's Test found that the homogeneity of variance assumption had been violated, ($F_{(1, 88)}$ = 10.97, p = .004) comparison of the mean scores of the BCKQ questionnaire was based on unequal variance. There was a difference of 8.74 points between mean scores of BCKQ between patients admitted to the intervention and to control units and this difference was noted to be significant ($t_{(100)}$, 10.97, p < .001, d = 2.17, 95% Confidence interval [7.16, 10.33]).

To test the hypothesis that the patients admitted to the intervention unit would report higher levels of readiness for discharge home when compared to patients admitted to the control unit, an independent *t*-test was performed (Table 11). Results of the analysis showed that patient participants admitted to the intervention unit had a higher mean RHDS score (M = 60.02, SD = 5.89) than the control unit (M = 48.14, SD = 3.71). Levene's Test results showed that the homogeneity of variance assumption had been

violated, ($F_{(1, 84)} = 12.20$, $p = .002$); therefore, comparison of the mean scores of the RHDS questionnaire was based on unequal variance. There was a difference of 11.88 points between mean scores of the RHDS for intervention and control groups and this difference was noted to be significant ($t_{(100)} = 12.20$, $p < .001$, $d = 2.01$, 95% Confidence interval [9.95, 13.82]). As the Cohen's *d* is greater than 2 the difference between the two means indicates a large effect size. The hypothesis that patients admitted to the unit where the nurses attended the education intervention would have increased knowledge about COPD and readiness for discharge home was therefore supported.

Phase III Results – 30-Day Readmission Rates

The final hypothesis stated that implementation of a hospital-based education intervention that includes a standardized approach to discharge of patients with COPD that is targeted to nurses' results in reduced 30-day rate of readmission for COPD.

Readmission rates for the months of April, May, June, July, and August 2018 were obtained from decision support for both the intervention and control units. From April to August 2018 a total of 96 patients were discharged from the hospital medicine units and a total of 32 patients were readmitted to hospital within 30 days of discharge for a total percentage of 33.33%. Of those 48 patients who were discharged from the intervention unit, 17 were readmitted to hospital after discharge for a total readmission rate in percentage of 35.42% on the intervention unit. In comparison 48 patients were discharged from the control unit and of those, 15 patients were readmitted to hospital within 30 days of discharge for a total percentage of 31.25% on the control unit. Results of the analysis indicate no change in the number of 30-day readmission for the intervention unit when compared to control, $X^2 (1, N = 96) = .003$, $p = .96$.

Using a significance level of $p = < .05$ and a two-tailed test, the monthly readmission data were analyzed using the Fisher's exact test for the 2 X 2 contingency table as the expected cell counts were less than five (Plichta & Kelvin, 2013). The Fisher's exact test is valid even when expected cell counts are extremely small as in the case of unit specific readmission numbers (Plichta & Kelvin, 2013). There was no significant difference in the readmission rate for the intervention unit when compared to control for: April, $X^2(1, N = 22) = 4.55$, $p = .86$; June, $X^2(1, N = 19) = 4.77$, $p = .08$; July, $X^2(1, N = 15) = 1.27$, $p = .37$ and August, $X^2(1, N = 21) = .269$, $p = .67$. The number of readmissions to hospital within 30 days among patients with an index hospitalization of COPD differed for the month of May 2018. Within the month of May 2018 twelve patients were discharged from the intervention unit and one patient readmitted within 30 days when compared to the control group, seven patients were discharged from the control unit and three patients readmitted. This difference was found to be significant $X^2(1, N = 19) = 11.38$, $p = .002$.

Readmission data were examined for differences when compared to the previous year. In 2017 in the same calendar months, April to August, 59 patients were discharged from the intervention unit and 13 readmitted to hospital after discharge for a total readmission rate in percentage of 22.03%. In 2018 during the same calendar months, on the intervention unit 48 patients were discharged and 15 patients readmitted within 30-days of discharge for a total readmission rate in percentage of 31.25%. There was no significant difference in the readmission rate for 2018 for the intervention unit 2018, $X^2(1, N = 107) = 2.35$, $p = .125$ when compared to 2017.

The hypothesis that implementation of a hospital-based education intervention that includes a standardized approach to discharge of patients with COPD targeted to nurses' results in reduced 30-day rate of readmission for was not supported.

Summary

Analysis of the data from participants demonstrated that nurses who received an education intervention which is based on the four domains of the self-efficacy theory (Bandura, 1977, 1986) and includes components of patient collaborative self-management (Make, 1994) had higher levels of knowledge of COPD and higher levels of self-efficacy for teaching patients about COPD and how to manage after discharge compared to the control group. Overall significant increases in both knowledge (p <.001) and self-efficacy (p <.001) were demonstrated by the intervention group revealing a large effect size for knowledge (d = 2.47) and self-efficacy (d = 1.87). As well, patients on the intervention unit scored 8.74 points higher on the BCKQ and 11.88 points higher on the RHDS when compared to control and these differences were noted to be significant with effect sizes of d = 2.17 BCKQ and d = 2.01 RHDS.

Paired *t*-test analysis from nurses in the control group who attended the viewing of the videotaped presentation demonstrated an increase from pretest to post-test self-efficacy for preparing patients for discharge (p = .013) and may indicate that viewing the video of patients in the community describing their experience with lung function testing, smoking cessation, and lifestyle changes is useful as an educational resource.

CHAPTER FIVE: DISCUSSION

Introduction

The purpose of this study was to determine the effect of an educational program for nurses on nurse knowledge and self-efficacy for preparing patients admitted to hospital for COPD exacerbation for discharge. This study was framed using Bandura's (1977, 1986) self-efficacy theory and integrated the components of collaborative self-management (Make, 1994) as well as the *Quality based procedures clinical handbook for COPD* (HQO & MOHLTC, 2015). An additional aim of the study was to examine if any changes in nurse outcomes and/or patient outcomes would affect the 30-day rate of readmission to hospital for COPD. In this final chapter, an overview of study findings, implications for nursing practice and nursing research and the strengths and limitations of this clinical research study are presented. Finally, the conclusions arising from the data analysis in this study are stated.

Summary of Findings

Phase I Results-Nurses

Hypothesis a) was supported as results indicated that nurses who attended the intervention session reported statistically significant increases in both knowledge of COPD and self-efficacy for teaching patients when compared to the control group. This finding is important to note as increased self-efficacy for an activity is associated with an increased likelihood of participating in an activity (Bandura, 1994).

The first step in self-management is having the knowledge to know how to manage; therefore, nurses with increased knowledge of COPD and increased self-efficacy for collaboratively preparing patients to self-manage after discharge should lead to improved patient outcomes. Teaching patients about their disease and how to self-manage

is akin to teaching patients how to solve problems and is necessary if patients are to be able to manage after discharge when they are in their home environment (Cordier, 2014). Using the BCKQ to assess healthcare professionals' knowledge of COPD, Edwards and Singh (2012) determined that gaps in knowledge around breathlessness, and medications could impact patient knowledge and the ability of patients to self-manage. In our study, baseline levels of knowledge of COPD and self-efficacy for teaching patients how to manage after discharge were similar across the intervention and control groups. However, nurses who attended the education intervention, which included medication education and inhaler technique as well as components of collaborative self-management related to teaching individuals with COPD to monitor for changes in baseline symptoms, demonstrated higher levels of both knowledge of COPD and self-efficacy for preparing patients to self-manage after discharge. In a study by Davison and Jongepier (2012) the researchers noted "serious deficiencies in training" as nurses identified that sources of information on how to care for patients with COPD included self-directed learning, partnering with an expert or secondary healthcare providers (p. A167). The high rate of participation among available nurses in our study may reflect that nurses take an active role in the pursuit of knowledge to address their learning needs. In their study of long-term effects of physician education for asthma management, Clark et al. (2000) provided physicians with two sessions of education for five hours in total and measured patient satisfaction with clinical visits. The researchers identified that parents of children with asthma who were managed by physicians who had participated in the education intervention demonstrated higher positive communication scores and an increased likelihood of receiving structured education than parents attended to by physicians in the control group. The authors identified that partnership for self-management is

demonstrated through effective communication skills and can enhance the clinical encounter. Although the study reported here is similar to Clark et al. (2000), in that education was provided to healthcare professionals, the setting in this study was the acute care hospital environment, and nurses received only one 90-minute education session.

Therefore, the first step in preparing patients with COPD for discharge was to provide nurses with information about COPD. Structuring evidence-informed, COPD education for nurses in acute care through the lens of both self-efficacy and collaborative self-management encourages partnership with patients and effectively strengthens the nurse-client therapeutic relationship (CNO, 2006). In the acute care setting, nurses provide support for patients 24 hours a day and are available to review COPD management along the continuum from acute illness to hospital discharge. Review of preparation for discharge could be part of the discussion of current medications, inhaler technique or disease characteristics and interventions such as recognition of baseline symptoms or changes in baseline and the need for regular follow up with primary care practitioners. Providing patients with information structured through a collaborative model of care can add to the skillset of patients to self-manage and can empower patients to engage in their health (Bodenheimer, & Abramowitz, 2010).

Patients often attribute problems incurred after discharge from hospital to lack of preparation therefore, preparing the patient to manage after discharge is vital to patient success (Mabire, Bachnick, Ausserhofer, & Simon, 2019). Admission to hospital for acute exacerbation of COPD may be the opportunity that is needed for nurses to prepare patients to manage their chronic disease as patients experiencing acute changes in a chronic illness may be more motivated to participate in their care and prevent recurrence of similar episodes (Janaudis-Ferreira et al., 2018). Ideally, as the average length of stay

for patients in this study was 4.77 (*SD* = 1.33) days, nurses would have an opportunity to support patients preparing for post hospital community-based management. Previous studies of the hospitalized patient with COPD and patient education for management implemented a specific role such as the respiratory clinical nurse specialist (Hopkinson et al., 2012), discharge coordinator (Lainscak et al., 2013), coordinating nurse (Abad-Corpa et al., 2012), or non-nurse healthcare provider roles including physiotherapy (Lawlor et al., 2009) and respiratory therapists (Collinsworth, Brown, Stanford, Alemayehu, & Priest, 2018). This study differs from previous research as the aim of this study was to influence the standard of usual care provided by the hospital-based nurse who is responsible for providing ongoing 24-hour care to the patient during the acute phase of illness and throughout the process of discharge preparation to the community.

This study is unique as the focus was on the ability of the hospital-based nurse to provide information to patients hospitalized with COPD in preparation to manage after discharge. The education could be integrated into patient care and be provided by each nurse caring for the patient to the patient or family member as needed during their acute illness as opposed to brief education sessions provided outside of regular patient care, and without partnership with or involvement of the hospital-based nurse. In this study, nurses in the intervention group were provided with COPD education. The education was provided to the nurses as framed by the components of collaborative self-management to promote partnership between the patient and the nurse and the development of goals to improve health, prevent illness and monitor chronic illness (Table 12). The intervention included the components of collaborative self-management which were discussed during review of the pathophysiology of COPD, medications and inhaler technique, and preparing a patient for discharge home with a focus on the patient's educational needs

such as smoking cessation, monitoring COPD and signs and symptoms of an exacerbation. Subsequently nurses with increased knowledge reported increased levels of self-efficacy for providing education to patients and nurses in the intervention group had a higher mean score self-efficacy specifically related to collaboration with patient for the development of a plan of care (M = 8.33, SD = .99), than the control unit (M = 6.62, SD = 1.48), which was statistically significant ($t_{(80)}$ = 6.08, p < .001, 95%, Confidence interval [1.16, 2.26]).

Patients admitted with COPD to the intervention unit in this study reported high levels of knowledge of COPD and readiness to manage after discharge. In comparison with other studies, Mabire et al. (2019) in an analysis of 1833 nurses and 1755 patients admitted to hospital with varied medical illnesses, explored structure and process factors with patient-reported readiness for discharge and found that scores of RHDS were higher in patients who had received education and in units where nurses had high levels of experience in nursing. Although, there was no statistically significant difference in years of experience of nurses on the intervention unit when compared to the control group, similar findings were demonstrated within this study as scores of RHDS were higher for patients admitted to the intervention group and nurses in the intervention group had a mean length of nursing experience of more than 16 years (SD = 11.88) years of nursing experience compared to the control group with 13.43 (SD = 11.57) years of nursing experience.

Personal efficacy plays a significant role in influencing participation in behaviour and the primary target for the intervention was self-efficacy of nurses for discharging patients with COPD (Bandura, 1986). The efficacy expectation of the individual nurse is theorized to influence participation in the specific activity and may be considered a

"situation-specific form of self-confidence" (McAuley, Szabo, Gothe & Olson, 2011, p. 2). In contrast to the study completed by Nosbusch et al. (2011) in which only one third of nurses surveyed believed that the patient they discharged could manage, nurses in this study, who received one 90-minute education session, reported a higher level of self-efficacy in the belief that the patient they discharge can manage after discharge when compared to the control group. As human behaviour is purposive and people have the capacity for forethought, the increased self-efficacy of nurses related to the behaviour of preparing a patient for discharge could be associated with increased involvement in the activity (Spence-Laschinger & Tresolini, 1999) which means that the nurses would be more likely to initiate discussion with patients related to medications and inhaler technique or review post discharge care needs such as scheduling primary care follow up. The focus of this study, on COPD and the role of the hospital-based nurse, was to support nurses to integrate patient discharge preparation into direct patient care and adds to the ability of this study to lead future research into this area. This study provides a valuable contribution to research as not only did nurses self-report their individual level of self-efficacy after the intervention but also the effect of the education session was measured by surveying patients hospitalized with COPD.

Phase II Results- Patients

Hypothesis b) was supported as results indicated that patients admitted with COPD to the intervention unit (n = 51) reported significantly higher scores for both knowledge of COPD and readiness for discharge home when compared to patients admitted to the control unit (n = 51). This may have resulted from the fact that nurses in the intervention group had higher levels of self-efficacy for teaching patients after the intervention and actively participated in providing education to patients consistent with

the education intervention. Other mechanisms could also have impacted patient knowledge including that patients received teaching from other healthcare professionals including physicians, respiratory therapists or physiotherapists.

The scope of the issue of management of COPD and prevention and management of exacerbations of COPD is vast, as there are 384 million people in the world with COPD (Adeloye et al., 2015) and the average individual with COPD experiences approximately two exacerbations annually (O'Donnell et al., 2008). Patients with COPD are breathless on exertion which is worsened with exacerbations (O'Donnell et al., 2008). Kessler et al. (2006) identified that patients lacked understanding of exacerbations, which could mean that as breathlessness is the baseline symptom, any changes in the severity of breathlessness may be under-estimated and dismissed by individual patients. In their examination of the experience of a COPD exacerbation Kessler et al. (2006) found that of the patients with moderate-to-very-severe COPD and a recent exacerbation only 32% of patients reported that they had responded to changes in baseline symptoms by self-administering medication. This highlights the need for individuals with COPD to recognize warning signs of exacerbation and understand the beneficial effects of medications and the need for assessment in primary care (O'Donnell et al., 2008). Patients with COPD report a fear of dying, a feeling of suffocation and increased anxiety and stress when experiencing an exacerbation of their symptoms (Strang, Ekberg-Jannson & Henoch, 2014). There is a strong suggestion in the literature on COPD exacerbation that providing education to patients with COPD specifically related to the recognition and management of exacerbations is key to improved disease management (Janaudis-Ferreira et al., 2018). Preparing patients with COPD for discharge includes teaching patients to recognize and respond to changes in baseline symptoms which aligns with evidence-

informed guideline management and could be the critical link that is needed to improve symptoms but also could improve primary care collaborative management and simultaneously reduce emergency room use (Benady, 2010; Janadudis-Ferreira et al., 2018). As the behaviour of the patient is crucial to the process of self-management and targeting behaviour change is the goal of self-management the intervention in this study included a review and discussion of topics that could frame the sharing of information between nurse and patient to support collaborative self-management of COPD. These topics included how to recognize changes that require assessment and strategies to prevent exacerbations such as frequent hand washing, medication adherence, smoking cessation and updating immunizations.

In this study, patients admitted with COPD to the intervention unit demonstrated an average 8.7-point higher (95% Confidence interval [7.16, 10.33]) BCKQ score when compared to patients admitted to the control unit. The results of this study are consistent with Hill et al. (2009) who noted an 8.9-point difference in BCKQ scores of patients surveyed in primary care after a brief education session and Janaudis-Ferreira et al. (2018) who noted an 8-point difference in BCKQ mean scores for patients in the intervention group when compared to control. Hill et al. (2009) determined that a single two-hour session of education provided to patients recently diagnosed with COPD was effective for increasing disease-specific knowledge. Janaudis-Ferreira et al. (2018) studied the feasibility of 30-minute sessions of education guided by a COPD written resource and provided by a physiotherapist on patients who were recently discharged from hospital. The researchers determined that the two education sessions were an important self-management intervention specifically for patients post-exacerbation. In a study by White et al. (2006) knowledge of COPD was measured using the BCKQ of

patients after an eight week pulmonary rehabilitation program. The researchers noted an 18.3-point difference in BCKQ scores for patients in the intervention group. This increase in mean scores of BCKQ for patients in the intervention group could be credited to attendance at a specialized outpatient pulmonary rehabilitation program and the provision of ongoing education by specialists during the eight weeks of attendance (White et al., 2006).

This study differs from Hill et al. (2009) in notable ways including setting, awareness of the length of patient education sessions and the characteristic of new diagnosis of COPD in the patient population. In this study, patients diagnosed with COPD were recruited during their hospital stay, length of COPD diagnosis was not measured, nor was the total number of minutes of COPD education provided to the patient by the nurse. However, this study did demonstrate higher BCKQ scores in the group of patients admitted to the intervention unit where nurses had received education on COPD when compared to the BCKQ scores of patients on the control unit which could indicate that nurses caring for the patients provided more effective education to patients. Although this study is similar to Janaudis-Ferreira et al. (2018) as the target patient population was post-exacerbation, this study examined the effects of the role of the hospital nurse for preparing patients for discharge as opposed to physiotherapists, and again, the length of sessions of education between the nurse and the patient are not known. While this study did not measure the number of education encounters, minutes or instructions provided by the hospital-based nurses to the patients, the higher BCKQ for the intervention unit when compared to the control unit, could indicate that the hospital-based nurse integrates preparation of the patient into regular clinical care providing a more consistent approach to discharge preparation. Therefore, preparing patients for discharge from hospital

translates to providing support and reassurance. Future research into this setting and measurement of the number of minutes of education provided could be helpful to determine what the time commitment of nurses could be to meet the educational needs of the patients.

In contrast to research focused on patients hospitalized with COPD which also included components of community care including home visits in partnership with primary care (Abad-Corpa et al., 2012; Lawlor et al., 2009), telephone follow up (Aboumatar et al., 2018; Casas et al., 2006; Hopkinson et al., 2012; Jennings et al., 2015; Lawlor et al., 2009) or unscheduled access to the program post discharge (Casas et al., 2006; Jennings et al., 2015), this study took place within the acute care hospital setting only; there were no follow up telephone calls to patients after discharge or home visits completed. Although the ability to follow patients from hospital to the community to compare outcomes could strengthen the measurement outcomes, the addition of the intervention provided to nurses to increase nurse knowledge and self-efficacy for preparing patients for discharge provides further metrics which may be useful to answer the complex question of how to reduce the 30-day hospital readmission rate for COPD.

Phase III Results- Rate of 30-Day Readmission

Hypothesis c) was not supported. In Phase III the rate of 30-day readmission to hospital for COPD reported in percentage of overall patient readmission activity was noted to be increased from a similar time frame one year previous (April to August, 2017). As an outcome this may be reflective of the complexity of this chronic disease and the difficulty for individual patients to manage post discharge when dyspnea is the major symptom. Alternatively the higher levels of readmission from the previous year may indicate multiple concerns including patient specific issues such as disease progression,

comorbid illnesses, or fear and anxiety (Cao, Ong, Eng, Tan, & Ng, 2006; Gudmundsson et al., 2005), the presence of gaps within the system of health care such as primary care or homecare service availability (Crisafulli, Ortega, & Torres, 2015; Sharif et al., 2014) or seasonal variation in the severity of COPD exacerbations (Wise et al., 2018).

Previous studies of COPD management have shown a reduction in the rate of readmission to hospital through the integration of multiple interventions and by crossing the chasm between the hospital and the community (Bourbeau et al., 2003, Casas et al., 2006). However, studies implementing similar patient education programs have shown no reduction in the rate of readmission (Hopkinson et al., 2012; Jennings et al., 2015) or have been terminated due to an increase in mortality within the intervention arm (Fan et al., 2012).

As well the readmission rate actually may reflect that a small group of patients discharged and readmitted on more than one occasion causing an increase in the readmission rate for the medicine unit. Although there was no significant difference in the number of previous emergency department visits and the number of previous admissions to hospital between the intervention and control groups reported in this study, of the patients surveyed (n = 99) the self-reported number of admissions to hospital for COPD within the previous 12 months ranged from zero to three (M = .75, SD = .825). Therefore, patients within the population surveyed presented to the hospital on more than one occasion and experienced admission to hospital more than once per year perhaps comprising a component of the small group of patients who are discharged and readmitted to hospital. George et al. (2016) in their study of disease management identified that the higher readmission rate among patients in the intervention group was driven by “frequent flyers” (p. 1669). The authors define a frequent flyer as patients who

had over four readmissions to hospital. Further, the authors conclude that the higher readmission rates noted in their intervention group may be due to the small group of frequent flyers within this cohort or be the consequence of good care as the patients have heightened monitoring skills and seek medical care for assessment of changes (George et al., 2016). As well, Collinsworth et al. (2018) in their prospective, pilot study, randomized patients hospitalized with COPD to receive 15-30 minutes of COPD education, post discharge telephone calls and home visits by the respiratory therapist or usual care. Topics reviewed included symptoms, medications, nutrition, stress and smoking cessation (Collinsworth et al., 2018). Outcomes measured included time to readmission, readmission and patient activation. Of the 308 patients randomized there were no significant differences in readmission between the two groups, but when stratified by the type of hospital admission, the readmission rate was significantly lower in the control group when compared to the education group. The researchers concluded that patients who received education were readmitted to hospital sooner than patients in the control group which was an unexpected result as these patients also showed significant improvements in health status (Collinsworth et al., 2018).

Although the "true proportion of avoidable readmissions is not known" reducing readmission to hospital for this primary care manageable chronic illness is an international priority (Harries et al., 2017, p. 2). As an outcome metric, the rate of readmission to hospital may still be an indicator of a health facility's ability to coordinate care (Townsend, McNully, & Grillo-Peck, 2017); however, use of readmission rate data may not be a reliable tool for assessment of programs as it may be sensitive to individual patient characteristics including age or oxygen use (Garcia-Aymerich et al., 2003), sociodemographic variables (Bracken, 2016; Garcia-Aymerich et al., 2003), or disease

severity (Harries et al., 2017; Rezaee et al., 2018). As such, patients at risk of readmission after an index hospitalization of COPD are not easily identified and therefore use of the rate of 30-day readmission to hospital for COPD as a marker of the quality of care should be discouraged (Harries et al., 2017).

Strengths and Limitations

Strengths of this quasi-experimental, two-group, intervention study include the use of a control group, one session of education, the high participation rate of nurses and including the patient admitted to hospital as a study participant. The pre-post study design with a control group in Phase I adds strength to the study in terms of assessing the validity of the intervention and generalizability of findings to hospital-based nurses (Schildmann & Higginson, 2011). The study integrated an intervention that was well developed and based on the well-established self-efficacy theory (Bandura, 1986) and components of collaborative self-management (Make, 1994). The 90-minute intervention was provided to small groups by experts in COPD, who were known to the participants which may have facilitated discussion and interaction with the content. A high percentage of the available nurses were recruited during the study period and only two nurses did not complete the full survey data. Only one session was provided for each group of nurses attending and data obtained from nurses indicated increased knowledge and self-efficacy scores, as well, scores of knowledge of COPD and readiness for discharge home for patients admitted to the medicine unit where nurses participated as the intervention group were higher than patients who were admitted to the control unit. The study was completed in a multi-phase design with phase one completed prior to initiating phase two ensuring that all nurses that wished to participate had completed participation. A further strength of

this study is the study aimed to include the patient admitted to hospital with COPD and recruited patients admitted to hospital on both the intervention and control units.

Several limitations of the current study need to be addressed. Interpretation of the results of the current study should be done with consideration of: (a) the quasi-experimental design, (b) the characteristics of the patient participant groups, (c) measurement issues, and (d) the follow up period.

The study was completed in a small community hospital and may not be generalizable to other hospitals. Blinding of the study participants to the intervention was not possible and healthcare practitioners may question the validity of the findings because nurses knew they were participating as the intervention group and patients knew which unit they were admitted to as the information was identified on the Letter of Information for patients. Patients were given the information about which unit they were admitted to so that patients could make an informed consent.

In Phase I, the small sample and participation of only nurses in this study limits the generalizability of the results to similar healthcare provider populations such as respiratory therapists or pharmacists. As well, due to the sample availability of nurses, this study included both registered nurses and registered practical nurses in the nurse sample population; however, future studies could examine specifics of one group of nurses. Nurses and patients were not randomized to intervention and control group in this study as randomization would require involvement in the management of their care and randomization of the nurses to the intervention potentially could cause confusion for patient care. The quasi-experimental study design aimed to evaluate interventions without randomization; however, lack of randomization impacts the ability to imply causality and limits the generalizability of the results as there is less control for pre-existing factors and

influences (Harris et al., 2006). Although the two-group intervention study is not randomized to group selection, the groups were assessed for similarity at baseline to help to determine the comparability of the two groups. The more similar the two groups are at baseline pretest the less likely that confounding variables between the groups can be credited for changes in the dependent variable (Harris et al., 2006). The hospital was built in 1888 and has undergone renovations and program changes to support the changing needs of the community. This has ultimately resulted in the allocation of two separately located medical units existing within the hospital. One medical unit has 34 beds and the other unit has 20 beds; each unit experienced a five-bed surge throughout the period of study. Although the two units share a manager, each medical unit has their own dedicated clinical staff. The advantage to pretest-post-test design is change occurring between testing periods can quickly be measured and pre-post-test design adds to the strength of the intervention, using the same testing post-test can sensitize the participants to the study material and reduces internal validity. To help mitigate the possibility of exposure effect the post-testing questions, although similar to the pre-testing format, were arranged differently (Harris et al., 2006).

Prior to implementation of this study, the knowledge questionnaire was provided to ten health care professionals including clinic physicians, outpatient nurses and staff prior to implementation. Face validity and content validity was assessed by clinic physicians and staff, who were identified as experts on the research subject and, who were asked if the instrument measured the characteristic of interest (Bhattacharyya et al., 2017). The experts were asked to provide feedback for each of the six questions related to readability, comprehensiveness and clarity (Bhattacharyya et al., 2017). Questions related to the risk of developing COPD, pathophysiology of COPD, benefits of smoking

cessation and exacerbation management. The feedback from the pilot study identified that the questions aligned with the topics currently discussed between patient and nurse; therefore, no changes were requested from the experts. The low results of the KR-20 analysis of the COPD Knowledge questionnaire may limit the validity of the study outcome (McGahee & Ball, 2009). However, the KR-20 analysis of the COPD Knowledge could be impacted as the questionnaire consisted of only six questions and scales with less than ten items could cause low scores of reliability analysis (Bolarinwa, 2015). Future research into COPD knowledge would benefit from adding more items to the scale as reliability increases as the length of the test increases (Bhattacharyya et al., 2017) or extending the time period between testing so that testing at time one could not influence testing at time two (Bolarinwa, 2015).

Limitations to this study also include a lack of longer-term follow up period for nurses and patients after the intervention session. Nurses participating in the study provided two scores measured at two different times during the study. An additional follow up measurement in 30, 60 and 90 days of the two study outcome measurements for both nurses and patients would have resulted in a more powerful examination of the study variables and enhanced the power of the analysis (Plichta & Kelvin, 2013). Additionally, there was no tracking of nurses' activity after the intervention; therefore, no data were obtained related to the extent that the nurses implemented what they were taught. Assessment of the amount, frequency and duration of nurse interactions with patients administered either through a self-report or observation component would permit calculation of the intervention use rate and further strengthen the analysis by providing information related to the dose of the intervention (Reed et al., 2007).

In Phase II the study patient participants were not randomized to groups. As a method of experimental control, randomization would prevent issues with selection bias and produce comparable groups (Suresh, 2011). Patients admitted to hospital are assigned to any available medical bed by hospital utilization staff. Therefore, the process of randomizing patients to be admitted to the intervention unit was not feasible for this study, as it would have required involvement in their managed care.

In this study, patients self-identified their level of education by choosing from options such as high school, college or university. The option to choose incomplete high school preparation was not available. Although 44% of patients chose high school as their level of education it is unclear if any were to have chosen less than high school preparation had the option been available. This could be a limitation as the wording of both the BCKQ and RHDS questionnaires could be impacted by the level of literacy of the study participants and therefore the understanding of the content (Janaudis-Ferreira et al., 2018). Further examination using a larger sample of study participants and offering more choice in options for self-reporting level of education is required.

Also, the researcher cannot rule out the effect of participation on outcome because being informed of the ongoing study and visited by the researcher may have changed individual patient behaviour and reporting on questionnaires. As noted previously, patients self-reported the number of emergency room visits and previous hospital admissions, which was dependent on patient recall.

Patients participating in the study provided two scores measured at one point in time only. Although measuring the two outcomes at two different time-points would have added strength to the study outcomes repeated measures of knowledge and readiness for hospital discharge was not possible in this study for two reasons. First, the mean

length of stay was less than five days, which would mean that some patients would be discharged prior to completion of the study measurements, and therefore lost to follow up and repeating the measurements within the short period of time may create sensitivity to the instrument questions and improve scores (Plichta & Kelvin, 2013). Secondly although completion of follow up surveys at 30-days and at 60-days post discharge would have added strength to the study outcomes and should be a consideration for future research in this population the primary research focus was nurse self-efficacy for preparing patients for discharge. As such, absence of pretest scores for patients provides a limitation to this study as each patient would have participated as their own control (Plichta & Kelvin, 2013).

In Phase III, the decision support office from the participating hospital provided frequency data related to the 30-day rate of readmission to hospital specific to each unit. The additional information related to patient name, date of birth or hospital identification could have provided for the collection of patient specific data and could have enabled the ability of the study to track patient-specific readmission to hospital. Therefore, due to the lack of patient information the researcher was unable to link hospital readmission rate data to specific patient data. As patient specific data were not accessed, diagnosis of COPD was not confirmed by lung function testing and patient medical information was not obtained related to level of disease, physical function, current activity level or current pharmacologic management and no correlations between this data and nurse knowledge and self-efficacy could be performed.

Garcia-Aymerich et al. (2003) examined the association between readmission to hospital for COPD and modifiable potential risk factors such as functional status, medication adherence, social support, health status, medical care and prescriptions and

lifestyle. The researchers found that patients with COPD who reported 60 minutes of walking per day had substantially lower risk of readmission. Information related to a history of hospital ICU admission was also not included in study data; however, this information may have correlated to readmission within the study population. Chu et al. (2004) examined the risk of readmission in patients who had required non-invasive ventilation (NIV) and found that patients with COPD and acute hypercapnic respiratory failure (AHRF) requiring NIV were at a higher risk of readmission. Therefore, review of patient medical history, including current level of physical function, admission to intensive care, and presence of mechanical ventilation during admission may have provided an opportunity to determine any association between these variables and the rate of readmission (Wedzicha & Seemungal, 2007). Future research should integrate patient specific demographic information as the literature supports higher levels of risk for readmission among patients with COPD and variables such as admission to ICU and level of lung function (Cao et al, 2006; Garcia-Aymerich et al., 2003; Gudmundsson et al., 2005; Lajas, Gonzalez, Parrado, Maestu, & Miguel-Diez, 2018), smoking status (Garcia-Aymerich et al., 2003), level of physical activity (Garcia-Aymerich et al., 2003), comorbid illness (Cao et al., 2006; Gudmundsson et al., 2005), malnutrition (Zapatero et al., 2013), and discharge disposition (Jiang, Xiao, Segal, Mobley, & Park, 2018); therefore, collection of data related to these patient demographics may be helpful when reviewing the 30-day rate of readmission to hospital for COPD.

In reviewing the data for 30-day readmission in this study it is noteworthy to mention that the rate of readmission may have been impacted by a confounding variable introduced on the medical units. During this study a new model of physician care was introduced within the hospital. This model of care was based on a management model and

targeted at implementing a change in the provision of physician coverage from patient-based to unit-based care. This meant that the most responsible physician (MRP) was assigned to the unit within the hospital as opposed to the individual patient. Along with this change, the new model of physician coverage meant that the patients' physician could change frequently during the admission which increased the number of physicians involved in the individual patient's care and subsequently the number of transfer reports from physician to physician. Therefore, the admitting physician was not the MRP and the MRP was not consistently assigned to the patient during the hospitalization potentially creating fragmented patient care. The effect of this new model of unit-based physician coverage may have inadvertently influenced the 30-day rate of readmission to hospital. This change in the patient care was implemented April 2, 2018 and continued during the study. The model has since been changed to a hybrid model merging components of the previous physician coverage system with the unit-based model. During this same time, the model of nursing care did not change.

Consideration must be given to the possibility that, as an outcome, the rate of 30-day readmission does not align with a nursing-based clinical trial as the impact of care provided by nurses cannot be measured by this specific quality metric. Although, "hospital readmission is increasingly considered an indicator of care quality", the results of this study posit that the readmission rate may not fit as an indicator of the quality of nursing care or of the nurse-client therapeutic relationship (Berry et al., 2011, p. 682). In fact, the opposite may be true, in that nurses develop a therapeutic relationship with each client embedding respect, compassion and caring potentially creating the need for the patient to return to hospital when they are unwell as opposed to seeking primary care management. Therefore, the looming question is how can you measure the impact of

nursing actions if they do not translate into a quality metric in a system heavily driven by economic pressures? On further consideration, had the model of care changed to a healthcare team actively partnering in the provision of care to patients with equal responsibility into the decisions that affect patient care from both nurses and physicians the rate of readmission in 30-days could then be a measurable outcome of the quality of care effectively measuring the model of team-based patient care.

Implications

Clinically competent nurses and support for education are cited as two of the eight essentials of magnetism that provide the foundation for the nursing work environment (Schmalenbery & Kramer, 2008). Kieft, de Brouwer, Franke and Delnoij (2014) in their study of nurse work environments and quality of care reported that nurses identified the need to continually invest in nursing knowledge to provide safe and effective patient care. The findings of this study add to the science of nursing education related to hospital-based care of patients with COPD and have numerous implications for staff nurses, nursing research and hospital nurse administrators. This study focused on the role of the hospital-based nurse in preparing COPD patients for discharge home from hospital and examined the effects of providing targeted instruction to nurses on their knowledge and self-efficacy for teaching patients with COPD.

Implications for Clinical Practice

Patients preparing to be discharged need education and nurses doing the education need to be prepared and competent to provide that education (Scullion, 2018). The intervention described within this study focused on providing information to nurses that would structure patient discharge preparation. Key components of the intervention

included review of medications and inhaler technique, exacerbation management and prevention of exacerbations through lifestyle changes.

Within the literature examined in the previously presented scoping review, each article described inhaler technique as a patient educational intervention perhaps linking efficacy of treatment to correct inhaler technique and ultimately positive patient outcomes (Aboumatar et al., 2018; Lainscak et al., 2013; Lawlor et al., 2013). This is supported by a recent meta-analysis by Maricoto et al. (2019) who evaluated the effect of inhaler education on clinical outcomes and exacerbation rates in asthma and COPD patients and found that inhaler technique education significantly reduced exacerbation risk. The intervention in this study provided inhaler education to nurses to ensure knowledge and skill of inhaler use, and the ability to demonstrate, coach and support patients. Although in this intervention review of inhaler technique was provided within a 90-minute session of education and nurses were able to work with demonstrator inhalers, it is feasible that review of inhalers can be completed during unit orientation, by video or through a variety of educational methods. The intervention implemented in this study was targeted to nurses in the medicine program with the consideration that increased knowledge would increase the self-efficacy for providing education to patients admitted with COPD and ultimately translate into integration into clinical practice or in effect, usual care.

Nurses are frequently and consistently in contact with patients placing the role of the hospital-based nurse as central to assisting patients to adopt self-management strategies (Scullion, 2018). Integration of patient-specific educational needs into daily care or usual care by nurses can produce consistency in information (Ortoleva, 2010). As well, ongoing assessment, review and evaluation of inhaler technique provides the opportunity for nurses to offer reassurance to patients and review strategies to prevent and

manage exacerbations potentially building capacity for the patient to collaboratively self-manage.

In this study, nurses who attended the intervention session, provided in an interactive manner and based on the four domains of self-efficacy, demonstrated significant increases in self-efficacy for approaching and teaching patients how to manage COPD when compared to control nurses who did not receive the intervention. Bandura (1977) supported that the sources of self-efficacy information including vicarious experiences, verbal persuasion, mastery experiences and emotional and physiological states. The intervention in this study provided for direct observation and experience of a task in a low stress environment and was accompanied by influential people with the goal of strengthening each individual nurses' belief in their ability. As SCT focuses on the ability of individuals to be self-directed and aligns human motivation, the nurses with increased self-efficacy may have been motivated to participate in the activity of teaching patients as they expected patients would be successful in learning how to manage COPD. Active participation by nurses in the learning sessions through use of demonstrator inhalers and role playing may have added to the effectiveness of the intervention on increasing self-efficacy (Chaghari, Saffari, Ebadi, & Ameryoun, 2017). Conceptually; however, the expectation of personal mastery affects initiation of an activity but building efficacy for an activity is more than conveying positive appraisal (Bandura, 1986). As such, the education session was framed by the components of the collaborative self-management model, which included specific interventions. Aligning perceived self-efficacy with particular activities such as demonstrating inhaler use, encouraging community follow up, and applauding smoking cessation and hand washing as prevention

measures permits the measurement of individual items of self-improvement (Bandura, 1986).

Initiating a self-management plan during hospitalization gives patients with COPD an opportunity to engage with the nurse, review strategies to improve health, recognize symptoms and plan for alternate care when discharged such as primary care review. Although it was not determined how many nursing encounters each patient received or the structure of the education provided to the patient by an individual nurse, patients on the intervention unit reported higher levels of readiness to manage post discharge and higher levels of knowledge of COPD than patients admitted to control. This is promising as it may reflect that patients and nurses were willing to participate in the teaching and learning about COPD, which is a necessary component of CSM and which would support the feasibility of implementing similar programs in the future.

Implications for Education

Strategies for promoting nurse self-efficacy for providing patients with information during hospitalization could include developing orientation sessions for all new nurses which would highlight the critical role of the nurse to prepare the patient to be successful on discharge. Also providing education to nurses with the goal of increasing self-efficacy for participating in an activity creates a positive learning environment where nurses with increased self-efficacy can mentor, support, reassure and educate nurse colleagues through the development of a nurse-nurse relationship. The role of unit nursing leaders could be highlighted as nurses with higher levels of self-efficacy could provide ongoing mentoring and coaching to novice nurses, in essence, translating the domains of verbal persuasion and emotional physiological states into each teaching encounter. Undergraduate education prepares student nurses with excellent theory and

understanding of the science of health and illness including the how social determinants of health such as poverty impact health (Canadian Association of Student Nurses, 2015). Tutors and mentors could reinforce the application of theory and skill during clinical learning to help prepare student nurses with sufficient practical experience in managing chronic disease during exacerbations. Providing education to nurses directly increases the quality of care and indirectly supports patients and improves patient outcomes (Chaghari et al., 2017). Synthesizing clinical practice guidelines and tools such as the Quality Based Procedures for COPD management in relation to hospital-based care ensures the knowledge is evidence-informed (Curtis, Fry, Shaban, & Considine, 2016). At the unit level, individual nurses benefit from the provision of educational sessions provided in a non-threatening manner.

Implications for Policy

It is vital to recognize the valuable contributions that hospital-based nurses make to the experience of hospitalization for each individual patient. Clinical nurse educators and hospital administrators have a vested interest in ensuring that staff nurses have opportunities to share knowledge in a practice culture that enhances confidence. Education of staff is integral to achieving organizational goals (Chaghari et al., 2017). While investing in staff development is fundamental to organizational success and can promote professionalism, skill competency and best practice, staffing issues, lack of opportunity, and lack of support can challenge access to education and support for attendance from management (Keane & Alliex, 2018). Providing nurses with additional skills and training can help to improve care of the patient with chronic illness (HQO, 2013). The looming epidemic of age-related chronic diseases and the emergence of multimorbid, complex patients means that ongoing support of hospital-based nurses is

vital to the current patient care needs, organizational needs and system needs. Providing education to nurses to increase knowledge and self-efficacy for teaching patients with COPD demonstrates a commitment to health professional training and a system response to meeting the needs of changes in population health (Keane & Alliex, 2018). Hospital-based nurses can advocate for policy changes that support the development of evidence-informed, programs and access to sessions through a variety of formats. Facilitating programs to support ongoing education demonstrates an organizational commitment to the delivery of quality patient care and to the development of a culture of knowledge sharing (Keane & Alliex, 2018).

Implications for Future Research

Patients want to survive an exacerbation; therefore, it is important to provide patients with the tools and the education so that they know how to manage. The average patient with COPD could experience two exacerbations annually which impact their physical function, quality of life, and adds to the progression of disease severity (O'Donnell et al., 2008). Although exacerbations of COPD are primary care manageable, the rate of hospitalization and readmission to hospital for COPD places COPD in the lead over all other chronic illnesses in Canada for hospital management (Benady, 2010). The hospital-based nurse is strategically placed to provide education, support and reassurance to patients admitted with COPD which could help to prevent exacerbations, encourage primary care assessment and subsequently reduce hospitalization rates.

At the system level, COPD and readmission of COPD cause significant economic hardship for the healthcare system. One strategy to reduce the economic impact of COPD is implementation of the Quality based procedures such as the Clinical handbook of COPD management, which provides a pathway for patient care and may reduce both the

length of stay and the risk of readmission (HQO & MOHLTC, 2015). Although, integrating the COPD clinical handbook of hospital COPD management and the clinical practice guidelines for management of hospitalized patients into a session of education for nurses demonstrated increased knowledge and self-efficacy, it may not be enough to provide one session of education. To achieve sustainability in the practice setting it may be helpful to provide additional sessions of education and add the education sessions to staff orientation or to the annual skill review activities within the organization.

The findings of this study provides evidence that the education of nurses is paramount if nurses are to prepare patients to manage after the acute illness is over. More research is needed into the acute care setting, the role of the hospital-based nurse and how to integrate the self-management needs of patients with COPD during an acute exacerbation of illness. Further research is needed into standardizing the process of discharge of patients with COPD and the role of the hospital-based nurse, which could include standardizing both the components of education for patients with COPD and the process of discharge. Preparing patients for discharge could include providing access to education modules or smart phone applications facilitated by the hospital-based nurse or through group discussion. It is also important to continue to conduct research into the hospital-based nurse as nurses provide 24-hour nursing care to patients admitted with COPD and are available to teach, review, reassure and prepare patients to manage after discharge. To build on the results of this study, further research is needed into how to translate increased knowledge and readiness for discharge into reduced emergency room visits and readmission. This study did not provide written information to patients about COPD; however, further research could include providing information to patients and to family members in written or electronic format including smart phone applications that

are easily accessible. Although this study maintained the focus on the hospital setting, future research could include clinical assessment and review of patients within 30 days of discharge from hospital in a specialized clinic setting to review their physical status, symptoms and management with the goal of reducing the risk of readmission to hospital.

Nurse researchers need to continue to advance the body of knowledge of self-efficacy, patient COPD self-management and the role of the hospital-based nurse. Future research into the role of the registered nurse working in acute care could also include analysis of self-efficacy for teaching patients with chronic diseases other than COPD and qualitative review of the experience with the learning process by patients during the acute hospital phase of their care. Research into how education is translated into daily clinical practice by nurses could be obtained through reporting mechanisms of actual patient education by nurses including the content and duration of sessions to determine how patient education is operationalized and what interventions are most effective for patients. It is important to continue to conduct research into the acute care hospital setting and the care of patients admitted with chronic illnesses. Future research into chronic illness, self-efficacy and collaborative self-management can provide individual nurses, nurse educators, hospital administrators and policy makers with further insight into the complexities of managing chronic illness within this setting.

Conclusions

In an effort to support both the learner and the teacher of self-management, the primary purpose of this study was to focus on providing education to nurses that could promote increased self-efficacy for preparing patients admitted with COPD for discharge. The results of this research study demonstrated that providing education through interactive discussion with nurses had a positive impact on nurse knowledge and self-

efficacy. Nurses (*n* = 83) were assigned to one of two groups, intervention or control and completed a pretest and post-test questionnaire. The assignment to the group was wholly dependent on the nurse identifying which unit they worked on in the hospital. Nurses assigned to the intervention group attended one interactive education session on site at the hospital and nurses assigned to control viewed a videotape presentation of two separate patients discussing their experience with COPD in a non-scripted format.

Although the improvements in knowledge and self-efficacy of nurses, and increased knowledge and readiness for discharge home of patients was noted within Phase I and Phase II, the improvements were not reflected in Phase III. The 30-day rate of readmission for COPD was noted to have increased over the same time frame one year previous which did not support the hypothesis. The increased rate of readmission may have been impacted by several factors. Analysis of the data from patient participants (*n* =102) demonstrated a statistically significant improvement in patient self-reported level of knowledge of COPD and ability to manage post discharge for patients admitted to the intervention unit compared to control. This level of knowledge of COPD may have improved the self-awareness of patients to monitor symptoms for changes prompting return to hospital for assessment.

Patients with COPD have complex comorbid illnesses and patient related issues may have impacted the risk of readmission and therefore the 30-day rate of readmission. Also, as this study was completed within the hospital only, community healthcare-related issues such as the lack of post discharge primary care follow up and lack of pharmacy follow up were not examined. This study focused on the role of the nurse as patient educator and how supporting the nurse to participate in patient education can increase patient knowledge and readiness for discharge. Although this research study was

successful in demonstrating increased knowledge and increased self-efficacy for participating in patient education, a reduction in the rate of 30-day readmission to hospital for COPD was not noted in the analysis which may indicate that the complexity of this chronic respiratory disease requires multiple layers of practitioner involvement and patient support. This study focused on the hospital-based nurse to provide discharge preparation to patients with COPD, collection of data related to patient demographics and activity during their hospitalization may have been helpful when examining the 30-day rate of readmission to hospital. As well, the lack of patient specific data provided a significant limitation to this research study as the researcher was unable to calculate the individual patient 30-day readmission rate or track their readmissions by unit status. Future research into nursing education related to COPD should capture the individual patient demographic, clinical, economic and hospitalization information which would provide a more thorough and robust examination of all variables that may affect the 30-day rate of readmission within this cohort and allow for examination related to cost-benefit analysis and the downstream impact of nurse education.

People form beliefs about what they can do (Bandura, 1994). It is this belief in one's ability or level of perceived self-efficacy for an activity that can become a motivating factor for participating in the activity (Bandura, 1994). However, a nursing activity such as engaging in patient education or partnering with a patient to negotiate a management plan may require more than knowledge of the disease and clinical skills of assessment. Participation may require an awareness of the need to educate the patient in order to improve patient outcomes. Bandura (1994) writes that an "inextinguishable sense of personal efficacy and a firm belief in the worth of what they are doing" is testament to success (p. 8). Managing a complex chronic, progressive illness, which is known to cause

impairments in breathing, makes self-management of COPD challenging for many individual patients. By integrating the components of collaborative self-management with the four sources of self-efficacy this research study provided an opportunity for nurses to review the challenges faced by many patients with COPD and the significance of the role of the hospital-based nurse for providing education to patients. Providing collaborative education in the form of partnership, education, shared goals and a structured monitoring program has been recommended as the best approach to assist the patient to manage after discharge (HQO & MOHLTC, 2015).

In our study, hospital-based nurses assigned to the intervention group demonstrated increased knowledge and self-efficacy for teaching patients with COPD about how to manage after discharge. The intervention was provided by a team of COPD experts and was guided by Bandura's Self-Efficacy Theory. Aligning the intervention session with the four sources of self-efficacy offered a non-threatening environment where information was shared, reviewed and facilitated for the advancement of learning and increasing self-efficacy. Performance experiences was integrated into the education session through the use of inhaler review and demonstration. The use of multiple, different demonstrator inhalers by the nurses in attendance provided opportunity for direct feedback from the expert team related to specific inhaler technique. A positive vicarious experience was developed as verbal persuasion and vicarious experience were integrated into the session through observational learning and encouraging feedback from the expert team who were well known to the nurses in attendance. The interactive discussion and the question and answer discussion period provided at the completion of the intervention session was designed to enhance nurse self-efficacy to implement specific interventions and participate in educating patients admitted with COPD.

Promotion of collaborative self-management was integrated into the intervention with discussion and review of specific patient care goals including the need for lung function testing to assess current lung function, the benefits of smoking cessation for slowing progression of illness, and the use of controller therapy and inhaler demonstration which directly relate to patient education needs. Findings of this research add a new perspective to the body of literature on managing COPD not only because it views the role of the hospital-based nurse and the care of the hospitalized patient through the lens of self-efficacy theory but also because the study measured patient outcomes. Teaching patients how to manage COPD through integration of clinical practice guidelines and the Quality based procedures clinical handbook for COPD management (HQO & MOHLTC, 2015) focuses care on the role of the patient as collaboratively self-managing their chronic respiratory illness, promotes partnership between the nurse and the patient and aligns with current evidence. Therefore, understanding the role of nurse self-efficacy is relevant when discussing care of the hospitalized, complex patient with COPD because increased knowledge links seamlessly to self-efficacy inherently becoming the motivator for engaging in patient education.

This study builds on previous research completed in similar hospital settings with similar metrics including patient knowledge of COPD (Abad-Corpa et al., 2012; Collinsworth et al., 2018) and the rate in percentage of patients who readmit to hospital for COPD (Abad-Corpa et al., 2012; Casas et al., 2006; Hopkinson et al., 2012; Jennings et al., 2015). However, this study differs from all previous research into hospital-based programs of education for patients with COPD because this study focuses entirely on the hospital-based nurse. The role of the nurse in this research study offers opportunity for future research to focus on providing education to the nurse caring for the patient through

the development of orientation sessions, ongoing skill-based learning and quality assurance programs. Integrating the nurse, who is providing the bulk of the care for the patient during the acute phase of illness, into all programs of patient education is an exact fit with patient-centered care, the partnership paradigm and the nurse-client therapeutic relationship.

There are two significant outcomes resulting from this study. First, the increased levels of knowledge of COPD and readiness for hospital discharge noted in this study for patients admitted to the intervention unit suggest that nurses provided the patient with education while delivering hospital-based care such as medications and clinical assessments. Secondly, the high rate of response of participating nurses in this study is both surprising and encouraging and demonstrates the commitment that nurses have to stay current and knowledgeable. Although further research is indicated into the impact of the role of nursing on the readmission rate, these two points together support that the role of the hospital-based nurse is integral to supporting collaborative self-management for patients admitted to hospital with COPD. Addressing the 30-day rate of readmission to hospital for this complex, respiratory disease may require a review of the involvement of multiple factors, including primary care, community care, and the knowledge, skills and ability of a patient to self-manage when breathlessness is the key symptom and fear is the subjective response.

REFERENCES

Abad-Corpa, E., Royo-Morales, T., Intesta-Sanchez, J., Carrillo-Alcaraz, A., Rodriguez-Mondejar, J.J., Saez-Soto, A.R., & Vivo-Molina, M.C. (2012). Evaluation of the effectiveness of hospital discharge planning and follow up in the primary care of patients with chronic obstructive pulmonary disease. *Journal of Clinical Nursing, 22,* 669-680. doi: 10.1111/j.1365-2702.2012.04155.x

Aboumatar, H., Naqibuddin, M., Chung, S., Chaudhry, H., Kim, S.W., Saunders, J.…Wise, R.A. (2018). Effect of a program combining transitional care and long-term self-management support on outcomes of hospitalized patients with chronic obstructive pulmonary disease: A randomized clinical trial. *Journal of American Medical Association, 320*(22). 2336-2343. doi: 10.1001/jam.2018.17933

Abedi, H., Salimi, S.J., Feizi, A., & Safari, S. (2013). Effect of self-efficacy enhancement program on self-care behaviours in chronic obstructive pulmonary disease. *Iranian Journal of Nursing and Midwifery Research. 18*(5), 421-424.

Adeloye D, Chua S, Lee C, Basquill C, Papana A, Theodoratou E.,… Global Health Epidemiology Reference Group (GHERG). (2015). Global and regional estimates of COPD prevalence: Systematic review and meta-analysis. *Journal of Global Health, 5*(2):020415. https ://doi.org/10.7189/jogh.05-02041 5.

Aiken, L.H., Clarke, S.P., Sloane, D.M., Sochalski, J.A., Busse, R., Clarke, H., Giovannetti, P., Hunt, J., Rafferty, A.M., & Shamian, J. (2001). Nurses report on hospital care in five countries, *Health Affairs, 20*(3), 43-53. doi: 10.1377/hlthaff.20.3.43

Albrecht, J.S., Park, Y., Hur, P., Huang, T., Harris, I., Netzer, G., Lehmann, S.W., Langenberg, P., Khokhar, B.,Wei, Y., Moyo, P., & Simoni-Wastila, L. (2016). Adherence to maintenance medications among older adults with chronic obstructive pulmonary disease. *Annals of American Thoracic Society, 13*(9), 1497-1504. doi:10.1513/AnnalsATS.2102-136OC

Arksey, H., & O'Malley, L. (2005) Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32.

Bailey, P. H. (2001). Death stories: Acute exacerbations of chronic obstructive pulmonary disease. *Qualitative Health Research, 11*(3), 322-338. doi.org/10.1177/104973201129119136

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management, 38*(1), 9-44. doi:10.1177.0149206311410606

Bandura, A. (2006). Guide for constructing self-efficacy scales. In Frank Pajares & Tim Urdan (Eds.). *Self-efficacy beliefs of adolescents*, pp. 307-337. Information Age Publishing: Greenwich, Connecticut ISBN 1-59311-367-6

Bandura, A. (2004). Health promotion by social cognitive means. *Health, Education & Behavior, 31*(2), 143-164, doi: 10.1177/1090198104263660.

Bandura, A. (2001). Social cognitive theory of mass communication. *Mediapsychology, 3*, 265-299.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior*, pp. 71-81. New York: Academic Press. Retrieved from https://www.uky.edu/~eushe2/Bandura/Bandura1994EHB.pdf

Bandura, A. (1989) Human agency in Social Cognitive Theory. *American Psychologist, 44*(10, 1175-1184.

Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*(5), 729-735. doi:10.1037/DD12-1649.25.5.729

Bandura, A. (1986). From thought to action: Mechanisms of personal agency. *New Zealand Journal of Psychology, 15*(1), 1-17.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. Retrieved from: https://www.apa.org/pubs/journals/rev/

Bandura, A. & Adams, N.E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research, 1*(4), 287-310. Retrieved from: https://link.springer.com/journal/10608

Bandura, A., Adams, N.E., & Beyer, J. (1977). Cognitive processes mediating behavioural change. *Journal of Personality and Social Psychology, 35*(3), 125-139. Retrieved from: https://www.apa.org/pubs/journals/psp/

Bandura, A. & Locke, E.A. (2003). Negative self-efficacy and goals effects revisited. *Journal of Applied Psychology, 88*(1), 87-99. doi: 10.1037/0021-9010.88.1.87

Barlow, J., Wright, C., Sheasby, J., Turner, A., & Hainsworth, J. (2002). Self-management approaches for people with chronic conditions: a review. *Patient Education and Counseling, 48*(2), 177–187.

Barnett, M. (2005). Chronic obstructive pulmonary disease: A phenomenology study of patient's experiences. *Journal of Clinical Nursing*, 14(7), 805-812. doi.org/0.1111/j.1365-2702.2005.01125.x

Been-Dahmen, J.M.J., Dwarswaard, J., Hazes, J.M.W., van Staa, A., & Ista, E. (2015). Nurses' views on patient self-management: A qualitative study. *Journal of Advanced Nursing, 71*(12), 2834-2845. doi: 10.1111/jan.126767

Bellamy, D., & Smith, J. (2007). Role of primary care in early diagnosis and effective management of COPD. *International Journal of Clinical Practice, 61*(8), 1380-1389.

Benady, S. (2010) The human and economic burden of COPD: A leading cause of hospital admission in Canada. Retrieved from Canadian Thoracic Society: http://www.lung.ca/cts-sct/pdf/COPDReport_E.pdf

Bentsen, S.B., Langeland, E., & Holm, A.M. (2012). Evaluation of self-management interventions for chronic obstructive pulmonary disease. *Journal of Nursing Management, 20*(6), 802-813. doi: 10.1111/j.1365-2834.2012.01469.x

Benzo, R.P., Kirsch, J.L., Dulohery, M.M., & Abascal-Bolado, B. (2016). Emotional intelligence: A novel outcome associated with wellbeing and self-management in chronic obstructive pulmonary disease. *Annals of American Thoracic Society*, 13(1), 10-16. doi.10.1513/AnnalsATS.201508-490OC

Berry, J.G., Hall, D.E., Kuo, D.Z., Cohen, E., Agrawal, R., Feudtner, C…Neff, J. (2011). Hospital utilization and characteristics of patients experiencing recurrent readmissions within children's hospitals. *Journal of American Medical Association, 305*(7), 683-690. doi: 10.1001/jama.2011.122

Bhattacharyya, P., Ghosh, P.R., Dey, R., Dey, R., Barooah, N., Islam, S., Acharya, D., Nag, S., Bardhan, S. (2017). Prevalence of osteoporosis and osteopenia in advanced chronic obstructive pulmonary disease patients. *Lung India, 28*(3), 84-186. doi: 10.4103/0970-2113.80974

Blackstock, F.C., ZuWallack, R., Nici, L., & Lareau, S. (2016). Why don't our patients with chronic obstructive pulmonary disease listen to us? The enigma of

nonadherence. *Annuals of American Thoracic Society, 13*(3), 317-323. doi: 10.1513/AnnalsATS.201509-600PS

Bodenheimer, T. & Abramowitz, S. (2010). *Helping patients help themselves: How to implement self-management support*. California Healthcare Foundation: U.S. Retrieved from www.chcf.org

Bodenheimer, T., Lorig, L., Holman, H., & Grumback, D. (2002). Patient self-management of chronic disease in primary care. *Journal of the American Medical Association, 200*(19), 2469-2475.

Bolarinwa, O. A. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science research. *Nigerian Postgraduate Medical Journal. 22*(4), 195-201. doi: 10.4103/1117-1936.173959

Boot.C., van der Guiden, J.W., Vercoulen, J.H.M.M., van den Borne, H.W., Rooijackers, J.M., van Weel, C., Folgering, H.T. M. (2005). Knowledge about asthma and COPD associations with sick leave, health complaints, functional limitations, adaptation and perceived control. In *Sick leave in asthma and COPD*. Chapter 6 (pp.59-70).

Bourbeau, J. (2008). Clinical decision processes and patient engagement in self-management. *Disease Management and Health Outcomes*, 16(5). 327-333. doi:10.2165/0115677-200816050-00009

Bourbeau, J. & Bartlett, S.J. (2007). Patient adherence in COPD. *Thorax, 63*(9), 831-838. doi:10.1136/thx.2007.086041

Bourbeau, J., Collet, J.P., Schwartzman, K., Ducruet, T., Naulty, D., Bradley, C., and the COPD axis of the Respiratory Health Network of The Fond de la recherché

ensante du Quebec. (2006). Economic benefits of self-management education in COPD. *Chest, 130*,1704-1711.

Bourbeau, J., Julien, M., Maltais, F., Rouleau, M., Beaupre, A., Begin, R., Renzi, P., Nault, D., Borycki, E., Schwartzman, K., Singh, R., Collet, J.P. and the COPD axis of the Respiratory Health Network of The Fond de la recherché en sante du Quebec. (2003). Reduction of hospital utilization in patients with chronic obstructive pulmonary disease. *Archives Internal Medicine, 163*, 585-591.

Bourbeau, J. & Nault, D. (2007). Self-management strategies in chronic obstructive pulmonary disease. *Clinical Chest Medicine, 28*, 617-628.

Bourbeau, J., & Saad, N. (2012). Integrated care model with self-management in chronic obstructive pulmonary disease: from family physicians to specialists. *Chronic Respiratory Disease*, 10(2), 99-105. doi:10.1177/1479972312473844

Bourbeau, J., Saad, N., Joubert, A., Ouellet, I., Drouin, I., Lombardo, C., Paquet, F., Beaucage, D., & Lebel, M. (2013). Making collaborative self-management successful in COPD patients with high disease burden. *Respiratory Medicine, 107,* 1061-1065. doi:10.1016/j.rmed.2013.03.003

Boyle, A.H. (2009). An integrative review of the impact of COPD on families. *Southern Online Journal of Nursing, 9*(3). Retrieved from http://www.resourcenter.net/images/SNRS/Files/SOJNR_articles2/Vol09Num03Art05.html

Bracken, N. (2016). Reducing readmissions in COPD patients. *American Nurse Today, 11*(7), 24-29. Retrieved from: https://americannursetoday.com/wp-content/uploads/2016/07/ant7-CE-COPD-615.pdf

Brandt, C.L. (2013). Study of older adult's use of self-regulation for COPD self-management informed an evidence-based teaching plan. *Rehabilitation Nursing, 38*(1), 11-23. doi:10.1002/mj.56

Bryan, S., & Navaneelan, T. (2015). *Health at a glance*: *Deaths from chronic obstructive pulmonary disease in Canada, 1950 to 2011*. Retrieved from https://www150.statcan.gc.ca/n1/en/pub/82-624-x/2015001/article/14246-eng.pdf?st=gJbmAJDe

Bucknall, C., Miller, G., Lloyd, S., Cleland, J., McCluskey, S., Cotton, M., Stevenson, R., Cotton, P., & McConnachie, A. (2012). Glasgow supported self-management trial (GSuST) for patients with moderate to severe COPD: Randomised controlled trial. *British Medical Journal, 344*(7849), e1060. doi: 10.1136/bmj.e1060

Bunker, J.M., Reddel, H.K., Dennis, S.M., Middleton, S., Van Schayck, CP., Crockett, A.J., …Zwar, N.A. (2012). A pragmatic cluster randomized controlled trial of early intervention for chronic obstructive pulmonary disease by practice nurse-general practitioner teams: Study protocol. *Implementation Science*, 7, 83-93. doi:10.1186/1748-5908-7-83

Burke, R.E., & Coleman, E.A. (2013). Interventions to decrease hospital readmissions. *Journal of the American Medical Association*, 173(8). 695-698. doi: 10.1001/jamainternmed.2013.171

Canadian Association of Student Nurses (2015). *National nursing education framework*. Ottawa: Author Retrieved from www.casn.ca

Canadian Institute for Health Information (2008). *Health indicators*, CIHI: Ottawa, ON. Retrieved from https://secure.cihi.ca/free_products/HealthIndicators2008_ENGweb.pdf

Canadian Institute for Health Information (2012). *All-Cause Readmission to Acute Care and Return to the Emergency Department.* Ottawa: ON. Retrieved from: https://secure.cihi.ca/free_products/Readmission_to_acutecare_en.pdf

Cao, Z., Ong, K.C., Eng, P., Tan, P., & Ng, T.P. (2006). Frequent hospital readmissions for acute exacerbation of COPD and their associated factors, 11(2), 188-195. doi: 10.1111/j.1440-1843.2006.00819.x

Carlson, M.L., Ivnik, M.A., Dierkhising, R.A., O'Byrne, M.M., & Vickers, K.S., (2006). A learning needs assessment of patients with COPD. *Medsurg Nursing, 15*(4), 204-212.

Casas, A., Troosters, T., Garcia-Aymerich, J., Roca, J., Hernandez, C., Alonso, A., … Decramer, M. and members of the CHRONIC Project. (2006). Integrated care prevents hospitalisations for exacerbations in COPD patients. *European Respiratory Journal, 28*(1), 123-130.

Center for Disease Control and Prevention (2018). *Cigarette smoking among U.S. adults lowest ever recorded: 14% in 2017*. Retrieved from: https://www.cdc.gov/media/releases/2018/p1108-cigarette-smoking-adults.html

Chaghari, M., Saffari, M., Ebadi, A., & Ameryoun, A. (2017). Empowering educations: A new model for in-service training of nursing staff. *Journal of Advances in Medical Education & Professionalism, 5*(1), 26-32.

Chan, F. Wong, F., Yam, C., Cheung, W., Wong, E., Leung, M., Goggins, W., & Yeoh, E. (2011). Risk factors of hospitalization and readmission of patients with COPD in Hong Kong population: Analysis of hospital admission records. *BioMed Central Health Services Research*. 11(186) Retrieved from http://www.biomedcentral.com/1472-6963/11/186.

Chandra, A., Cutler, D., & Song, Z. (2012).Who ordered that? The economics of treatment choices in medical care. In *Handbook of health economics*. Volume 2. Chapter six. (pp.397-431). Mark V. Pauly, Thomas G. McGuire, Pedro P. Barros (eds). doi: 10.1016/B978-0-444-53592-4.00006-2

Choi, J.Y., Cho, H.I., & Han, G. (2013). Patient outcomes according to COPD action plan adherence. *Journal of Clinical Nursing, 23,* 883-891. doi: 10.1111/jocn.12293

Choi, P., Day, A., & Etchells, E. (2004). Gaps in care of patients admitted to hospital with an exacerbation of chronic obstructive pulmonary disease. *Canadian Medical Association Journal, 170*(9), 1409-1413.

Christensen, C. M., Grossman, J.H., & Hwang, J. (2009). The Innovator's Prescription: A Disruptive Solution for Health Care. McGraw-Hill.

Chu, C., Chan, V., Lin, A., Wong., I., Leung, W., & Lai, C. (2004). Readmission rates and life threatening events in COPD survivors treated with non-invasive ventilation for acute hypercapnic respiratory failure. *Thorax, 59,* 1020-1025. doi: 10.1136/thx.2004.024307

Cicutto, L.C., & Brooks, D., (2006). Self-care approaches to managing chronic obstructive pulmonary disease: A provincial survey. *Respiratory Medicine, 100*(9), 1540-1546.doi: 10.1016.j.rmed.2006.01.005

Cicutto, L., Brooks, D., & Henderson, K. (2004). Self-care issues from the perspective of individuals with chronic obstructive pulmonary disease. *Patient Education and Counseling*, 55, 168-176.

Clark, N.M., Gong, M., Schork, M.A., Kaciroti, N., Evans, D., Roloff, D., Hurwitz, M., Maiman, L.A., & Melins, R.B. (2000). Long-term effects of asthma education for physician on patient satisfaction and use of health services. *European Respiratory Journal, 16,* 15-21 ISSN 0903-1936.

Coe, R. (2002). It's the effect size, stupid. What effect size is and why it is important. Paper presented at the 2002 Annual Conference of the British Educational Research Association, University of Exeter, Exeter, Devon, England, September 12–14, 2002. http://www.leeds.ac.uk/educol/documents/00002182.htm.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. New York, NY: Routledge Academic.

College of Nurses of Ontario. (2006). *Practice Standard. Therapeutic Nurse-Client Relationship*. Toronto: Author. Retrieved from: http://www.cno.org

College of Nurses' of Ontario. (2006). *Practice Standard. Therapeutic nurse-client relationship,* Author: Toronto, ON. Retrieved from: http://www.cno.org

College of Nurses' of Ontario. (2017). *Membership statistics report 2017*. Retrieved from: http://www.cno.org

Collinsworth, A., Brown, R., Stanford, R.H., Alemayehu, D. & Priest, E.L. (2018). The impact of patient education and shared decision making on hospital readmissions for COPD. *International Journal of COPD, 13,* 1325-1332. doi:10.2147/COPD.S154414

Cordier, J. (2014). The expert patient: Towards a novel definition. *European Respiratory Journal, 44*, 853-857. doi: 10.1183/09031936.00027414

Crighton, E.J., Ragetlie, R., Luo-J., To, T., & Gershon, A. (2015). A spatial analysis of COPD prevalence, incidence, mortality and health service use in Ontario. *Health Reports Statistics Canada, 26*(3), 10-19-8.

Crisafulli, E., Ortega, S., & Torres, A. (2015). Predictors of readmission in a period of 30 days or less in acute exacerbation of chronic obstructive pulmonary disease, *Clinical Pulmonary Medicine, 22*(4), 172-176. doi: 10.1097/CPM.000000000000090

Curtis, K., Fry, M., Shaban, R.Z., & Considine, J. (2016). Translating research findings to clinical nursing practice. *Journal of Clinical Nursing, 26*, 862-872. doi: 10.1111/jocn.13586

Dajczman, E., Robitaille, C., Ernst, P., Hirsch, A., Wolkove, N., Small, D., Bianco, J., Stern, H., & Palayew, M. (2013). Integrated interdisciplinary care for patients with chronic obstructive pulmonary disease reduces emergency department visits and admission: A quality assurance study. *Canadian Respiratory Journal, 20*(5), 351-356.

Dang-Tan, T., Ismaila, A., Zhang, S., Zarotsky, V., & Bernauer, M. (2015). Clinical, humanistic, and economic burden of chronic obstructive pulmonary disease (COPD) in Canada: a systematic review. *BMC Research Notes, 8*, 464.

Davison, A.G. & Jongepier, L. (2012). Training deficiencies and lack of confidence around knowledge in primary care nurses treating asthma and COPD patients. *Thorax, 67*, A167. doi: 10.1136/thoraxjnl-2012-202678-295

Decramer, M., Janssens, W., & Miravitles, M. (2012). Chronic obstructive pulmonary disease. *The Lancet, 379,* 1341-1351.

Dimitrov, D.M., & Rumrill, Jr. P.D. (2003). Pretest-posttest designs and measurement of change. Work, 20(2), 159-165. Retrieved from: https://www.ncbi.nlm.nih.gov/pubmed/12671209

Disler, R.T., Gallagher, R.D., & Davidson, P.M. (2012) Factors influencing self-management in chronic obstructive pulmonary disease: An integrative review. *International Journal of Nursing Studies*, 49, 230-242. doi:10.1016/j.ijnurstu.2011.11.005

Dowling, M., Murphy, K., Cooney, A., & Casey, D. (2011). A concept analysis of empowerment in chronic illness from the perspective of the nurse and the client living with chronic obstructive pulmonary disease *Journal of Nursing and Healthcare of Chronic Illness*, 3, 476-487.

Edwards, K. & Singh, S. (2012). The Bristol COPD knowledge questionnaire (BCKQ): Assessing the knowledge of healthcare professionals involved in the delivery of COPD services. *Thorax, 67,* A167. doi: 10.1136/thoraxjnl-2012-202678.296

Effing, T. (2014). Education in COPD self-management: Only part of the game. *Respirology,* 19, 151-152.

Effing, T., Monninkhof, E.M., van der Valk, P.D., van der Palen, J., Van Herwaarden,C.L., Partridge, M.R., & Walters, E.H. (2007). Self-management education for patients with chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews, 17*(4).

Effing, T., Vercouten, J. H., Bourbeau, J., Trappenburg, J., Lenferink, A., Cafarella, P., …van der Palen, J. (2016). Definition of a COPD self-management intervention:

International expert group consensus. *European Respiratory Journal, 48*(1), 46-54. doi: 10.1183/13993003.00025-2016

Entwistle, V.A., Carter, S.M., Cribb, A., & McCaffery, K. (2010). Supporting patient autonomy: The importance of clinician-patient relationships. *Journal of General Internal Medicine, 25*(7), 741-745. doi: 10.1007/s11606-010-1292-2

Estes, T.S. (2008). Assessing collaborative management in Asthma: A pilot study. *Journal of Theory Construction & Testing, 12*(2), 63-67.

Evans, J., Chen, Y., Camp, P.G., Bowie, D.M., & McRae, L. (2014). Estimating the prevalence of COPD in Canada: Reported diagnosis versus measure airflow obstruction. *Health Reports Statistics Canada, 25*(3), 10-18. Accessed from http://www.statcan.gc.ca/pub/82-003-x/2014003/article/11908- eng.pdf

Falk, E.B., Hyde, L.W., Mitchell, C., Faul, J., Gonzalez, R., Heitzeg, M.M… Schulenberg, J. (2013). What is a representative brain? Neuroscience meets population science. *Proceedings of the National Academy of Sciences of the United States of America, 110*(44), 17615-17622 doi: 10.1073/pnas.1310134110

Fan, V.S., Gaziano, J.M., Lew, R., Bourbeau, J., Adams, S.G., Leatherman, S. … Niewoehner, D. (2012). A comprehensive care management program to prevent chronic obstructive pulmonary disease hospitalizations. *Annals of Internal Medicine, 156*(10), 673-683. doi:10.7326/0003-4819-156-10-201205150-00003

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160 doi:10.3758/BRM.41.4.1149

Feemster, L., & Au, D. (2014). Penalizing hospitals for chronic obstructive pulmonary disease readmissions. *American Journal of Respiratory Critical Care Medicine, 189*(6) doi: 10.1164/rccm.201308-1542PP, 22, 172-176

Forbes, A. & While, A. (2008). The nursing contribution to chronic disease management: A discussion paper. *International Journal of Nursing Studies,* 46; 120-131 doi:10.1016/j.ijnurstu.2008.06.010

Fromer, L. (2011). Implementing chronic care for COPD: Planned visits, care coordination, and patient empowerment for improved outcomes. *International Journal for COPD, 6,* 605-614 doi:10.2147/COPD.S24692

Gallefoss, F. (2004). The effects of patient education in COPD in a 1-year follow-up randomised, controlled trial. *Patient Education and Counseling*, 52(3), 259-266 doi:10.1016/S0738-3991(03)00100-9

Gallefoss, F., & Bakke, P.S. (2000). Impact of patient education and self-management on morbidity in asthmatics and patients with chronic obstructive pulmonary disease. *Respiratory Medicine, 94,* 279-287 doi:10.1053/rmed.1999.0749

Garcia-Aymerich, J., Farrero, E., Felez, M.A., Izuierdo, J., Marrades, R.M., & Anto, J.M. (2003). Risk factors of readmission to hospital for a COPD exacerbation: A prospective study. *Thorax, 58,* 100-105.

George, P.P., Heng, B.H., Lim, T.K., Abisheganaden, J., Keong, A.W., Ng, A.V., & Lim, F.S. (2016). Evaluation of a disease management program for COPD using propensity matched control group. *Journal of Thoracic Disease, 8*(7), 1661-1771. doi: 10.21037/jtd.2016.06.05

Gershon, A.S., Guan, J., Victor, J.C., Goldstein, R., & To, T. (2013). Quantifying health services use for chronic obstructive pulmonary disease. *American Journal of*

Respiratory Critical Care Medicine, 187(6), 596-601
doi: 10.1164/rccm.201211-2044OC

Glasgow, R.E., Wagner, E.H., Schaeffer, J., Mahoney, L.D., Reid, R.J. & Greene, S.M. (2005). Development and validation of the Patient Assessment of Chronic Illness Care (PACIC). *Medical Care, 43*(5), 436-444

Gliner, J.A., Morgan, G.A., & Harmon, R.J. (2003). Pretest-Posttest comparison group designs: Analysis and interpretation. *Journal of the American Academy of Child Adolescent Psychiatry, 42*(4), 500 – 503.
doi: 0.1097/01.HI.0000046809.95464.BE

Global strategy for the diagnosis, management and prevention of COPD, global initiative for chronic obstructive lung disease (GOLD). (2017). Retrieved from: http//goldcopd.org

Graban, M. (2016). *Lean hospitals: Improving quality, patient safety, and employee engagement.* (3rd ed). Boca Raton, FL.: CRC Press Taylor & Francis Group
ISBN: 978-1-4987-4326-6

Gudmundsson, G., Gislason, R, Janson, C., Lindberg, E., Hallin, R., Ulrik, C.S., Brondum, E., Nieminen, M.M., Aine, R., & Bakke, P. (2005). Risk factors for rehospitalisation in COPD: Role of health status, anxiety and depression. *European Respiratory Journal, 26*, 414-419 doi: 10.1183/09031936.05.00078504

Hackett, G., & Betz, N. (1981). A self-efficacy approach to the career development of women. *Journal of Vocational Behavior, 18*(3), 326-339
doi: 10.1016/0001-8791(81)90019-1

Han, M.K., Martinez, C.H., Au, D.H., Bourbeau, J., Boyd, C.M., Branson, R….Dransfield, M.T. (2016). Meeting the challenge of COPD care delivery in the

USA: A multiprovider perspective. Lancet, 4(6), 473-525. doi: 10.1016. S2213-2600(16)00094-1

Handley, M.A., Lyles, C.R., McCulloch, C., & Cattamanchi, A. (2018). Selecting and improving quasi-experimental designs in effectiveness and implementation research. *Annual Review of Public Health, 39*(5), 5-25. doi: 10.1146/annurev-publhealth-040617-014128

Harries, T.H., Thornton, H., Crichton, S., Schofield, P., Gilkes, A., & White, P. (2017). *Primary Care Respiratory Medicine, 27*, 31. doi: 10.1038/s41533-017-0028-8

Harris, A.D., McGregor, J.C., Perencevich, E.N., Furuno, J.P., Zhu, J., Peterson, D.E., Finkelstein, J. (2006). The use and interpretation of quasi-experimental studies in medical informatics. *Journal of American Medical Information Association, 13(1)*, 16-23. doi:10.1197/jamia.M1749

Haughney, J., Partridge, M.R., Vogelmeier, C. Larsson, T., Kessler, R., Stahl, E., Brice, R., & Lofdahl, C.G. (2005). Exacerbations of COPD: Quantifying the patient's perspective using discrete choice modelling. *European Respiratory Journal 26*, 623-629. doi: 10.1183/09031936.05.00142704

Health Quality Ontario. (2013). Specialized nursing practice for chronic disease management in the primary-care setting: An evidence-based analysis. *Ontario Health Technology Assessment Series, 13*(10), 1–66. Retrieved from: https://www.hqontario.ca/

Health Quality Ontario, & Ministry of Health & Long-Term Care (2015). *Quality-based procedures clinical handbook for chronic obstructive pulmonary disease.* Health Quality Ontario: Author: Toronto, ON. Retrieved from: https://www.hqontario.ca/

Hill, K., Mangovski-Alzamora, S., Blouin, M., Guyatt, G., Heels-Ansdell, D., Bragaglia, P., Tamari, I, Jones, K., & Goldstein, R. (2009). Disease-specific education in the primary care setting increases the knowledge of people with chronic obstructive pulmonary disease: A randomized controlled trial. *Patient Education and Counseling, 81*, 14-18. doi: 10.1016/j.pec.2009.09.035

Hopkinson, N.S., Englebretsen, C., Cooley, N., Kennie, K., Lim, M., Woodcock, T., …Lai, D. (2012). Designing and implementing a COPD discharge care bundle. *Thorax, 67*, 90-92. doi: 10.1136/thoraxjnl-2011-200233

Hurst, J.R., Vestbo, J., Anzueto, A., Locantore, N., Mullerova, H., Tal-Singer, R., … Wedzicha, J.A. for the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) Investigators (2010). Susceptibility to exacerbation in chronic obstructive pulmonary disease. *New England Journal of Medicine, 363*, 1128-1138. doi: 10.1056/NEJMoa0909883

Hyland, M.E., Jones, R.C.M., & Hanney, K.E. (2006). The lung information needs questionnaire: Development, preliminary validation and findings. *Respiratory Medicine, 100*(10), 1807-1816. doi:10.1016/j.rmed.2006.01.018

IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0, Armonk, NY: IBM Corp.

Jacobson, A.F., Warner, A., Fleming, E., & Schmidt, B. (2008). Factors influencing nurses' participation in clinical research, *Gastroenterology Nursing, 31*(3), 198-2008. doi:10.1097/01SGZ.0000324112.63532.a2

Jain, V.V., Allison, R., Beck, S.J., Jain, R., Mills, P.K., McCurley, J.W., Van Gundy, K.P. & Peterson, M.W. (2014). Impact of an integrated disease management

program in reducing exacerbations in patients with severe asthma and COPD. *Respiratory Medicine, 108*, 1794-1800. doi: 10.1016/j.rmed.2014.09.010

Janaudis-Ferreira, T., Carr, S. J., Harrison, S.L., Gershon, A.S., Milner, S.C., Carr, S., Fishbein, D., & Goldstein, R. (2018). Can patients with COPD assimilate disease-specific information during an acute exacerbation? Results of a pilot randomized controlled trial. *CHEST, 154*(3), 588-596. doi: 10.1016/jchest.2018.05.028

Janssens, L., Brumagne, S., McConnell, A.K., Claeys, K., Pijnenburg, M., Burtin, C., … Troosters, T. (2013). Proprioceptive changes impair balance control in individuals with chronic obstructive pulmonary disease. PLoS ONE, 8(3), e57949. doi: 10.1371/journal.pone.0057949

Janz, T. (2012). *Current smoking trends*. Statistics Canada. Retrieved from: https://www.150.statcan.gc.ca

Jennings, J.H., Thavarajah, K., Mendexz, M.P., Eichenhorn, M., Kvale, P., & Yessayan, L. (2015). Predischarge bundle for patients with acute exacerbations of COPD to reduce readmissions and ED visits. *CHEST, 147*(5), 1227-1234. doi: 10.1378/chest.14.1123

Jerant, A., von Friederichs-Fitzwater, M., & Moore, M. (2005). Patients' perceived barriers to active self-management of chronic conditions. *Patient Education and Counselling,57*, 300-307. doi:10.1016/j.pec.2004.08.004

Jiang, K., Xiao, H., Segal, R., Mobley, W. & Park, H. (2018). Trends in readmission rates, hospital charges, and mortality for patients with chronic obstructive pulmonary disease (COPD) in Florida from 2009 – 2014. *Clinical Therapeutics, 40*(4), 613-626.ei. doi:10.1016/j.clinthera.2018.03.006

Jolly, K., Majothi, S., Sitch, A.J., Heneghan, N.R., Riley, R.D., Moore, D.J., … Jordan, R.E. (2016). Self-management of health care behaviours for COPD: A systematic review and meta-analysis. *International Journal of Chronic Obstructive Pulmonary Disease, 11*, 305-326. doi:10.2147/COPD.S90812

Jonkman, N.H., Westland, H., Trappenburg, J.C., Groenwold, R.H., Bischoff, E.W., Bourbeau, J.,… Schuurmans, M.J. (2016). Characteristics of effective self-management interventions in patients with COPD: Individual patient data meta-analysis. *European Respiratory Journal, 48*(1). doi:10.1183/13993003.101860-2015

Jonsdottir, H. (2013). Self-management programmes for people living with chronic obstructive pulmonary disease: A call for reconceptualisation. *Journal of Clinical Nursing, 22*, 621-637. doi:10.1111/jocn.12100

Jonsdottir, H., Amundadottir, O.R., Gudmundsson, G., Halldorsdottir, B.S., Hrafnkelsson, B., Ingadottir, T.S., … Stefansdottir, I.K. (2015). Effectiveness of a partnership-based self-management programme for patients with mild and moderate chronic obstructive pulmonary disease: a pragmatic randomized controlled trial. *Journal of Advanced Nursing*, *71*(11), 2634-2649. doi: 10.1111.jan.12728

Jordan, R.E., Majothi, S., Heneghan, N.R., Blissett, D.B., Riley, R.D., Sitch, A.J., … Jolly, K. (2015). Supported self-management for patients with moderate to severe chronic obstructive pulmonary disease (COPD): An evidence synthesis and economic analysis. *Health Technology Assessment, 19*(36). doi: 10.3310/hta19360

Kaptein, A.A., Fischer, M.J., & Scharloo, M. (2014). Self-management in patients with COPD: Theoretical context, content, outcomes, and integration into clinical care. *International Journal of COPD, 9*, 907-914. doi:10.2147/COPD.S49622

Kaptein, A.A., Scharloo, M., Fischer, M.J., Snoel, L., Cameron, L.D., Sont, J.K., Rabe, K.F., & Weinman, J. (2008). Illness perceptions and COPD: an emerging field for COPD patient management. *Journal of Asthma, 45*, 625-629. doi:10.1080/02770900802127048

Kara, M., & Asti, T. (2004). Effect of education on self-efficacy of Turkish patients with chronic obstructive pulmonary disease. *Patient Education and Counselling, 55,* 114-120 doi:10.1016/j.pec.2003.08.006

Kasikci, M.K., & Alberto, J. (2006). Family support, perceived self-efficacy and self-care behaviour of Turkish patients with chronic obstructive pulmonary disease. *Journal of Clinical Nursing, 16,* 1468-1478. doi: 10.1111/j.1365-2702.2006.01782.x

Keane, C. & Alliex, S. (2018). An investigation of nurse education service models in acute care metropolitan hospitals across Australia. *Nurse Education in Practice, 28*, 202-211.

Kessler, R., Partridge, M.R., Miravitlles, M., Cazzola, M., Vogelmeier, C., Leynaud, D., & Ostinelli, J. (2011). Symptom variability in patients with severe COPD: A pan-European cross-sectional study. European Respiratory Journal, 37, 264-272. doi: 10.1183/09031936.00051110

Kessler, R., Stahl., E., Vogelmeier, C. Haughney, J., Trudeau, E. & Lofdahl., C. (2006). Patient understanding, detection, and experience of COPD exacerbations: An

observational, interview-based study. *CHEST, 130*(1), 133-142. doi: 10.1378/chest.130.1.133

Khdour, M.R., Hawwa, A. F., Kidney, J.C., Smyth, B.M., & McElnay, J.C. (2009). Clinical pharmacy-led disease and medicine management programme for patients with COPD. *British Journal of Clinical Pharmacology, 68*(4), 588-598. doi: 10.1111/j.1365-2125.2009.03493.x

Kieft, R.A., de Brouwer, B. B., Francke, A.L., & Delnoij, D.M.J. (2014). How nurses and their work environment affect patient experiences of the quality of care: A qualitative study. *BioMed Central Health Services Research, 14*, 249. doi: 10.1186/1472-6963-14-249

Kilgore, M. (2010). Transitional case management: A method for establishing self-advocacy and reducing hospital readmission in COPD patients. *Home Health Care Management & Practice, 22*(6), 435-438. doi:10.1177/1084822309357008

Korpershoek, Y.J.G., Bos-Touwen, I.D., de Man-van-Ginkel, J.M., Lammers, J-W. J., Schuurmans, M.J., & Trappenburg, J.C.A. (2016). Determinants of activation for self-management in patients with COPD. *International Journal of COPD, 11*, 1757-1766. doi:10.2147/COPD.S109016

Korpershoek, Y. J. G., Verboort, S, Nijssen, L., Trappenburg, J., & Schuurmans, M.J. (2016). Factors influencing exacerbation-related self-management in patients with COPD: A qualitative study. *International Journal of COPD, 11*, 2977-2990. doi:10.2147/COPD.S116196

Kruis, A.L., Smidt, N., Assendelft, W.J.J., Gussekloo, J., Boland, M.R.S., Rutten-van Molken, M., & Chavannes, N.H. (2013). Integrated disease management

interventions for patients with chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews, 10.* doi: 10.1002/14651858.CD009437.pub2.

Kwak, S.K. & Kim, J.H. (2017). Statistical data preparation: Management of missing values and outliers. *Korean Journal of Anesthesiology, 70*(4), 401-411. doi: 10.4097/kjae.2017.4.407

Lainscak, M., Kadivec, S., Kosnik, M., Benedik, B., Bratkovic, M., Jakhel, T.,…Farkas, J. (2013). Discharge coordinator intervention prevents hospitalization in patients with COPD: A randomized controlled trial. *American Medical Directors Association, 14*, 450e1-450e6. doi: 10.1016/jamda.2013.03.003

Laschinger, H., McWilliam, C., & Weston, W. (1999). The effects of family nursing and family medicine clinical rotations on nursing and medical students' self-efficacy for health promotion counseling. *Journal of Nursing Education, 38*(8), 347-356.

Lajas, A. C., González, E.G., Parrado, C. L., Maestu, L.P. & Miguel-Diez, J. (2018). Readmission due to exacerbation of COPD: Associated factors. *Lung, 196*(2), 185-193. doi:10.1007/s00408-018-0093-y

Lawlor, M., Kealy, S., Agnew, M., Korn, B., Quinn, J., Cassidy, C., …O'Donnell, R. (2009). Early discharge care with ongoing follow-up support may reduce hospital readmissions in COPD. *International Journal of COPD, 4*, 55-60.

Lawn, S., McMillan, J., & Pulvirenti, M. (2011). Chronic condition self-management: Expectations of responsibility. *Patient Education and Counselling, 84*(2), e5-e8. doi:10.1016/j.pec.2010.07.008

Lawn, S. & Schoo, A. (2010). Supporting self-management of chronic health conditions: Common approaches. *Patient Education and Counseling, 80*(2), 205-211. doi:10.1016/j.pec.2009.10.006

Lenferink, A., Brusse -Keizer, M., van der Valk, P., Zerink, M., Monninkhof, E.M., van der Palen, J., & Effing, T. (2015). Self management interventions including action plans for exacerbations versus usual care in people with chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews, 5*, Art. No: CDO11682. doi:10.1002/14651858.CDO11682

Levac, D., Colquhoun, H., O'Brien, K.K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(69). doi: 10.1186/1748-5908-5-69

Little, R.J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202. doi: 10.2307/2290157

Lorig, K.R. & Holman, H.R. (2003). Self-management education: history, definition, outcomes and mechanisms. *Annals of Behavioural Medicine, 26*(1), 1-7. doi:10.1207/S15324796ABM2601_01

Lundell, S., Tistad, M., Rehn, B., Wiklund, M., Holmner, A., & Wadell, K. (2017). Building COPD care on shaky ground: A mixed methods study from Swedish primary care professional perspective. *BioMed Central Health Services, 17* (467). doi: 10.1186/s12913-017-2393-y

Mabire, C., Bachnick, S., Ausserhofer, D., & Simon, M. (2019). Patient readiness for hospital discharge and its relationship to discharge preparations and structural factors: A cross-sectional study. *International Journal of Nursing Students, 90*, 13-20. doi: 10.1016/j.ijnurstu.2018.09.016

Mabire, C., Coffey, A., & Weiss, M. (2015). Readiness for hospital discharge scale for older people: Psychometric testing and short form development with a three

country sample. *Journal of Advanced Nursing, 71*(11), 2686-2696 doi:10.1111/jan.12731

MacIntyre, N., & Huang, Y.C. (2008). Acute exacerbations and respiratory failure in chronic obstructive pulmonary disease. Proceedings of the American Thoracic Society, 5,530-535. doi:10.1513\pats.200707-088ET

Make, B. (2003). Chronic obstructive pulmonary disease: Developing comprehensive management. *Respiratory Care, 48*(12), 1225-1237.

Make, B. (1994). Collaborative self-management strategies for patients with respiratory disease, *Respiratory Care, 39*(5), 566- 578.

Marcos, P.J., Sanjuan, P., Huerta, A., Nieto-Cedesido, I., Ferrreira-Gonzalex, L., Sibila, O., & Restrepo, M.J. (2017). Acute exacerbations of chronic obstructive pulmonary disease and clinical outcomes in hospitalized patients. *Cureus, 9*(1), e988. doi: 10.7759/cureus.988

Maricoto, T., Monteiro, L., Gama, J.M.R., Correia-de Sousa, J., & Taborda-Barata, L. (2019). Inhaler technique education and exacerbation risk in older adults with asthma or chronic obstructive pulmonary disease: A meta-analysis. *The American Geriatrics Society, 671,* 57-66. doi: 10.1111/jgs.15602

Mathieson, K. (2014) Making sense of biostatistics: Types of nonprobability sampling. *Journal of Clinical Research Best Practices, 10*(10). Retrieved from https://firstclinical.com/journal

Mathews, H., Tooley, C., Lindsey-Halls, A. (2013). Care bundles reduce readmission for COPD. *Nursing Times, 109*(7), 18-20.

Mazzuca, S.A. (1982). Does patient education in chronic disease have therapeutic value? *Journal of Chronic Disease, 35*(7), 5121-529. doi:10.1016/0021-9681(82)90071-6

McAuley, E., Szabo, A., Gothe, N., & Olson, E.A. (2011). Self-efficacy: Implications for physical activity, function, and functional limitations in older adults. *American Journal of Lifestyle Medicine, 5*(4). doi: 10.1177/1559827610392704

McGahee, T.W. & Ball, J. (2009). How to read and really use an item analysis. *Nurse Educator, 34*, 166-171. doi: 10.1097/NNE.0b013e3181aaba94.

Miller, C., Johnson, J.L., Mackay, M., & Budz, B. (1997). The challenges of clinical nursing research: Strategies for successful conduct. *Clinical Nurse Specialist, 11*(5), 213-216.

Messenger, R. W. (2012). Reducing chronic obstructive pulmonary disease readmissions. *Professional Case Management, 17*(1), 109-114. doi: 10.1097/NCM.0b013e31823ba2b8

Mitchell, K.E., Johnson-Warrington, V., Apps, L.D., Bankart, J., Sewell, L., Williams, J.E., Rees, K., Jolly, K., Steiner, M., Morgan, M., & Singh, S.J. (2014). A self-management programme for COPD: A randomised controlled trial. *European Respiratory Journal, 44*, 1538-1547. doi: 10.1183/09031936.00047814

Monette, M. (2012). Hospital readmission rates under the microscope. *Canadian Medical Association Journal, 184*(12), E651 doi:10.1503/cmaj.109-4245

Monninkhof, E., van der As, M., van der Valk, P., van der Palen, J., Zielhuis, G., Koning, K., & Pieterse, M. (2004). A qualitative evaluation of a comprehensive self-management programme for COPD patients: effectiveness from the patients' perspective. *Patient Education and Counseling, 55*, 177-184. doi:10.1016/j.pec.2003.09.001

Newman, S., Steed, L., & Mulligan, K. (2009). Self-management interventions for chronic illness. *Lancet, 364*, 1523-1532. doi: 10.1016/S0140-6736(04)17277-2

Nici, L., Bently, T.D., ZuWallack, R. & Gross, N. (2014). Self-management in Chronic Obstructive Pulmonary Disease time for a paradigm shift? *Annals of American Thoracic Society*, *11*(1), 101-107. doi:10.1513/AnnalsATS.201306-150FR

Noordzij, M., Tripepi, G., Dekker, F.W., Zoccali, C., Tanck, M.W. & Jager, K.J. (2010). Sample size calculations: Basic principles and common pitfalls. *Nephrology Dialysis Transplant*, *25*, 1388-1393. doi:10.1093/ndt.gfp732

Nosbusch, J.M., Weiss, M.E., & Bobay, K., L. (2011). An integrated review of the literature on challenges confronting the acute care staff nurse in discharge planning. *Journal of Clinical Nursing*, *20*, 754-774 doi:10.1111/j.1365-2702.2010.03257.x

Oancea, C., Fira-Miadinescu, O., Timar, B., & Tudorache, V. (2015). Impact of a medical education program on COPD patients: A cohort prospective study. *The Central European Journal of Medicine*, *127*, 388-393 doi: 10.1007/s00508-015-0712-z

O'Donnell, D.E., Hernandez, P., Kaplan, A., Aaron, S., Bourbeau, J., Marciniuk, D., … Voduc, N. (2008). Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2008 update- highlights for primary care. *Canadian Respiratory Journal*, 15, Supp A, 1A – 8A.

Ortoleva, C. (2010). An approach to consistent patient education. *Association of Perioperative Registered Nurses Journal*, *92*(4), 437-444. doi: 10.1016/j.aom.2010.04.018

Ospina, M.B., Mrklas, K., Deuchar, L., Rowe, B.H., Leigh, R., Leigh, R., Bhutani, M., & Stickland, M.K. (2017). A systematic review of the effectiveness of discharge care

bundles for patients with COPD. *Thorax, 72*(10, 31-39. doi: 10.1136/thoraxjni-2016-208820.

Osterlund, E. E., Klang, B., Larsson, K., Ehrenberg, A., & Fossum, B. (2009). Communication and self-management education at nurse-led COPD clinics in primary health care. *Patient Education and Counseling*, 77(2), 209-217. doi: 10.1016/j.pec.2009.03.033

Pajares, F. (1996). Self-efficacy in academic settings. Paper presented at a symposium held during the meeting of the American Educational Research Association, San Francisco, Session 39.10. Retrieved from files.eric.ed.gov/fulltext/ED384608.pdf

Panos, R.J., Krywkowski-Mohn, S.M., Sherman, S.N., & Lach, L.A. (2013). Patient reported determinants of health: A qualitative analysis of veterans with chronic obstructive pulmonary disease. *Journal of Chronic Obstructive Pulmonary Disease, 10*, 333-347. doi: 10.3109/15412555.2012.752805

Ping, A., Lee, K.H., & Lim, T.K. (2005). In-hospital and 5-year mortality of patients treated in the ICU for acute exacerbations of COPD: A retrospective study. *Chest, 128*(2). 518-524 doi: 1378/chest.128.2.518

Pinnock, H., Steed, L., & Jordan, R. (2016). Supported self-management for COPD: Making progress, but there are still challenges. *European Respiratory Journal, 48*, 6-9. doi: 10.1183/13993003.00576-2016

Plichta, S. P. & Kelvin, E. (2013). *Munro's statistical methods for health care research*. Lippincott Williams & Wilkins: NY

Rabe, K.F., Hurd, S., Anzueto, A., Barnes, P.J., Buist, S.A., Calverley, P., … Zielinski, J. (2007). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD Executive Summary. *American Journal of*

Respiratory Critical Care Medicine, 176, 532-555.
doi: 10.1164/rccm.200703-456SO

Reed, D., Titler, M.G., Dochterman, J.M., Shever, L.L., Kanak, M., & Picone, D.M. (2007). Measuring the dose of nursing intervention. *International Journal of Nursing Terminologies and Classifications, 18*(4), 121-130, doi: 10.1111/j.1744-618X.2007.00067.x

Registered Nurses' Association of Ontario (2005). *Nursing care of dyspnea: The 6th vital sign in individuals with chronic obstructive pulmonary disease*. Author: Toronto, ON. Retrieved from http://rnao.ca/bpg/guidelines/dyspnea

Reineke, D.M., Baggett, J., & Elfessi, A. (2003). A note on the effect of skewness, kurtosis, and shifting on one-sample *t* and sign tests. *Journal of Statistics Education, 11*(3). doi: 10.1080/10691898.2003.11910723

Rezaee, M.E., Ward, C.E., Nuanez, B., Rezaee, D.A., Ditkoff, J. & Halalau, A. (2018). Examining 30-day COPD readmissions through the emergency department. *International Journal of Chronic Obstructive Pulmonary Disease, 13*, 109-120, doi: 10.2147/COPD.S147796

Rice, K., Bourbeau, J., MacDonald, R., & Wilt, T.J. (2014). Collaborative management and behavioural change. *Clinical Chest Medicine, 35*(2), 337-351
doi: 10.1016/j.ccm.2014.02.004

Rice, K.L., Dewan, N., Bloomfield, H.E., Grill, J., Schult, T. M., Nelson, R.B., … Niewoehner, D.E. (2010). Disease management program for chronic obstructive pulmonary disease: A randomized controlled trial. *American Journal of Respiratory Critical Care Medicine, 182,* 890-896.
doi: 10.1116/rccm.200910-1579OC

Risor, M.B., Spigt, M., Iversen, R., Godycki-Cwirko, M., Francis, N.,Altiner, A., … Melbye, H. (2013). The complexity of managing COPD exacerbation: A grounded theory study of European general practice. *BMJ Open*, 3; e003861. doi: 10.1136/bmjopen-2013-003861

Robinson (2010). Empowering people to self manage COPD with management plans and hand held records. *Nursing Times, 106*(38),

Roche, N., Zureik, M., Soussan, D., Neukirch, F., Perrotin, D., Urgence BPCO (COPD Emergency) Scientific Committee. (2008). Predictors of outcomes in COPD exacerbation cases presenting to the emergency department. *European Respiratory Journal, 32*(4), 953-961. doi:10.1183/09031936.DD128507

Schildmann, E.K., & Higginson, I.J. (2011). Evaluating psycho-educational interventions for informal carers of patients receiving cancer care of palliative care: Strengths and limitations of different study designs. *Palliative Medicine, 25*(4), 345-356. doi: 1.1177/0269216310389223

Schlomer, G.L., Bauman, S., & Card, N.A. (2010). Best practices for missing data management n counselling psychology. *Journal of Counseling psychology, 57*(1), 1-10. doi: 10.1037/a0018082

Schmalenberg, C., & Kramer, M. (2008). Essentials of a productive nurse work environment. *Nursing Research, 57*(1), 2-13. doi: 10.1097/01.NNR.0000280657.04008.2a

Scott, A.S., Baltzar, M.A., Dajczman, E., & Wolkove, N. (2011). Patient knowledge in chronic obstructive pulmonary disease: Back to basics. *Journal of Chronic Obstructive Pulmonary Disease,* 8, 375-379. doi:10.3109/15412555.2011.605402

Scullion, J. (2018). The nurse practitioners' perspective on inhaler education in asthma and chronic obstructive pulmonary disease. *Canadian Respiratory Journal*. doi: 10.1155/2018/2525319

Seemungal, T.A., Donaldson, G.C., Paul, E.A., Bestall, J.C., Jeffries, D.J., & Wedzicha, J.A. (1998). Effect of exacerbations on quality of life in patients with chronic obstructive pulmonary disease. *American Journal of Respiratory and Critical Care, 157*, 1418-1422.

Seemungal, T.A.R., & Wedzicha, J.A. (2006). Integrated care: a new model for COPD management? *European Respiratory Journal, 28*, 4-6. doi:10.1183/09031936.06.00061006

Shapiro, S.S. & Wilk, M.B. (1965). An analysis of variance test for normality (complete samples). Biometrika, 52(3-4), 591-611. doi: 10.2307/2333709

Sharif, R., Parekh, R.M., Pierson, K.S., Kuo, Y.F., & Sharma, G. (2014). Predictors of early readmission among patients 40 to 64 years of age hospitalized for chronic obstructive pulmonary disease. *American Thoracic Society*, 11 (5), 685- 694. doi: 10.1513/AnnalsATS.201310-358OC

Spence Laschinger, H., & Tresolini, C.P. (1999). An exploratory study of nursing and medical students health promotion counselling self-efficacy. Nurse Education Today, 19(5), 408-418. doi: 10.1054/nedt.1999.0326

Spencer, S., Calverley, P., Burge, P.S., & Jones, P.W. (2004). Impact of preventing exacerbations on deterioration of health status in COPD. *European Respiratory Journal, 23(5)*, 698-702. doi:10.1183/09031936.0400121404

Sridhar, M., Taylor, R., Dawson, S., Roberts, N.J. & Partridge, M.R. (2008). A nurse led intermediate care package in patients who have been hospitalised with an acute exacerbation of chronic obstructive pulmonary disease. *Thorax, 63,* 194-200. doi: 10.1136/thx.2007.077578

Steindal, S.A., Torheim, H., Oksholm, T., Christensen, V.L., Lee, K., Lerdal, A….Borge, C.R. (2018). Effectiveness of nursing interventions for breathlessness in people with chronic obstructive pulmonary disease: A systematic review and meta-analysis. *Journal of Advanced Nursing*. doi: 10.1111/jan.13902

Strang, S., Ekberg-Jannson, A., & Henoch, A., (2014). Experience of anxiety among patients with server COPD: A qualitative, in-depth interview study. *Palliative and Supportive Care, 12*, 465-472. doi: 10.1017/S1478951513999369

Sullivan, G.M. & Feine, R. (2012) Using effect size – or why the p value is not enough. *Journal of Graduate Medical Education, 4*(3), 279-282, doi: 10.4300/JGME-D-12-00156.1

Suresh, K.P. (2011). An overview of randomization techniques: An unbiased assessment of outcomes in clinical research. *Journal of Human Reproductive Science, 4*(1), 8-11. doi: 10.4103/0974-1208.82352

Suresh, K., & Chandrashekara, S. (2012). Sample size estimation and power analysis for clinical research studies. *Journal of Human Reproductive Sciences, 5*(1), 1-7. Retrieved from http://www.jhrsonline.org.proxy1.liv.uwo.ca/

Tabachnick, B.G., & Fiddel, L.S. (2013). *Using multivariate statistics*. (6th ed.) New York: Harper and Row.

Townsend,C.S., McNulty, M., & Grillo-Peck, A. (2017). Implementing huddles improves care coordination in an academic health center. *Professional Case Management, 22*(1), 29-35. doi: 10.1097/NCM.000000000200

Trappenburg, J., Jaarsma, T., van Os-Medendorp, H., Kort, H., Hoes, A., & Schuurmans, M. (2013). Self-management: One size does not fit all. *Patient Education and Counseling*, *92,* 134-137 doi:10.1016j.pec.2013.02.009

Verbrugge, R., De Boer, F., & Georges, J.J. (2013). Strategies used by respiratory nurses to stimulate self-management in patients with COPD. *Journal of Clinical Nursing, 22*, 2787-2799 doi: 10.1111/jocn.12048

Viniol, C., & Vogelmeier, C.F. (2018). Exacerbations of COPD. *European Respiratory Review, 27*, 170103. doi: 10.1183/16000617.0103-2017

Warsi, A.,Wang, P.S., La Valley, M.P., Avorn, J., & Solomon, D.H. (2004). Self-management education in chronic disease. A systematic review and methodological critique of the literature. *Archives of Internal Medicine, 164*(15), 1641-1649 doi: 10.1001/archinte.164.15.1641

Wedzicha, J.A. & Seemungal, T.A.R. (2007). Exacerbations: Defining their cause and prevention. *Lancet, 370*(9589). 786-796. doi: 10.1016/S0140-6736(07)61382-8

Weiss, M.E., & Piacentine, L.B. (2006). Psychometric properties of the readiness for hospital discharge scale. *Journal of Nursing Measurement, 14*(3), 163-180.

Weiss, M.E., Piacentine, L.B., Ancona, J., Gresser, S., Toman, S., & Vega-Stromberg, T. (2007). Perceived readiness for hospital discharge in adult medical-surgical patients. *Clinical Nurse Specialist, 21*(1). 31-43.

White, R., Walker, P., Roberts, S., Kalisky, W., & White, P. (2006). Bristol COPD questionnaire (BCKQ): Testing what we teach patients about COPD. *Chronic Respiratory Journal,3*(3), 123-131. doi:10.1191/1479972306cd117oa

White, H., & Sarbarwal, S. (2014). Quasi-experimental design and methods. *Methodological Briefs: Impact Evaluation, 8,* UNICEF: Office of Research, Florence, Italy.

Whitehead, D. (2001). A social cognitive model for health education/health promotion practice. *Journal of Advanced Nursing, 36*(3), 417-425. doi:10.46/j.1365-2648.2001.01973.x

Wise, R.A., Calverley, P.M.A., Carter, K., Clerisme-Beaty, E., Metzdorf, N., & Anzueto, A. (2018). Seasonal variation in exacerbations and deaths in patients with COPD during the TIOSPIR trial. *International Journal of COPD, 13,* 605-616. doi: 10.2147/COPD.S148393

Wong, E.M.L., Lo, S.M., Ng, Y., Lee, L.L.Y., Yuen, T.M.Y., Chan, J.T.S., & Chair, S.Y. (2016). Cost-effectiveness of Program We Care' for patients with chronic obstructive pulmonary disease: A case-control study. *International Emergency Nursing*. doi: 10.1016/j.ienj.2015.11.001

Worth, H. & Dhein, Y. (2004). Does patient education modify behaviour in the management of COPD? *Patient Education and Counseling*, *52*(3), 267-270. doi:10.1016/S0738-3991(03)00101-0

Young, H., Apps, L.D., Harrison, S.L., Johnson-Warrington, V.L., Hudson, N., & Singh, S.J. (2015). Important, misunderstood, and challenging: A qualitative study of nurses' and allied health professionals' perceptions of implementing self-

management for patients with COPD. *International Journal of Chronic Obstructive Pulmonary Disease, 10*, 1043-1052. doi: 10.2147/COPD.S78670

Zapatero, A., Barba, R., Ruiz, J., Losa, J.E., Plaza, S., Canora, J., & Marco, J. (2013). Malnutrition and obesity: Influence in mortality and readmissions in chronic obstructive pulmonary disease patients, *Journal Hum Nutrition and Diet 26,* (suppl 1), 16-22. doi:10.1111/jhn.12088.

Zimmerman, B. (2000). Attaining Self-regulation A social cognitive perspective. Chapter 2 In Handbook of self-regulation Edited by Monique Boekaerts, Paul R. Pintrich and Moshe Zeidner Academic Press San Diego, California pp. 13-39.

Zwerink, M, Brusse-Keizer, M, van der Valk, P., Zielhuis, G. A., Monninkhof, E. M., van der Palen J, Frith, P. A., & Effing T. (2014). Self management for patients with chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews*, Issue 3.Art. No.: CD002990. doi: 0.1002/14651858.CD002990.pub3

APPENDIX A

You are Invited!

If you are a nurse working on the medicine unit you are invited to participate in a study.

Come to a coffee-break session to find out more!

Date:
Time:

Refreshments Provided

Is there a connection between nurse self-efficacy and teaching?

Project Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

Principle Investigator: *Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxxx, (xxxxxx)*

APPENDIX B

Western UNIVERSITY · CANADA

Letter of Information for Nurse Participants

Project Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

Principle Investigator: Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxx, (xxxxxxx)

Student Investigator: Loretta G. McCormick, RN (EC), MScN, PHCNP (xxxxxx)

Invitation to Participate: You are being invited to participate in this research study examining the effect of an education session on the level of knowledge and self-efficacy of nurses to provide education to patients hospitalized with COPD because you are a nurse working in medicine at the hospital.

Purpose of the Letter: The purpose of this letter is to give you the information needed to decide if you want to take part in this study.

Purpose of this Study: The purpose of this study is to examine how nurse knowledge of COPD and level of self-efficacy for teaching patients hospitalized with COPD can influence nurse participation in education of patients hospitalized with COPD. I would like to better understand if there is a connection between the level of self-efficacy of nurses to educate and the rate of patients returning to hospital after discharge with COPD.

Inclusion Criteria: To be in the study you must be a nurse who is working full time or part time on the medicine units of the hospital. This would include the nurse educators on the unit.

Exclusion Criteria: If you are a nurse that works on any other unit or are a nurse working in management you are not eligible to be in the study.

Study Procedures: If you agree to be in the study and consent to participate, you will be provided with a questionnaire to complete. After you complete the questionnaire, you will be placed into one of two groups of nurses. The group that you are assigned to will be determined by which medicine floor you are working on. One group will attend one education session and the other group will not attend. After the education session is completed, you will be provided with a questionnaire to complete as before. It is anticipated that the education session will take one hour. There will be a total of two

questionnaires. Each questionnaire might take 15 minutes to complete. The questionnaire will ask you about patient education during the hospital stay.

Possible Risks and Harms: There are no known or expected risks or harms from participating in this research study. There may be a psychological risk related to anxiety or embarrassment related to the questionnaires. You do not have to answer questions that you do not want to. Your responses will be separate from your personal information to protect your confidentiality and privacy. Your questionnaire will only have a study number for identification. All questionnaire data will be stored on our secure research computer at the university.

Possible Benefits: The benefits of participating in this study include learning about COPD and supporting research in general. The information from this study can be used to support nurse education in this hospital or all hospitals creating a benefit for society and patients with COPD in any community.

Compensation: You will be compensated with a 20$ Tim Horton gift card for participating in this study and you will also receive a colorful t-shirt with a WORDLE graphic picture at the completion of the study.

Voluntary Participation: Participation in this study is voluntary. You may decide not to participate, not answer any questions or withdraw from the study at any time with no penalty.

Confidentiality: To protect your confidentiality and your privacy your questionnaires will be identified with a study identification number. Your name will be in a separate file. All data collected will remain confidential and will only be accessed by study personnel. The questionnaires will be stored in a secure locked file and the data transferred to a password-protected computer database only accessible by study personnel. Only group-level data will be used for analyses. If you decide to withdraw from the study, your data will be deleted from the database. All information collected during the study will be stored until the study is completed and the results of the study have been released to a maximum of 5 years. Representatives of the Health Sciences Research Ethics Board at Western University may contact you to monitor how the study is being done.

Contacts for Further Information: If you have any questions and require further information about this research project or about taking part in the study please contact Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxxx or by email: xxxxx.

If you have any questions about your rights as a research participant or how this study is being done, you can contact The Office of Research Ethics (519) 661-3036, or by email*:* xxxxxx.

Publication: If the results of this research study are published your name will not be used. If you would like a copy of the study results, you could contact the principle

investigator Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western Unity 519-661-2111 ext: xxxxx, or by email.

This letter is yours to keep for future reference.

Nurse Consent Form: Study Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs Into an Educational Program for Nurses

I have read the Letter of Information. I have had the nature of the study explained to me. All questions I had have been answered to my satisfaction. I agree to participate. I have received a copy of the Letter of Information and Consent form for this study. I do not waive any legal right by signing this consent form.

Name of participant: _____

Signature of participant: _____

Name of person obtaining consent: _____

Signature of person obtaining consent: _____

Date: _____

APPENDIX C

Teaching Plan for Intervention Education Session

Title of Activity: Integrating CSM and Self-Efficacy Sources into a Program of COPD Education for Nurses

Presenter/Facilitator: Loretta McCormick RN(EC)

Learning Outcome: Knowledge of COPD

Components of Collaborative Self-management (CSM)

_____ Partnership _____ Goal Setting _____ Education
_____ Monitoring _____ Family Involvement

4 Sources of Individual Self-Efficacy based on Bandura Social Cognitive Theory

_____ Mastery _____Vicarious Learning
_____ Social Persuasion _____ Emotional Support

Required time for completion: 90 minutes

Table 12

Integrating CSM and Self-efficacy into an Educational Program

COMPONENT	**CONTENT**	**QBP**	**CSM Component**	**Self-Efficacy Component**	**Teaching Strategies**	**Time Allotted**
COPD Pathophysiology	-diagnostic test -causes -signs & symptoms	Module 4	Partnership	Emotional Support	Powerpoint	15 minutes
COPD Patient	-assessment of patient needs for education -education of patient	Module 4	Partnership Goal Setting Instruction	Emotional Support Mastery Experience	Case Study Review	15 minutes
COPD Exacerbation	-assessment of patient needs for exacerbation education including monitoring for exacerbations and management of exacerbation	Module 4	Partnership Goal Setting Instruction	Emotional Support Vicarious Learning	Role model of patient assessment using components of CSM	20 minutes
COPD Medications	-assessment of inhaler use -review of medications -inhaler demonstration	Module 4	Instruction	Emotional Support Social persuasion	Interactive learning activity with demonstrator inhalers	15 minutes
Preparing a patient for discharge	-assessment of patient -arrange follow up -benefits of immunizations -monitoring COPD -non-pharmacologic -smoking cessation -exercise	Module 4	Partnership Goal Setting Instruction Monitoring Willingness	Emotional Support Mastery Experience	Interactive group discussion	25 minutes
Total Time						90 minutes

COPD-Chronic Obstructive Pulmonary Disease, QBP-Quality-based Procedures, CSM- Collaborative Self-management

APPENDIX D

Letter of Information for Patient Participants For 1A

Project Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

Principal Investigator: Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111

Student Investigator: Loretta G. McCormick, RN (EC), MScN, PHCNP

Invitation to Participate: You are being invited to take part in a research study because you are in the hospital on 1A medicine and the nurses on this unit who have taught you about your disease have attended education session learning about COPD. Would you consider participating by filling out this questionnaire because we are measuring if the nurses have been able to provide you with information about your disease and increased your understanding of your disease. We will be asking a total of 102 patients admitted to the hospital with COPD to participate in this study.

Purpose of the Letter: The purpose of this letter is to give you the information needed for you to decide if you want to take part in this study.

Purpose of this Study: The purpose of this study is to examine if nurses who are given education about COPD will teach their patients about COPD and then patients might feel ready to go home when it is time to leave the hospital.

Inclusion Criteria: To be in the study you must be a patient admitted to the medicine unit of the hospital with COPD.

Exclusion Criteria: If you are a patient admitted to any other unit or admitted for another reason you are not eligible to be in the study.

Study Procedures: The nurses on 1A have attended the education session to learn about COPD and have completed their participation. If you agree to be in the study, you will be provided with two separate surveys to complete which would help us to determine if the nurses' participation in the study has better prepared them to teach patients about COPD. One survey will ask you questions about your COPD and might take about 15 minutes to complete. The other survey will ask you about how ready you are to go home from the hospital. Completion of the surveys will tell us that you have consented to participate.

Possible Risks and Harms: There are no known or expected risks or harms from participating in this research study but answering some of the questions may cause

anxiety. You do not have to answer questions that you do not want to. Your survey will only have a study number for identification.

Possible Benefits: The benefits of participating in this study include learning about COPD and supporting research in general. The information from this study can be used to support nurse education in this hospital or all hospitals creating a benefit for society and patients with this lung disease in any community.

Compensation: You will be given a 20$ Tim Horton gift card for taking part in this study.

Voluntary Participation: Taking part in this study is voluntary. You may decide not to participate, not answer any questions or stop participating in the study at any time with no penalty. If you decide that you do not want to participate your care in the hospital will not be affected.

Confidentiality: Your participation in this study is anonymous. The surveys that you complete will be identified with a study identification number. Your name or any identifying information will not be collected. All data collected from the completed surveys will be available to people involved in the study. The surveys will be stored on this laptop which is password protected and the laptop will be stored in a secure locked file and the data transferred from your survey to a password-protected computer database that only people involved in the study can access. The results of the surveys will be reviewed as a group only. All completed surveys will be completed on this laptop and will be stored until the study is completed and the results of the study have been released to a maximum of 5 years. A Representative from the Health Sciences Research Ethics Board at Western University may contact you to review how the study is being done.

Contacts for Further Information: Contacts for Further Information: This research project has been reviewed and received ethics approval through the Tri-Hospital Research Ethics Board. If you have any questions or need any more information about this research project or about taking part in the study you could contact the Chair of the Tri-Hospital Research Ethics Board, Dr. Michael Coughlin at xxx-xxxx ext. xxxx or Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxx. If you have any questions about your rights as a research participant or how this study is being done, you can contact The Office of Research Ethics at Western University (519) 661-3036, or by email.

Publication: If the results of this research study are published your name will not be used. If you would like a copy of the study results, you could contact the principal investigator Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxxx, or by email.

This letter is available in hard copy format for you to keep for future reference.

Patient Consent Form: Study Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

I have read the Letter of Information. I have had the nature of the study explained to me. All questions I had have been answered to my satisfaction. I know that by completing the surveys I am agreeing to participate I have received a copy of the Letter of Information and Consent form for this study. I do not waive any legal right by participating in the study and completing the survey questionnaires.

Letter of Information for Patient Participants For 1B

Project Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

Principal Investigator: Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxx, or by email xxxxx

Student Investigator: Loretta G. McCormick, RN (EC), MScN, PHCNP (xxxxx)

Invitation to Participate: You are being invited to take part in a research study because you are in the hospital on 1B medicine and the nurses on this unit who have taught you about your disease participated in a study about COPD as a comparison group; they did not attend the education session. Would you consider participating by filling out this questionnaire because we are measuring if the nurses have been able to provide you with information about your disease and increased your understanding of your COPD. We will be asking a total of 102 patients admitted to the hospital with COPD to participate in this study.

Purpose of the Letter: The purpose of this letter is to give you the information needed for you to decide if you want to take part in this study.

Purpose of this Study: The purpose of this study is to examine if nurses who are given education about COPD will teach their patients about COPD and then patients might feel ready to go home when it is time to leave the hospital.

Inclusion Criteria: To be in the study you must be a patient admitted to the medicine unit of the hospital with COPD.

Exclusion Criteria: If you are a patient admitted to any other unit or admitted for another reason you are not eligible to be in the study.

Study Procedures: The nurses on 1B have completed their participation in the study as a comparison group about COPD. If you agree to be in the study, you will be provided with two separate surveys to complete which would help us to determine if the nurses' participation in the study has better prepared them to teach patients about COPD. One survey will ask you questions about your COPD and might take about 15 minutes to

complete. The other survey will ask you about how ready you are to go home from the hospital. Completion of the surveys will tell us that you have consented to participate.

Possible Risks and Harms: There are no known or expected risks or harms from participating in this research study but answering some of the questions may cause anxiety. You do not have to answer questions that you do not want to. Your survey will only have a study number for identification.

Possible Benefits: The benefits of participating in this study include learning about COPD and supporting research in general. The information from this study can be used to support nurse education in this hospital or all hospitals creating a benefit for society and patients with this lung disease in any community.

Compensation: You will be given a 20$ Tim Horton gift card for taking part in this study.

Voluntary Participation: Taking part in this study is voluntary. You may decide not to participate, not answer any questions or stop participating in the study at any time with no penalty. If you decide that you do not want to participate your care in the hospital will not be affected.

Confidentiality: Your participation in this study is anonymous. The surveys that you complete will be identified with a study identification number. Your name or any identifying information will not be collected. All data collected from the completed surveys will be available to people involved in the study. The surveys will be stored on this laptop which is password protected and the laptop will be stored in a secure locked file and the data transferred from your survey to a password-protected computer database that only people involved in the study can access. The results of the surveys will be reviewed as a group only. All completed surveys will be completed on this laptop and will be stored until the study is completed and the results of the study have been released to a maximum of 5 years. A Representative from the Health Sciences Research Ethics Board at Western University may contact you to review how the study is being done.

Contacts for Further Information: Contacts for Further Information: This research project has been reviewed and received ethics approval through the Tri-Hospital Research Ethics Board. If you have any questions or need any more information about this research project or about taking part in the study you could contact the Chair of the Tri-Hospital Research Ethics Board, Dr. Michael Coughlin at xxx-xxx ext. xxxx or Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxxx or by email. If you have any questions about your rights as a research participant or how this study is being done, you can contact The Office of Research Ethics at Western University (519) 661-3036, or by email.

Publication: If the results of this research study are published your name will not be used. If you would like a copy of the study results, you could contact the principal investigator Dr. Carol Wong RN, PhD, Professor, Arthur Labatt Family School of

Nursing, Faculty of Health Sciences, Western University 519-661-2111 ext: xxxxx, or by email.

This letter is available in hard copy format for you to keep for future reference.

Patient Consent Form: Study Title: Collaborative Self-Management and Chronic Obstructive Pulmonary Disease: Integrating Patient Needs into an Educational Program for Nurses

I have read the Letter of Information. I have had the nature of the study explained to me. All questions I had have been answered to my satisfaction. I know that by completing the surveys I am agreeing to participate I have received a copy of the Letter of Information and Consent form for this study. I do not waive any legal right by participating in the study and completing the survey questionnaires.

APPENDIX E

Nurse Study Instruments

Demographics:
Thank you for participating in this research study. Please respond to the following questions by providing the answer that describes you. Please select only one answer.

1. Age: _____

2. Sex: Male: _____ Female: _____ (Please mark an X in the area provided)

3. Registered Nurse: _____

   Registered Practical Nurse: _____ (select one response)

4. How long have you been a nurse? _____ years _____ months

5. How long have you been working on Medicine? _____ years _____months

6. Please list any certifications in nursing that you have.
   _____
   _____

7. What is your highest level of nursing education completed? (select all that apply)

   Diploma: _____
   Bachelor of Nursing Science: _____
   Master of Nursing or Master of Science in Nursing: _____
   Other : _____

Nurse Knowledge Inventory

This questionnaire is based on RNAO (2005) and the clinical practice guidelines for COPD (O'Donnell et al., 2008). The questions are designed to help us assess COPD education topics to gain a better understanding of educational needs of nurses who work on the medicine unit. There are two types of questions included in this survey; multiple choice and yes/no/unsure. Please indicate your response by placing the answer that best reflects your knowledge in the space provided beside the question.

1. COPD is diagnosed by?
   a) ECHO
   b) CT Chest
   c) Spirometry / pulmonary function
   d) Chest X-Ray

2. Risk factors for the development of COPD include? (choose any or all that apply)
   a) Alpha-1 Antitrypsin deficiency
   b) biomass fuel exposure
   c) cigarette Smoke
   d) infections

3. COPD is the _____ leading cause of death in the world as of now?
   a) 8 th
   b) 5 th
   c) 2 th
   d) 4 th

4. Which of the following items (pick one) is the only intervention that is known that can slow the rate of progression of COPD?
   a) exercise
   b) oxygen
   c) smoking cessation
   d) medication adherence

5. All exacerbations can only be managed in a hospital setting?
   a) yes
   b) no
   c) unsure

6. Exacerbations are preventable?
   a) yes
   b) no
   c) unsure

Nurse Appraisal Inventory for Implementing Discharge Care of Patients with COPD

This questionnaire is designed to help us gain a better understanding of the kinds of activities related to patients hospitalized with COPD who are preparing to go home.

To familiarize yourself with this rating form, please complete the practice question first.

Practice Question:
If you were asked to lift weights right now,
In the space provided please rate how confident you are that you could do the activity **as of now** by recording a number from 0-10 using the following scale:

0	1	2	3	4	5	6	7	8	9	10
Cannot do at all					Moderately can do					Highly certain can do

1. How confident are you that you can lift 25 pounds as of now ? _____

2. How confident are you that you can lift 50 pounds as of now ? _____

3. How confident are you that you can lift 100 pounds as of now ? _____

Nurse Appraisal Inventory for Implementing Discharge Care of Patients with COPD

This questionnaire is designed to help us gain a better understanding of the knowledge and self-efficacy of nurses related to the kinds of activities for patients hospitalized with COPD who are preparing to go home. Your answers will be kept strictly confidential and you will not be identified by name or in any other manner.

Please rate how confident you are that you could do the activity **as of now** by recording a number from 0-10 in the space provided using the following scale:

0	1	2	3	4	5	6	7	8	9	10
Cannot do at all					Moderately can do					Highly certain can do

1. How confident are you that you **can** complete a full clinical assessment **as of now**? _____
2. How confident are you that you **can** demonstrate correct inhaler technique **as of now?** _____
3. How confident are you that you **can** teach patients about immunizations **as of now**? _____
4. How confident are you that you **can** teach patients about oxygen **as of now?** _____
5. How confident are you that you **can** arrange CCAC home care **as of now**? _____
6. How confident are you that you **can** teach patients about COPD medications **as of now?** _____
7. How confident are you that you **can** develop an individualized discharge plan **as of now?** _____
8. How confident are you that you **can** teach patients about how to monitor COPD **as of now?** _____
9. How confident are you that you **can** teach patients about quitting smoking **as of now**? _____
10. How confident are you that you **can** collaborate with patients to determine an individualized management plan **as of now**? _____
11. How confident are you that you **can** determine components of a management plan related to new medications, inhaler technique, and follow up appointments **as of now**? _____
12. How confident are you that you **can** describe symptoms of an exacerbation to a patient hospitalized with COPD **as of now**? _____
13. How confident are you that you **can** teach about how to manage an exacerbation of COPD **as of now**? _____
14. How confident are you that the patient you teach **can** manage when the patient is discharged from hospital **as of now**? _____

APPENDIX F

Patient Study Instruments

Demographics:
Thank you for participating in this research study. Please respond to the following questions by providing the answer that describes you. Please select only one answer.

1. Age: _____

2. Sex: Male: _____ Female: _____

3. Marital status (Please mark with an X)
    a. Married _____
    b. Widowed _____
    c. Divorced _____
    d. Single _____
    e. Separated _____

4. Highest level of education achieved (Please mark with an X)
    f. High school _____
    g. College _____
    h. University _____

5. What is your occupation?
    _____

6. Medicine Unit assignment for admission 1A_____ 1B _____

7. Number of days in hospital _____

8. Number of admissions to hospital in the past 12 months if any _____

9. Number of emergency room visits for COPD in the past 12 months if any _____

NHS BRISTOL COPD KNOWLEDGE QUESTIONNAIRE (BCKQ)©

Name: _____ Date: _____

This questionnaire is designed to find out what you know about your lung problem. It should be completed without help from anyone else. This usually takes between 10 and 20 minutes. Your answers will help us to find out what information you need to help you to understand and manage your lung condition.

Mark the circle which you think is the correct answer.

		True	False	Don't Know
1	**In COPD:**			
a	In COPD the word "chronic" means it is severe.	○	○	○
b	COPD can only be confirmed by breathing tests.	○	○	○
c	In COPD there is usually gradual worsening over time.	○	○	○
d	In COPD oxygen levels in the blood are always low.	○	○	○
e	COPD is unusual in people less than 40 years old.	○	○	○
2	**COPD:**			
a	More than 80% of COPD cases are caused by cigarette smoking.	○	○	○
b	COPD can be caused by occupational dust exposure.	○	○	○
c	Longstanding asthma can develop into COPD	○	○	○
d	COPD is commonly an inherited disease.	○	○	○
e	Women are less vulnerable to the effects of cigarette smoking than men.	○	○	○
3	**The following symptoms are *COMMON* in COPD:**	True	False	Don't Know
a	Swelling of ankles	○	○	○
b	Fatigue (tiredness)	○	○	○
c	Wheezing	○	○	○
d	Crushing chest pain	○	○	○
e	Rapid weight loss	○	○	○
4	**Breathlessness in COPD:**	True	False	Don't Know
a	Severe breathlessness prevents travel by air.	○	○	○
b	Breathlessness can be worsened by eating large meals.	○	○	○
c	Breathlessness means that your oxygen levels are low.	○	○	○
d	Breathlessness is a normal response to exercise.	○	○	○
e	Breathlessness is primarily caused by a narrowing of the bronchial tubes.	○	○	○

5	Phlegm (sputum):	True	False	Don't Know
a	Coughing phlegm is a common symptom in COPD	○	○	○
b	Clearing phlegm is more difficult if you get dehydrated.	○	○	○
c	Bronchodilator inhalers can help clear phlegm.	○	○	○
d	Phlegm causes harm if swallowed.	○	○	○
e	Clearing phlegm can be assisted by breathing exercises.	○	○	○

6	Chest infections / exacerbations:	True	False	Don't Know
a	Chest infections often cause coughing of blood.	○	○	○
b	With chest infections phlegm usually becomes coloured (yellow or green).	○	○	○
c	Exacerbations (episodes of worsening) can occur in the absence of a chest infection.	○	○	○
d	Chest infections are always accompanied by a high temperature.	○	○	○
e	Steroid tablets should be taken whenever there is an exacerbation.	○	○	○

7	Exercise in COPD:	True	False	Don't Know
a	Walking is better exercise than breathing exercises to improve fitness.	○	○	○
b	Exercise should be avoided as it strains the lungs.	○	○	○
c	Exercise can help maintain your bone density.	○	○	○
d	Exercise helps relieve depression.	○	○	○
e	Exercise should be stopped if it makes you breathless.	○	○	○

8	Smoking:	True	False	Don't Know
a	Stopping smoking will reduce the risk of heart disease.	○	○	○
b	Stopping smoking will slow down further lung damage.	○	○	○
c	Stopping smoking is pointless as the damage is done.	○	○	○
d	Stopping smoking usually results in improved lung function.	○	○	○
e	Nicotine replacement therapy is only available on prescription.	○	○	○

9	Vaccination:	True	False	Don't Know
a	A flu jab is recommended every year.	○	○	○
b	You can get flu from having a flu jab.	○	○	○
c	You can only have a flu jab if you are 65 or over.	○	○	○
d	A pneumonia jab protects against all forms of pneumonia.	○	○	○
e	You can have a pneumonia jab and a flu jab on the same day.	○	○	○

10	Inhaled brochodilators:	True	False	Don't Know
a	All bronchodilators act quickly (within 10 minutes).	○	○	○
b	Both short and long acting bronchodilators can be taken on the same day.	○	○	○
c	Spacers (e.g. volumatic, nebuhaler, aerochamber) should be dried with a towel after washing.	○	○	○
d	Using a spacer device will increase the amount of drug deposited in the lungs.	○	○	○
e	Tremor may be a side effect of bronchodilators.	○	○	○

11	Antibiotic treatment in COPD:	True	False	Don't Know
a	To be effective, the course should last at least 10 days.	○	○	○
b	Excessive use of antibiotics can cause resistant bacteria (germs).	○	○	○
c	Antibiotics will clear all chest infections.	○	○	○
d	Antibiotic treatment is necessary for an exacerbation (worsening) however mild.	○	○	○
e	You should seek advice if antibiotics cause severe diarrhoea.	○	○	○

12	Steroid tablets given for COPD (eg Prednisolone):	True	False	Don't Know
a	Steroid tablets help strengthen muscles.	○	○	○
b	Steroid tablets should be avoided if there is a chest infection.	○	○	○
c	The risk of long-term side effects due to steroids is less with short courses than with continuous treatment.	○	○	○
d	Indigestion is a common side effect from using steroid tablets.	○	○	○
e	Steroid tablets can increase your appetite.	○	○	○

13	Inhaled steroids (brown, red or orange):	True	False	Don't Know
a	Inhaled steroids should be stopped if you are given steroid tablets.	○	○	○
b	Steroid inhalers can be used for rapid relief of breathlessness.	○	○	○
c	Spacer devices reduce the risk of getting thrush in the mouth.	○	○	○
d	Steroid inhaler should be taken before your bronchodilator.	○	○	○
e	Inhaled steroids improve lung function in COPD.	○	○	○

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Further supplies can be obtained from:
Department of Medicine (BCKQ)
Frenchay hospital,
Bristol BS16 1LE

Ref : White R, Walker P, Roberts S, Kalisky S, White P,
Chronic Respiratory Disease. 2006;3:123-131

Designed by the Medical Illustration Department, Frenchay Hospital, Bristol.

Hospital Discharge Readiness Scale

(Mabire, Coffey, & Weiss, 2015)

ID # ☐☐☐

READINESS FOR HOSPITAL DISCHARGE – OLDER PEOPLE - SF

Please check or circle your answer. Most of the responses are on a scale from 0 to 10. The words below the number indicate what the 0 or the 10 means. Pick the number between 0 and 10 that best describes how you feel. For example, circling number 7 means you feel more like the description of number 10 than number 0 but not completely.

1. How physically **ready** are you to go home ?	0 Not ready	1	2	3	4	5	6	7	8	9	10 Totally ready
2. How much do you **know about caring for yourself** after you go home?	0 Know nothing at all	1	2	3	4	5	6	7	8	9	10 Know all
3. How well will you be able to **handle the demands** of life at home?	0 Not at all	1	2	3	4	5	6	7	8	9	10 Extremelly well
4. How much do you **know about problems to watch for** after you go home?	0 Know nothing at all	1	2	3	4	5	6	7	8	9	10 Know all
5. How much do you **know about restrictions** (what you are allowed and not allowed to do) after you go home?	0 Know nothing at all	1	2	3	4	5	6	7	8	9	10 Know all
6. How much do you **know about what happens next** in your follow-up medical treatment plan after you go home ?	0 Know nothing at all	1	2	3	4	5	6	7	8	9	10 Know all

ID # ☐☐☐

7. How much **help** will you have with **your personal care** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
8. How much **help** will you have with **household activities** (for example, cooking, cleaning, shopping) after you go home ?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
9. How much **help** will you have with your **medical care** needs (treatments, medications) ?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal

Comments :

Thank you for participating in our study.

APPENDIX G

Permission to use Bristol Knowledge COPD Questionnaire

Yes, Loretta. I am happy for you to use BCKQ. it is attached.
Regards
Roger White

Hello Dr. White,

I am a third year doctoral student at University of Western Ontario, London, ON, Canada
I am interested in making the world a better place for patients with COPD by helping with education of both the patient and the practitioner during hospitalization for exacerbation. I would like very much to be able to use your tool in my study in Canada.
If you could consider providing permission and use of your tool, and a copy that I could include in the ethics board approval application and my proposal, I would be most appreciative.

Please advise and thank you very much!
Loretta McCormick RN(EC)

Loretta McCormick RN (EC), BScN, MScN

APPENDIX H

Permission to use Hospital Discharge Readiness Scale

Thank you for your interest to use this scale. I send you the scale and permission to use.
For citation, please use the JAN publication.
Tell me if you need more information.
Best regards,

Cedric
[

HAUTE ÉCOLE
DE SANTÉ VAUD
Kind regards
Cedric
Cédric MABIRE
Professeur HES ordinaire

Le 1 déc. 2016 à 21:10, Loretta McCormick

Good afternoon Dr. Mabire,
I am a 3rd year doctoral student researching patients preparation for discharge after hospitalization and would very much like permission to use your tool in my proposal. I will cite your tool as you would like, and would welcome the complete details of the psychometric analysis, reliability and validity for my proposal and publications when the study is completed.
I very much appreciate this opportunity to use this tool that you have developed. I have copied my home email and will be working on the proposal this weekend, if you could reply by clicking reply all I would very much appreciate it.
Many thanks for your consideration,
Loretta McCormick

Loretta McCormick RN (EC), BScN, MScN

<permission for RHDS completed.pdf>

CURRICULUM VITAE

Loretta G. McCormick RN (EC)

Professional Education

University of Western Ontario	PhD 2019
York University	Masters of Science of Nursing 2011
McMaster University	Primary Health Care Nurse Practitioner Certificate 2007
McMaster University	Bachelor of Science in Nursing 2005
Mohawk College	Registered Nurse Diploma 1988

Awards and Fellowship

2018 Recipient of the Ashenhurst Award, Cambridge Memorial Hospital
2014 Award for Excellence in Best Practice Rehab Care, WWLHIN
2009 Recipient of an Advanced Clinical Practice Fellowship RNAO

Professional Affiliations

Member of the Health Quality Ontario Advisory Committee: Quality Standard for COPD Care in the Community for Adults
Member of the College of Nurses of Ontario: Extended Class Registration
Graduate Student Member of the Nursing Best Practice Research Centre
Member of the Registered Nurses' Association of Ontario
Past Member of the Board of Directors for the Waterloo Region NP- Led Clinic 2011-2014
Past Member of the LTC/REHAB/CCC Advisory Panel for the College of Nurses of Ontario 2010-2011

Employment History

2007 – Present	Cambridge Memorial Hospital- PHC Nurse Practitioner
2017 – 2018	McMaster University/ Conestoga College
2007 – 2014	Primacare Family Health Team- PHC Nurse Practitioner
2012 – 2013	George Brown College – Part time Faculty
2008 – 2009	Conestoga College- Part time Faculty
2004 – 2006	McMaster University – Clinical Research Nurse

2001 – 2002	Hamilton Health Sciences – Clinical Research Nurse
1988 – 2004	Hamilton Health Sciences- Registered Staff Nurse

Publications and Presentations

McCormick, L., Godfrey, C., Muscedere, J., & Hendrikx, S. (2016). Integrated knowledge translation strategies in the acute care of older people: A scoping review protocol. *JBI Database of Systematic Reviews and Implementation Reports, 14*(9), 103-107. doi: 10.11124JBISRIR-2016-003084

Almost, J., Wolff, A.C. Stewart-Pyne, A., **McCormick, L.G**., Strachan, D., & D'Souza, C. (2016). Managing and mitigating conflict in health care teams: An integrative review. *Journal of Advanced Nursing, 72(7), 1490-1505.* doi: 10.1111/jan.12903

McCormick, L. (2018). *The structure and characteristics of hospital-based COPD programs: A scoping review*. Poster session presented at European Respiratory Society International Congress: Paris, France

McCormick, L., (2015). *Building capacity in patient-centered care at the COPD Clinic, Cambridge Memorial Hospital*. *CONNECTIONS*, 5-6, Ontario: The Lung Association, Ontario Respiratory Care Society

McCormick, L. (2013). *Examining indicators influencing hospital admission in patients with COPD. CONNECTIONS*, 1-6, Ontario: The Lung Association

McCormick, L. (2012). *The right nurse, for the right patient at the right time.* Poster session presented at Registered Nurses Association of Ontario, Jerusalem, Israel

McCormick, L. (2008). *Chronic Disease Management. Poster presented at* RNAO International Conference and Workshop, Beijing, China