Factors Relating to Self-management Behaviors of Patients With Chronic Obstructive Pulmonary Diseases in Bangladesh

Sormin Sultana Parvin

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Nursing Science (International Program)

Prince of Songkla University

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ABSTRACT

Chronic Obstructive Pulmonary Diseases (COPD) is the third leading cause of mortality worldwide. Patients' self-management is the fundamental component of prevention of COPD complication resulting in a reduction of its morbidity and mortality. This descriptive correlational study aims to examine the level of self-management behaviors of patients with chronic obstructive pulmonary diseases, and to identify the factors relating to their self-management behaviors. One hundred and thirty COPD patients were recruited at a 250-bed general hospital in Bangladesh and data were collected by using structured questionnaires. The questionnaires were validated and tested for internal consistency reliability. The reliability of the Modified Bristol COPD Knowledge Questionnaire (MBCKQ) was .80 which was tested by using the KR-20 formula. The reliability of the COPD Self-management Behavior Questionnaire (COPDSMBQ), the Modified Family Support Questionnaire (MFSQ), and the Accessibility to Health Care Resources Questionnaire (AHCRQ) were tested by using Cronbach's alpha coefficient, and had yielded values of .64, .76, and .77, respectively. Descriptive statistics and Spearman's Rho correlation statistics were used to analyze the data.

The research finding showed that the patients with COPD demonstrated a moderate level of self-management behaviors (M = 2.67, SD = 0.64). Furthermore, there was a highly positive relationship between accessibility to health care resources and self-management behaviors (*rho* = .76, $p < .01$). Similarly, there was a moderately positive relationship between family support and self-management behaviors (*rho* = .59, $p < .01$). On the other hand, there were no significant relationships between age, education, duration of illness, and knowledge regarding COPD and its management and self-management behaviors.

The findings of this study provide baseline data for nursing practice, nursing education, and nursing research. A self-management program integrated with family support should be developed for patients with COPD in Bangladesh.

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Sormin Sultana Parvin

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Chronic Obstructive Pulmonary Diseases (COPD) is a public health problem worldwide. COPD is a chronic disease characterized by many effects such as a progressive airflow obstruction, non-reversible damage in lung tissue, loss of lung function and chronic hypoxemia (Global Initiative for Chronic Obstructive Pulmonary Disease [GOLD], 2010; National Institute for Health and Clinical Excellence [NICE], 2010). COPD is the preferred term of chronic bronchitis, emphysema, or chronic obstructive airway disease. It is a major cause of morbidity and mortality around the world. Approximately 210 million people are suffering from COPD (World Health Organization [WHO], (2008). According to the WHO (2012), COPD contributes to five percent of deaths globally. Moreover, the prevalence of COPD is around 17/1000 globally (Uronis, Currow, & Abernethy, 2006). It is estimated that COPD will be the third leading cause of death worldwide by the year 2020 (Murray & Lopez, 1997 as cited in Fletcher et al., 2011). In Bangladesh, formal reports on the prevalence of COPD are very few. The prevalence of COPD among Bangladeshi hospitalized patients is approximately 0.7 percent in the outpatient department (OPD) and 5.9 percent in the inpatient department (IPD) (Ilias et al., 2009).

Bangladesh is facing COPD as a major public health problem. Bangladesh, as a developing country which is concerned about the growth of people diagnosed with COPD. WHO (2009) reported that ranking of COPD in Bangladesh is fifth among 22 countries. The possibility for that diagnosis of COPD is due to the fact

that patients were over the age of 40 (GOLD, 2013). In fact, three percent of the general population and six percent of patients admitted to hospital, whose age was 30 years old or more, had suffered from COPD (Zaman et al., as cited in WHO, 2007).

COPD has been considered as a burdened in Bangladesh, due to its acute exacerbation, which leads patients into a worse condition. The most common manifestations in diagnosing COPD are wheezing, breathlessness on exertion, chronic coughing, sputum production, and prolonged dyspnea (GOLD, 2010). Prolonged dyspnea and breathlessness on exertion can cause severe disabilities, negative impacts on individual health, families, and communities (Peate, 2011). COPD is an unpredictable progressive trajectory disease marking a great effect on the patients and health care system. COPD does not only affect the physical and psychological wellbeing of the patients, but it is also a burden for the health care system of the world (GOLD, 2010; Mannino & Buist, 2007).

COPD patients are often involved to a progressively deteriorating health status and punctuating intermittent exacerbations. Many patients with COPD have less episodes of an exacerbation, while in some cases the symptoms are greater. This situation could happen because different patients manage their dyspnea differently. Some patients use bronchodilator inhalers and corticosteroids to treat their dyspnea (GOLD, 2010; Rabe et al., 2007), while others use non-pharmacological treatments, such as breathing and coughing exercises, increasing physical exercise, smoking cessation, and life style modification (Morton, Fontaine, Hudak, & Gallo, 2005).

Having effective self-management behavior can reduce the severity and frequency of an exacerbation, prevent hospitalization, and generally improve the

patient health condition (Omachi et al., 2010). For example, effective self-management might include breathing and coughing exercises, inhaler use, smoking cessation, regular physical exercise for pulmonary rehabilitation, and application of corticosteroid (prednisolone, hydrocortisone, and aldosterone) at the onset of exacerbation. In addition, a prior study reported that patients can control their symptoms through smoking cessation, breathing and coughing exercises, nutritional maintenance, inhaler use, and rest (Turnock, Walters, Walters, & Wood-Baker, 2005).

Self-management behavior is the individual's capability of being "self-contained" regarding the COPD condition. From this capability, patients are able to conduct day-to-day decision making, task controlling, reduction and improvement of the chronic conditions (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Lorig & Holman, 2003). Self-management behavior is important for patients with COPD in order to reduce an acute exacerbation and control symptoms (Gadoury et al., 2005). Wedzicha and Donaldson (2003) stated that patients with COPD frequently suffer from an acute exacerbation of a chronic condition. They require frequent emergency treatment and hospital admission which increase patients' demand on hospital resources such as health care providers, medication, and transportation. However, especially elderly patients are prone to frequent exacerbations which are an important cause for hospital admission and readmission. Gadoury and colleagues (2005) conducted a study aimed to assess the long-term impact on hospitalization of a self-management program for COPD patients. They found that the patients with COPD who have received self-management education significantly reduced their hospital admission rate and emergency room visit. In addition, Worth and Dhein (2004) conducted a randomized controlled study and revealed that there was a significant

improvement of inhalation technique and self-control of the disease as well as a significant reduction of exacerbation after six months in the education group in comparison to the control group.

In contrast, Nguyen et al. (2012) conducted a study aimed to test the efficacy of twelve month dyspnea self-management programs (DSMPs), internet based (eDSMP), and face-to-face rehabilitation (fDSMP), which were then compared with general health education (GHE) control on the primary outcome of dyspnea with daily activities. Dyspnea with daily activities was measured by the Chronic Respiratory Questionnaire at three, six, and twelve months. There were no differences in dyspnea while performing daily activities across the groups over twelve months ($p = 0.48$). Furthermore, they concluded that their self-management programs were based on the internet, and face-to-faced, and did not significantly reduce dyspnea with activities compared with attention control group.

COPD patients can control their symptoms through a self-management process and improve their successful self-management behaviors. The self-management process emphasizes active engagement in daily treatment of chronic disease symptoms (Kanfer & Gaelick-Buys, 1991). It includes three processes consisting of self-monitoring, self-evaluation, and self-reinforcement. Several factors can influence successful self-management behaviors. All factors are described below in the following paragraph:

There are some internal and external (social support and health care service) factors affecting the level of self-management behavior of patients with COPD. Internal factors include physical dyspnea, functional impairment, and energy maintenance. Internal factors also include age, gender, education, socioeconomic

status of the individual**,** knowledge regarding COPD and its management, and health related characteristics of the patients (time since diagnosis of COPD). External factors are family support, relationship with health care providers, and accessibility to health care resources (Disler, Gallagher, & Davidson, 2012). Among those factors included in this study were internal factors: age, education, time since diagnosis of COPD, and knowledge regarding COPD and its management and external factors: family support and accessibility to health care resources.

Age and education are factors that can influence chronic disease self-management behaviors. Sinclair, Girling, and Bayer (2000) stated that in old age, patients' cognitive ability could decline which may affect their self-management behaviors. Education is also considered as one influencing factor of chronic disease self-management behaviors. Kolbe (2002) stated that education is an essential prerequisite to the self-management behavior of a chronic disease management. Weijman et al. (2005) conducted an explorative study and concluded that educational levels related to chronic disease self-management behaviors.

The duration of illness is also considered as one of the influencing factor of self-management behaviors. Weijman et al. (2005) conducted a study and investigated how personal factors influence chronic disease self-management behaviors. They have found that the level of education is related to frequency of self-management behaviors.

Knowledge regarding COPD and its management is one kind of relating factor of chronic disease self-management behaviors (Xu, Toobert, Savage, Pan, & Whitmer, 2008). Barlow and colleagues (2002) expressed that knowledge indirectly influences chronic disease self-management behavior and recommended

that successful self-management requires sufficient knowledge regarding the disease and its management to improve the chronic condition. In addition, Bourbeau, Nault, and Dang-Tan (2004) reviewed papers and concluded that information is required for patients with COPD to self-manage their illness.

Family support can influence the success of self-management behaviors of patients with COPD. Brooks-Brunn (2004) stated that family support can empower COPD patients by encouraging inhaler use, exercise, smoking cessation, nutritional diet maintenance, and medication taking. Moreover, family support consists of motivation enhancing, love, information, and feedback (Procidano & Heller as cited in Xiaolian Chaiwan, Panuthai, Yijuan, & Jiping, 2002). Identification of family support is an influencing factor to the more successful self-management behavior patterns.

Accessibility to health care resources clearly influences patients' self-management behavior (Bourbeau et al., 2003). Gysels and Higginson (2009) stated that accessibility to hospital medication can improve the COPD patients' chronic condition and reduce mortality and morbidity. Identification of accessibility to health care resources is also influencing factors in successful self-management behaviors.

Patients with COPD have a significant challenge of 'self-manage' when it comes to their chronic conditions. Currently, a study examined chronic disease self-management among patients with hypertension in Bangladesh (Akter, 2010). There is no known study in Bangladesh about factors relating to self-management behaviors of patients with COPD. Identification of factors relating to self-management behavior of patients with COPD could guide nursing interventions for this group of people. Therefore, it is important to identify the internal and external

factors that influence COPD patients' self-management behaviors. For this reason the researcher was interested in identifying the factors relating to self-management behaviors of patients with COPD in Bangladesh.

Objectives

The objectives of the study were as follows:

1. To examine the level of self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh

2. To identify the factors relating to self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh

Research Questions

The research questions of the study are stated as follows:

1. What is the level of self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh?

2. Are there relationships between individual factors (age, education, time since diagnosis of COPD, and knowledge regarding COPD and its management) and self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh?

3. Are there relationships between external factors (family support and accessibility to health care resources) and self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh?

Conceptual Framework

Successful strategy for symptom control of patients with COPD depends upon the patient's self-management behaviors or actions or practice to maintain certain behaviors. In this study, the researcher conceptualized self-management behavior and identified the factors relating to self-management behaviors (age, education, time since diagnosis of COPD, knowledge regarding COPD and its management, family support, and accessibility to health care resources) based on Self-Management Methods of Kanfer and Gaelick-Buys and related literature about COPD treatment and care. Identified factors relating to self-management behaviors were guided by an integrative review conducted by Disler and colleagues.

Firstly, to examine the level of self-management behaviors of patients with COPD, the Self-Management Methods of Kanfer and Gaelick-Buys (1991) was used. Kanfer and Gaelick-Buys stated that self-management is a process. This process is important while behavioral change becomes the target for self-management. According to Kanfer and Gaelick-Buys (1991), behaviors are viewed as the product of three sources of control: (1) the immediate environment, (2) the person's biological system, and (3) the cues originating from the person's repertoire of cognitive and self-directed behavior. These three sources of control interact and influence people's behaviors.

Ultimately, behavior is shaped by a mutual effect at a particular point in time. Among those three sources, the influences of a single source can never be eliminated, rather its relative importance shifts across time and changes environment.

For example, allergic symptom control falls under the immediate environment (such as summer or winter season, indoor or outdoor air pollution, and chemical dust). Patients cannot eliminate their immediate environment but they can control the allergic symptom by using protective measures such as warm clothes in winter and face masks for chemical dust. In addition, patient could simply avoid the polluted area. At other times, dyspnea symptom control is generally under the control of the biological systems. Eating behavior and individual immunity are also relates to biological systems. Training in self-management can decrease the effects of temporary fluctuations in biological and environmental variables on a person's behaviors. Hence, people can control their behaviors even though the outcome might be unsuccessful due to a change in the strength of the above variables.

Symptoms control is the personal action to minimize perceived adverse changes regarding physical and emotional functioning and how the patient makes day-to-day decisions. A decision is made when the patient needs to monitor and evaluation symptoms, engaging in breathing and coughing exercises, or deciding whether he or she needs oxygen or an inhaler or not. This decision making is the action of self-control. Kanfer and Gaelick-Buys (1991) stated that self-control is related to a specific situation rather than a personality trait. Self-control requires that: (1) the behavior in query has rarely equal positive and negative consequences, (2) the behavior is brought on by a chain of events, a response is introduced influencing the patient to take control, (3) at the time of execution the controlling response is initiated by self generated cues and not under the direct control of the social or physical environment. Thus, self-control is in fact present in the absence of immediate external control that particularly patient engages in a controlling response.

Kanfer and Gaelick-Buys (1991) viewed the self-management is a process which emphasizes as essential aspect of care and managing for patients with chronic conditions. It emphasizes the importance of the patients' responsibility which encourages chronic disease self-management. The focus on the self-management process is the patient's engagement in the behavioral change process. The aim of this process consists of three outcomes: (1) to learn more effective interpersonal, cognitive, and emotional behaviors, (2) to enhance perception and evaluative attitude toward problematic situations, and (3) to either change a stress-inducing or hostile environment or learn to cope with it by accepting that it is inevitable. Kanfer and Gaelick-Buys stated that the self-management process starts when an individual needs to learn new behaviors, formulate a decision making strategy, and modify current behaviors. The overall self-management process consists of three processes: self-monitoring, self-evaluation, and self-reinforcement.

Self-monitoring is when a person monitors, and observes his or her own existing behaviors including dyspnea occurrences, duration and intervals, also coughing, wheezing, and sputum color in order to adjust to self-care activities and symptom control (Kanfer & Gaelick-Buys, 1991).

Self-evaluation refers to a comparison between the individual's existing behaviors with what needs to be done (desired behaviors). The patient then makes a judgment whether the existing behaviors meet expectations or not. This judgment is evaluative and involves a determination whether a particular behavior is good or bad, a success or a failure (Kanfer & Gaelick-Buys, 1991).

Self-reinforcement refers to how patients reinforce themselves cognitively and emotionally by changing behavior. As a result of the self-

reinforcement process, the individual decides to take action, modify, maintain or change their behaviors for the better (Kanfer & Gaelick-Buys, 1991).

Secondly, to identify the factors relating to self-management behaviors of patients with COPD, the related literature about COPD treatment and care was used. In this study the two major factors related to self-management behaviors of patients with COPD are: internal factors (age, education, time since diagnosis of COPD, and knowledge regarding COPD and its management) and external factors (family support and accessibility to health care resources) (Disler et al., 2012).

Young adult chronic patients can perform effective self-management behaviors in daily basis (Akter, 2010). In contrast, due to the aging process, people may decline in cognitive ability and this may affect their chronic disease self-management behavior (Sinclair et al., 2000). However, the longer the duration of chronic patients' self-management behavior, the more they can learn the complications of the disease and its management. Furthermore, they can learn how to control symptoms and how they can continue effective self-management behaviors (Gallagher, Donoghue, Chenoweth, & Stein-Parbury, 2008).

Highly educated and knowledgeable patients with COPD can evaluate their health conditions, such as changes in frequency of exacerbations and can understand the need of medication adherence and gauge whether they need hospitalization or not, and how they can control their disease symptoms. After that, they can evaluate their conditions by analyzing and understanding self-management behavioral patterns and changing their behaviors (Worth & Dhein, 2004).

Knowledge is defined as specific information about something (Dictionary.com as cited in Xu, 2005). Knowledge regarding COPD and its

management is defined as patient understanding of information about the physiological aspects of COPD and the disease epidemiology, etiology, common signs and symptoms, and its management. It is a factor that influences self-management behaviors. It does not always cause behavioral change, but it is a positive association with changes in behaviors (Green & Kreuter, 1991). It is necessary before a conscious action can be taken such as recognizing the benefits of smoking cessation, breathing and coughing exercises, nutritional maintenance, inhaler use, and rest. The behavior may not change immediately in response to awareness or knowledge, but the cumulative effects of sensitive awareness understanding, greater control of self-efficacy, and finally cause behavior change (Green & Kreuter, 1991).

Family support can influence self-management behaviors of patients with COPD. According to Green and Kreuter (1991), the family must be involved in the process of self-management behaviors. Family members must recognize the severity of the illness, help the patient relieve COPD symptoms, encourage the patient to perform the breathing and coughing exercises, encourage the patient to adhere medication, and help the patient to continue physical activity. Family support can be understood as having four major attributes: emotional, informational, instrumental, and appraisal support (House as cited in Biswas, 2010). In contrast, according to Sherbourne and Stewart (1991), family support attributes to five dimensions consisting of emotional, informational, tangible, positive social interaction, and affectionate support.

Accessibility to health care resources can influence chronic disease self-management behaviors. These include hospitalization, consultation with physicians, transportation (use of ambulance in emergency situations), and

medication. Health care providers give information about hospital services, the availability of transportations (ambulance services), and medications.

In this study, the internal factors (age, education, time since diagnosis of COPD, and knowledge regarding COPD and its management) and external factors (family support and accessibility to health care resources) were identified. After the literature review, it was found that those factors are the more common influencing factors for successful self-management behaviors.

The conceptual framework was developed to illustrate those internal and external factors that may influence the self-management behaviors of patients with COPD. The conceptual framework of this study is shown in Figure 1.

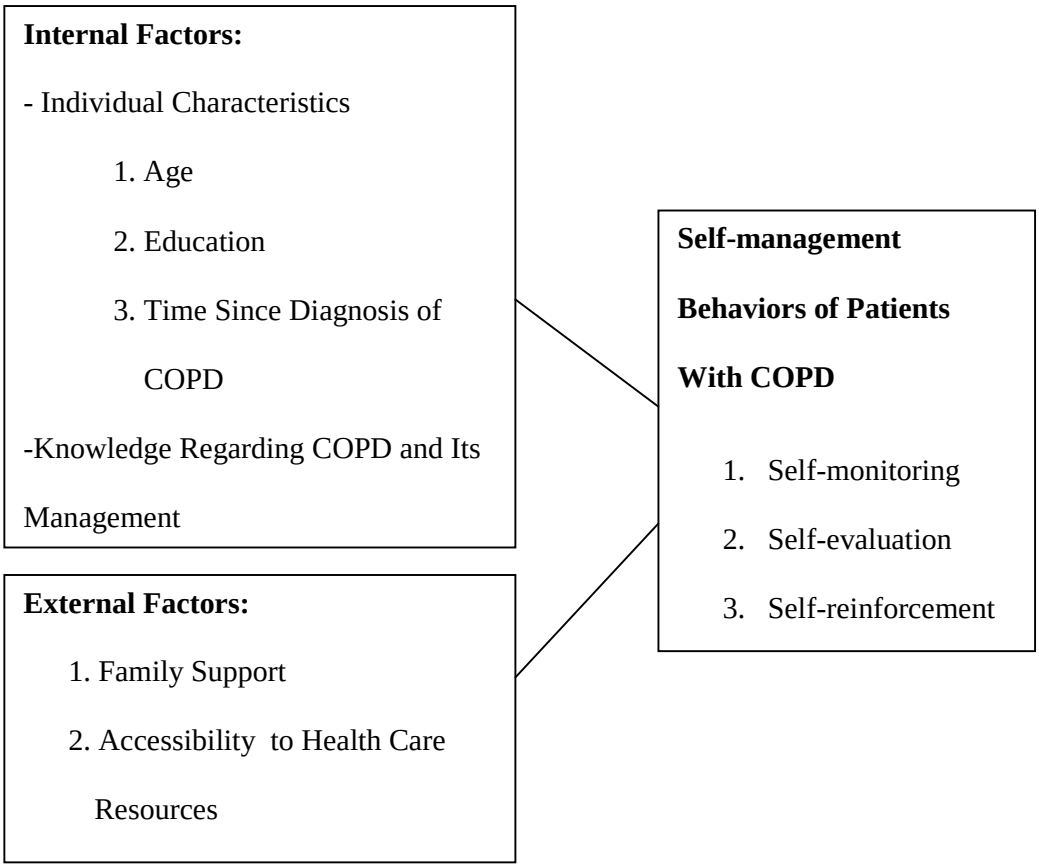

Figure 1. Conceptual Framework of the Study

Hypotheses

The hypotheses of this study were as follows:

1. There are relationships between internal factors (age, education, time since diagnosis of COPD, and knowledge regarding COPD and its management) and self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh.

2. There are relationships between external factors (family support and accessibility to health care resources) and self-management behaviors of patients with chronic obstructive pulmonary diseases in Bangladesh.

Definition of Terms

Self-management Behaviors

Self-management behaviors refer to individual's actions and reactions pertaining to COPD symptom (dyspnea, cough, wheezing, and fatigue) control, and management of the illness by continuing breathing and coughing exercises, taking medication, visiting physicians, and taking rest. The self-management process consists of self-monitoring, self-evaluation, and self-reinforcement.

Self-monitoring. Self-monitoring refers to the involvement of behavior. Patient intentionally concerned or observed with his/her particular existing behaviors (dyspnea occurrence, duration, wheezing sound, how long cough, fatigue or tiredness) tends to closely monitor themselves in order to ensure a desired goal.

Self-evaluation. Self-evaluation refers to a comparison of the current symptoms with previous monitored symptoms and an action what one ought to do based on the criteria that he/she has made.

Self-reinforcement. Self-reinforcement is when an individual decides to take action, modify, maintain or change their behaviors in order to achieve the goal, a positive outcome.

These self-management behaviors were measured by using the COPD Self-management Behavior Questionnaire (COPDSMBQ) developed by the researcher from literature review. The level of self-management behavior was assessed by using the 4-point Likert type scale ranging from 1 (never) to 4 (always). The higher score means the higher level of self-management behaviors.

Factors Relating to Self-management Behaviors

Internal Factors

Internal factors are individual characteristics (age, education, and time since diagnosis of COPD) and knowledge regarding COPD and its management.

Age. Age refers to the length of time that patient has lived. The researcher determined the age from medical records by using Demographic Information and Health Related Questionnaire (DIHRQ). The researcher categorized the age based on range from minimum to maximum and divided it into three categories.

***Education*.** Education can be operationally defined as the highest level of education received by an individual at a school or formal institution. It was recorded in ordinal data by using (DIHRQ).

Time Since Diagnosis of COPD. Time since diagnosis of COPD refers to the duration of time from being diagnosed and how many months and years they got COPD. It was recorded by using DIHRQ.

Knowledge Regarding COPD and Its Management. Knowledge regarding COPD and its management refers to patient's understanding and remembering information about the physiological aspects of COPD and the need for symptom control through appropriate self-management in the following areas: epidemiology of COPD, etiology, common symptom of COPD, breathlessness, sputum, chest infections/exacerbations, exercise, smoking, inhaled bronchodilators, antibiotics, oral steroid tablets, and inhaled steroids. The COPD patients' knowledge regarding COPD and its management were assessed by using the Modified Bristol COPD Knowledge Questionnaire (MBCKQ). It was a "true", "false", and "don't know" response. By getting one correct response, the subjects received a score of 1, and by getting incorrect response or "don't know" response, the subject received 0. The total score of the MBCKQ were 47, ranging from 0-47. The score of each subject was converted to a percentage. The higher score means the higher level of knowledge regarding COPD and its management.

External Factors

External factors include family support and accessibility to health care resources.

Family Support. Family support can be operationally defined as a patient's perception of support from their family members and spouses over the past month at home. These include emotional (such as caring, empathy, love, and trust), instrumental/tangible support or actions (such as providing good service),

informational support (such as providing advice as well as personal information or suggestions), appraisal support consisting of information relevant to self-evaluation such as to help individuals realize their own strengths and potential) (House as cited in Biswas, 2010), and positive social interaction (Sherbourne & Stewart, 1991). In this study, the level of family support was assessed by using the Modified Family Support Questionnaire (MFSQ), using a 4-point Likert type scale ranging from 1(never) to 4 (all the time). The higher score means the higher level of family support from their families as perceived by the patients.

Accessibility to Health Care Resources. Accessibility to health care resources refers to the utilization of health care services by the patient over the past month including medication, transportation (ambulance), and routine visits to the physician. This data was assessed by using the Accessibility to Health Care Resources Questionnaire (AHCRQ) developed by the researcher from literature review. The AHCRQ was rated by using a 4-point Likert type scale ranging from 1 (not at all) to 4 (all the time). The higher score means the higher level of accessibility to health care resources.

Scope of the Study

This descriptive correlational study was conducted to identify the factors relating to self-management behaviors of patients with COPD. This study was conducted at a 250-bed general hospital in Jessore, Bangladesh. The subjects in the present study were patients who were admitted in the male or female medical wards

and those who had follow-up visits at the OPDs after initial diagnosis of COPD in the past three months. The data were collected between April and May, 2013.

Significance of the Study

The findings of this study may provide useful information for nursing practice and development of further research in the nursing profession as follows:

1. For nursing practice, the research findings provide useful information to develop self-management behavior intervention particularly for patients with COPD.
2. Research findings could offer baseline data for further research on issues relating to self-management behaviors of patients with COPD.
3. The outcomes of this study should be significant in understanding relating factors of COPD self-management behavior and enhancing the continuing self-management behaviors of patients with COPD.

CHAPTER 2

LITERATURE REVIEW

The literature review was aimed to explore the factors relating to self-management behaviors of patients with COPD. This chapter presents a review of relevant literature. The review covers the following topics:

1. Overview of COPD
    - 1.1 Introduction
    - 1.2 Situation of COPD in Bangladesh
    - 1.3 Pathophysiology of COPD
    - 1.4 Management of COPD
2. Self-management Behaviors
    - 2.1 Significance of Self-management Behaviors
    - 2.2 Process of Self-management Behaviors
    - 2.3 Self-management Behaviors of Patients With COPD in Bangladesh
    - 2.4 Measurement Tools of Self-management Behaviors
3. Factors Relating to Self-management Behaviors of Patients With COPD
    - 3.1 Internal Factors
    - 3.2 External Factors
4. Summary of the Literature Review

Overview of COPD

Introduction

COPD is a life threatening lung disease associating to a heterogeneous group of lung disorders. It is a chronic progressive lung disease characterized by chronic obstruction of airflow to the lungs. Furthermore, it is not fully reversible. The airflow obstruction is due to a combination of bronchitis, emphysema and an abnormal inflammatory response of the lungs (GOLD, 2010; NICE, 2010). This chronic disease has significant extra-pulmonary effects that may contribute to a severe inflammatory response of the lungs to noxious particles or gases (Fraser, Page, Skingley, 2007; Hudd & Zaiken, 2011; NICE, 2010; Peate, 2011; Rabe et al., 2007). According to GOLD (2010), COPD is the four categories: mild, moderate, severe, and very severe.

The most common symptoms of COPD are acute exacerbation or breathlessness on exertion, coughing, wheezing, and sputum production (GOLD, 2013). Breathlessness on exertion gradually reduces exercise and physical activity (Mannino & Buist, 2007). Eventually, this could force the patient to stop working followed by a range of emotions, anger, anxiety, and fear of death (GOLD, 2013).

COPD is not only a burden on the health care system, but also a major lifestyle setback for the patient causing an early mortality. The economic impact causes direct and indirect costs (GOLD, 2013). The direct costs are those linked with medical management including medication, hospitalization, psychological support and pulmonary rehabilitation. Indirect costs are those connected with individual family costs which are fundamentally attributable to the loss of work and time (Rabe

et al., 2007). Moreover, the United States in 2010, the direct and indirect costs of COPD were $49.9 billion (GOLD, 2013).

Pharmacological and non-pharmacological management is essential for patients with COPD. A COPD patient's clinical history and hemodynamic status may guide the drug regimen. Early management regimens of acute breathlessness of patients with COPD are nebulization, oxygen inhalation, and corticosteroids (Urden, Stracy, & Lough, 2010).

The Situation of COPD in Bangladesh

In Bangladesh, the prevalence of COPD is found in people aged above 40 (Habib et al., 2010). The National Institute of Diseases of Chest and Hospital, Dhaka (NIDCH) is the only tertiary referral hospital for chest diseases in Bangladesh. There are approximately 4,500 people admitted annually in the respiratory medicine department and 19 percents of them suffer from COPD (Government of the People's Republic of Bangladesh, 2011).

In Jessore, the 250-bed general hospital is the biggest hospital in the southern part of Bangladesh, but there are no available chest specialists or a pulmonary rehabilitation center. Fortunately, there is a spirometer used to diagnose lung problems. This gives an indication of the situation in Bangladesh. Most of the patients come from the Jessore in municipal area, upazilla hospitals, and villages. Their living areas are far from the 250-bed general hospital. Some patients come to emergency department (ED) for follow-up during the evening and night time when the 250-bed general hospital outpatient department (OPDs) is closed. Pattients can attent the ED for treatment of their health problems, but there is no available chest

specialist on duty at the ED. Usually general physicians admit the COPD patient to the medical IPDs for better managements.

Most patients with COPD, who have suffered an acute exacerbation, want to be admitted to the medical IPDs to receive appropriate treatment from a chest specialist. However, the availability of medical staff is limited. Even so, all patients with dyspnea are hospitalized and are treated with oxygen and a bronchodilator. The immediate management of dyspnea symptom includes; a propped up position (raising the bed of the head up to 45 degree angle by using back rest or support by the pillow), oxygen inhalation, use of bronchodilators, nebulizers, intravenous access, inhaled steroid therapy. Further management includes; the regular use of prescribed drugs such as inhaler and salbutamol, early symptom management, and risk factor or lifestyle modification.

The role of physicians varies in terms of areas. In the outdoor settings, they assess the patients for deciding whether the patients require any investigation or not. After initial assessment, a decision is made either admission to the hospital or a medical prescription, depending on the severity of the patient's conditions.

Pathophysiology of COPD

The pathophysiologic changes of COPD include chronic inflammation of the lungs and an increase number of specific inflammatory cells in alveolar part of the lung. There are several clinical manifestations of COPD such as dyspnea or breathlessness, cough, wheezing, frequent sputum production, fatigue or tiredness, and airflow obstruction (Gruffydd-Jones & Loveridge, 2011; Hudd & Zaikken, 2011; Peate, 2011). Patients with oxygen deficiency are unable to maintain normal breathing

during sleep and walking, the diameters of peripheral airways become smaller, causing difficulty in breathing. As a result, the diameter of the airways may diminish to the extent to which, during light exercise, patients feel uncomfortable (Lynes, 2010).

As a result, the alveolar walls become damaged day by day. Furthermore, it can decrease the Forced Expiratory Volume in one second (FEV_1), Forced Vital Capacity (FVC), Residual Volume (RV) and total lung capacity. When the alveoli are not ventilated, the alveoli become hypoxic and the blood capillaries constrict resulting insufficient blood circulation to the lower extremity and follow by edema (Avidan et al., 2008; Lynes, 2010; Rabe et al., 2007). COPD can be confirmed by using spirometry. Spirometry measures the volume of air exhaled from the lungs following maximal inhalation. Vital capacity may be measured in two ways: slow vital capacity (SVC) and forced vital capacity (FVC). The highest of either measurement should be used to measure FEV_1. FEV_1 is the maximum volume of air that can be expelled from the lungs in a specific time interval when starting from maximum inspiration. FEV_1 and $FVC \leq 0.70$ confirms the airflow limitation. According to GOLD (2010) criteria, COPD severity was classified into four stages or categories. It is shown in the following Table1:

Table 1

Classification of Severity of Airflow Limitation in COPD (Based on Post Bronchodilator FEV_1)

Stages	Severity	FEV_1/FVC
Stage 1	Mild	$FEV_1/FVC < 0.70$ $FEV_1 \geq 80\%$ predicted
Stage 2	Moderate	$FEV_1/FVC < 0.70$ $50\% \leq FEV_1 < 80\%$ predicted
Stage 3	Severe	$FEV_1/FVC < 0.70$ $30\% \leq FEV_1 < 50\%$ predicted
Stage 4	Very Severe	$FEV_1/FVC < 0.70$ $FEV_1 < 30\%$ predicted or $FEV_1 < 50\%$ predicted plus chronic respiratory failure

Post bronchodilator spirometry can be performed when the patient is clinically stable (Lynes, 2010). The Modified Medical Research Council (MMRC), and chest X-ray can be helpful in diagnosis of COPD. The MMRC scale can be used for evaluation of limitation of activities due to dyspnea in patients with COPD. This scale ranges grade from 1 to 5. Grade-1 only get troubled with breathless except with strenuous exercise. Grade-2 troubled by shortness of breath when hurrying or walking up a slight hill. Grade-3 walks slower than people of the same age due to breathlessness. Grade-4 stops for breath after walking every100 yards or after a few minutes on level ground, and grade-5 too breathless to leave the house or breathless when dressing or undressing (NICE, 2010). Furthermore, a chest X-ray may be obtained to exclude alternative diagnoses. Using a stethoscope to listen to the lungs could be helpful for diagnosis of the severity of patients with COPD.

Patients with COPD have a high risk of developing short and long term complications. The short term complications include acute exacerbation, cough, sputum production, chest tightness, and weight loss. Often an acute exacerbation

results from an infection in severe hospitalization cases (Ferrara, 2011; GOLD, 2010). The long term complications include pulmonary hypertension, corpulmonale, lung cancer, hyper apnea, and a mixture of cardiovascular and respiratory disease (Ferrara, 2011).

Management of COPD

The major management goals for patient with COPD are: (1) disease assessment and monitoring, (2) reduction of risk factors, (3) stable COPD, (4) management of exacerbation, and exercise tolerance improving (GOLD, 2010). Still, COPD management is complex and requires many issues beyond COPD symptom control. Patients with COPD require counseling about smoking cessation, physical exercise, breathing and coughing exercises, nutritional advice, and continued nursing support (GOLD, 2010). Successful management of COPD patient and appropriately symptom control in patients with COPD, need pharmacological, non-pharmacological management, and lifestyle modification. These are described as the following:

Pharmacological Management of COPD. Pharmacological management helps prevent the disease, control symptoms, reduce the frequency and severity of exacerbations, improve general health status, and increase exercise tolerance (GOLD, 2010). The most well known and recommended medications for management of patients with COPD are bronchodilator, and glucocorticosteroids (Geiger-Bronsky & Wilson, 2008).

Bronchodilators are essential to the symptomatic management of patients with COPD. COPD patients, whose dyspnea are not relieved during daily activities, they need bronchodilator. Bronchodilator relieves bronchospasm, reduces

airway obstruction and improves alveolar ventilation (Smeltzer & Bare, 2004). The side effects of bronchodilator are nervousness, restlessness, trembling, and dry throat. Several classes of bronchodilators are commonly used in treating patients with COPD including long-acting β2- agonist, short or long-acting anti-cholinergic agent, and methylxanthines.

Long-acting β2 Agonist. Regular use of a long-acting β2- agonist or a short or long-acting anticholinergic improves health status. (Rabe et al., 2007). In addition, long acting β2-agonist inhaled drugs reduce the rate of COPD exacerbations and improve the effectiveness of pulmonary rehabilitation.

Short or Long-acting Anti-cholinergic Agents. The combination of short-acting β_2 -agonist and an anti-cholinergic produces greater improvements in FEV_1 than the other drugs (Rabe et al., 2007). For additional symptom control of COPD patients need a regular long-acting bronchodilator such as theophylline (GOLD, 2010).

Theophylline.Theophylline can produce additional improvements in lung functions. It inhibits phosphodiesterase, an enzyme, that helps to break down cyclic adenosine monophosphate. It decreases smooth muscle spasms, enhances mucociliary clearance, improves right ventricular function, and decreases pulmonary vascular resistance and arterial pressure. Its mode of action is poor. It has anti-inflammatory properties and may enhance the effects of inhaled corticosteroids (NICE, 2010).

Corticosteroids. The regular use of corticosteroids significantly improves the dyspnea over the first six hours of treatment and improves the lungs

function. It exaggerates response by inhibiting neutrophil apoptosis. The common corticosteroid is methylprednisolone sodium succinate (Hunter & King, 2001).

Mucolytics. Mucolytics help to expectorate the viscosity of sputum and improves expectoration. It reduces the mucus hyper secretion and disability during exacerbations (GOLD, 2010). Poole and Black (2001) reviewed 23 randomized controlled trials in Europe and United states that compared at least two months of regular oral mucolytics drugs with a placebo. They found that patient exacerbations was significantly reduced after taking oral mucolytics ($p < .0001$).

Non-pharmacological Management of COPD. Non-pharmacological management can improve both long and short-term survival of patients with COPD (Talang, 2008). It is often called lifestyle modification (Irusen & Plekker, 2009). Adoption of non-pharmacological management requires a lifestyle change, a regimen of exercise, nutritional maintenance, correct technique of inhaler use, smoking cessation, long term oxygen therapy, pulmonary rehabilitation (PR), and complementary therapy (Irusen & Plekker, 2009; Morton et al., 2005; Talang, 2008).

Exercise. The exercise program is the main component of patient rehabilitation and it is integrated with education, nutritional assessment, and psychological support (Irusen & Plekker, 2009). Exercise training includes bicycle ergometry or treadmill exercise timed walking test, inspiratory muscle training, and aerobic training (Morton et al., 2005). Regular breathing, coughing, and physical exercises may reduce lung function decline, sputum production, strengthen respiratory muscles, and increase oxygen saturation. (Morton et al., 2005).

Nutritional Counseling. Nutritional counseling is needed for optimal nutritional status of patients with COPD (Kelly, 2007). Nutritional reduction leads to

decrease respiratory, peripheral muscle function, impaired lung function, and decrease exercise tolerance (Uronis et al., 2006). Some foods can be beneficial for the maintenance of nutrition such as small energy-dense, fortified meals, and snacks (Shepherd, 2010).

Technique of Inhaler Use. Health educators educate the patients about technique of inhaler use. Appropriate technique of inhaler use is very important for the management of acute exacerbation by verbal instructions, physical demonstration or by video. According to the National Asthma Council Australia (2008), different inhalers require different techniques. Health educators should be aware of this guide themselves accordingly.

Smoking Cessation. Smoking cessation is the most effective method to reduce risk for the development of COPD. It reduces the decline of pulmonary function and improves the prognosis of the disease, however, structured counseling is needed for long term addicted patients. (Valk, Manninkhof, Palen, Zielhuis, & Herwaarden, 2004).

Long-term Oxygen Therapy. Use of long-term domiciliary oxygen helps to reduce hypoxia and improves functional activity of COPD patient. It provide to the individual patient's need. As a result, reduce the mortality and patients can survive long time. (Hunter & King, 2001; Uronis et al., 2006).

Pulmonary Rehabilitation (PR). The PR program includes the training of the peripheral muscle, smoking cessation, medication, and complementary therapy. The PR program usually involves various health care professionals such as physicians, physiotherapists, dieticians, and psychologists (Irusen & Plekker, 2009).

Complementary Therapy. Complementary therapy such as mindfulness meditation (MM) and yoga training is very effective for patients with COPD. Mularski et al. (2009) conducted a study of 86 COPD patients to test the efficacy of a mindfulness-based breathing therapy (MBBT) to improve symptoms and health-related quality of life of patients with COPD. They found that MM helps to decrease COPD related dyspnea. Donesky-Cuenco et al. (2009) conducted a study to evaluate a yoga program for its safety, feasibility, and efficacy in decreasing dyspnea intensity (DI), and dyspnea related distress (DD) in older adults with COPD. They reported that there were greater reductions of DD in the yoga group than the usual care group. Furthermore, they reported that yoga is safe and feasible for patients with COPD.

Self-management Behaviors

Significance of Self-management Behaviors

Self-Management is critical to improvements in chronic care. Self-management is a top priority for the United States health system (Institute of Medicine as cited in Clark et al,. 2008). The term of “self-management behaviors” has been used in chronic care. According to Lorig and Holman (2003), the individual has the responsibility for day-to-day management learning, engaging, and practicing self-management activities. This self-management is necessary to carry on an active and emotionally satisfying life to the control symptoms and face to chronic condition. Self-management is concerned with encouraging people to be active by being engaged in such activity. Its aim is to promote health, reduce risk, monitor and

manage symptom, manage the impacts of illness on functioning, emotions, make decisions, and continue the medication (Ridwan, 2012). Hibbard, Mahoney, Stock, and Tusler (2007) mentioned that the aim of self-management is to enhance the patient's engagement in monitoring and activation of self-management behaviors.

The main concept of self-management is the individuals' decision to be active in controlling symptoms and managing their illness rather than being controlled by their illness (Lorig & Holman, 2003). Self-management refers to the individual's ability to manage the symptom, treatment, physical and psychological consequences, life style changes inherent in living with a chronic condition resulting in the ability to monitor one's condition and to affect the cognitive, behavioral, and emotional responses (Barlow et al., 2002; McDonald & Gibson, 2006; Richard & Shea, 2011; Wilkinson & Whitehead, 2009). Furthermore, DeMonaco & Hippel (2007) defined self-management behaviors as a person's behavior including: (1) engaging in activities that protect and promote health, (2) monitoring and controlling symptoms of illness, (3) managing the impacts of illness on functions, emotions and interpersonal relationships, and (4) adhering to treatment regimens.

Kanfer and Gaelick-Buys (1991) stated that self-management behaviors means the individual's management or action to chronic disease symptom control through the three self-management process (self-monitoring, self-evaluation, and self-reinforcement). These individual self-management behaviors are aimed to achieve the required responses including the cognitive, behavioral, and emotional responses to maintain and improve the desired self-management behavior through self-management process.

Self-management behaviors can be seen as a process, program, method and outcomes (Ryan & Sawin, 2009). Self-management behaviors entail the usages of self-management skills to manage conditions or risk factors. Self-management behaviors are especially important to manage chronic disease symptom control, where the patient is to be responsible for his/her day-to-day care of own self (Lorig & Holman, 2003). The adoption of self-management behaviors can reduce disease and prevent hospital admissions. In addition, patients with COPD need to individually monitor their symptoms, detect the onset of acute exacerbations, and control symptoms. COPD patients must manage the impact of their illness on daily life, maintain their general health, avoid risk factors for serious complications such as pneumonia, pneumothorax, acute respiratory failure, and cor pulmonale (Ferrara, 2011).

Self-management reduces the risk factor of chronic disease. A study expressed that the life style modification or changes are not easy to achieved (Drevenhorn as cited in Ridwan, 2012). Many changes are not acceptable by the patients. Therefore, the patient should be able to become observer, recorder, evaluator, and take action to change their behaviors. The practice of self-management is not only reduce the symptoms, but also help the patient to avoid future problem, improve the ability to manage an exacerbation, and anticipate self-management behaviors outcome (Kanfer & Gaelick-Buys, 1991).

Warwick, Gallagher, Chenoweth, and Stein-Perbury (2010) conducted a study to describe self-management, symptom monitoring and the associated influences among older adults with chronic obstructive pulmonary diseases. They found that self-management was good to very good with poorer self-management

predict by lower self-efficacy (β = -0.21), a weaker sense of coherence (β = -0.03), and no hospitalization in the past month (β = -0.05). Furthermore, they stated that symptom monitoring was not ideal, with more than 20 percent of patient not monitoring any of the key symptoms, more frequent symptom monitoring occurred among participants who were married (β = 5.14). In addition, they concluded that self-management and symptom monitoring ensure better outcomes among patients with COPD.

Bourbeau et al. (2004) stated that patients successful self-management requires a multifaceted approach that incorporates not only teaching various disease contents but also implementing strategies to change behavior in patients with COPD. Behavioral changes are essential for COPD patients' in self-management.

Process of Self-management Behaviors

According to Kanfer and Gaelick-Buys (1991), self-management involves three processes: self-monitoring, self-evaluation, and self-reinforcement. Patients with COPD need to control symptoms to reduce the risk of COPD complications. Patients can control their symptoms through a self-management process. Symptoms control and effective management are the key elements for patients with COPD in everyday life (Chen, Chen, Lee, Cho, & Weng, 2008). Moreover, patients can follow the self-management process to control their symptoms by visiting physicians, doing breathing and coughing exercises, using medication, and reducing activity (Cicutto & Brooks, 2006). For effective self-management, patients can practice breathing and coughing exercises, use a face mask, stop smoking, use

inhaler technique, maintain nutrition, rest, and maintain propped up position (Barnett, 2009).

Self-monitoring is a process of observation, paying close intension to dyspnea occurrences, intervals, duration, and sputum color in order to avoid exacerbation by timely treatment (Bourbeau et al., 2004; Bourbeau & van der Palen, 2009). There are two components of self-monitoring: (1) awareness of body symptoms, sensations, cognitive process, and daily activities, and (2) information or condition measurements and recording (Wilde & Garvin, 2007).

Self-evaluation is the process in which comparison between current action and what one ought to be doing based on the criteria standards that he/she has made (Kanfer & Gaelick-Buys, 1991). There are several steps in this self-evaluation process: (1) patients must know the differences that occur, (2) the standard must be established, (3) patients should be able to judge the symptoms and compare to the standard, (4) patients must learn to evaluate any changes that happen in terms of prior conditions, and (5) contextual factors must be considered, such as physical, environmental, cognitive, and behavioral elements (Creer as cited in Ridwan, 2012).

Meanwhile, self-reinforcement refers to how clients reinforce themselves cognitively and emotionally in changing behavior to achieve goals. The results of this stage may make the person decide to change their standards (Kanfer & Gaelick-Buys, 1991).

Feedback influences and strengthens the decision to adopt new behaviors of the individual to continue self-management behavior. The individual's future expectations and behavior may modify until a desired result is attained.

Self-management Behaviors of Patients With COPD in Bangladesh

The self-management perspective increased attention in chronic illness patient. In Bangladesh, there are limited studies about chronic disease self-management behaviors by nurses. A study by Akter (2010) found that the level of self-management behaviors of chronic disease patients was at a moderate level.

Bangladesh is a highly populated, developing country in South-East Asia. The density of population is about 964 people per square kilometer. The area of Bangladesh is 147,570 square kilometers. The total population of Bangladesh is 161083,804. The death rate is 57/1000 population from different communicable disease in hospitalized patients. COPD is seen as a common clinical problem in Bangladesh (Ilias et al., 2009), and is one of the leading reported causes of death in Bangladesh. Approximately 14.67 percent COPD patients are death in Bangladesh (Government of the People's Republic of Bangladesh, 2011).

In Bangladesh, accessibility to medication and transportations are limited, health care centers are far from residential areas. Eventhough, the government hospitals provide both IPDs and OPDs services for free to all (the total health care expenditure is 3.2 percent of the national gross domestic product), the increasing demand for health facilities can't be met. The WHO and United Nations Agencies (UNA) provide financial and technological support to the government to attain "health for all" in Bangladesh.

In Bangladesh, normally patients came to hospital to make appointment with health care providers by bus, private car, van, and rickshaw and pay by the patients. On the other hand, an emergency case or situation patients can use ambulance, but they had need to pay for that acoording to government rate. In

Bangladesh, there is no implication for COPD patients self-management educational program, physicians write prescriptions for patients treatment and nurses only provide instructions to the patients about their medication.

Bangladesh has a shortage of nurses (Hadley et al., 2006). Nurses do not provide any education regarding COPD, so patients may not know the importance of smoking cessation, importance of nutritional maintenance, the techniques of inhaler use at home, breathing and coughing exercises, or how they can manage their COPD complications. Therefore, an effective self-management program is essential for Bangladeshi patients with COPD.

Measurement Tools of Self-management Behaviors

Several measurements tools have been used to measure self-management behaviors. These include the Partners in Health Scale, and COPD Self-management Interview (COPDSMI).

The Partners in Health Scale (PHS) is an instrument that was developed by Battersby, Ask, Reece, Marwick, and Collins (2003) and aimed to assess the general self-management for chronic illness in contrast to specific disease requirements. The PHS consists of 11 items addressing different aspects of self-care for chronic disease patients including disease related knowledge, sharing in decisions, taking medication, understanding the symptoms of the disease, and ability to monitor symptom and response to symptoms changes, making and keeping appointments. Patients were rated on each item using a Likert-type scale from 0 (very good) to 8 (poor). The total scores ranged from 0 (very good self-management) to 88 (poor self-management). The scale has been used for several chronic illness patients (Battersby

et al., as cited in Gallagher et al., 2008) and showed Cronbach's alpha coefficient of 0.92 (Gallagher et al., 2008). Specifically, this tool was used for assessing the general self-management behavior for chronic diseases, but this tool had not specifically measure self-management behaviors of patients with COPD.

The COPD Self-management Interview (COPD-SMI) developed by Dowson, Town, Frampton, and Mulder (2004). It was a structured 15 minutes interview comprising of three hypothetical scenarios based on stages of an evolving exacerbation (such as maintenance when well, early exacerbation, and severe exacerbation). All participants were read the same three scenarios. After reading each scenario, participants were assessed on the same 13 key areas (phone GP or after hours practice, take extra prednisolone, continue regular medications, take extra reliever, go to hospital, maintain COPD exercises, start an antibiotic, do sputum sample and send to GP, call the hospital services, see my GP, use breathing control methods, used 'huff and puff' to clear phlegm, and use a nebulizer) of self-management behavior for all three scenarios (Dowson et al., 2004).

Among 13 type's behaviors, they assessed two behaviors such as "self-management academic knowledge' and "self-management actions". The respiratory physician, respiratory nurse specialist, study nurse, and clinical psychologist developed a scoring system. Responses were scored separately for knowledge and actions (adherence) on a three-point scale (0-2) yielding a maximum possible score of 26 for both "knowledge scores" and the "action scores" in each scenario (Dowson et al., 2004).

Higher scores implied better self-management for the 13 behaviors. Responses were scored separately for knowledge and actions (adherence) on a three

point scale (0-2), yielding a maximum possible score of 26 for both the knowledge score and the action score for each scenario. Higher scores implied better self-management (Dowson et al., 2004). Although, this tool was used for COPD-SMI, it is unsuitable to measure self-management behavior. That's why for the present study, the researcher developed a new tool (COPDSMBQ) from the literature review for assessing the level of self-management behaviors of patients with COPD.

The COPDSMBQ focused on self-management process (Kanfer & Gaelick-Buys, 1991). It consisted self-monitoring, self-evaluation, and self-reinforcement. For assessing the level of self-management behaviors, the researcher used a 4 point Likert-type scale ranging from 1 = never, to 4 = always.

Factors Relating to Self-management Behaviors of Patients With COPD

Several factors contribute to the self-management behaviors of patients with COPD. They are internal factors and external factors.

Internal Factors

Internal factors refer to individual characteristics and knowledge regarding COPD and its management. Individual characteristics relate to the patients' personality: age, education, and health related characteristics including time since diagnosis of COPD. These are described as follows:

Age. Age is a factor that can affect self-management behaviors. According to a study conducted by Akter (2010) in Bangladesh, middle aged and young adults had a significantly higher self-management score than older adults (*t* =

4.54, $p < .05$). However, due to the aging process people may suffer a decline in their cognitive ability to make daily decisions. This may affect their chronic disease self-management (Sinclair et al., 2000; Dickson, Tkacs, & Riegel, 2007). Furthermore, Wen, Parchman, and Shepherd (2004) stated that age is a factor and it can influence the chronic disease self-management behaviors.

Education. Patient literacy is important for successful self-management behaviors of patients' with COPD. Weijman et al. (2005) stated that the level of education is related to the frequency of self-management behaviors. Furthermore, Bourbeau and colleagues (2004) stated that a high education level tends to be related to a better self-management behavior pattern among COPD patients. In addition, Mead, Andres, Ramos, Siegel, and Regenstein (2010). They stated that the educational factor may affect the performance of COPD self-management.

Time Since Diagnosis of COPD. Time since diagnosis or the duration of illness is a influencing factors of chronic disease self-management. Lee et al. (2010) found that the longer the duration of chronic disease significantly relates to chronic disease self-care behavior ($p < .01$). They stated that those with a longer duration of chronic disease had more opportunity to learn self-care and its benefit. In addition, the patients who had been diagnosed with their illness for a long time proved to have better self-management (Gallagher et al., 2008).

Knowledge Regarding COPD and Its Management. Knowledge regarding COPD and its management is the cornerstone for self-management behaviors of patients with COPD in order to evaluate and implement their individual plan. A study stated that patients' knowledge regarding COPD and its management are symptom control and behavior modification (Bourbeau et al., 2004). Knowledge

regarding COPD and its management consists of epidemiology, etiology, common signs and symptoms of COPD, breathlessness, smoking cessation, sputum, infections, exercise (effective coughing and breathing exercises), inhaled bronchodilators, antibiotics, steroid tablets, and inhaled steroids (White, Walker, Roberts, Kalisky, & White, 2006).

This is an important factor to adequate knowledge regarding chronic disease management is one of the sources of effective self-management behaviors (Xu et al., 2008). Health care providers are helpful in providing information, managing the disease, overcoming mental, physical, and social problems of patients (Chen et al., 2008). Patients' knowledge regarding COPD and its management is reflected by an individual patient's behavior such as the use of prescription medication, the technique of inhaler use, breathing and coughing exercise, smoking cessation, and nutritional maintenance (Kheirabadi, Keypour, Attaran, Bagherian, & Maracy, 2008).

External Factors

The most common external factors are family support and accessibility to health care resources (Disler et al., 2012).

Family Support. Family support is an important consideration for patients managing a chronic disease. In order to provide appropriate support, family members must be sensitive to the needs to the patients with COPD. Family support includes effective communication, respect to the needs of each family member, establishment family expectations of mutual help and assistance (Pender, Murdaugh, & Parsons, 2006). Appropriate family support can potentially influence self-management behaviors on patients with COPD. When patients perceive strong

support from their family members, they can cope better with their disease conditions (Toljamo & Hentinen, 2001). Similarly, patients also can gain great emotional support for self-management behaviors from spouse (Halding, Wahl, & Heggdal, 2010). Costa and Nogueira (2008) conducted a descriptive study aimed to analyze whether the family positively contributes to the patient's control of the disease. They stated that family support is essential for the patients to control their disease.

Management of COPD complications, patient needs the good family support. Spouse support is the main ingredient to self-management behaviors of patients with COPD. The patient whose get spouse support, they can prevent their COPD complications, maintain nutritional diet, and improve their COPD self-management behaviors (Halding et al., 2010). Furthermore, a previous study suggests that spouse support plays an important role in recovery from COPD. Moreover, a previous study conducted by Sherbourne and Stewart (1991) stated that family support is one kind of support that perceived by the patients from their family members including emotional, informational, tangible, positive social interaction, and affectionate supports. Toljamo and Hentinen (2001) reviewed literature and concluded that family support can be defined in terms of emotional, instrumental, informational, and appraisal supports. Similarly, another study was conducted by Biswas (2010) in Bangladesh, of 126 pulmonary TB patients. The researcher stated that family support consists of emotional, instrumental, informational and appraisal support (House as cited in Biswas, 2010).

Emotional support refers to the dimension of caring, empathy, love, and trust (House as cited in Biswas, 2010). It consists of the expression of compassion. This idea can apply to COPD patients in ways whereby family members

help patients during taking medication, accompanying him or her to schedule an appointment with physicians, being with him or her when consulting with physicians, and generally helping to provide information about their health condition.

Instrumental support includes tangible support or actions including providing good services (House cited in Biswas, 2010). That is specific tasks, such as preparing nutritious meals or arranging transport. Family members can help the COPD patients to perform daily activities like bathing and washing clothes.

Informational support means the offering of advice and providing information as well as personal information or suggestion (such as COPD symptoms, risk factors, management of COPD), and guidance about self-management behaviors practice from the patients. Appraisal support is a affirmative support consists of constructive feedback to help individuals to realize their own strengths and potential (House as cited in Biswas, 2010). Positive social interaction means the availability of the other person to make fun with the patients from surrounding areas (Sherbourne & Stewart, 1991).

Family is the core aspect for motivating and counseling the patients with COPD. Appropriate family counseling can help maintain the COPD patients self-management behaviors (Alberto & Joyner, 2008; Halding et al., 2010). Family members need to understand the symptoms of COPD disease. However, they need to know which information is pertinent for the patients. Cohen, Gottlieb, and Undrwood (2000) stated that they play an important role for the recovery from chronic illness. In addition, they stated that family relationship influence behaviors and health, such as nutritional diet, breathing and effective coughing exercise, smoking cessation, inhaler use, and adherence to medical regimen.

Family members play an essential role in the care of patients with COPD. An acute exacerbation of COPD can develop complications, often they require frequent re-evaluation. Gallant (2003) reviewed 13 literatures on the subjects and suggested that COPD patients need to pay attention to their family members' opinions. Family support might influence an individual's self-management behaviors through motivation, information, and feed back (Procidano & Heller as cited in Xiaolian et al., 2002). Some studies examined adherence to medication aspect of self-management behavior for chronic patients. Dunbar, Clark, Quinn, Gray, and Kaslow (2008) wrote a manuscript and stated that family support including financial assistance, collecting medicine, and emotional support, appeared to be a strong influence on patients' adherence to treatment.

Furthermore, a study was conducted by Xiaolian et al. (2002). They found that there is a significant positive relationship between family support and total self-care behavior ($r = .25$, $p = .012$). In contrast, the lack of family support can destabilize the whole plan of treatment.

Accessibility to Health Care Resources. The degree of accessibility to health care resources clearly influences the patient's ability to self-manage their COPD condition in the hospital level. Gysels and Higginson (2009) in their qualitative study noted that the influence of accessibility to medication and transportation impacts on the patient's ability to manage dyspnea. Furthermore, low socioeconomic status directly impacts on accessibility to medication. The disease itself causes financial expenses to patients with COPD, since they have to deal with several laboratory checks, medication, and treatment to deal with the complications of COPD (Mannino & Buist, 2007).

Limited accessibility to transportation will also diminish the patients' accessibility to health care services such as regular visit to the physician in hospital. In addition, the inability to access the transportation with diminishes patients' quality of life such as in case of emergency. If the patient is unable to access transportation (ambulance) he/she may delay to seek the medical treatment which could be the greatest impact on the patient life. A study from Jeon, Essue, Jan, Wells, and Whiteworth (2009) noted that economic hardship forced patients to prioritize some medication or self-management behavior pattern over others.

Summary of the Literature Review

In summary, three major aspects of the literature have been reviewed. These are the concept of COPD, concept of self-management behaviors, and factors relating to self-management behaviors. COPD is one of the most devastating chronic diseases of the lungs. It is not only a medical problem, but it also has an enormous impact on the individual patient, patient's family, society, and health care systems. In Bangladesh, COPD is a major public health problem, its management and prevention are the major public health issue. The common symptoms of patients with COPD are breathlessness (dyspnea), coughing, wheezing, and sputum production. To improve one's condition, the patient needs to take appropriate action and implement a plan of self-management.

According to the theory of Kanfer and Gaelick-Buys (1991), the self-management process consists of three processes: self-monitoring, self-evaluation, and self-reinforcement. There are several internal and external factors influenced the

successful self-management behaviors of patients with COPD including age, education, time since diagnosis of COPD, knowledge regarding COPD and its management, family support, and accessibility to health care resources. Many studies showed that there were factors relating to self management behaviors knowledge regarding COPD and its management, family support, and accessibility to health care resources. A patient's knowledge regarding COPD and its management includes epidemiology, etiology, noticing signs and symptoms, breathlessness, sputum, infections, exercise, smoking, use of inhaled bronchodilators, antibiotics, steroid tablets, and inhaled steroids. Knowledge regarding COPD and its management can help the patients to control symptoms and improve their ability to take action and improve self-management behaviors.

Furthermore, good family support leads to an improvement of a patient's step-by step self-management processes. For example, if the patient perceived high level of family support from their families they can better management of their disease condition and control symptoms. Availability or ensuring of accessibility to health care resources can help to reduce or prevent COPD complications and improve effective self-management behaviors. In Bangladesh there are unknown studies to explore the factors relating to self-management behaviors of patients with COPD.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research design, setting and target population, sample and sampling, instrumentations, ethical consideration, data collection procedures, and data analysis of the study.

Research Design

The descriptive correlational study aimed to examine the level of self-management behaviors and to identify the factors relating to COPD self-management behaviors of patients with COPD.

Setting

This study was conducted at the 250-bed general hospital in Jessore, which is located in southern part of Bangladesh. It is a secondary and an educational hospital and is the largest hospital in the central part of Jessore. This hospital has a total of 15 wards and outpatient departments (OPDs). Nearly 350 patients receive medical care in the hospital daily. From January to December, approximately 1,000 COPD patients visited OPDs and 200 patients are admitted into the male and female IPDs each month (A. Sobur, personal communication, April 10, 2013). The hospital has some facilities for hospitalized patients and OPD patients such as pathology, radiology, electrocardiogram (ECG), ultra sonogram (USG), and social welfare. This

hospital sometimes provides counseling session about family planning, breast feeding, immunization, personal hygiene, and nutritional diet for OPD patients. There is no specific counseling system about pulmonary rehabilitation such as breathing and coughing exercises, physical exercise, smoking cessation, technique of inhaler use, and nutritional maintenance especially for COPD patient's self-management.

The researcher obtained the sample from inpatient and outpatient department. Patients are referred from the surrounding rural area, primary level hospitals, the Jessore municipality area, and private clinics. The 250-bed general hospital provides care to both rural and urban people. Moreover, chest specialists work in the medical inpatient and outpatient department and take care of patients every day from 9.00 AM to 2.00 PM. They assess the patient and make decisions about their medication depending on their conditions. The chest specialists are on-call 24 hours a day to cover the care assigned unit in case of emergencies for hospitalized patients. Nurse work three shifts per day to provide care for the patients. Furthermore, they provide information, medication, inhalers, advice on diet, and monitor follow-up visits with the physician in the OPDs.

Population and Sample

Target Population

The target population of this study consists of all COPD male and female patients who were admitted in the medical IPDs or who attended the OPDs at the 250-bed general hospital, Jessore, Bangladesh.

Sample

The sample of this study was patients with COPD admitted in the medical IPDs or attended in the OPDs at the 250-bed general hospital, Jessore, Bangladesh. The inclusion criteria of the sample included: (1) age of 20 years or older, (2) the patient being clinically diagnosed COPD for at least 3 months (3) able to understand and communicate in Bangla verbally or by writing, and (4) no severe vision and hearing problems.

Sampling Method

The sample was selected by using the convenient sampling technique. The COPD patients were admitted in male or female medical IPDs or visited the OPDs at the 250-bed general hospital in Bangladesh.

Sample Size Estimation

The sample size of this study was determined by using power analysis (Polit & Beck, 2012). Three parameters are required including a level of significance alpha (α = .05), an expected power ($1-\beta$ = .80), and an effect size (ES = .25). The researcher determined an effect size (ES = .25) from two related studies. The first study, Eakin and Glasgow (1997) reported a positive relationship between perceived importance of self-management behaviors and recall of provider advice (considered to be close to knowledge regarding COPD and its management and accessibility to health care resources) in patients of COPD with correlation coefficients ranging from .43 to .79. The second study measured self-care behaviors using Orem's Self-care Theory (Xiaolian et al., 2002). Although, it was conceptually different from this

present study, it covered ranges of behaviors close to this study. Xiaolian et al. (2002) found a positive relationships between self-care behaviors and family support (r = .252). The researcher decided to take the minimum effect size across these two studies, yielding a sample size of 123 (α = .05, p = .80, ES = .25), according to Polit and Beck (2012). The researcher rounded up this number to 130.

Instrumentation

Data Collection Instruments

Structured instruments were used for data collection. They were composed of five parts.

Part 1: Demographic Information and Health-Related Questionnaire (DIHRQ),

Part 2: COPD Self-Management Behavior Questionnaire (COPDSMBQ).

Part 3: Bristol COPD Knowledge Questionnaire (BCKQ).

Part 4: Family Support Questionnaire (FSQ),

Part 5: Accessibility to Health Care Resources Questionnaire (AHCRQ). An explanation of each part is as follows:

Part 1: Demographic Information and Health Related Questionnaire (DIHRQ). The Demographic Information and Health Related Questionnaire (Appendix C, Part 1) was developed by the researcher and used to collect the patient's demographic information and health related information. The demographic information consisted of 7 items including age, gender, religion, level of

education, marital status, occupation, and monthly average income. The health related information consisted 5 items including smoking habit, time since diagnosis of COPD, comorbid or any systemic disease, COPD common signs and symptoms that have affected on the patients' health, often been admitted at the hospital due to COPD. All data were obtained from interviews and patients' medical records.

Part 2: COPD Self-Management Behavior Questionnaire (COPDSMBQ). The Chronic Obstructive Pulmonary Diseases Self-Management Behavior Questionnaire (COPDSMBQ) (Appendix C, part 2) was developed by the researcher based on relevant literature review and the context of Bangladesh. It consisted of 27 items addressing different aspects of self-management behavior for the COPD illness symptom control through three self-management process. These included: self-monitoring (9 items), self-evaluation (7 items), and self-reinforcement (11 items). The subjects were asked to rate each item and indicated the frequency which they performed over the past month at home. Items were scored on a 4-point Likert-type scale: 1 = never, 2 = rarely, 3 = sometimes, and 4 = always. Therefore, the mean scores of self-management behaviors ranged from 1-4. Based on its mean scores, the level of self-management behaviors was determined as follows: 1.00-2.00 = low, 2.01-3.00 = moderate, and 3.01-4.00 = high. The following formula was used for identifying the mean range level of COPDSMBQ, MFSQ, and AHCRQ.

$$\frac{\text{Maximum mean score} - \text{Minimum mean score}}{\text{Number of level}}$$

Part 3: Modified Bristol COPD Knowledge Questionnaire (MBCKQ). In this study, the original BCKQ was developed by White and colleagues (2006). In this study, the BCKQ was used after modification (Appendix C, part 3).

The original BCKQ was a satisfactory instrument which measured COPD patients' knowledge and was appropriate for COPD patients. It was a “true”, “false”, and “don’t know” answer. There were 13 dimensions including; epidemiology, etiology, symptoms, breathlessness, phlegm (sputum), infections, exercise, smoking, vaccination, inhaled bronchodilators, antibiotics, oral steroids, and inhaled steroids. Each dimension was consisted of 5 items and a total of 65 items and the scores ranged from 0-65. It was good internal consistency of the 65 items (Cronbach’s alpha .73). The researcher modified the original BCKQ by deleting one dimension (vaccination) and 13 items in order to adjust to the Bangladeshi cultural context (there was no availability to vaccination in Bangladesh).The Modified Bristol COPD Knowledge Questionnaire (MBCKQ) consisted of 12 dimensions and a total of 47 items. There were 28 true questions and 19 false questions. By getting one correct response, the subjects received a score of 1. And by getting an incorrect or “don’t know” response, the subjects received 0. The total scores of the MBCKQ were ranging from 0-47. The total scores of each subject were converted to a percentage.

In this study the researcher categorized knowledge regarding COPD and its management level into three levels. This was > 80% (> 38 marks) high, 60% - 80% (28-38 marks) moderate, and < 60% (< 28 marks) low. In this study, the researcher asked and received permission from the developer to use and modify the BCKQ (Appendix G).

Part 4: Modified Family Support Questionnaire (MFSQ). In this study, the original Family Support Questionnaire (FSQ) was developed by Biswas (2010). In this study, this FSQ was used after modification (Appendix C, Part 4). The original FSQ had four domains (32 items) including; emotional, instrumental/tangible,

informational, and appraisal support. The researcher deleted eleven items because they were more specific for pulmonary TB patients and redundant. The researcher added one domain (positive social interaction) including one item based on Sherbourne and Stewart (1991) which stated that family support consists of five domains: emotional, tangible, informational, positive social interaction, and affectionate support. Sherbourne and Stewart not emphasized affectionate support in the literature as a distinct type of support, but they emphasized positive social interaction support. So, the researcher felt that positive social interaction support would be beneficial to self-management outcomes of this group of study. That's why the researcher chose the positive social interaction domain in this study. After modification, the researcher changed the original name of this questionnaire and used the new name MFSQ for this study. So, the MFSQ included five domains and a total of 22 items as follows:

1. Emotional Support (8 items)
2. Instrumental/Tangible Support (5 items)
3. Informational Support (4 items)
4. Appraisal Support (4 items)
5. Positive Social Interaction (1 item)

Each statement of the family support questionnaire was scored on a 4-point Likert type scale: 1 = never, 2 = sometimes, 3 = most of the time, and 4 = all the time. Therefore, the mean scores of family support ranged from 1-4. Based on its mean scores, the level of family support was determined as follows: 1.00-2.00 = low, 2.01-3.00 = moderate, and 3.01-4.00 = high. In this study, the researcher asked and received permission from the developer to use and modify the FSQ (Appendix H).

Part 5: Accessibility to Health Care Resources Questionnaire (AHCRQ). The accessibility to health care resources questionnaire (AHCRQ) (Appendix C, part 5) developed by the researcher based on relevant literature review and the perspective of present day Bangladesh. It consisted of 3 items addressing different aspects of accessibility to health care resources. The subjects were asked to rate each item to indicate the convenience at which they accessed health care resource over the past month. Accessibility to health care resources was identified based on a 4-point Likert type scale: 1 = not at all, 2 = some of the time, 3 = most of the time, and 4 = all the time. Therefore, the mean scores of accessibility to health care resources ranged from 1-4. Based on its mean scores, the level of accessibility to health care resources was determined as follows: 1.00-2.00 = low, 2.01-3.00 = moderate, and 3.01-4.00 = high.

Validity of the Instruments

The content validity refers to the accuracy of instruments used to conduct the assessment. The content validity of the COPDSMBQ, the MBCKQ, the MFSQ, and the AHCRQ were examined by a panel of four medical experts: three nurse lecturers from the Faculty of Nursing, Prince of Songkla University in Thailand, and one nurse lecturer from Dhaka, Bangladesh. The researcher modified the instruments for their appropriateness based on the experts recommendations. After that the instruments were back translated into Bengali versions by bilingual translators from Bangladesh.

Reliability of the Instruments

The reliability of the MBCKQ was examined by using the Kuder-Richardson (KR-20) internal consistency reliability formula yielded a value of .80. The internal consistency reliability of the COPDSMBQ, the MFSQ, and the AHCRQ was examined by using Cronbach's alpha coefficient. All instruments' reliability was examined through a pilot study with 20 subjects from the 250-bed general hospital, Jessore, Bangladesh who were diagnosed with COPD at least three months. Cronbach's alpha coefficient values were the COPDSMBQ = .64, the MFSQ = .76, and the AHCRQ = .77, respectively. The reliability coefficient being equal to or more than .70 was considered acceptable. This method was widely used for testing the internal consistency of the instruments (Burns & Grove, 2005). Therefore, only the COPDSMBQ was considered to have low reliability.

Translation of the Instruments

In this study the DIHRQ, the COPDSMBQ, and the AHCRQ were originally developed in English by the researcher. The original English versions of the instruments were translated into a Bengali by using the translation-back translation procedure (Sperber, Devellis, & Boehlecke, 1994) with the help of three bilingual translators as follows:

Step1: The original English version was translated into the national Bengali language by a Bangladeshi bilingual translator.

Step 2: The Bengali version were back translated into English by another Bangladeshi bilingual translator.

Step 3: The two English versions were compared by a third Bangladeshi bilingual translator checked the appropriate meaning and ensured the equivalence of the two English versions.

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University, Thailand. The study was conducted with the intention of protecting and respecting the human rights of every subject. The researcher obtained permission for data collection from the nursing superintendent of the 250-bed general hospital Jessore, Bangladesh, and the head of the OPDs and medical IPDs. The researcher clearly explained the purposes of the study to each subject. The subjects who were freely willing to participate in the study were asked to sign a consent form before data collection. The participants were reassured that they could refuse to participate in the study and could withdraw at any time at their wish. They could be free to ask any questions about the study. The confidentiality of the collected data was maintained throughout and after the study. The researcher used the coding system in order to keep confidentiality and anonymity.

Data Collection Procedures

Data collection was conducted at the 250-bed general hospital, Jessore in both the male and female IPDs and OPDs. It was divided into two phases: preparation phase and implementation phase.

Preparation Phase

Data was collected after obtaining approval for the thesis proposal from the Institutional Review Board (IRB) of the Faculty of Nursing, Prince of Songkla University, Thailand. After obtaining written consent from the Faculty of Nursing, Prince of Songkla University, the researcher asked permission from the superintendent of the 250-bed general hospital, Jessore, Bangladesh to collect data. Then the researcher met the nurse superintendent of the nursing department, and the nurse superintendent introduced the researcher to the head nurses of the IPDs and OPDs. The researcher asked for permission to collect data and inform the head nurses about the research objectives, methods and the expected benefits of the study. The researcher selected a convenient sample of the COPD patients both inpatients and outpatients.

Implementation Phase

The researcher met with each patient while conducting the research for IPD and OPD patients in the company of the nurse in charge of the IPDs and OPDs. The researcher explained the objectives to each patient, their rights and benefits of the study and asked the patients to participate in the study.

The researcher obtained written consent form the each patient who agreed to participate in the study.

The researcher collected data using a set of the questionnaires including the DIHRQ, the COPDSMBQ, the MBCKQ, the MFSQ, and the AHCRQ. Subjects were asked if they had any questions. The researcher allowed time for the patients to answer each question and clarified the questions when necessary.

The questions were completed in approximately 45 minutes. For subjects who were illiterate, the researcher read the questionnaire for them and they choose the answer themselves. The researcher checked all answers of the questions. The researcher asked the patients to complete the answers when necessary. After completing the data collection, the researcher thanked the patients. After that the researcher coded the questionnaires to assure the anonymity of the subjects.

Data Analysis

All data were entered and then analyzed by using a computer program related to the objectives of the study. Before data analysis, the researcher performed all data management procedures including coding, data entry, data screening, and data cleaning using each subject's original questionnaire to ensure accuracy of data entry in the computer software. The analysis included both descriptive and inferential statistics related to the research questions. Descriptive statistics were used for demographic and health related characteristics, factors relating to self-management and self-management behaviors of the subjects. That was described in frequencies (*n*), percentages (*%*), mean (*M*), and standard deviations (*SD*). The inferential non-parametric statistics, Spearman's Rho was used to examine the relationships between factors and self-management behaviors. The criteria for level of correlation were described as follows: small = .00-.25, low = .26-.49, moderate = .50-.69, high = .70-.89, and very high = .90-1.00 (Munro, 2001, p. 234). Before data analysis, the underlying assumptions were examined as follows:

Normality. Normality of variables can be detected by either statistical or graphical methods. In this study, univariate normality was detected by examining skewness and kurtosis. The distribution of data was considered normal when the values of skewness divided by its standard error and kurtosis divided by its standard error were in the range of 0 to ± 3. For this study, the variables of age, education, knowledge regarding COPD and its management, family support, accessibility to health care resources were normally distributed, whereas, the duration of illness, and self-management behaviors were not normally distributed (Appendix D, Table 18).

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this chapter was to present the results and discuss the findings of the study. This descriptive correlational study aimed to examine the level of self-management behaviors of patients with COPD, and to identify the factors relating to self-management behaviors of patients with COPD in Bangladesh. The study findings were derived from one hundred and thirty COPD patients at the 250-bed general hospital, Jessore, in Bangladesh. Data were entered and analyzed by using computer software. The results and discussion of the study are presented under the following headings.

1. Demographic and health related characteristics
2. Self-management behaviors
3. Factors relating to self-management behaviors

Results

Demographic and Health Related Characteristics

Demographic Characteristics. The average age of the subjects was 63.95 years (*SD* = 7.98) with range at 47-80 years. The majority of the subjects were male (66.2%), and Muslim (83.1%). The educational level of the subjects was mainly in primary school (43.1%), and married (74.6%). Their occupations included farmers, housewives, and the private sector (17.7%, 16.9%, and 16.2%, respectively). In addition, 43.8 percent of the subjects earned between 5,000-10,000 Bangladeshi Taka

per month, which was considered low socio-economic status in Bangladesh than other countries (Table 2).

Table 2

Frequency and Percentage of Demographic Characteristics (N = 130)

Variables		Frequency *(n)*	Percentage *(%)*
Age	*M* = 63.95, *SD* = 7.98, Min = 47, Max = 80		
	47-58 year	39	30.0
	59-70 year	69	53.1
	71-80 year	22	16.9
Gender			
	Male	86	66.2
	Female	44	33.8
Religion			
	Muslim	108	83.1
	Hindu	22	16.9
Education			
	No formal education	17	13.1
	Primary school	56	43.1
	High school	30	23.1
	College	20	15.4
	University	07	05.4
Marital Status	Married	97	74.6
	Widowed/Widower	33	25.4
Occupation			
	Farmer	23	17.7
	Labor	14	10.8
	Private job	21	16.2
	Government job	20	15.4
	Retired	18	13.8
	Housewife	22	16.9
	No-occupation	12	09.2
Monthly Income (Taka)	< 5,000	31	23.8
	5,000 – 10,000	57	43.8
	>10,000	42	32.3

Health Related Characteristics. The frequency and percentage of health related characteristics of the subjects was demonstrated (Table 3 and 4). The

majority of the subjects had no smoking habits (73.8%). Around 73.8 percent of the subjects had the duration of illness between 1 year to 5 years, with a mean duration 2.06, *SD* = 0.51. The majority of them had not developed comorbid diseases at the time of recruitment (73.1%). Predominantly, most of the subjects reported common signs and symptoms of COPD which consisted of breathlessness, cough, fatigue or tiredness, and wheezing (99.2%, 96.2%, 90.8%, and 74.6%, respectively). Around 32 percent of the subjects were readmitted to or visited the hospital more than 4 times (Table 3). In addition, most of the subjects suffered from breathlessness and coughing monthly (73.8% and 67.7%, respectively), where as fatigue occurred daily (36.9%) (Table 4).

Table 3

Frequency and Percentage of Health Related Characteristics (N = 130)

Variables		*n*	*%*
Smoking Habit			
	No	96	73.8
	Yes	34	26.2
Duration of COPD	*M* = 2.06 years, *SD* = 0.51, Min-Max = <1year-15 years		
	< 1year	13	10.0
	1 year-5 years	96	73.8
	>5 years	21	16.3
Having Comorbid Disease	No	95	73.1
	Yes	35	26.9
COPD Common Signs and Symptoms			
Breathlessness			
	No	01	0.8
	Yes	129	99.2
Cough			
	No	05	03.8
	Yes	125	96.2

Table 3 (continued)

Variables		*n*	*%*
Wheezing			
	No	33	25.4
	Yes	97	74.6
Fatigue or Tiredness	No	12	09.2
	Yes	118	90.8
Times of admitted or visited at the hospital	First time	-	-
	Second time	33	25.4
	Third time	32	24.6
	Fourth time	24	18.5
	>Four times	41	31.5

Table 4

Frequency and Percentage of Duration of Symptoms (N = 130)

Variables	*n*	*%*
Breathlessness		
Daily	04	03.1
Weekly	29	22.3
Monthly	96	73.8
Cough		
Daily	05	03.8
Weekly	32	24.6
Monthly	88	67.7
Fatigue		
Daily	48	36.9
Weekly	33	25.4
Monthly	37	28.5

Self-management Behaviors

The research findings revealed that there was a moderate level of self-management behaviors ($M = 2.67$, $SD = 0.64$) (Table 5).

Table 5

Mean, Standard Deviation, and Levels of Self-management Behaviors (N = 130)

Variables	*M*	*SD*	Level
Self-monitoring	2.53	0.72	Moderate
Self-evaluation	2.51	0.70	Moderate
Self-reinforcement	2.88	0.61	Moderate
Total	2.67	0.64	Moderate

Factors Relating to Self-management Behaviors

Knowledge Regarding COPD and Its Management. The subjects' knowledge regarding COPD and its management mean score was 79.39 percent (*SD* = 6.53), and the minimum to the maximum scores were 62-to 98. The patients demonstrated their level of knowledge regarding COPD and its management equally at a moderate and high level (Table 6).

Table 6

Frequency and Percentage of Knowledge Levels Regarding COPD and Its Management (N = 130)

Variables		*n*	*%*
	M = 79.39, *SD* = 6.53, Min = 62, Max = 98		
Low	<60% (< 28 scores)	-	-
Moderate	60% - 80% (28-38 scores)	65	50.0
High	> 80% (> 38 scores)	65	50.0

Family Support. The 130 subjects with COPD who participated in this study perceived a high level of support from their family members (*M* = 3.22, *SD* = 0.18). All dimensions of family support scored were at the high level, except for 'informational support', which was reported at a moderate level (Table 7).

Table 7

Mean, Standard Deviation, and Levels of Family Support (N = 130)

Variables	*M*	*SD*	Level
Emotional Support	3.41	0.20	High
Instrumental/Tangible Support	3.41	0.23	High
Informational Support	2.22	0.79	Moderate
Appraisal Support	3.50	0.27	High
Positive Social Interaction	3.68	0.54	High
Total	3.22	0.18	High

Accessibility to Health Care Resources. This study results revealed that accessibility to health care resources was at a moderate level (M = 2.31, SD = 0.78) (Table 8).

Table 8

Mean, Standard Deviation, and Levels of Accessibility to Health Care Resources (N = 130)

Variables	*M*	*SD*	Level
Accessibility to Health Care Resources	2.31	0.78	Moderate

The Relationships Between Factors and Self-management Behaviors. The relationships between the proposed factors and self-management behaviors of patients with COPD are shown in Table 9. The study findings showed that there was a highly positive relationship between accessibility to health care resources and self-management behaviors (*rho* = .76, $p < .01$). Similarly, family support had a moderately positive relationship with self-management behaviors (*rho* = .59, $p < .01$). Interestingly, there was no significant relationship between age,

education, duration of illness, and knowledge regarding COPD and its management with self-management behaviors.

Table 9

The Relationships Between Factors and Self-management Behaviors of patients With COPD Tested by Spearman's Rho (N =130)

Variables	Self-management Behaviors
Age	.14
Education	.07
Duration of Illness	.08
Knowledge Regarding COPD and Its Management	-.06
Family Support	.59**
Accessibility to Health Care Resources	.76**

* $p < .05$ level (2-tailed), ** $p < .01$ level (2-tailed).

Discussion

Demographic and Health Related Characteristics

The findings of this study indicated that the subjects' age ranged from 47-80 years with a mean age of 63.95 years old (*SD* = 7.98). Around 54 percent of the subjects were 59-70 years and male (66.2%). It was congruent with a prior study conducted by Esteban and colleagues (2011), which reported that people 60 years or older are at significant risk to develop COPD. According to Rabe and colleagues (2007), the prevalence of COPD increased 15 to 25 percent among adults age 40 years and older. Roberts, Ghiassi, and Partridge (2008) stated that older patients, who had cognitive impairment were more likely unable to take medication, missed appointment with physician, and forgot the process of self-management. During the

period of data collection, there were more male patients who met the inclusion criteria found in both OPDs and IPDs. The data were congruent with an early study in Bangladesh conducted by Mosharraf-Hossain and colleagues (2009) who reported that the incidence rate of COPD was higher among male compared to female. More male patients visited or were admitted to the OPDs and IPDs at the Jessore 250-bed general hospital. Male patients usually get privileged treatment because of the social structure in Bangladesh. Males can go to visit physician at hospital without the help of family members but a female can't visit a physician at hospital without others because of Islamic culture in Bangladesh.

Moreover, the majority of the subjects in this study were married (74.6%), which related to a study of Warwick and colleagues (2010), which conducted a prospective descriptive survey with 78 patients. They found that among them 66.7 percent were married. This may be because in Bangladeshi culture, females marry after turning 18 years of age and males marry after turning 25 years of age that means most of the populations are married.

Unsurprisingly, most of the subjects were Muslim (83.1%) due to the fact, 89.35 percent of the total population in Bangladesh is Muslim (Government of the People's Republic of Bangladesh, 2011), and their religions assert that smoking is harmful to health. Therefore, in this study the majority of the subjects had no history of smoking (73.8%). Each subject, who had a history of smoking stopped smoking after they were diagnosed with COPD. Among the subjects' characteristics, the level of education was generally in primary school (43.1%). This result is not congruent with a prior study (Xiaolian et al., 2002) conducted on 98 COPD patients in China. They found that 22.45 percent had no formal education. This may be because in

Bangladesh, the government policy dictates primary education is compulsory for all, and there is free education for girls up to grade 10.

In addition, around 17.7 percent of the subjects were farmers, 16.9 percent housewives, and 16.2 percent worked in private sectors. Around 44 percent of the subjects earned less than 10,000 Bangladeshi Taka per month which is equal to 1,650- 3,300 Thai baht or approximately 125 USD. According to the Bangladesh Country Report (2012), this is considered a low income in Bangladesh compared to other countries. Nearly three-fourths of the subjects (73.8%) suffered from COPD between 1 year to 5 years and only 10 percent of them having COPD for less than 10 years. COPD is a chronic disease and it is treatable but not curable so the patients usually suffer from its symptoms and acute exacerbation off and on. As found in this study, all of them, except one, experienced breathlessness, followed by coughing, fatigue, and wheezing over the past month. These common symptoms also occur before an acute exacerbation starts. An evidence support that on the day of exacerbation, these symptoms increased: 64 percent of them had increased dyspnea, 35 percent had cold-like symptoms, and 20 percent had cough (Seemangal et al., as cited in Criner, 2003).

Among these symptoms, breathless or difficulty in breathing or dyspnea is the most commonly reported symptom that has been reported to have the severity at a moderate to severe level (Parveen, 2013; Suwanno, 2005). This may be due to patients' unawareness of their disease management and symptom control through the process of self-management. Nearly one-fourth of the subjects visited or were readmitted to the hospital more than four times (31.5%). This study result is not congruent with a Gallagher et al.'s study (2008). They found that 42 percent of COPD

patients had a hospital admission in the past year of their exacerbation. In contrast, Gucciardi, DeMelo, Offenheim, and Stewart (2008) stated that for chronic disease management, patients need to enhance effective self-management behaviors through follow-up visits with physicians.

Self-management Behaviors

The findings of this study showed that the mean score of self-management behaviors was at a moderate level (M = 2.67, SD = 0.64). This is congruent with a prior study in Bangladesh. Akter (2010) found that young adults with chronic disease (i.e., hypertension) reported a moderate level of self-management behaviors whereas older adults demonstrated a low level of self-management behaviors. In Bangladesh, there is no initiative to offer a COPD self-management educational program. In contrast, one of the major health programs in Bangladesh is an Expanded Program on Immunization (EPI) against six killer diseases including tuberculosis, whooping cough, diphtheria, tetanus, measles, and poliomyelitis for children and tetanus immunization for pregnant women (Government of the People's Republic of Bangladesh, 2011). In Bangladesh, for COPD patients treatment and care, physicians are mainly responsible for the management of COPD; nurses are rarely involved in health education about COPD patient self-management care. When a patient with COPD was discharged from the hospital, physicians write a discharge certificate for the patient and nurses give it to the patient. This discharge certificate contains the patient's address, investigation report, name of the necessary medication, and some advice for the patient such as the date of next follow-up visit with physician.

According to the subjects, it was very less chance that the nurses explained about the discharge certificate to the patient. According to Xu and colleagues (2008), interaction between the health care providers and patients may play the important role in building patients self-confidence to manage a chronic disease. On the same issue, Bangladeshi nurses are rarely involved in health education sessions, especially for this group of patients. In addition, only a few patients are involved in educational sessions.

Hospitals in Bangladesh have a shortage of nurses (Hadley et al., 2006). According to the recent report by WHO (2011), the distribution of physicians per 10,000 was 3.5 whereas, the distribution of nurses was 1.7 per 10,000. Since time is limited, health care providers rarely discuss the process of self-management behaviors and rarely explain how COPD patient can self-manage their chronic conditions. As a consequence, patients may be unable to have a chance to discuss their health condition, and be unable to know learn how they can self-manage. That's why this study COPD patient may receive less information regarding their disease management from health care providers. As a result, patient may showed relatively a moderate level of self-management behaviors.

An item analysis, it was found that there were two items was rated in a low level. One item is self-monitoring and one is self-evaluation. These items were: "I have counted by breathing rate when I have difficulty in breathing," and "I have performed breathing exercise to reduce my difficulty in breathing" (Table 11, Appendix D). Moreover, for breathing rate count, less than half of the subjects (42.3%) reported to "never" count it and for breathing exercise, nearly half of them (47%) reported to "never" perform it. COPD patients can learn by assessing their own

breathing rate allows the patients to start recognize what is going on in their chest and that may result in proper preventing and managing any further serious problem. Breathing exercise, either pursed lip exercise or diaphragmatic breathing should always be taught to these patients as they are easy to perform and can be used to control their breathing rate (Alexander, 2009).

Factors Relating to Self-management Behaviors

This study was identified the internal factors such as age, education, duration of illness, and knowledge regarding COPD and its management, and external factors such as family support and accessibility to health care resources. Those factors were related according to direction and strength to perform and enhance effective self-management behaviors. In this study revealed that accessibility to health care resources and family support had a positive relationship with self-management behaviors. In contrast, age, education, duration of illness, and knowledge regarding COPD and its management had no significant relationship with self-management behaviors. These are explained as follows:

Accessibility to health care resources contributed to self-management behaviors. The results showed that accessibility to health care resources had a highly positive relationship with self-management behaviors ($rho = .76$, $p < .01$) (Table 9). The high relationship between accessibility to health care resources and self-management behaviors may be because the patients may received appropriate treatment from hospital, in which increasing the patient's ability to performed self-management behaviors. This study results also supported by another study which revealed that accessibility to medication are significantly related to chronic disease

health behaviors (Biswas, 2010). Biswas found that highest score was in complying with anti-TB medication in Bangladesh. Another study found that patient medication compliance rate was 100 percent (Irani, Kabalimu, and Kasesela, 2007). A possible explanation, patients may received counseling about COPD management and care from health care providers. In addition, the patients' own motivation may improve their self-management and may help to seek medical treatment and take medication daily.

Moreover, the majority of the study subjects visited or was admitted to hospital more than four times and patients received care and medication from public hospital according to their needs such as nebulization, oxygenation, and salbutamol. In Bangladesh, there was a government policy to provide some free medicine to all. Although, Bangladesh government has the low health budget. The current health budget of Bangladesh is $5.0 per person yearly (The Financial Express, 2013). As a result, patients could not access sufficient medication from public hospitals. They have to perchage medication to outside.

On the other hand, the majority of the subjects earned between 5,000-10,000 Bangladeshi Taka per month (lower than 125 USD/month), which is considered as low income in Bangladesh compared than other countries. Lower income directly impacts negatively on COPD patients as they can't afford the medication (Jeon & colleagues, 2009; Jerant, von Friederichs-Fitzwater, & Moore, 2005). Gysels and Higginson (2009) depicted that the availability of medication is a factors which contribute to the patients management and their symptom control. It can be conform in the following item analysis, one fourth of the subjects (32.3%) reported to "not at all" access the health care resources. These are: "I have used transportation

(ambulance) from the hospital when I come to visit physician" (Table 16, Appendix D). In addition, the majority of the subjects (73.8%) suffered between 1 year to 5 years. Although, they may have experienced repeated COPD symptom, such as dyspnea and as a consequence have sought medical treatment to obtain relief, financial problems have probably been an obstacle in performing better self-management.

Furthermore, the results showed that family support had a moderately positive relationship with self-management behaviors (*rho* = .59, *p* = < .01). This result was consistent with a previous study by Biswas (2010). Biswas found that a significant positive relationship between the total health behaviors and family support (*rho* =.47, *p* < .01). This study finding about the relationship between family support and self-management behaviors can be explained in different ways:

An explanation is religion and culture. In Bangladesh, people live with their family and care for their family members. Caring for family members was an accepted and expected part of familial duties (Merrell, Kinsella, Murphy, Philpin, & Ali, 2005). When family members get sick, the other family members try to provide their best care to bring about recovery from the disease. Such practices have been well-recognized, not only among Bangladeshi families, but also among Asian families as shown in the statement: "Asian people will look after their families" (Atkin & Rollings as cited in Merrel et al., 2005).

The family is the most significant source of support especially with chronic diseases such as COPD. Family members help to improve health of the patient and reduce the severity of the disease by encouraging the patient to care for his or herself. The family takes care of patients who are unable to self-manage the disease

condition and provide psychological support to the patients (Pierce & Lutz, 2009). Family support has a positive influence on the adoption and maintenance of chronic disease self-management behaviors. A study stated that emotional, informational, affectionate, tangible, and appraisal supports are positively associated with chronic illness self-management behaviors (Gallant, 2003), and it plays a role in recovery from physical illness (Cohen et al., 2000).

Concerning the support of family that overall, subjects in this study perceived a high level of emotional, instrumental, appraisal, and positive social interaction support except “informational support”, which was perceived as a moderate level (Table 7). These findings were consistent with Biswas study which mentioned earlier. Biswas found that all dimensions of family support were at high level except’ informational support. Chronic illness patients as well as COPD patients normally need emotional support from their families to improve self-management behaviors. This may be because patients perceived that emotional support is most important to perform and enhance effective self-management behaviors. Emotional support might be a motivating factor in improving adherence to recommendations about health (Taljamo & Hentinen, 2001). Tsouna-Hadjis, Vemmos, Zakopoulos, & Stamatelopoulos as cited in Biswas (2010) supported that the spouses are the significant person to provide all kinds of support to the patients particularly “emotional support”.

A prior study found a higher relationship between emotional support and adherence to medication (average *r* effect sizes = 1.74). The same study also stated that there was a significant difference to chronic disease self-care behaviors who received emotional support and who did not receive emotional support from their

families (DiMatteo, 2004). Gallant (2003) stated that a higher level of family support is associated with better self-management behaviors.

Moreover, chronic illness patients need encouragement, love and affection from their family members. COPD is not only a physical problem but it is also a psychological problem. This can be seen in the following two items. An item analysis, which had the highest mean scores among all items: “My family is loving and affectionate to me eventhough I have COPD” (*M* = 3.54, *SD* = 0.62); and “My family listens to me when I want to talk about anything” (*M* = 3.72, *SD* = 0.49) (Table 15, Appendix D). Another reason may be that family members can provide emotional support without any cost either tangible support (such as money or equipments), or intangible (such as knowledge or cognitive ability).

Similarly, the highest score for family support was the positive social interaction and appraisal support (*M* = 3.68, *SD* = 0.54 and *M* = 3.50, *SD* = 0.27, respectively) (Table 7). This may be that “positive social interaction” and “appraisal support” are necessary to improve COPD patients self-management behaviors. However, COPD patients need to interaction with their family members and spouses because family members and spouses be available, who can make fun or to provide enjoyable moment to the patient. COPD patients need affirmative support as well, which consists of constructive feedback to help individuals realize their own strengths. This can be seen in the following two items: “My family is very open in discussing things with me” (*M* = 3.63, *SD* = 0.54), and “My family allows me to make decisions about my treatment” (*M* = 3.63, *SD* = 0.55) (Table 15, Appendix D). Hence, family members can provide appraisal support without any cost.

On the other hand, this study result showed that age, education, duration of illness, and knowledge regarding COPD and its management had no significant relationship with self-management behaviors (Table 9). This study results was not congruent with a previous study. A study conducted by Balbay, Annakkaya, Arbak, Bilgin, and Erbas (2005) in a rural area of Turkey. They found that older patients had more nonadherent than younger patients (p = .008). Sinclair and colleagues (2000) stated that the cognitive dysfunction of the elderly is associated with changes in chronic disease self-management behaviors and use of health care services. Cognitive deficits may cause delay in making daily decisions due to early symptoms (Dickson et al., 2007). A possible explanation for this discrepancy is that age alone may not be related to self management behaviors because Bangladeshi people tend to care sick people without considering the age.

The duration of illness had no significant relationship with self-management behaviors. Inconsistent result with the researcher's study has been found in a previous study conducted by Lee et al. (2010). They found that long duration of illness was related to chronic disease self-care behaviors. A study stated that patients whose attacks were over long time in chronic disease they had better self-management than the new attacks patient (Akter, 2010). The difference might be because patients diagnosed for long time had more opportunity to collect the disease related information from health care providers and had better self management ability.

This study result showed that education had no significant relationship with self-management behaviors. This result were not congruent with previous study. This inconsistent result may be that patient may learn about self-management from multimedia such as television. In contrast, a recent study found that primary school,

high school and college educated respondent was higher self-management behaviors compared to those with non- educated respondent (Akter, 2010). It may be expected that patients with a higher educational level should have better self-management of chronic disease. Educated person may learn more about the importance of self-management and they can remember the self-management process. In addition, Bender and Bender (2005) stated that patient education and knowledge is very important when taking medication.

Furthermore, this study result showed that knowledge regarding COPD and its management had no significant relationship with self-management behaviors. A study reported that knowledge regarding chronic disease and its management indirectly related with chronic disease self-management behaviors (Xu et al., 2008). Inconsistent results may be due to the lack of clear definition of knowledge regarding COPD and its management, and limitations in the measurement of knowledge regarding COPD and its management (Chan & Molassiotis as cited in Xu, 2005). In this study subjects, half of them demonstrated their level of knowledge regarding COPD and its management equally at a moderate and high level (Table 6). It may be that the majority of the subjects (43.1%) were finished primary school and they could read physicians advice. 73.8 percent of the subjects duration of illness was between 1 year to 5 years. It may be that a long duration of illness is associated with increased patients' knowledge regarding chronic disease and its management. So, patients may try to obtain knowledge regarding COPD and its management from health care providers, which might be the reason that duration of illness and knowledge regarding COPD and its management had no significant relationship with self-management

behaviors. Another possible reason is although patients had sufficient knowledge however they did not practice self-management in their daily life.

Concerning an item analysis, eleven dimensions of knowledge regarding COPD and its management was equally at moderate and high level except one dimension ("inhaled steroid"), which demonstrated a low level (M = 2.61, SD = 1.03). Moreover, 31.5 percent of the subjects visited or were readmitted to the hospital more than four times. It can be supported that hospitalized patients can collect more information about specific disease management information from health care providers (Bourbeau et al., 2003). For this reason patient may showed an equally high and moderate level of knowledge regarding COPD and its management.

Therefore, it is unclear why the results of this study were not consistent with prior study. The study possibly failed to catch the real picture of the relationship between factors and self-management behaviors because it was conducted only at a single hospital. The lack of relationship between the age, education, duration of illness, and knowledge regarding COPD and its management may be because of the manner in which self-management is conceptualized. The concept of self-management are primarily proposed and described by the Western culture. The Eastern culture is different than the Western culture. The Eastern culture, family members' responsibility is to take care their families when they are sick. On the other hand, the patients may mainly practice in the narrow context of self-management behavior such as rest, reduce activities during breathlessness to maintain and control symptom as a part of self-management.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter presents the conclusion based on the research findings, strengths and limitations, implications and recommendations.

Conclusion

There were two aims of this descriptive correlation study. The first was to examine the level of self-management behaviors of patients with COPD, and the second was to identify the factors relating to self-management behaviors of patients with COPD in Bangladesh. One hundred and thirty subjects were recruited in this study by using a convenient sampling technique from OPDs and IPDs at the 250-bed general hospital, Jessore in Bangladesh. Subjects were asked to respond a set of questionnaire consisting of five parts. Part 1: DIHRQ, Part 2: COPDSMBQ, Part 3: MBCKQ, Part 4: MFSQ, and Part 5: AHCRQ. All questionnaires have been validated by four experts. The instruments were back translated and one physician in Bangladesh examined the questionnaires for their cultural relevancy of Bangladeshi context.

The reliability of the MBCKQ was .80 which was tested by using KR-20 formula, and the reliability of the COPDSMBQ, the MFSQ, and the AHCRQ were tested by using Cronbach's alpha coefficient yielded values of .64, .76, and .77, respectively. The reliability of all questionnaires was examined by testing with 20 COPD patients who were similar to the actual sample. Data were collected between

April and May, 2013. For this study, the data were gathered and analyzed by using descriptive statistics and inferential (non-parametric) statistics.

The demographic and health related characteristics were presented in terms of frequency (*n*), percentage (*%*), mean (*M*), and standard deviation. The Spearman's Rho correlation was used to examine the relationships between factors and self-management behaviors.

The majority of the subjects were 59-70 years with a mean age 2.06 years, (*SD* = 0.51), predominantly Muslim (83.1%), male (66.2%), and married (74.6%). The educational level of the subjects were mainly in primary school (43.1%), farmers, housewives, and worked in private sectors (17.7%, 16.9%, and 16.2%, respectively), with earned between 5,000-10,000 Bangladeshi Taka per month (43.8%), none had smoking habits (73.8%), duration of illness between 1 year to 5 years (73.8%), and had not developed comorbid diseases (73.1%). Most of the subjects were experienced COPD symptoms such as breathlessness and cough monthly (73.8% and 67.7%, respectively) except fatigue or tiredness symptom which were experienced daily (36.9%). Around 32 percent of the subjects were admitted or visited at the hospital more than four times over the past month

The main findings of this study were as follows: The patients demonstrated a moderate level of self-management behaviors ($M = 2.67$, $SD = 0.64$). Statistically, it was revealed that accessibility to health care resources had a highly positive relationship with self-management behaviors ($rho = .76$, $p < .01$). Similarly, family support had a moderately positive relationship with self-management behaviors ($rho = .59$, $p < .01$).

Strengths and Limitations

Strengths

The strengths of this study are identified as follows: Firstly, the findings of this study would be used as baseline evidence to further study in Bangladesh. Secondly, some items of the original BCKQ and the FSQ were modified to make it more relevant to the study context, and their content validity was ascertained by four experts. Lastly, the instruments were translated into Bengali version and adjusted by using reversed translation methods with cultural sensitivity addressed in order to enhance subjects understanding to the items.

Limitations

The limitations of this study are identified as follows: The first limitation, this study was conducted only one general hospital, medical OPDs and IPDs. This limits the result of this study as they may not be generalized to all general hospitals in Bangladesh. The last limitation, the measurement was the relatively lower Cronbach's alpha value of the COPDSMBQ (.64) than the accepted value (.70). The possible reason, pilot study sample size was small (20 subjects) to test the internal consistency reliability. Another reason may be that the COPDSMBQ had two items (16 and 17) which had zero correlation variance. If these two items were removed then Cronbach's alpha would have accepted values. But the researcher think that those two items are important to assess those group of patients self-management behaviors. For this reason, the researcher did not modify these two items.

Implications and Recommendations

The implications of this study are as follows: The findings suggest that clinical practitioner should be aware about the importance of self-management behaviors, family support, and accessibility to health care resources especially for COPD patients. To improve and enhance COPD patients self-management behaviors the following recommendations are offered:

Nursing Practice

The findings of the study provide valuable information for nurses in clinical practice to gain better understanding about factors relating to self-management behaviors of patients with COPD. Nurses, particularly who work in clinical area, they can use this evidence to facilitate the effectiveness of patient care. Furthermore, nurses can provide information to the patients and their family regarding the disease and its management, Nevertheless, nurses should enhance their role as the advocator for patients with COPD. Nurse should encourage the family members to support and take care the patients, encourage the patients to assess the health care resources particularly where and how they can access health care resources easily for their better self-management.

Nursing Education

The findings from the study provide evidence for nursing knowledge about the factors relating to self-management behaviors of patients with COPD. The finding can be applied by nurse educators to teach nursing students about the

importance of family support, accessibility to health care resources, and effective self-management behaviors of patients with COPD. Nurse should consider the factors relating to self-management behaviors while develop teaching-learning content of COPD patient care.

Nursing Research

This study would contribute to understanding of the theoretical links among the factors and self-management behaviors of patients with COPD. However, the present study is a descriptive correlational study. Its findings provide more information about self-management behaviors, family support, and accessibility to health care resources of patients with COPD. Based on this finding some recommendations are offered as follows:

1. The COPDSMBQ and the AHCRQ were developed for this study should be further tested for construct validity. Specially, to identify the factors and level of self-management behavior should be done to assess those variables whether these two questionnaires as originally constructed or not.

2. Furthermore, in order to obtain a complete picture of factors relating to self-management behaviors of patients with COPD, studying the other factors (age, education, duration of illness, and knowledge regarding COPD and its management) either relationship with self-management behaviors or not in Bangladeshi cultural context.

3. The findings can be used as a baseline data to develop nursing interventions in caring COPD patients in future.

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APPENDICES

APPENDIX A

Sample Size Estimation

Sample size was estimation by using power analysis as Estimated Population Correlation Coefficient (*r*)

Selected level of Power (*1-β*) = .80.

Alpha (*α*) = .05

Effect Size (*ES*) = .25 got from a previous two studies (Xiolian et al., 2002; and Eakin & Glasgow, 1997).

The approximate sample size for this study = 130.

Estimated Population Correlation Coefficient (*r*)											
Power	.10	.15	.20	.25	.30	.35	.40	.50	.60	.70	.80
.60	489	217	122	78	54	39	30	19	13	9	7
.70	614	72	152	97	67	49	37	23	16	11	8
.80	785	47	194	123	85	62	47	29	19	13	10
.90	1047	63	258	164	112	81	61	37	25	17	12
.95	1296	75	322	204	141	101	80	50	32	22	18

(Polit & Beck, 2012, p 425).

APPENDIX B

Invitation Letter and Informed Consent Form

Dear patients,

Assalamualicum, my name is Sormin Sultana Parvin, working as a senior staff nurse in Upazilla Health Complex, Jhikorgacha, Jessore. Now I am studying Master of Nursing Science (International Program), Faculty of Nursing, Prince of Songkla University, Thailand. I would like to ask you to participate in a research study entitled "Factors Relating to Self-management Behaviors of Patients With COPD in Bangladesh" to fulfill the requirement of my master degree study.

I hope that these study findings will be helpfull for nurses to provide useful information to the COPD patient about factors and self-management behaviors. Information will be supported for COPD patients to manage their symptoms and improve their physical conditions. It will be helpful for the nurses to understand the objectives of the study and to provide quality of nursing care for that group of patients.

The Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University, Thailand, has approved this study title and the process. The study procedure does not involve risk or harm to you. You will decide to participate in an interview with the researcher for this study. You would be right to participate or not to participate.

The interview will take Bangla language. There will not identify by name on the interview schedule. I only use code number so your identity will not discover. I will ask some questions that will need approximately 30-45 minutes. I am committed

to you that anonymity and confidentiality will maintain strict. The information will gather and use to write research reports and it will be presented at professional meetings. Only the researcher and the advisor will be eligible for assessing the data.

You will be right to withdraw from participation in this study at any time without any information prior to completion of data collection. If you have any question or suggestion in this study, you can directly contact with me by mobile 8801712708718. If you decide to participate in this study voluntary, you will receive a copy of the consent form. After that I will request you to sign your name on the consent form. Your signature will indicate that, you understand the study objectives and will involve this study.

Thank you for your kind cooperation.

……	……	……
Name of Participant	Signature of Participant	Date
Sormin Sultana Parvin	……	…….
Name of the Researcher	Signature of the Researcher	Date

If you have any questions now or at any time during the study, please feel free to ask or discuss with me. You can be contact with me at the following address:

Sormin Sultana Parvin sorminsultana@ymail.com 8801712708718/ +660842563492.
Master of Nursing Science (International Program)
Prince of Songkla University, Hat-Yai, Thailand.

APPENDIX C

Instrumentations

Part 1: Demographic Information and Health Related Questionnaire (DIHRQ)

Code:_____
Date:_____

Instruction: This questionnaire is designed to collect the information about your personal and health related information. I will collect this information from the medical record and asking you some questions. Please give me the answer and I will put a mark "√" and fill in the available space which is appropriate for you.

1. Age…….Years
2. Gender ( ) 1. Male ( ) 2. Female
3. Religion ( ) 1. Islam ( ) 2. Hindu
4. Level of education ( ) 1. No formal education ( ) 2. Primary school ( ) 3. High school ( ) 4. College ( ) 5. University ( ) 6. Others (identify…….
5. Marital status ( ) 1. Single ( ) 2. Married ( ) 3. Separated ( ) 4. Widowed/Widower
6. Occupation ( ) 1. Farmer ( ) 2. Labor ( ) 3. Private employee ( ) 4. Government employee ( ) 5. Retired ( ) 6. Housewife ( ) 7. No-occupation
7. Monthly average income…… Taka per month

8. Smoking habit ( ) 1. No
   ( ) 2. Yes……Years……pieces/day
9. Time since diagnosis of COPD…….months/years
10. Comorbid or any systemic disease ( ) 1. No
    ( ) 2. Yes (give details…….)
11. COPD common signs and symptoms that have affected on your health
    a. Breathlessness (dyspnea)
       ( ) 1. No
       ( ) 2. Yes ( ) Daily ( ) Weekly ( ) Monthly
    b. Cough
       ( ) 1. No
       ( ) 2. Yes ( ) Daily ( ) Weekly ( ) Monthly
    c. Wheezing sound on breathing
       ( ) 1. No
       ( ) 2. Yes (give details it worsens or not)
    d. Fatigue or tiredness
       ( ) 1. No
       ( ) 2. Yes ( ) Daily ( ) Weekly ( ) Monthly
12. Often been admitted at the hospital due to COPD
    ( ) 1. First time ( ) 2. Second time
    ( ) 3. Third time ( ) 4. Fourth time
    ( ) 5. More than four times

Part 2: COPD Self-management Behavior Questionnaire (COPDSMBQ)

Code:_____
Date:_____

Instruction: This questionnaire is aimed to assess **how often you have performed behavior** related to COPD symptom control **in the past month.** There is no right or wrong answer. Please answer truly to each statement to indicate your actual behavior by marking "√" in the column that applies to you using the following four options:

1= Never (I have never performed the behavior)

2= Rarely (I have rarely or 1-2 days/week performed the behavior)

3= Sometimes (I have sometimes or 3-5 days/week performed the behavior)

4= Always (I have always or daily performed the behavior)

Example:

No.	COPD Self-management Behaviors	1	2	3	4
1.	I have visited my doctor to check my physical condition when I have experienced of sign and symptoms of COPD				√

If you mark (√) in column 4, it means you have always monitor or checked your physical condition after you have been diagnosed with COPD.

Now, please respond to the following statements according to your real life situation

No	COPD Self-management Behaviors	Never	Rarely	Sometimes	Always
	Self-monitoring				
1.	I have concerns about my difficulty in breathing	1	2	3	4
2.	I have monitored about the duration of difficulty in breathing	1	2	3	4
3.	I have counted my breathing rate when I have difficulty in breathing	1	2	3	4
4.	I have observed my breathing sound	1	2	3	4
5.	I have concerned about my cough whether my cough is worsening	1	2	3	4
6.	I have observed about how long/how many days of my cough	1	2	3	4
7.	I have concerned whether I feel tired or fatigue	1	2	3	4
8.	I have pay special attention about my COPD medications	1	2	3	4
9.	I have observed the side effects of medication (such as muscle crump, palpitation, headache, skin rash, and sleep problem)	1	2	3	4
	Self-evaluation				
10.	I have recognized how my current difficulty in breathing symptoms developed	1	2	3	4
11.	I have evaluated that my difficulty in breathing unusual different than before	1	2	3	4
12.	I have taken rest to reduce my difficulty in breathing	1	2	3	4
13.	I have performed breathing exercise to reduce my difficulty in breathing	1	2	3	4
14.	I have evaluated my current wheezing sound with the	1	2	3	4

No	COPD Self-management Behaviors	Never	Rarely	Sometimes	Always
	previous wheezing sound				
15.	I have recognized whether I felt tired or fatigue	1	2	3	4
16.	I have understood that my COPD symptom is getting better when I use of inhaler medication.	1	2	3	4
	Self-reinforcement				
17.	I continue propping up positioning that helps to reduce my difficulty in breathing	1	2	3	4
18.	I remain open the window to reduce my difficulty in breathing	1	2	3	4
19.	I keep on breathing exercise to reduce my difficulty in breathing	1	2	3	4
20.	I maintain using an inhaler to control my difficulty in breathing	1	2	3	4
21.	I go on seeking medical care while wheezing worsen	1	2	3	4
22.	I sustain using a face mask to protect from allergy.	1	2	3	4
23.	I have performed effective coughing exercise and spell out cough to keep clear my airway passes.	1	2	3	4
24.	I remain an avoiding cold to reduce my cough	1	2	3	4
25.	I keep on taking rest to reduce my tiredness or fatigue	1	2	3	4
26.	I remain on taking COPD medication timely	1	2	3	4
27.	I continue taking medication regularly as prescribed	1	2	3	4

Part 3: Modified Bristol COPD Knowledge Questionnaire (MBCKQ)

Instruction: This questionnaire is designed to find out what you know about your lung problem. You just put the "√" (tick) which option is true, false or don't know.

Code:_____
Date:_____

Statement	True	False	Don't Know
1. In COPD (epidemiology):			
a. COPD can only be confirmed by breathing tests	√		
b. In COPD there is usually a gradual worsening over time	√		
c. COPD is unusual in people less than 40 years old	√		
2. COPD (etiology):			
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:			
a. Fatigue or tiredness	√		
b. Wheezing	√		
c. Crushing chest pain		√	
d. Rapid weight loss		√	
4. Breathlessness in COPD:			
a. Breathlessness can be worsened by eating large meals	√		
b. Breathlessness is a normal response to exercise	√		

Statement	True	False	Don't Know
c. Breathlessness is primarily caused by a narrowing of the bronchial tubes	√		
5. Sputum:			
a. Coughing sputum is a common symptom in COPD	√		
b. Clearing sputum is more difficult if you get dehydrated	√		
c. Bronchodilator inhalers can help clear sputum	√		
d. Clearing sputum can be assisted by breathing exercise.	√		
6. Chest Infections/Exacerbations:			
a. Chest infections often cause coughing of blood.		√	
b. With chest infections sputum usually becomes colored (yellow or green)	√		
c. Exacerbations can occur in the absence of a chest infection.	√		
d. Chest infections are always associated with a high temperature.		√	
e. Steroid tablets should be taken whenever there is an exacerbation.		√	
7. Exercise in COPD:			
a. Exercise should be avoided as it strains the lungs		√	
b. Exercise can help maintain your bone density	√		
c. Exercise should be stopped if it makes you breathless		√	
8. Smoking:			
a. Stopping smoking will reduce the risk of heart disease.	√		
b. Stopping smoking will slow down further lung damage	√		
c. Stopping smoking usually results in improved lung function		√	
9. Inhaled Bronchodilators:			
a. Both short and long acting bronchodilators can be taken on the same day.	√		
b. Spacers (e. g. nebulizer, aero chamber) should be dried with a		√	

Statement	True	False	Don't Know
towel after washing.			
c. Using a spacer device will increase the amount of drug deposited in the lungs	√		
d. Tremor may be a side effect of bronchodilators.	√		
10. Antibiotic Treatment of COPD:			
a. To be effective, the course should last at least 10 days		√	
b. Antibiotics will clear all chest infections		√	
c. Antibiotic treatment is necessary for an exacerbation (worsening) however mild.		√	
d. You should seek advice if antibiotics cause severe diarrhea	√		
11. Steroid Tablets Given for COPD (e.g. prednisolone)			
a. Steroid tablets should be avoided if there is a chest infection		√	
b. The risk of long-term side effects due to steroids is less with short courses than with continuous treatment	√		
c. Indigestion is a common side effect from using steroid tablets	√		
d. Steroid tablets can increase your appetite.	√		
12. Inhaled Steroids (brown, red or orange)			
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.		√	

Part 4: Modified Family Support Questionnaire (MFSQ)

Code:_____
Date:_____

Instruction: This questionnaire is about your experience and feelings which occur between you and your family **over the past month**. Please select one number, 1 to 4, which best corresponds to your opinion. Please respond to each item as correct as possible and do not skip any items. If you have selected any number please circle that item. The meaning of each number is: 1 = never, 2 = sometime, 3 = most of the time, and 4 = all the time.

	Statement	Never	Sometime	Most of the time	All the time
	Emotional Support				
1.	My family encourages me when I am afraid about my long term COPD treatment regimen.	1	2	3	4
2.	My family is concerned about symptoms related that happened to me.	1	2	3	4
3.	My family encourages me to maintain religious activities (such as praying, or going to temple).	1	2	3	4
4.	My family encourages me to relax such as watching television, listening to the radio, and telling me funny stories.	1	2	3	4
5.	My family is loving and affectionate to me even though I have COPD	1	2	3	4
6.	My family asks me about my feeling since I am diagnosed as a COPD patient	1	2	3	4
7.	My family is very concern about my emotions change.	1	2	3	4
8.	My family listens to me when I want to talk about anything.	1	2	3	4
	Instrumental/Tangible Support				
9.	My family helps me pay for my medication, treatment, and transportation.	1	2	3	4

	Statement	Never	Sometime	Most of the time	All the time
10.	My family accompanies me when I go to see the doctor.	1	2	3	4
11.	My family helps me perform in my daily activities such as clean room, and wash cloths.	1	2	3	4
12.	My family helps me open the window to maintain good ventilation in my room.	1	2	3	4
13.	My family provides me with well-balanced food and adequate nutrition (such as rice, meat, egg, fish, fruits and vegetables).	1	2	3	4
	Informational Support				
14.	My family helps me ask information from doctor and understands information regarding disease and treatment.	1	2	3	4
15.	My family provides information to me about the way to control dyspnea.	1	2	3	4
16.	My family collects information from health care professionals when I need it	1	2	3	4
17.	My family tells me about the importance of follow-up visits at the hospital for getting further information.	1	2	3	4
	Appraisal Support				
18.	My family ensures that I have the ability to deal with my health related problems.	1	2	3	4
19.	My family is very open in discussing things with me.	1	2	3	4
20.	My family allows me to make decisions about my treatment.	1	2	3	4
21.	My family assures me that I am still important to them	1	2	3	4
	Positive Social Interaction				
22.	My family allows me to participate in social activities	1	2	3	4

Part 5: Accessibility to Health Care Resources Questionnaire (AHCRQ)

Code:_____
Date:_____

Instruction: This questionnaire is aimed to **how convenience you are able to access** to the health care services **over the past month.** There is no right or wrong answer. Please answer truly to each statement to indicate your actual utilization of health care resources by making "√" in the column that applies to you using the following four options:

1 = Not at all (I have at all not utilized the health care resources)

2 = Some of the time (I have some of the time utilized the health care resources)

3 = Most of the time (I have most of the time utilized the health care resources)

4 = All the time (I have all of times utilized the health care resources)

No	Statement	Not at all	Some of the time	Most of the time	All the time
1.	I have visited the physicians at the hospital when I get worse	1	2	3	4
2.	I have received COPD medications and/or nebulization from the hospital	1	2	3	4
3.	I have used transportation (ambulance) from the hospital when I came to visit physicians	1	2	3	4

THANK YOU FOR YOUR KIND CO-OPERATION

APPENDIX D

Additional Analysis

Table 10

Distribution of Frequency and Percentage of Each Item of Self-management Behaviors (N = 130)

S/N	Items	Never	Rarely	Sometimes	All the time
	Self-monitoring				
1	I have concerns about my difficulty in breathing	07 (5.45%)	19 (14.6%)	52 (40.0%)	52 (40.0%)
2	I have monitored about the duration of difficulty in breathing	46 (35.4%)	27 (20.8%)	47 (36.2%)	10 (7.7%)
3	I have counted my breathing rate when I have difficulty in breathing	55 (42.3%)	37 (28.5%)	30 (23.1%)	08 (6.2%)
4	I have observed my breathing sound	47 (36.2%)	32 (24.6%)	40 (30.8%)	11 (8.8%)
5	I have concerned about my cough whether my cough is worsening	15 (11.5%)	30 (23.1%)	53 (40.8%)	32 (24.6%)
6	I have observed about how long/how many days of my cough	52 (40.0%)	18 (13.8%)	33 (25.4%)	27 (20.8%)
7	I have concerned whether I feel tired or fatigue	10 (7.7%)	30 (23.1%)	43 (33.1%)	47 (36.2%)
8	I have pay special attention about my COPD medications	08 (6.2%)	27 (20.8%)	50 (38.5%)	45 (34.6%)
9	I have observed the side effects of medication (such as muscle cramps, palpitation, headache, skin rash, and sleep problem)	39 (30.0%)	20 (15.4%)	52 (40.0%)	19 (14.6%)

Table 10 (continued)

S/N	Items	Never	Rarely	Sometimes	All the time
	Self-evaluation				
10	I have recognized how my current difficulty in breathing symptoms developed	42 (32.3%)	30 (23.1%)	47 (36.2%)	11 (8.5%)
11	I have evaluated that my difficulty in breathing unusual different than before	36 (27.7%)	33 (25.4%)	54 (41.5%)	07 (5.4%)
12	I have taken rest to reduce my difficulty in breathing	05 (3.8%)	19 (14.6%)	45 (34.6%)	61 (46.9%)
13	I have performed breathing exercise to reduce my difficulty in breathing	61 (46.9%)	38 (29.2%)	13 (10.0%)	18 (13.8%)
14	I have evaluate my current wheezing sound with the previous wheezing sound	33 (25.4%)	57 (43.8%)	30 (23.1%)	10 (7.7%)
15	I have recognized whether I felt tired or fatigue	35 (26.9%)	22 (16.9%)	26 (20.0%)	47 (36.2%)
16	I have understood that my COPD symptom is getting better when I use of inhaler medication.	05 (3.8%)	20 (15.4%)	53 (40.8%)	52 (40.0%)
	Self-reinforcement				
17	I continue propping up positioning that helps to reduce my difficulty in breathing	01 (0.8%)	21 (16.2%)	50 (38.5%)	58 (44.6%)
18	I remain open the window to reduce my difficulty in breathing	16 (12.3%)	37 (28.5%)	56 (43.1%)	21 (16.2%)
19	I keep on breathing exercise to reduce my difficulty in breathing	41 (31.5%)	39 (30.0%)	37 (28.5%)	13 (10.0%)
20	I maintain using an inhaler to control my difficulty in breathing	02 (1.5%)	19 (14.6%)	60 (46.2%)	49 (37.7%)
21	I go on seeking medical care while wheezing worsen	03 (2.3%)	24 (18.5%)	46 (35.4%)	57 (43.8%)

Table 10 (continued)

S/N	Items	Never	Rarely	Sometimes	All the time
22	I sustain using a face mask to protect from allergy	25 (19.2%)	36 (27.7%)	51 (39.2%)	18 (13.8%)
23	I have performed effective coughing exercise and spell out cough to keep clear my airway passes	27 (20.8%)	29 (22.3%)	67 (51.5%)	07 (5.4%)
24	I remain an avoiding cold to reduce my cough	11 (8.5%)	37 (28.5%)	47 (36.2%)	35 (26.9%)
25	I keep on taking rest to reduce my tiredness or fatigue	-	24 (18.5%)	50 (38.5%)	56 (43.1%)
26	I remain on taking COPD medication timely	01 (0.8%)	24 (18.5%)	58 (44.6%)	47 (36.2%)
27	I continue taking medication regularly as prescribed	01 (0.8%)	24 (18.5%)	68 (52.3%)	37 (28.5%)

Table 11

Mean, Standard Deviation, and Levels of Self-management Behaviors of Each Item (N = 130)

S/N	Items	*M*	*SD*	Level
	Self-monitoring			
1	I have concerns about my difficulty in breathing	3.15	0.86	High
2	I have monitored about the duration of difficulty in breathing	2.16	1.00	Moderate
3	I have counted my breathing rate when I have difficulty in breathing	1.93	0.95	Low
4	I have observed my breathing sound	2.12	1.00	Moderate
5	I have concerned about my cough whether my cough is worsening	2.78	0.98	Moderate
6	I have observed about how long/how many days of my cough	2.27	1.19	Moderate
7	I have concerned whether I feel tired or fatigue	2.98	0.95	Moderate
8	I have pay special attention about my COPD medications	3.02	0.89	High

Table 11 (continued)

S/N	Items	*M*	*SD*	Level
9	I have observed the side effects of medication (such as muscle cramps, palpitation, headache, skin rash, and sleep problem)	2.39	1.06	Moderate
	Self-evaluation			
10	I have recognized how my current difficulty in breathing symptoms developed	2.21	0.99	Moderate
11	I have evaluated that my difficulty in breathing unusual different than before	3.39	0.67	High
12	I have taken rest to reduce my difficulty in breathing	3.25	0.84	High
13	I have performed breathing exercise to reduce my difficulty in breathing	1.91	1.06	Low
14	I have evaluate my current wheezing sound with the previous wheezing sound	2.44	0.83	Moderate
15	I have recognized whether I felt tired or fatigue	2.65	1.22	Moderate
16	I have understood that my COPD symptom is getting better when I use of inhaler medication.	3.17	0.82	High
	Self-reinforcement			
17	I continue propping up positioning that helps to reduce my difficulty in breathing	3.27	0.75	High
18	I remain open the window to reduce my difficulty in breathing	2.63	0.89	Moderate
19	I keep on breathing exercise to reduce my difficulty in breathing	2.17	0.98	Moderate
20	I maintain using an inhaler to control my difficulty in breathing	3.20	0.74	High
21	I go on seeking medical care while wheezing worsen	3.21	0.82	High
22	I sustain using a face mask to protect from allergy	2.48	0.95	Moderate
23	I have performed effective coughing exercise and spell out cough to keep clear my airway passes	2.42	0.87	Moderate
24	I remain an avoiding cold to reduce my cough	2.82	0.93	Moderate
25	I keep on taking rest to reduce my tiredness or fatigue	3.25	0.74	High
26	I remain on taking COPD medication timely	3.16	0.74	High
27	I continue taking medication regularly as prescribed	3.08	0.70	High

Table 12

Freequency and Percentage of Correct Responses of Each Item of MBCKQ (N = 130)

No	Items	*n*	*%*
1. In COPD (epidemiology)			
a.	COPD can only be confirmed by breathing tests	119	91.5
b.	In COPD there is usually gradual worsening over time	130	100
c.	COPD is unusual in people less than 40 years old	130	100
2. COPD (etiology)			
a.	More than 80% of COPD cases are caused by cigarette smoking	129	99.2
b.	COPD can be caused by occupational dust exposure	129	99.2
c.	Longstanding asthma can develop into COPD	129	99.2
d.	COPD is commonly an inherited disease	129	99.2
e.	Women are less vulnerable to the effects of cigarette smoking than men	108	83.1
3. Common Symptoms			
a.	Fatigue or tiredness	130	100
b.	Wheezing	129	99.2
c.	Crushing chest pain	117	90.0
d.	Rapid weight loss	118	90.8
4. Breathlessness			
a.	Breathlessness can be worsened by eating large meals	130	100
b.	Breathlessness is a normal response to exercise	130	100
c.	Breathlessness is primarily caused by a narrowing of the bronchial tubes	130	100
5. Sputum			
a.	Coughing sputum is a common symptom in COPD	130	100
b.	Clearing sputum is more difficult if you get dehydrated	130	100
c.	Bronchodilator inhalers can help clear sputum	103	79.2
d.	Clearing sputum can be assisted by breathing exercise	86	66.2
6. Infections			
a.	Chest infections often cause coughing of blood	119	91.5
b.	With chest infections sputum usually becomes colored (yellow or green)	125	96.2
c.	Exacerbations can occur in the absence of a chest infection	126	96.9
d.	Chest infections are always associated with a high temperature	91	70.0
e.	Steroid tablets should be taken whenever there is an exacerbation	46	35.4
7. Exercise			
a.	Exercise should be avoided as it strains the lungs	115	88.5
b.	Exercisecan help maintain your bone density	124	95.4
c.	Exercise should be stopped if it makes you breathless	02	1.5

Table 12 (continued)

No	Items	*n*	*%*
8. Smoking			
a.	Stopping smoking will reduce the risk of heart disease.	126	96.9
b.	Stopping smoking is slow down further lung damage	123	94.6
c.	Stopping smoking usually results in improved lung function	76	58.5
9. Inhaled Bronchodilators			
a.	To be effective, the course should last at least 10 days	119	91.5
b.	Antibiotics will clear all chest infections	43	33.1
c.	Antibiotic treatment is necessary for an exacerbation (worsening) however mild	93	71.5
d.	You should seek advice if antibiotics cause severe diarrhea	126	96.9
10. Antibiotics			
a.	To be effective, the course should last at least 10 days	52	40.0
b.	Antibiotics will clear all chest infections	83	63.8
c.	Antibiotic treatment is necessary for an exacerbation (worsening) however mild	54	41.5
d.	You should seek advice if antibiotics cause severe diarrhoea	125	96.2
11. Steroid Tablets			
a.	Steroid tablets should be avoided if there is a chest infection	94	72.3
b.	The risk of long-term side effects due to steroids is less with short courses than with continuous treatment	125	96.2
c.	Indigestion is a common side effect from using steroid tablets	128	98.5
d.	Steroid tablets can increase your appetite	129	99.2
12. Inhaled Steroids			
a.	Inhaled steroids should be stopped if you are given steroid tablets	78	60.0
b.	Steroid inhalers can be used for rapid relief of breathlessness	46	35.4
c.	Spacer devices reduce the risk of getting thrush in the mouth	122	93.8
d.	Steroid inhaler should be taken beforeyour bronchodilator	28	21.5
e.	Inhaled steroids improve lung function in COPD	65	50.0

Table 13

Mean, Standard Deviation, and Levels of Each Dimension of MBCKQ (N = 130)

S/N	Items	*M*	*SD*	Level
1	In COPD (epidemiology)	2.92	0.27	High
2	COPD (etiology)	4.60	0.63	High
3	Symptoms	3.80	0.45	High
4	Breathlessness	3.00	0.00	High
5	Sputum	3.45	0.72	High
6	Chest Infections	3.90	0.85	Moderate
7	Exercise	1.85	0.39	Moderate
8	Smoking	2.18	0.56	Moderate
9	Inhaled Bronchodilator	2.93	0.77	Moderate
10	Antibiotic	2.42	0.93	Moderate
11	Steroid Tablets	3.66	0.56	High
12	Inhaled Steroids	2.61	1.03	Low

Table 14

Distribution of Frequency and Percentage of Family Support of Each Item (N = 130)

S/N	Items	Never	Sometime	Most of the time	All the time
	Emotional Support				
1	My family encourages me when I am afraid about my long term COPD treatment regimen	01 (0.8%)	10 (7.7%)	51(39.2%)	68 (52.3%)
2	My family is concerned about symptoms related that happened to me	-	11 (8.5%)	67(51.5%)	52 (40.0%)
3	My family encourages me to maintain religious activities (such as praying, or going to temple)	-	14 (10.8%)	43 (33.1%)	73 (56.2%)
4	My family encourages me to relax such as watching television, listening to the radio, and telling me funny stories	01 (0.8%)	22 (16.9%)	46 (35.4%)	61 (46.9%)

Table 14 (continued)

S/N	Items	Never	Sometimes	Most of the time	All the time
5	My family is loving and affectionate to me even though I have COPD	-	09 (6.9%)	39 (30.0%)	82 (63.1%)
6	My family asks me about my feeling since I am diagnosed as a COPD patient	01 (0.8%)	24 (18.5%)	55 (42.3%)	50(38.5%)
7	My family is very concern about my emotional change	-	16 (12.3%)	56 (43.1%)	58 (44.6%)
8	My family listens to me when I want to talk about anything	-	03 (2.3%)	30 (23.1%)	97 (74.6%)
	Instrumental/Tangible Support				
9	My family helps me pay for my medication, treatment, and transportation	-	02 (1.5%)	36 (27.7%)	92 (70.8%)
10	My family accompanies me when I go to see the doctor	-	03 (2.3%)	20 (15.4%)	107(82.3%)
11	My family helps me perform in my daily activities such as clean room, and wash cloths	-	14 (10.8%)	51 (39.2%)	65 (50.0%)
12	My family helps me open the window to maintain good ventilation in my room	01 (0.8%)	21 (16.2%)	76 (58.5%)	32 (24.6%)
13	My family provides me with well-balanced food and adequate nutrition (such as rice, meat, egg, fish, fruits and vegetables)	01 (0.8%)	36 (27.7%)	43 (33.1%)	50 (38.5%)
	Informational Support				
14	My family helps me ask information from doctor and understands information regarding disease and treatment	9 (14.6%)	45 (34.6%)	56 (43.1%)	10 (7.7%)

Table 14 (continued)

S/N	Items	Never	Sometimes	Most of the time	All the time
15	My family provides information to me about the way to control dyspnea	72 (55.4%)	28 (21.5%)	20 (15.4%)	10 (7.7%)
16	My family collects information from health care professionals when I need it	38 (29.2%)	38 (29.2%)	43 (33.1%)	11 (8.5%)
17	My family tells me about the importance of follow-up visits at the hospital for getting further information	34 (26.2%)	32 (24.6%)	32 (24.6%)	32 (24.6%)
	Appraisal Support				
18	My family ensures that I have the ability to deal with my health related problems	-	11 (8.5%)	73 (56.2%)	46 (35.4%)
19	My family is very open in discussing things with me	-	04 (3.2%)	40 (30.8%)	86 (66.2%)
20	My family allows me to make decisions about my treatment	-	05 (3.8%)	38 (29.2%)	87 (66.9%)
21	My family assures me that I am still important to them	01 (0.8%)	08 (6.2%)	49 (37.7%)	72 (55.4%)
	Positive Social Interaction				
22	My family allows me to participate in social activities	-	05 (3.8%)	32(24.6%)	93 (71.5%)

Table 15

Mean, Standard Deviation, and Levels of Family Support of Each Item (N = 130)

No	Items	*M*	*SD*	Level
	Emotional Support			
1	My family encourages me when I am afraid about my long term COPD treatment regimen	3.43	0.67	High
2	My family is concerned about symptoms related that happened to me	3.32	0.62	High
3	My family encourages me to maintain religious activities (such as praying, or going to temple)	3.45	0.68	High
4	My family encourages me to relax such as watching television, listening to the radio, and telling me funny stories	3.28	0.77	High
5	My family is loving and affectionate to me even though I have COPD	3.56	0.62	High
6	My family asks me about my feeling since I am diagnosed as a COPD patient	3.18	0.75	High
	Instrumental/Tangible Support			
7	My family is very concern about my emotional change	3.32	0.68	High
8	My family listens to me when I want to talk about anything	3.72	0.49	High
9	My family helps me pay for my medication, treatment, and transportation	3.69	0.49	High
10	My family accompanies me when I go to see the doctor	3.80	0.45	High
11	My family helps me perform in my daily activities such as clean room, and wash cloths	3.39	0.67	High
12	My family helps me open the window to maintain good ventilation in my room	3.07	0.66	High
13	My family provides me with well-balanced food and adequate nutrition (such as rice, meat, egg, fish, fruits and vegetables)	3.09	0.83	High
	Informational Support			
14	My family helps me ask information from doctor and understands information regarding disease and treatment	2.44	0.83	Moderate
15	My family provides information to me about the way to control dyspnea	1.73	0.98	Low
16	My family collects information from health care professionals when I need it	2.21	0.96	Moderate
17	My family tells me about the importance of follow-up visits at the hospital for getting further information	2.48	1.12	Moderate

Table 15 (continued)

No	Items	*M*	*SD*	Level
	Appraisal Support			
18	My family ensures that I have the ability to deal with my health related problems	3.27	0.60	High
19	My family is very open in discussing things with me	3.63	0.54	High
20	My family allows me to make decisions about my treatment	3.63	0.55	High
21	My family assures me that I am still important to them	3.48	0.65	High
	Positive Social Interaction			
22	My family allows me to participate in social activities	3.68	0.54	High

Table 16

Distribution of Frequency and Percentage of Accessibility to Health Care Resources (N = 130)

S/N	Items	Not at all	Some of the time	Most of the time	All the time
1	I have visited the physicians at the hospital when I get worse	-	69 (53.1%)	43 (33.1%)	18 (13.8%)
2	I have received COPD medications and/or nebulization from the hospital	33 (25.4%)	44 (33.8%)	40 (30.8%)	13 (10.0%)
3	I have used transportation (ambulance) from the hospital when I came to visit physicians	42 (32.3%)	44 (33.8%)	37 (28.5%)	07 (5.4%)

Table 17

Mean, Standard Deviation, and Levels of Accessibility to Health Care Resources of Each Item (N = 130)

No	Items	*M*	*SD*	Levels
1	I have visited the physicians at the hospital when I get worse	2.61	0.72	Moderate
2	I have received COPD medications and/or nebulization from the hospital	2.25	0.95	Moderate
3	I have used transportation (ambulance) from the hospital when I came to visit physicians	2.07	0.90	Moderate

Table 18

Skewness and Kurtosis of the Study Variables

Items	Skewness/SE	Skewness Ratio	Kurtosis/SE	Kurtosis Ratio
Self-management Behaviors	.106/.212	0.5	-1.695/.422	-4.01
Self-monitoring	.193/.212	0.91	-1.581/.422	-3.74
Self-evaluation	.085/.212	4.00	-1.483/.422	-3.51
Self-reinforcement	-.072/.212	-0.33	-1.449/.422	-3.43
Age	-.087/.212	-0.41	-.647/.422	-1.53
Education	1.071/.548	1.95	-.363/.422	-0.86
Duration of Illness	1.432/.212	6.76	2.237/.422	5.30
Knowledge Regarding COPD and Its Management	-.102/.212	-0.48	-.053/.422	- 0.12
Epidemiology	-3.020/.212	-14.24	7.232/.422	17.13
Etiology	-1.519/.212	-7.16	1.998/.422	4.73
Symptoms	-2.235/.212	-10.54	4.428/.422	10.49
Breathlessness	00/.212	00	00/.422	00
Sputum	-.942/.212	-4.44	-.494/.422	-1.17
Chest Infections	-.493/.212	-2.32	.098/.422	0.23
Exercise	-2.756/.212	-13	7.386/.422	17.50
Smoking	-.504/.212	-2.37	2.518/.422	5.96
Inhaled Bronchodilators	-.277/.212	-1.30	-.428/.422	-1.01
Antibiotics	-.065/.212	-0.30	-.662/.422	-1.56
Steroid Tablets	-1.454/212	0.00	1.173/.422	2.77
Inhaled Steroids	.245/.212	1.15	-.069/.422	-0.16
Family Support	.597/.212	2.81	.129/.422	0.30
Emotional Support	-.337/.212	-1.58	-.143/.422	-0.33
Instrumental/Tangible Support	-.312/.212	-1.47	.589/.422	1.39
Informational Support	.410/.212	1.94	-1.197/.422	-2.83
Appraisal Support	-.649/.212	-3.07	.835/.422	1.97
Positive Social Interaction	-1.470/.212	-6.93	1.254/.422	2.97
Accesibility to Health Care Resources	.425/.212	2.00	-1.089/.422	2.16

APPENDIX E

List of Experts on Content Validation of the Instruments

Four experts validated the content validity of the COPDSMBQ, the MBCKQ, the MFSQ, and the AHCRQ. They were:

1. Asst. Prof. Dr. Wongchan Petpichetchian

   Department of Surgical Nursing, Faculty of Nursing, Prince of Songkla University, Hat-Yai, Thailand.

2. Dr. Charuwan Kritpracha

   Nursing Lecturer, Faculty of Nursing, Prince of Songkla University, Hat-Yai, Thailand.

3. Asst. Prof. Dr. Ploenpit Thaniwattananon

   Nursing Lecturer, Faculty of Nursing, Prince of Songkla University, Hat-Yai, Thailand.

4. Dr. Mohammad Nurul Anowar

   Instructor, Dhaka Nursing College, Dhaka, Bangladesh

APPENDIX F

List of Back Translators of the Instruments

Three persons worked on the translation of the instruments. They were:

1. Dr. Md. Shamsuzzoha, MBBS, FCPS (USA), DTCD, (Dhaka), Diploma in Asthma (England), CCD, (Diabetology), Senior Consultant, Chest Diseases Hospital, Khulna, Bangladesh.

   He was translated the questionnaire original English to Bengali version
2. Dr. MD Nasir Uddin, MBBS, BCS (Health), T.H.A Sharsha Upazilla Health Complex, Jessore, Bangladesh.

   He was translated the questionnaire from Bengali to English version
3. Dr. Faruk Ahmed, MBBS, BCS (Health),

   Emergency Medical Officer, National Institute of Kidney Diseases and Urology, Shere-Bangla Nagar, Dhaka.

   He checked the linguistic discrepancies both the original English version questionnaire and the back translated English version questionnaire.

APPENDIX G

Permission Letter for Using and Modify the BCKQ

RE: Request for asking permission for use and modify the Bristol COPD Knowledge Questionnaire (BCKQ)

Show Details

From: Roger White <roger.white4@virgin.net>
To: 'Sormin Sultana' <sorminsultana@ymail.com>
Sent: Thursday, December 27, 2012 4:29 PM
Subject: RE: Asking permission for use and modify the Bristol COPD Knowledge Questionnaire (BCKQ)

Thank you, Sormin,

As long as you are just making alterations to fit in with your culture, I am happy for you to use the questionnaire. I attach a copy.

Regards
Roger White

From: Sormin Sultana [mailto:sorminsultana@ymail.com]
Sent: 27 December 2012 12:38
To: Roger White
Subject: Re: Asking permission for use and modify the Bristol COPD Knowledge Questionnaire (BCKQ)
Dear sir,

Good evening. I am Sormin Sultana Parvin from Bangladesh, studying Master of Nursing Science (International Program), Prince of Songkla University, Hat-Yai, Thailand. My major is Adult Nursing and my Thesis Title is "Factors Relating to Self-management Behaviours of Patients With Chronic Obstructive Pulmonary Diseases in Bangladesh". I would like to use and modify your BCKQ for my study in Bangladeshi cultural context. Could you please give me permission to use and modify it for my study? It will be more effective and helpful for completion of my study.

Best Regards,

Sormin Sultana Parvin, Master Student (International Program)
Prince of Songkla University,
Hat-Yai, Thailand.

APPENDIX H

Permission Letter for Using and Modify the FSQ

Re: Request for asking permission for use and modify the Family Support Questionnaire(FSQ)

Hide Details
From Bethikabevu Chanda
To
Sormin Sultana
Dear Sormin Sultana
Thanks to you for asking permission to me to use my research instrument (Family Support Questionnaire). You can use this instrument in order to meet your study purpose.
Thanks to you
Bethika Rani Biswas
19.02.2013
--- On **Sat, 2/16/13, Sormin Sultana <*sorminsultana@ymail.com*>** wrote:
From: Sormin Sultana <sorminsultana@ymail.com>
Subject: Request for asking permission for use and modify the Family Support Questionnaire (FSQ)
To: "bethikabevu@ymail.com" <bethikabevu@ymail.com>
Date: Saturday, February 16, 2013, 3:02 AM

Dear Madam,

Assalamualicum. I am Sormin Sultana Parvin, studying Master of Nursing Science (International Program), Prince of Songkla University, Hat-Yai, Thailand. My major is Adult Nursing. My Thesis Title is "Factors Relating to Self-management Behaviors of Patients With Chronic Obstructive Pulmonary Diseases in Bangladesh". I would like to use and modify your FSQ for my study purpose. Could you please give me permission to use and modify your FSQ for my study? It will be more effective and helpful for completion of my study. Thanks.

Best Regards,

Sormin Sultana Parvin. Master Student (International Program)

Prince of Songkla University.

Hat-Yai, Thailand.

VITAE

Name Mrs. Sormin Sultana Parvin

Student ID 5410420054

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing Science	College of Nursing, Mohakhali, Dhaka, Bangladesh	2007

Scholarship Awards During Enrollment:

Project	Granting Agency	Year
Scholarship by the Ministry of Health & Family Welfare Government of the People's Republic of Bangladesh	Director of Nursing Services, Bangladesh	2011-2013
Research Grant	Graduate School, PSU, Thailand	2012- 2013

Work-Position and Address:

Work Position Senior Staff Nurse (RN) at Upazilla Health Complex, Jhikorgacha, Jessore, Bangladesh

Address: Shankarpur, Jessore, Bangladesh

Email Address: sorminsultana@ymail.com

Mobile Number: +8801712708718