

**FACTORS INFLUENCING COMPLIANCE OF PATIENTS WITH
CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

The seal of Mahidol University is a circular emblem. It features a central blue circle containing a golden chedi (a traditional Thai Buddhist stupa). The chedi is intricately detailed with multiple tiers and a pointed spire. Surrounding the central blue circle is a wider yellow ring. Within this ring, the Thai text "จุฬาลงกรณ์มหาวิทยาลัย" (Mahidol University) is written in a circular path. There are also four small golden floral motifs positioned at the top, bottom, left, and right of the central blue circle, within the yellow ring.

WANIDA TANCHAROENRAT

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Thesis
Entitled

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CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

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FACTORS INFLUENCING COMPLIANCE OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

This study was descriptive research, aiming to examine compliance level in Chronic Obstructive Pulmonary Disease (COPD) patients, relationships and predictive power of several factors, namely perceived barriers, perceived self-efficacy, social support, and disease severity on compliance in COPD patients. This study employed Pender's Health Promotion Conceptual Framework (Pender, 2002). The samples in this study were 100 COPD patients, with no complications such as tuberculosis or heart diseases, who were attending the outpatient department at the Chest Disease Institute, Nonthaburi Province. The data was collected through interview using an instrument comprised of 6 sections: general characteristics of the samples, levels of disease severity, perceived barriers, perceived self-efficacy, social support, and compliance in COPD patient measurements. The data were analyzed using percentage, means, standard deviations, Pearson's product moment correlation coefficients, and stepwise multiple regression technique.

The results revealed that compliance of the samples were at a good level (mean = 2.08, S.D.= .36). Perceived barriers had a significant negative relationship with compliance in COPD patients ($r = -.624, p < .01$). Perceived self-efficacy and social support had significant positive relationships with compliance ($r = .621, p < .01$; $r = .407, p < .01$, respectively). However, disease severity had a non-significant negative relationship with compliance ($r = -.108, p > .05$). Through stepwise multiple regression analysis, it was found that perceived barriers and perceived self-efficacy could be used to predict compliance in COPD patients for about 43.1 percent at $p = .01$.

Recommendations from this study include that nurses need to assess patients' information, especially factors influencing compliance such as perceived barriers, perceived self-efficacy, and social supports. Nursing care activities should also improve knowledge and skills necessary for physical and lung rehabilitations both at the hospital and at home. Further research should be conducted to gain a better understanding in this area.

KEY WORDS: COMPLIANCE / PERCEIVED BARRIERS / PERCEIVED
SELF-EFFICACY / SOCIAL SUPPORT / DISEASE SEVERITY

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ปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง
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บทคัดย่อ

การศึกษานี้เป็นการวิจัยเชิงบรรยาย มีวัตถุประสงค์เพื่อศึกษาระดับความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ความสัมพันธ์และอำนาจการทำนายของปัจจัยต่างๆ ได้แก่การรับรู้อุปสรรคต่อการรักษาพยาบาล การรับรู้ความสามารถของตนเอง การสนับสนุนทางสังคม และระดับความรุนแรงของโรคต่อความร่วมมือในการรักษาพยาบาล ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง โดยใช้แนวคิดพฤติกรรมส่งเสริมสุขภาพของเพนเดอร์ (Pender, 2002) เป็นกรอบแนวคิดในการศึกษา กลุ่มตัวอย่างเป็นผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ซึ่งไม่มีโรคอื่น โรคปอดหรือโรคหัวใจร่วมด้วย ที่มารับการรักษาที่แผนกผู้ป่วยนอก สถาบันโรคทรวงอก จังหวัดนนทบุรี จำนวน 100 ราย เก็บรวบรวมข้อมูลโดยการสัมภาษณ์ตามแบบสัมภาษณ์ข้อมูลส่วนบุคคล แบบประเมินระดับความรุนแรงของโรค แบบวัดอุปสรรคต่อการรักษาพยาบาล แบบวัดการรับรู้ความสามารถของตนเอง แบบวัดการสนับสนุนทางสังคม และแบบวัดความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง วิเคราะห์ข้อมูลโดยการหา ร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน สัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน และการวิเคราะห์ถดถอยพหุคูณแบบขั้นตอน

ผลการวิจัยพบว่าความร่วมมือในการรักษาพยาบาลโดยรวมอยู่ในระดับดี (mean = 2.08, S.D.= .36) การรับรู้อุปสรรคต่อการรักษาพยาบาลมีความสัมพันธ์ทางลบกับความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง อย่างมีนัยสำคัญทางสถิติ ($r = -.624, p < .01$), การรับรู้ความสามารถของตนเองและการสนับสนุนทางสังคมมีความสัมพันธ์ทางบวกกับความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรังอย่างมีนัยสำคัญทางสถิติ ($r = .621, P < .01$ และ $r = .407, p < .01$ ตามลำดับ) ส่วนความรุนแรงของโรคมีความสัมพันธ์ทางลบกับความร่วมมือในการรักษาพยาบาลอย่างไม่มีนัยสำคัญทางสถิติ ($r = -.108, p > .05$) เมื่อวิเคราะห์ถดถอยพหุคูณแบบขั้นตอน พบว่าการรับรู้อุปสรรคต่อการรักษาพยาบาล และการรับรู้ความสามารถของตนเองสามารถร่วมทำนายความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ได้ร้อยละ 43.1 ที่ระดับความมีนัยสำคัญทางสถิติ .01

จากการวิจัยมีข้อเสนอแนะ คือ พยาบาลควรประเมินข้อมูลต่างๆ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรังเกี่ยวกับปัจจัยต่างๆที่มีผลต่อความร่วมมือในการรักษาพยาบาลได้แก่การรับรู้อุปสรรคต่อการรักษาพยาบาล การรับรู้ความสามารถของตนเอง และการสนับสนุนทางสังคมและจัดรูปแบบการพยาบาลที่เน้นให้ผู้ป่วยมีความรู้และทักษะในการปฏิบัติตนเพื่อฟื้นฟูสภาพปอดและร่างกายทั้งในโรงพยาบาลและที่บ้านอย่างต่อเนื่อง และทำวิจัยในรูปแบบต่างๆ ในประเด็นอื่นๆ ต่อไป

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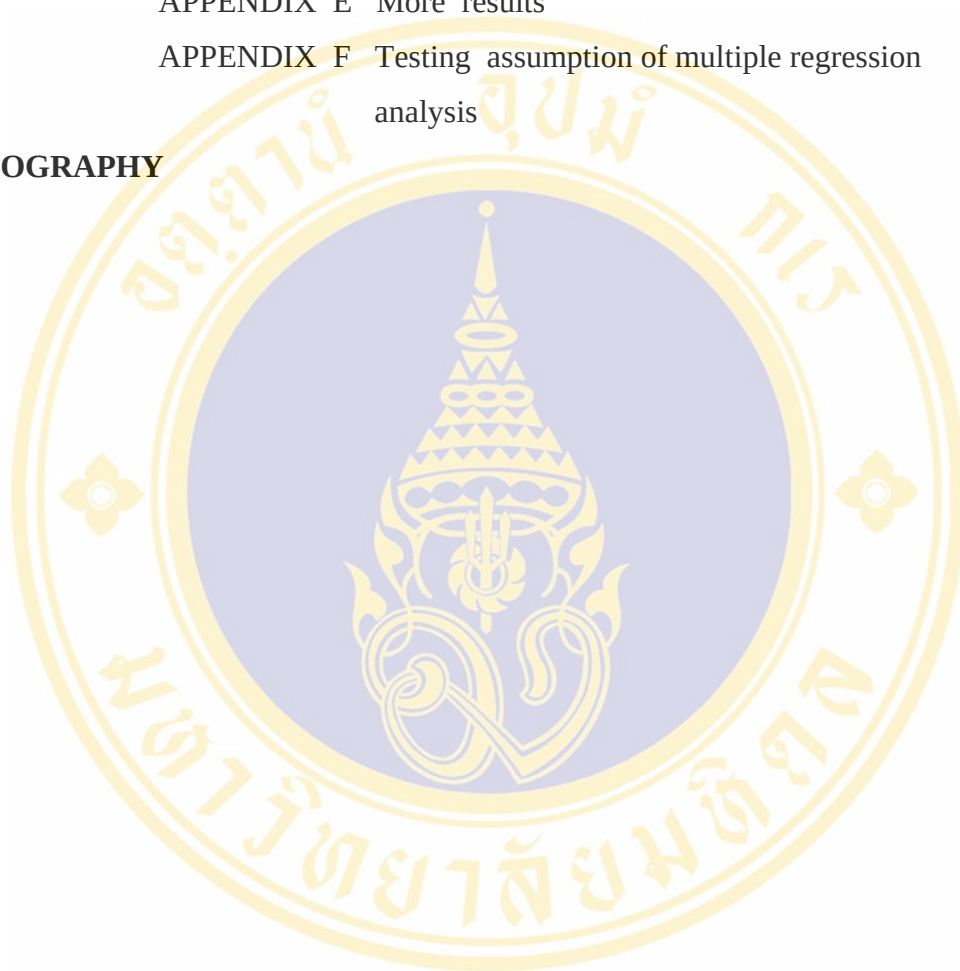
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CHAPTER I

INTRODUCTION

Background and Significance of the Problem

Chronic Obstructive Pulmonary Disease (COPD) is characterized by limited airflow to lungs due to pathology in the airways, parenchyma, and pulmonary vasculature. It might take up to 20 to 30 years for symptoms to occur, so patients with COPD usually have COPD symptoms around ages of 50-60 years old. When the symptoms are evident, the damage of alveoli is permanent and lung compliance is usually lost. With airflow limitation, carbondioxide (CO₂) is collected in the lungs causing dyspnea and tissue hypoxia. When dyspnea and tissue hypoxia occure, damages of lungs is usually incurable and irreversible (Wongtim, & Nuchprayoon, 1999).

In Thailand, COPD is the most prevalent lower respiratory tract disease. It is the third most prevalent chronic disease following heart diseases and diabetes (Ministry of Public Health, 2000). It is expected that in 2010, there will be 7,035.3 COPD cases per 100,000 population in Thailand (Chupraphawan, 2000). According to medical statistics from the Chest Disease Institute between 2001 and 2003 (Chest Disease Institute, 2003) there is an increased in numbers of new and old COPD cases who are seeking for treatment in outpatient department. The statistics showed 4,387, 5,155, and 5,582 old cases in 2001, 2002, and 2003, respectively. There is increased from 2001 to 2003 as well; being 923, 1,375, and 1,255 new cases respectively. There were 780 cases admitted to the hospital in 2003; a 41.8% increase from 2001 (550 cases). In 2003, 1,662 cases came to an emergency room with dyspnea; averaging 139 cases each month. Patients and families had to spend money and time related to treatments and had to lose their incomes due to sick leaves. COPD has also become the nation's financial burdens. It was estimated that a patient who visited at outpatient department had to pay 140 Baht per week, while patients who admitted to hospitals had to pay 1,270 Baht in average each day. In the big picture, Thailand had to spend virtually billions of Baht annually to take care of persons with COPD (Wathisatokit,

1992). One of the reasons the numbers of COPD patients, both in and outpatients, continue to increase, is due to patients' noncompliance to medical regimens. Sangthong's study of the elderlies with COPD (1997) revealed that 63.3% of them did not take medications as prescribed; 35.2% missed doctor's appointments; 83.3% did not perform breathing exercises correctly; 54.9% did not exercise; and 77.5% still lived in the environments with irritants to respiratory system. It was also found that about 25.5% did not protect themselves or avoid irritants that aggravate the symptoms at all. These behaviors made elderlies more susceptible to respiratory diseases and aggravated symptoms of the disease; forcing them to visit hospitals more frequently. According to Unsamatham, et al. (2001), 32% of asthma patients who did not receive treatments continuously and stopped taking medications when symptoms disappeared experienced asthmatic attacks more than 12 times per year. It can be stated that COPD patients who do not comply with treatment plan and do not have appropriate preventive behaviors will be unable to control the symptoms of the disease and will have poor prognosis.

Previous studies have shown several factors associated with noncompliance among COPD patients. They are unpleasant experiences due to a long term medication causing patients to stop treatment without consulting physicians; lacking of knowledge about the disease; severity of the disease; lacking of confidence about the treatment (Murphy, 2001); memory deficit (Conn et al., 1994), lacking of social supports (Morisky et al., 1990, Tolijamo & Hentinen, 2001) and low education (Knygas & Lahdenpera, 1999). Moreover, it was also found that severity of the disease, which directly affects patients' ability to function, is also associated with compliance (Kyngas, 1999). If nurses are knowledgeable about factors influencing compliance in COPD patients, nursing care plan will be more appropriate in promoting patients' compliance to treatment which, in the long run, improve health and quality of life among patients.

Compliance is a set of behaviors or actions one agreed to practice according to treatment plans (Dracup & Melies, 1982). To comply successfully, patients' health behavior must be adjusted congruence with physicians' and nurses' treatments and advices. These health promoting behaviors help controlling symptoms of the disease at an acceptable stage. According to Pender (1987, 2002), health promoting behaviors

are defined as activities an individual continually performs until they became a part of their life. Persons, both healthy or under chronic stage, have to have health promoting behaviors to maintain their good health. Lannon (1997) placed activities that control disease severity in the set of behaviors that promote health. Pender's health promoting behavior concepts were used to understand compliance among epilepsy and chronic patients to control disease severity.

Although COPD is an incurable disease, patients' health promoting behaviors, in other words compliance to treatments and nursing care, will certainly delay aggravations of lung functions and help controlling the disease. Such behaviors include taking medications correctly and regularly, having good eating behaviors, having breathing exercises, participating in physical activities, resting, and so on (Theeranut, 1999; Wirat, 2001).

In conclusion, compliance among COPD patients is, in fact, health promoting behaviors is a vital factor that affects patients' health. Additionally, Pender (1996, 2002) stated that person's continuous health promoting behaviors are influenced by their behavior-specific cognitions and affects specific to compliance, namely perceived benefits of action, perceived barriers to action, perceived self-efficacy, perceived outcomes related to own evaluation and other influences. These factors are used essentially to motivate people to practice health promoting behaviors frequently. Previous studies found that perceived barriers are negatively associated with health promoting behaviors in patients with chronic lung diseases (Chanchanakit, 1998), hypertension patients (Thongpila, 1999), and Glaucoma patients (Pattaramongkolrit, 1999). Perceived self-efficacy had a positive association on self-care behaviors among patients with COPD (Pitchayamongkol, 2002), hypertension (Onchim, 2002), chronic renal failure (Chibsamanboon, 2000) and tuberculosis (Wongsonton, 2000). Additionally, social support also positively impacted self-care behaviors in COPD patients (Xiaolian, et al., 2002) and patients who lost their limbs (Wichitwathee, 1991). Individual characteristics were also associated with compliance such as education in patients with hypertension (Kyngass & Labdenpera, 1999) and disease severity in adolescent patients with asthma (Kyngas 1999).

Until now, there are a few studies focusing on compliance in COPD patients. Sangthong (1997) conducted a quantitative and qualitative study looking at selected

factors associated with 75 COPD patients' compliance after being discharged from the hospital and found that self care, discharge plan, health needs, and social supports all positively associated with compliance. It was also found that there was a significant negative relationship between health beliefs, namely perceived barriers, and compliance. However, perceived susceptibility and perceived severity were not statistically significant with compliance. This study focused on COPD patients, ages 60 years and above who were discharged from the hospitals. It did not include patients of all ages. Conducting a study in this aspect but including all age groups will certainly benefit health care providers to promote compliance, providing benefits to health among COPD patients.

From the significance of the problem stated above, it is important to examine factors influencing compliance in COPD patients based on Pender's health promotion conceptual model. The factors include 1) perceived barriers, 2) perceived self-efficacy, 3) social supports, and 4) disease severity. Findings from this study will be benefit to provide a nursing care plan which most appropriate to COPD patients and treatments will be more effective in controlling disease symptoms. Relapse and aggravation of the disease symptoms can also be controlled. Patients will be re-admitted at a lower rate. Finally, COPD patients will have higher quality of life and quality of nursing care will be more evident.

Research Questions

1. What is the level of compliance in COPD patients?
2. Which factors have relationship with compliance in COPD patients?
3. Which factors can predict compliance in COPD patients?

Research Objectives

1. To study compliance level in COPD patients.
2. To study relationships between perceived barriers, perceived self-efficacy, social supports, and disease severity with compliance in COPD patients.
3. To study predictive power of perceived barriers, perceived self-efficacy, social supports, and disease severity on compliance in COPD patients.

Hypotheses

1. Perceived barriers are negatively correlated with compliance in COPD patients.
2. Perceived self-efficacy is positively correlated with compliance in COPD patients.
3. Social supports are positively correlated with compliance in COPD patients.
4. Disease severity is negatively correlated with compliance in COPD patients.
5. Perceived barriers, perceived self-efficacy, social supports, and disease severity can predict compliance in COPD patients.

Conceptual Framework

To understand compliance in COPD patients, Pender's Health Promotion Model (Pender, 2002) was used as conceptual model. Health promoting behaviors are defined as activities individuals regularly perform that must become an integral part of an individual's life style in order to maintain or to improve health (Pender, 1987; 2002). Compliance is behaviors that COPD patients conform to medical or health advice and treatment plan (Heynes, 1979). Behaviors such as taking medications, eating nutritious food, physical exercise, breathing exercise, effective cough, resting, follow ups, and avoiding irritants in order to maximize their dyspnea control and relieving the severity of the disease. In this context, the patients have to live with their chronic disease. Compliance is essential to control and relieve dyspnea which enhance well being. Successful compliance requires the individual to develop behaviors which support it. In that sense, compliance can be seen as a health promoting behavior (Lannon, 1997).

COPD, as a chronic and incurable disease, affects patients in physical, psychological, and socioeconomic aspects. Ability to adjust to the disease depends on compliance behaviors. Pender's Health Promotion Model provides a framework that can be used to identify factors which interfere with the patient's ability to practice compliance and develop a treatment plan. Several factors influence ability to continually perform these behaviors: perceived barriers, perceived self-efficacy, and social supports. These factors are important motivators for COPD patients to become aware and change for better behaviors (Pender, 1996, 2002).

Perceived barriers act as impediments to recommended behaviors. When patients perceived that recommended activities, such as eating nutritious foods, taking

medications, exercising, breathing exercising, coming to check ups and so forth, are unpleasant, difficult, expensive, time-consuming, or inconvenience, they are most likely to avoid performing these advised behaviors. With a number of barriers and without readiness, those recommended behaviors will not happen causing noncompliance. Pasunant (1986) studied noncompliance in ischemic heart disease patients while Kruawanichkit (1988) worked on patients with heart failure. Both studies found that patients with high perceived barriers complied less with treatment plans.

Perceived self-efficacy is defined as the conviction that one can successfully execute the behavior required to produce the outcomes. Several studies have shown a positive relationship between persons with high perceived self-efficacy and health promoting behaviors (Chanchanakit, 1998; Kurat, 1996; Panyathong, 2001) and self-care behaviors (Charoenwongwiwat, 1995; Homnarn, 1996).

Similar to perceived self-efficacy, social supports, especially from family, friends and health care providers, is another factor that encourages health promoting behaviors among patients. Specifically with COPD patients who usually have limitations performing certain recommended behaviors, supports from families or friends are important. Patients with higher level of social supports complied with treatment plans and self care better than those with fewer social supports (Sangthong, 1997; Wichitwathee, 1991; Xiaolian, et al., 2002; Yainontad, 1999).

Additionally, perceived disease severity, which is a biological factor, also affects compliance. When the disease is severe, persons are unable to perform daily activities, causing low compliance. In Chaithiamwong's study (1992), it was found that when COPD symptoms are more severe, patients were less likely to perform self-care activities. Kyngas (1999) also found a negative association between disease severity and compliance in patients with asthma.

In conclusion, severity of the disease, perceived barriers, perceived self-efficacy, and social supports are factors that play a key role with compliance in COPD patients. This conceptual framework is presented in figure 1.

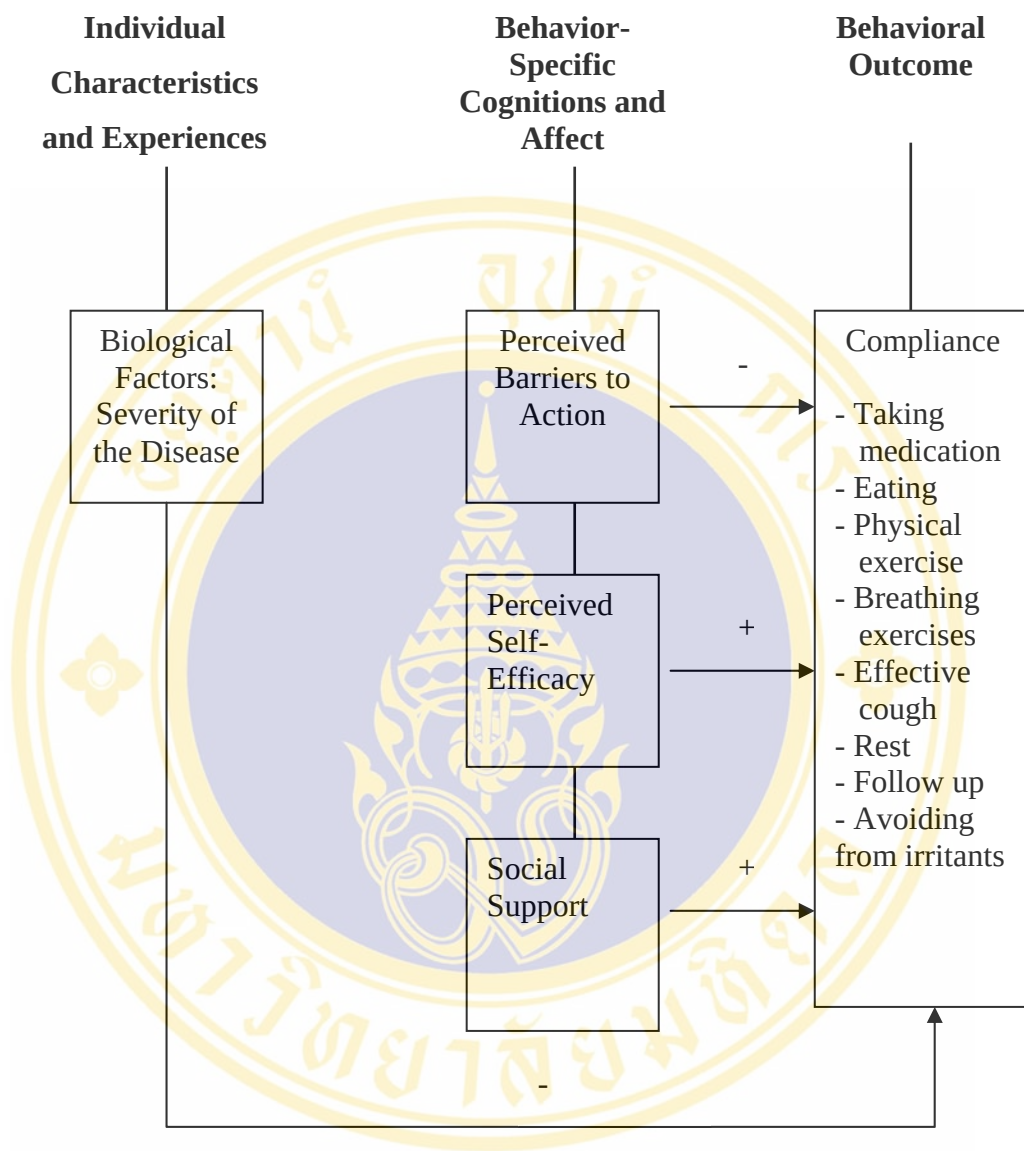


Figure 1 Conceptual Framework

Scope of the study

This study aimed to examine the factors affecting compliance in COPD patients. The factors include perceived barriers, perceived self-efficacy, social supports, and severity of disease. The study is conducted in an outpatient department, at Chest Disease Institute, Nonthaburi Province since November 2004 to January 2005

Definitions of Terms

Compliance is set of behaviors COPD patients regularly perform according to treatment plan to decrease disease severity and to promoting behavior. The behaviors include taking medications, getting appropriate nutrients, physical activities, breathing exercises, practice effective cough, rest, follow-up, and avoiding from irritants that aggravate the symptoms. Compliance is measured by an instrument adapted from Compliance Measurement developed by Sangthong (1997) and Poonpanchai (1997).

Perceived Barriers are negative aspects that would impede COPD patients from undertaking recommended behaviors. The recommended behaviors include taking medications, getting essential nutrients, physical activities, breathing exercises, practice effective cough, rest, follow-up, and avoiding from irritants that aggravate the symptoms. Perceived barriers are measured by Perceived Barriers Measurement adapted from Health Belief Measurement originally developed by Sangthong (1997).

Perceived Self-Efficacy is the personal confidence that one can perform behaviors according to treatment plans and advises. These behaviors include taking medications, getting essential nutrients, physical activities, breathing exercises, practice effective cough, rest, follow-up, and avoiding from irritants that would aggravate the symptoms. It is measured by Perceived Self-Efficacy Measurement adapted from Self-Performance Measurement developed by Onchim (2002).

Social Support are the supports of COPD patients which received from family members. Supports can be in terms of financial support, disease control, maintaining regular follow-ups, mental supports, and empathy. Such supports help patients to

comply with treatment plans and are measured by Social Support Measurement by Sangthong (1997).

Severity of the Disease are measured by Pulmonary Function Test (PFT) to indicate the abilities how COPD patients can perform daily activities and levels of wheezy symptoms. They are classified according to American Thoracic Society (2005) in 5 levels:

Level 1 – Risk: No limitation; able to perform daily activities like normal; the forced expiratory volume at one second (FEV_1) > 80%

Level 2 – Mild: minimal limitations, able to perform daily activities but not like normal; changes in daily activities; FEV_1 between 70-80%

Level 3 – Moderate: unable to perform occupation, able to perform self care and do chores; easily tired when climbing 1 story and need to rest when climbing 2 stories building; FEV_1 50-69%

Level 4 – Severe: unable to perform occupation and housework, still able to self-care, unable to walk horizontally longer than 100 yards; need to rest when climbing 1 story building; FEV_1 30-49%

Level 5 – Extremely Severe: Unable to perform occupation, housework, and self-care; able to walk only 2-3 steps; may get tired with even sit still; FEV_1 < 30%.

Expected Outcome and Benefits

1. Results from this study can be used to develop a nursing guideline to plan for appropriate nursing care for COPD patients
2. Results can be used as a guideline for families and community to understand factors affecting compliance and to help support COPD patients to comply with treatment recommendations.
3. Results can be used as foundations for further studies in COPD patients and other chronic diseases.

CHAPTER II

LITERATURE REVIEW

This research aims to study factors affecting compliance in patients with chronic obstructive pulmonary disease (COPD). The literature review covers topics as follows:

1. Compliance in COPD Patients
 - 1.1 Compliance Concepts
 - 1.2 Etiology and Pathology of COPD
 - 1.3 Compliance in COPD Patients
2. Pender's Health Promotion Concepts and Compliance in COPD Patients
 - 2.1 Development of Pender's Health Promotion Model
 - 2.2 Factors Affecting Compliance in COPD Patients
 - 2.2.1 Individual Characteristics and Experiences
 - Relationships between Disease Severity and Compliance in COPD Patients
 - 2.2.2. Behavior-Specific Cognitions and Affect
 - Relationships between Perceived Barriers to Action and Compliance in COPD Patients
 - Relationships between Perceived Self-Efficacy and Compliance in COPD Patients
 - Relationships between Social Supports and Compliance in COPD Patients
 - 2.2.3 Behavioral Outcomes
3. Evaluation of Compliance in COPD Patients
4. Conclusion

1. Compliance in COPD Patients

1.1 Compliance Concepts

There are several terms and definitions related to compliance such as compliance, adherence, mutuality, or therapeutic alliance (Madden, 1990; Heneman, et al., 1995; Henson, 1997). Madden (1990) provided definitions for both compliance and adherence as outcomes of interactions between patients and health care providers. In this study, the term “compliance” is used in the sense that a person complies with treatment plan or advices from physicians and nurses.

Dracup and Meleis (1982) defined compliance as behaviors or actions patients willingly practice according to treatment plan or physicians’ recommendations. Noncompliance is defined as actions or behaviors against treatment plan either neglect or leave undone (omission) or overdo (commission).

Smith and Birrel (1991) provided a definition of compliance as practices that ones conform to health advices provided by health personnel such as quit smoking, eating, follow up, etc.

Kyngas (1999) viewed compliance as patients’ actions, intention, and responsibilities to comply with physicians’ treatments or health professionals’ advices in order to maintain good health.

Murphy (2001) stated that compliance is behaviors patients agree to follow health care professionals’ advices.

Wanichanukorn (1993) defined compliance as patients’ practices that follow physicians’ advices especially taking medication as prescribed.

Sangthong (1997) stated that patients’ behavior according to treatment or advices can be either voluntary or mandatory.

From all definitions above, it can be concluded about compliance as follows:

1.) Intentional behaviors which intentions occurred from patients’ value that illness is terrifying and life threatening. Patients’ compliance to the treatment and advices will minimize severity and complications of the illness.

2.) Behaviors occurred from patients’ responsibilities to health and illness; Because patients are concerned about their health or about risks and severity caused by the diseases. Persons comply because they want to protect themselves from disease or to reduce risks of getting the disease. To maintain good health in this sense includes

having good physical and psychosocial health, receiving good care, not having untimely death, having appropriate adaptation, ability to control disease symptoms, ability to perform own activities, and satisfactions in relationships with others.

3.) Behaviors persons agreed to practice in accordance with physicians' or nurses' expectations in certain disease. The behaviors might be either voluntary or compulsory depending on personal decision based on authority or benefits gained from practicing such behaviors. These result in compliance to physicians' or nurses' advices and treatment plan aiming to maintain good health of that person.

1.2 Etiology and Pathology of Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) refers to a group of respiratory disease characterized by the presence of airflow obstruction, including chronic bronchitis, emphysema, chronic bronchitis asthmatic, or any combination of these illness (American Thoracic Society, 1995). Measurement of the force expiratory volume at 1 second (FEV₁) is the best measure of the severity of COPD (Heffner & Frye, 2002). The disease has a slow onset causing the respiratory tract to be more sensitive to irritants and permanent obstruction of the airways. The obstruction of the airways is normally irreversible. However, the severity of the disease can be controlled by avoiding from irritants (Anderson, 1995; Celli, 1999; Weinberger, 2004).

Causes of COPD are still unknown, however most leading cause of the disease is smoking. Contributing factors include living in environments with air pollutants, dusts, and toxins that can irritate airways, genetic disorder caused by Alpha 1-antitrypsin deficit, or history of infections in respiratory system (Wongtim, & Nuchparyoon, 1999; Weinberger, 2004). Other factors include abnormalities of pulmonary vascular causing lung ischemia and damages and autoimmune disease (Nuchparyoon, 1995).

COPD is characterized by three primary symptoms: cough, sputum production, and dyspnea on exertion. These symptoms often worsen over many years. The onset of the disease is usually slow and gradual. Initially, patients may experience only productive cough in the morning. Later when more damage is done to the lungs, dyspnea on exertion occurs with wheezing sound when breathing. This usually occurs at the ages of 50-60 years old. Dyspnea may be severe and often interferes with patient's activities when acute exacerbation often occurs with hypoxemia and

hypercapnia (Celli, 1999). Cor pulmonale causing right heart failure showing on leg edema, dyspnea even at rest, and weight loss often occurs at the late stage of the disease (Wongtim, & Nuchparyoon, 1999; Weinberger, 2004). In diagnosis and determining the disease severity, signs and symptoms especially dyspnea is used for evaluation. Levels of Disease Severity are measured by Pulmonary Function Test (PFT) to indicate the abilities how COPD patients can perform daily activities and levels of wheezy symptoms.

The severity of diseases are classified according to American Thoracic Society (2005) in 5 levels:

Level 1 – Risk: No limitation; able to perform daily activities like normal; the forced expiratory volume at 1 second of a forced expiration (FEV_1) > 80%

Level 2 – Mild: minimal limitations, able to perform daily activities but not like normal; changes in daily activities; FEV_1 between 70-80%

Level 3 – Moderate: unable to perform occupation, able to perform self care and do chores; easily tired when climbing 1 story and need to rest when climbing 2 stories building; FEV_1 50-69%

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Level 5 – Extremely Severe: Unable to perform occupation, housework, and self-care; able to walk only 2-3 steps; may get tired with even sit still; FEV_1 < 30%.

1.3 Compliance in COPD Patients

Although COPD is an incurable disease with chronic conditions with symptoms periodically presented and latent, disease severity can be controlled (Hordon, 1997). Goals in managing this disease are to alleviate the symptoms for as long period as possible, to prevent exacerbation, and to maintain respiratory function or to slow the deterioration process (Theeranut, 1999; Wongtim, & Nuchprayoon, 1999). Patients are required to undergo a life-time treatment with medications or bronchodilators. Patient's compliance is extremely important to effectiveness of disease management. It can be stated that diagnosis and treatments are only halfway successful in managing the disease. Another important half belongs to patient's compliance to the treatments. For instance, if the patient does not take

medications as prescribed (under or over medication) decreasing effectiveness of the treatment, symptoms of the disease may not be controlled and will be more severe (Hasler, 1990), increasing readmissions and medical cost (Conn, Taylor, Foan, & Miller, 1994). This makes patient's compliance an essence of COPD care (Dracup, & Meleis, 1982).

Incidence of noncompliance is increasing specifically in chronic diseases (Lannon, 1997). Issues like taking more medications than prescribed (Stewart, 1991 cited in Conn, Taylor, Foan, & Miller, 1994), stop taking medications (Sumartogo, 1993 cited in Murphy, 2001), lacking of knowledge, cost of medication, and inconvenience (Lannon, 1997) are major causes of noncompliance. Noncompliance not only affects patients and family, but also become financial burdens of the nation. Activities necessary for COPD patients to control diseases and prevent exacerbation of the disease include medications, nutrition, physical activities, breathing exercises, effective cough, rest, routine follow ups, and avoiding from irritants.

1.3.1 Medications

Medications help reduce dyspnea. Medications used in managing dyspnea are bronchodilators. Actions of bronchodilators include not only relieve bronchospasm and reduce airway obstruction, but also promote the excretion of sputum. In acute and severe cases, corticosteroid is considered to improve responses to bronchodilators (Wongtim, & Nuchprayoon, 1999). Given the importance of medications in managing COPD symptoms, taking right dosage, right type, and right time of bronchodilators will be the most effective use to control the symptoms (American College of Chest Physicians, 2003).

Management of COPD requires a lifetime medications. Side effects of the medications may lead to unpleasant experience. Patients make self-adjustment or stop taking medications with symptoms disappear causing failure in treatment management. Several factors contribute to failure in medication management such as their characteristics (odor and taste) and frequency and amount of medications required each day (Murphy, 2001). Amount of medications taking each day means difficulties in medication taking especially in elderly patients (Kroenke & Pinlhot, 1990 cited in Murphy, 2001). More than half of tuberculosis patients stopped taking their medications because of nausea and vomiting by their side effects (Dixon, et al.

cited in Murphy, 2001). According to Lannon's study (1997), reasons in which epilepsy patients did not comply with medications included their side effects, lack of knowledge in usage, complexity of medication taking, expenses, memory deficit, denial of diagnosis, and health beliefs. Unsamatham, et al. (1999) did a study about knowledge and attitude towards diseases in 499 asthma patients and found that most frequent reason patients did not take medications regularly was unfelt need to take medications due to no symptom presented (70.8%), followed by anxiety to side effects (40.5%). Difficulties in using bronchodilators when asthma attacks (50.8%), unsure whether they used the bronchodilators correctly are two leading cause of discontinuation of the use of bronchodilators. For a long duration of treatment, most patients stopped their treatment when the symptoms get better even though the treatment is still required (Sumartogo, 1993 cited in Murphy, 2001). Sangthong's study found that compliance among 75 COPD patients was at low level. Non compliance behaviors founded in the study included not taking medications as prescribed (63.3%) because assumed that they were already well or were afraid of drug reactions. Another study done by Wanichanukorn, (1983) on compliance in 271 hypertension patients and found that having to take many types, many pills, and many times are significantly correlated with compliance to medications ($p < 0.0001$). About 11.8% intentionally do not take the whole course of medication and 6.3% increase the dose because they perceived the disease will be relieved sooner. Therefore, in promoting compliance in medication takings in COPD patients, dosage, frequency, route, and time to take medication need to be focused.

1.3.2 Nutrition

Getting adequate nutrients is essential for COPD patients to increase strength of the respiratory muscles, to maintain immunity, and to reduce lung infections (American Association of Cardiovascula and Pulmonary Rehabilitation, 2003). Poor nutrition is frequently found among COPD patients. About one quarter of COPD patients have protein-calorie malnutrition with 90 % below body weight (Ferguson & Cherniak, 1993). Loss of appetite occurs from gastric shifting due to lung hyperexpansion (Theeranut, 1999). Dyspnea and fatigue with productive cough and change of taste also caused the loss of appetite. Food may also produce gastric gas and cause abdominal distension and discomfort for patients.

Good eating behaviors surely increase strength in diaphragm and breathing muscles. The recommended nutrients for COPD patients are comprised of 55% fat, 28% carbohydrate, and protein. Recent studies showed that COPD patients should received all nutrients without exceeding calorie (Theeranut, 1999) to maintain ideal body weight (Fishman, et al. cited in Theeranut, 1999). Nutrients COPD patients needed include meats, fats, fruits and vegetables. Patients should also received antioxidants such as vitamin D (corn oil), vitamin C (fresh fruits and vegetables), selenium (salt water fish), and beta carotene (green and yellow leafy vegetables) (Julkrangka, 1999). Antioxidants help promote lung functions by help preventing lung tissues from damage (Nidus Information Services, 1998). Foods most suitable should be small proportions of soft diets 4-6 times daily. Patients should have at least 30-60 minutes rest before and after each meal. (Inprasit, 2001; Cleveland Clinic Health System, 2002). Patients should avoid onions, cabbages, beans, milk products or chocolates for they can cause gas and secretions. Alcohol and caffeine such as coffee and tea should also be avoided to reduce risk of getting peptic ulcer from side effects of methylxanthines (Cleveland Clinic Health System, 2002). Kurat's (1996) study showed that nutrition health promotion behaviors among COPD patients were at a moderate level. Kyngas' study (1999) also showed that asthma adolescent patients comply less in avoiding food that promote the symptoms. Kyngas and Lahdenpera (1999) studied compliance in 138 patients with hypertension. Results showed the least cooperation in control of food (30%). Attention in nutrition should be paid to prevent exacerbation of the disease.

1.3.3 Physical exercises and breathing exercises

COPD patients have limitations to works and exercises because of the low level of blood oxygen, high level of carbondioxide, and acidosis. Exercise will aggravate these conditions. Physical activities and breathing exercises are aimed for reducing dyspnea and improving ability to perform daily activities (Hilling & Smith, 1995). COPD patients whose symptoms are controlled by medications should be advised about appropriate exercises and breathing exercise (Wongtim, & Nuchprayoon, 1999) in order to promote effectiveness of the treatment and to maintain quality of daily living (American Association of Cardiovascula and Pulmonary Rehabilitation, 2003).

Physical exercises

Physical exercises in COPD patients aim to help maintain lung function and improve the remainder of the oxygen delivery system (Ries, 1994). It is recommended for the patients to exercises session lasting 20-30 minutes, and then increasing to 40-60 minutes each time, at least 2 to 5 day per week (Wongtim, & Nuchprayoon, 1999; American College of Chest Physicians, (2003); Rudkin, 2001). The amount of time spent on each exercise was individualized depending on the physical tolerance of the patient (Scherer, and Schmieder, 1998). Positions should be easy and safe to perform that promote the strength of muscles at chest, shoulders, arms, and legs (Cleveland Clinic Health System, 2002). Physical exercises will improve muscle tone and strength, improve balance joint flexibility. So can perform daily tasks (Warner, 2002).

Breathing exercises

Breathing exercises can be done through “pursed-lip breathing” and through diaphragmatic breathing by first, inhale slowly through your nose until your lung fill up with air (counting to 2), second, purse your lips as if you are going to whistle, third, breathe out slowly while keeping your lips pursed (counting to 4), and finally, take twice as long to breathe out as you do to breathe in and do not force your lips to empty. Breathing exercises help increasing air ventilation, blood circulation, and gas exchange which help decrease dyspnea. Patients should start with 5 minutes and increasing the following days until able to incorporate the exercises with daily activities (Wongtim, & Nuchprayoon, 1999). Tangjitpitak (1988) did a quasi-experimental study on effects of a twelve-week patterned exercise program on COPD patients and found that the program significantly increased gas exchange and decreased dyspnea among COPD patients ($p < .05$). Wirat. (2001) did a similar study on effects of the lung rehabilitation program on dyspnea in 40 COPD patients. The program included doing a 12-week long pursed-lip breathing twice daily (20-30 minutes each time). It was found that dyspnea decreased while tolerance in daily activities improved with better sleeping behavior ($p < .01$). Other studies show effectiveness of breathing exercises on several outcome behaviors include: heart rehabilitation (exercises) in reducing dyspnea in heart patients (Inprasit, 2001); relaxation techniques with pursed-lip breathing on dyspnea and personal comfort in

COPD patients (Meecharoen, 1998). It is recommended that breathing exercises is more effective when practicing with purse-lip breathing (American College of Chest Physicians, 2003). Even though breathing exercise is beneficial for patients with COPD, the majority of elderly with COPD still cannot perform breathing exercise correctly (80.3%) and still did not exercise (54.9%) (Sangthong, 1997). Breathing exercise is important in promoting health and decrease the severity of disease.

1.3.4 Effective cough

COPD produces a high volume of viscous secretion causing greater chance of sputum blocking and infection. Drinking at least 2,000 c.c. of warm water per day with effective cough helps removing secretion from bronchus (Theeranut, 1999). It is therefore recommended as a health promotion measure for COPD patient. Effective cough starts by breathing in slowly and deeply; holding the breath for 2-3 seconds; leaning slightly forward; opening the mouth and coughing 2-3 times to remove secretion (Theeranut, 1999). It is recommended not to cough continuously because it will cause dizziness and fainting. Continuous coughing also causes air retention in the lungs that will lead to severity of disease.

1.3.5 Rest

COPD patients experience dyspnea and changes in breathing pattern causing diminishing in air ventilation and retention of CO₂ and hypoxemia (Martin, 1987). Patients usually experience restless, frequent wake ups, nightmares, and unable to sleep through the nights and decrease body function. Resting is important to COPD patients because patients regain energy for daily function in the next day. Sleeping 6-8 hours during the night and rest for 30-60 minutes after activities. Activities at rest include take a nap, reading, listening to radio or doing hobbies during the day are recommended (Borhringer Ingethiem Pharmaceutical, 1999). Additionally, places with good air ventilation and without disturbance will promote patients' sleep. A study in 75 COPD patients revealed that 14.1% of the patients did not have time to rest during the daytime and had fewer than 4 hours of sleep in the night. They claimed coughing and dyspnea as the reasons for sleeplessness. About 47.1% did not seek help while 25.5% used sleeping pills. Only 11.8% read Buddhist's dharma books or did meditations (Sangthong, 1997). Therefore, adequate resting is very important for COPD patients to comply effectively with treatment plan.

1.3.6 Follow up

The main purpose of having follow up is to monitor the symptoms and to evaluate effectiveness of the treatments. Sangthong's study (1997) with 75 COPD patients showed that 64.8 % had follow up; 22.5% had not follow up; while 12.7% of the patients did not come to the appointments at all. Main reasons patients did not regularly come to the appointments were not having persons to take them, not having money to pay for the transportation, and inconvenience of transportation. The patients not coming to the appointment at all reported that they thought they already been cured. A study in asthma patients showed that among of the patients who did not have follow up(57%) had asthmatic attacks and had to come to emergency room (27%) (Unsamatham, et al., 1999). Therefore, follow up is important in controlling the severity of the disease and to maintain the effectiveness of the treatment.

1.3.7 Avoiding from Irritants

Irritant are the major cause of respiratory tract infection leading to more severity and destruction of alveoli. COPD patients should avoid from irritants to respiratory system by stop smoking, avoiding from crowd, avoiding from smoke, dust, fire, and animal hair, avoiding others with respiratory infections, and avoiding from unstable temperature (too hot or too cold). Patients are recommended to take care of dental hygiene and monitor infectious symptoms i.e. fever, dyspnea, mucoid sputum, etc., and see the doctor immediately if these symptoms present (Theeranut, 1999; American College of Chest Physicians, 2003). However, one study found that 77.5% of COPD patients still lived with respiratory irritants, while 25.5% did not practice or made attempt to avoid from irritants at all. This is another reason patients had to visit hospital more frequently (Sangthong, 1997). Similarly, Kyngas' (1999) study with 266 adolescents with asthma showed that the patients avoided from irritants at the lowest level. Only 7% of the patients avoided from irritants in a regular basis; 52% avoided some times; leaving about 40% did not avoid from irritants at all. Therefore promoting understanding among patients to avoid from respiratory irritants will surely decrease dyspnea and promote treatment effectiveness.

2. Pender's Health Promotion Behavior Concepts and Compliance in COPD patients

2.1 Development of Pender's Health Promotion Model

Pender's development of health promotion model was first reported in 1982 modeling after the 1975 health protection model. The model was modified for the second time after studies proved that several sub-concepts from original model were unable to explain some health promoting behaviors. The second modification of this model was made based on social learning theory. In this edition, Pender defined health promoting behavior as activities a person perform continuously until these activities become parts of his/her life. The model can be shown in figure 2.

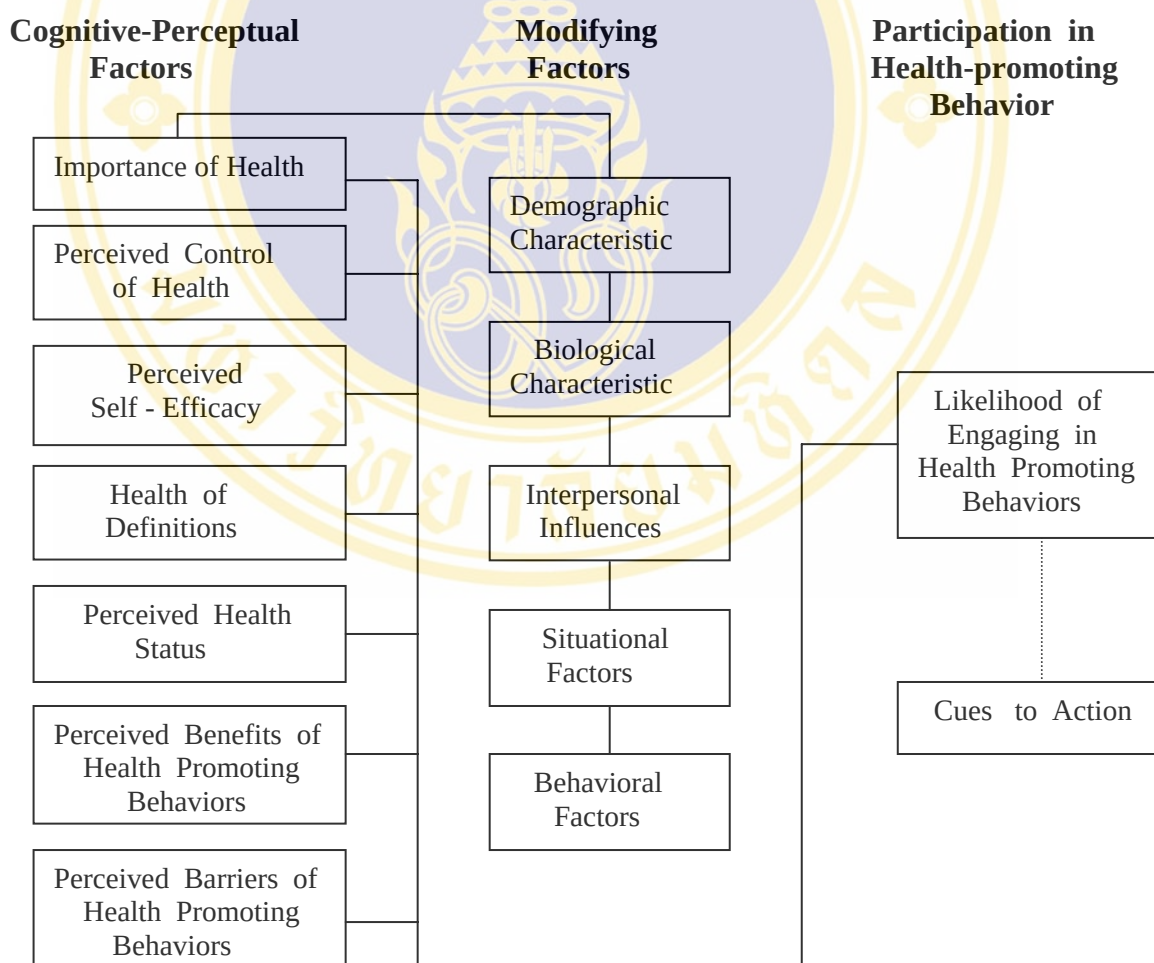


Figure 2 Pender's Health Promotion Model (1987)

In 1996, Pender made the third adjustment to the model by modifying the main and sub-concepts to better explain health promoting behaviors. The adjusted main concepts included “individual characteristics and experiences,” “personal and behavior-specific cognitions and affect,” and “behavioral outcome;” while the sub-concepts excluded from the model were importance perceived health control, perceived health status, and health definitions. Pender incorporated these sub-concepts within personal psychological factors. New sub-concepts added in this version were past behaviors, immediate competing demands and preferences, and commitment to a plan of action. Pender also defined health promoting behaviors as activities a person performs with the aim to improve living conditions and to obtain good health in personal, familial, community, and social levels.

Pender, Murgauth, and Parsons (2002), made another adjustment to the model and provided a new definition of health promoting behaviors as person’s practices aiming at good health, ability to self care and satisfy with relationships with others to maintain physical strengths and balance environment.

The main purpose of this recent modification of health promotion model was to make better usage of this model for persons both in normal and ill conditions. The model comprised of 3 components: 1) individual characteristics and experiences, 2) behavioral-specific cognition and affect, and 3) behavioral outcome. The model is presented in figure 3.

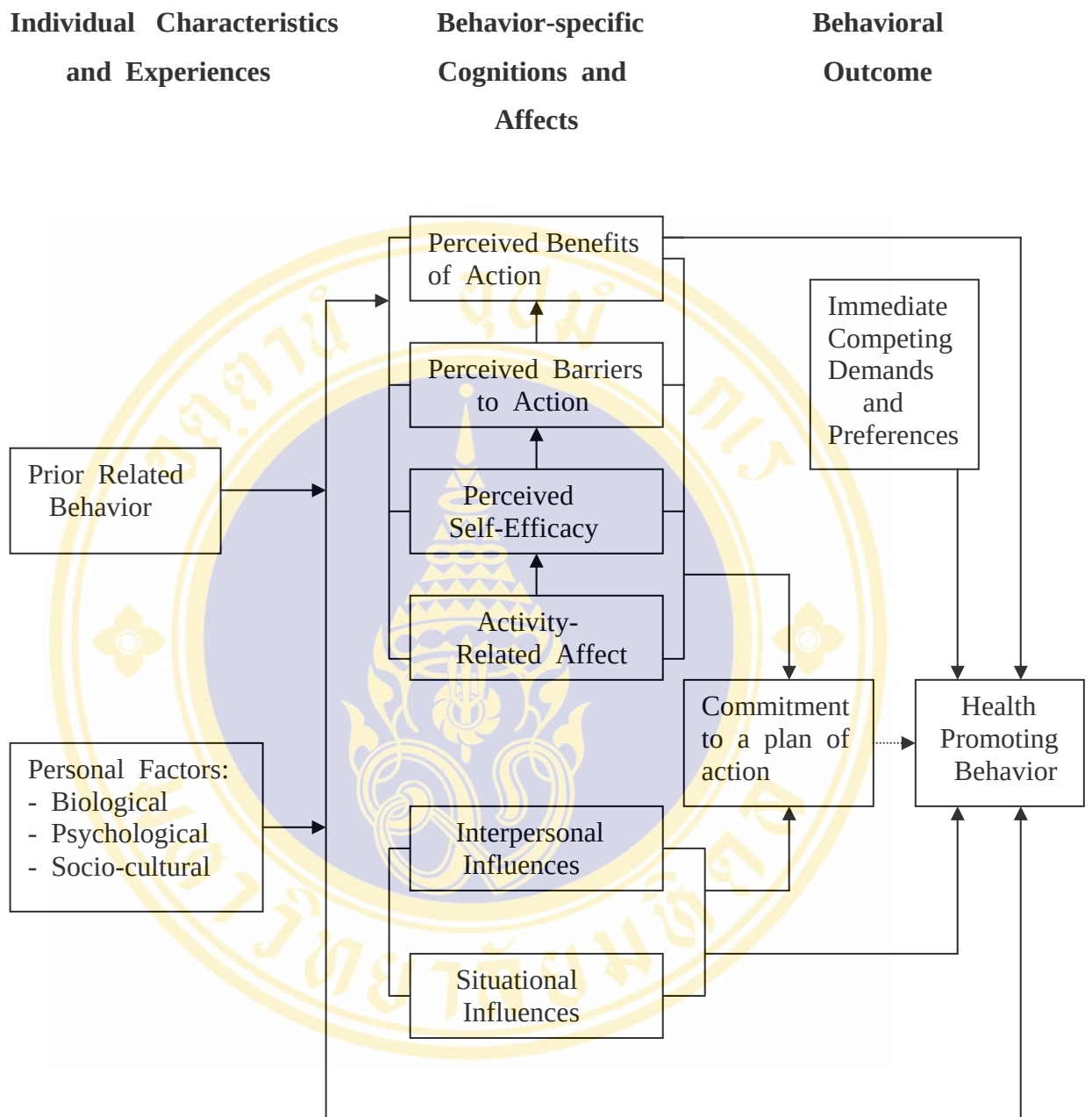


Figure 3 Pender's Health Promotion Model (1996,2002)

From the development of the health promotion model, it can be concluded that health promoting behaviors are defined as activities a person continuously perform until they are a part of his/her daily life aiming to improve the ability to self care and become satisfied with relationships with others and to maintain strength and balance with environments either in a healthy or ill condition.

With chronic conditions and incurable disease like COPD, patients are recommended to comply with treatment plans and advices aiming to control dyspnea-condition that suffers patients the most. Behavioral modification is important in compliance behaviors which Lannon (1997) also recognized them as health promoting behaviors as well.

2.2 Factors Affecting Compliance in COPD Patients

Compliance are considered health promoting behaviors even in chronic conditions like COPD. To perform health promoting behaviors, several factors played either direct or indirect roles: perceived benefits of behaviors, perceived barriers to perform behaviors, perceived self-efficacy, activity-related affect, and interpersonal and situational influences (Pender, 1996, 2002).

2.2.1 Individual Characteristics and Experiences

Individual characteristics and experiences affect behaviors. However the relationships may apply only to selected groups not the population as a whole.

2.2.1.1 Prior Related Behavior

The best predictor of current behavior is frequency of same or similar behaviors in the past. The effects of prior related behaviors can be either direct or indirect. Direct effects include habit, which can lead to automatic behavior. The more a person performs certain behavior, the better it becomes habit. Indirect effects include perceived benefits, perceived barriers, perceived self-efficacy, and activity-related effect. It is noted that indirect effects are processed through behavior-specific cognition and affects.

2.2.1.2 Personal Factors

- Biological Factors i.e. age, gender, body weight, physical ability, strength, mobility, or physical balance.
- Psychological Factors i.e. self esteem, self motivation, personal ability, and perceived health status and health definition.

- Socio-cultural Factors i.e. race and ethnicity, acculturation, education, economic and social status.

Most personal factors are unable to change and are not used as a primary target in changing behaviors, although they can influence health promoting behaviors. Biological factors-disease severity is the only personal factors used in this study.

Relationships between Disease Severity and Compliance in COPD Patients

Disease severity affects person's activity and is a factor indicating health status. Patients with more severity report dyspnea more frequently (Janson-Bjerklie et al, 1986; Gift et al, 1986). Increasing disease severity causes the increasing of dyspnea. Patients cannot tolerate daily activities as they can previously (Leidy, 1995). Bruckhardt (1985) found that arthritis patients who suffer high level of disease severity had lower level of self control. Kinsman et al (1983) also found that COPD patients with more severe symptoms wanted to participate in other activities and had lower self-care attention because of lowered ability to perform activities. Kyngas's study (1999) on adolescents with asthma showed that severity of disease was significantly associated with compliance ($p < .01$). Because of severity of disease was directly linked to functional ability and as symptoms increase patients will find increasingly different to carry out their normal activity of daily living and affect to patients' lifestyle. Patients usually perceive themselves as different from others at the same age. These changing may reduce compliance (Kyngas, 1999). It can be said that COPD patients who have different levels of disease severity will have different compliance levels. Patients with more disease severity usually comply with treatment and advices less than those with less severe symptoms of disease who can still perform behaviors by themselves.

In order for COPD patients to understand the importance of treatment plan, patients' compliance should be evaluated for better planning and promoting the compliance among patients.

2.2.2 Behavior-specific Cognitions and Affect

This set of variables is considered important to motivations and are essential in changing person's behaviors.

2.2.2.1 Perceived Benefits of Action

It is the perceptions based on good experiences or positive reinforcements a person has for a certain behavior. Person's motivation comes from the expected benefit of such behavior based on personal direct or learned experience. Persons who perceive that certain health promoting behavior would be beneficial for them will practice that behavior more frequently. This concept is used in this study.

2.2.2.2 Perceived Barriers to Action

In relation to health-promoting behavior, barriers may be imagined or real. They consist of perceptions concerning the unavailability, inconvenience, difficulty, or time-consuming nature of a particular action in which affect intention to engage in particular behavior and the actual execution of the behavior. Barriers are often viewed as the blocks, hurdles, and personal costs of undertaking a given behavior. When readiness to act is low and barriers are high, action is unlikely to occur. When readiness to act is high and barriers are low, the probability of action is much greater. Perceived barriers to action affect health-promoting behavior directly by serving as blocks to action as well as indirectly through decreasing commitment to a plan of action.

Relationships between Perceived Barriers to Action and Compliance in COPD Patients

Perceived barriers cause COPD patients not to comply with treatment plan lead to increase severe symptoms. The higher the level or number of barriers such as costs and time spent for each visit, no time to spend on physical activities or breathing exercises, etc., the less likely the patient's compliance. Conversely, patients with lower level of barriers are most likely to comply with treatment plan. Pasunant (1986) found a negative relationship between perceived barriers of self care and compliance in patients with ischemic heart disease ($p < .05$). Similarly, negative relationships between perceived barriers and compliance were also found in patients with other diseases or conditions such as congestive heart failure ($p < .01$) (Kruawanichkit, 1988), tuberculosis ($p < .05$) (Satchapong, 1991), COPD ($r = -.438, p < .001$) (Sangthong, 1997), and health promoting behaviors in COPD patients ($r = -.282, p < .001$) (Janchanakit,

1998). It can be concluded that perceived barriers is negatively correlated with compliance in COPD patients.

2.2.2.3 Perceived Self-Efficacy

It is a perception of ones skills and abilities in performing a certain behavior. Individuals with such perception will be able to achieve than ones with no perceived ability or skills. Perceived self-efficacy is developed through 4 factors:

- 1.) Past achievement based on self-evaluation or feedbacks from others.
- 2.) Observations from role model.
- 3.) Motivations from others.
- 4.) Physical and Psychological conditions such as fear, anxiety, etc.

Perceived self-efficacy affects individual emotion that influences the performing of certain behaviors. Individuals, with positive aspect about certain behaviors, will believe in their ability to perform such behaviors. Individuals with high self-efficacy will have low perceived barriers. Perceived self-efficacy has a direct influence on health promoting behaviors while it has indirect influence on perceived barriers and intention to perform behaviors.

Relationships between Perceived Self-Efficacy and Compliance in COPD Patients

Due to dyspnea that COPD patients have, the patients are usually not confident in performing daily activities causing more deteriorations and severity of the disease. Perceived self-efficacy is most crucial for activities that promote health and attempts in participating in health promoting behaviors (Pender, 1996; Moore, 1990; Brubaker & Wickersham, 1990 cited in Tedesco, Keffer, & Fleck-Kandath, 1990). COPD patients who have confidence in their ability will be motivated to perform health promoting behavior and follow treatment plan advised by physicians and nurses. Such confidence may come from past achievements of the same or similar behaviors, motivations received from others to perform such behaviors, or observing other successfully perform behaviors. Patients with high perceived self-efficacy to conduct self care will comply with treatment plan. Several studies showed positive

relationships between perceived self-efficacy and compliance in different areas such as health promoting behaviors in elderly ($r = .18, p < .05$) (Yamjanchai, 1995), self-care behaviors in patients with myocardial infarction ($r = .76, p < .001$) (Jaroenwongwiwat, 1995), in patients with chronic renal failure ($r = .516, p < .001$) (Chibsamanboon, 2000), in tuberculosis patients ($r = .802, p < .001$) (Wongsonton, 2000), and in patients with hypertension ($r = .535, p < .01$) (Onchim, 2002). Janchanakit (1998) also found a positive relationship between perceived self-efficacy and health promoting behaviors in elderly with chronic lung disease ($r = .566, p < .001$). It can be concluded that perceived self-efficacy is associated with compliance in COPD patients.

2.2.2.4 Activity-Related Affect

Personal activity-related affect may occur before, during, and after each behavior. It comprised of 3 components: activity-related affect, self-related affect, and context-related affect. These affects will influence individuals to choose to or not to repeat or to maintain certain behaviors. Activity-related affect influences both directly and indirectly through personal capabilities and behavioral intention to perform certain behaviors. This component is not included in this study.

2.2.2.5 Interpersonal Influences

This is a learning experience about others belief or attitudes, which can be either true or not true. Individuals are influenced through 3 processes: social norms, social supports, and observations. Primary sources of interpersonal influences are families, friends, and health care providers. The processes directly affect changes in health promoting behaviors. They also act as a social power for individuals to decide to perform behaviors or even motivate individuals to plan for performing behaviors. Factor included in this study is social support.

Relationships between Social Support and Compliance in COPD Patients

Social supports in COPD context is helps COPD patients receive either emotional, instrumental, informational, or appraisal support so they can live appropriately in society (Pender, et al., 2002). They are a psychosocial variable influencing health promoting behaviors both directly and indirectly (Primomo, Yates, & Wood, 1990; Pender, et al., 2002). Types of support include emotional supports-expressions of empathy, love, trust, and caring, instrumental supports-tangible and

service, informational supports-advice, suggestions, and information, and appraisal support-information that is useful for self-evaluation (House, 1981 cited in Tiden, 1985; Riegel, 1989; Pender, et al., 2002).

Social support may come from family, friends, or health care providers. Family, being most important source of support, can encourage or provide care for patients to appropriately adjust to symptoms, which will lead to compliance (Riegel, 1989; Pender, et al., 2002). It was found that females with chronic illness received most supports from their families. They also perceived that supports from families were most effective (Primomo, Yates, & Wood, 1990). Xiaolian, et al. (2002) found that primary sources of supports came from spouses (70.4%), followed by children (26.5%), and relatives (3.06%). In normal condition, individuals need helps and information exchanges with families, friends, and others. The needs increase when individuals face chronic conditions which are considered a life crisis (Margereson, 2001).

COPD is caused the reduction of ability to perform daily activities and fear from dyspnea episodes, causing limitations in daily activities, social separations, and dependency (Miller, 1983 cited in Keele-Card et al, 1993). Social supports are therefore crucial for COPD patients (Margereson, 2001). Patients with adequate supports will better adapt to chronic conditions, have lower level of anxiety, and have better health status (Riegel, 1989; Primomo, Yates, & Wood, 1990; Pender, et al, 2002). Several studies showed positive relationships between social supports and patients' compliance and self-care. Sangthong (1997) found that social supports had a significant positive effect on compliance in COPD patients ($r = .32$, $p < .01$). Xiaolian, et al. (2002) found a significant positive relationship between social supports and self care in 98 COPD patients ($r = .252$, $p < .01$). Other studies showed similar results. Wichitwathee (1991) studied relationships between self-esteem and social supports and self-care behaviors in 100 amputated patients and found a positive association ($r = .64$, $p < .001$). Yainonetard (1999) also found that social supports are a positively associated with self-care behaviors in 210 menopausal women ($r = .64$, $p < .05$). COPD patients with less social supports experienced exacerbation of the symptoms and visited hospital more frequently than those with more supports (Jansen et al, 1994 cited in Margereson, 2001). It can be concluded that social supports are

another factor affecting compliance in COPD patients. Promoting supports from families, health care provides, or others to COPD patients will benefits in compliance in treatment program among them.

2.2.2.6 Situational Influences

Situational influences are perceived or learned experiences ones have on certain situations that are for or against behavior practice. Examples of situational influences are perceptions of appropriate options, desired characteristics, and environments that affect health. Individuals will be able to perform well in situations individuals feel confident and safe. Suitable environment is another factor that motivated individuals to be involved in continuing health promoting behaviors. This factor is not included in this study.

2.2.3 Behavioral Outcomes

When performing behaviors, individuals may or may not choose to follow their action plans depending on several factors. Behaviors may show in different characteristics:

2.2.3.1. Commitment to a plan of action

It happens when individuals choose to perform behavior according to their plans. The performance may be independent or based on reinforcements from others. The commitment is influenced by behavior-specific cognitions and affect and will lead to health promoting behaviors.

2.2.3.2. Immediate competing demands and preference

These are behaviors practiced based on immediate demands and preference; may or may not against the plan of action. They may or may not be health promoting behaviors.

2.2.3.3. Health promoting behaviors

Persons make decision to perform certain behaviors in creative ways according to their lifestyles. Health promoting behaviors among COPD patients aiming at preventing exacerbation of the disease and maintain acceptable health are compliance in treatment which vary greatly upon their conditions and environments.

3. Evaluation of Compliance in COPD Patients

In treatment perspective, physicians usually expect that patients would follow their treatment regimens. However, a number of patients cannot comply with treatment plan (Kaplan & Ries, 2000). Therefore, the compliance behaviors are measured to evaluate compliance and motivate COPD patients. There are 2 measures in evaluating compliance:

1. Direct measure

It is done through direct observations, blood test, urine examination, urinary excretion of medication, and urinary excretion of metabolite.

2. Indirect measure

It is done by using questionnaires, interviews, follow-up reports, physician's evaluation, and counting of medications.

4. Conclusion

Chronic Obstructive Pulmonary Disease (COPD) cannot be completely treated. Patients suffer a life-long disease that affects them in physical, psychological, emotional, economic, and social aspects. Health promoting behaviors through appropriate self care and compliance to treatment plan and advices are important in controlling the disease and decreasing the complications. Such advices include taking medications, having proper and adequate exercises, breathing exercises, and effective cough, getting enough nutrients and rest, having regular check-ups, and avoiding from respiratory irritants. Motivations are crucial for compliance in COPD patients. Several factors play a key role in increasing patients' motivations: perceived benefits of the treatment plan and self-care strategies, perceived barriers such as time and inconvenience, perceived self-efficacy to perform behaviors, appropriate social supports from families, health care providers, etc., and disease severity which affect ability to perform activities and independency among patients. Understanding factors influencing compliance in COPD patients will provide nurses and health care professionals important information to develop and provide nursing care that will promote their health.

CHAPTER III

METHODOLOGY

The methodology adopted in this study is descriptive research aiming at understanding factors affecting compliance in COPD patients.

Population and Samples

Population in this study is COPD patients being treated at outpatient departments in Chest Disease Institute, Nonthaburi Province. Sample selection criteria include patients who:

1. were diagnosed to have chronic obstructive pulmonary disease (COPD) through history takings, physical examinations, chest x-ray, and the forced expiratory volume at one second (FEV₁) from Pulmonary Function Test (PFT)
2. have no complications in respiratory systems including heart failure, pulmonary tuberculosis, or lung cancer

Researcher selected 100 patients based on criteria stated above through simple purposive sampling. Sample size was calculated using Thorndike's calculation formula (1978 cited by Vorapongsathorn, 1989) as follows:

$$N \geq (10 \times n) + 50$$

When N = sample size, n = number of independent variables

There were 4 independent variables for this study. So in collecting data, the sample size was at least 90 patients. In this study, the total sample size was 100 patients.

Settings

The data were collected at outpatient department (OPD) in Chest Disease Institute, Nonthaburi Province. The institute is a tertiary care institute for heart and lung diseases. The OPD serviced heart and lung patients from Mondays to Fridays between 8:30 A.M. until 12:00 P.M. (noon). There was no specific clinic for COPD. There were 6 examination rooms for lung patients. COPD patients were examined and treated by specialists in pulmonary diseases. According to medical record department of the institute, there were 5,212, 6,391, and 6,837 out patients from 2001 to 2003, respectively. Among them, 567, 703, and 780 patients were admitted to the institute from 2001 to 2003, respectively. Out patients received home medications for 30 days. Follow-up appointments were made based on physicians' decisions. Medication advises were provided by pharmacists in every case.

Research Instrument

Instrument used in this study comprised of 5 sections:

Section 1

1.1 Personal information on samples which include age (in years), gender, education, occupation, average monthly family income, type of family (nuclear or extended), duration of illness, number of visits to emergency rooms and number of admissions to the hospital during the past year, FEV₁, and level of disease severity.

1.2 Level of disease severity (American Thoracic Society, 2005) using ability to perform activities and FEV₁. The level of disease severity can be categorized into 5 levels:

Level 1 – Risk: No limitation; able to perform daily activities like normal; Forced expiratory volume in the first second of a forced expiration (FEV₁) > 80%

Level 2 – Mild: minimal limitations, able to perform daily activities but not like normal; changes in daily activities; FEV₁ between 70-80%

Level 3 – Moderate: unable to perform occupation, able to perform self care and do chores; easily tired when climbing 1 story and need to rest when climbing 2 stories building; FEV₁ 50-69%

Level 4 – Severe: unable to perform occupation and housework, still able to self-care, unable to walk horizontally longer than 100 yards; need to rest when climbing 1 story building; FEV_1 30-49 %.

Level 5 – Extremely Severe: Unable to perform occupation, housework, and self-care; able to walk only 2-3 steps; may get tired with even sit still; $FEV_1 < 30\%$.

Section 2

Measures of perceived barriers adapted from Health Belief Measurement (Sangthong, 1997) base on Maiman's concept (1977). The original measurement comprised of 7 items. Researcher adjusted wordings and added 2 items. All items were positively worded. Patients were asked to select only one option from 2 scales (yes or no), scoring yes = 1 and no = 0. The total possible score was 9 with higher score indicating having higher level of perceived barriers.

Section 3

Perceived self-efficacy measurement adapted from Self-Performance Measurement in hypertension patients (Onchim, 2002) based on Bandura's concepts (1986). Original instrument comprised of 13 items. Researcher adjusted wordings and deleted 5 items, making as 8 items instrument. All items are positively worded with 2 options (yes or no), scoring yes = 1 and no = 0. The total possible score was 8 with higher score indicating having higher perceived self-efficacy.

Section 4

Social support measurement is adjusted from social support measurement (Sangthong, 1997) based on Brandt and Weinert's concepts (1985). Researcher adjusted wordings in some questions. Ten items (2, 4, 5, 7, 8, 9, 14, 15, 16, and 18) were positively worded with 2 response options (yes or no), scoring yes = 1 and no = 0 and the rest of the items (1, 3, 6, 10, 11, 12, 13, and 17) were negatively worded with 2 response options (yes or no), scoring no = 1 and yes = 0. Possible scores ranged from 0 to 18 with higher score indicating higher social supports.

Section 5

Measurement of Compliance used in this study was adapted from compliance observation in COPD patients (Sangthong, 1997) and compliance measurement in patients having hypertension with unknown cause (Poonpanchai, 1997). This section comprised of the total of 24 items asking frequency of certain behaviors including

eating, resting, exercise, breathing exercise, effective cough, avoiding from irritants, follow-up, and taking medications. Eighteen items (1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, and 24) looked at appropriate behaviors while 6 items (3, 7, 14, 21, 22, and 23) looked at inappropriate behaviors.

Rating scales were used for appropriate behavior questions where 3 = “regularly perform behavior,” 2 = “perform behavior sometimes,” 1 = “rarely perform behavior,” and 0 = “never perform behavior.” Rating scales for inappropriate behaviors included 0 = “regularly perform behavior,” 1 = “perform behavior sometimes,” 2 = “rarely perform behavior,” and 3 = “never perform behavior.” Total possible score ranged from 0 to 72 points. The interpretation of the score mean had four level (0-3) as follows:

average score of 0.00 - 0.75 : poor level of compliance.

average score of 0.76 - 1.50 : fair level of compliance.

average score of 1.51 - 2.25 : good level of compliance.

average score of 2.26 - 3.00 : very good level of compliance.

Validation of Instruments

Instrument Validity

All instruments (perceived barrier measurement, perceived self-efficacy measurement, social support measurement, and level of compliance measurement) were tested for content validity and clarity by 5 experts :

- One specialist in respiratory disease (physician)
- Two experts in respiratory care (nursing instructors)
- Two experts in respiratory care (clinical nurses)

Instrument Reliability

The reliability of the original instruments were as follows:

- Perceived barrier and social support measurements were tested with 30 COPD patients with Cronbach’s alpha coefficient of .45 and .90, respectively (Sangthong, 1997).
- Perceived self-efficacy measurement (13 items) was tested with 30 hypertension patients with Cronbach’s alpha coefficient of .83 (Onchim, 2002).

Instruments used in this study, after being modified and corrected based on experts' advises, were tested with 30 COPD patients who had the same characteristics as the proposed samples before using with the real samples. The reliability of the whole instrument was calculated using Cronbach's alpha coefficient yielding coefficients as follows:

- Perceived barrier measurement = .55
- Perceived self-efficacy measurement = .67
- Social support measure measurement = .82
- Compliance measure measurement = .70

The reliability of instruments that were used with 100 COPD patients as follows:

- Perceived barrier measurement = .56
- Perceived self-efficacy measurement = .65
- Social support measure measurement = .85
- Compliance measure measurement = .76

Protection of Participants' Rights

Researcher is fully aware of research ethics therefore samples' dignity, values, and protection of impacts that could happen during data collection and the use of data are assured throughout the research process. Before collecting data, samples were explained the objectives of this study and uses of the data. Samples could make decision whether or not to participate in the study. Agreeing or not willing to participate did not affect the way patients were treated. Data obtained from the study were confidential and were used only in this study. Research provided sample opportunities for patients to ask questions or express concerns at any point. The informed consent was signed when the patient agreed to participate in the study.

If the samples were upset or felt uneasy replying to the questions or if their symptoms were aggravated during the data collection process, researcher planned on using the following protocols:

1. Stopped interview and data collection immediately
2. Explained to the sample (patient) and family (if applicable) that the sample has full rights to resign from the study without any effects on treatments
3. Coordinate with health care team for appropriate care in case sample is

exhausted and show wheezy symptoms

4. Give samples opportunities to express themselves and ask questions
5. Contact advisors, head of outpatient department, or ward head immediately

Data Collection

The data were collected by the researcher in the following steps as follows:

1. An introduction letter and request for permission for data collection, issued by the Graduate School, Mahidol University, was presented to the director of the Chest Disease Institute, Nonthaburi Province for data collections at respiratory exam rooms, out patient department from Monday to Fridays between 8:30 AM to 12:00 PM.
2. After permission granted, researcher met with head of outpatient department to explain research objectives and description of data collection.

The data were collected through the following procedures:

Out Patient Department (OPD)

1. Researcher selects COPD patients who came to OPD with the inclusion criteria of the study.
2. COPD patients were approached during waiting for the physician or after meeting the physician. Researcher evaluates patients' exhaustion by observation. For patients without exhaustion, researcher introduced herself, explained objectives of the study, and rights to participate the study. The inform consent was signed if the patient agreed to participate.
3. The samples were interviewed in a private room. Researcher collected the data using instruments sections 1 to 5 (personal information, perceived barrier measurement, perceived self-efficacy measurement, social support measurement, and compliance level). Samples were notified that they would not loss their queue for researcher has already arranged with the nurse at examination room. Instructions to response to the instrument were fully explained. Each question was read to the sample and replies were noted in the questionnaire. Estimated time used for each instrument was 30-40 minutes.
4. Samples could ask any questions during the process. If the sample did not allow the data collection process to continue, researcher discontinued the data collection and canceled that case.

5. After finishing the interview, researcher thanked the samples for their cooperation.

6. Researcher calculated the scores based on instructions and prepare for data analysis.

Data Analysis

Data were analyzed using statistical software as follows:

1. Frequencies, percents, and means of personal information and levels of disease severity.
2. Means and standard deviations (S.D.) of scores from perceived barrier, perceived self-efficacy, social support, and compliance in COPD patient sections.
3. Pearson's Product Moment Correlation Coefficient between perceived barrier, perceived self-efficacy, social support, disease severity, and compliance in COPD patient at significant levels of .05
4. Stepwise multiple regression technique for predictive ability of perceived barriers, perceived self-efficacy, social support, and levels of disease severity in COPD patients.

CHAPTER IV

RESULTS

Results of the study

This study examines the influences of several factors, namely disease severity, perceived barriers, perceived self-efficacy, and social supports, on compliance among COPD patients. The data were collected with 100 COPD patients at out patient department, Chest Disease Institute, Nonthaburi province. Results from this study are presented in tables located in each section:

Section 1: General characteristics of the samples, presented in percentages as classified by gender, age, marital status, religion, educational level, occupations, average family income, adequacy of income, source of hospital financial support, person whom the patients live with, person providing care for the patient, number of time and duration of hospital during the previous year, are presented in tables 1 to 5

Section 2: Levels of disease severity using FEV₁ and disease severity classification are presented in percentages in table 6.

Section 3: Compliance among COPD patients, presented in percentages, mean, and standard deviation are presented in tables 7 to 9.

Section 4: Relationships between compliance and perceived barriers, perceived self-efficacy, social supports, and disease severity among COPD patients are presented in table 10.

Section 5: Predictive abilities of independent variables on compliance among COPD patients are presented in table 11.

Table 1 Demographic characteristics of COPD patients classified by gender, age, marital status, and religion (n = 100)

Sample Characteristics	Number	Percent
Gender		
Male	82	82
Female	18	18
Religion		
Buddhism	97	97
Muslim	3	3
Marital Status		
Single	2	2
Married	78	78
Widowed/Divorced/Separated	20	20
Age (years)		
45 – 59	16	16
60 – 74	60	60
≥ 75	24	24
Mean = 67.82, S.D. = 8.79		
Min = 46, Max = 85		

Table 1 shows that a large number of the samples were male (82 percent). The vast majority were Buddhist (97 percent). More than three quarters were married (78 percent). Sixty percent (60%) aged between 60 to 74 years old with an average age of 67.82. The maximum age of the samples was 85 years old, while the youngest was 46 years old.

Table 2 Demographic characteristics of COPD patients classified by educational level and occupation (n = 100)

Sample Characteristics	Number	Percent
Educational Level		
None	5	5
Primary School	69	69
Secondary School	16	16
Vocational Diploma/Associate Degree	4	4
Bachelor Degree and above	6	6
Occupation		
Merchandise	12	12
Agriculture (rice farming, fruits and vegetable farming, raising livestock)	13	13
General hired worker (construction, goods lifting, etc.)	7	7
Government Services	1	1
State enterprise/business/private Company	1	1
Did not work	49	49
Others (e.g. retired)	17	17

According to table 2, it was found that the majority of the samples had primary school education (69 percent). Similar proportion (66 percent) did not have current occupation (49 percent being did not work and 17 percent being retired).

Table 3 Demographic characteristics of COPD patients classified by average family income, adequacy of income, and source of hospital financial support (n = 100)

Sample Characteristics	Number	Percent
Average family income (Baht/month)		
≤ 1,000	16	16
1,001-5,000	45	45
5,001-10,000	15	15
10,001-50,000	24	24
Mean = 8,959.00 SD = 11,050.33		
Min = 200 Max = 50,000		
Adequacy of income		
Adequate	65	65
Inadequate	35	35
Source of hospital financial support		
Own expenses	27	27
Reimburse from the government	60	60
Universal coverage	13	13

As shown in table 3, it was found that almost half (45 percent) of the samples have an average monthly family income ranging from 1001-5000 Baht. The highest salary was 50,000 Baht per month, while the lowest salary among the samples was 200 Baht per month. The majority of the samples had adequate income (65 percent). Sixty percent could reimburse the hospital costs from the government.

Table 4 Demographic characteristics of COPD patients classified by person whom the patients live with, person providing care for the patient, and the duration of illness (n = 100)

Sample Characteristics	Frequency	Percent
Person whom the patients live with (choosing all that applies)		
Spouse	71	51.08*
Son/Daughter	60	43.17*
Relatives	6	4.31*
Live alone	1	0.72*
Others (i.e. friends)	1	0.72*
Person providing care for the patient		
Spouse	51	51
Son/Daughter	42	42
Relatives	5	5
Self	1	1
Others (i.e. friends)	1	1
Duration of illness (year)		
1-10	83	83
11-20	12	12
21-30	3	3
≥ 31	2	2
Mean = 6.55 S.D. = 7.84 Min = 1 Max = 40		

* Total does not equal a hundred due to rounding.

According to table 4, the majority of the samples live with spouses or sons/daughters (51.08 and 43.17 percents, respectively). Spouses were the primary person providing care for COPD patients (51 percent). The duration of the illness among the sample was between 1 to 10 years (83 percent), with the maximum duration of illness of 40 years and the minimum of 1 year.

Table 5 Number of hospital admission, length of stay during hospital admission, duration between last hospital admission and present, and number of visit at the emergency department during the past year of COPD patients (n = 100)

Sample Characteristics	Number	Percent	Mean	S.D.	Min.	Max
Number of hospital admission in the past year (time)			1.44	2.22	0	10
≤ 5	94	94	-	-	-	-
6-10	6	6	-	-	-	-
Length of stay during hospital admission (day)			4.27	7.49	0	48
≤ 10	83	83	-	-	-	-
11-20	12	12	-	-	-	-
21-30	3	3	-	-	-	-
≥ 31	2	2	-	-	-	-
Duration between last hospital admission and present (day)			57.27	99.69	0	365
≤ 30	70	70	-	-	-	-
31-180	21	21	-	-	-	-
181-365	9	9	-	-	-	-
Number of visit at the emergency department in the past year (time)			2.57	3.79	0	15
≤ 5	86	86	-	-	-	-
6-10	10	10	-	-	-	-
≥ 11	4	4	-	-	-	-

From table 5, it was found that the vast majority of the samples were admitted to the hospital 5 times or fewer (94 percent). Each admission mostly took no longer than 10 days (83 percent). Number of days between last hospital admission and present did not exceed 30 days (70 percent). Eighty six percent of the samples visited the emergency department 5 times or fewer during the past year.

Table 6 Percentage of COPD patients' levels of disease severity using FEV₁ and disease severity classification (n = 100)

Level of %FEV ₁ (Level of Disease Severity)	Number	Percent
≥ 81 (Level 1)	3	3
70 - 80 (Level 2)	22	22
50 - 69 (Level 3)	52	52
30 - 49 (Level 4)	23	23
≤ 29 (Level 5)	0	0
Maximum FEV ₁ = 87		
Minimum FEV ₁ = 32		

According to table 6 shows the levels of disease severity and it was found that the majority of the sample (52 percent) were at Level 3 (FEV₁ 50-69%). The highest FEV₁ level found among the samples were 87 percent and the lowest FEV₁ level of 32 percent.

Table 7 Mean and standard deviation of compliance among COPD patients in different activities (n = 100)

Compliance in COPD patients	Mean	S.D.	Interpretation
Nutrition			
1. Avoid from eating too much each day	2.51	0.78	Very Good
2. Eat complete meal (containing rice or starch, meat, oil, fruits and vegetables) each day	2.27	0.90	Very Good
3. Avoid from food that produce gas in digestive system	1.12	0.91	Fair
4. Drink at least 8 glasses of water each day	1.36	1.28	Fair
Rest			
5. Rest during day time by doing activities such as listening to radio, watching television, reading newspaper, taking a nap	2.49	0.83	Very Good
6. Sleep at least 6 hours each night	2.09	1.07	Good
7. Avoiding from using sleep inducing pills	2.40	0.98	Very Good
8. Consult with close friends or others when worried	1.92	1.03	Good
9. Do other activities that make them feel pleasurable or relax	2.15	0.98	Good
Physical exercise			
10. Exercise such as walk, jog, or do arms and legs exercise 20-30 minutes each time	1.74	1.24	Good
Breathing exercise			
11. Inhale deeply through nose and exhale by blowing slowly through mouth. Do at least 5 minutes each time	1.13	1.23	Fair

Table 7 Mean and standard deviation of Compliance among COPD patients in different activities (n = 100) (continued)

Compliance in COPD patients	Mean	S.D.	Interpretation
Effective cough			
12. Inhale deeply, hold the breath, and cough out when having viscous secretion	0.99	1.07	Fair
13. Frequently drink or sip warm water when having viscous secretion	1.64	1.28	Good
Avoiding from irritants			
14. Stop smoking	2.63	0.93	Very Good
15. Avoid from persons with common cold, from places with lots of dust, smoke, or crowd such as movie theaters or markets	2.03	1.10	Good
16. Use cloths to cover mouth and nose when entering places with lots of dust or smoke	1.15	1.21	Fair
17. Consult doctors when having cold, fever, and sore throat	1.57	1.05	Good
Follow up			
18. Come to doctor's appointment regularly	2.91	0.32	Very Good
Medications			
19. Take all prescribed medications every day	2.53	0.67	Very Good
20. Take prescribed medications on time every day	2.52	0.64	Very Good
21. Do not double the dosage when forgetting the previous dose	2.87	0.46	Very Good
22. Do not adjust dosage by themselves when having asthmatic symptoms	2.70	0.69	Very Good
23. Do not purchase medications from drug store by themselves	2.14	0.84	Good
24. Keep the medications away from sunlight and heat	2.97	3.17	Very Good

Table 7 shows compliance in COPD patients in different areas.

Nutrition: It was found that the samples avoid from eating too much and eat complete meals which comprised of rice or starch, meat, oil, fruits and vegetables each day in a very good level (Mean = 2.51, S.D. = 0.78 and Mean = 2.27, S.D. = 0.90, consecutively). Activity that was found in fair level was drinking at least 8 glasses of water each day and avoiding from food that produce gas in digestive system (Mean = 1.36, S.D. = 1.28 and Mean = 1.12, S.D. = 0.91, consecutively).

Rest: Compliance in a very good level was found in resting during day time by doing activities such as listening to radio, watching television, reading newspaper, and taking a nap and avoiding from using sleep inducing pills (Mean = 2.49, S.D. = 0.83 and Mean = 2.40, S.D. = 0.98, consecutively). Compliance in a good level includes doing other activities that make them feel pleasurable or relax, sleeping at least 6 hours each night, and consulting with close friends or others when worried (Mean = 2.15, S.D. = 0.98, Mean = 2.09, S.D. = 1.07, and Mean = 1.92, S.D. = 1.03, consecutively).

Physical exercise : It was found that the samples comply with activity in this area in a good level (Mean = 1.74, S.D. = 1.24).

Breathing exercise: The samples' compliance level in activity in this area was rated as fair (Mean = 1.13, S.D. = 1.23).

Effective cough: Activities in this area that was rated as good include frequently drinking or sipping warm water when having viscous secretion (Mean = 1.64, S.D. = 1.28), while activities that was rated as fair was if the samples inhale deeply, hold the breath, and cough out when having viscous secretion (Mean = 0.99, S.D. = 1.07).

Avoiding from irritants: Activity that was rated as very good was that the samples stop smoking (Mean = 2.63, S.D. = 0.93). Activities in good level were avoiding from places with lots of dust or smoke and consulting with doctors when having symptoms (Mean = 2.03, S.D. = 1.10 and Mean = 1.57, S.D. = 1.05, consecutively). Activity rated as fair was using cloths to cover mouth and nose when entering places with lots of dust or smoke (Mean = 1.15, S.D. = 1.21).

Follow up : The samples comply with activities in this area in a very good level (Mean = 2.91, S.D. = 0.32).

Medication: Most activities were rated as a very good level including keeping the medications away from sunlight and heat (Mean = 2.97, S.D. = 3.17), not doubling the dosage when forgetting the previous dose (Mean = 2.87, S.D. = 0.46), not adjusting the dosage by themselves when having asthmatic symptoms (Mean = 2.70, S.D. = 0.69), taking all prescribed medications every day (Mean = 2.53, S.D. = 0.67), and taking prescribed medications on time every day (Mean = 2.52, S.D. = 0.64). One activity rated in a good level was not purchasing medications from drug store by themselves (Mean = 2.14, S.D. = 0.84).

Table 8 Compliance in overall and in eight areas from highest to lowest scores (n = 100)

Compliance in COPD patients	Range of the Score		Adjusted Mean*	S.D.	Interpretation of Adjusted Mean
	Instrument	Sample			
Overall compliance	0-72	29-67	2.08	0.36	Good
- Follow up	0-3	1-3	2.91	0.32	Very good
- Medication	0-18	8-18	2.63	0.36	Very good
- Rest	0-15	4-15	2.21	0.57	Good
- Avoiding from irritants	0-12	0-12	1.84	0.68	Good
- Nutrition	0-12	2-11	1.82	0.57	Good
- Physical exercise	0-3	0-3	1.74	1.24	Good
- Effective cough	0-6	0-6	1.32	0.89	Fair
- Breathing exercise	0-3	0-3	1.13	1.23	Fair

*Adjusted mean is the mean adjusted from mean of raw scores divided by number of items in each category

As shown in table 8, overall compliance among COPD patients was at a good level (Mean = 2.08, S.D. = 0.36). Upon examining each category, compliance in regular check up and medication were at a very good level. Compliance category including rest, avoiding from irritants, nutrition, and physical exercise were at a good level. Fair level was given to compliance activities being effective cough and breathing exercise.

Table 9 Level of compliance in COPD patients (n = 100)

Level of Compliance	Number	Percent
Very Good	24	24
Good	67	67
Fair	9	9
Poor	0	0

According to table 9, the compliance levels among the samples (n = 100) were found mostly in a good level (67 percent), following by a very good level (24 percent), and a fair level (9 percent), respectively.

Table 10 Pearson's Product Moment Correlation Coefficient of the study variables (n = 100)

Variables	1	2	3	4	5
1. Perceived Barriers	1.000				
2. Perceived Self Efficacy	-.800**	1.000			
3. Social Supports	-.427**	.469**	1.000		
4. Disease Severity	.085	-.013	.095	1.000	
5. Compliance	-.624**	.621**	.407**	-1.08 ^{ns}	1.000

** p < .01, ns = not significant at $\alpha = .05$

According to table 10, a significant negative relationship was found between perceived barriers and compliance ($r = -.624$, $p < .01$).

A significant positive relationship was found between perceived self-efficacy and compliance ($r = .621$, $p < .01$).

A significant positive relationship was found between perceived social supports and compliance ($r = .407$, $p < .01$).

A relationship between disease severity and compliance was not significant ($p > .05$).

When considering the level of relationships between independent variables and compliance in COPD patients, the highly correlated significant relationship was found between compliance and perceived barriers ($r = -.624$, $p < .01$), followed by perceived self-efficacy ($r = .621$, $p < .01$), and social support ($r = .407$, $p < .01$), respectively.

Table 11 Multiple correlation coefficient between independent variables (predictors): perceived treatment barriers, perceived self-efficacy, social supports, and disease severity, and dependent variable: compliance in COPD patients using stepwise multiple regression (n = 100)

Step	Predictor	R	R ²	R ² Change	F Change	b	Beta	t	P- value
1	Perceived Barriers	.624	.389	.389	62.517	-2.484	-.624	-7.907	.000
2	Perceived Barriers and Perceived Self-efficacy	.656	.431	.041	7.009	-1.613 1.588	-.353 .388	-2.767 2.647	.007 .009

Constant (a) = 45.421, R² adjust = .419, S.E. = 4.673, Overall F = 36.679

As shown in table 11, perceived barriers being the variable with the highest level of relationship (R = .624) with compliance were introduced in step1 of the stepwise multiple regression included perceived barriers yielding predictive coefficient of .389 (R² = .389). The perceived barriers in step1 was able to predict compliance for about 38.9 percent at p-value = .01. When adding perceived self-efficacy in step 2 of the stepwise multiple regression, the multiple correlation coefficient was at .656 (R = .656) and the predictive coefficient improved to .431 (R² = .431). At this step, both perceived barriers and perceived self-efficacy together were able to predict compliance in COPD patients for about 43.1 percent at p-value = .01. When adding other variables such as social supports and disease severity in the following steps, the predictive coefficients were not statistically significant. The stepwise multiple regression was therefore stopped at the second step with two independent variables namely perceived barriers and perceived self-efficacy, providing 43.1 percent predictive ability at p-value = .01.

CHAPTER V

DISCUSSION

This chapter discusses effects of independent variables such as perceived barriers, perceived self-efficacy, social supports, and disease severity on compliance in COPD patients. The discussion section is presented according to research objectives and hypotheses.

General Characteristics of the Samples

The majority of the samples were male (82 percent). Sixty percent (60%) aged between 60 to 74 years old. According to the national statistics, COPD was found in males more than females and more in elderly than other age groups (Chupraphawan, 2000). Similarly, previous studies found male samples more than female counterparts (Akanit, 1993; Kurat, 1996; Sangthong, 1997; Wirat, 2001), because smoking behavior was found in males more than females. Smoking is the primary cause of COPD and usually takes about 20-30 years after the start smoking to show COPD symptoms (Wongtim & Nuchprayoon, 1999; Theeranut, 1999; Weinberger, 2004). The symptoms directly affect ability to perform activities causing a lot of COPD patients to quit working prematurely and cannot work afterwards. This study found that 66 percent did not work. The majority of the samples live with spouses or sons/daughters (71 and 60 percents, respectively). About half of the samples were taken care by spouses or son/daughter (51 and 42 percent, respectively). The duration of COPD was mostly 1-10 years (83 percent). Admission to the hospital mostly took no longer than 10 days (83 percent). Eighty six percent of the samples visited the emergency department 5 times or fewer during the past year. The levels of disease severity that was found in the majority of the sample (52 percent) were at Level 3 (FEV₁ 50-69%).

Objective 1: To examine compliance levels in COPD patients.

Compliance levels in COPD patients

This study found that overall compliance among 100 samples was at good level with mean score of 2.08 (Mean = 2.08, S.D. = 0.36) (Table 8), meaning that health promoting behaviors through complying with treatment plan and advices given by physicians and nurses among samples were good. When examining different categories of compliance behaviors, the highest score was in Follow up, followed by medication, rest, avoiding from irritants that can aggravate COPD symptoms, nutrition, physical activities, effective cough, and breathing exercise (table 8). Compliance in each area can be explained in details as follows:

Follow up

The sample keep regular check-ups with physicians at very good level (Mean = 2.91, S.D. = 0.32). Several factors contributed to very good compliance behavior in this area might include the reason that two-third did not have current occupation (66 percent) and aged between 60-70 years old (60 percent). Elderly usually take better care of their health than those who are younger (Chibsamanboon, 2000). Not having to worry about works, elderly can participate in different activities, incorporating with being cared by their spouses and sons/daughters, elderly can usually comply with check-up requirements better. Data from the interview show that the samples usually come to doctors' appointments with spouses or sons/daughters. Approximately 90 percent were taken to the institute by their families (Appendix E). Helps from their families encourage patients to comply with treatment program (Pender, et al., 2002).

About 60 percent of the samples could reimburse the medical cost from the government and 16 percent used universal coverage cards (gold cards); meaning that these two groups did not have to worry about paying for medical cost when coming to the check-ups. The majority of the samples were satisfied and confident about the treatments they received. They said that the process of the services is not complicated. Nurses and staffs clearly explained the process. They could see the same doctor every time. Appointments were 1-2 months apart so they did not have to come too often. Eighty percent of the samples did not feel that seeing the doctor regularly waste their time. Additionally, 81 percent felt they could come to the check-ups regularly (Appendix E). When persons do not perceive that activities they perform are difficult

or burden, and if they are confident in their ability to perform, they will be motivated to perform such activities continuously (Pender, et al., 2002). Similar results were found in Sangthong's study (1997) on elderly with COPD who regularly came to the doctors' appointments (64.8 percent) and Tuan's study (1999) on SLE patients who regularly came to the appointments (60 percent). Reasons for not coming to doctors' appointments in this study included forgetting the appointments, having a conflict of the appointment, and not having persons to take them to the appointments.

Medications

The samples take medications regularly at a very good level (Mean = 2.63, S.D. = .36). The majority of the samples have had COPD for about 1-10 years (83 percent). Having the disease for quite some time made them knowledgeable and experienced about the exacerbation of the disease resulting from not taking medications regularly (Hasler, 1990). Patients in this group usually take medications regularly to control the symptoms of the disease (McGavock, 1996, cited in Rudkin, 2001). It is not difficult to follow the medication regimen because the amounts of medications patients have to take each time are not too many and they do not have to take them too frequently (not more than 2 times each day). When adding to the good consequences of taking medications, patients are usually comply well with medications. It was found in this study that the samples take all prescribed medications and take prescribed medications on time every day (Mean = 2.53, S.D. = .67 and Mean = 2.52, S.D. = .64, respectively).

When come to the appointments at the hospital, patients have a chance to receive instructions about drug use from pharmacists and assistants, including media and information provided about drug use during the hospital visits (Unsamatham et al. 2001). Results from this study showed that the samples kept the medications away from sunlight and heat (Mean = 2.90, S.D. = .17), did not double the dosage when forgetting the previous dose (Mean = 2.87, S.D. = .46), did not adjust dosage by themselves when having asthmatic symptoms (Mean = 2.70, S.D. = .67), and did not purchase medications from drug store by themselves (Mean = 2.14, S.D. = .84). Compliance in taking prescribed medications occurs when patients do not feel that taking medication is a burden or that it disturbs daily life. This study found that about three-fourth (75 percent) of the samples did not feel taking medication as a burden

(Appendix E) and 73 percent were confident that they could take all medication as prescribed by the physicians (Appendix E). This perception will motivate patients to perform health promoting behavior continually (Pender, et al., 2002). In contrary, Sangthong's study (1997) in elderly with COPD revealed that elderly had difficulties taking medication continuously. That is probably because samples in that study were elderly who were admitted and discharged from the hospitals. Some COPD patients who were admitted to the hospital do not take prescribed medication regularly (Conn, Taylor, & Miller, 1994; Unsamatham et al., 2001). Additionally, this study found patients who purchased medications by themselves (21 percent). Some of them explained that they did not enough time for the doctor's appointment so they purchased the medications from drug stores close to their houses. Although not found in the majority, this practice can be harmful for the patients.

Rest

Overall, the samples comply with activities in this area at the good level with mean of 2.21 (Mean = 2.21, S.D. =.57). The reasons for "good" compliance in this area might be the reason that resting did not provide unpleasant effects to the patients, although with disease severity levels 3 (52 percent) and 4 (23 percent). Among these groups, the samples reported not having dyspnea during the night. It was also found that 86 percent came to the emergency department with the worsening of symptoms not exceeding 5 times each year. Among the samples, 66 percent did not work and 85 percent did not have to do house work (Appendix E). They had more time to rest during the day. From the interview, they said their spouses and kids took care of all the house works. Such family supports help reduced patients anxiety, help adjust to the chronic conditions, and help improve confidence to perform any activities that would promote health (Primomo, Yate, & Wood, 1990; Pender, et al., 2002). It was also found that about 85 percent did not have trouble resting and 77 percent were certain that they could use techniques to help them sleep (Appendix E). These made the samples had appropriate resting behaviors. Behaviors found in this study included resting during day time by doing activities such as listening to radio, watching television, reading newspaper, taking a nap, etc. (Mean = 2.49, S.D. =.83), sleeping at least 6 hours each night (Mean = 2.09, S.D. =1.07), consulting with close friends or

others when worried (Mean = 1.92, S.D. =1.03), and doing other activities that make them feel relax (Mean = 2.15, S.D. =.98).

A proportion of the samples still had inappropriate behavior regarding resting; using drugs like chropheniramine(CPM) to help with sleeping. This result did not support a study by Sangthong (1997) when elderly patients with COPD had trouble with rest; claiming that they did not have time due to the need to do house works. The reason for different was because of different social status and lifestyle of the samples. Sungthong's study collected the data from samples from rural areas with little income. In such situation, when the patient is sick, spouses or family members needed to work for the patients to provide income for the family and the patients then had to do the house work; causing limited time for rest. Unlike this study, the majority of the samples live in Bangkok and surrounding areas where the location yielded different results.

Avoiding from Irritants

Overall, the samples comply with activities in this area at the good level with the mean of 1.85 (Mean = 1.85, S.D. =.68). The majority of the samples reported living with the disease for about 1 – 10 years (83 percent). They were experienced with dyspnea and knew the causes of exacerbation of the disease. The samples revealed said that the causes of dyspnea came after sweeping the floor or inhaling dust or smoke. Some said the symptoms came after smoking or even smelling cigarettes smokes. Experiences from dyspnea and several other symptoms made the patients adjusted for a better behavior (Pender, et al., 2002). Being admitted at the hospital helped the patients avoid from such irritants, plus had information exchanged with other patients with similar symptoms helped the patients learn and motivated them to practice health promoting behaviors that follow their lifestyles (Pender, 1996).

This study showed that the samples avoided from irritants by stop smoking (Mean = 2.63, S.D. =.93, avoiding from places with lots of dust or smoke (Mean = 2.03, S.D. =1.10), and consulting the doctors when having cold, fever, and sore throat (Mean = 1.57, S.D. =1.05). The patients protected themselves by using cloths to cover mouth and nose when entering places with lots of dust or smoke still at a low level (Mean = 1.15, S.D. =1.21). This is perhaps because the patients were not used to using cloths to cover their nose and mouth; some said using cloths caused difficulties

breathing or did not feel like others. The results were similar to Sangthong's findings where COPD patients' compliance level in this level was in fair level; they did not use cloth to cover their mouth because they were not used to. Additionally, this study found that about 15 percent of the samples still smoke, saying that they would not feel comfortable without cigarettes or were worried about something. Any how, they intended to quit smoking by reducing number of cigarettes each day.

Nutrition

The samples complied with activities in this area in a good level (Mean = 1.815, S.D. =.56). As shown in table 1, most of the samples were male (82 percent) and married (78 percent). The patients usually received care including food preparation from spouses and kids. Having the disease for 1-10 years made the patients more experienced in preventing themselves from undesirable symptoms especially when they occurred because of what the patients eat (Theeranut, 1999). According to the interviews, abdominal distention and difficulty in breathing occurred after eating too much. The samples reported avoiding from eating too much each day at a very good level (Mean = 2.51, S.D. =.78), while avoid from food that produce gas in digestive system were at a fair level (Mean = 1.12, S.D. =.91). The samples said they did not know types of food they should avoid, had to purchase food or their spouses cooked for them so they could not choose what to eat. The results were similar to Janchanakit's study (1998) where compliance in nutrition among COPD patients was at a good level.

Physical Exercise

Compliance in this area was at a good level (Mean = 1.74, S.D. =1.24). The majority of the samples was male, ages 60-74, and did not work. Aging group usually pays more attention to health than other age groups. Males also usually exercise more than females (Ngaosomskul, 2000). Persons who exercise regularly means that they are aware of their health and perceive that exercise is a good measure to maintain health. Nowadays, media campaigns to promote physical activities help improve knowledge and understandings about exercise among COPD patients. When having the disease, they usually do not perceive illness as a barrier to exercise. It was found that 63 percent of the samples did not feel exercise as a difficult or complicated

activity and 62 percent were confident that they could exercise regularly (Appendix E). This made the compliance level in this area in good level.

Additionally, it was found that the samples exercised 20-30 minutes each time. Some exercised every day for at least 30 minutes before getting the disease. They followed what is shown in the television and read books about exercises. It was also found that the samples who did not exercise as much as 20-30 minutes usually exercised in a simple manner based on their understanding about exercise such as walking in the house, vibrating their arms 5-10 minutes each day, 2-5 days per week. They did like that because they did not know a proper method and duration of exercise. Some thought that doing house works was an exercise. Some even did not exercise because they were afraid of exhaustion or believed that this disease did not allow exercises. The findings from this study support Ngaosomskul's study (2000) when exercise behaviors among patients with coronary heart disease were at good level; and Kurat (1996) when COPD patients had a higher exercise score.

Effective Cough

Compliance in activities in this areas were found at a fair level (Mean = 1.32, S.D. =.89). This is because the samples did not know how to do, did not know the benefits of effective cough, or even persons in the same family did not know how to do. Only 38 percent of the samples were provided supports in this activity (Appendix E). Additionally, the samples claimed that nurses had taught them but they already forgot; did not have enough energy to do so; relatives did not know how to do; or some felt more exhausted after performing effective cough. From this study, the samples inhaled deeply, held the breath, and coughed out at a fair level (Mean = .99, S.D. =1.07). With lacking of knowledge, understanding, and confident, incorporating with lack of family supports patients tend to lose their attention to perform health promoting behaviors (Pender, et al., 2002) resulting in low compliance score in this area. The results support a study done by Sangthong (1997) when elderly with COPD also had low level of compliance in this area, claiming not knowing how to perform.

Breathing Exercise

The samples complied with breathing exercise activities in a fair level (Mean = 1.13, S.D. =1.23). Breathing exercise, by inhaling deeply through nose and exhaling by blowing slowly through mouth and doing at least 5 minutes each time, helps slow

down the degeneration of the lungs (Make, 1998). The samples' educational level was mostly primary school education (69 percent). This might hinder the ability to understand information or practice guides. Without trainings or appropriate teaching techniques, patients may not know how to practice and are not motivated to practice (Theeranut, 1999). Breathing exercise usually takes some time to see the benefits. Patients might not be patient enough to continue performing. When lacking of family supports is added, patients might not concern and will not comply with such activities.

From this study, 63 percent received general health care information from health care providers. Fifty percent got advices of how to prevent from getting sick from family. However, no information about breathing exercises was provided from their families, resulting in lacking of confident to perform breathing exercises among the patients. According to Pender (1996), persons with lack of confident will lost their motivation and will not participate in health promoting activities. The study found reasons for not performing breathing exercises including: forgotten what have been told, were afraid to ask, did not have enough energy to perform, felt weaker after performing, and even never received information about how to do at all. Some mixed the use of inhalator and breathing exercise. These reasons resulted in the fair level of compliance in this activity. The vast majority of the samples (94 percent) were admitted to the hospital 5 times or less each year. Seventy percent of the samples were admitted frequently (fewer than 30 days of the time lapse) (table 5). These pieces of information should alert nurses and patient care teams to realize the importance and find solutions to the problems. Some of the samples who could perform breathing exercise said that they were taught from private hospitals before coming to the institute. Result from this study support Sangthong's study (1997) when compliance level in elderly with COPD in this area was the least comparing to other areas.

Objective 2: To study relationships between perceived barriers, perceived self-efficacy, social supports, and disease severity with compliance in COPD patients

Hypothesis 1: Perceived barriers are negatively correlated with compliance in COPD patients

Results from this study supported the hypothesis and showed a significant negative relationship between perceived barriers and compliance in COPD patients at $p = .01$ ($r = -.624$). Perceived barriers are the perception of the barriers that prevent from performing health promoting behaviors, whether they are real or only expected. Barriers can prevent a person from performing behaviors or can cause a person to avoid from performing behaviors. These barriers directly affect health promoting behaviors by directly preventing actions and indirectly affect intention in planning for health promoting behavior; reducing the intention to perform behaviors (Pender, et al., 2002). Patients with high level of perceived barriers or with low level of readiness in performing behaviors will reduce intention to perform behaviors. Actions will not happen according to treatment plan. It was found from this study that the samples had relatively low level of perceived barriers with a mean of 2.78 (Mean = 2.78, S.D. = 1.89, skewness = .416) and ranging from 0-8 from the total of 0-9 from the instrument (Appendix E).

This study supports the findings from Sangthong's study (1997) when perceived barriers were negatively associated with compliance in elderly patients with COPD ($r = -.438$, $p < .001$); from Chanchakit's study (1998) when perceived barriers were negatively associated with compliance in health promoting behaviors among COPD patients; and from Thongpila's study (1999) when perceived barriers were also negatively associated with health promoting behaviors in patients with hypertension ($r = -.440$, $p < .001$).

Hypothesis 2: Perceived self-efficacy is positively correlated with compliance in COPD patients

Result from this study supported the hypothesis and showed a significant positive relationship between perceived self-efficacy and compliance in COPD patients at $p = .01$ ($r = .621$). COPD patients with high self-efficacy will have high level of compliance. In contrary, patients with low self-efficacy will have low or even no compliance in treatment. Self-efficacy is a source of motivation and influence on health promoting behaviors, especially if the patients are capable of performing certain activities before or other persons similar to the patients can perform activities (Pender, et al., 2002; Moore, 1990). Such situations help build self-efficacy in performing

certain activities and in compliance in treatment plan. Samples in this study had a moderate level of self efficacy (Mean = 5.38, S.D. = 1.84, skewness = -.550) with the score ranging from 1-8 from the total of 0-8 from the instrument (Appendix E).

This study supports a study done by Scherer and Bruce (2001) when they found that perceived self-efficacy had a significant positive relationship with compliance in using peak-flow meter, had a significant negative relationship with number of emergency department visits, and had a significant negative relationship with number of hospital admission in asthma patients ($r = .319$, $p < .05$, $r = -.382$, $p < .05$, and $r = -.561$, $p < .001$, respectively). Janchanakit (1998) and Kurat (1996) found that perceived self-efficacy had a significant positive relationship with health promoting behaviors in patients with chronic lung disease and COPD ($r = .566$, $p < .001$, and $r = .235$, $p < .01$, respectively). It was also found that perceived self-efficacy had significant positive relationships with self care behaviors in patients with ischemic heart disease ($r = .76$, $p < .001$) (Charoenwongwiwat, 1995), chronic renal failure ($r = .516$, $p < .001$) (Chibsamanboon, 2000), tuberculosis ($r = .802$, $p < .001$) (Wongsonton, 2000), and hypertension ($r = .535$, $p < .01$) (Onchim, 2002).

Hypothesis 3: Social supports are positively associated with compliance in COPD patients

This study support the hypothesis and found a significant positive association between social supports and compliance at $p = .01$ ($r = .407$), showing that patients with higher social supports usually had higher compliance level. In contrary, patients with lower social supports had lower or did not have compliance. It can be described that social supports had both direct and indirect influence on health promoting behaviors (Pender, et al., 2002). Sources of social supports might come from families, friends, or health care personnel. Family is the best source of support. Half of the samples (51 percent) received supports from spouses and 42 percent from their children. COPD patients who receive adequate supports from families, friends, or health care personnel will feel empowered and motivated to received treatments and follow the treatment plans and advices. In contrary, if patients receive fewer or no supports, patients will feel desperate, lack of motivation and will not pay attention to treatment plans, resulting in aggravation of the disease. It was found that patients with

higher social supports were admitted to the hospital less frequently than those with lower social supports (Jensen, et al., 1994 cited in Margereson, 2001). Samples in this study were found having relatively high social support (Mean = 14.41, S.D. = 3.44, skewness = 1.366) with the score ranging from 3-18 from the total of 0-18 from the instrument (Appendix E).

The study supports the result from Xiaolian et al.'s study (2002) when family supports were found positively associated with compliance in COPD patients ($r = .252$, $p < .01$). Sources of supports were mostly from spouses (70.4 percent) and children (26.5 percent). Sangthong's study (1997) found a significant positive association between social supports and compliance in COPD patients ($r = .32$, $p < .01$). Wichitwathee (1991) also found a significant positive association between social supports and self care behaviors in amputated patients ($r = .64$, $p < .001$).

Hypothesis 4: Disease severity is negatively associated with compliance in COPD patients

This study found no significant relationship between diseases severity and compliance in COPD patients ($p > .05$). It can be interpreted that patients with different levels of disease severity may not have different compliance. The result does not support Pender's statement (Pender, et al., 2002) when physiological status (i.e. disease severity) has an effect on health promoting behaviors which means compliance behaviors in this study.

Although slightly more than half of the sample (52 percent) had the disease severity at level 3 ($FEV_1 = 50-69\%$), followed by 23 percent at level 4 ($FEV_1 = 30-49\%$), the majority of the samples comply well with treatment recommendations. It is probably because the samples received high level of social supports (Mean = 14.41, S.D. = 3.44, skewness = 1.366) and, from the interviews, the patients received cares from spouses and children. It appeared in this case that social supports especially from families were the most important to patients' health behaviors (Simons & Johnson, 1996, cited in Pender, et al., 2002). Patients participated in activities that comply with treatment recommendations such as taking medications, having regular follow-ups, etc. Although with high level of disease severity, patients were taken to the follow-ups or were taken care in medication by their families. This study supported the findings in

Yimwilai (1988), Chibsamanboon, (2000), and Kapraedee (1998) when disease severity were not significantly associated with self-care behaviors in patients with asthma ($p > .05$) and chronic renal failure ($p > .05$), and with health promoting behaviors patients with BPH ($p > .05$).

Objective 3: To study predictive power of perceived barriers, perceived self-efficacy, social supports, and disease severity on compliance in COPD patients

Hypothesis 5: Perceived barriers, perceived self-efficacy, social supports, and disease severity can predict compliance in COPD patients.

The study showed factors that could predict compliance in COPD patients: perceived barriers and perceived self-efficacy. The predictive ability was at 43.1 percent at $p = .01$. It can be explained and concluded from hypothesis 5 as follows:

Perceived barriers to treatment recommendations was the factor that had the highest impact on compliance in COPD patients. With $r = .624$, this factor was included in the predictive equation and could predict compliance at about 38.9 percent at $p = .01$.

Perceived self-efficacy was the second factor included in the stepwise multiple regression procedure, as explained in hypothesis 2, with slightly lower level of relationship with compliance ($r = .621$). Both perceived barriers and perceived self-efficacy could predict compliance in COPD patients with a higher level (43.1 percent) at $p = .01$.

Social supports, even though having a significant positive relationship with compliance ($r = .407$, $p < .01$), was not included in the predictive equation, probably because it has an interrelationships with perceived barriers ($r = -.427$, $p < .01$) and perceived self-efficacy ($r = .469$, $p < .01$). When both variables were introduced in the equation first, the social support variable, with lower level of relationship, was rejected from the equation during the stepwise multiple regression procedure. Moreover, disease severity was another variable rejected from the equation because of no significant relationship with compliance. Therefore both social supports and

disease severity were two variables not included in the predictive equation for compliance in COPD patients.

It can be concluded in this study that there were only two variables, perceived barriers and perceived self-efficacy, which could predict compliance in COPD patients for 43.1 percent. The rest 56.9 percent that could not be explained in this study might be other factors that affect health promoting behaviors based on Pender's conceptual model (Pender, et al., 2002). Other factors not included in this study were prior related behavior, perceived benefits of action, activity-related affect, and situational influences. Pender stated that these factors can both directly and indirectly influence health promoting behaviors.

The results from this study could, therefore, support only a part of Pender's Health Promotion Model (Pender, 1996, 2002). It was found that perceived barriers and perceived self-efficacy influenced health promoting behaviors, which are compliance behaviors in this study. Perceived barriers to treatment recommendations are barriers to treatment and indirectly reduce patients' intention in performing behaviors. Perceived self-efficacy is a source of motivation of compliance. Perceived barriers have a negative impact on compliance, while perceived self-efficacy has a positive impact on compliance in COPD patients. It can be concluded that patients who do not perceive the treatment recommendations as complicated, time-consuming, or less troubled will comply to the treatment recommendations well. Patients with high level of self-efficacy will also comply well to the treatment recommendations.

CHAPTER VI

CONCLUSION

Conclusion of the Study

This study is a descriptive research aiming to examine factors influencing compliance in COPD patients. Compliance is consisted of perceived barriers, perceived self-efficacy, social supports, and disease severity.

Sample selection was done through purposive sampling method. Samples included in this study were 100 patients who were diagnosed with Chronic Obstructive Pulmonary Disease (COPD) at the Chest Disease Institute through history takings, physical examinations, chest x-ray, and FEV₁ from Pulmonary Function Test (PFT). The samples must not have complications in respiratory system such as heart failure, pulmonary tuberculosis, or lung cancer. The diagnosis and treatment of the samples were done by physicians specialized in respiratory disease. The data were collected during November 2004 and January 2005.

Instrument used in this study comprised of general characteristics of the samples, level of disease severity, perceived barrier, perceived self-efficacy, social support, and compliance in COPD patient measurements. The instrument reliabilities were measured using Cronbach's alpha coefficient and results in each section are perceived barrier measurement = 0.55, perceived self-efficacy measurement = 0.67, social support measurement = 0.82, and compliance in COPD patient measurement = 0.70

The data were collected through interviews, by researcher being a sole interviewer. The collected data were analyzed using statistical software as follows:

1. Frequencies, percents, and means of personal information and levels of disease severity.
2. Means and standard deviations (S.D.) of scores from perceived barrier, perceived self-efficacy, social support, and compliance in COPD patient sections.
3. Pearson's Product Moment Correlation Coefficient between perceived

barrier, perceived self-efficacy, social support, disease severity, and compliance in scores in COPD patient at significant levels of .05

4. Stepwise multiple regression technique for predictive ability of perceived barriers, perceived self-efficacy, social support, and levels of disease severity on compliance in COPD patients.

It can be concluded from the study that:

1. A large number of the samples were male (82 percent). The vast majority were Buddhist (97 percent). More than three quarters were married (78 percent). Sixty percent (60%) aged between 60 to 74 years old. The majority of the samples not have current occupation (66 percent). Almost half (45 percent) of the samples have an average monthly family income ranging from 1001-5000 Baht. Sixty-five percent of the samples felt that they had had adequate income and sixty percent could reimburse the hospital costs from the government. The majority of the samples live with spouses or sons/daughters (71 and 60 percents, respectively). Spouses were the primary person providing care for COPD patients (51 percent), following by sons/daughters (42 percent). The duration of the illness among the sample was between 1 to 10 years (83 percent). Eighty six percent of the samples visited the emergency department 5 times or fewer during the past year. Fifty-two percent of the sample were at Level 3 (FEV₁ 50-69%).

2. The overall compliance in COPD patients were at “good” level (Mean = 2.08, S.D. = 0.36) (Table 8). Upon examining different categories of compliance behaviors, the areas that were rated as “very good” included regular check-up and medication. Areas that were rated as “good” were rest, avoiding from irritants that can aggravate the symptoms, nutrition, and physical activities. Compliance areas that were rated as “fair” were effective cough and breathing exercise.

3. The analysis of variable relationships using Pearson’s Product Moment Correlation Coefficient showed a significant negative relationship between perceived barriers and compliance ($r = -.624$, $p < .01$), a significant positive relationship between perceived self-efficacy and compliance ($r = .621$, $p < .01$), and a significant positive relationship between perceived social supports and compliance ($r = .407$, $p < .01$). However, the relationship between disease severity and compliance were not statistically significant ($r = -1.08$, $p > .05$).

4. Upon examining multiple correlation coefficient between independent variables (predictors) and a dependent variable using stepwise multiple regression, it was found that perceived barriers and perceived self-efficacy together were able to predict compliance in COPD patients for about 43.1 percent at $p\text{-value} = .01$.

Recommendations

The researcher provides recommendations in two different areas as follows:

1. Recommendations for nursing practices

1.1 Several factors that affect compliance in COPD patients should be assessed, especially perceived barriers, perceived self-efficacy, and social supports that related to the treatment plan for COPD. Results from this study clearly demonstrate that these three factors can influence compliance; especially perceived barriers and perceived self-efficacy are significantly associated with compliance in COPD patients. Assessment in these factors should be focused among nurses who provide care for COPD patients both in the hospital and at home to promote compliance among these patients. This will certainly reduce exacerbation of the disease and minimize length of stay in the hospital, yielding the improvement of patients' general health and quality of life.

1.2 Nurses should set up a set of standard nursing care activities that promote the understanding of nature of disease and rehabilitation techniques such as breathing exercise, physical activities, and effective cough for patients and families. Results from this study show that the most concerned problems related to compliance is breathing exercise, followed by effective cough behavior and exercises. Moreover, it was found that some patients adjusted the medications or even purchased medications from drug stores by themselves. Although not in a majority of the samples, these behaviors could be dangerous for patients' lives. The major reasons for these problems are lacking of knowledge and skills related to self-care for COPD, including lacking of correct understanding about drug usage. Nurses should be aware of these issues and set up a set of care activities that promotes the patients knowledge about self-care and promotes skills necessary for patients, starting from admission to the hospital until being discharged from the hospital. By doing this, patients will become knowledgeable and will be more confident in practicing such activities. Moreover,

patients will realize the importance of compliance in treatment of COPD. Perceived barriers will be minimized. If incorporating with social supports from family, patients' compliance will continually improve. This study clearly shows the influence of social supports on perceived barriers and perceived self-efficacy. Different techniques including languages should be tailored based on each patient. Different techniques may include individual or group teaching, using various technologies such as video information, return demonstrated, manual, or leaflet/brochures.

1.3 Develop an effective referral system for the continuing of care for COPD patients.

1.4 Provide education including trainings about care and rehabilitation techniques for nurses and persons who are involved in care providing for COPD patients or patients with other respiratory diseases for them to apply in teaching and training patients to become more skillful in self-care in the long run.

2. Recommendations for future researches

2.1 Study on compliance in different areas such as breathing exercise, effective cough, physical activities, etc. should be done in patients with low level or patients who never receive any kinds of training or information before. The study should be done in experimental or quasi-experimental designs.

2.2 More study should be done in other aspects of perceived barriers and perceived self-efficacy. These factors can be studied in different genders, educational levels, disease severity, etc.

2.3 This study was conducted at the out patient department while the samples came for their follow up treatment. There might be some bias in recruiting the samples who were willing to attend the follow up treatment. These groups of the patients might not show non-compliance behaviors. It is therefore recommended that in the next study, patients who should be recruited in the study should include ones who missed the follow up treatment.

2.4 In this study, there was no correlation between compliance and severity of disease. This might be due to the measurement problem. In order to achieve an accurate measurement, the instruments to measure patients' compliance as well as severity of disease should be revised for their validity and sensitivity.

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ในตนเอง การสนับสนุนทางสังคม กับพฤติกรรมการดูแลตนเองของผู้ป่วยที่สูญเสีย

แขนขา. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาพยาบาลศาสตร์ บัณฑิต

วิทยาลัย มหาวิทยาลัยมหิดล.

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APPENDIX A

LIST OF EXPERTS

The validity of research instruments was assessed by five consulting experts:

Dr. Charoen Chuchottaworn

Department of Medical, Chest Disease Institute

Asst. Prof. Dr. Orasa Panpakdee

Department of Nursing, Faculty of Medicine, Ramathibodi Hospital

Asst. Prof. Dr. Sasima Kusuma Na Ayuthya

Department of Medical Nursing, Faculty of Nursing, Mahidol University

Mrs. Tida Suparoj

Outpatient Department, Chest Disease Institute

Miss Chomnapa Kittisup

Respiratory Care Unit, Chest Disease Institute

APPENDIX B

PERMISSION LETTER OF DATA COLLECTION

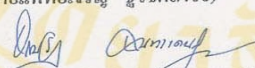


คณะกรรมการจริยธรรมเพื่อการวิจัยสถาบันโรคทรวงอก
กรมการแพทย์
กระทรวงสาธารณสุข

โครงการวิจัย : ปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง
ผู้ดำเนินการวิจัย : นาง วณิดา ตันเจริญรัตน์
สถานที่ทำการวิจัย : สถาบันโรคทรวงอก

คณะกรรมการจริยธรรมเพื่อการวิจัยสถาบันโรคทรวงอก กรมการแพทย์
กระทรวงสาธารณสุข อนุมัติในแจ้งจริยธรรมให้ดำเนินการศึกษาวิจัยเรื่องข้างต้นได้


..... ประธานกรรมการ
(นายแพทย์เจริญ หูโชติถาวร)


..... เลขานุการ
(นายแพทย์ธรรมรัฐ ถันทนแดนสุวรรณ)

รับรองวันที่ 13 ตุลาคม 2547

ที่ สร 0316/ 113/5

สถาบันโรคทรวงอก
ถนนติวานนท์ จังหวัดนนทบุรี 11000

11 เมษายน 2548

เรื่อง อนุญาตให้นักศึกษาเข้ามาเก็บข้อมูลเพื่อประกอบการทำวิทยานิพนธ์

เรียน คณะบดีบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

อ้างถึง หนังสือบัณฑิต มหาวิทยาลัยมหิดล คณะแพทยศาสตร์ศิริราชพยาบาล ที่ สร. 0517.02 (สร)/2127
ลงวันที่ 9 พฤศจิกายน 2547

ตามหนังสือที่อ้างถึง แจ้งว่ามีความประสงค์ขอส่งนางวนิดา ตันเจริญรัตน์ นักศึกษาหลักสูตร
ปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ เข้าเก็บข้อมูลจากผู้ป่วยโรคปอดอุดกั้นเรื้อรัง
ณ ห้องตรวจอายุรกรรม โรคระบบหายใจ แผนกผู้ป่วยนอก สถาบันโรคทรวงอก โดยวิธีสัมภาษณ์ผู้ป่วย
ด้วยตนเอง ตั้งแต่วันที่ 8 พฤศจิกายน 2547- วันที่ 8 มีนาคม 2548 ความละเอียดแจ้งแล้ว นั้น

สถาบันโรคทรวงอก ยินดีอนุญาตให้นางวนิดา ตันเจริญรัตน์ มาเก็บข้อมูลฯ ตามวัน
และสถานที่ดังกล่าวได้ตามความประสงค์

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

(นางพรพรรณ โพธิ์โต)

รองผู้อำนวยการกลุ่มภารกิจอำนวยการ
ปฏิบัติราชการแทน ผู้อำนวยการสถาบันโรคทรวงอกกลุ่มภารกิจอำนวยการ
โทร.0-2580-3423
โทรสาร.0-2589-8450

APPENDIX C

CONSENT FORM

การพิทักษ์สิทธิผู้เข้าร่วมโครงการวิจัย

ดิฉัน นางวนิดา ดันเจริญรัตน์ นักศึกษาปริญญาโท สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล กำลังศึกษาวิจัยเรื่อง “ปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง” ท่านเป็นบุคคลหนึ่งที่มีความสำคัญยิ่งในการให้ข้อมูลครั้งนี้ จึงขอความร่วมมือในการตอบแบบสัมภาษณ์ ซึ่งจะใช้เวลาประมาณ 30-40 นาที แบบสัมภาษณ์ชุดนี้มีทั้งหมด 5 ส่วน คือ

ส่วนที่1 แบบบันทึกข้อมูลส่วนบุคคล และแบบประเมินระดับความรุนแรงของโรค

ส่วนที่2 แบบวัดการรับรู้อุปสรรคต่อการรักษาพยาบาล

ส่วนที่3 แบบวัดการรับรู้ความสามารถของตนเอง

ส่วนที่4 แบบวัดการสนับสนุนทางสังคม

ส่วนที่5 แบบวัดความร่วมมือในการรักษาพยาบาล

การตอบแบบสัมภาษณ์ชุดนี้ท่านสามารถตอบตามความรู้สึกที่แท้จริงส่วนตัวของท่าน ข้อมูลที่ได้จากท่านในครั้งนี้ จะนำไปใช้วางแผนการปฏิบัติการพยาบาลเพื่อส่งเสริมผู้ป่วยโรคปอดอุดกั้นเรื้อรังให้มีพฤติกรรมการให้ความร่วมมือในการรักษาพยาบาลที่เหมาะสมต่อไป การเข้าร่วมการวิจัยในครั้งนี้จะเป็นไปตามความสมัครใจของท่าน ไม่ว่าท่านจะเข้าร่วมการวิจัยหรือไม่ก็ตาม จะไม่มีผลกระทบ ต่อการได้รับบริการหรือการรักษาที่ท่าน หรือผู้เกี่ยวข้อง与您มีสิทธิจะได้รับแต่ประการใด หากท่านยินดีเข้าร่วมการวิจัยหรือเกิดการเปลี่ยนใจในระหว่างการวิจัย ท่านมีสิทธิที่จะถอนตัวได้โดยไม่มีข้อแม้ใดๆ ข้อมูลที่ได้จากท่านทั้งหมดจะเป็นความลับและนำเสนอผลการวิจัยในภาพรวม

ในระหว่างเข้าร่วมการวิจัยถ้าท่านมีข้อสงสัยใดๆ ดิฉันยินดีตอบข้อสงสัยของท่าน ตลอดเวลา การวิจัย ครั้งนี้จะสำเร็จได้ตามวัตถุประสงค์ด้วยความอนุเคราะห์และความร่วมมือจากท่านที่กรุณาเสียสละเวลาในครั้งนี้ จึงขอขอบคุณมา ณ โอกาสนี้ด้วย

วนิดา ดันเจริญรัตน์

ผู้วิจัย

แบบยินยอมเข้าร่วมโครงการวิจัย

วันที่.....เดือน.....พ.ศ.....

ข้าพเจ้า.....อายุ.....ปี อาศัยอยู่บ้านเลขที่.....

หมู่.....ซอย.....ถนน.....ตำบล.....

อำเภอ.....จังหวัด.....

ได้รับทราบรายละเอียดของโครงการวิจัยเรื่อง “ปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง” จากผู้วิจัยว่า ข้าพเจ้ามีสิทธิที่จะขอการเข้าร่วมโครงการวิจัยนี้และการงดการเข้าร่วมการวิจัย จะไม่มีผลกระทบใดๆต่อการได้รับบริการหรือการรักษาที่ข้าพเจ้าหรือผู้ที่เกี่ยวข้องมีสิทธิได้รับแต่ประการใด อีกทั้งได้รับทราบว่า การเข้าร่วมในการวิจัยครั้งนี้ผู้วิจัยจะไม่เปิดเผยข้อมูล หรือผลการวิจัยของข้าพเจ้า หรือผู้ที่เกี่ยวข้องกับข้าพเจ้าเป็นรายบุคคล ต่อสาธารณชน

ข้าพเจ้าและผู้ที่เกี่ยวข้องกับข้าพเจ้าได้รับทราบข้อมูลจากผู้วิจัยจนหมดข้อสงสัยโดยตลอดแล้ว และยินดีตอบแบบสัมภาษณ์ของการวิจัย จึงได้ลงลายมือชื่อไว้เป็นหลักฐานต่อหน้าพยาน

ลงชื่อ.....ผู้ยินยอมหรือผู้แทน โดยชอบธรรม
(.....)

ลงชื่อ.....ผู้วิจัย
(.....)

ลงชื่อ.....พยาน
(.....)

ลงชื่อ.....พยาน
(.....)

APPENDIX D

RESEARCH INSTRUMENTS

แบบสัมภาษณ์ผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

- การวิจัยเรื่อง** ปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง
- คำชี้แจง** แบบสัมภาษณ์นี้สร้างขึ้นเพื่อศึกษาปัจจัยที่มีอิทธิพลต่อความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง โดยแบบสอบถามนี้จะประกอบด้วย ข้อมูล 5 ส่วน และมีจำนวนข้อคำถามทั้งหมด 59 ข้อ ดังนี้
- ส่วนที่ 1** แบบบันทึกข้อมูลส่วนบุคคลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง และแบบประเมินระดับความรุนแรงของโรคปอดอุดกั้นเรื้อรัง
- ส่วนที่ 2** แบบวัดการรับรู้อุปสรรคต่อการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง จำนวน 9 ข้อ
- ส่วนที่ 3** แบบวัดการรับรู้ความสามารถของตนเองของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง จำนวน 8 ข้อ
- ส่วนที่ 4** แบบวัดการสนับสนุนทางสังคมของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง จำนวน 18 ข้อ
- ส่วนที่ 5** แบบวัดความร่วมมือในการรักษาพยาบาลของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง จำนวน 24 ข้อ

เครื่องมือที่ใช้ในการวิจัยสำหรับผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

ส่วนที่ 1 แบบบันทึกข้อมูลส่วนบุคคล

คำชี้แจง โปรดเติมข้อความลงในช่องว่างและเขียนเครื่องหมาย □ ลงใน () หน้าข้อความที่ตรงกับท่าน

ช่องนี้สำหรับผู้วิจัย

เพศ	() ชาย () หญิง	□
อายุ	ปี	□ □
สถานภาพสมรส	() โสด () คู่ () หม้าย/หย่าร้าง/แยกกันอยู่	□
ศาสนา	() พุทธ () คริสต์ () อิสลาม () อื่นๆ โปรดระบุ.....	□
ระดับการศึกษา	() ไม่ได้รับการศึกษา () ประถมศึกษา () มัธยมศึกษา () ประกาศนียบัตรวิชาชีพ/อนุปริญญา () ปริญญาตรี/สูงกว่าปริญญาตรี	□
อาชีพ	() ค้าขาย () เกษตรกรรมเช่นทำนา ทำสวน ทำไร่ เลี้ยงสัตว์ เป็นต้น () รับจ้างทั่วไป เช่น ชุมนดิน ถางหญ้า ก่อสร้าง ขกของ เป็นต้น () รับราชการหรือรัฐวิสาหกิจ () ทำงานบริษัท หรือหน่วยงานเอกชน () ไม่ได้ประกอบอาชีพ () อื่นๆ โปรดระบุ.....	□
รายได้ของครอบครัวโดยเฉลี่ย ต่อเดือน	บาท	□ □ □ □ □

ช่องนี้สำหรับผู้จับ

ความเพียงพอของรายได้

() เพียงพอ

() ไม่เพียงพอ

☐

แหล่งที่มาของค่าใช้จ่ายในการรักษา

() จ่ายเอง

() เบิกคืนสังกัด

() บัตรทอง

() ประกันสังคม

() อื่น ๆ โปรดระบุ.....

☐

บุคคลที่ท่านอาศัยอยู่ด้วย

() คู่สมรส

() ลูก

(ตอบได้มากกว่า 1 ข้อ)

() บิดา/มารดา

() ญาติพี่น้อง

() อยู่คนเดียว

() อื่นๆ โปรดระบุ.....

บุคคลที่เป็นผู้ดูแลท่านคือ.....

☐

ระยะเวลาที่เป็นโรค.....ปี

การเข้านอนพักรักษาในโรงพยาบาลในรอบปี ที่ผ่านมา จำนวน.....ครั้ง

นอนพักรักษานานประมาณ.....วัน

และครั้งสุดท้ายเมื่อ.....วันที่ผ่านมา

การเข้ารับบริการรักษาที่ห้องฉุกเฉินในรอบปีที่ผ่านมา จำนวน.....ครั้ง

ค่า FEV₁.....%

ระดับความรุนแรงของโรค

() ระดับ 1

(ตามแบบประเมินความรุนแรง)

() ระดับ 2

() ระดับ 3

() ระดับ 4

() ระดับ 5

☐

แบบประเมินระดับความรุนแรงของโรคปอดอุดกั้นเรื้อรัง

ความสามารถในการปฏิบัติกิจกรรม	ระดับความรุนแรงของโรค
ไม่มีข้อจำกัดใดๆสามารถปฏิบัติกิจกรรมได้ตามปกติเท่าบุคคลทั่วไป ค่า $FEV_1 > 80\%$	1
มีข้อจำกัดในการทำกิจกรรมเล็กน้อย สามารถประกอบอาชีพได้แต่ ความสามารถไม่เท่าบุคคลทั่วไปเริ่มมีการเปลี่ยนแปลงแบบแผนการดำเนินชีวิต ค่า $FEV_1 70 - 80\%$	2
ไม่สามารถประกอบอาชีพได้ตามปกติ แต่สามารถดูแลตนเองและทำงานบ้านได้ เหนื่อยเมื่อเดินขึ้นตึกสูง 1 ชั้นและต้องหยุดพักเมื่อเดิน ขึ้นตึกสูง 2 ชั้นค่า $FEV_1 50 - 69\%$	3
ไม่สามารถประกอบอาชีพและไม่สามารถทำงานบ้านได้ แต่ยัง สามารถดูแลช่วยเหลือตนเองได้ เดินทางราบไกลกว่า 100 หลาไม่ได้ ต้องหยุด พักเมื่อเดินขึ้นตึกสูง 1 ชั้น ค่า $FEV_1 30 - 49\%$	4
ไม่สามารถประกอบอาชีพ ไม่สามารถทำงานบ้านและไม่สามารถ ดูแลช่วยเหลือตนเองในการปฏิบัติกิจวัตรประจำวันได้ เดินเพียง 2-3 ก้าวหรือ แก่งก็เหนื่อย ค่า $FEV_1 < 30\%$	5

ส่วนที่ 2 แบบวัดการรับรู้ประสบการณ์ต่อการรักษาพยาบาล

คำชี้แจง แบบสอบถามนี้ต้องการทราบถึงความรู้สึกหรือ ความคิดเห็นของท่าน ต่ออุปสรรคในการรักษา ระหว่างการเจ็บป่วยด้วยโรคปอดอุดกั้นเรื้อรัง แต่ละข้อไม่มีคำตอบที่ถูกหรือผิด คำตอบที่ดีที่สุดคือคำตอบที่ตรง หรือใกล้เคียงกับความรู้สึกของท่านมากที่สุด ดังนั้นโปรดตอบแบบสอบถามตามความเป็นจริง

การตอบแบบสอบถาม

ให้ท่านกาเครื่องหมาย ☒ ลงในช่องว่างที่ตรงกับความรู้สึกของท่านมากที่สุด เพียงข้อละ 1 คำตอบ เท่านั้น และขอให้ท่านตอบทุกข้อ โดยแต่ละคำตอบมีความหมายดังนี้

ใช่ เมื่อข้อความนั้นตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ไม่ใช่ เมื่อข้อความนั้นท่านเห็นว่าไม่แน่ใจหรือไม่ตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ข้อความ	ใช่	ไม่ใช่
1. การรับประทานอาหารตามที่แพทย์ พยาบาลแนะนำเป็นการระดมครอบครัวที่ต้องมาเตรียมอาหารให้ท่าน		
2. ปัญหาด้านการเงินเป็นอุปสรรคที่สำคัญที่ทำให้ท่านไม่สามารถปฏิบัติตามคำแนะนำของแพทย์ พยาบาลได้		
3. การที่ต้องรับประทานยาทุกวันติดต่อกัน ไม่มีที่สิ้นสุด เป็นภาระสำหรับท่าน		
.....		
.....		
.....		
.....		
.....		
9. ภาระงานในบ้านทำให้ท่านไม่มีเวลาสำหรับการนอนพักผ่อนในตอนกลางวัน		

☐☐☐☐☐☐☐☐☐

ส่วนที่ 3 แบบวัดการรับรู้ความสามารถของตนเอง

คำชี้แจง แบบสอบถามนี้ต้องการทราบถึงความรู้สึกหรือ ความคิดเห็นของท่าน ต่อความสามารถของตนเองในการปฏิบัติตามการรักษาระหว่างการเจ็บป่วยด้วยโรคปอดอุดกั้นเรื้อรัง แต่ละข้อไม่มีคำตอบที่ถูกหรือผิด คำตอบที่ดี

ที่สุดคือคำตอบที่ตรงหรือใกล้เคียงกับความรู้สึกของท่านมากที่สุด ดังนั้นโปรดตอบแบบสอบถามตามความเป็นจริง

การตอบแบบสอบถาม

ให้ท่านกาเครื่องหมาย ☒ ลงในช่องว่างที่ตรงกับความรู้สึกของท่านมากที่สุด เพียงข้อละ 1 คำตอบเท่านั้น และขอให้ท่านตอบทุกข้อ โดยแต่ละคำตอบมีความหมายดังนี้

ใช่ เมื่อข้อความนั้นตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ไม่ใช่ เมื่อข้อความนั้นท่านเห็นว่าไม่แน่ใจหรือไม่ตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ข้อความ	ใช่	ไม่ใช่
1. ท่านมั่นใจว่าท่านสามารถจัดารับประทานและใช้ยาพ้นขยายหลอดลมได้ครบตามที่แพทย์สั่งทุกมื้อ		
2. ท่านมั่นใจว่าท่านสามารถไอขับเสมหะได้อย่างมีประสิทธิภาพ		
.....		
.....		
.....		
.....		
.....		
8. ท่านมั่นใจว่าท่านสามารถหลีกเลี่ยงจากสิ่งกระตุ้นต่างๆ ที่ทำให้เกิดอาการเหนื่อยหอบขึ้น เช่น บุหรี่ ฝุ่นละออง ฯลฯ		

☐☐☐☐☐☐☐☐

ส่วนที่ 4 แบบวัดการสนับสนุนทางสังคม

คำชี้แจง แบบสอบถามนี้ต้องการทราบว่าท่านได้รับการสนับสนุนช่วยเหลือจากครอบครัว บุคลากรทางการแพทย์ระหว่างการเจ็บป่วยด้วยโรคปอดอุดกั้นเรื้อรัง แต่ละข้อไม่มีคำตอบที่ถูกหรือผิด คำตอบที่ดีที่สุดคือคำตอบที่ตรงหรือใกล้เคียงกับความรู้สึกของท่านมากที่สุด ดังนั้นโปรดตอบแบบสอบถามตามความเป็นจริง

การตอบแบบสอบถาม

ให้ท่านกาเครื่องหมาย ☒ ลงในช่องว่างที่ตรงกับความรู้สึกของท่านมากที่สุด เพียงข้อละ 1 คำตอบเท่านั้น และขอให้ท่านตอบทุกข้อ โดยแต่ละคำตอบมีความหมายดังนี้

ใช่ เมื่อข้อความนั้นตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ไม่ใช่ เมื่อข้อความนั้นท่านเห็นว่าไม่แน่ใจหรือไม่ตรงกับความรู้สึกหรือความคิดเห็นของท่าน

ข้อความ	ใช่	ไม่ใช่
1. คู่สมรส บิดา มารดา ลูกๆ ของท่าน หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกับท่าน ไม่ถามเกี่ยวกับการเจ็บป่วยของท่านเลย		
2. ท่านมีโอกาสดูแลเรื่องการเจ็บป่วยของท่านกับคู่สมรส บิดา มารดา ลูกๆ ของท่าน หรือบุคคลอื่น ที่อาศัยอยู่ในบ้านเดียวกับท่าน บ่อยๆ		
3. คู่สมรส บิดา มารดา ลูกๆ ของท่าน หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกับท่าน ไม่สนใจตัวท่านเลย		
4. ท่านมีคนในบ้านที่สนิทสนมและไว้วางใจพอที่จะปรับทุกข์ได้		
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16. ท่านมีเพื่อนบ้านที่จะให้ความช่วยเหลือเมื่อมีเหตุฉุกเฉินหรือจำเป็นได้		
17. นอกเหนือจากบุคคลในครอบครัวแล้ว ท่านไม่สามารถขอความช่วยเหลือจากใครได้เลย		
18. ท่านมีโอกาสดูแลข้อมูลข่าวสารเกี่ยวกับการดูแลสุขภาพจากเจ้าหน้าที่ หรือบุคคลอื่นๆ นอกเหนือจากสมาชิกในครอบครัว		

ส่วนที่ 5 แบบวัดความร่วมมือในการรักษาพยาบาล

คำชี้แจง แบบสอบถามนี้ต้องการทราบถึงความร่วมมือในการรักษาเกี่ยวกับการรับประทานอาหาร การรับประทานยา การพักผ่อน การออกกำลังกาย การบริหารการหายใจ การไออย่างมีประสิทธิภาพ การหลีกเลี่ยงจากสิ่งกระตุ้นให้เกิดอาการรุนแรงของโรค และการมาตรวจตามนัดของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง แต่ละข้อไม่มีคำตอบที่ถูกหรือผิด คำตอบที่ดีที่สุดคือคำตอบที่ตรงหรือใกล้เคียงกับความรู้สึกของท่านมากที่สุด ดังนั้นโปรดตอบแบบสอบถามตามความเป็นจริง

การตอบแบบสอบถาม

ให้ท่านกาเครื่องหมาย ✓ ลงในช่องว่างที่ตรงกับความรู้สึกของท่านมากที่สุด เพียงข้อละ 1 คำตอบเท่านั้น และขอให้ท่านตอบทุกข้อ โดยแต่ละคำตอบมีความหมายดังนี้

ปฏิบัติเป็นประจำ	หมายถึง	ปฏิบัติทุกวันหรืออย่างน้อย 5 วันต่อสัปดาห์
ปฏิบัติเป็นบางครั้ง	หมายถึง	ปฏิบัติ 3-4 วันต่อสัปดาห์
ปฏิบัติน้อยครั้ง	หมายถึง	ปฏิบัติ 1-2 วันต่อสัปดาห์
ไม่ปฏิบัติเลย	หมายถึง	ไม่เคยปฏิบัติในเรื่องนั้นๆ เลย

ข้อความ	ปฏิบัติเป็นประจำ	ปฏิบัติเป็นบางครั้ง	ปฏิบัติน้อยครั้ง	ไม่ปฏิบัติเลย
1. ในแต่ละวันท่านจะรับประทานอาหารในแต่ละมื้อไม่ให้อิ่มมากเกินไป				
2. ในวันหนึ่งๆ ท่านจะรับประทานอาหารครบถ้วนทั้งจำพวก ข้าว แป้ง เนื้อสัตว์ ไขมัน ผัก และผลไม้				
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23. ท่านซื้อยารับประทานเองจากร้านขายยา				
24. ท่านจะเก็บยาไว้ให้พ้นจากแสงแดดและความร้อน				

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APPENDIX E

MORE RESULTS

ตารางที่ 12 ร้อยละ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง เกี่ยวกับความร่วมมือในการรักษาพยาบาล จำแนกตามรายด้าน เรียงจากมากไปน้อย (n = 100)

ความร่วมมือในการรักษาพยาบาล	เป็นประจำ (ร้อยละ)	เป็นบางครั้ง (ร้อยละ)	น้อยครั้ง (ร้อยละ)	ไม่ปฏิบัติ (ร้อยละ)
ด้านการมาพบแพทย์ตามนัด				
- มาพบแพทย์ตามนัด	92	7	1	-
ด้านการรับประทานยา				
- รับประทานยาครบทุกชนิดทุกวัน	68	22	10	-
- รับประทานยาตรงตามเวลาทุกวัน	60	32	8	-
- หากลืมรับประทานยาในมือใดมือหนึ่ง จะรับประทานยาเพิ่มเป็น 2 เท่าในมือต่อไป	1	2	6	91
- ถ้ามีอาการหอบเหนื่อยมาก ท่านจะปรับเพิ่มยาเอง	3	4	13	80
- ซื้อยารับประทานเองจากร้านขายยา	4	17	40	39
- เก็บยาไว้ให้พ้นจากแสงแดดและความร้อน	97	3	-	-
ด้านการพักผ่อน				
- หาเวลาในการพักผ่อนช่วงกลางวันเช่น ฟังวิทยุ ดูโทรทัศน์ อ่านหนังสือพิมพ์ นอนพัก	67	19	10	4
- ในแต่ละวันนอนหลับได้ไม่น้อย 6 ชม.	49	24	14	13
- รับประทานยานอนหลับเพื่อช่วยให้นอนหลับได้	9	9	15	67
- เมื่อรู้สึกไม่สบายใจ จะพูดคุยปรึกษากับบุคคลใกล้ชิด	36	33	18	13
- ทำกิจกรรมอื่นที่ช่วยให้ผ่อนคลาย	48	27	17	8
ด้านการหลีกเลี่ยงสิ่งกระตุ้นให้เกิดอาการรุนแรงของโรค				
- ปัจจุบันยังสูบบุหรี่	10	1	5	84
- ไม่อยู่ใกล้คนที่สูบบุหรี่ หรือเข้าไปในสถานที่ ๆ มี ฝุ่นละออง ควันไฟ หรือที่มีคนจำนวนมาก เช่น โรงภาพยนตร์ ตลาดนัด	46	26	13	15

ตารางที่ 12 ร้อยละ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง เกี่ยวกับความร่วมมือในการรักษาพยาบาล จำแนกตามราย
ด้าน เรียงจากมากไปน้อย (n = 100) (ต่อ)

ความร่วมมือในการรักษาพยาบาล	เป็นประจำ (ร้อยละ)	เป็นบางครั้ง (ร้อยละ)	น้อยครั้ง (ร้อยละ)	ไม่ ปฏิบัติ (ร้อยละ)
ด้านการหลีกเลี่ยงสิ่งกระตุ้นให้เกิดอาการรุนแรงของโรค(ต่อ)	21	18	16	45
- หากจำเป็นต้องเข้าไปในที่ที่มีฝุ่นละอองหรือควันไฟ จะใช้ผ้าปิดปาก จมูก				
- เมื่อมีอาการเป็นหวัด คัดจมูก มีไข้ ไอ เจ็บคอจะไปพบแพทย์	24	27	31	18
ด้านการรับประทานอาหาร				
- ในแต่ละวันจะรับประทานอาหารในแต่ละมื้อไม่ให้อิ่มมากเกินไป	65	25	6	4
- ในวันหนึ่งๆ จะรับประทานอาหารครบถ้วนทั้งจำพวก ข้าว แป้ง เนื้อสัตว์ ไขมัน ผัก และผลไม้	53	25	18	4
- รับประทานอาหารประเภทที่ทำให้เกิดแก๊สในกระเพาะอาหาร เช่น แตงโม กะหล่ำปลี องุ่น หัวหอม ถั่วลิสง	29	37	27	7
- ดื่มน้ำอย่างน้อย 8 แก้วต่อวัน	30	16	14	40
ด้านการออกกำลังกาย				
- ออกกำลังกายเช่น เดิน วิ่งเหยาะๆ หรือ บริหารแขนและขา ครั้งละ 20-30 นาที	44	9	24	23
ด้านการไออย่างมีประสิทธิภาพ				
- สูดหายใจเข้าลึกๆ กลั้นไว้แล้วไอออกแรงๆ เพื่อเอาเสมหะออกเวลา ที่มีเสมหะมาก	12	20	23	45
- เมื่อมีเสมหะเหนียวข้นจะดื่มมากๆหรือจิบน้ำอุ่นบ่อยๆ	38	19	12	31
ด้านการบริหารการหายใจ				
- ฝึกการหายใจ โดยการหายใจเข้ายาวๆ ทางจมูก และหายใจออกโดย การเป่าลมออกช้าๆทางปาก ให้นานกว่าหายใจเข้าโดยทำติดต่อกันนาน ครั้งละไม่น้อยกว่า 5 นาที	25	7	24	44

ตารางที่ 13 ร้อยละ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรังที่มีต่อการรับรู้อุปสรรคต่อการรักษาพยาบาล จำแนกเป็นรายข้อ (n = 100)

การรับรู้อุปสรรคต่อการรักษาพยาบาล	ใช่ (ร้อยละ)	ไม่ใช่ (ร้อยละ)
1. การรับประทานอาหารตามที่แพทย์ พยาบาลแนะนำเป็นการระต่อ ครอบครัวที่ต้องมาเตรียมอาหารให้ท่าน	27	73
2. ปัญหาด้านการเงินเป็นอุปสรรคที่สำคัญที่ทำให้ท่านไม่สามารถปฏิบัติตาม ตามคำแนะนำของแพทย์ พยาบาลได้	38	62
3. การที่ต้องรับประทานยาทุกวันติดต่อกันไม่มีที่สิ้นสุด เป็นภาระสำหรับ ท่าน	25	75
4. การไปตรวจตามนัดทำให้ท่านและครอบครัวเสียเวลา	20	80
5. การเลิกสูบบุหรี่เป็นเรื่องที่ทำได้ยาก	15	85
6. การออกกำลังกายตามคำแนะนำของแพทย์ พยาบาล เป็นสิ่งที่ทำยาก	37	63
7. การฝึกหายใจเพื่อลดอาการเหนื่อยหอบ เป็นสิ่งที่ทำยาก	53	47
8. การหลีกเลี่ยงฝุ่นละออง คandles ไฟ เกสรดอกไม้ เป็นเรื่องที่ได้ยาก	48	52
9. ภาระงานในบ้านทำให้ท่าน ไม่มีเวลาสำหรับการนอนพักผ่อนในตอน กลางวัน	15	85

ตารางที่ 14 ร้อยละ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ที่มีการรับรู้ความสามารถของตนเอง จำแนกเป็นรายข้อ (n = 100)

การรับรู้ความสามารถของตนเอง	ใช่ (ร้อยละ)	ไม่ใช่ (ร้อยละ)
1. มีความมั่นใจว่าสามารถจัดจ้ดรับประทานและใช้ยาพ้นขยาย หลอดลมได้ครบตามที่แพทย์สั่งทุกมื้อ	73	27
2. มีความมั่นใจว่าสามารถไอขับเสมหะได้อย่างมีประสิทธิภาพ	71	29
3. มีความมั่นใจว่าสามารถเลือกรับประทานที่ไม่ทำให้เกิดอาการ ท้องอืดหรือเกิดลมในท้องมากได้ทุกมื้อ	73	27
4. มีความมั่นใจว่าสามารถปฏิบัติตามการออกกำลังกายตามคำแนะนำ ของ แพทย์หรือพยาบาลได้อย่างสม่ำเสมอ	62	38
5. มีความมั่นใจว่าสามารถปฏิบัติตามการหายใจแบบเป่าปากและการ หายใจโดยใช้ กล้ามเนื้อหน้าท้องและกระบังลมได้อย่างสม่ำเสมอ	49	51
6. มีความมั่นใจว่าสามารถหาวิธีทำให้อ่อนหลับได้อย่างเพียงพอ	77	23
7. มีความมั่นใจว่าสามารถหาวิธีมาพบแพทย์ได้ตามนัดทุกครั้ง	81	19
8. มีความมั่นใจว่าสามารถหลีกเลี่ยงจากสิ่งกระตุ้นต่างๆ ที่ทำให้เกิด อาการเหนื่อยหอบขึ้น เช่น บุหรี่ ฝุ่นละออง ฯลฯ	52	48

ตารางที่ 15 ร้อยละ ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง เกี่ยวกับการสนับสนุนทางสังคม จำแนกเป็นรายข้อ
(n = 100)

การสนับสนุนทางสังคม	ใช่ (ร้อยละ)	ไม่ใช่ (ร้อยละ)
1. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกันไม่ถามเกี่ยวกับการเจ็บป่วยเลย	16	84
2. มีโอกาสได้พูดคุยเรื่องการเจ็บป่วยกับคู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่น ที่อาศัยอยู่ในบ้านเดียวกันบ่อยๆ	79	21
3. ไม่ได้ได้รับความสนใจจากคู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกันเลย	9	91
4. มีคนในบ้านที่สนิทสนมและไว้วางใจพอที่จะปรับทุกข์ได้	91	9
5. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่น ที่อาศัยอยู่ในบ้านเดียวกันสนใจซักถามและดูแลเรื่องการกินยาของฉัน	83	17
6. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกัน ไม่เคยพูดเตือนเลยแม้ว่าจะปฏิบัติตัวไม่เหมาะสมในขณะที่เจ็บป่วย	13	87
7. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกัน ยอมรับฟังเวลาที่พูดหรือแสดงความคิดเห็น	93	7
8. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกัน มักให้คำแนะนำเรื่องการปฏิบัติตัวเพื่อไม่ให้อาการหรือโรครุนแรงขึ้น	50	50
9. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกันจะไปหาข้อมูล ข่าวสารและวิธีการต่างๆ ที่จะช่วยให้หายป่วยหรือทุเลาอาการเจ็บป่วยมาบอก	38	62
10. ไม่สามารถปรับทุกข์หรือปรึกษาเรื่องความเจ็บป่วยกับ คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกันได้เลย	12	88

ตารางที่ 15 ร้อยละของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง เกี่ยวกับการสนับสนุนทางสังคม จำแนกเป็นรายชื่อ (n = 100) (ต่อ)

การสนับสนุนทางสังคม	ใช่ (ร้อยละ)	ไม่ใช่ (ร้อยละ)
11. สมาชิกในครอบครัวไม่ค่อยมีเวลาว่างให้ปรับทุกข์หรือปรึกษาหารือด้วย	21	79
12. ต้องทำงานบ้านเอง ไม่มีคนช่วยเหลือเลย	15	85
13. ต้องทำงานหาเงินเอง ไม่สามารถหยิบยืมหรือใช้เงินของ คู่สมรส บิดา มารดา บุตรหรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกันได้	10	90
14. คู่สมรส บิดา มารดา ลูกๆ หรือบุคคลอื่นที่อาศัยอยู่ในบ้านเดียวกัน สนใจที่จะพาไปพบแพทย์หรือไปตรวจตามนัด	90	10
15. ถ้าเจ็บป่วยต้องเข้ารับการรักษาในโรงพยาบาล มั่นใจว่าจะมีผู้รับผิดชอบค่าใช้จ่ายให้	93	7
16. มีเพื่อนบ้านที่จะให้ความช่วยเหลือเมื่อมีเหตุฉุกเฉินได้	78	22
17. นอกเหนือจากบุคคลในครอบครัวแล้ว ไม่สามารถขอความช่วยเหลือจากใครได้เลย	21	79
18. มีโอกาสได้รับข้อมูลข่าวสาร เกี่ยวกับการดูแลสุขภาพจากเจ้าหน้าที่ หรือบุคคลอื่นๆ นอกเหนือจากสมาชิกในครอบครัว	63	37

ตารางที่ 16 ช่วงคะแนน ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐานของผู้ป่วยโรคปอดอุดกั้นเรื้อรังเกี่ยวกับการรับรู้
อุปสรรคต่อการรักษาพยาบาล การรับรู้ความสามารถของตนเอง และการสนับสนุนทางสังคม (n=100)

ตัวแปร	ช่วงคะแนน		Mean	S.D.	Skewness	S.E.
	แบบวัด	กลุ่มตัวอย่าง				
การรับรู้อุปสรรคต่อการ รักษาพยาบาล	0 - 9	0 - 8	2.78	1.89	.416	.241
การรับรู้ความสามารถของ ตนเอง	0 - 8	1 - 8	5.38	1.84	-.550	.241
การสนับสนุนทางสังคม	0 - 18	3 - 18	14.41	3.44	-1.366	.241

APPENDIX F

TESTING ASUUMPTION OF MULTIPLE REGRESSION ANALYSIS

Testing assumption of multiple regression analysis

The data were check before conduction an analysis that consist of checking for normal distribution, multicollinearity, check the bivariate relationship to be sure they were linear, and homoscedasticity. The results for each assumption were present as follow:

1. Normal distribution was assessed by using a histogram standardized residuals. The relationship between the independent variables and dependent variable were shown as linear, and the dependent variable was shown as normal distribution. (Figure 4)

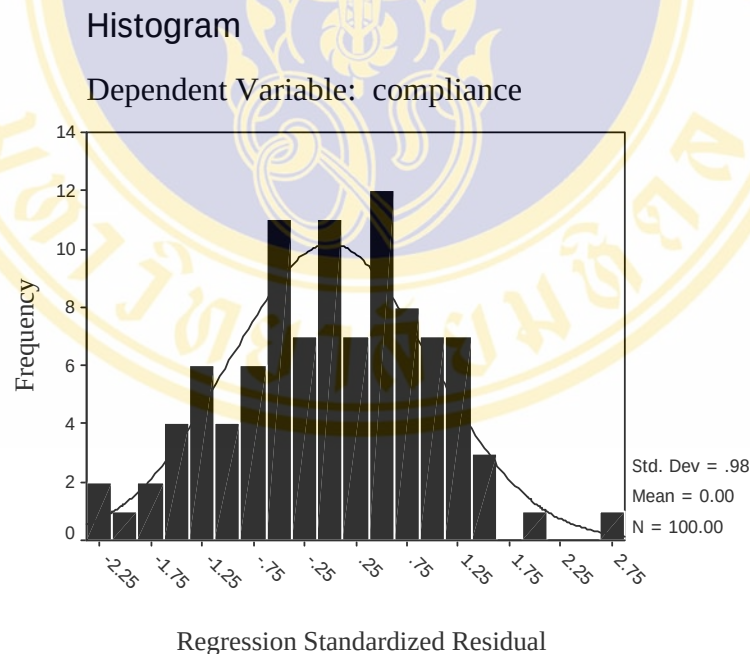


Figure 4: Histogram of residuals

2. Homoscedasticity. The residuals were plotted against the predicted values and against the independent variables. The results were revealed that the actual scores varies around the prediction line, which the data was formed as straight line from the upper-left corner to lower-right corner, and the lower-left corner to upper-right corner. (Figure 5.1-5.2)

When the residuals from a normal distribution, the plotted values fell close to the line of normal probability (Figure 6)

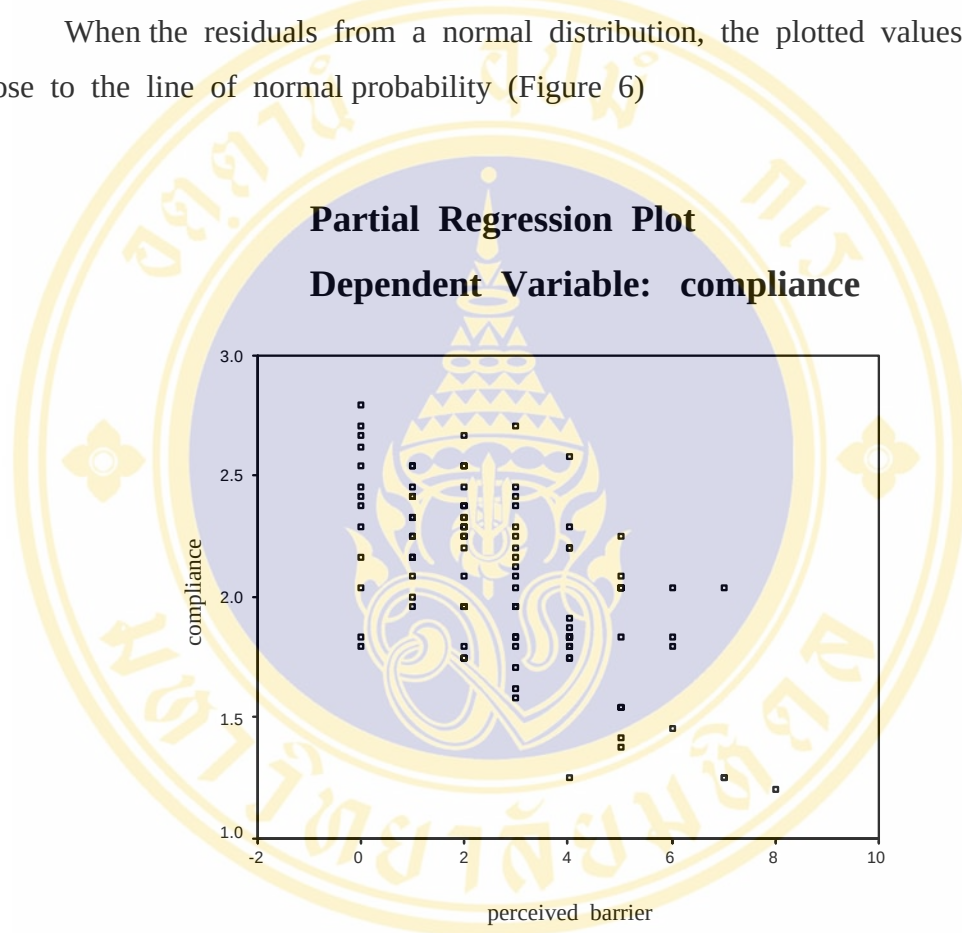


Figure 5.1

Partial Regression Plot

Dependent Variable: compliance

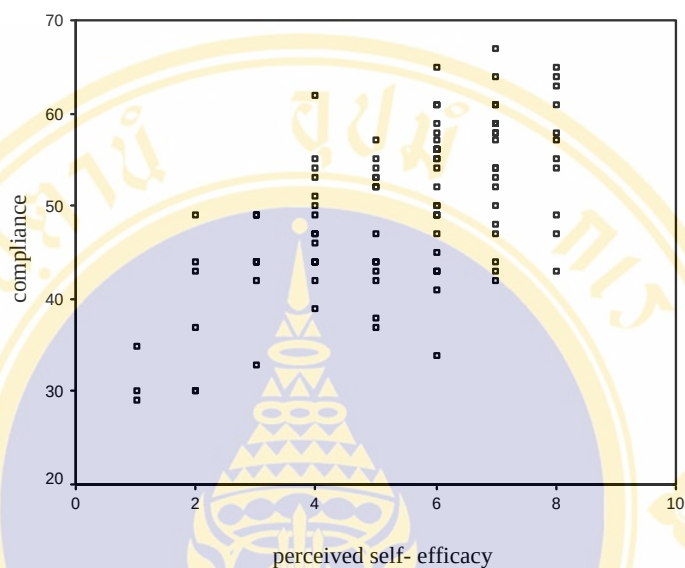


Figure 5.2

Figure 5 (5.1-5.2) Scatter plot between regression residual and regression predicted value

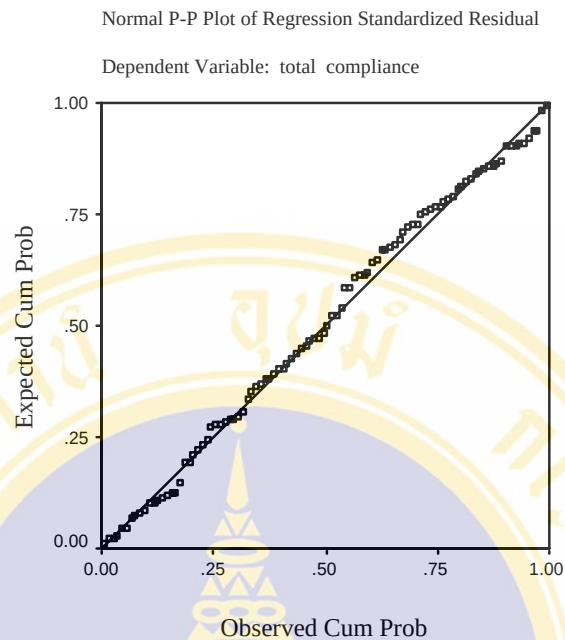


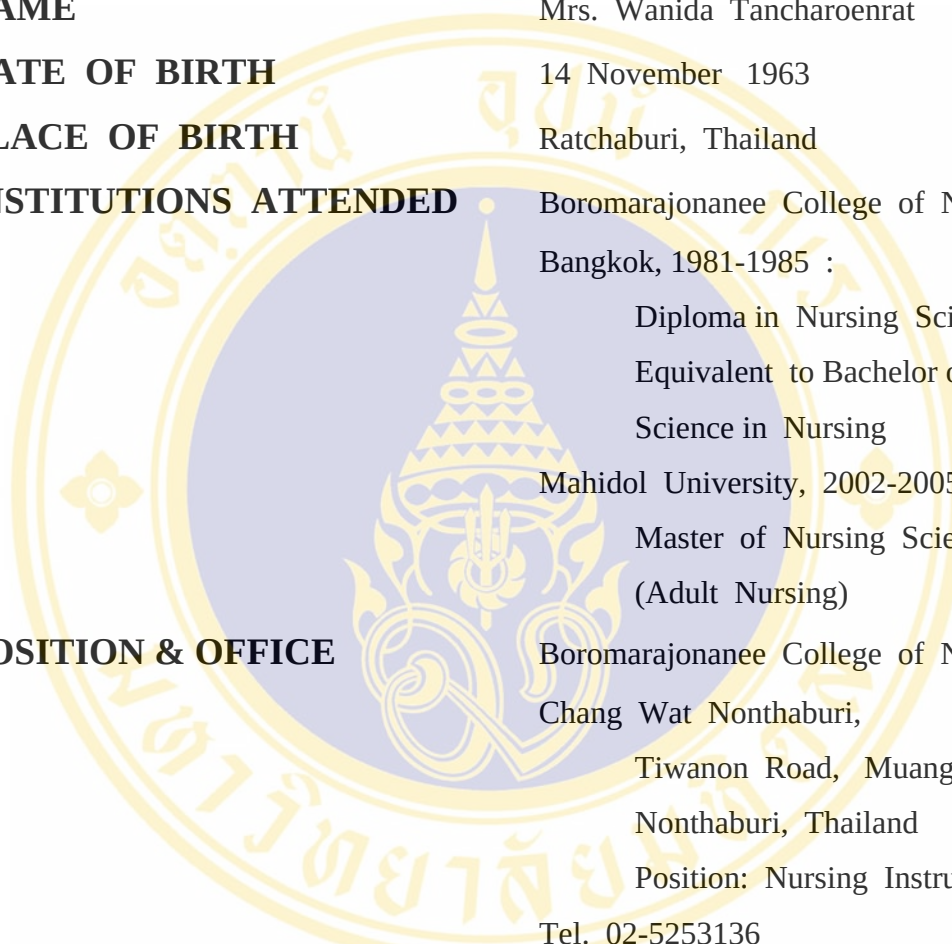
Figure 6 Normal P-P plot of regression standardized residual

3. Multicollinearity The tolerance of a variable was used as a measure of collinearity. A tolerance of 0 indicated complete collinearity. The variance inflation factor (VIF) is the reciprocal of tolerance. So, variables with high tolerances have small VIF and vice versa. In this analysis, it was found that multicollinearity was not a problem (Table 17)

Table 17 Unstandardized coefficients, Std.Errors, standardized coefficients, t-value, and collinearity statistics of perceived barrier and perceived self-efficacy.

Model	Unstandardized		Standardized	t	Sig.	Collinearity		
	Coefficients					Beta	Statistics	
	b	std.Error					Tolerance	VIF
1. (Constant)	57.796	1.208		47.825	.000			
perceived - barrier	-2.848	.360	-.624	-7.907	.000	1.000	1.000	
2. (Constant)	45.821	4.673		9.806	.000			
perceived - barrier	-1.613	.583	-.353	-2.767	.007	.360	2.780	
perceived - self-efficacy	1.588	.600	.338	2.647	.009	.360	2.780	

BIOGRAPHY



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