CAUSAL FACTORS IN HEALTH-RELATED QUALITY OF LIFE AMONG THAI PERSONS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A MIXED METHODS STUDY

BY

MRS. ATCHANAT WANGSOM

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
THE DOCTOR OF PHILOSOPHY (NURSING SCIENCE)
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THAMMASAT UNIVERSITY
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was approved as partial fulfillment of the requirements for
the degree of the doctor of philosophy of nursing science

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Thesis Title	CAUSAL FACTORS IN HEALTH-RELATED QUALITY OF LIFE AMONG THAI PERSONS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A MIXED METHODS STUDY
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ABSTRACT

Health-related quality of life (HRQOL) is an important consideration for persons living with chronic obstructive pulmonary disease (COPD). This convergent parallel mixed methods study aimed to examine the factors predicting HRQOL and explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. The conceptual framework was a revised version of Wilson and Cleary's health-related quality of life and integrative literature review. The simple random sampling resulted in 240 participants who were Thai persons with COPD coming for follow-ups at the chest clinics of hospitals in Health Region 4 of Thailand from August to December 2018. The research instruments were self-reported questionnaires including a demographic data form, St. George's Respiratory Questionnaire for COPD patients (SGRQ-C), a fat-free mass index (FFMI) record form, the Multi-dimensional Scale of Perceived Social Support (MSPSS), a peak expiratory flow rate (PEFR) record form and the Functional Performance Inventory Short Form (FPI-SF). Concurrently, the purposive sampling resulted in 30 participants who had different scores for the SGRQ-C in the qualitative semi-structured interviews. The quantitative data were analyzed by the computer software, Statistical Package for the Social Sciences (SPSS) for Windows, by using descriptive statistics, ANOVA, independent t-test and hierarchical stepwise multiple regression analysis. The

qualitative data were analyzed by the computer software, ATLAS.ti for Windows, by using content analysis. Side-by-side joint display tables were used to merge the data and compare the quantitative and qualitative findings presented as both similar and dissimilar within each predictor variable.

The results of the study indicate that the majority of the participants had moderate levels of HRQOL associated with experience of physical symptoms, psychological symptoms, perceived social isolation and adherence to self-care practices related to COPD. Social support was the strongest predictor of HRQOL, followed by nutritional status, pulmonary function and functional performance accounting for 80.10 percent of the variances in HRQOL, which is interpreted as a high level. Four variables had significantly negative direct effects and negative indirect effects on HRQOL by using SGRQ-C scores. The participants perceived that social support can create encouragement, build convenience and lead to good recommendations received among persons with COPD. The participants also reported the effects of COPD to be insufficient nutrients, deterioration of pulmonary function and activity limitations. As a result, the participants had greater awareness of self-care with regard to food consumption, reducing and preventing and functional performance in living with COPD.

However, age was not statistically significant in terms of negative direct effects on HRQOL and had insignificant positive indirect effects on HRQOL. Most of the participants in the present study were elderly persons with COPD who perceived differences in age as incapable of predicting disease prognosis. Gender was not statistically significant in terms of negative direct effects on HRQOL and had insignificant negative indirect effects on HRQOL. Most of the participants were males who perceived differences in gender as incapable of predicting disease prognosis. Therefore, the results of this study indicate that nurses and healthcare teams can modify the predicting factors and implement appropriate care leading to increased HRQOL among persons with COPD.

Keywords: Health-related quality of life, Chronic obstructive pulmonary disease

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Mrs. Atchanat Wangsom

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LIST OF ABBREVIATIONS

Symbols/Abbreviations	Terms
AE	Acute Exacerbation
APN	Advance Practice Nurse
BIA	Bioelectrical Impedance Analysis
BMI	Body Mass Index
COPD	Chronic Obstructive Pulmonary Disease
DE	Direct Effect
FEV_1	Forced Expiratory Volume in one second
FFMI	Fat-Free Mass Index
FPI-SF	Functional Performance Inventory Short Form
FVC	Forced Vital Capacity
GOLD	Global Initiative for Chronic Obstructive Lung Disease
HADS	Hospital Anxiety and Depression Scale
HRQOL	Health-related Quality of Life
IE	Indirect Effect
IOC	Item-Objective Congruence
mMRC	Modified Medical Research Council
MSPSS	Multi-dimensional Scale of Perceived Social Support
PEFR	Peak Expiratory Flow Rate
SGRQ-C	St. George's Respiratory Questionnaire for COPD patients
SPSS	Statistical Package for the Social Sciences
TE	Total Effect

CHAPTER 1
INTRODUCTION

1.1. Background and Significance of the Study

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality worldwide. In 2012, the World Health Organization estimated the global COPD morbidity rate to be approximately 210 million persons and the mortality rate was over 3 million persons, making COPD the fourth leading cause of death (World Health Organization [WHO], 2015). It has been predicted that COPD will become the third leading cause of death by 2020. In 2014, Thailand's Ministry of Public Health (MOPH) estimated the annual morbidity rate of COPD to be 1.5 million persons and the mortality rate was approximately 10,019 persons, thereby making it the fifth leading cause of death (Bureau of Non Communicable Diseases, 2015; National Health Security Office [NHSO], 2016). As evidenced by these alarming statistics, COPD is a major public health issue worldwide, including Thailand.

The Global Initiative for Chronic Obstructive Lung Disease classified persons with COPD based on the value of forced expiratory volume in one second (FEV_1), into the following four categories of severity: mild, moderate, severe and very severe (Global Initiative for Chronic Obstructive Lung Disease [GOLD], 2017). The WHO (2015) has estimated that 65 million persons have moderate to severe COPD. Persons with COPD usually suffer from multiple concurrent symptoms due to chronic bronchitis and emphysema, which may contribute to airflow obstruction (Hinkle & Cheever, 2014). Most persons with moderate to severe COPD have variability in their symptoms in which morning is typically the worst time of the day for ease of breathing (Kessler et al., 2011). Solano, Gomes and Higginson (2006) found that most persons with moderate to severe COPD have clinically relevant dyspnea, fatigue and anxiety. Similarly, Srirat, Hanucharurnkul, Aree-Ue, Viwatwongkasem and Junda (2014) found seven clusters of distress symptoms among Thai persons with COPD, ranging from the highest to lowest levels of distress: difficulty in breathing, fatigue-related COPD, sleep-wake alteration, pain and discomfort, emotional reaction, decline in memory function and respiratory muscle weakness. These clusters involving both physical and

psychological symptoms are critical health problems among persons with COPD. The trajectory of COPD involves a chronic condition with certain physical limitations and unpredictable intermittent exacerbations (Murray, Kendall, Boyd & Sheikh, 2012). The pathophysiology of COPD begins with an abnormal inflammatory response of the airways and alveoli to air pollution or noxious particles resulting in airflow limitation (GOLD, 2017). This airflow limitation leads to a reduction in pulmonary function, a decrease in lung compliance and hyperinflation. This mechanism results in a ventilation-perfusion (V_A/Q) mismatch which can impair the gas exchange process, creating physical symptoms, including dyspnea, which is one of the most frequently cited distressing symptoms (Hinkle & Cheever, 2014). These physical symptoms can also have long-term effects on the health-related quality of life (HRQOL) among persons with COPD (Benzo, Abascal-Bolado & Dulohery, 2016; Kessler et al., 2011; Zamzam, Azab, El Wahsh, Ragab & Allam, 2012).

HRQOL among persons with COPD has been defined as an individual's perception of the effects of health and illness, conceived as dynamic and multi-dimensional and involving the physical, psychological and social dimensions (Dignani, Toccaceli, Guarinoni, Petrucci & Lancia, 2015; Ferrans, Zerwic, Wilbur & Larson, 2005; Mouser, 2014; Sharma & Joshi, 2015). Moreover, Ferrans et al. (2005), who revised the Wilson and Cleary model (1995) and added the construct of biological function influenced by both individual and environmental characteristics among persons with chronic illness. Persons with moderate to severe COPD often suffer from physical symptoms such as the increasing work of breathing to consume more oxygen, which can impede the ability to engage in activities of daily living (O'Donnell et al., 2007). This activity limitation also restricts the person's interactions with his or her environment, thereby leading to the loss of previous role identification, the inability to earn a living and social isolation (Wahls, 2012). This suffering tends to exacerbate over time and can result in emotional reactions to symptoms potentially leading to permanent psychological symptoms such as anxiety and depression, the most frequently cited distress symptoms in persons with COPD (Park & Larson, 2016; Zamzam et al., 2012).

GOLD also reported that the estimated direct costs of caring for persons with COPD in the United States in 2011 were $29.5 billion per year with indirect costs

of $20.4 billion per year. The NHSO (2016) reported that a major expense for Thai persons with COPD was hospitalization with estimated costs of $363 million in 2012. Therefore, the impact of symptom clusters is multi-dimensional, affecting many aspects of the person, including physical suffering, psychological suffering, social isolation and a high economic burden, leading to a low level of HRQOL among persons with COPD (Ahmed, Neyaz & Aslami, 2016; Mouser, 2014; Songprasert, Noonil & Ackwarangkoon, 2014).

Low HRQOL among persons with COPD is related to dyspnea, decreased pulmonary function, social isolation, dependence on others, lack of social support and hospital readmissions resulting in dissatisfaction with life and depression due to ineffective coping with the symptoms and a feeling of helplessness (Ahmed et al., 2016; Dignani et al., 2015). In contrast, a high level of HRQOL is related to an increase in social engagement, independence, life satisfaction and self-efficacy as well as a decline in dyspnea and depression (Dignani et al., 2015; Mouser, 2014; Zamzam et al., 2012). However, there are also individual characteristics associated with poor HRQOL among persons with COPD including age, education level and smoking index (Sharma & Joshi, 2015). In contrast, characteristics not associated with poor HRQOL include gender, marital status, habitat, income and duration of diagnosis (Benzo et al., 2016; Sharma & Joshi, 2015; Songprasert et al., 2014). In conclusion, multiple factors contribute to the HRQOL among persons with COPD, including physiological, psychosocial, individual and environmental characteristics.

In Thailand, there have been several studies related to HRQOL among persons with COPD. Jantiya, Chamnansua and Kunapan (2011) found in Saraburi Province in Health Region 4 that HRQOL among persons with COPD was at moderate level. In contrast, Songprasert et al. (2014) found in Nakhon Si Thammarat Province that HRQOL among persons with COPD was low and half of the participants in the study reported having depression. Similarly, Wangsom (2010) revealed a low level of HRQOL among persons with COPD in Bangkok and Pathum Thani Province with regard to symptoms, activities and psychosocial impact. Therefore, in order to improve health outcomes, healthcare teams must conduct assessments that measure the severity of disease and gain a better understanding of the relationships between related factors and HRQOL among persons with COPD (Phuwilai, Tansuphasawadikul & Siripornpibul,

2012; Santos, Karloh, Araujo, D'Aquino & Mayer, 2014). Multiple factors are related to HRQOL among persons with COPD, including personal factors, pulmonary function, functional performance and social support (Ahmed et al., 2016; Phuwilai et al., 2012; Suntornchaturavit, 2003). However, it is unclear how these factors together affect people's perceptions of HRQOL, subsequently creating a barrier to appropriate care for Thai persons with COPD.

Personal factors include age, gender and nutritional status. The aging process is a common cause of the gradual deterioration of pulmonary function among persons aged 40 years and over (Eisner et al., 2010). Similarly, HRQOL is different in women compared with men, whereby chronic sputum is associated with HRQOL in women but not men. Consequently, the HRQOL of women with COPD is poorer than that of men (Raherison et al., 2014). Moreover, nutritional status is generally best quantified by body mass index (BMI), which is positively correlated with HRQOL among persons with COPD (Phuwilai et al., 2012; Salepci et al., 2007). However, Pothirat et al. (2016) conducted a quantitative research to identify the correlation between BMI and the fat-free mass index (FFMI) among persons with COPD in Chang Mai Province. The results showed that BMI was strongly correlated with FFMI but not correlated with HRQOL and that FFMI was correlated with HRQOL among persons with COPD. Several studies have stated that FFMI can more accurately assess nutritional status compared to BMI because the loss of skeletal muscle mass contributes to weight loss among persons with COPD (GOLD, 2017; Luo et al., 2016; Pothirat et al., 2016). Presently, few studies have investigated or described the relationships among these factors in Thai persons with COPD.

Suntornchaturavit (2003) conducted a qualitative research to explore and describe quality of life among persons with COPD in Songkhla Province. The results showed that social support included family members, friends and healthcare teams, all of which are related to HRQOL among persons with COPD. In contrast, Phuwilai et al. (2012) conducted quantitative research to explore the relationships of known influential factors and predict the factors affecting quality of life among persons with COPD in the Kamphaeng Phet Province. The results showed that family support and access to healthcare services were not associated with HRQOL among persons with COPD. Therefore, the difference in the outcomes of the two studies needs to be investigated further among Thai persons with COPD. Pulmonary function is generally best quantified by

$FEV_{1,}$ which is positively correlated with HRQOL among persons with COPD (Ahmed et al., 2016; GOLD, 2017; Phuwilai et al., 2012). However, in chest clinics in Thailand, the most common measurement performed for monitoring the pulmonary function of persons with COPD is the peak expiratory flow rate (PEFR) where the value is easier to obtain at lower cost and is strongly correlated with FEV_1 (Obaseki et al., 2014; Pothirat et al., 2015).

Most quantitative research has emphasized the assessment of functional performance focusing on functional and exercise capacity among Thai persons with COPD (Phuwilai et al. 2012; Sairat, Wattana & Takviriyanun, 2014). However, multiple factors contribute to functional performance among Thai persons with COPD, including physical symptoms, psychological symptoms, social support and uncertainty about the illness (Intarasorn & Jitpanya, 2016; Yormprakhon, Wattanakitkrileart, Pongthavornkamol & Chuchottaworn, 2014). Moreover, Leidy and Knebel (2012) conducted qualitative research to examine the content validity of the Functional Performance Inventory Short Form (FPI-SF) among American persons with COPD. The results revealed the following six components of the FPI-SF: personal hygiene care, household maintenance, physical exercise, recreation activities for personal pleasure, spiritual activities and social interaction with family and friends. Moreover, this study reported that personal hygeine activities were of type priority, while physical exercise and spiritual activities were of the lease priority. Therefore, this study focused on the following four factors: personal factors (age, gender and nutritional status), social support, pulmonary function and functional performance. These factors need to be better understood in terms of how they are associated with HRQOL among persons with COPD and how they facilitate nursing care, caregiver support and self-care (Dignani et al., 2015).

Most previous research focused on the quantitative method and emphasized the assessment of HRQOL, exploring specific dimensions of HRQOL and investigating the relationships among FEV_1, BMI, six-minute walk tests, behaviors aimed at preventing exacerbation and HRQOL among Thai persons with COPD. Research studies focusing on symptom management methods that can reduce suffering from symptoms and improve the HRQOL among persons with COPD have produced evidence on energy conservation techniques, breathing techniques, relaxation techniques, exercise training, nutritional strategies and secretion clearance strategies (GOLD, 2017; Hinkle & Cheever, 2014). These

techniques may be helpful in reducing suffering from symptoms and increasing HRQOL but only in the short term as the effects decrease over time. In reality, the relationships of HRQOL among persons with COPD are complex and involve the interplay of multi-dimensional factors. Understanding and explaining the relationships of these factors affecting HRQOL can facilitate appropriate care for persons with COPD (Chirawatkul, 2015; Creswell & Clark, 2011; Hoaas andreassen, Lien, Hjalmarsen & Zanaboni, 2016). Thus, the researcher highlighted these mixed methods with the aims of examining the predictors of the relationships among four factors and exploring a comprehensive in-depth understanding of the factors associated with HRQOL among persons with COPD. Consequently, nurses and healthcare teams can become more aware of the factors potentially associated with HRQOL in order to help persons with COPD perform self-care and implement appropriate care leading to increased HRQOL.

The present study reveals several gaps in knowledge regarding HRQOL among persons with COPD. First, there is a need to highlight the importance of COPD as a leading cause of death and a major public health problem. Second, there is also a need to emphasize the low levels of HRQOL among persons with COPD in both physical and psychosocial dimensions. Third, symptom management methods that can be performed to reduce suffering from symptoms and increase HRQOL despite its short-term effect and its tendency to decrease over time need to be described. The fourth, to study the aforementioned four factors to increase understanding about associated with HRQOL among persons with COPD, as there have been few studies focused on both quantitative and qualitative methods that have investigated relationships of HRQOL among persons with COPD in Thailand.

In summary, the present study addresses the necessity to understand the relationships among the above factors, which can facilitate appropriate care for persons with COPD. The research framework was a revised version of Wilson and Cleary's health-related quality of life model (1995) and an integrative literature review. As a result, a clear understanding of these factors associated with HRQOL is expected to become useful in healthcare team, which can lead to appropriate care that increase HRQOL in the long term among Thai persons with COPD.

1.2 Research Objectives

The objectives of this convergent parallel mixed methods study were as follows:

1. 2. 1 To examine the relationships of personal factors, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD.

1.2.2 To predict what type and how strong the effects of personal factors, social support, pulmonary function and functional performance have on HRQOL among Thai persons with COPD.

1. 2. 3 To provide a comprehensive in-depth understanding of personal factors, social support, pulmonary function and functional performance associated with HRQOL among Thai persons with COPD.

1.3 Research Questions

1. 3. 1 What are the relationships between personal factors, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD?

1.3.2 To what extent and how do personal factors, social support, pulmonary function and functional performance predict HRQOL among Thai persons with COPD?

1. 3. 3 What are the common factors that associated with HRQOL among Thai persons with COPD?

1.4 Variables and Qualitative Data used in the Study

The variables of this study were as follows: age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD. Qualitative data of this study focused on a comprehensive in-depth understanding of these factors associated with HRQOL among Thai persons with COPD.

1.5 Scope of the Study

The participants of this study were Thai persons with COPD who are 40 years old or over. The research settings were chest clinics at the outpatient departments of hospitals in the Health Region 4 of Thailand. The time of data collection was August

to December 2018. This study of HRQOL among Thai persons with COPD was used the convergent parallel mixed methods design. In the quantitative phase, a cross-sectional descriptive correlation research design was used to examine the predictors of the relationship between personal factors, social support, pulmonary function, functional performance and HRQOL. Concurrently, in the qualitative phase a descriptive qualitative design was used to explore a comprehensive in-depth understanding of these factors associated with HRQOL among Thai persons with COPD.

1.6 Definitions of Terms

1.6.1 Persons with chronic obstructive pulmonary disease (COPD) refers to Thai persons that have been medically diagnosed with COPD, living in the Health Region 4, either female or male and are 40 years old or over. They have experienced symptom clusters from COPD and have attended medical follow-up at the chest clinics of the outpatient department of hospitals in the Health Region 4 of Thailand.

1.6.2 Health-related quality of life (HRQOL) refers to the individual's perception of the effects of health and illness among Thai persons with COPD. HRQOL attributes are conceived as dynamic and multi-dimensional involving physical, psychological and social dimensions (Dignani et al., 2015; Ferrans et al., 2005; Mouser, 2014; Sharma & Joshi, 2015). The physical dimension refers to physiological response to COPD and a decline in physical functioning that are dyspnea, activity limitations and fatigue (Hinkle & Cheever, 2014). The psychological dimension refers to the emotional reactions to COPD and lack of confidence in one's physical capabilities that lead to anxiety and depression (Zamzam et al., 2012). The social dimension refers to social relationships and social functioning such as social isolation and loss of previous role identification (Wahls, 2012).

1.6.3 Perceived effects of COPD are defined as perception in terms of quantitative measure with regard to the effects of COPD including physical, psychological and social dimensions, measured by using the St. George's Respiratory Questionnaire for COPD patients (SGRQ-C). The perceived effects of COPD were divided into the following three levels: high, moderate and low levels. High levels of perceived effects of COPD mean the participants reported high SGRQ-C scores leading to low HRQOL. Moderate levels of perceived effects of COPD mean the participants

reported moderate SGRQ-C scores led to moderate level of HRQOL. Low level of perceived effect of COPD means the participants reported low SGRQ-C scores leading to high HRQOL.

1.6.4 Personal factors are defined as the individual characteristics of persons with COPD including three variables as follows:

1.6.4.1 Age refers to the number of full years among persons with COPD counting from the date of birth to the date of the study. The age groups were classified as adults with COPD within an age range of 40 - 59 years and elderly with COPD, including the youngest-old ranging from ages 60 - 69 years; the middle-old ranging from ages 70 - 79 ages; the oldest-old, aged more than 80 years.

1.6.4.2 Gender refers to the biological aspects between males and females among persons with COPD.

1.6.4.3 Nutritional status refers to the state of nutrition, including the intake of food and utilization of nutrients and focuses on body composition among Thai persons with COPD. The fat-free mass index (FFMI) was used to measure nutritional status and bioelectrical impedance analysis (BIA) was used to investigate the ratios of FFMI (Luo et al., 2016). In this study, nutritional status was divided into the following four categories: 1) normal body composition defined as normal BMI with normal FFMI; 2) semi-starvation defined as a low level of BMI with normal or above normal FFMI; 3) muscle atrophy defined as a normal or above-normal BMI with low FFMI and 4) cachexia defined as a low BMI with low FFMI (Gologanu, Ionita, Gartonea, Stanescu & Bogdan, 2014; Luo et al., 2016; Pothirat et al., 2016).

1.6.5 Social support is defined as the way Thai persons with COPD receive care and assistance provided by others involving informal and formal sources of support, including family members, friends, healthcare providers, religious leaders and significant others (Zimet, Dahlem, Zimet & Farley 1988). These various types of support involve providing personal care with informational, emotional, spiritual and financial support. Social support among persons with COPD was quantified by using the Multi-dimensional Scale of Perceived Social Support (MSPSS), the components of which include family, friends and healthcare providers.

1.6.6 Pulmonary function refers to the ability of the lungs with regard to airflow during inspiration and expiration among Thai persons with COPD. Pulmonary

function was quantified by measuring the peak expiratory flow rate (PEFR). The PEFR was the maximal rate persons with COPD can exhale during a short maximal expiratory effort after a full inspiration, affirming that the worse a person's airflow limitation is, the lower his/her PEFR value. Severity of airflow limitations can be categorized by using the designation of FEV_1 in which the predicted values were as follows: GOLD 1 or mild level defined as more than 80 percent of predictive values; GOLD 2 or moderate level defined as 50 to 79 percent of predictive values; GOLD 3 or severe level defined as 30 to 49 percent of predictive values and GOLD 4 or very severe level defined as 0 to 29 percent of predictive values (GOLD, 2017).

1.6.7 Functional performance is the individual perceptions of Thai people with COPD concerning their ability to perform the activities of daily living. Functional performance was quantified by using the Functional Performance Inventory Short Form (FPI-SF). The measurements involve personal hygiene care, household maintenance, physical exercise, recreation activities for personal pleasure, spiritual activities and social interaction with family and friends (Leidy & Knebel, 2012).

Personal hygiene care refers to an individual's ability to bathe, wash hair, dress and undress independently. Household maintenance refers to activities involving housework, cooking, carrying groceries, activities around the house and going to appointments with the doctor. Physical exercise refers to activities to maintain physical fitness, including walking up and down the stairs and walking around the house. Recreation refers to activities for personal pleasure for relaxation and enjoyment involving both indoor and outdoor activities. Spiritual activities are associated with religious beliefs and spiritual development. Social interaction refers to the ability to perform activities with family and friends.

1.7 Conceptual Framework

The conceptual framework for this study was based on a revised version of Wilson and Cleary's health-related quality of life model (1995) and an integrative literature review. The revised conceptual model of HRQOL focuses on the following four domains of overall quality of life: biological function, symptoms, functional status and general health perceptions (Ferrans et al., 2005; Wilson & Cleary, 1995). The model begins with biological function focused on the functions of cells, organs and organ

systems among patients and resulting in symptoms. The impacts of symptoms can affect the ability to perform activities of daily living and functional status. All of these influence a person's perception of overall health and can contribute to a low level of HRQOL. Moreover, the person's individual characteristics and environmental factors influence all of these four domains and quality of life (Ferrans et al., 2005; Wilson & Cleary, 1995).

The conceptual framework for this study began with the pathophysiology of COPD which consists of airflow limitations and reduction in the ratio of PEFR resulting in a ventilation-perfusion (V_A/Q) mismatch, which can impair the gas exchange process and create physical symptoms (Hinkle & Cheever, 2014; Kapella, Larson, Covey & Alex, 2011). Persons with moderate to severe COPD often suffer from physical symptom clusters that tend to deteriorate over time, thereby causing psychological symptom clusters (Park & Larson, 2016). Both physical and psychological symptom clusters can impede the ability to engage in the activities of daily living, which can lead to a negative correlation with functional performance among persons with COPD (Srirat et al. , 2014; Witheethamsak, Duangpaeng & Masingboon, 2010; Zamzam et al., 2012). Therefore, pulmonary function is related to functional performance among persons with COPD.

Regarding the characteristics of the individual, the aging process is a common cause of the gradually deteriorating pulmonary function (Eisner et al., 2010). HRQOL was also found to differ in women compared to men (Raherison et al., 2014). Moreover, malnutrition and dyspnea during exertion could cause activity limitations (O'Donnell et al., 2007; Witheethamsak et al., 2010). Concerning the aforementioned personal factors, persons with COPD need support from family members, neighbors and healthcare providers (Eisner et al., 2010; Phuwilai et al., 2012). Consequently, the personal factors of persons with COPD, such as age, gender and nutritional status, are associated with social support, pulmonary function, functional performance and HRQOL (Hinkle & Cheever, 2014). Similarly, social support has been associated with the environmental characteristics of persons with COPD because they require the assistance of family members, friends and healthcare providers in accomplishing daily tasks they can no longer manage alone due to dyspnea intensity on exertion (Wahls, 2012). Hence, social support is correlated with pulmonary function and functional performance among persons with COPD. Therefore,

all of the aforementioned can be life-threatening experiences and affect HRQOL among persons with COPD (Santos et al., 2014; Zamzam et al., 2012).

This study focused on the following four factors: personal factors (age, gender and nutritional status) referring to the characteristics of the individual. Social support refers to the characteristics of the environment and pulmonary function refers to the biological function of the lungs, which was used to describe the severity of COPD. Functional performance focuses on the ability to perform activities of daily living and functional status. All of these are related to HRQOL among persons with COPD (Dignani et al., 2015; Ferrans et al., 2005; Witheethamsak et al., 2010). However, this study removed symptoms and general health perceptions because these factors are strongly correlated with HRQOL and required a clear understanding of HRQOL among persons with COPD (Phuwilai et al., 2012; Witheethamsak et al., 2010; Zamzam et al., 2012). The conceptual framework of this study was adapted from a revised version of Wilson and Cleary's health-related quality of life model (1995) as shown in Figure 1.1.

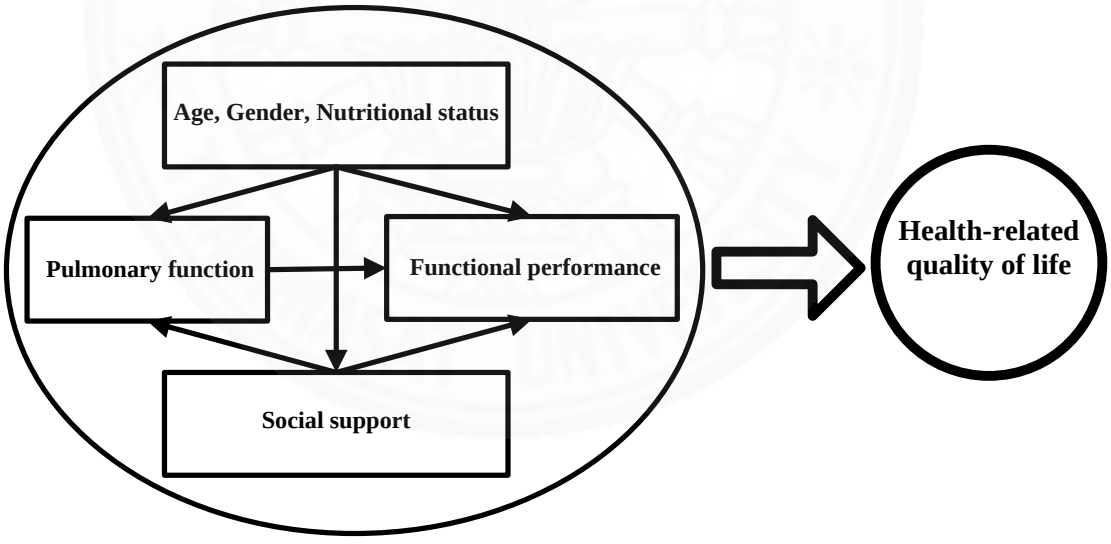

Figure 1.1 - Conceptual framework of the study

1.8 Research Hypotheses

1. 8. 1 Personal factors, social support, pulmonary function and functional performance are related to HRQOL among Thai persons with COPD.

1.8.2 Personal factors, social support, pulmonary function and functional performance are incorporated predictors of HRQOL among Thai persons with COPD.

1.8.3 Personal factors, social support, pulmonary function and functional performance can explain the relationships with HRQOL among Thai persons with COPD.

CHAPTER 2
REVIEW OF LITERATURE

In this chapter, the literature review is presented for the purpose of providing an integrative overview and reviews of variables involving HRQOL among persons with COPD. The literature review focused on COPD epidemiology and concepts of interest, literature search strategy, factors associated with HRQOL among persons with COPD and the conceptual framework used in this study.

2.1 Epidemiologic and Concepts of Interest

2.1.1 Definition of COPD

The GOLD (2017, p. 6) defines COPD as "a common preventable and treatable disease, which is characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gasses." The trajectory of COPD involves a chronic condition with certain physical limitations and unpredictable intermittent exacerbations (Murray et al., 2012).

COPD is a significant cause of morbidity and mortality worldwide. In 2012, the WHO estimated the global COPD morbidity rate to be approximately 210 million persons and the mortality rate to be over three million persons, thereby making COPD the fourth leading cause of death worldwide (WHO, 2015). In 2014, Thailand's MOPH estimated the annual morbidity rate of COPD to be 1.5 million persons with a mortality rate of approximately 10,019 persons, thereby making COPD the fifth leading cause of death (Bureau of Non Communicable Diseases, 2015; NHSO, 2016). Most of persons with COPD are elderly (Srirat et al., 2014). Two-thirds of these are men with numbers increasing among women with COPD (NHSO, 2016). The Health In 2017, Region 4 of Thailand's MOPH reported the morbidity rate of COPD among individuals aged 40 years or over to be 8,276 persons with a mortality rate of 913 persons. In 2018, the morbidity rate was 9,146 persons and the mortality rate was 1,065 persons. Therefore, there were increasing morbidity and mortality rates among individuals aged 40 years or over from 2017 to 2018. As these alarming statistics show, COPD is a major public health issue worldwide, including in Thailand.

2.1.2 Causes and Risk Factors of COPD

The genetics, age, gender, smoking habits, environment and socioeconomic status of people are found to be the main contributors to the causes and risk factors for COPD. First, the genetic risk factors are associated with the deficiency of alpha-antitrypsin (AATD), which is an enzyme inhibitor for protecting against lung parenchyma inflammation, thereby causing emphysema and a decline in pulmonary function (GOLD, 2017; Hinkle & Cheever, 2014). Second, the aging process is a common cause of the gradual deterioration of pulmonary function in persons with 40 years of age and over (Eisner et al., 2010). Women have also been found to be more likely to respond negatively to the effects of cigarette smoke and air pollution, thereby resulting in greater likelihood for the development of COPD in women than in men (GOLD, 2017).

Third, smoking habits and passive exposure to cigarette smoke are among the most important risk factors for COPD due to effects on the inflammatory response of the airways and parenchyma resulting in airflow limitation (Hinkle & Cheever, 2014; WHO, 2015). Fourth, environmental factors refer to both indoor and outdoor air pollution. Indoor air pollution and biomass fuels (main energy sources used for cooking and heating) are found to be the most prevalent among non-smoking women with COPD. Both can adversely affect pulmonary function, thereby resulting in increased airflow limitations and emphysema (WHO, 2015). Similarly, high levels of outdoor air pollution in urban areas can cause abnormal pulmonary function growth in childhood and adolescence leading to COPD in adulthood (Eisner et al., 2010; GOLD, 2017). Finally, the most frequently cited risk factor for the development of COPD involves low socioeconomic status, which encompasses low education level, poor quality accommodations and low income (Eisner et al., 2010; Gershon, Dolmage, Stephenson & Jackson, 2012; GOLD, 2017).

2.1.3 Pathophysiology of COPD

The pathophysiology of COPD involving both chronic bronchitis and emphysema begins with an abnormal inflammatory response of the airways and/or alveoli with air pollution or noxious particles resulting in airflow limitations (GOLD, 2017). The inflammatory response in the airways causes the small airway lumen to narrow in a way that the ciliary function is reduced whereby the hyper-secretion of mucus can result in airflow obstruction leading to parenchymal destruction (Hanania &

Sharafkhaneh, 2010). Additionally, the inflammatory response in the parenchyma causes imbalances of proteinase and anti-proteinase causing parenchymal destruction and resulting in reduced lung elastic recoil pressure (Hinkle & Cheever, 2014). Both airflow obstruction and parenchymal destruction can lead to airflow limitations, which processes slowly for many years and becomes so severe that it may not be fully reversible (O'Donnell et al., 2007). The airflow limitations cause a reduction in the ratio of FEV_1 by decreasing lung compliance and hyperinflation (GOLD, 2017). Hyperinflation occurs when the air is trapped within the lungs after each breath because of an imbalance in the volume of inspiratory and expiratory air (Hanania & Sharafkhaneh, 2010). This mechanism can lead to a ventilation-perfusion (V_A/Q) mismatch and can impair gas exchange (Hinkle & Cheever, 2014). Dynamic lung hyperinflation leads to increases in the elastic and threshold loads on the inspiratory muscles, thereby increasing the work of breathing and resulting in respiration difficulty and long-term effects on fatigue, sleep alterations, pain, emotional reactions, memory function decline and respiratory muscle weakness (GOLD, 2017; Srirat et al., 2014).

2.1.4 Diagnosis and Classification of COPD

The objective of the diagnosis of COPD is to investigate the degree of airflow obstruction and the consequences of COPD on HRQOL in COPD persons with the aim of seeking guidelines for effective treatments. According to GOLD (2017), the diagnosis of COPD is based on the symptoms, risk factors and spirometry results. The following symptoms and risk factors of COPD that are usually assessed include dyspnea, chronic cough and/or sputum production and history of exposure to the risk factors for COPD (Hanania & Sharafkhaneh, 2010). Spirometry testing is the most widely used method for assessing pulmonary function and is a gold standard in the definitive diagnosis of COPD. Spirometry is the assessment of airflow limitations among persons with COPD based on the presence of a post-bronchodilator forced expiratory volume in one second (FEV_1)/forced vital capacity (FVC) or FEV_1/FVC. Both of the ratios of FEV_1 and FVC can have a value of below 80 percent as predicted from the results of the ratio of FEV_1/FVC, with a value below 0.7 showing an airflow limitation that ensures having the condition of COPD (GOLD, 2017). The classification of severity of airflow limitations can be categorized by using designation of FEV_1 predicted values are as follows: GOLD 1 or mild level defined as more than

80 percent of predictive values, GOLD 2 or moderate level defined as 50 to 79 percent of predictive values, GOLD 3 or severe level defined as 30 to 49 percent of predictive values and GOLD 4 or very severe level defined as 0 to 29 percent of predictive values (GOLD, 2017).

2.1.5 Treatment and Nursing Interventions for COPD

The treatment of COPD consists of three major approaches, namely pharmacological, non-pharmacological and other kinds of treatments. Pharmacological approaches are used based on physicians' prescriptions, including bronchodilators, anticholinergics, corticosteroids, methylxanthines, antibiotics, mucolytic agents and vaccines (GOLD, 2017). These approaches are used with the aim of reducing the symptoms and frequency of COPD, decreasing the severity of exacerbations, improving health status, increasing exercise tolerance and enhancing quality of life (Bailey et al., 2012; Hinkle & Cheever, 2014). In Thai persons with COPD, the most useful pharmacological approaches are bronchodilators and inhaled corticosteroids, which ameliorate dyspnea (Srirat et al., 2014).

Non-pharmacological approaches refer to any methods of symptom management that do not include administering medication among persons with COPD, and these methods suggested by nurses can be practiced independently including the following: energy conservation techniques, breathing techniques, relaxation techniques, exercise training, nutritional strategies and secretion clearance strategies (Bailey et al., 2012). The principal goals of these approaches are to reduce dyspnea, increase physical and emotional participation in everyday activities and enhance quality of life (GOLD, 2017). For Thai persons with COPD, the most commonly used non-pharmacological approaches are breathing techniques, effective coughing and energy conservation techniques (Srirat et al., 2014). The least commonly used techniques are listening to songs or music, relaxation techniques and exercise training (Parveen, Thaniwattananon & Larson, 2014; Suwanno, 2007).

Other kinds of treatments have been found to include smoking cessation strategies, oxygen therapy and surgical treatments. For the case of smoking, GOLD (2017), a treatment called a five-step program is suggested (asking, advising, assessing, assisting and arranging) for persons with COPD as an intervention stating that it can be used as a strategic framework that is helpful to nurses and other healthcare

providers who are interested in helping persons with COPD stop smoking. Oxygen therapy can be administered as a long-term continuous treatment provided during exercise to prevent acute exacerbation. Long-term oxygen therapy can be used to enhance quality of life in severely hypoxic persons with COPD (Spathis & Booth, 2008). Surgical treatments among persons with COPD are lung volume reduction surgery (LVRS), bullectomy and lung transplantation. The most commonly used LVRS to treat severe hyperinflation for persons with COPD and emphysema (GOLD, 2017; Hinkle & Cheever, 2014).

2.2 Literature Search Strategy

This study presents the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) in reviewing the literature related to HRQOL among persons with COPD (Stovold, Beecher, Foxlee & Noel-Storr, 2014). A review of English language scientific literature was conducted by the researcher by using three main health science academic databases, namely Science Direct, PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) as well as the review of related Thai language published articles using the Google search engine. The searches focused on the articles published between January 1, 2012 and January 31, 2019. The keywords used included "health-related quality of life" AND "quality of life" AND "chronic obstructive pulmonary disease." However, the keywords for health-related quality of life and general quality of life were used together in conducting the searches as they were used interchangeably in the articles published in this subject area.

The search yielded a total of 1,857 articles from Science Direct (n = 1,160), PubMed (n = 555) and CINAHL (n = 142). The results of the initial search had a duplication of 1,306 articles. After removing these duplicate articles and adding 12 articles published in the Thai language, the results were a total of 563 articles with unique titles to be screened. Both titles and abstracts were then examined based on the inclusion and exclusion criteria. The inclusion criteria used in selecting relevant articles as primary sources refer to articles written in the English or Thai language, focused on factors associated with HRQOL among persons with COPD and describing interventions aiming to enhance HRQOL among persons with COPD. The exclusion criteria involved articles not written in the English or Thai languages and those with no relevance to HRQOL among

persons with COPD. A total of 174 full articles were obtained and assessed for eligibility, thereby resulting in 121 articles (102 quantitative and 19 qualitative) being included as the most relevant to HRQOL among persons with COPD. A summary of the literature search strategy of this study adapted from Moher, Liberati, Tetzlaff, Altman and Prisma Group (2009) is shown in Figure 2.1.

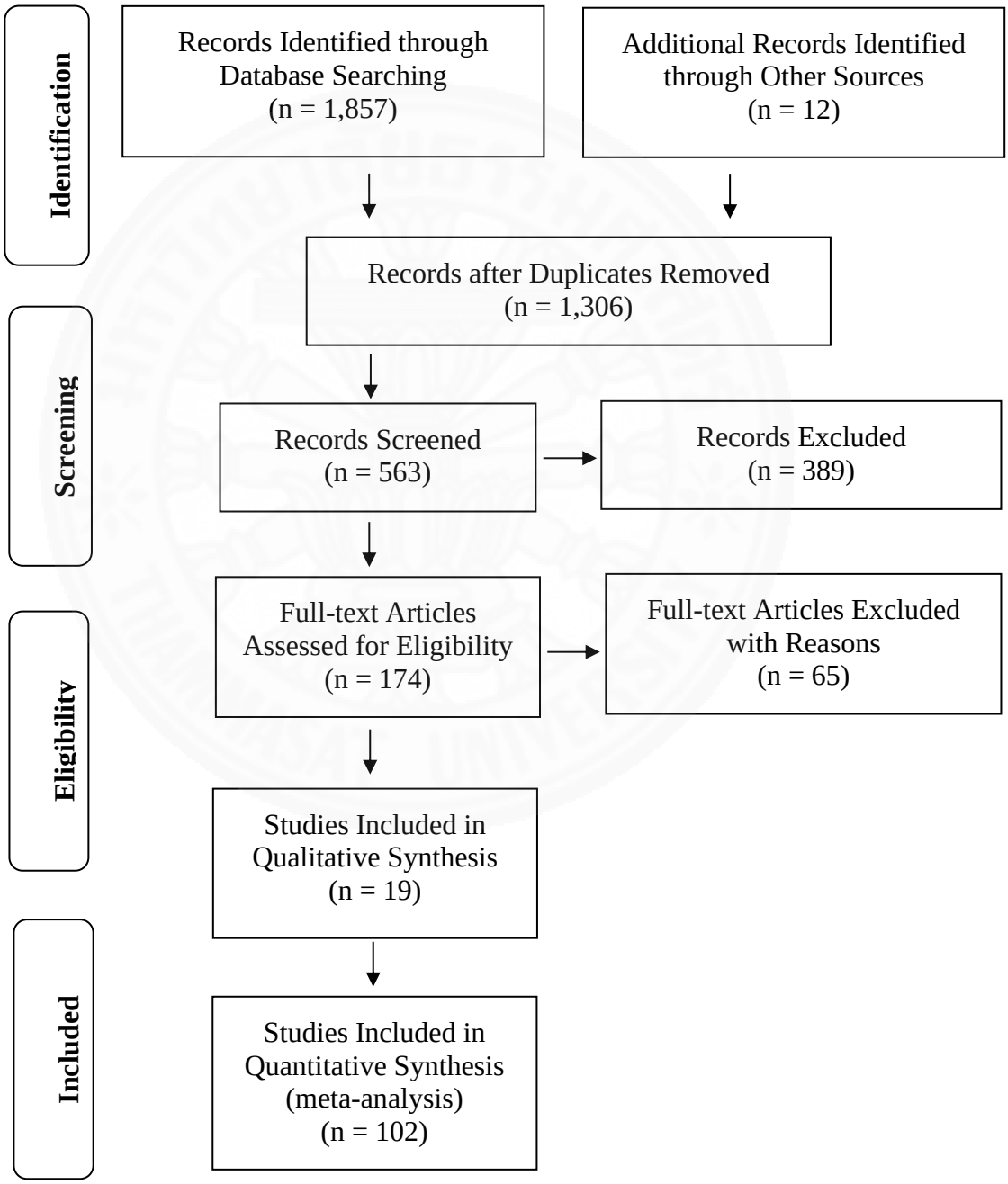

Figure 2.1 - Literature search flow diagram

2.3 Health-Related Quality of Life among Persons with COPD

2.3.1 Definitions of HRQOL

The terms quality of life (QOL) and health-related quality of life (HRQOL) have been widely used in nursing research to assess the effectiveness of interventions and their health outcomes (Moy et al., 2009). The WHO (1997) provides the definition of the term QOL as an individual's perception of life in the contexts of the culture and value systems in which they live concerning their goals, expectations, standards and concerns. The Centers for Disease Control uses the term QOL in a broader sense than HRQOL and defines HRQOL as an individual's perception of physical and psychological with respective correlates including health risk and conditions, functional status, social support and socioeconomic status associated with effects on symptoms and treatment (Centers for Disease Control [CDC], 2016). Similarly, Ferrans et al. (2005) defined HRQOL as an individual perception associated with effects on health, illness and treatment, while is not associated with cultural, political and societal attributes. HRQOL is specific to each disease and this study focuses on HRQOL among Thai persons with COPD.

HRQOL among persons with COPD has been defined as individual experiences with complex physiological and psychosocial related factors (Jones, 1998; Moy et al., 2009). Moreover, HRQOL in persons with COPD is subjective, involving self-assessment of dynamic and multi-dimensional concepts that evolve with the progression of pathology and a decline in health status (Dignani et al., 2015; Pickard, Lee & Yang, 2011). As for Thai persons with COPD, a definition for HRQOL has been proposed as individual perception regarding having good living conditions, being safe and happy, successful performance in activities of daily living and receiving support and help from family members and society (Phuwilai et al., 2012; Suntornchaturavit, 2003). In summary, HRQOL among persons with COPD has an overall definition of an individual's perception of the effects of health and illness conceived as dynamic and multi-dimensional while involving physical, psychological and social dimensions (Dignani et al., 2015; Phuwilai et al., 2012; Pickard et al., 2011; Sharma & Joshi, 2015).

2.3.2 Dimensions of HRQOL among Persons with COPD

The multi-dimensional domains of HRQOL among persons with COPD include physical, psychological and social dimensions (Dignani et al., 2015; Kwon & Kim, 2016; Paap et al., 2014; Sharma & Joshi, 2015). The physical dimension refers to the physiological response to COPD and a decline in physical functioning causing dyspnea, activity limitations and fatigue (Hinkle & Cheever, 2014). Dyspnea is the most common symptom of COPD and signals increased effort or physical work in breathing, while the physiologic response includes tachypnea, tachycardia and use of accessory muscles (Wahls, 2012). Dyspnea during exertion can result in activity limitations. A study conducted in 2007 found that approximately one-third of the persons with COPD had dyspnea when doing light housework (O'Donnell et al., 2007) and another study found that nearly 70 percent of the subjects to have dyspnea when walking up a flight of stairs (Witheethamsak et al., 2010). Dyspnea also interferes with eating and the work of breathing means energy depletion resulting in weight loss and fatigue (Hinkle & Cheever, 2014).

The psychological dimension refers to the emotional reactions to COPD, including a lack of confidence in physical capabilities potentially leading to permanent psychological symptoms (Park & Larson, 2016). Anxiety and depression are frequently associated with COPD with anxiety generally appearing earlier than depression (Zamzam et al., 2012). Moreover, the experience of dyspnea promotes hyper-vigilance of respiratory symptoms leading to increased stress, distress, anxiety and depression (Harrison, Lee, Janaudis-Ferreira, Goldstein & Brooks, 2016). Within this psychological dimension, the social dimension refers to the aspects of social relationships and social functioning. Symptoms such as social isolation and loss of previous role identification are included in this dimension. Wahls (2012) found that dyspnea, fatigue and reduction of physical activity can lead to the loss of previous role identification, the inability to earn a living and social isolation. This dimension can have considerable impacts on families and caregivers as many persons with COPD require significant care, which may affect family and other types of relationships (Gardiner et al., 2010; Kwon & Kim, 2016).

2.3.3 Measurement of HRQOL among Persons with COPD

As HRQOL among persons with COPD is subjective, its data can only be obtained directly from the people in this group. Presently, several instruments are used to measure HRQOL, including both generic and specific instruments (Gupta & Kant, 2009; Nagata et al., 2012). The generic HRQOL instrument is a broad outcome indicator with certain applicability. Its advantage is that it can be used to compare various conditions or interventions of multiple diseases (Gupta & Kant, 2009; Lin, X., Lin, I. & Fan, 2013). The most commonly used generic instrument for measuring HRQOL among persons with COPD is the 'Short Form 36' or SF-36. It consists of 36 items and covers eight components as follows: physical functioning, role limitations due to physical health problems, body pain, social functioning, general mental health, role limitations due to an emotional problem, vitality and general health perception (Ware & Sherbourne, 1992). The Thai version of the SF-36 was tested for reliability with 30 persons with COPD by using Cronbach's alpha coefficient, which resulted in a high reliability value of 0.91 (Benismaall, Ruangdej, Lim & Chaosuansreecharoen, 2013).

As for the specific HRQOL instruments, the main focus of their use is on the aspects of a specific disease. These are the instruments used for measuring patients' responsiveness and clinically important changes (Gupta & Kant, 2009; Lin et al., 2013). The most commonly used specific instruments for measuring HRQOL among persons with COPD include the Chronic Respiratory Disease Questionnaire (CRDQ), the COPD Assessment Test (CAT) and the St. George's Respiratory Questionnaire for COPD patients (SGRQ-C) (Arpinelli, Riccardo, Bertolotti & Carone, 2016; Gupta & Kant, 2009). First, the CRDQ consists of 20 items and covers three components involving information on dyspnea, fatigue, emotional function and mastery (Guyatt, Berman, Townsend, Pugsley & Chambers, 1987). The Thai version of the CRDQ was tested for reliability with 30 persons with COPD by using Cronbach's alpha coefficient, which resulted in a high reliability value of 0.93 (Sittikool, 2004). Second, the CAT consists of eight items and focuses on assessing and monitoring the impact of COPD on health status (Jones, 2013). The Thai version of the CAT was tested for reliability with 20 persons with COPD by using Cronbach's alpha coefficient, which resulted in a reliability value of 0.85 (Pattarakantakul & Donlao, 2017). Third, the SGRQ-C consists of 14 items and covers three components requesting information on the symptom, activity and

psychosocial impact of the disease (Jones & Forde, 2012). The Thai version of the SGRQ-C was tested for reliability with 30 persons with COPD by using Cronbach's alpha coefficient, which resulted in a high reliability value of 0.78 (Songprasert et al., 2014).

In evaluating and describing the instruments used to measure HRQOL among persons with COPD, Arpinelli et al. (2016) conducted a review of related literature. The results showed that the most widely used instrument was the SGRQ-C, which was used to measure HRQOL in persons from 2009 to 2014. The SGRQ-C is a specific HRQOL instrument that focuses on the measurement of health impairment among persons with COPD. Its development, testing and validation as an instrument has been well-documented and the instrument is available in 77 languages, including the Thai language. Therefore, this instrument is appropriate for use in the present study. However, semi-structured interviews were also used as one of the data collection strategies in the research design, because HRQOL among persons with COPD is complex and involves the interplay of multi-dimensional factors. Understanding and explaining the relationships of these factors affecting HRQOL by using patients' narratives can facilitate appropriate care for persons with COPD (Chirawatkul, 2015; Creswell & Clark, 2011; Hoaas et al., 2016; Klassen, Creswell, Clark, Smith & Meissner, 2012). The findings are expected to provide comprehensive in-depth understanding of the factors influencing HRQOL among Thai persons with COPD.

2.3.4 HRQOL among Persons with COPD

Most of chronic diseases have effects on health and lifestyles (Ferrans et al, 2005). According to the pathophysiology of COPD, both physical and psychological symptoms can also have long-term effects on HRQOL among persons with COPD. The attributes of HRQOL among persons with COPD are an individual, subjective perception conceived as dynamic and multi-dimensional. Low levels of HRQOL among persons with COPD are related to social isolation, dependence on others, lack of social support resulting in dissatisfaction with life and depression due to ineffective coping with symptoms and a feeling of helplessness (Ahmed et al., 2016; Dignani et al., 2015). In contrast, a high level of HRQOL is related to an increase in social engagement, independence, life satisfaction and self-efficacy as well as a decrease in depression (Dignani et al., 2015; Mouser, 2014). Most previous research studied

HRQOL among persons with COPD, which was quantified by measuring the SGRQ-C. The results showed that HRQOL among persons with COPD was mostly low to moderate; the highest HRQOL was in the psychosocial component, while the lowest of HRQOL was in the activity component, and half of the respondents reported having depression (Ekici et al., 2015; Negi, Sarkar, Raval, Pandey & Das, 2014; Sharma & Joshi, 2015).

This is supported by the results of Zamzam et al. (2012) who studied HRQOL among persons with COPD in Egypt and quantified the findings by measuring SGRQ-C scores. According to the findings, most of the participants had low to moderate levels of HRQOL; the highest HRQOL was found in the psychosocial impact component, while the lowest HRQOL was found in the activity component. Moreover, severity of COPD was positively correlated with SGRQ-C scores, but pulmonary function was quantified by measuring the FEV_1 and PEFR values, which were negatively correlated with the SGRQ-C scores. This study suggests that evaluation among persons with COPD should not be based on pulmonary function alone, but also on investigation of HRQOL. Similar findings were revealed in Thailand where Songprasert et al. (2014) studied HRQOL among persons with COPD in Nakhon Si Thammarat Province and quantified the findings by measuring the SGRQ-C scores. According to the findings, most of the participants had low HRQOL; the highest HRQOL was found in the psychosocial impact component, while the lowest HRQOL was found in the activity component and half of the respondents reported having depression. Moreover, persons with severe to very severe COPD had higher SGRQ-C scores than persons with mild to moderate COPD. On the other hand, Jantiya et al. (2011) studied HRQOL among persons with COPD in Saraburi Province and found most of the partipants to have moderate HRQOL; the highest HRQOL was found in the physical well-being component with most of the participants being able to perform household maintenance, while the lowest HRQOL was found in the body image component concerned with life satisfaction. It can be concluded, therefore, that a low level of HRQOL among persons with COPD is present worldwide, including in Thailand.

2.4 Factors Associated with HRQOL among Persons with COPD

The literature review of the factors associated with HRQOL among persons with COPD in this study was mostly based on the HRQOL model created and revised by Wilson and Cleary (1995) and an integrative literature review of other related work. The factors associated with HRQOL among persons with COPD are as follows: personal factors as an individual characteristic; social support as a characteristic of the environmental factor; pulmonary function as a biological function; and functional performance as functional status. In conclusion, the research framework of this study is shown in Figure 2.2. Each factor is fully described below.

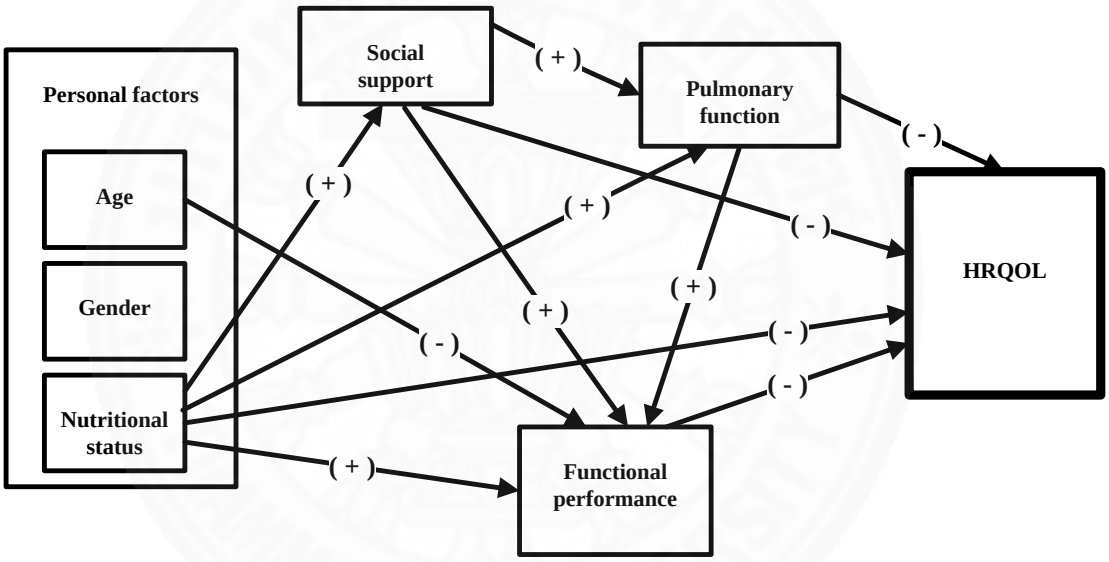

Figure 2.2 - Research framework for the study

2.4.1 Personal Factors

Personal factors, namely age, gender and nutritional status, are described as follows:

2.4.1.1 Age

Age is an important personal factor and individual characteristic worth investigating as suggested in a revised version of Wilson and Cleary's HRQOL model (1995). Age refers to the number of full years among persons with COPD counting from the date of birth to date of the study. The age groups were classified as

adults with COPD within age ranges of 40 - 59 years and elderly with COPD including youngest-old within age ranges of 60 - 69 years; middle-old within age ranges 70 - 79 years; oldest-old within age ranges for more than 80 years (GOLD, 2017).

Impact of Age among Persons with COPD

The aging process is a common cause of gradual deterioration of pulmonary function in persons aged 40 years and over. The American Thoracic Society has reported that the aging process brings about a decrease in lung elasticity, a progressive condition of the stiffness of the chest wall and a decrease in respiratory muscle strength, thereby causing chronic lung disease (Eisner et al., 2010). Similarly, impact of increasing age among elderly with COPD involving sleep troubles, dyspnea and loss of muscle mass resulting declining functional performance and HRQOL (Incalzi, Scarlata, Pennazza, Santonico & Pedone, 2014). This is supported by the results of Hanania, Sharma and Sharafkhaneh (2010) which revealed that COPD in the United States appeared to be more prevalent in persons aged 65 and over (14.20 percent) compared to those aged 40 years old and over (9.90 percent). There appears to be increasing prevalence of COPD strongly associated with age. Similarly, the age groups among Thai persons with COPD were significant in the study of Srirat et al. (2014) who found most Thai persons with COPD to be elderly within an age range of 51 to 91 years with a mean age of 71.03 years. Consequently, the participants of this study were Thai persons with COPD aged 40 years and up.

Holm et al. (2014) conducted a study finding age to have an impact on psychological and clinical outcomes among persons with COPD in the United States. The psychological outcomes of COPD in this study consisted of anxiety and depression measured by using the Hospital Anxiety and Depression Scale (HADS). The clinical outcomes of COPD consisted of HRQOL, which was measured by using SGRQ-C scores, while the modified Medical Research Council (mMRC) was used to measure dyspnea severity. The results showed that increasing age was associated with anxiety, depression, dyspnea and HRQOL, but marital status was not associated with the other health outcomes among persons with COPD. Moreover, in this study, persons with COPD who were single and younger had more depression and dyspnea with poorer HRQOL. The findings of this study suggest a necessity to identify specific concerns of younger persons with COPD. Similarly, the findings of Chen, Fan, Belza, Pike and

Nguyen (2017) revealed that most elderly persons with COPD reported having a family caregiver and had high levels of perceived social support. Furthermore, this study showed that social support was positively correlated with functional performance and pulmonary rehabilitation among persons with COPD.

In other studies on HRQOL scores and age groups, the study of Sharma and Joshi (2015) revealed that age groups were associated with HRQOL among persons with COPD in Nepal where HRQOL was significantly higher in persons aged 60 to 69 years, whereas persons aged 80 years or over showed significantly lower HRQOL compared to younger age groups. Similarly, Corlateanu, Botnaru, Covantev, Dumitru and Siafakas (2016) found that both the elderly age group and the adult age group had a significantly positive correlation with HRQOL among persons with COPD in Greece. In addition, elderly persons with COPD have a deterioration of psychosocial aspects of life and a decline in functional performance. In Thailand, Songprasert et al. (2014) found that most persons with COPD were in the elderly age group with a mean age of 69.70 years. The subjects had low HRQOL and half reported having depression. In contrast, Boonreung, Suwanno, Phonphet, Petsirasan and Thiamwong (2017) showed that poor HRQOL and higher depression among persons with COPD were predictors of severe acute exacerbation (AE). None of the personal factors (age, gender, education, income and smoking habits) were predictors of severe AE. Therefore, there is a need to investigate further regarding the impact of age groups on HRQOL among persons with COPD.

2.4.1.2 Gender

In the revised version of the HRQOL model written by Wilson and Cleary (1995), gender is mentioned as a personal factor and an individual characteristic. For this study, gender refers to the biological aspects between male and female persons with COPD.

Gender Differences among Persons with COPD

Most persons with COPD are males, but the prevalence of COPD among women is increasing due to increased tobacco use (GOLD, 2017). Gender differences among persons with COPD involving nutritional status, pulmonary function, functional performance and HRQOL are often worse among women when compared with men (Ferrari et al., 2010; Odencrants, Bjuström, Wiklund & Blomberg,

2013; Van Haren-Willems & Heijdra, 2010), possibly because women show greater anxiety, more vulnerability of the lungs and more complaints about dyspnea during exertion. Similarly, De Torres, Casanova, Garcini, Aguirre-Jaime and Celli (2007) found that men and women with COPD have different coping mechanisms. Women with COPD expressed more dyspnea than men, despite the same degree of airway obstruction. One study suggested that non- respiratory factors such as anxiety, depression or coping mechanisms probably play an important role in perceived HRQOL in women (Wahls, 2012). Several other studies have even suggested that women are more susceptible to the effects of tobacco smoke and air pollution than men (GOLD, 2017). Thus, gender related to HRQOL may involve the perception of developing dyspnea in women more than in men.

Raherison et al. (2014) studied the personal factors associated with HRQOL, especially the effects of gender among persons with COPD in France. The The results showed that gender related to poor HRQOL among persons with COPD included a decline in pulmonary function, an increase in the severity of dyspnea, chronic sputum, respiratory infection and higher levels of anxiety and depression. Gender varied in characteristics in women than in men while chronic sputum was associated with HRQOL in women, but not in men. However, the most common comorbidities in men with COPD were cardiac disease, dyslipidemia, alcoholism and sleep apnea syndrome, while osteoporosis, anxiety and depression were more frequently found in women. In France, the HRQOL of women with COPD was lower than that of men with COPD. Similarly, Ferrari et al. (2010) studied gender differences in predictors of HRQOL among persons with COPD in Brazil. The The results showed that nutritional status and functional performance were lower in women than men, which led to HRQOL in women being poorer than in men among persons with COPD. Moreover, age, gender and perception of dyspnea were related to HRQOL among persons with COPD. Therefore, gender is correlated with nutritional status, pulmonary function, functional performance and HRQOL among persons with COPD.

In contrast, a study by Ahmed et al. (2016) investigated HRQOL among 124 persons with COPD in India. The results also showed that poor pulmonary function, increasing age and low socioeconomic status were associated with HRQOL. Nevertheless, gender, BMI and education were not associated with HRQOL among Indians

with COPD. Perhaps the different outcomes of this study are due to the different social structures in Indian persons with COPD. In Thailand, two-thirds of persons with COPD are men and increasing numbers are reported among women with COPD (NHSO, 2016). Previous studies have revealed gender to be associated with HRQOL with more significant impact in women than in men (Phuwilai et al., 2012; Srirat et al., (2014); Songprasert et al., 2014). This is supported by the results of Wangsom (2010) who found most persons with COPD to be males with low levels of HRQOL among persons with COPD. Moreover, functional performance and HRQOL among persons with COPD are lower for women than men among persons with COPD. To clarify the impact of gender on HRQOL among persons with COPD, further research is needed.

2.4.1.3 Nutritional Status

Individual characteristics consist of demographic, developmental, psychological and biological factors, all of which can influence health conditions (Eyler et al., 2002). This study focused on nutritional status included within personal factors. Nutritional status refers to the state of nutrition, including the intake of food, the utilization of nutrients in individuals and body composition among Thai persons with COPD.

Measurement of Nutritional Status

Presently, several instruments are used for the assessment of nutritional status, including anthropometric assessment, body composition assessment and biochemical assessment (Chaudhary et al., 2015; Yazdanpanah, Shidfar, Moosavi, Heidarnazhad & Haghani, 2009). First, the most commonly used anthropometric assessment for measuring nutritional status among persons with COPD is 'body mass index' or BMI. The value of BMI based on the participants' weight in kilograms was divided by the square of height in meters (kg/m^2). The level of BMI consisted of the following four categories: 1) less than 18.5 kg/m^2 was defined as a low level; 2) 18.5 to 24.9 kg/m^2 as a normal level; 3) 25.0 to 29.9 kg/m^2 as high level and 4) over 30 kg/m^2 as obese (Pothirat et al., 2016). Second, the most commonly used body composition assessment for measuring nutritional status among persons with COPD is 'bioelectric impedance analysis' or BIA. The BIA is a safe and rapid method in which the researcher analyzes body composition by the fat-free mass index (FFMI) (Srigiripura, Urooj, Krishnarao & Anand, 2017). The normal values for the FFMI are calculated based

on gender, weight and height. The value is divided into two categories consisting of low and normal levels. An FFMI of less than 15 kg/m^2 in women and less than 16 kg/m^2 in men is defined as a low level. An FFMI of more than 15 kg/m^2 in women and more than 16 kg/m^2 in men is defined as a normal level (Gologanu et al., 2014). Third, the most commonly used biochemical assessments for measuring nutritional status among persons with COPD are 'serum albumin', 'serum total protein', 'serum cholesterol'. The normal values of biochemistry laboratory results are as follows: serum albumin at 3.50 to 5.30 g/l, normal values of serum total protein at 6.40 to 8.30 g/l and normal values of serum cholesterol at less than 200 mg/dl (Yazdanpanah et al., 2009).

Chaudhary et al. (2015) studied the assessment of nutritional status among persons with COPD. The research instruments were as follows: FFMI, BMI, subjective global assessment (SGA) and mini nutritional assessment (MNA). The results showed that persons with severe to very severe COPD had malnutrition and significant decreases in mean FFMI, BMI, SGA and MNA levels were observed with increasing severity of COPD. Several studies have stated that the FFMI can more accurately assess nutritional status compared to BMI because the loss of skeletal muscle mass contributes to weight loss among persons with COPD (GOLD, 2017; Luo et al., 2016; Pothirat et al., 2016). This is supported by the results of Pothirat et al. (2016) who studied the correlation between BMI and FFMI among persons with COPD in Chang Mai Province. The results showed that BMI was strongly correlated with FFMI, but not correlated with HRQOL and that the FFMI was correlated with HRQOL among persons with COPD. Therefore, FFMI is appropriate for use in measuring nutritional status among persons with COPD.

Nutritional Status among Persons with COPD

Persons with severe to very severe COPD are often associated with weight loss. Loss of body cell mass is a major problem among persons with COPD, which can cause severe physical symptoms. Concurrently, dyspnea among persons with COPD interferes with eating, and the work of breathing leads to energy depletion and subsequent changes of body composition, loss of skeletal muscle mass and weight loss due to malnutrition (Hinkle & Cheever, 2014). This is supported by the results of Odencrants et al. (2013) who stated that approximately half of all participants had malnutrition and risk for malnutrition among persons with COPD in Sweden. In contrast, several studies have shown that some persons with COPD have normal levels of BMI, while others

have low fat-free mass index values (FFMI) (Collins, Stratton & Elia, 2012). This is because the loss of skeletal muscle mass is a common cause of malnutrition among persons with COPD (Luo et al., 2016; Pothirat et al., 2016). Therefore, monitoring nutritional status is necessary for persons with COPD and the FFMI can accurately determine nutritional status.

Sehgal, Dhooria and Agarwal (2017) conducted a systematic review to describe the relationships between COPD and malnutrition in developing countries. The findings showed that malnutrition is a significant health problem for persons with COPD in these countries. Nutritional status measured with the degree of loss of fat mass among persons with COPD consists of four types: semi-starvation defined as having a low level of BMI, but with normal or above normal FFMI; muscle atrophy defined as a normal or above-normal BMI with a low level of FFMI, cachexia defined as having a low BMI and a low FFMI and normal body composition defined as having normal BMI and with normal FFMI. Malnutrition and loss of muscle mass can cause a decrease in respiratory muscle function, a decline of functional performance, an increase in the level of dyspnea, a decrease in the performance of pulmonary function and poor HRQOL among persons with COPD. Most previous studies found that the assessment results of nutritional status among persons with COPD lack uniformity in terms of definition and malnutrition detection. This review recommends FFMI for assessing malnutrition condition among persons with COPD since the value obtained is more accessible and using BIA makes quick calculation possible (Sehgal et al., 2017). To summarize, it is necessary to study malnutrition status by using the FFMI and functional performance among persons with COPD.

Nutritional status was also recently the focus of another study conducted by Rawal and Yadav (2015), who completed a review of nutrition among persons with COPD. The results show that malnutrition is a major risk factor for declining functional performance and poor HRQOL among persons with COPD. Most elderly persons with COPD who live alone show loss of FFMI due to inadequate dietary intake and declining muscle strength. Nutritional supplement therapy among persons with COPD is as follows: high-fat and low carbohydrate diet, plenty of fruits and vegetables, omega-3 polyunsaturated fatty acids and Vitamins D and C. The above therapy is not only effective for maintaining malnutrition, but also beneficial in improving pulmonary function, preventing acute

exacerbation, increasing muscle strength and exercise tolerance, which led to enhanced functional performance and HRQOL among persons with COPD. Similarly, Nguyen et al. (2019) explored nutritional status and HRQOL among persons with COPD in Vietnam, finding that approximately half of the participants had mild or moderate malnutrition, lack of social support and inadequate dietary intake, which are the commonly cited reasons for malnutrition. Malnutrition was significantly associated with ratio of protein intake, pulmonary function and HRQOL among persons with COPD. Moreover, Luo et al. (2016) studied the FFMI for assessment of nutritional status and severity of COPD in China, finding that approximately half of the participants had malnutrition involving both men and women. Low levels of FFMI are significantly correlated with older age, frequent AE, pulmonary function and functional performance among persons with COPD.

In Thailand, Pothirat et al. (2016) found nearly 60 percent of persons with COPD in Chang Mai Province to have normal levels of nutritional status, but nearly 40 percent to have cachexia levels. Nutritional status was assessed by the FFMI, which was found to be significantly correlated with pulmonary function, dyspnea severity and HRQOL among Thai persons with COPD. Similarly, Phuwilai et al. (2012) found that 47 percent of persons with COPD in Kamphaeng Phet Province had normal nutritional status, but 37 percent had malnutrition. Nutritional status was assessed by BMI and found to be positively correlated with HRQOL among Thai persons with COPD. However, most of the participants had normal nutritional status, while others had malnutrition resulting in important health problems. Therefore, nutritional status needs to be better understood among Thai persons with COPD.

2.4.2 Social Support

Ferrans et al. (2005) defined the characteristics of the environment in the revised version of Wilson and Cleary's HRQOL model (1995) as involving three aspects of support, namely psychological, social and economic support (Wilson & Cleary, 1995). Therefore, social support was presented as the characteristics of the environment of persons with COPD due to its correlation with HRQOL among persons with COPD (Chen et al., 2017). For this study, social support is defined as the way persons with COPD receive care and assistance provided by others involving informal

and formal sources of support from family members, friends, healthcare providers, religious leaders and significant others (Zimet et al., 1988).

Measurement of Social Support

As perceived social support among persons with COPD is subjective, data can only be obtained directly from the persons involved. The instruments currently used to measure social support among persons with COPD are as follows: the Medical Outcomes Social Support Scale (MOSSS) and the Multi-dimensional Scale of Perceived Social Support (MSPSS). The MOSSS questionnaire consists of 20 questions, which can be summarized into a total score ranging from 0 to 100 points and the following four components: emotional and informational support, tangible support, affectionate support and positive social interaction. Chen et al. (2017) studied social support among persons with COPD and quantified the findings by measuring the MOSSS. The results showed that most of the participants were living with others, had a family caregiver and had the highest mean score on affectionate support with the lowest mean scores on emotional and informational support. The MSPSS questionnaire consists of 12 questions that can be summarized into a total score ranging from 0 to 72 points with perceived social support from the following three specific sources: family members, friends and healthcare providers. The MSPSS is the most widely used test for investigating social support among persons with COPD. Naklamai, Wattanakitkrileart, Pongthavornkamol and Chuchottaworn (2011) studied social support among Thai persons with COPD and quantified the findings by measuring the MSPSS. The Thai version of the MSPSS was tested for reliability among 30 persons with COPD by using Cronbach's alpha coefficient, thereby resulting in a high reliability value of 0.870, while most of the participants had high levels of social support. Consequently, the MSPSS is appropriate for use in measuring social support among persons with COPD.

Social Support among Persons with COPD

Most persons with moderate to very severe COPD need the help of a caregiver to accomplish daily tasks they can no longer manage alone due to dyspnea intensity with exertion (O'Donnell et al., 2007; Wahls, 2012). This is supported by the findings of Gardener, Ewing, Kuhn and Farquhar (2018) who conducted a systematic review to identify perceived support needs among persons with COPD and showed that support needs are related to three categories. First, physical support needs are as

follows: 1) understanding about COPD; 2) managing symptoms and medications and 3) healthy lifestyles. Second, psychological and emotional support needs include: 1) managing feelings and worries; 2) living positively with COPD; 3) thinking about the future and 4) anxiety and depression. Third, social support needs include: 1) practical support; 2) finance, working and housing; 3) social and recreational life; 4) navigating services; 5) maintaining independence and 6) families and close relationships. Similarly, Lenferink, Van der Palen and Effing (2018) found that perceived social support among persons with COPD was enhanced by self-management interventions including group meetings, partner involvement and case manager support. Moreover, social support was positively correlated with fewer AEs, reduced hospitalizations and increased HRQOL among persons with COPD. Therefore, social support is one of the factors associated with HRQOL among persons with COPD.

In this regard, Barton, Effing and Cafarella (2015) conducted a review to describe social support and social networks among persons with COPD. This review focused on articles published between 1996 and 2013, showing that the relationships between perceived social support, functional status, HRQOL and self-rated health were unclear. Moreover, hospital readmission was not found to be associated with the level of perceived social support among persons with COPD. DiNicola, Julian, Gregorich, Blanc and Katz (2013) conducted a study to examine the contribution of perceived social support to the anxiety of persons with COPD in northern California. Social support in this 2013 study consisted of the following five components: instrumental support, emotional support, companionship, failure to provide needed help and unsympathetic or insensitive behavior. The results showed that all components were rated as high predictors of anxiety in persons with COPD. This study suggests that nurses and healthcare teams should include social support in the design of nursing interventions if the aim of research is to enhance HRQOL among persons with COPD.

In Thailand, Suntornchaturavit (2003) conducted a qualitative research to explore and describe HRQOL among persons with COPD in Songkhla Province. The finding showed that social support received from family members, friends and healthcare providers was significantly and positively correlated with HRQOL in this group. Social support in this study consisted of family members and friends who

encouraged and helped the persons accomplish the activities of daily living, followed by assistance from the healthcare team who also provided advice for patients and their families. The findings are similar to those from a study conducted by Wangsom (2010) whose pre- experimental study aimed to investigate the effects of a dyspnea management program and family support on dyspnea and HRQOL among persons with COPD. This intervention program focused on family support, including emotional support, appraisal support, information support and instrumental support over four weeks. The results revealed that the interventions were effective in helping reduce dyspnea and enhance HRQOL among Thai persons with COPD.

However, another study showed that family support and access to healthcare services were not associated with HRQOL among persons with COPD. This is supported by the results of Phuwilai et al. (2012) whose quantitative research aimed to explore the relationships of known influential factors and determine which factors can serve as predictors of HRQOL among persons with COPD in Kamphaeng Phet Province. Similarly, social support among Thai persons with congestive heart failure had a negative direct effect on HRQOL, whereby the subjects rated their HRQOL as being at a low level while having high social support (Krethong, 2007). Therefore, the differences found in the outcomes of these two studies imply that further investigation on social support is required.

2.4.3 Pulmonary Function

According to in the revised version of the HRQOL model written by Wilson and Cleary (1995) and Ferrans et al. (2005), biological function refers to the function of cells, organs and organ systems. For this study, pulmonary function refers to the biological function of the lungs or the ability of the lungs with regard to airflow during inspiration and expiration among persons with COPD. COPD is commonly characterized as a low level of breathing due to a decline in pulmonary function. This is why persons with COPD are usually ill for many months or years with occasional acute and often severe AE (Murray et al., 2012).

Measurement of Pulmonary Function

According to the pathophysiology of COPD, the objective of pulmonary function assessment is to investigate the degree of airflow limitation. It is widely accepted that spirometry is the most widely used test to assess airflow

limitations involving confirmation of diagnosis with COPD and monitoring of pulmonary function. The ratio of FEV_1/FVC is required to confirm diagnosis of COPD in which the presence of a post-bronchodilator FEV_1/FVC with a value below 0.70 shows an airflow limitation that ensures the presence of COPD (GOLD, 2017; Hanania & Sharafkhaneh, 2010). Regarding the ratio of FEV_1, the predicted value can be used to determine the severity of airflow limitations in which a value of below 80 percent shows airflow limitations in COPD. GOLD staging of COPD refers to the classification of severity of airflow limitations and can be categorized by using a designation of FEV_1 in which the predicted values are as follows: GOLD 1 or mild level defined as more than 80 percent of predictive values; GOLD 2 or moderate level defined as 50 to 79 percent of predictive values; GOLD 3 or severe level defined as 30 to 49 percent of predictive values and GOLD 4 or very severe level defined as 0 to 29 percent of predictive values (Coton et al., 2017; GOLD, 2017).

However, spirometry is not commonly used in the primary care settings of many developing countries due to its high costs (Pothirat et al., 2015). At chest clinics in primary care, the most common measurement performed for pulmonary function among persons with COPD is the peak expiratory flow rate (PEFR) and a peak flow meter is used to investigate the PEFR value. The peak flow meter is a standard medical device used for monitoring pulmonary function and airflow limitations (Hinkle & Cheever, 2014). The normal predictive value is calculated based on gender, age and height. A lower level of the PEFR indicates a low level of pulmonary function or a high level of airflow limitations. Moreover, the PEFR value is easy to obtain at a low cost and PEFR-predicted values are strongly correlated with FEV_1 predicted values (Obaseki et al., 2014; Pothirat et al., 2015). Classification of severity of airflow limitations with PEFR-predicted values and FEV_1-predicted values are similar. This is supported by the results of Pothirat et al. (2015) who evaluated pulmonary function with FEV_1 and PEF-predicted values based on the GOLD severity classification criteria among Thai persons with COPD. The results showed that the FEV_1 value was strongly correlated with the PEFR value, but the severity categories of airflow limitations based on PEFR may not be appropriate for clinical decision-making in the primary diagnosis of patients. This is because PEFR reflects large airway function, while FEV_1 reflects both large and peripheral airway function. Consequently, pulmonary function in this study was quantified by measuring

the PEFR value and the severity levels of COPD were categorized according to designations per PEFR-predicted values.

Pulmonary Function among Persons with COPD

The pathophysiology of COPD begins with an abnormal inflammatory response of the airway and alveoli to air pollution or noxious particles resulting in airflow limitations (GOLD, 2017). This airflow limitation leads to a reduction in pulmonary function, a decrease in lung compliance and hyperinflation. This mechanism results in a ventilation-perfusion (V_A/Q) mismatch, which can impair the gas exchange process, thereby creating physical symptoms including dyspnea, which is one of the most frequently cited distressing symptoms (Hinkle & Cheever, 2014). This is supported by the results of Cukic, Lovre and Ustamujic (2013) who studied the changes of pulmonary function among persons with COPD during four years of evolution of the disease and found that airflow limitations among persons with COPD is progressive, involving both the value of FVC and FEV_1 showing a significant decrease during a follow-up period of four years. However, these parameters may be made slower by using appropriate treatment including pharmacological and non- pharmacological approaches during stable and exacerbation periods of COPD. Moreover, Boutou et al. (2013) conducted a study to identify pulmonary function prognostic factors among persons with COPD, stating that both of the ratios of FEV_1 and FEV_1/FVC reflected changes in pulmonary function because small airways affected by disease and parenchymal destruction of the lungs can lead to airflow limitations. Therefore, pulmonary functional decline among persons with COPD can become highly severe and may not be fully reversible.

Justine, Tahirah and Mohan (2013) conducted a study to examine the relationships between pulmonary function, dyspnea and HRQOL among persons with COPD in Malaysia. Pulmonary function was quantified by measuring the ratio of FEV_1 in flow screen portable spirometry, whereas dyspnea was quantified by measuring the baseline dyspnea index (BDI) and HRQOL was quantified by measuring the SF-36 which encompassed both a physical health component summary (PHCS) and a mental health component summary (MHCS). The results showed that dyspnea was a key factor in predicting HRQOL among persons with COPD. However, pulmonary function was poorly correlated with PHCS and had no correlation with the MHCS. This implies that changes in pulmonary function may affect HRQOL among persons with

COPD in Malaysia. On the other hand, Obaseki et al. (2014) showed that pulmonary function had a strong correlation with HRQOL among persons with COPD in Nigeria. In determining the relationship of pulmonary function and HRQOL among persons with COPD, pulmonary function was measured by using the ratios of both FEV_1 and PEFR, while HRQOL was measured by using the SGRQ-C. The results showed that FEV_1 had a low correlation with SGRQ-C, while PEFR had a moderate correlation with SGRQ-C. This study suggests that the PEFR value may be a useful investigational tool for both pulmonary function and HRQOL among persons with COPD in primary care settings in developing countries.

In Thailand, Boonreung et al. (2017) studied the predictors of severe AE among persons with COPD in Surat Thani Province and found most of the participants to be classified with moderate stages of COPD with a mean FEV_1/FVC of 56.47 percent. The ratio of FEV_1/FVC was used to assess pulmonary function and the percent of predicted FEV_1 was used to investigate the severity of COPD, which significantly predicted severe AE. Phuwilai et al. (2012) found that most persons with COPD in Kumphaeng Phet Province were classified with moderate stages of COPD with a mean FEV_1/FVC of 60.0 percent and a moderate level of HRQOL. Both of the ratios of FEV_1 and FEV_1/FVC were correlated with HRQOL among persons with COPD. Similarly, the findings of Areerob and Anlamlert (2019) showed that most persons with COPD in Kanchanaburi Province were classified with moderate stages of COPD with a mean FEV_1-predicted value of 50.62 percent. The ratio of PEFR was used to assess pulmonary function and the percent of predicted FEV_1 was used to investigate the severity of COPD. The ratio of PEFR and the percent of predicted FEV_1 were correlated with HRQOL among persons with COPD. This is supported by the findings of Witheethamsak & Duangpaeng (2017) who found that most persons with COPD in Chonburi Province were classified with moderate stages of COPD with a mean PEFR-predicted value of 66.67 percent. Pulmonary function, health status perception and self-efficacy were positively correlated with functional performance among persons with COPD. However, how this factor affects persons' perception of HRQOL remains unclear and needs to be investigated further among Thai persons with COPD.

2.4.4 Functional Performance

According to the revised version of Wilson and Cleary's HRQOL model (1995), functional status refers to the ability to perform an activity in multiple domains, including physical function, social function, role function and psychological function. Similarly, Ferrans et al. (2005) used Leidy's framework of functional status guide to study HRQOL models including functional capacity, functional performance, functional capacity utilization and functional reserve. In this study, functional status focuses on functional performance, which is the perception of persons with COPD on their ability to perform activities of daily living. Dyspnea is one of the most frequent disorders that can affect the physical health in a way that requires additional energy in breathing, which can impede persons with COPD from participating in many activities in their daily lives (Leidy & Knebel, 2012; O'Donnell et al., 2007).

Measurement of Functional Performance

Intarasorn & Jitpanya (2016), who conducted a systematic review to describe the factors associated with functional performance among persons with COPD, indicated that the instruments used to investigate functional performance include the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0), the Medical Outcomes Study 36-Item (MOS-36) and Functional Performance Inventory-Short Form (IFP-SF). First, the WHODAS 2.0 questionnaire is composed of the following six components: cognition, mobility, self-care, relationship, daily activities and participation. Silva et al. (2016) studied assessment of functional performance among persons with COPD in Brazil and quantified the findings by measuring WHODAS 2.0. The results showed that most of the participants had mild difficulty levels of functional performance in which the highest mean score on participation domain refers to moderate difficulty level while the lowest mean score on self-care domain refers to mild difficulty level. Second, the 36-item Short-From (SF-36) was developed to assess health status in the MOS-36, which is composed of the following eight components: physical functioning, role limitations due to physical health problems, body pain, social functioning, general mental health, role limitations due to an emotional problem, vitality and general health perception (Ware & Sherbourne, 1992). The Thai version of the SF-36 was tested for reliability among 30 persons with coronary artery disease by using Cronbach's alpha coefficient resulting in a reliability value of 0.73 (Chintapanyakun & Ua-kit, 2017).

Third, the IFP-SF questionnaire is composed of the following six components: personal hygiene care, household chores, physical exercise, recreation, spiritual activities and social interaction (Leidy & Kneble, 2012). It is the most widely used test for investigating functional performance among persons with COPD. Kittisuktarkul, Wattanakitkrileart & Pongthavornkamol (2016) studied functional performance among Thai persons with COPD, which was quantified by measuring the IFP-SF. The results showed that most of participants had moderate to high level of functional performance; the highest mean score was found in the personal hygiene care domain, while the lowest mean score was found in physical exercise domain. Moreover, the Thai version of the IFP-SF was tested for reliability among 20 persons with COPD by using Cronbach's alpha coefficient, which resulted in a high reliability value of 0.96 (Witheethamsak et al., 2010). Therefore, the IFP-SF is appropriate for use in measuring functional performance among persons with COPD.

Functional Performance among Persons with COPD

Leidy and Knebel (2012) conducted a qualitative research to examine the content validity of the FPI-SF among American persons with COPD. This study reported that the body care activities had the highest level of importance, while physical exercise and spiritual activities had the lowest levels. Most participants described physical exercise activities as running, moving and lifting weights in which they were having difficulty to perform due to dyspnea. Due to dyspnea, the most common spiritual activities that are challenging for them to do at church include joining religious services, religious reading, meditation and religious ceremonies. The difficulties to perform these activities restrict the person's interactions with their environment, leading to a tendency for a decrease in spiritual of activity and poor HRQOL among persons with COPD. This study recommends the FPI-SF as a measurement for functional performance, which can be used to identify the daily activities of persons with COPD. Multiple factors contributing to functional performance among persons with COPD are as follows: 1) physiological factors including severity of disease, body composition and pulmonary function; 2) a physical symptom cluster including dyspnea, fatigue and insomnia; 3) a psychological symptom cluster involving both anxiety and depression; 4) psychological factors involving both self-efficacy and health perception; 5) situational factors involving both social support and regimen

adherence; and 6) socio-demographic factors including age, gender, education level, marital status and socioeconomic status (Gimeno-Santos et al., 2017, Intarasorn & Jitpanya, 2016; Wongderm & Duangpaeng, 2014). On the other hand, most persons with COPD have low to moderate levels of pulmonary function in which a slow decline of functional performance is associated with a drop in functional capacity and increased body fat, but not associated with illness perceptions, proactive coping, dyspnea and fatigue among persons with COPD (Kapella et al., 2011; Weldam, Lammers, Decates & Schuurmans, 2013).

Gimeno-Santos et al. (2017) conducted a systematic review to identify functional performance among persons with COPD. According to the findings, the outcomes of functional performance were as follows: frequency of exacerbation, mortality, dyspnea, exercise capacity, pulmonary function and HRQOL among persons with COPD. This is supported by the findings of Witheethamsak et al. (2010) who studied functional performance among Thai persons with COPD, which was measured by the FPI-SF. The results showed that most of the participants had a rather high level of functional performance; the highest mean score was found in the personal hygiene care domain, while the lowest mean score was found in the physical exercise domain. Symptom clusters involving both a physical symptom cluster (dyspnea, fatigue and insomnia) and a psychological symptom cluster (anxiety and depression) had negative correlations with functional performance in which the physical symptom cluster was the most influential factor in predicting functional performance among Thai persons with COPD. According to the studies mentioned above, it is apparent that further research is required for better understanding of the complexity of the conditions of persons with COPD and how they are associated with HRQOL among persons in this group.

The literature review table contains studies of the relationships of personal factors, social support, pulmonary function, functional performance and HRQOL among persons with COPD. These are summarized in Table 2.1.

Table 2.1 - Studies of the relationships of personal factors, social support, pulmonary function, functional performance and HRQOL among persons with COPD

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Mouser (2014)	To identify the HRQOL among persons with COPD.	Articles focused on QOL and HRQOL among persons with COPD	Walker and Avant's concept analysis	HRQOL among persons with COPD is an individual, subjective perception, conceived as dynamic, multi-dimensional and are affected by the achievement of goals and aspirations and the conditions of COPD. The attributes of positive HRQOL were related to social engagement and life satisfaction.
Negi et al. (2014)	To investigate the HRQOL among persons with COPD.	Persons with COPD in India (n = 126)	A cross-sectional descriptive correlation research design - Pulmonary function assessed by the FEV_1 value and HRQOL assessed by the SGRQ - Depression and anxiety were assessed by the patient health questionnaire (PHQ-9) and breathlessness assessed by mMRC	Most participants had a low level of HRQOL; the highest HRQOL was in the psychosocial impact, while the lowest HRQOL was in the activity component and half of the respondents reported having depression. Impairment of HRQOL was associated with pulmonary function, nutritional status, physical and psychological symptoms.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Holm et al. (2014)	To examine the effects of age on outcome among persons with COPD.	Persons with COPD in the United States and Canada (n = 621)	A cross-sectional descriptive correlation research design - Psychological outcomes refer to symptoms of depression and anxiety that were assessed by the hospital anxiety and depression scale (HADS). - Clinical outcomes refer to breathlessness assessed by mMRC and HRQOL assessed by the SGRQ-c.	Most participants were elderly with COPD with a mean age of 60.0 years and moderate levels of HRQOL. Increasing age was associated with anxiety, depression, dyspnea and HRQOL, but marital status was not associated with the other health outcomes among persons with COPD. Persons with COPD who were younger had more depression and dyspnea and poorer HRQOL.
Corlateanu et al. (2016)	To investigate possible age-related differences in HRQOL among persons with COPD with similar severity of disease.	Persons with stable COPD in Greece aged between 44 to 80 years old. (n = 180)	A cross-sectional descriptive correlation research design - BODE index assessed by BMI, FEV_1, mMRC and 6-min walking distance (6MWD). - HRQOL assessed by the SGRQ-C, Clinical COPD Questionnaire (CCQ).	The mean SGRQ and mean CCQ score were higher in the elderly age group than in the adult age group; a higher score indicated poorer HRQOL. Age groups and BODE index had a significantly positive correlation with HRQOL among persons with COPD. Elderly with COPD had a decline in functional performance.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Ferrari et al. (2014)	To identify HRQOL among persons with COPD.	Persons with COPD in Brazil (n = 90)	A cross-sectional descriptive correlation research design - BODE index assessed by BMI, FEV_1, mMRC and 6MWD. - HRQOL assessed by the SGRQ-C.	Most participants were males with COPD, had a low level of HRQOL. Women with COPD had higher SGRQ-C scores than men, indicating poorer HRQOL. Women were younger, smoked less, had fewer comorbidities and lower the FFMI values than men, while pulmonary function was lower in men, which led to HRQOL.
Raherison et al. (2014)	To describe the factors associated with HRQOL, especially the effects of gender among persons with COPD.	Persons with moderate to severe COPD in France (n = 446)	A cross-sectional observational study - BODE index assessed by BMI, FEV_1, mMRC and 6MWD. - HRQOL assessed by the SGRQ-C.	Gender related to poor HRQOL among persons with COPD included a decline in pulmonary function, an increase in the severity of dyspnea, chronic sputum and higher levels of anxiety and depression. Gender meant more varied in characteristics in women than in men, while chronic sputum was associated with HRQOL in women, but not in men.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Nguyen et al. (2019)	To explore nutritional status and HRQOL among persons with COPD.	Persons with COPD in Vietnam (n = 168)	A cross-sectional descriptive study - Nutritional status assessed by subjective global assessment (SGA). - Pulmonary function assessed by the FEV_1 value. - HRQOL assessed by the SGRQ-C.	Approximately half of the participants had mild or moderate malnutrition; most of the respondents reported weight loss during the past 6 months. HRQOL among persons with COPD was associated with nutritional status and severity of disease, but not associated with age, gender and smoking habit. Moreover, malnutrition was associated with ratio of protein intake, pulmonary function and HRQOL among persons with COPD.
Odencrants et al. (2013)	To describe nutritional status, pulmonary function, gender and marital status among persons with COPD.	Persons with COPD in Sweden both involving 47 women and 34 men (n = 81)	A cross-sectional descriptive and comparative study. - Nutritional status evaluate by mini nutritional assessment (MNA). - Pulmonary function assessed by the FEV_1 value.	Approximately half of the participants had very severe COPD and malnutrition or risk of malnutrition. Persons with COPD who lived alone had worse nutritional status than those who lived with extended families. Women with COPD had worse nutritional status than their men.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Gardener et al. (2018)	To identify perception of support needs among persons with COPD.	Articles focus on aspects of support need	A systematic search and narrative review of the literature.	Perception of support needs among persons with COPD were as follows: physical, psychological, emotional and social support needs. Aspects of support need social included practical support with finances, work and housing, social and recreational life, navigating services, maintaining independence, families and close relationships.
Phosawang, Srisong and Suporn, (2015)	To develop and investigated a nursing care model based on social support among persons with COPD.	30 Persons with COPD, 30 caregivers and 30 nurses in Nakhon Phanom Hospital, Thailand	Action research design - Breathlessness assessed by mMRC. - Functional performance assessed by 6MWD. - HRQOL assessed by the CAT.	Nursing model composed of the following five components: clinical nursing guidelines for lung rehabilitation, use of case management systems, social support and continuing care, all of which can decrease the mean score for dyspnea and lead to increased functional performance and HRQOL among persons with COPD.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Justine et al. (2013)	To examine the relationships of pulmonary function and HRQOL among persons with COPD.	Persons with COPD in Malaysia (n = 100)	A cross-sectional descriptive study - Pulmonary function assessed by the ratio of FEV_1/FVC and the percent of predicted FEV_1. - HRQOL assessed by the SF-36.	Most of the participants had severe COPD with a mean FEV_1-predicted value of 58.19 percent. Pulmonary function was associated with HRQOL among persons with COPD, which focuses only on the physical health component summary (PHCS), but not the mental health component summary (MHCS).
Pothirat et al. (2015)	To evaluate pulmonary function with the FEV_1-predicted value and PEFR-predicted value among persons with COPD.	Persons with COPD in Chiang Mai, Thailand (n = 300)	A cross-sectional descriptive study - Pulmonary function assessed by the ratio of FEV_1/FVC, the percent of predicted FEV_1 and PEFR.	The most common measurement performed for monitoring pulmonary function among persons with COPD is the PEFR-predicted value. The majority of the participants had moderate to severe COPD with a mean FEV_1/FVC ratio of 50.40 percent; the mean FEV_1-predicted value was 51.4 percent and the mean PEFR-predicted value was 52.3 percent. Therefore, the FEV_1 value was strongly correlated with the PEFR value.

Authors	Objective	Study Sample	Study Design/Key Measure	Key Findings
Leidy and Knebel (2012)	To examine the content validity of the FPI-SF among persons with COPD.	Persons with COPD in the United States (n = 20)	A qualitative research design in which a semi-structured cognitive interview guide was used to clarify data on functional performance.	Most of the participants had a low level of HRQOL; the lowest HRQOL was in the activity component. Moreover, the body care activities had the highest level of importance and the physical exercise and spiritual activities had the lowest levels. Physical exercise activities included running and lifting weights in which the participants had difficulty performing due to dyspnea.
Witheethamsak et al. (2010)	To investigate the relationships of symptoms and functional performance among persons with COPD.	Persons with COPD in Phramongkutklao Hospital, Thailand. (n = 130)	A cross-sectional descriptive correlation research design - Functional performance assessed by the FPI-SF. - Psychological symptoms were assessed by the HADS. Physical symptoms were assessed by the dyspnea, fatigue and insomnia assessment scale.	Most of the participants had a rather high level of functional performance. Physical symptoms and psychological symptoms had a negative correlation with functional performance in which the physical symptom cluster was the most influential factor in predicting functional performance among Thai persons with COPD.

2.5 Conceptual Framework

Bakas et al. (2012) conducted a systematic review of HRQOL models. The results showed that the most common HRQOL models used in the English language articles published included those of Wilson and Cleary, Ferrans and colleagues and the WHO, while Wilson and Cleary's model was ranked as the most frequently used model among those published articles. However, this study recommended Ferrans and colleagues' model, which provided clearer definitions of individual and environmental characteristics than the original Wilson and Cleary model. Ferrans et al.'s framework was based on a revised version of Wilson and Cleary's HRQOL model (1995) and an integrative literature review of previous studies. To clarify, Wilson and Cleary's HRQOL model focuses on the following five health outcomes related to HRQOL: biological and physiological factors, symptoms, functioning, general health perceptions and overall quality of life. Moreover, the individual and environmental characteristics are linked with four domains with the exception of the biological and physiological factors (Wilson & Cleary, 1995) as shown in Figure 2.3.

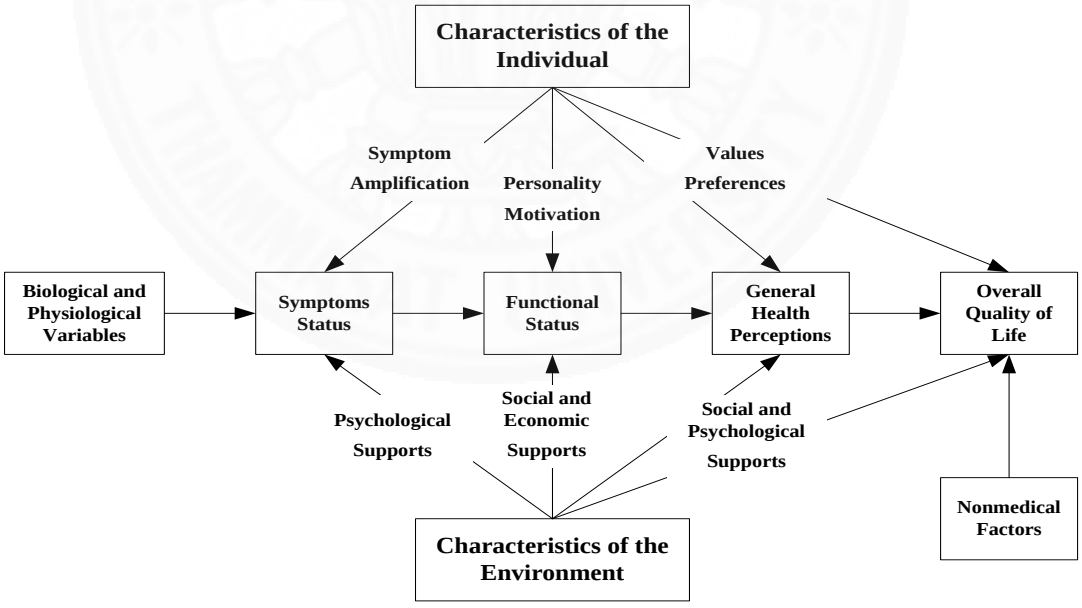

Figure 2.3 - Wilson and Cleary's HRQOL model (1995)

On the other hand, Ferrans et al. (2005), who revised Wilson and Cleary's HRQOL model (1995), provided the theoretical background for HRQOL. Their goals

were to guide nurses and other healthcare providers in applying research and providing optimized care for persons, thereby resulting in improved HRQOL (Bakas et al., 2012; Ferrans et al., 2005). This revised model consists of three sections. First, definitions were added to the individual and environmental characteristics in the original model to better explain HRQOL and both characteristics are related to meta-paradigms in nursing. Secondly, non-medical factors were eliminated to avoid factor duplication in the individual and environmental characteristics. Lastly, unnecessary labels were eliminated due to the overuse of labels in the original model that could restrict the characterization of the relationships as shown in Figure 2.4.

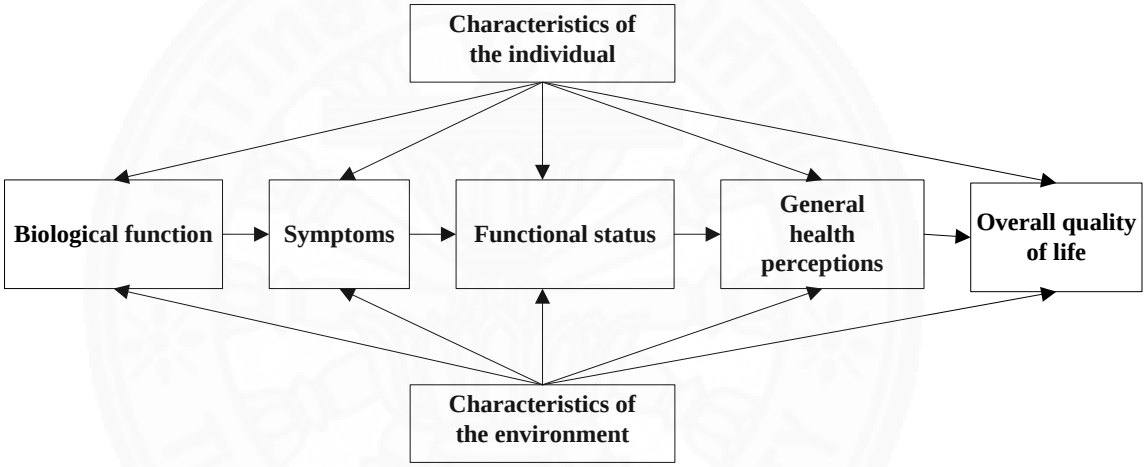

Figure 2.4 - Ferrans and colleagues' HRQOL model (2005), a revised version of Wilson and Cleary's HRQOL model (1995)

This revised version of Wilson and Cleary's HRQOL model focuses on the following four domains of overall quality of life: biological function, symptoms, functional status and general health perceptions. Clearly, the person's individual characteristics and environmental factors influence all of these four domains and quality of life (Ferrans et al., 2005; Wilson & Cleary, 1995). In summary, Ferrans et al. (2005) expanded the theoretical background of HRQOL as follows: First, biological function refers to the function of cells, organs and organ systems. Second, symptoms are described as a person's subjective perception of an abnormal physical, psychological and cognitive state. Third, functional status is described as the person's ability to perform physical, psychological, social and role functions. Fourth, general health

perceptions are described as a person's subjective perceptions towards overall health. Finally, overall quality of life refers to subjective wellness, which is associated with how happy or satisfied a person is with his/her life as a whole. As for the characteristics of the individuals, demographic, psychological, developmental and biological factors are included, while the characteristics of the environment involve psychological, social and economic support (Bakas et al., 2012; Ferrans et al., 2005; Wilson & Cleary, 1995).

Numerous studies have shown that the revised version of Wilson and Cleary's HRQOL model (1995) has been widely used to investigate a number of interesting research populations, including persons with traumatic brain injury, cancer and hypertension (Ananta-ard, 2014; Daggett, Bakas & Habermann, 2009). For example, Daggett et al. (2009) used Ferrans and colleagues' HRQOL model (2005) to explain the relationships of HRQOL among TBI survivors. The results showed that the characteristics of the environment were related to social support and positively correlated with HRQOL, but were negatively correlated with biological functions among TBI survivors. The characteristics of the individuals were positively correlated with general health perceptions and HRQOL among TBI survivors. These models and relationships are among the concepts frequently used in clinical nursing and could be useful on healthcare teams with the aim of improving HRQOL in a long-term effect with TBI survivors in the context of combat veterans. Theander, Jakobsson and Jorgensen (2009) conducted a study to test the outcome of a pulmonary rehabilitation program on the fatigue, functional status and health perceptions of persons with COPD in Sweden. This study used Ferrans and colleagues' HRQOL model (2005) to explain the influences of related variables on the wellness of persons with COPD. The results showed that, after 12 weeks, the rehabilitation program improved the participants' performance and satisfaction.

However, few studies have investigated the relationships between these variables and HRQOL among persons with COPD. Therefore, this conceptual framework was considered appropriate for use in this study. Moreover, as HRQOL among persons with COPD is complex in characteristics and conceived as dynamic and multi-dimensional, involving the three domains of physical, psychosocial and social dimensions (Dignani et al., 2015; Mouser, 2014; Sharma & Joshi, 2015), it

appears that the HRQOL model (1995) written and revised by Wilson and Cleary and is appropriate for investigating the relationships of the variables involved with HRQOL among persons with COPD.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

This study of HRQOL among Thai persons with COPD used the convergent parallel mixed methods design, the procedures of which are shown in Figure 3.1 below.

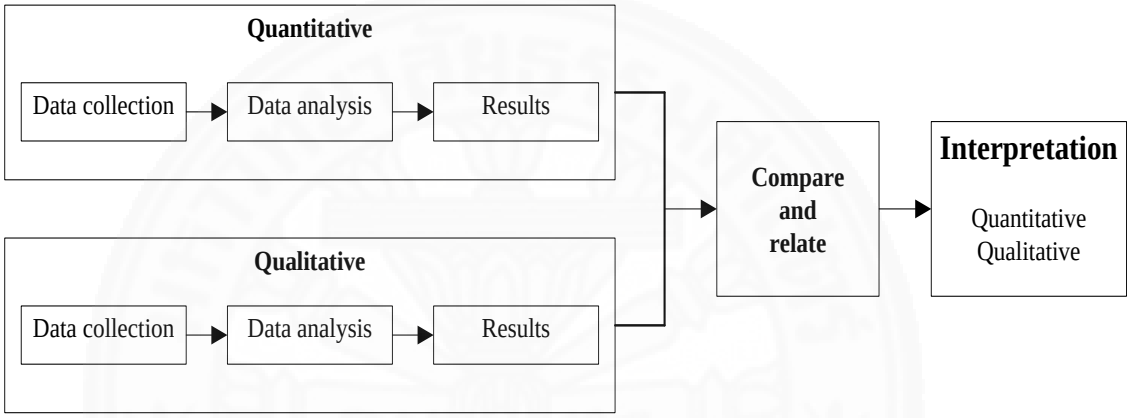

Figure 3.1 - Research design adapted from Creswell and Clark (2011)

The convergent parallel mixed methods design refers to a mixed concurrent equal design involving quantitative and qualitative phases conducted simultaneously where both types of data are collected in a palarelled manner and analyzed separately. Then the results of the two data types are merged into an overall interpretation (Creswell & Clark, 2011). The strength of this design is the triangulation between the results of quantitative and the findings of qualitative methods for further corroboration and validation. In essence, the outcome gained from both methods can provide multiple perspectives and a complete understanding of research questions (Creswell & Clark, 2011; Chirawatkul, 2015).

The underlying principle of mixed methods research is in the pragmatic philosophical paradigm (Creswell & Clark, 2011). This paradigm focuses on both objective and subjective data, research questions and research outcomes rather than methods. The merging of the two methods of data collection in a single study can lead

to a more complete understanding of research problems and complex phenomena (Creswell & Clark, 2011). As the causes and conditions among persons with COPD are subjectively perceived, complex and multi-dimentional, the pragmatic philosophical paradigm is appropriate not only for testing the hypotheses, but also for providing a better understanding of HRQOL among Thai persons with COPD. In the quantitative phase, a cross-sectional descriptive correlation research design was used to examine the predictors of the relationship between personal factors, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD. Concurrently, a descriptive qualitative design was used in the qualitative phase to explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD.

3.2 Population and Sample

3.2.1 Population

The target population of this study was either male or female Thai persons with COPD who came for follow-up sessions at chest clinics in the outpatient departments of secondary and tertiary hospitals in provinces Health Region 4 of Thailand.

3.2.2 Sample of Participants

Simple random sampling was used to obtain the participants for the quantitative phase of the study from Thai persons with COPD who came for follow-up sessions at chest clinics in the outpatient departments of secondary and tertiary hospitals Health Region 4 and persons whose characteristics met the following inclusion criteria: 1) diagnosis with COPD; 2) at least 40 years old or over; 3) no symptoms potentially affecting the ability to respond to the questions on the questionnaires and interviews; 4) good command of spoken Thai language and 5) willingness to participate in both quantitative and qualitative data collection in this study. Persons with COPD were excluded from this study if they met any of the following criteria: 1) severe dyspnea or fatigue during data collection; 2) receipt of long-term oxygen therapy and 3) co-morbidities such as cancer, chronic kidney disease (CKD), congestive heart failure (CHF) or hyperthyroid disease. Next, the researcher selected the participants from the quantitative phase by using purposive sampling to obtain the research participants for the qualitative phase.

3.2.3 Sample Size

3.2.3.1 Quantitative Phase

The quantitative data was collected from a sample size of 240 participants who were Thai persons with COPD. In principle, the rule of thumb for the sample size to be used in a multiple regression analysis is to base the sample size on the number of independent variables. The minimum sample size requires at least five persons per independent variable. However, the preferred ratio is 15 to 20 persons per independent variable, while the recommended number for stepwise analysis can be increased to 50 per independent variable, because this technique aims to select only the strongest relationships within the data set and suffers less from a greater tendency to become sample-specific (Hair, Black, Basin & Anderson, 2010). Similarly, Harrell (2015) indicated that the minimum sample size requires at least 10 persons per coefficient. For a linear model to have a good chance of providing reliable results, the ratio of the sample size to coefficients to be estimated is approximately 15 to 1 coefficient with a minimum sample size of 70 persons where the higher the ratio, the better. In this regard, Knofczynski and Mundfrom (2008) recommended that a sample size of 200 persons is appropriate for an excellent prediction level with four predictor variables.

In this study, hierarchical stepwise multiple regression analysis was used to determine the predictors of HRQOL among persons with COPD involving the following six factors: age, gender, nutritional status, social support, pulmonary function, and functional performance. The HRQOL among persons with COPD was quantified by using SGRQ-C with the following three subscales: symptom, activity and psychosocial impact. This study was fit for four regression models (one for the overall HRQOL score and three for each of the three subscales). Furthermore, each model had six slope coefficients corresponding to the six predictors of interest. According to the equation, six slope coefficients x four models = 24 total regression coefficients that were estimated and tested. Therefore, the recommended sample size is 10 persons per coefficient for a total sample size of 10 x 24 = 240. Hence, a sample size of 240 persons with COPD was considered appropriate for this study.

3.2.3.2 Qualitative Phase

A qualitative descriptive research design with semi-structured interviews is generally used to obtain in-depth data, which normally requires at least 30 to

60 participants, while relatively shallow data require a small group and the most common sample size ranges from 11 to 20 participants (Kim, Sefcik & Bradway, 2017; Morse, 2000). Similarly, Dworkin (2012) states that several studies have recommended the adquate sample sizes for qualitative research with semi-structured interviews as ranging from 5 to 50 participants. As for doctoral-level qualitative studies using the interview method, the most common sample sizes recommended are from 20 to 30 participants in order to reach thematic saturation (Mason, 2010). These are the reasons why a sample size of 30 persons with COPD was selected for this study in the qualitative phase. The researcher selected the participants by using purposive sampling of 15 persons with COPD who had high SGRQ-C scores and 15 persons with COPD who had low SGRQ-C scores with particular consideration given to those who had completed the data collection in the quantitative phase. Therefore, participants of the qualitative phase were 10 participants with high levels, 10 participants with moderate levels and 10 participants with low levels of HRQOL.

3.2.4 Sampling Technique

A multi- stage sampling procedure was used to determine the representative sample of research participants who were Thai persons with COPD from the hospitals in Health Region 4 as shown in Figure 3.2. In Health Region 4 in 2018, the MOPH reported the morbidity rate to be 9,146 persons with COPD. Starting with the selection of hospitals from Thailand's Health Region 4, eight provinces were found to have hospitals treating persons with COPD. Consequently, a simple random sampling method was used at the provincial level to select eight hospitals from each of the four provinces. Next, two hospitals were randomly selected from each province in order to obtain a total of eight hospitals as follows: 1) Pathum Thani Hospital; 2) Thammasat University Hospital; 3) Bang Yai Hospital; 4) Bang Bua Thong Hospital; 5) Sing Buri Hospital; 6) Phrom Buri Hospital; 7) Pra Na Khon Sri Ayutthaya Hospital and 8) Sena Hospital, all of which were randomly selected for inclusion. Finally, the number of research participants from each hospital was obtained by using the database of persons with COPD during 2017-2018. Thus, approximately 50 persons with COPD came for follow-up sessions at chest clinics in the outpatient departments of each selected hospital. The simple random sampling method was used to select the research participants in the quantitative phase and the purposive sampling method was used to select

the research participants in the qualitative phase based on the aforementioned inclusion criteria.

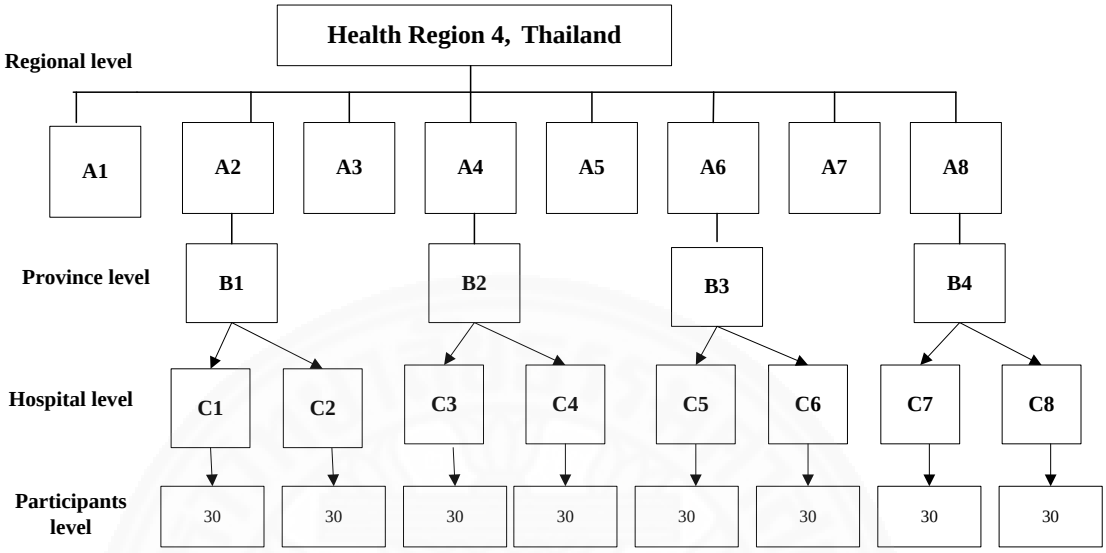

Figure 3.2 - Multi-stage random sampling procedure in the study

3.3 Data Collection

The data collection plan for this study followed the convergent parallel mixed methods design, which concurrently and equally involves quantitative and qualitative phases (Creswell & Clark, 2011).

3.3.1 Quantitative Phase

In order to examine the predictors among the variables, namely, age, gender, nutritional status, social support, pulmonary function and functional performance associated with HRQOL among Thai persons with COPD, a cross-sectional descriptive correlation research design was used to collect the data in the quantitative phase of this study.

3.3.1.1 Protection of Participant Rights

The data collection in this phase was conducted following the approval of the institutional review board (IRB) of Thammasat University (Ethics Review Sub-Committee for Research Involving Human Research Subjects of Thammasat University, No. 3: Faculty of Health Sciences and Science and Technology) on July 18, 2018 and project no 086/2561 regarding the research settings, procedures and anonymity of the participants with informed consent forms for the

participants. Next, the researcher contacted the doctors, head nurses and staff nurses at the chest clinics in the outpatient departments of the selected hospitals in order to introduce herself and explain the objectives, type of questionnaire and process of the quantitative phase.

A research assistant who was a nurse working in the research setting was used. The research assistant had received training concerning the research objectives, selection criteria and research instruments. The researcher then tested the research assistant in order to ensure her understanding of the content and procedures involving the questionnaires. The researcher and research assistant reviewed the medical records among persons with COPD and selected research participants among those engaged in follow-ups at the selected hospitals. This process mainly involved the diagnosis and examination of the PEFR value among persons with COPD. By referring to the inclusion criteria, the researcher and research assistant selected participants by using the simple random sampling method and ensured that all of the participants were willing to participate in the study.

The researcher and research assistant then informed all of the participants about the objectives of the study, expected benefits and time required to complete the questionnaire. Next, the persons who were willing to participate in the study signed informed consent forms. If any of the participants desired to not answer any of the questions on the questionnaire or felt tired during the data collection, the researcher had the participant take a break or withdraw from the study at any time. Withdrawal had no repercussions or negative consequences regarding the care the participants would receive at the clinics. The data provided by those who withdrew in the middle of the quantitative data collection were not included in the data analysis. The participants were asked to answer all of the questions on the questionnaire within a period of approximately 30 minutes. Coded numbers were used instead of the participants' real names to ensure confidentiality. Next, the researcher and research assistant rechecked all of the questionnaires for completion of data. Finally, the participants received a100-baht gift card; the researcher and research assistant thanked the participants for their participation in the study.

3.3.1.2 Research Instruments

Six research instruments (please see attached: Appendix D) were used to collect data in the quantitative phase of the study as described below:

1) Demographic Data Form

The questionnaire was developed by the researcher to collect the demographic data on the participants, including gender, age, religion, marital status, education level, occupation, income, medical payment, comorbidity and time since diagnosis with COPD as well as the participants' severity levels.

2) St. George's Respiratory Questionnaire for COPD patients (SGRQ-C)

The SGRQ-C questionnaire is commonly used to measure HRQOL among persons with COPD. This instrument was developed by Jones and Forde (2012) and its updated version was translated into the Thai version by Noonil (2014). The reliability of the Thai version of the SGRQ-C was tested with 30 persons with COPD by using Cronbach's alpha coefficient which resulted in a reliability value of 0.78 (Songprasert et al., 2014). The internal consistency reliability of this study was applied to 30 persons with COPD who met the same inclusion criteria for participation in the study. The Cronbach's alpha coefficient was 0.914. The content validity of the SGRQ-C Thai version of this study was evaluated by five experts. The index of item-objective congruence (IOC) was used to indicate content validity. The IOC indices for each item were reported between 0.60 - 1.00. However, the IOC of Items 9.30 (walking outside on a level surface) and 9.50 (walking uphill) with values of 0.40 were removed.

The SGRQ-C consists of a 14-item questionnaire and the scores are calculated by using the SGRQ-C with the aim of studying persons based on the following three components: symptom, activity and psychosocial impact. The symptom component is concerned with effects on the respiratory symptom, symptom frequency and severity level. The activity component involves activities caused or limited by dyspnea. The psychosocial impact component covers a range of aspects concerned with social functioning and psychological disturbances resulting from airflow limitations. Each item response was weighted based on a unique empirically derived value. The total scores of the SGRQ-C ranged from 0 to 56. These total scores indicated that higher SGRQ-C scores mean higher levels of perceived effects of COPD led to lower level of HRQOL, while lower SGRQ-C scores mean lower levels of

perceived effects of COPD led to higher levels of HRQOL among persons with COPD (Jones & Forde, 2012). Therefore, the classification of HRQOL was divided into the following three levels:

High level of HRQOL	=	SGRQ-C scores of 0 to 18 points
Moderate Level of HRQOL	=	SGRQ-C scores of 19 to 37 points
Low Level of HRQOL	=	SGRQ-C scores of 38 to 56 point

3) Fat-Free Mass Index (FFMI)

The FFMI was used to measure nutritional status; an UM-075 body fat monitor of Tanita BIA was used to investigate the ratios of FFMI by researcher at all research settings that are in accordance with the equation FFMI = fat-free mass/height^2. The BIA, which is the most common instrument for the assessment of FFMI, can accurately assess nutritional status without the need for expensive equipment or highly skilled technicians (Pothirat et al., 2016; Srigiripura et al., 2017). The normal value for the FFMI are calculated based on gender, weight and height. Lower FFMI indicates lower nutritional status and higher FFMI indicates higher nutritional status. The values are divided into two categories consisting of low and normal levels. An FFMI of less than 15 kg/m^2 in women and less than 16 kg/m^2 in men is defined as a low level. An FFMI of more than 15 kg/m^2 in women and more than 16 kg/m^2 in men is defined as a normal level (Gologanu et al., 2014).

The classification of nutritional status in this study focused on the values of both the FFMI and BMI (Luo et al., 2016; Pothirat et al., 2016). The value of BMI based on the participants' weight in kilograms was divided by the square of height in meters (kg/m^2). The level of BMI consisted of the following four categories: 1) less than 18.50 kg/m^2 was defined as a low level; 2) 18.50 to 24.99 kg/m^2 as normal level; 3) 25.0 to 29.99 kg/m^2 as high level and 4) over 30 kg/m^2 as obese (Pothirat et al., 2016). Therefore, the classification of nutritional status was divided into the following four levels:

Normal	=	normal BMI with normal FFMI
Semi-starvation	=	low BMI with normal or above normal FFMI
Muscle atrophy	=	normal or above-normal BMI with low FFMI
Cachexia	=	low BMI with low FFMI

4) Multi-dimensional Scale of Perceived Social Support (MSPSS)

The MSPSS was used to measure social support in persons with COPD. This instrument was developed by Zimet et al. (1988) and translated into a Thai version by Wongpakaran, N. and Wongpakaran, T. (2012). The reliability of the Thai version was tested in 30 persons with COPD by using Cronbach's alpha coefficient, thereby resulting in a reliability value of 0.91 (Naklamai et al., 2011). The internal consistency reliability of this study was applied to 30 persons with COPD who met the same inclusion criteria as the participants in the study. Cronbach's alpha coefficient was 0.870. The content validity of the MSPSS Thai version of this study was evaluated by five experts. The index of IOC was used to indicate content validity. The IOC index among each item was reported at 1.00.

This instrument consists of a 12-item questionnaire rated on a seven-point numeric rating scale that measures self-perceived social support from three specific sources, family members, friends and healthcare providers. The conversion of the MSPSS scores of zero to six refers to the change from a score of zero, which means "very strongly disagree," to a score of six, which means "very strongly agree." The total score for the MSPSS can range from 0 to 72 in which lower scores indicate lower social support and higher scores indicate higher social support. The classification of social support was divided into the following three levels:

Low Degree of Social support	=	0 – 23 points
Moderate Degree of Social support	=	24 – 47 points
High Degree of Social Support	=	48 – 72 points

5) Peak Expiratory Flow Rate (PEFR)

The percent of predicted of PEFR was used to indicate the measurement of pulmonary function and a standard mini-wright peak flow meter was used to investigate the value of the PEFR by nurse which all research settings used the same brand and similar checking for standardized measuring processes. It is a standard medical device used for monitoring pulmonary function and airflow limitations (Hinkle & Cheever, 2014; Obaseki et al., 2014). The normal predictive values are calculated based on gender, age and height. A lower PEFR score indicates a low level of pulmonary function or a high level of airflow limitation. Furthermore, a higher level of PEFR indicates a high level of pulmonary function or a low level of airflow limitations (Hinkle & Cheever,

2014; Pothirat et al., 2015). The severity of airflow limitations with PEFR was categorized into the following four stages:

Mild	=	more than 80 percent of predicted values
Moderate	=	between 50 to 79 percent of predicted values
Severe	=	between 30 to 49 percent of predicted values
Very Severe	=	between 0 to 29 percent of predicted values

6) Functional Performance Inventory Short Form (FPI-SF)

The FPI-SF was used to measure the functional performance of persons with COPD. This instrument was developed by Leidy and Kneble (1999) and translated into a Thai version by Witheethamsak et al. (2010). The reliability of the Thai version of the FPI-SF was tested in 20 persons with COPD by using Cronbach's alpha coefficient, thereby resulting in a reliability value of 0.96 (Witheethamsak et al., 2010). The internal consistency reliability of this study was applied to 30 persons with COPD who met the same inclusion criteria as the participants for the study. Cronbach's alpha coefficient was 0.928. The content validity of the FPI-SF Thai version of this study was evaluated by five experts. The index of IOC was used to indicate content validity. The IOC index among each item was reported between 0.60 - 1.00. However, the IOC of Items 13 (going to appointments), 18 (activities such as swimming or bicycling) and 21 (going to the movies) with values of 0.40 were removed.

This instrument consists of a 29-item questionnaire rated on a four-point numeric rating scale and the scores are calculated using the FPI-SF to examine persons using the following six components: personal hygiene care, household chores, physical exercise, recreation, spiritual activities and social interaction (Leidy & Kneble, 2012). However, the conversion of the FPI-SF scores of one to four refers to the change from a score of one, which means "don't do because of health reasons," to a score of four, which means "do with no difficulty." The subjects who had never performed an activity or activities due to other reasons not associated with health problems were given the option of selecting "don't do because I choose not to", a choice that was given no points and was not used in calculating scores. Therefore, the total scores for the FPI-SF ranged from 29 to 116 in which a higher score indicated higher ability to perform functional activities without difficulty and a lower score indicated lower ability

to perform functional activities among persons with COPD. The classification of functional performance consisted of the following five levels:

Low Levels of Functional Performance	=	1.00 - 1.59 points
Rather Low Level of Functional Performance	=	1.60 - 2.19 points
Moderate Level of Functional Performance	=	2.20 - 2.79 points
Rather High Level of Functional Performance	=	2.80 - 3.39 points
High Level of Functional Performance	=	3.40 - 4.00 points

3.3.1.3 Monitoring Instrument Quality

All of the three instruments used in this study, namely the SGRQ-C, the MSPSS and the FPI-SF, were examined for content validity. All of the Thai versions of the instruments obtained approval for use from the publishers by mail. These instruments were evaluated and revised based on the suggestions of the experts and used after approval had been granted. The five experts consisted of a chest physician, an advance practice nurse (APN) in the area of COPD, one university lecturer with expertise in mixed methods research and two nursing instructors. The experts checked the nature and consistency of the content as well as the accuracy of the assessment and language used. The index of IOC was used to indicate content validity. The IOC index among each item of the SGRQ-C and FPI-SF questionnaire were reported between 0.60 - 1.00, while the MSPSS questionnaire was reported at 1.00. In order to determine the internal consistency reliability of the three instruments (SGRQ-C, MSPSS, FPI-SF), the instruments were tested with 30 persons with COPD whose characteristics were similar to the research participants, but came from another hospital in Health Region 4. The internal consistency reliability of the instruments was analyzed by using Cronbach's alpha coefficient. The results showed that the Cronbach's alpha coefficient of the SGRQ-C, MSPSS and FPI-SF questionnaire were 0.914, 0.870 and 0.928, respectively.

3.3.2 Qualitative Phase

A descriptive qualitative design is suitable for research questions focusing on investigating experiences and gaining insight from participants regarding an unclear phenomenon (Kim et al., 2017). A semi-structured interview is one of the data collection strategies in this research design where the method was used to explore a comprehensive understanding of the factors associated with HRQOL among Thai persons

with COPD. The in-depth interviews provided more detailed information as the participants might have felt comfortable having a conversation with the researcher (Boyce & Neale, 2006).

3.3.2.1 Protection of Participant Rights

After the completion in the quantitative phase, the researcher collected the data for the qualitative phase in person to make certain that the data was complete and credible. The data collection in this phase began with the researcher selecting the participants by using purposive sampling to select 15 persons with COPD who had high SGRQ-C scores and 15 persons with COPD who had low SGRQ-C scores with particular consideration given to those who had completed the data collection in the quantitative phase with reassurance from the participants they were willing to participate in the qualitative data collection for the study. However, if some of the participants preferred to not answer the interview questions or felt tired, the researcher had them take a break or withdraw from the study at any time with no repercussions or negative consequences on the care they received at the clinics. Moreover, the data provided by the participants who withdrew in the middle of the qualitative data collection were not included in the data analysis. The researcher informed all of the participants about the objectives of the study, expected benefits, time spent answering the interview questions and permission for audio recording and hand note-taking. The participants who were willing to participate in the study signed informed consent forms before the data collection.

The schedule appearing in the semi-structured interview guide included dates, times and locations for the interviews, which were conducted in a room of the chest clinics of the outpatient departments or another location that was convenient for the participants. Coded numbers were used instead of real names to ensure confidentiality. The participants were asked to answer the interview questions within a period of approximately 30 minutes. Next, the researcher accomplished member checking for all of the interview questions, audio records and hand notes to make certain that data were complete and accurate. Finally, the participants received a 100-baht gift card and the researcher thanked them for their participation in the study.

3.3.2.2 Semi-Structured Interview Guide

The semi-structured interview guide included the following essential instruments: an audio recorder for voice recording; a notebook and pen for hand note-taking and interview questions for exploring HRQOL among persons with COPD. The interview questions were open-ended rather than close-ended as open-ended questions were more likely to elicit useful and sufficient information from the conversation (Bevan, 2014). In this study, the questions in the interview were developed from the questions recommended in the literature review related to HRQOL among persons with COPD. The interview guide (please see attached: Appendix E) was developed to explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD, including individual perceptions of HRQOL and individual perceptions of age, gender, nutritional status, social support, pulmonary function and functional performance, all which are associated with HRQOL. The interview questions in this study were as follows: 1) tell me more about things are important in your life and health; 2) tell me more about the level of age associated with your life; 3) tell me more about the gender status associated with your life; 4) tell me more about your current weight; 5) tell me more about the persons in your life who support and help you; 6) tell me more about your breathing; and 7) tell me more about your ability to perform daily activities.

In essence, the questions in the semi-structured interview guide were evaluated and revised based on the suggestions of the experts, which was the same as the persons in the quantitative phase. The semi-structured interview guide was found to contain some questions that were difficult to understand which might have caused the participants to answer indirectly in a way that did not meet the objectives of the questions. Hence, the experts offered recommendations concerning revisions to the questions to facilitate the understanding of the participants. Next, the semi-structured interview questions were tested before real use in three persons with COPD whose characteristics were similar to those of the research participants. According to the findings, the participants offered vague responses, did not understand some of the medical terms and took a long time to respond during the interviews. Therefore, the researcher revised some of the terminology to make the questions more concise and easier to understand. This process ensured the feasibility of the semi-structured interview guide in terms of

content in order to be certain that the questions were clear, understandable and specific to the area of HRQOL among persons with COPD.

3.3.2.3 Trustworthiness of the Qualitative Process

Trustworthiness is an important criterion for ensuring rigor in the process of qualitative research involving its credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985; Shenton, 2004). First, credibility is important in determining trustworthiness as it involves the data triangulation process to ensure that the research results are credible. In this study, the researcher created credibility by spending a long time with participants provided a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. The researcher conducted interview questions with each participant within a period of approximately 30 minutes. Then the researcher accomplished member checking for all of the interview questions, audio records and hand notes to make certain that data were accurate. Moreover, a high quality audio recorder was used and the recorded voice data was transcribed by the researcher in order to ensure completion and creditability of the data.

Second, dependability requires experts to evaluate the research and data analysis processes in order to make certain that the findings are consistent with the objectives. In this study, the researcher created dependability by evaluation of the research process with qualitative research experts and dissertation committee audit. The research process and questions in the semi-structured interview guide were evaluated and revised based on the suggestions of the experts, which was the same as for the persons in the quantitative phase. Next, the semi-structured interview questions were tried in three persons with COPD whose characteristics were similar to those of the research participants, but who came from another hospital in Health Region 4. This process ensured the feasibility of the research process and semi-structured interview guide in terms of content in order to be certain that the questions were clear and consistent with the research objectives.

Third, confirmability refers to the process where the findings are based on the participants' perception without any potential bias. In this study, the researcher created confirmability by audit of the research process; the findings were based on participants' perception and not researcher bias with qualitative research experts and the

dissertation committee. Moreover, the researcher kept the audio recorder and hand notes in a safe place to reduce any potential bias, changes or flaws during relocations to other selected hospitals in the course of the research. Finally, transferability refers to the importance of the applicability of the research findings to other situations. In this study, the researcher provided a detailed description of the findings that can be used as an important guideline for healthcare professionals and other researchers in areas related to COPD.

3.4 Data Analysis

According to the convergent parallel mixed methods design, both types of quantitative and qualitative data were analyzed separately. The results were then merged into aggregate data for comprehensive interpretation (Creswell & Clark, 2011).

3.4.1 Quantitative Phase

First, the descriptive statistics used in the present study consisted of the values of frequency, percentage, mean and standard deviation (SD), all of which were used to test the demographic data, age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL by using the computer software Statistical Package for the Social Science (SPSS) for Windows (Version 22.0). Second, data screening was used to detect data for errors and accurate data entry. Next, the analysis of missing data was used to investigate missing values in data. Both of methods were assessed by using the SPSS program (Version 22.0). Missing data consisted of missing completely at random (MCAR), missing at random (MAR) and missing not at random (MNAR). Case deletion is one of the most frequently used methods for handling missing data. However, the full information maximum likelihood (FIML) and multiple imputation can also handle missing data involving both MAR and MNAR (Kang, 2013). The present study had no missing MCAR, MAR and MNAR data. Third, the internal consistency values of the instruments, including SGRQ-C, FPI-SF and MSPSS, were established by using Cronbach's alpha coefficient, whereby a coefficient value of .70 or higher was considered acceptable. Fourth, analysis of variance (ANOVA) and independent t-test were used to analyze the differences between levels of factors and HRQOL among persons with COPD.

Fifth, the hypothesis testing in this study was as follows: Hypothesis 1: age, gender, nutritional status, social support, pulmonary function and functional performance associated with HRQOL among Thai persons with COPD. This hypothesis was tested by using Pearson's product moment correlation coefficient to examine the relationships of age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD. Hypothesis 2: age, gender, nutritional status, social support, pulmonary function and functional performance can predict HRQOL among Thai persons with COPD. This hypothesis was tested by using multiple regression analysis (MRA). The hierarchical stepwise multiple regression analysis was used to examine the predictability of HRQOL among Thai persons with COPD by using age, gender, nutritional status, social support, pulmonary function and functional performance.

Sixth, the researcher tested the data obtained according to the following five assumptions of the multiple regression analysis: 1) normal distribution; 2) homoscedasticity; 3) multicollinearity; 4) autocorrelation and 5) interval or ratio level of measurement (Hair et al., 2010; Keith, 2006). Assumption 1: multiple regression analysis requires that all variables have normal distributions. This assumption can best be checked with a histogram and a fitted normal curve. Normality can be checked with Kolmogorov-Smirnov. Assumption 2: the data need to show homoscedasticity and a scatter plot is good way to check whether homoscedasticity is given. Assumption 3: multiple regression assumes that there is little or no multicollinearity in data. This assumption can best be checked with a correlation matrix; when computing the matrix of Pearson's bivariate correlation among all independent variables, the correlation coefficients need to be smaller than 0.08. Steven (2002) describe $r > 0.80$ as mean multicollinearity, while Burn and Grove (2005) describe $r > 0.65$ as mean multicollinearity. Assumption 4: multiple regression analysis requires that there is little or no autocorrelation in data. This assumption can best be checked with a scatter plot and the Durbin-Watson test. The Durbin-Watson test tested the null hypothesis to determine that the residual was not a linearity autocorrelation. While Durbin-Watson can assume values of $0 \leq \text{D-W} \leq 4$ in which values of approximately two indicate no autocorrelation. Assumption 5: the level of measurement involves both the dependent variable, which is one continuous (interval or ratio) variable and the independent

variables, which are two or more continuous (interval or ratio) variables in the matrix. In this study, the dependent variable was HRQOL with an interval level of measurement. The independent variables were as follows: 1) age with a ratio level of measurement; 2) nutritional status with a ratio level of measurement; 3) social support with an interval level of measurement; 4) pulmonary function with a ratio level of measurement; and 5) functional performance with an interval level of measurement. However, gender was a non-metric independent variable and could only be included in a regression analysis by creating dummy variables.

3.4.2 Qualitative Phase

Content analysis is one of the data analysis methods commonly used in the descriptive qualitative design. Elo and Kyngäs (2008) defined content analysis as a systematic coding and categorization method for making the findings replicable. Furthermore, a number of different strategies are used to analyze into data, which has the outcome of concepts or categories describing the phenomenon. Inductive content analysis was suitable for use in this study as it provided a conceptualized comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. Content analysis consists of three main phases, namely preparation, organization and reporting (Elo & Kyngäs, 2008). In the preparation phase, the data obtained from the interviews were transcribed verbatim in the original Thai version and then translated into an English version by the researcher using the Royal Institute Dictionary (RID) (2011 version) for consistency and relevancy of all of the interview data. However, an independent bilingual expert in Thailand reviewed the English transcriptions for accuracy. All of the data were entered into the computer software ATLAS.ti for Windows (Version 8.0), which is qualitative data analysis software for overall content analysis. In the organization phase, the qualitative data obtained in this study were submitted to the following three steps: open coding, creating categories and abstraction (Elo & Kyngäs, 2008). To explain the above three steps, the data analysis began with open coding. This was when the researcher listened to the audio recordings of the interview data, repeatedly read the transcripts and wrote memos for each interview. The researcher then generated initial codes once the codebook had been developed to contain the coded statements of the interview data in a way that was easy for subsequent categorization and organization. Next, at the second step of creating categories, the researcher grouped all of

the relevant coded statements together into broader categories. This step was aimed at reducing the number of categories by collapsing similar or dissimilar groups into broader categories to increase understanding about the factors associated with HRQOL among Thai persons with COPD. The third step involved the abstraction, which was when the researcher reviewed and refined the categories and sub-categories to make certain that the coded statements were relevant to each category. The name of each category used content-characteristic words and sub-categories with similar events and incidents grouped together as categories (Elo & Kyngäs, 2008). Moreover, coding, sub-categories and categories were reviewed and confirmed by two qualitative researchers. Finally, the last process involved producing the report, which was when the researcher wrote up the findings in order to provide answers to the research questions and support the answers with adequate evidence of the categories emerging within the data (Creswell & Clark, 2011).

3.5 Data Integration

The advantages of both quantitative and qualitative methods were used to better understand the complexity of HRQOL among persons with COPD. Therefore, data in this study was integrated during the interpretation phase by using triangulation methods to assess concordance between the quantitative and qualitative results (Creswell & Clark, 2011). The researcher compared and contrasted the results to assess similarities and dissimilarities between the quantitative and qualitative results. The side-by-side comparison is the most frequently used method to merged data analysis, because it presents similar and dissimilar data within one set of results and another (Fetters, Curry & Creswell, 2013). Therefore, side-by-side comparison was appropriate for use in this study. The researcher first presented the quantitative statistical results and then provided the qualitative findings involving either confirmation or disconfirmation of the statistical results. The visual diagram of the mixed methods procedures in this study is shown in Figure 3.3.

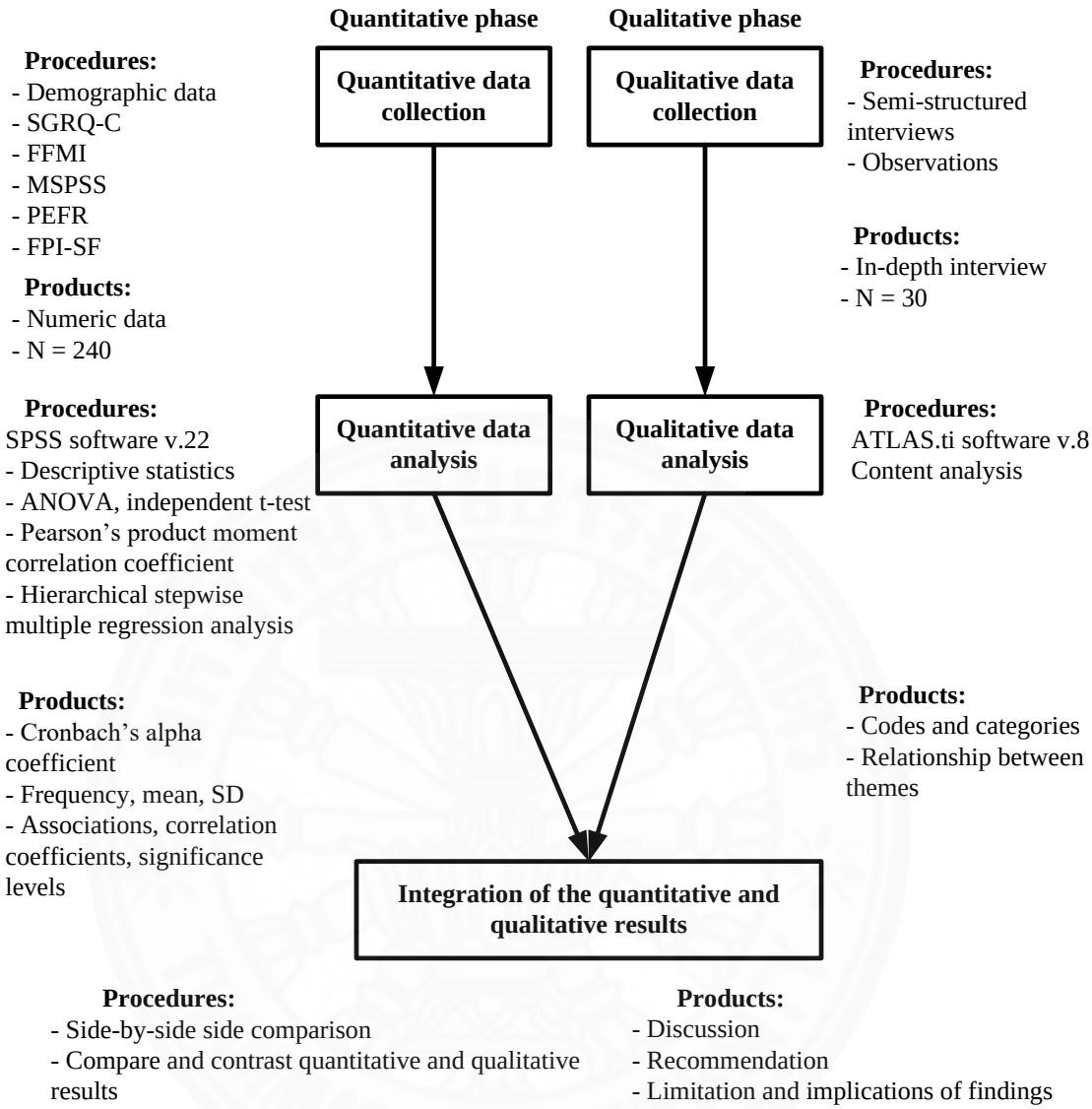

Figure 3.3 - Visual diagram for convergent parallel mixed methods design of the study

CHAPTER 4
RESULTS AND FINDINGS

This study of HRQOL among Thai persons with COPD used the convergent parallel mixed methods design. The quantitative phase was aimed at examining the predictors of the relationship between age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD by using self-reported questionnaire data. The sample size was composed of 240 persons with COPD coming for follow-up sessions at chest clinics in the outpatient departments of hospitals in Thailand's Health Region 4. Concurrently, the qualitative phase was aimed at exploring a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD by using semi-structured interviews with 30 purposively selected participants. The results and findings of this study covered the following topics: demographic characteristics; health-related quality of life among Thai persons with COPD; the relationships of the predictor variables on HRQOL; and the predictor variables and categories.

4.1 Demographic Characteristics

4.1.1 Results of the Quantitative Phase

Two hundred and forty persons with COPD participated in the quantitative phase. The demographic characteristics of the participants in the quantitative phase are shown in Table 4.1. Most of the participants were males (85.00%) and Buddhists (87.50%). The percentage of participants who were married was 65.0 percent. The ages ranged from 44 to 92 years with a mean age of 68.80 years (SD = 9.49). Most of the participants (66.30%) had primary education levels and were unemployed (68.30%), while 41.30 percent earned family incomes ranging from 10,001 to 20,000 baht per month. The majority of the participants had health care insurance coverage (78.80%) and lived with extended families (78.30%), while approximately 7.10 percent lived alone. The times since diagnosis with COPD ranged from 1 to 20 years with a mean of 6.93 years (SD = 5.04). Approximately 40.40 percent had no co-morbidities, while approximately 59.60 percent had co-morbidities. Approximately

twenty nine percent (29.59%) had been diagnosed with hypertension, followed by hyperlipidemia (11.25%) and gastro-esophageal reflux disease (GERD) (6.25%).

4.1.2 Results of the Qualitative Phase

Thirty persons with COPD who had been part of the participants in the quantitative phase participated in the qualitative phase of the study. The demographic characteristics of the participants in the qualitative phase are shown in Table 4.1. Most of participants were males (83.33%) and Buddhists (90.00%). And the percentage of the participants who were married was 63.30 percent. Most of the participants were elderly persons with COPD (83.70%) with ages ranging from 44 to 83 years and a mean age of 70.07 years (SD = 9.05). The majority of the participants (76.70%) had primary educations and were unemployed (86.70%), while 40.0 percent earned family incomes ranging from 10,001 to 20,000 baht per month. Most of the participants had health care insurance coverage (86.60%) and lived in extended families (86.60%), while approximately 6.70 percent lived alone and 6.70 percent lived with spouses. The times since diagnosis with COPD ranged from 1 to 20 years with a mean age of 6.57 years (SD = 4.44). Nearly 40 (36.70%) percent of the participants had no co-morbidities, while approximately 63.30 percent had co-morbidities. Slightly over thirty (33.33%) had been diagnosed with hypertension, followed by GERD (9.99%), hyperlipidemia (6.66%) and diabetes mellitus (DM) (6.66%). Therefore, the demographic characteristics of the participants in both the quantitative and qualitative phases were similar.

Table 4.1 - Demographic characteristics of the participants in the quantitative (N = 240) and qualitative phases (N = 30).

Characteristic	Quantitative		Qualitative	
	N	%	N	%
Gender				
Male	204	85.00	25	83.33
Female	36	15.00	5	16.67

Table 4.1 - Demographic characteristics of the participants in the quantitative (N = 240) and qualitative phases (N = 30) (cont.)

Characteristic	Quantitative		Qualitative	
	N	%	N	%
Age Group				
Adult with COPD (40 – 59 years)	39	16.30	2	6.70
Elderly with COPD	201	83.70	28	93.30
Youngest-old (60 – 69 years)	88	36.70	10	33.30
Middle-old (70 – 79 years)	77	32.00	12	40.00
Oldest-old (More than 79 years)	36	15.00	6	20.00
Quantitative: (Range = 44 - 92, $\bar{X}$ = 68.80, SD = 9.49)				
Qualitative: (Range = 44 - 83, $\bar{X}$ = 70.07, SD = 9.05)				
Religion				
Buddhism	210	87.50	27	90.00
Islam	30	12.50	3	10.00
Marital Status				
Single	12	5.00	1	3.30
Marriage	156	65.00	19	63.30
Windowed/ Divorced/ Separated	72	30.00	10	33.40
Education Level				
No Formal Education	9	3.80		
Primary School (Grades 1 – 6)	159	66.30	23	76.70
Secondary School (Grades 7 – 12)	47	19.50	4	13.30
Diploma	13	5.40	1	3.30
Bachelor	12	5.00	2	6.70
Occupation				
Unemployed	164	68.30	26	86.70
Employee	44	18.30	3	10.00
Entrepreneur	17	7.10	1	3.30
Agriculturist	11	4.60		
Government Official/Government Enterprise	4	1.70		

Table 4.1 - Demographic characteristics of the participants in the quantitative (N = 240) and qualitative phases (N = 30) (cont.)

Characteristic	Quantitative		Qualitative	
	N	%	N	%
Family Income (baht per month)				
No Response	15	6.30	6	20.00
Less than 10,000	83	34.60	8	26.60
10,001 – 20,000	99	41.30	12	40.00
20,001 – 30,000	27	11.30	2	6.70
30,001 – 40,000	10	4.00	2	6.70
More than 40,000	6	2.50		
Medical Entitlements				
Health Care Insurance Coverage	189	78.80	26	86.60
Government Officer Reimbursement	46	19.20	2	6.70
Social Security/Welfare	4	1.60	2	6.70
Out of Pocket	1	0.40		
Cohabitation				
Alone	17	7.10	2	6.70
Spouse	35	14.60	2	6.70
Extended Family	188	78.30	26	86.60
Time Since Diagnosis with COPD (years)				
1 – 5	125	52.10	14	46.70
6 – 10	60	25.00	12	40.00
11 - 15	38	15.80	3	10.00
More than 15	17	7.10	1	3.30
Quantitative: (Range = 1 - 20, $\bar{X}$ = 6.93, SD = 5.04)				
Qualitative: (Range = 1 - 20, $\bar{X}$ = 6.57, SD = 4.44)				

Table 4.1 - Demographic characteristics of the participants in the quantitative (N = 240) and qualitative phases (N = 30) (cont.)

Characteristic	Quantitative		Qualitative	
	N	%	N	%
Co-morbid Conditions (other chronic diseases)				
No comorbidity	97	40.40	11	36.70
Comorbidity	143	59.60	19	63.30
Hypertension	71	29.59	10	33.33
Diabetes Mellitus	11	4.58	2	6.66
Gastro-esophageal Reflux Disease	15	6.25	3	9.99
Gout	4	1.68	1	3.33
Hyperlipidemia	27	11.25	2	6.66
Benign Prostatic Hyperplasia	5	2.08	1	3.33
Osteoporosis	2	0.83		
Depression	1	0.42		
Cardiovascular Disease	7	2.92		

4.2 Health-related Quality of Life (HRQOL) among Thai Persons with COPD

The results of the HRQOL levels of the participants in the quantitative and qualitative phases are shown in Table 4.2. The SGRQ-C was used to measure HRQOL among Thai persons with COPD. The subscale of HRQOL consists of the following three components: symptom, activity and psychosocial impact. The HRQOL of the participants in the quantitative phase shows that the SGRQ-C scores ranged from 3 to 46 with a mean of 22.89 (SD = 8.43). Most of the participants had moderate levels of HRQOL (65.80%), followed by high levels (29.20) and low levels (5.00%). The HRQOL of the participants in the qualitative phase show that the SGRQ-C scores ranged from 3 to 46 with a mean of 24.23 (SD = 13.50). Three levels of HRQOL, including high, moderate and low levels, had equal percentages of participants (33.33%).

Table 4.2 - Overall frequency, percentage and level of HRQOL of the participants in the quantitative (N = 240) and qualitative phases (N = 30)

Level of Health-related Quality of Life	Quantitative		Qualitative	
	N	%	N	%
High	70	29.20	10	33.33
Moderate	158	65.80	10	33.33
Low	12	5.00	10	33.33
Quantitative: (Range = 3 - 46, $\bar{X}$ = 22.89, SD = 8.43)				
Qualitative: (Range = 3 - 46, $\bar{X}$ = 24.23, SD = 13.50)				

Table 4.3 shows the subscale scores of HRQOL among Thai persons with COPD. Regarding each subscale, the highest mean scores of SGRQ-C were for symptom (mean = 9.38, SD = 3.83), followed by psychosocial impact (mean = 8.54, SD = 4.04) and activity (mean = 4.97, SD = 2.21). These results indicate that higher levels of SGRQ-C score mean higher levels of perceived effects of COPD leading to lower levels of HRQOL. Therefore, the symptom component is a major perceived effect of COPD, followed by the psychosocial impact and activity components.

Table 4.3 - Possible range, actual range, mean and SD of HRQOL (n = 240)

Health-related Quality of Life	Possible Range Min - Max	Actual Range Min - Max	Mean	SD
Symptom	0 - 21	0 - 19	9.38	3.83
Activity	0 - 11	0 - 11	4.97	2.21
Psychosocial Impact	0 - 24	1 - 21	8.54	4.04
Total	0 - 56	3 - 46	22.89	8.43

In addition, each item in the components of symptom, activity and psychosocial impact is shown in Appendix G. For the symptom component, the majority of the participants had dyspnea (44.20%), chronic cough (42.90%) and sputum production (39.20%) several days per week. Slightly more than 60 percent (63.30%) of the participants had attacks involving chest trouble, and approximately 55.00 percent

had wheezing attacks due to respiratory tract infections. On the activity component, most of the participants felt breathless while walking fast (98.80%), walking up one flight of stairs or walking uphill (70.40%) and walked slower than other people of the same age (79.20%). However, nearly all of the participants could take care of themselves without breathlessness, including dressing (96.70%), showering or bathing (93.80%) and walking around the home (86.70%). On the psychosocial impact component, most of the participants reported being unable to play sports (96.30%) and/or leave the home for entertainment (76.70%). Approximately 86 percent of the participants reported exercise as unsafe and stated that shortness of breath made them feel afraid and anxious (55.00%).

The HRQOL results among persons with COPD in the quantitative phase were consistent with the findings on HRQOL in the qualitative phase. The qualitative phase was aimed at exploring a comprehensive in-depth understanding of factors associated with HRQOL among Thai persons with COPD. According to the in-depth interviews in 30 persons with COPD concerning HRQOL, the findings revealed perceived HRQOL from the effects of COPD to have consistent characteristics in four categories consisting of the following: experiences with physical symptoms; experiences with psychological symptoms; perceived social isolation; and adherence to self-care practices related to COPD. Table 4.4 lists the categories, sub-categories and codes of HRQOL among persons with COPD.

In experiences with physical symptoms, the effects of COPD cause physical symptoms that can be summarized in two sub-categories involving experience with perceived symptoms and experience with activity limitations. According to all of the participants, most of the symptoms encountered were shortness of breath, productive cough and insomnia as in the following statements:

"Most of the time, I had dyspnea, shortness of breath and difficulty breathing. If I have very viscous mucous, I cough until it keeps me up at night. I've noticed that my symptoms become more severe if I inhale dust, smoke or have a cold. I sneeze more and have sticky, yellow-green mucous. I have shortness of breath, so I have to go see the doctor at the hospital before my appointment data. I was treated for several days before I got well." (Participant 13)

Table 4.4 - Categories, sub-categories and codes of HRQOL

Categories	**Sub-categories**	**Codes**
Experiences with physical symptoms	a. Experience with perceived symptoms	1) Shortness of breath 2) Productive cough 3) Insomnia
	b. Experience with activity limitations	1) Inability to perform activities as before 2) Shortness of breath on exertion 3) Avoiding activities
Experiences with psychological symptoms	a. Uncertainty in illness	1) Uncertainty about changes in symptoms 2) Uncertainty about life 3) Fear of death
	b. Emotional changes	1) Anxiety 2) Frustration 3) Fear of dependence on others
Perceived social isolation	a. Fear of going outside the home	1) Fear of difficulty breathing when going outside the home
	b. Fear others will hate and despise	1) Fear of disgust from others caused by symptoms of COPD
Adherence to self-care practices related to COPD	a. Experience with physical self-care	1) Taking prescription drugs continuously to improve symptoms 2) Dealing with shortness of breath as appropriate 3) Controlling food consumption as appropriate 4) Continuing to exercise every day
	b. Experience with psychological self-care	1) Using relaxation techniques

Twenty-five out of thirty participants reported experiences with activity limitations due to the effects of COPD. The participants were unable to perform activities normally like before, were prone to shortness of breath when performing activities with heavy exertion and avoided activities as in the following statements:

"I haven't been able to perform activities like before. In the past, I was able to dig and lift fertilizer sacks by myself. I can't do that now. I've noticed that doing labor-intensive activities, lifting heavy objects or even speaking for a long time gives me dyspnea and shortness of breath. So, I don't dare to do labor-intensive activities and do only activities as I can, because I'm afraid of having to go to the hospital." (Participant 9)

In experiences with psychological symptoms, the impacts of COPD cause physical symptoms, thereby preventing persons with COPD from following their daily routines. Moreover, activity limitations can also have long-term psychological effects, which can be summarized into two sub-categories consisting of uncertainty in illness and emotional changes. Twenty out of thirty participants reported uncertainty in illness, including uncertainty about changes in symptoms, uncertainty about life and fear of death as in the following statements:

"I've had to keep inhalers nearby, because the symptoms are uncertain. I don't know when I'll get tired of breathing again. Sometimes, I start coughing until I gasp for air, especially when I'm at home during the day. I don't dare to do much housework because I'm afraid I'll start wheezing and no one will be there to help me. I'm afraid of burdening my children with more expenses. There's only stabilizing and deteriorating with this disease." (Participant 17)

Fifteen out of thirty participants reported the impacts of COPD to have caused emotional changes related to anxiety, frustration and fear of dependence on others as in the following statements:

"About two or three years ago, I used to be able to cut the grass near the house by myself and water my plants. I can't do it now, because I get tired easily. I feel irritated and frustrated when I see weeds near my house and when I see the trees next to my house die because I can't do anything like before." (Participant 24)

Perceived social isolation, the effects of COPD cause experiences of physical and psychological symptoms. Hence, persons with COPD have social isolation with two sub-categories consisting of fear of going outside the home and fear others will hate and despise. Eighteen out of thirty participants reported fear of going outside the home due to fear of difficulty breathing as in the following statements:

"I haven't been going far from home. I haven't visited relatives or vacationed in other provinces. My children don't want me to drive or go anywhere by myself, because I feel tired when I sit in a car or drive for a long time. I'm afraid of difficulty breathing when traveling and there's no one to help me. If it's a village affair like a wedding, a funeral or a big merit making, I'll go only to the ones where our families are really close and I always carry the inhaler with me." (Participant 26)

Ten out of thirty participants perceived fear others would hate and despise as in the following statements:

"Most of my friends smoke, so I don't go to parties with friends as before because I cough if I smell cigarette smoke until I get tired. Speaking for a long time sometimes makes me tired, too. And when I cough, I sometimes get mucous in my throat. I am afraid my friends will mind and think I have a communicable disease. I only talk with friends from my group by telephone once in a long while." (Participant 23)

In terms of adherence to self-care practices related to COPD, the effects of COPD cause experiences with physical symptoms, psychological symptoms and social isolation. Thus, persons with COPD require self-care, which can be summarized into two sub-categories consisting of experiences with physical and psychological self-care. Every participant perceived the aforementioned effects of COPD to require physical self-care. In addition, regular compliance with recommendations of healthcare providers causes symptoms of COPD to improve and stabilize are as follows: taking prescription drugs continuously to improve symptoms, dealing with shortness of breath as appropriate, controlling food consumption as appropriate and continuing to exercise every day as in the following statements:

"I've been taking medications and using the inhaler given by the doctor at the hospital every day for about two to three months. My symptoms have improved a lot in the past two to three months. My breathing is clearer and I don't have as much mucous in my throat like before I came for treatment. I exercise as much as I can. I walk around the house, swing my arms, inhale and exhale deeply every day. It's given me more energy to perform activities." (Participant 10)

"I'm trying to quit smoking like the doctor recommended and I've resigned from my cement working because I can't avoid the dust and work hard. I've

changed to driving a taxi. If I have a passenger who has a cold, I wear a mask to keep myself from having a cold. I've noticed that, since I've stopped smoking and since I've changed my job, I'm less tired and I don't cough with mucous." (Participant 2)

Fourteen out of thirty participants reported the aforementioned effects of COPD to require psychological self-care as in the following statements:

"Every day, I have to face living with this disease because it's incurable. I've tried to follow the nurses' recommendations. I try not to get stressed. If I am uncomfortable about something, I talk to my daughter or close friends and I pray every night before I go to sleep. It helps me sleep the night through and wake up refreshed with no fatigue in the morning." (Participant 3)

On the contrary, if persons with COPD neglect self-care, they will suffer from the disease and have exacerbation of COPD as in the following statements:

"I once traveled in another province for about a week and forgot to take my medications and inhaler. When I was in the other province, I rode a motorcycle and I probably inhaled dust. I had difficulty breathing, coughed mucous until I started wheezing. I had to have my children take me to the hospital at night in the other province and I had to be hospitalized because of a complication from pneumonia. Since then, I haven't dared to miss my medications." (Participant 22)

4.3 Relationships of the Predicting Variables of HRQOL

The following three hypotheses were tested in this study:

Hypothesis 1: Age, gender, nutritional status, social support, pulmonary function and functional performance are associated with HRQOL among Thai persons with COPD. Pearson's product moment correlation coefficient was used to examine the relationships between age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD. Table 4.5 and Figure 4.1 show that social support ($r = -0.807$, $p = .000$), followed by nutritional status ($r = -0.771$, $p = .000$), pulmonary function ($r = -0.703$, $p = .000$) and functional performance ($r = -0.620$, $p = .000$) are significantly and negatively correlated with HRQOL by using SGRQ-C scores. The results indicated that higher levels of social support, nutritional status, pulmonary function and functional performance correlated with lower levels of SGRQ-C score indicate lower levels of perceived effects of COPD.

Therefore, higher levels of social support, nutritional status, pulmonary function and functional performance are correlated with better HRQOL among Thai persons with COPD. However, age (r = 0.099, *p* = .127) and gender (r = 0.039, *p* = .550) had no significant correlations with HRQOL.

Table 4.5 - Relationships between age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL (N = 240)

Variable	1	2	3	4	5	6	7
1. Age	1.000						
2. Gender-Female	.029 (.657)	1.000					
3. Nutritional Status	-.104 (.109)	-.141 (.029)	1.000				
4. Social Support	-.043 (.509)	-.063 (.332)	.643 (.000)	1.000			
5. Pulmonary Function	-.046 (.479)	.021 (.745)	.609 (.000)	.580 (.000)	1.000		
6. Functional Performance	-.383 (.000)	-.077 (.235)	.526 (.000)	.569 (.000)	.473 (.000)	1.000	
7. HRQOL	.099 (.127)	.039 (.550)	-.771 (.000)	-.807 (.000)	-.703 (.000)	-.620 (.000)	1.000

Note. $p < .05$

In addition, the relationships among individual factors of HRQOL are shown in Table 4.5 and Figure 4.1. First, age had a significantly negative correlation with functional performance (r = -0.383, *p* = .000). Second, gender had a significantly negative correlation with nutritional status (r = -0.141, *p* = .029). Third, nutritional status was significantly positive correlations with social support (r = 0.643, *p* = .000), pulmonary function (r = 0.609, *p* = .000) and functional performance (r = 0. 526, *p* = .000), respectively. Fourth, social support had significantly positive correlations with pulmonary function (r = 0.580, *p* = .000) and functional performance (r = 0.569, *p* = .000), respectively. Fifth, pulmonary function had a significantly positive correlation with functional performance (r = 0.473, *p* = .000).

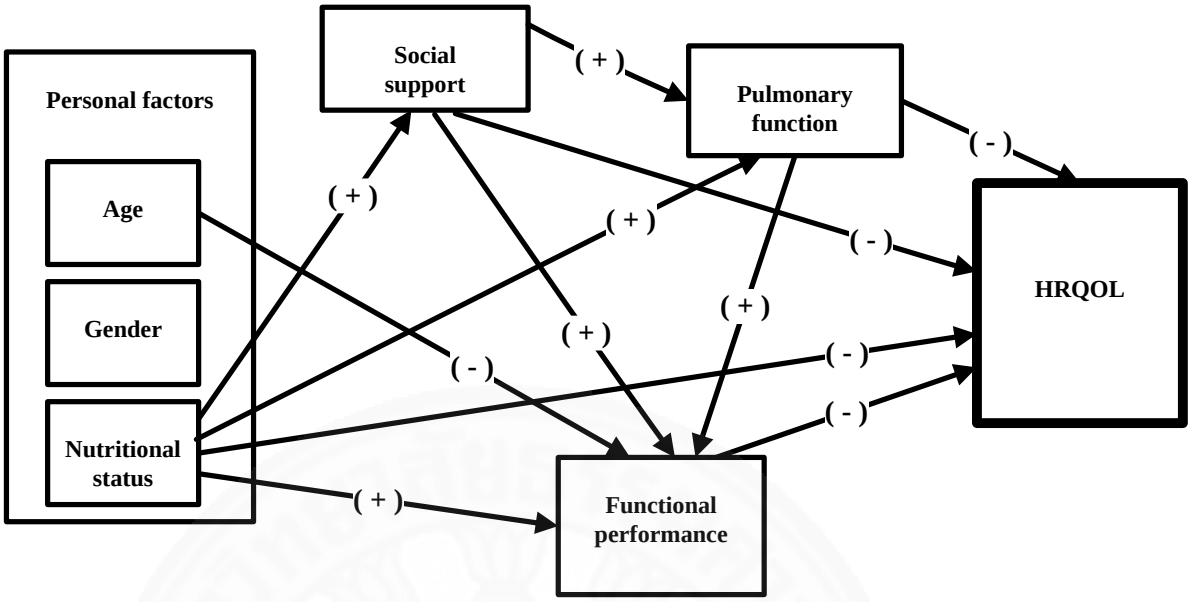

Figure 4.1 - Relationships between age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL

Hypothesis 2: Age, gender, nutritional status, social support, pulmonary function and functional performance are incorporated predictors of HRQOL among Thai persons with COPD. Hierarchical stepwise multiple regression analysis was used to examine the predictability of HRQOL among Thai persons with COPD by using age, gender, nutritional status, social support, pulmonary function and functional performance. The assumptions were tested before using multiple regression analysis (please see attached: Appendix F). For Assumption 1, a histogram of standardized residual and the Kolmogorov-Smirnov test were used to investigate the relationships between the independent variables and dependent variable in terms of linearity and normal distribution. The results show that age, nutritional status, social support, pulmonary function, functional performance and HRQOL are normally distributed. However, gender is not normally distributed because it is a nominal variable in which the numbers defined in each category are simply coded. For Assumption 2, a scatter plot was selected to test the homoscedasticity. According to the findings, the actual scores vary around the prediction line then the data in this study showed homoscedasticity. For Assumption 3, a correlation matrix was used to investigate multicollinearity among all

independent variables. The results show that the highest correlation coefficients among independent variables was 0.643. Therefore, the correlation coefficients among the independent variables in this study had no multicollinearity, because scores with multicollinearity needed to be lower than 0.65 (Burn & Grove, 2005) and 0.80 (Steven, 2002). For Assumption 4, the Durbin-Watson test was used to investigate auto-correlation in the data. The results show that the Durbin-Watson value was 1.868. Therefore, the data in this study had no autocorrelation, because the Durbin-Watson values were between 1.50 and 2.50. Next, hierarchical stepwise multiple regression analysis was performed to analyze the data obtained in this study.

The four steps of hierarchical stepwise multiple regression analysis that were conducted with HRQOL as the dependent variable are presented in Table 4.6. In the first step, personal factors including age, gender and nutritional status were entered for the first model. Personal factors contributed significantly to the regression model ($F = 118.271$; $df = 3,236$; $p = .000$) and accounted for 60.10 percent of the variance in HRQOL ($R^2 = 0.601$), which is interpreted as a moderate level. The variable with predictive power for HRQOL with statistical significance at the .000 level was nutritional status ($t = -18.662$), while the regression coefficients were age ($t = 0.482$, $p = .630$) and gender ($t = -1.723$, $p = .086$). At the second step, adding social support to the regression model explained an additional 16.40 percent, which increased the predictive power to 76.40 percent of the variance in HRQOL (R change = 0.164, $R^2 = 0.764$). The above finding was interpreted as a high level and this change in R^2 was significant ($F = 163.264$; $df = 1,235$; $p = .000$). At the third step, adding pulmonary function to the regression model explained an additional 2.90 percent, which increased the predictive power to 79.30 percent of the variance in HRQOL (R change = 0.029, $R^2 = 0.793$). This was a high level and the change in R^2 was significant ($F = 32.903$; $df = 1,234$; $p = .000$). At the fourth step, adding functional performance to the regression model explained an additional 0.80 percent, which increased the predictive power to 80.10 percent of the variance in HRQOL (R change = 0.008, $R^2 = 0.801$). This was a high level and the change in R^2 was significant ($F = 9.191$; $df = 1,233$; $p = .003$).

Therefore, when all six predictor variables were included in the four steps of the regression model, neither age nor gender were significant predictors of HRQOL. Social support ($\beta = -0.412$) was the strongest predictor of HRQOL among persons with

COPD, followed by nutritional status (β = -0.320), pulmonary function (β = -0.210) and functional performance (β = -0.125), with (R^2 = 0.801, p = .003). The hierarchical stepwise multiple regression equation was as follows:

$$Y = a + b_1 x_1 + b_2 x_2 + \ldots + b_k x_k$$

The hierarchical stepwise multiple regression equation for HRQOL was determined from the results in Table 4.6 where Y refers to HRQOL, a (alpha) refers to the constant of 82.180 and b refers to the regression coefficient of each predictor entered from the first step to the fourth step, namely, nutritional status, social support, pulmonary function and functional performance. The coefficients for these predictors were determined at statistical levels of -0.1 to -0.4. Therefore, the predictive equation in this study was as follows:

HRQOL = 82.180 -1.494 nutritional status; -0.373 social Support; -0.104 pulmonary function; -2.459 functional performance

This equation is shown to reduce the SGRQ-C scores among Thai persons with COPD as follows: 1) SGRQ-C scores decreased by 1.494 when the nutritional status scores increased one unit; 2) SGRQ-C scores decreased by 0.373 when the social support scores increased one unit; 3) SGRQ-C scores decreased by 0.104 when the pulmonary function scores increased one unit; and 4) SGRQ-C scores decreased by 2.459 when the functional performance scores increased one unit. These results indicated that higher levels of nutritional status, social support, pulmonary function and functional performance correlated with lower levels of SGRQ-C scores indicate lower levels of perceived effects of COPD. Therefore, higher levels of these factors are correlated with better HRQOL among Thai persons with COPD.

Table 4.6 - Hierarchical stepwise multiple regression analysis between predictors and HRQOL

Independent variable	Model 1				Model 2				Model 3				Model 4			
	b	**β**	**t**	***p***	**b**	**β**	**t**	***p***	**b**	**β**	**t**	***p***	**b**	**β**	**t**	***p***
Constant Term		83.746				80.600				75.734				82.180		
Step 1 - Personal factors																
1. Age	.018	.020	.482	.630	.029	.032	1.020	.309	.031	.034	1.151	.251	-.007	-.008	-.254	.800
2. Gender-Female	-1.687	-.072	-1.723	.086	-1.338	-.057	-1.774	.077	-.801	-.034	-1.122	.263	-.872	-.037	-1.242	.215
3. Nutritional status	-3.644	-.779	-18.662	.000	-2.037	-.436	-10.397	.000	-1.590	-.340	-7.958	.000	-1.494	-.320	-7.511	.000
Step 2																
4. Social support					-.479	-.529	-12.777	.000	-.413	-.457	-11.182	.000	-.373	-.412	-9.616	.000
Step 3																
5. Pulmonary function									-.113	-.228	-5.736	.000	-.104	-.210	-5.304	.000
Step 4																
6. Functional performance													-2.459	-.125	-3.032	.003
R	.755				.874				.891				.895			
R^2	.601				.764				.793				.801			
R change	.601				.164				.029				.008			
F	118.271				163.264				32.903				9.191			
Significant F	.000				.000				.000				.003			

Note. $p < .05$

Table 4.7 - Total effects, direct effects and indirect effects of causal factors in HRQOL (N = 240)

Independent Variable	DE	IE				TE	r	Error
		Social Support	Pulmonary Function	Functional Performance	Total			
Step 1								
1. Age	-.008	.020	.032	.034	.086	.078	.099	-.021
	(.800)	(.630)	(.309)	(.251)			(.127)	
2. Gender-Female	-.037	-.072	-.057	-.034	-.163	-.200	.039	-.239
	(.215)	(.086)	(.077)	(.263)			(.550)	
3. Nutritional Status	-.320	-.779	-.436	-.340	-1.555	-1.875	-.771	-2.646
	(.000)	(.000)	(.000)	(.000)			(.000)	
Step 2								
4. Social Support	-.412		-.529	-.457	-.986	-1.398	-.807	-2.205
	(.000)		(.000)	(.000)			(.000)	
Step 3								
5. Pulmonary Function	-.210			-.228	-.228	-.438	-.703	-1.141
	(.000)			(.000)			(.000)	
Step 4								
6. Functional Performance	-.125					-.125	-.620	-.745
	(.003)						(.000)	

Note. $p < .05$; TE = Total effect, IE = Indirect effect, DE = Direct effect

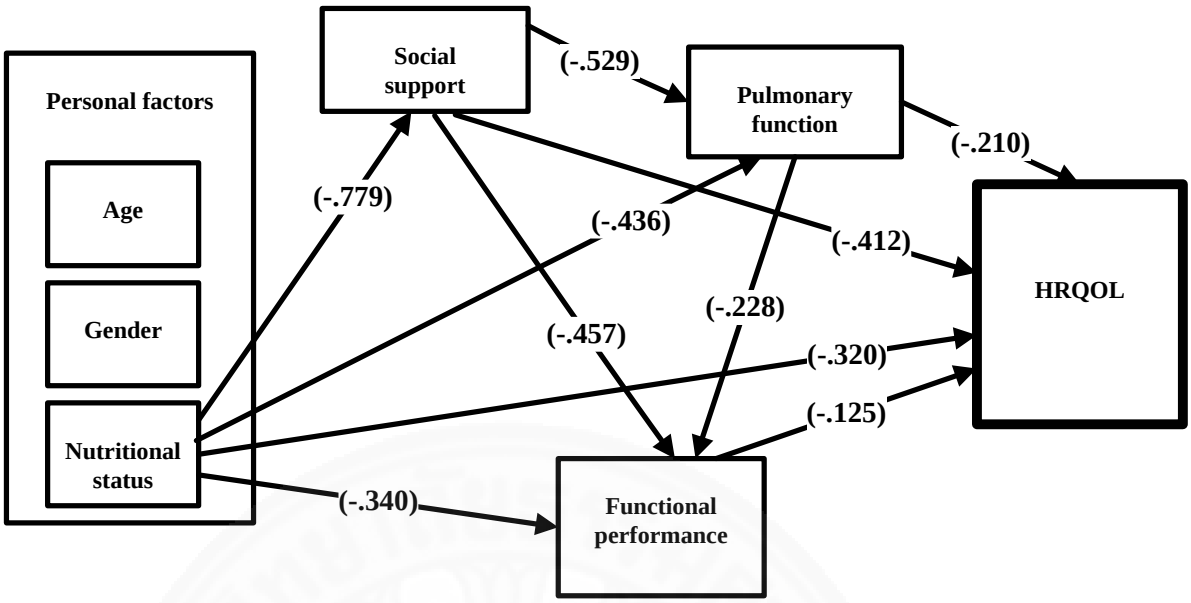

Figure 4.2 - Causal factors in HRQOL among Thai persons with COPD

In addition, the total effects, direct effects and indirect effects of the causal factors in HRQOL among Thai persons with COPD are shown in Table 4.7 and Figure 4.2. First, the results found age to have statistically insignificant negative direct effect on HRQOL by using SGRQ-C scores (β = -.008, *p* = .800) and a positive indirect effect on HRQOL through social support (β = .020, *p* = .630), pulmonary function (β = .032, *p* = .309) and functional performance (β = .034, *p* = .251). Second, gender had statistically insignificant negative direct effect on HRQOL (β = -.037, *p* = .215) and a negative indirect effect on HRQOL through social support (β = -.072, *p* = .086), pulmonary function (β = -.057, *p* = .077) and functional performance (β = -.034, *p* = .263). Therefore, both of age and gender had a statistically insignificant negative direct effect on HRQOL and these variables had indirect effects on HRQOL.

Third, nutritional status measured by using the FFMI had a significantly negative direct effect on HRQOL (β = -.320, *p* = .000) and a significantly negative indirect effect on HRQOL through social support (β = -.779, *p* = .000), pulmonary function (β = -.436, *p* = .000) and functional performance (β = -.340, *p* = .000). Fourth, social support had a significantly negative direct effect on HRQOL (β = -.412, *p* = .000) and a significantly negative indirect effect on HRQOL through pulmonary function (β = -.529, *p* = .000) and functional performance (β = -.457, *p* = .000). Fifth, pulmonary

function measured by using the PEFR had a significantly negative direct effect on HRQOL (β = -.210, *p* = .000) and a significantly negative indirect effect on HRQOL through functional performance (β = -.228, *p* = .000). Sixth, functional performance measured by using FPI-SF scores had a significantly negative direct effect on HRQOL (β = -.125, *p* = .000). Therefore, nutritional status, social support, pulmonary function and functional performance had significantly negative direct effects and significantly negative indirect effects on HRQOL by using SGRQ-C scores among Thai persons with COPD.

4.4 Predictor Variables and Categories

Hypothesis 3: Personal factors, social support, pulmonary function and functional performance can explain the relationships with HRQOL among Thai persons with COPD. In the results from the quantitative phase, the predictor variables were age, gender, nutritional status, social support, pulmonary function and functional performance, while the outcome variable was HRQOL. According to the findings of the qualitative phase, each of the variables were ultimately grouped into themes that aimed to explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. The following seven themes emerged during the data analysis: HRQOL, age, gender, nutritional status, social support, pulmonary function and functional performance.

4.4.1. Age

The results on age group and HRQOL among Thai persons with COPD are shown in Table 4.8. The ages of the participants ranged from 44 to 92 years with a mean of 68.80 (SD = 9.49). Most of them participants (36.70%) were 60 – 69 years of age, followed by 32.10 percent who were 70 to 79 years old, 16.30 percent who were 40 to 59 years old and 15.0 percent who were over 79 years old. Therefore, the majority of the participants were elderly persons with COPD. As regards each age group, the highest mean SGRQ-C score was found among the participants who were 70 to 79 years of age (mean = 23.92, SD = 8.775), while the lowest mean SGRQ-C score was 40 to 59 years of age (mean = 21.36, SD = 8.343). There were no statistically significant differences between age groups and mean SGRQ-C scores as determined by ANOVA (F = 1.108; df = 3,236; *p* = .347) and shown in Table 4.9. All of the

aforementioned had moderate levels of HRQOL with higher mean SGRQ-C scores referring to higher levels of perceived effects of COPD. Therefore, elderly persons with COPD who had higher levels of perceived effects of COPD are likely to have poorer HRQOL compared to other adults with COPD.

Table 4.8 - Actual range, mean and SD of HRQOL by age group (N = 240)

Age Groups (years)	N	%	Health-related Quality of Life			
			Min - Max	Mean	SD	Level of HRQOL
Adults with COPD						
40 – 59	39	16.30	6 - 37	21.36	8.343	Moderate
Elderly Persons with COPD						
60 – 69	88	36.70	7 - 46	22.28	8.243	Moderate
70 - 79	77	32.00	7 - 42	23.92	8.775	Moderate
More than 79	36	15.00	3 - 41	23.81	8.179	Moderate
Total	240	100.00	3 - 46	22.89	8.430	Moderate
Age Range = 44 - 92, $\bar{X}$ = 68.80, SD = 9.49						

Table 4.9 - ANOVA table of HRQOL and age groups

Source of Variation	Sum of Squares	df	Mean Square	F-test	p-value
Between Groups	235.919	3	78.640	1.108	.347
Within Groups	16750.043	236	70.975		
Total	16985.963	239			

Table 4.10 - Category, sub-categories and codes of age associated with HRQOL

Category	Sub-categories	Codes
Differences in age were unable to predict disease prognosis	a. Effects of COPD in adulthood	1) Burdens of duties and responsibilities
	b. Effects of COPD in old age	1) More difficulty treating COPD
		2) More severe symptoms
	c. Age unrelated to effects of COPD	1) Age was unrelated to effects of COPD

Concerning the results of age among persons with COPD, the findings in the quantitative phase were consistent with the findings on age in the qualitative phase. According to in-depth interviews with 30 persons who had COPD concerning age and HRQOL among persons with COPD, the findings revealed age and HRQOL to be perceived by persons with COPD with consistent characteristics in that differences in age were unable to predict disease prognosis. Table 4.10 lists the category, sub-categories and codes of age associated with HRQOL among persons with COPD.

The effects of COPD in adulthood cause persons with COPD to have activity limitations. Persons with COPD in adulthood have responsibilities as family leaders who care for family expenses, but persons with COPD are frequently unable to work in the same way as before the disease. Four out of thirty participants reported that this disease had effects on burdens, duties and responsibilities of adults as in the following statements:

"I've had this disease since I was 44 years old. Since I became sick, my life has gotten a lot worse. Even though my symptoms are not severe, I am not able to work as before. I get tired easily when I do hard work. I asked to be transferred to a department with lighter work, but the income is lower, so I am less able to support my family. My wife has to come to help me work." (Participant 21)

The effects of COPD in old age cause deteriorating physical impacts and psychosocial impacts in line with older age among persons with COPD. Twenty-four out of thirty participants perceived the disease to have effects on health. In addition, significant effects of symptoms were found among the elderly as in the following statements:

"I began to have this disease when I was over 70 years old. I spent 5 – 6 months to treat the disease until the symptoms improved. I think there are many effects when older people have this disease and it's more difficult to treat the disease because our bodies are old and have been used for a long time. Even though my mind fights, my body won't. I feel like I'm not as quick as before. I get tired easily when I do activities and it takes a long time for me to get better if I have a cold." (Participant 19)

Concerning age unrelated to the effects of COPD, the effects of COPD create physical and psychological impacts causing persons with COPD to practice self-

care. Two out of thirty participants reported age was unrelated to the effects of COPD. However, these effects are related to consistent physical and psychological self-care, thereby causing symptoms of the disease to improve during a calm period as in the following statements:

"How the symptoms are better or worse is probably not related to age and more related to self-care. I'm over 70 years old. I try to take care of myself. I use the inhaler every day. I avoid dust and smoke. I don't usually have difficulty breathing. I have mucous once in a long while. My neighbor has this disease, too. He is almost ten years younger than me, but he will not quit smoking and takes medications infrequently. I notice that he is easily tired. All it takes is for him to speak for a long time to get tired." (Participant 8)

4.4.2. Gender

The results on gender and HRQOL among Thai persons with COPD are shown in Table 4.11. Most of the participants were males (85%) and fewer were females (15%). The highest mean SGRQ-C scores were found among the female participants (mean = 23.69, SD = 8.088), followed by the male participants (mean = 22.75, SD = 8.501). There were no statistically significant differences between gender and mean SGRQ-C scores as determined by independent t-test (t = -.622; df = 238; p = .534). Both females and males had moderate HRQOL that higher levels of SGRQ-C scores referring to higher levels of perceived effects of COPD. Therefore, women with COPD had higher levels of perceived effects of COPD and are more likely to have poorer HRQOL than men.

Table 4.11 - Actual range, mean and SD of HRQOL on gender differences (N = 240)

Gender	N	%	Health-related Quality of Life				t	p-value
			Min - Max	Mean	SD	Level of HRQOL		
Male	204	85.00	3 - 46	22.75	8.501	Moderate	-.622	.534
Female	36	15.00	7 - 40	23.69	8.088	Moderate		
Total	240	100.00						

Table 4.12 - Category, sub-categories and codes of gender associated with HRQOL

Category	Sub-categories	Codes
Differences in gender aspects were unable to predict disease prognosis	a. Effects of COPD in women	1) Multiple concurrent symptoms 2) Anxiety
	b. Effects of COPD in men	1) More severe symptoms 2) Burdens of duties and responsibilities
	c. Gender unrelated to the effects of COPD	1) Gender unrelated to the effects of COPD

The results on gender among persons with COPD in the quantitative phase were consistent with the findings on gender in the qualitative phase. According to the in-depth interviews in 30 persons with COPD concerning gender and HRQOL in this group, the findings revealed gender and HRQOL as perceived by persons with COPD to have consistent characteristics in the differences in gender aspects being unable to predict disease prognosis. Table 4.12 lists the category, sub-categories and codes of gender associated with HRQOL among persons with COPD.

On the effects of COPD in women, eight out of thirty participants reported that COPD occurs in the lungs, causing the alveoli to expand, the lungs to deteriorate and difficulty breathing and coughing. However, women with COPD have more responses to multiple concurrent symptoms of the disease and leading to anxiety. Therefore, the effects of COPD in women can be more severe as in the following statements:

"I've known several women who have effects of COPD. We talk when we are waiting for follow-up at the chest clinic. Women with COPD have more symptoms such as difficulty breathing, coughing with mucous and getting tired easily when they perform activities, which can react by causing anxiety, while men with COPD have more severe symptoms than women." (Participant 25)

On the effects of COPD in men, more than half of the participants reported receiving explanations from doctors and nurses that cigarettes are the cause of COPD and loss of pulmonary function. Therefore, the participants perceived themselves and most men to have smoking behaviors and duties and responsibilities toward families, thereby causing symptoms of COPD to be more severe with effects in men as in the following statements:

"I've smoked for almost twenty years. The doctor said that I have this disease because I smoke. Most men smoke. I don't usually see women smoke. So, I think men's lungs are probably worse with more severe symptoms of the disease than women. When men have this disease, there are more effects than women because men would not be able to work as hard as before and they have less income. Most women work at home. They do work that is not very heavy and they take more care of themselves." (Participant 21)

Concerning gender unrelated to the effects of COPD, the effects of COPD create physical and psychosocial impacts, causing persons with COPD too have greater awareness and interest in self-care. Two out of thirty participants asserted that gender was not related to the effects of COPD. However, these effects concerning regular physical and psychological self-care caused the symptoms of the disease to be in a calm stage as in the following statements:

"The severity of the symptoms of COPD is more dependent on self-care and probably unrelated to gender. I try to take care of myself all the time. I use the inhaler every day. I don't often have difficulty breathing. I sometimes have a productive cough. My friend has COPD and he's also a man. He doesn't have time to go to the doctor's appointments and he takes medications irregularly. I see that he gets tired easily. He doesn't go out much." (Participant 8)

4.4.3. Nutritional Status

The results on nutritional status and HRQOL among Thai persons with COPD are shown in Table 4.13. The ratio of FFMI was used to assess nutritional status and both FFMI and BMI were used to investigate the classifications of nutritional status. Nutritional status ranged from 13.03 to 20.87 kg/ m^2 with a mean of 16.97 (SD = 1.80). Most of the participants (67.50%) had normal levels of nutritional status, followed by cachexia (17.50%), muscle atrophy (12.90%) and semi-starvation (2.10%). As regards each level of nutritional status, the highest mean SGRQ-C score was cachexia (mean = 32.24, SD = 6.472), while the lowest mean SGRQ-C score was at a normal level (mean = 19.12, SD = 6.129). There were statistically significant differences between the levels of nutritional status and mean SGRQ-C scores as determined by ANOVA (F = 60.499; df = 3,236; p = .000) as shown in Table 4.14. All of the aforementioned had moderate levels of HRQOL and higher mean SGRQ-C

scores indicated higher levels of perceived effects of COPD. Therefore, malnutrition among persons with COPD who had high perceived effects of COPD and poor HRQOL, while those with normal nutritional status had good HRQOL.

Table 4.13 - Actual range, mean and SD of HRQOL on nutritional status (N = 240)

Nutritional Status	**N**	**%**	**Health-related Quality of Life**			
			Min - Max	**Mean**	**SD**	**Level of HRQOL**
Normal	162	67.50	3 - 35	19.12	6.129	Moderate
Semi-starvation	5	2.10	13 - 34	24.60	8.444	Moderate
Muscle atrophy	31	12.90	13 - 44	29.61	7.191	Moderate
Cachexia	42	17.50	20 - 46	32.24	6.472	Moderate
Total	240	100.00	3 - 46	22.89	8.430	Moderate
Range of nutritional status = 13.03 – 20.87, $\bar{X}$ = 16.97, SD = 1.80						

Table 4.14 - ANOVA table of HRQOL and nutritional status

Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F-test**	**p-value**
Between Groups	7384.258	3	2461.419	60.499	.000
Within Groups	9601.705	236	40.685		
Total	16985.963	239			

The results on nutritional status among persons with COPD in the quantitative phase were consistent with the findings on nutritional status in the qualitative phase. According to the in-depth interviews in 30 persons with COPD regarding nutritional status and HRQOL among persons with COPD, the findings revealed nutritional status and HRQOL perceived by persons with COPD to have consistent characteristics in the following two categories: effects of COPD causes persons to receive insufficient nutrients and self-care with regard to food consumption. Table 4.15 lists the categories, sub-categories and codes of nutritional status associated with HRQOL among persons with COPD.

Table 4.15 - Categories, sub-categories and codes of nutritional status associated with HRQOL

Categories	Sub-categories	Codes
Effects of COPD causes persons to receive insufficient nutrients	a. Perceiving less weight due to the effects of COPD	1) Eating less due to coughing with mucous
		2) Eating less due to abdominal discomfort
	b. Higher energy requirements.	1) Normal consumption without weight gain
	c. Symptoms of insufficient nutrients	1) Weakness
		2) Perceiving more frequent exacerbation
Self-care with regard to food consumption	a. Controlling food consumption as appropriate	1) Eating little, but more frequently
		2) Eating healthy foods
		3) Avoidance of exacerbating foods

The effects of COPD caused persons to receive insufficient nutrients, experience coughing with mucus and pressure on the stomach from the diaphragm as the body exerted more energy than the amount of energy received, thereby resulting in insufficient nutrients and symptoms of the disease. Sixteen of thirty participants reported perceiving less weight due to the effects of the disease which caused the persons to eat less due to coughing with mucous and abdominal discomfort as in the following statements:

"Today, I weigh 50 kilograms. I was aware that I was losing weight because my belly just went down. I noticed that I had a lot of mucous in my throat when I coughed frequently. I don't dare to eat food like before. I am afraid of coughing until I choke, so I eat little. However, I am able to eat normally when I don't cough. My weight is the same without rising." (Participant 19)

Thirteen out of thirty participants reported normal consumption without weight gain or occasional weight loss as in the following statements:

"I weigh less than the criteria and the shirts I used to wear are now loose. I can eat only a little. Each time, I can eat only half a plate. If I eat more, I get discomfort and I won't be able to breathe fully. I try to eat little, but frequently.

My children buy milk for me to drink but my weight hasn't gone up. I've noticed that my weight doesn't go up, no matter how much I eat." (Participant 27)

Ten out of thirty participants reported weakness and being easily fatigued when performing activities and perceiving more frequent illness when body weight dropped as in the following statements:

"I eat only a little. I eat and then I feel tightness, so I don't want to eat much. In the last half of the year, I felt weak. I felt like I didn't have much energy for activities to the point that my daughter hired someone to provide care and stay with me. I notice that I'm not as strong as before lately. I have a cold once a month. Each time, it takes a long time before I'm healed. I think it's because I'm eating little, so my body has no immunity to fight the disease." (Participant 28)

Self-care with regard to food consumption, the effects of COPD cause the body to receive insufficient nutrients and have symptoms. This causes persons with COPD to have more awareness of self-care regarding food intake. Ten out of thirty participants reported eating little but more frequently as in the following statements:

"I eat little because it makes me feel tightness and discomfort. So, I follow what the nurses advise. I ate only a little at a time, but I eat frequently. I eat five meals a day. I eat in the morning, late morning, at noon, in the afternoon and in the evening. I eat only healthy foods like boiled eggs, steamed eggs, steamed fish and boiled vegetables with chili paste. It lets me eat more without feeling discomfort. When I eat more, I feel more energetic. I can walk around the house now." (Participant 26)

The participants reported eating nutritious foods and avoiding foods that caused exacerbations as in the following statements:

"Fried foods or oily stir-fried foods like fried chicken, fried pork or fried bread sticks are all my favorites. I've noticed that eating these foods makes me cough until I'm exhausted. Some nights, I wake up and cough until I can't sleep. Now I'm eating them less or once in a long while. It makes me cough less and sleep more fully. Taking medications or using inhalers helps to a certain degree. I have to eat healthy foods and avoid bad foods." (Participant 25)

4.4.4. Social Support

The results on social support and HRQOL among Thai persons with COPD are shown in Table 4.16. The MSPSS was used to measure social support among

Thai persons with COPD. The subscale of social support consists of the following three components: family members, friends and healthcare providers. The levels of social support ranged from 28 to 72 with a mean of 52.07 (SD = 9.31), whereby most of the participants had high levels of social support (59.20%). As regards each level, the highest mean SGRQ-C score was found among the participants who had moderate levels (mean = 30.06, SD = 6.358), followed by high levels (mean = 17.94, SD = 5.675) of social support. There were statistically significant differences between levels of social support and mean SGRQ-C scores as determined by independent t-test (t = 15.484; df = 238; *p* = .000). The mean SGRQ-C scores indicated that higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, the moderate level of social support among Thai persons with COPD had a high level of perceived effects of COPD likely leading to poor HRQOL compared with persons with COPD who had high levels of social support.

Table 4.16 - Actual range, mean and SD of HRQOL on social support (N = 240)

Level of Social Support	**N**	**%**	**Health-related Quality of Life**				**t**	**p-value**
			Min - Max	**Mean**	**SD**	**Level of HRQOL**		
Moderate	98	40.80	20 - 46	30.06	6.358	Moderate	15.484	.000
High	142	59.20	3 - 36	17.94	5.675	High		
Total	240	100.00						
Range of Social Support = 28 - 72, $\bar{X}$ = 52.07, SD = 9.31								

Table 4.17 - Possible range, actual range, mean and SD of social support (n = 240**)**

Social Support	**Possible Range Min - Max**	**Actual Range Min - Max**	**Mean**	**SD**
Family Members	0 - 24	4 - 24	19.74	3.79
Friends	0 - 24	0 - 24	14.74	4.47
Healthcare Providers	0 - 24	12 - 24	17.59	3.37
Total Score	0 - 72	28 – 72	52.07	9.31

Table 4.17 shows the subscale of social support among Thai persons with COPD. As regards each subscale, the highest mean score for social support was

the family component (mean = 19.74, SD = 3.79), followed by the healthcare provider (mean = 17.59, SD = 3.37) and friend components (mean = 14.74, SD = 4.47). Each item in the components of social support are shown in Appendix G. Concerning support from family members, most of the participants reported very strong agreement that their family members were willing to help them make decisions (40.40%) and offer emotional support (32.90%), while strongly agreeing that family members really tries to help with daily activities (37.90%). Concerning support from friends, most of the participants reported with mild agreement that friends really tried to help them (32.10%), while reporting with neutrality that they could trust their friends when things go wrong (35.00%) in addition to sharing their joys and sorrows (33.80%). On support from healthcare providers, the majority of the participants reported strong agreement that healthcare providers cared for their feelings (35.40%), really tried to help (32.90%) and were real sources of comfort to the participants (28.70%).

The results on social support among persons with COPD in the quantitative phase were consistent with the findings on social support in the qualitative phase. According to the in-depth interviews in 30 persons with COPD concerning social support and HRQOL among persons with COPD, the findings revealed the social support and HRQOL perceived by persons with COPD to have consistent characteristics in the three following categories: social support creates encouragement; social support creates convenience; and social support helps participants receive good recommendations.

Table 4.18 - Categories, sub-categories and codes of social support associated with HRQOL

Categories	Sub-categories	Codes
Social support creates encouragement	a. Receiving encouragement from family members, friends and healthcare providers	1) Support in taking to rest 2) Listening to problems 3) Perceived concern
Social support creates convenience	a. Receiving convenience in living from family members, friends and healthcare providers	1) Support with housework 2) Perceived receipt of care 3) Preparations of necessary items 4) Responsibility for expenses
Social support helps participants receive good recommendations	a. Receiving good recommendations from family members, friends and healthcare providers	1) Receiving accurate recommendations about COPD 2) Sharing experiences in living with COPD

Social support creates encouragement, while chronic illness with COPD reduces psychological security. In the present study, persons with COPD received the greatest support from family members, followed by healthcare providers and friends. All of the participants perceived concern, encouragement, support in taking the participants to rest, listening to problems and comforting the participants by family members and society which helped the participants have better morale in living with the disease as in the following statements:

"I'm lucky to have a good family, good friends and to have been treated at a good hospital. My children and my husband are worried. If I have something that makes me feel uncomfortable, my children, husband and close friends listen to my problems and give me good recommendations. They sometimes take me to make merit, then go out and meet my friends, so I'll feel better and not be depressed about staying in the house. When I come to be treated at the chest clinic at hospital, the doctor and nurses are nice. They smile and ask me about my symptoms in detail. It gives me more strength to live with COPD." (Participant 3)

Social support creates convenience, while the effects of COPD cause persons with COPD to have discomfort in life and be unready to prepare basic necessary equipment. All of the participants perceived receiving care, attention, support with

housework, preparations of necessary items, responsibility for expenses and creation of greater convenience in living as in the following statements:

"I can do light housework, but I have my children and my husband do heavy work like washing bathrooms, mopping the house and washing the car. They don't want me to do the work because they're afraid of me being tired. My children pay for the expenses in the house. Another one bought me my phone and bought an inhaler for me at home. If I get tired, they prepare the inhaler for me and take me to the hospital if I don't improve. I take the medications and use the inhaler from the hospital every day. It makes my symptoms much better. I don't have many friends of my age. I only have neighbors. They come to visit me and they cook the foods I like and bring them to me." (Participant 25)

Half of the participants perceived receiving medicine preparations and preparations from family members and neighbors to go to the hospital, thereby creating more convenience in living as in the following statements:

"The medications I get from the hospital are oral medications. They help me breathe much more clearly with less mucous. In the past, I couldn't use the inhaler correctly. I couldn't remember how. I was lucky that the pharmacist advised me and gave me an inhaler manual. If I forget, I can pick it up and read it. I still keep this manual. Last year, I had difficulty breathing. My children prepared medications for me. Even the inhaler didn't help improve my symptoms. My children had to go to the hospital at night. The neighbors helped drive me to the hospital, waited for me to finish the examination and took me home." (Participant 11)

Social support helps participants receive good recommendations, while the physical and psychosocial effects of the disease make persons with COPD have more awareness about self-care to minimize symptoms and prevent disease severity. Recommendations about self-care from social support enables persons with COPD to control the disease to a remissive stage. All of the participants perceived receiving accurate recommendations on taking medications and using inhalers, eating, exercising, quitting smoking, breathing, coughing effectively and avoiding exacerbation triggers from family members, friends and healthcare team members. The participants followed recommendations, thereby causing the symptoms to improve and making the participants breathe more conveniently as in the following statements:

"When I am waiting at the chest clinic, I talk with friends who have this disease. They tell me that drinking warm water or honey mixed with lime makes it easy to cough out mucous. I tried it and it does make it easy to get the mucous out. I'm drinking it every day now. I tried following the doctor's and nurses' recommendations to take medications and use the inhaler every day. I walk around the house to exercise. I eat good food. I eat eggs and steamed fish. It's helped me become much healthier. I don't get colds as frequently as before." (Participant 13)

"The doctor and the nurses recommended that I quit smoking and go to the Quit Smoking Clinic. I tried for many months. Now, I've quit smoking. My symptoms are much better. I don't have much mucous in my throat now and they've advised me to avoid dust, smoke and colds, because they'll make the symptoms more severe. I drive a motorcycle taxi. It's sometimes difficult to avoid the dust, so I wear a mask. It helps some. I notice that I'm not having difficulty breathing to the point where I have to use an inhaler at the hospital as frequently as before I started taking medications. I use the inhaler the doctor gave me and I try to take care of myself. Because I'm alone, I have only the hospital to depend on." (Participant 28)

4.4.5 Pulmonary Function

The results on pulmonary function and HRQOL among Thai persons with COPD are shown in table 4.19. The ratio of PEFR was used to assess pulmonary function and the percent of predicted PEFR was used to investigate the severity classifications of COPD. Pulmonary function ranged from 24.48 to 119.20 percent of predicted values with a mean of 55.95 (SD = 16.98). Approximately half of the participants (54.20%) was classified with moderate stages of the disease, while slightly over two percent had very severe stages. As regards each stage of the disease, the highest mean SGRQ-C score was the very severe stage of the disease (mean = 34.20, SD = 5.357), while the lowest mean SGRQ-C score was in the mild stage (mean = 12.36, SD = 4.125). There were statistically significant differences between pulmonary function and mean SGRQ-C scores as determined by ANOVA ($F = 54.020$; $df = 3,236$; $p = .000$) and shown in Table 4.20. Higher mean SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, persons with very severe COPD have high perceived effects of COPD and poor HRQOL.

Table 4.19 - Actual range, mean and SD of HRQOL on pulmonary function

Level of Pulmonary Function	N	%	Health-related Quality of Life			
			Min - Max	Mean	SD	Level of HRQOL
Mild	14	5.80	6 - 19	12.36	4.125	High
Moderate	130	54.20	3 - 36	19.45	5.926	Moderate
Severe	91	37.90	11 - 46	28.80	7.604	Moderate
Very Severe	5	2.10	27 - 42	34.20	5.357	Moderate
Total	240	10.00	3 - 46	22.89	8.430	Moderate
Range of Pulmonary Function = 24.48 – 119.20, $\bar{X}$ = 55.95, SD = 16.98						

Table 4.20 - ANOVA table of HRQOL and pulmonary function

Source of Variation	Sum of Squares	df	Mean Square	F-test	p-value
Between Groups	6915.386	3	2305.129	54.020	.000
Within Groups	10070.577	236	42.672		
Total	16985.963	239			

Table 4.21 - Categories, sub-categories and codes of pulmonary function associated with HRQOL

Categories	Sub-categories	Codes
Deterioration of pulmonary function	a. Deterioration of pulmonary function causing physical symptoms	1) Difficulty breathing 2) Coughing with mucus 3) Shortness of breath on exertion
	b. Deterioration of pulmonary function causing psychological symptoms	1) Anxiety 2) Disrupted sleep 3) Hopelessness from chronic illness
Dealing with degenerative pulmonary function	a. Experience with physical self-care	1) Dealing with shortness of breath as appropriate
	b. Experience with psychological self-care	1) Use of relaxation techniques

The results on pulmonary function among persons with COPD in the quantitative phase were consistent with the findings on pulmonary function in the qualitative phase. According to the in-depth interviews in 30 persons with COPD

regarding pulmonary function and HRQOL among persons with COPD, the findings showed pulmonary function and HRQOL perceived by persons with COPD to have consistent characteristics in the following two categories: deterioration of pulmonary function and be dealing with degenerative of pulmonary function.

Deterioration of pulmonary function causing physical symptoms, all of the participants reported receiving explanations from doctors and nurses that COPD occurs inside the lungs, causing the lungs to become deteriorated and causing difficulty breathing. Therefore, the participants perceived reduced pulmonary function causing physical effects, difficulty breathing, coughing with mucous and a proneness to becoming tired when performing activities with heavy exertion. In addition, colds, dust and smoke triggered more severe symptoms of the disease as in the following statements:

"This year, if I work hard, I'll get tired easily. I can't work like before and there's mucous in my throat when I cough every day. If I have a cold and my mucous is sticky or has a yellow-green color, I've noticed that I cough more until I become tired and unable to breathe fully and wheeze. I feel like my lungs are much worse than before and I have colds frequently. Today, the nurse told me that my PEFR is lower than before at 190 ml/min." (Participant 7)

Concerning the deterioration of pulmonary functions causing psychological symptoms, all of the participants reported declining pulmonary function with physical and psychological symptoms. Thus, the participants perceived lower pulmonary function causing psychological effects such as fear when having difficulty breathing and anxiety until the participants were unable to sleep, suffered hopelessness from chronic illness and fear of revulsion from others caused by symptoms of the disease as in the following statements:

"If I exert myself to do activities or go outside the house, I get easily tired by breathing. I feel irritated and unable to do much, because I'm afraid there won't be anyone to help me when I have difficulty breathing. Sometimes it gets better after I sit to rest or use my inhaler. But I have to be hospitalized when it doesn't get better. I have to take care of myself all the time. I feel hopeless because the disease is incurable. I sometimes cough until I can't sleep. If I cough, I have sticky mucous in my throat. I don't dare to eat

with my children and grandchildren. I'm afraid they won't like it when I cough and make sounds." (Participant 25)

As for dealing with degenerative of pulmonary function, the effects of COPD cause pulmonary function to be deteriorated with physical and psychological symptoms, thereby causing persons with COPD to practice self-care to reduce and prevent symptoms. All of the participants reported the effects of COPD to have caused the participants to require physical self-care as in the following statements:

"I drink warm water and honey mixed with milk every day. It helps drive out sticky mucous when I cough. I try to take care of myself because I'm afraid of becoming a burden to my children and grandchildren. I take my medications and use my inhaler every day. If I can't breathe fully, I sit down and use the emergency inhaler I carry with me and I follow the doctor's and nurses' recommendations. I've quit smoking and I do light exercise by swinging my arms and walking slowly. I breathe and blow through my mouth. I notice that I have more energy and that I don't get colds as frequently as before." (Participant 8)

Approximately half of the participants reported the effects of COPD to have caused the participants to require psychological self-care as in the following statements:

"I take care of my own mind. I try to rest by sleeping and waking early. If I have something on my mind, I talk to my wife, children and close friends, or I go to make merit and offerings at a temple near home. I don't keep it inside to stress me out and keep me from sleeping. I've observed that my symptoms are much better and I'm breathing much better without being as easily irritated as before since I have no stress and I'm resting sufficiently. Today, the nurse told me that my peak expiratory flow rate is slightly higher than the last time." (Participant 9)

4.4.6. Functional Performance

The results on functional performance and HRQOL among Thai persons with COPD are shown in Table 4.22. The FPI-SF was used to measure functional performance among Thai persons with COPD. The subscale of functional performance consists of the following six components: personal hygiene care; household maintenance; physical exercise; recreation; spiritual activities and social interactions. The levels of functional performance ranged from 1.68 to 4.00, with a

mean of 3.29 (SD = 0.43). The majority of participants had high levels of functional performance (44.20%), while slightly over two percent had rather low levels. As regards each level, the highest mean SGRQ-C score was a rather low level of functional performance (mean = 35.29, SD = 6.396), while the lowest mean SGRQ-C score was high (mean = 18.63, SD = 6.880). There were statistically significant differences between the levels of functional performance and mean SGRQ-C scores as determined by ANOVA (F = 31.563; df = 3,236; p = .000) and shown in Table 4.23.

Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, the rather low levels of functional performance among Thai persons with COPD had high perceived effects of COPD and a likelihood for poor HRQOL compared with those who had high level levels of functional performance.

Table 4.22 - Actual range, mean and SD of HRQOL on functional performance

Level of Functional Performance	**N**	**%**	**Health-related Quality of Life**			
			Min - Max	**Mean**	**SD**	**Level of HRQOL**
Rather Low	7	2.90	29 - 46	35.29	6.369	Moderate
Moderate	22	9.20	17 - 44	31.32	7.279	Moderate
Rather High	105	43.70	10 - 42	24.59	7.464	Moderate
High	106	44.20	3 - 35	18.63	6.880	High
Total	240	100.00	3 - 46	22.89	8.430	Moderate
Range = 1.68 – 4.00, $\bar{X}$ = 3.29, SD = 0.43						

Table 4.23 - ANOVA table of HRQOL and functional performance

Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F-test**	**p-value**
Between Groups	4863.720	3	1621.240	31.563	.000
Within Groups	12122.243	236	51.365		
Total	16985.962	239			

Table 4.24 shows the subscale of functional performance among Thai persons with COPD. As regards each subscale, the highest mean score on functional performance was the personal hygiene care component (mean = 3.88, SD = 0.28), while the lowest mean score on functional performance was the physical exercise component

(mean = 2.76, SD = 0.54). Each item in the components of functional performance is shown in Appendix G. Concerning the personal hygiene care component, most of the participants were able to shave their faces and apply makeup with no difficulty (92.10%), followed by washing their hair (91.70%) and performing foot care (91.70%), while approximately 75.80 percent were able to shower or bathe with no difficulty. On the household maintenance component, most of the participants were able to vacuum and sweep the floor (62.10%), carry groceries (61.30%) and water plants (60.40%) with some difficulty.

Moreover, nearly 30 percent (31.3%) of the participants' family members helped prepare meals (31.3%), mop the floor and clean the bathroom (20.80%). On the physical exercise component, most of the participants could walk up one flight of stairs or uphill (66.70%), walk around the home and neighborhood (65.40%) and perform light exercise (59.20%) with some difficulty. Nearly forty-five percent of the participants were unable to walk fast for more than 20 minutes due to shortness of breath. On the recreation component, most of the participants were able to sit outside their homes (61.30%) and read at home (60.40%) with no difficulty, while approximately 71.30 percent were able to participate in outdoor activities during vacation with some difficulty. As for the spiritual activity component, approximately half of the participants (57.10%) had visits from spiritual friends, monks and others, while approximately 55.00 percent engaged in personal reading, meditation or prayer with no difficulty. However, approximately 49.60 percent of the participants reported attending religious services and going to religious ceremonies with some difficulty. As regards the social interaction component, slightly over half of the participants had dinner or other activities at home with no difficulty (55.40%) took distant or overnight trips to visit others (52.10%) and had dinner or engaged in outdoor activities (51.2%) with some difficulty.

Table 4.24 - Possible range, actual range, mean and SD of functional performance

Functional Performance	Possible Range Min - Max	Actual Range Min - Max	Mean	SD
Personal Hygiene	1 - 4	2.40 – 4.00	3.88	0.28
Household Maintenance	1 - 4	1.00 – 4.00	3.12	0.51
Physical Exercise	1 - 4	1.25 – 4.00	2.76	0.54
Recreation	1 - 4	1.75 – 4.00	3.39	0.47
Spiritual Activities	1 – 4	1.00 – 4.00	3.34	0.64
Social Interaction	1 - 4	1.00 – 4.00	3.22	0.67
Total Score	1 - 4	1.68 – 4.00	3.29	0.43

The results on functional performance among persons with COPD in the quantitative phase were consistent with the findings on functional performance in the qualitative phase. According to the in-depth interviews in 30 persons with COPD regarding functional performance and HRQOL among persons with COPD, the findings revealed functional performance and HRQOL perceived by persons with COPD to have consistent characteristics in the two following categories: becoming weary as a result of degenerative disease and dealing with degenerative functional performance. Table 4.25 lists the categories, sub-categories and codes of gender associated with HRQOL among persons with COPD.

Table 4.25 - Categories, sub-categories and codes of functional performance associated with HRQOL

Categories	Sub-categories	Codes
Becoming weary as a result of degenerative disease	a. Experience with activity limitations	1) Inability to perform activities like before 2) Shortness of breath on exertion
	b. Emotional changes	1) Fear of dependence on others 2) Frustration
	c. Fearing go to outside the home	1) Fear of difficulty breathing when going outside the home
Dealing with degenerative functional performance	a. Self-care with regard to functional performance	1) Planning to perform activities 2) Asking for help from others 3) Continuing to exercise every day

In becoming weary as a result of degenerative disease, all of the participants perceived experience with activity limitations due to the effects of the disease that reduced functional performance when symptom severity increased, thereby causing activity limitations with a likelihood of becoming fatigued when performing activities requiring heavy exertion or when performing activities urgently. Thus, the participants were unable to perform activities normally as in the following statements:

"I can't perform activities as before. I can perform daily activities like showering, eating and dressing without getting tired. If I have to perform activities requiring a lot of force like carrying my grandchildren, digging or cutting grass, I get tired. I can't do this type of work anymore. If I walk quickly or hurry to do anything, I get tired, too. I haven't exercised as before. I'm afraid of getting tired after exercising." (Participant 24)

In terms of emotional changes, the effects of COPD reduced functional performance and caused long-term psychosocial effects, which can be summarized to have two sub-categories consisting of dependence and frustration. Twenty-one of thirty participants perceived more dependence on family members in activities when having lower functional performance, thereby causing emotional turmoil, discomfort and irritation as in the following statements:

"I feel that I'm irritable. I feel frustrated when I can't perform activities like before. I opened a convenience store at home. I immediately have difficulty breathing when lifting heavy objects, arranging things on shelves and picking objects in high places. I need my wife to help me with whatever I do. I'm a man, but I need a woman's help. My son has wanted me to stop selling at this shop for a long time now, because I get tired after I lift heavy objects to organize the store. My son complains and has me stay home. Sometimes, I feel hurt. I want to do whatever work I can by myself." (Participant 23)

"For the past 1 – 2 years, I get tired easily when I do things that take a lot of energy like cutting grass in the front lawn, or washing my car. It makes me tired easily. My wife helps me to do some of it like housework and cooking. My children take me to the hospital after they come back from work. I want to be considerate to my wife and I'm afraid of becoming a burden to my children and grandchildren, because I need other people to care for me if my symptoms get worse. So, I won't be a bigger burden on my family." (Participant 6)

On fearing go to outside the home, thirteen of thirty participants reported fear of traveling far from home or socializing due to fear of having difficulty breathing as in the following statements:

"I used to ride a bike to my friends around my house, to the temple or other events in the village. Now, I can't. I haven't gone far from home, because I'm afraid of getting tired on the way. I have to carry an inhaler with me all the time. In the past, I used to be a sponsoring host at weddings or merit-making events. I can't go to events or be a sponsoring host anymore, because I get tired when I speak for a long time, walk for a long time or stay in a place with many people. I didn't go to my granddaughter's wedding in another province last month. So, I choose to stay home. I'm afraid of going out and getting tired." (Participant 17)

In dealing with degenerative functional performance, the effects of COPD limited activities and created psychosocial effects, thereby causing persons with COPD to have proper self-care related to functional performance in living with COPD, which can be summarized in the characteristics of doing as much as persons with COPD can or asking for help from family members or surrounding people. All of the participants perceived self-care related to activity by attempting to perform activities

by themselves. The participants planned to perform activities by using labor-saving equipment. The participants performed activities as much as the participants can and performed activities slowly as in the following statements:

"I like to do things quickly. I can't do it like that now. I'll feel tired. If I exert myself in activities or if I do work in a hurry, I have to keep reminding myself to do things slowly and think first. Like with walking up the stairs. I fell twice. In the morning, I come down from my bedroom and I go up to my bedroom in the evening. I walk up the stairs slowly and breathe through my mouth like the nurse told me to, so I won't be very tired when I go up and down stairs. I've changed to watering my plants with a hose instead of using a bucket. I can work without getting tired. If I'm tired, I sit down to rest, breathe with my mouth and use the inhaler, so my symptoms improve and I can breathe conveniently." (Participant 20)

Fifteen out of thirty participants reported asking for help from family members or the people around them if the participants were unable to perform activities by themselves as in the following statements:

"I can do light housework like washing dishes and cooking, but I have my children and husband do heavy work like washing bathrooms, mopping the house and washing the car. If I do it myself, I'll have difficulty breathing immediately. My children are all grown and all of them help with housework because they don't want me to be tired. I'm lucky that my family takes care of me. If there's anything that makes me tired, I leave it for people in the house to do. I know myself which activities I can do and which ones I can't." (Participant 25)

CHAPTER 5
DISCUSSION AND RECOMMENDATIONS

This convergent parallel mixed methods study was conducted to examine the factors predicting HRQOL and explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. The quantitative phase was aimed at examining the predictors of the relationships between age, gender, nutritional status, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD by using self-reported questionnaire data. Based on the results of HRQOL scores in the quantitative phase, a sample of 30 persons with COPD was purposively selected for the qualitative phase. Concurrently, the qualitative phase was aimed at exploring a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD by using semi-structured interviews. This chapter is presented in three parts, including discussion of the research findings, conclusion of the study, strengths and limitations and research recommendations. The discussion of the findings by using previous studies and theoretical explanations are compared in terms of the quantitative and qualitative results.

5.1 Summary of Results and Findings

5.1.1 Summary of Results in the Quantitative Phase

The analysis of data in the quantitative phase provided information to answer two research questions, two research objectives and two research hypotheses. The first research question was, "What are the relationships between personal factors, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD?" The first research objective was to examine the relationships between personal factors, social support, pulmonary function, functional performance and HRQOL among Thai persons with COPD. Similarly, the first research hypothesis stated that personal factors, social support, pulmonary function and functional performance are related to HRQOL among Thai persons with COPD. Results shown that social support ($r = -0.807$, $p = .000$), nutritional status ($r = -0.771$, $p = .000$), pulmonary function ($r = -0.703$, $p = .000$) and functional performance ($r = -0.620$, $p = .000$) were significantly negatively correlated with HRQOL by using SGRQ-C scores. These results indicated

that higher levels of social support, nutritional status, pulmonary function and functional performance correlated with lower levels of SGRQ-C scores indicate lower levels of perceived effects of COPD. Therefore, higher levels of social support, nutritional status, pulmonary function and functional performance are correlated with greater HRQOL among Thai persons with COPD. In contrast, no statistically significant correlations were found between age (r = 0.099, *p* = .127) or gender (r = 0.039, *p* = .550) and HRQOL. Concerning the relationships among each factor of HRQOL, age had a significantly negative correlation with functional performance (r = -0.383, *p* = .000). Gender had a significantly negative correlation with nutritional status (r = -0.141, *p* = .029). Nutritional status had significantly positive correlations with social support (r = 0.643, *p* = .000), pulmonary function (r = 0.609, *p* = .000) and functional performance (r = 0.526, *p* = .000). Social support had significantly positive correlations with pulmonary function (r = 0.580, *p* = .000) and functional performance (r = 0.569, *p* = .000). Pulmonary function had a significantly positive correlation with functional performance (r = 0.473, *p* = .000). Therefore, hypothesis one was partially supported in terms of the causal factors of HRQOL among Thai persons with COPD.

The second research question was, "To what extent do personal factors, social support, pulmonary function and functional performance predict HRQOL among Thai persons with COPD?" The second research objective was to predict the types and strengths of the effects of personal factors, social support, pulmonary function and functional performance associated with HRQOL among Thai persons with COPD. Similarly, the second research hypothesis stated that personal factors, social support, pulmonary function and functional performance are incorporated predictors of HRQOL among Thai persons with COPD. The four steps of hierarchical stepwise multiple regression analysis found that social support (β = -0.412) was the strongest predictor for HRQOL among persons with COPD, followed by nutritional status (β = -0.320), pulmonary function (β = -0.210) and functional performance (β = -0.125) with the standardized regression coefficient β values, which account for 80.10 percent of the variance in HRQOL (*p* = .003), which is interpreted as a high level. Concerning the direct and indirect effects of causal factors of HRQOL, age had a statistically insignificant negative direct effect on HRQOL by using SGRQ-C scores (β = -.008, *p* = .800) with positive indirect effects on HRQOL through social support (β = .020, *p* =

.630), pulmonary function (β = .032, *p* = .309) and functional performance (β = .034, *p* = .251). Gender had a statistically insignificant negative direct effect on HRQOL (β = -.037, *p* = 215) and negative indirect effects on HRQOL through social support (β = -.072, *p* = .086), pulmonary function (β = -.057, *p* = .077) and functional performance (β = -.034, *p* = .263). Therefore, both of age and gender had statistically insignificant negative direct effects on HRQOL, while these variables had indirect effects on HRQOL.

Nutritional status using the FFMI had a significantly negative direct effect on HRQOL (β = -.320, *p* = .000) and significantly negative indirect effects on HRQOL through social support (β = -.779, *p* = .000), pulmonary function (β = -.436, *p* = .000) and functional performance (β = -.340, *p* = .000). Social support by using SGRQ-C scores had a significantly negative direct effect on HRQOL (β = -.412, *p* = .000) and significantly negative indirect effects on HRQOL through pulmonary function (β = -.529, *p* = .000) and functional performance (β = -.457, *p* = .000). Pulmonary function using the PEFR had a significantly negative direct effect on HRQOL (β = -.210, *p* = .000) and a significantly negative indirect effect on HRQOL through functional performance (β = -.228, *p* = .000). Functional performance using FPI-SF scores had a significantly negative direct effect on HRQOL (β = -.125, *p* = .003). Therefore, nutritional status, social support, pulmonary function and functional performance had a significantly negative direct effect and a significantly negative indirect effect on HRQOL among Thai persons with COPD. Moreover, Hypothesis 2 was partially supported in terms of the causal factors of HRQOL among Thai persons with COPD.

5.1.2 Summary of the Findings in the Qualitative Phase

The inductive content analysis in the qualitative phase yielded seven themes to provide information in response to two research questions, a research objective and a research hypothesis. The first research question, "How are personal factors, social support, pulmonary function and functional performance associated with HRQOL among Thai persons with COPD?" and the second research question, "What are the common factors associated with HRQOL among Thai persons with COPD?" The third research objective was to explore a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. Similarly, the

third research hypothesis stated that personal factors, social support, pulmonary function and functional performance can explain the relationships with HRQOL among Thai persons with COPD. The findings are shown in Appendix H. First, the participants perceived HRQOL in relation to COPD with consistency in the following four categories: all of the participants perceived experiences with physical symptoms; more than half of the participants perceived experience with psychological symptoms; half of the participants perceived social isolation and, based on the aforementioned effects, every participant reported adherence to self-care practices related to COPD as a means of reducing symptoms and preventing severe symptoms.

Second, the participants perceived age to be related and unrelated to HRQOL with consistent characteristics in that differences in age were unable to predict disease prognosis, which can be summarized in the following three sub-categories: more than half of the participants perceived the effects of COPD in adulthood, four out of thirty participants perceived effects of COPD in old age and two out of thirty participants perceived age was unrelated to the effects of COPD. Third, the participants perceived gender to be related and unrelated to HRQOL with consistent characteristics in that differences in gender were unable to predict disease prognosis, which can be summarized in the following three sub-categories: eight out of thirty participants perceived the effects of COPD in women, more than half of the participants perceived the effects of COPD in men and two out of thirty participants perceived gender was unrelated to the effects of COPD.

Fourth, the participants perceived nutritional status to be related to HRQOL with consistent characteristics in the two following categories: half of the participants reported effects of COPD causes persons to receive insufficient nutrients and from the aforementioned effects and ten out of thirty participants reported having self-care with regard to food consumption.

Fifth, all of the participants perceived social support to be correlated with living with COPD with consistent characteristics in the three following categories: social support creates encouragement among the participants; social support creates convenience; and social support helps participants receive good recommendations.

Sixth, the participants perceived pulmonary function to be related to HRQOL with consistent characteristics in the two following categories: every

participant perceived deterioration of pulmonary function and be dealing with degenerative of pulmonary function.

Seventh, the participants perceived functional performance to be related to HRQOL with consistent characteristics in the two following categories: all of the participants perceived becoming weary as a result of degenerative disease and dealing with degenerative functional performance. Therefore, Hypothesis 3 was supported in terms of the causal factors in HRQOL among Thai persons with COPD.

5.2 Integration of the Quantitative and Qualitative Results

The mixed methods research question of this study was, "To what extent and how do personal factors, social support, pulmonary function and functional performance predict HRQOL among Thai persons with COPD?" The essence of this question requires understanding about the qualitative categories in terms of ability to explain the quantitative results. The quantitative and qualitative results are jointly displayed in tables to enhance the interpretation. The side-by-side comparison was used to merge the data and comparison of the quantitative and qualitative results, which present similar and dissimilar findings within each predictive variable. These integrated findings are discussed and organized into seven variables based on the quantitative results.

5.2.1 HRQOL among Thai Persons with COPD

The first integrated finding of this study concerns HRQOL among Thai persons with COPD. The SGRQ-C was used to measure HRQOL, which consists of the following three components: symptoms, activity and psychosocial impact. The participants reported perceived effects of COPD with SGRQ-C scores. Most of the participants had moderate levels of HRQOL (65.80%), while approximately five percent had low levels. As regards each subscale, the highest mean SGRQ-C score was found in the symptom component (mean = 9.38), while the lowest mean SGRQ-C score was found in the activity component (mean = 4.97). These results indicated that higher mean SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, the symptoms component is a major perceived effect of COPD, followed by the psychosocial impact and activity components. The above findings are supported by the results of Jantiya et al. (2011) who studied HRQOL among persons with COPD in

Saraburi Province and revealed that most of the partipants had moderate levels of HRQOL. The highest HRQOL in the physical well-being component indicated that most of the participants were able to perform household maintenance, while the lowest HRQOL in body image concerns the life satisfaction component. On the other hand, Songprasert et al. (2014) studied HRQOL among persons with COPD in Nakhon Si Thammarat Province and found that most of the partipants had low levels of HRQOL, while half reported having depression. The highest HRQOL was found in the psychosocial impact component, while the lowest HRQOL was found in the activity component.

The categories of HRQOL in the qualitative findings complemented and expanded the quantitative findings as shown Table 5.1. These findings elucidated that the participants perceived living with COPD, which is consistent with the characteristics in the following four categories: experiences with physical symptoms, experiences with psychological symptoms, perceived social isolation and adherence to self-care practices related to COPD.

In terms of experiences with physical symptoms, all of the participants reported encountering symptoms of COPD, most of which were related to difficulty breathing, coughing with mucus and insufficient rest. This was consistent with the symptom component of the SGRQ-C in which the majority of the participants had dyspnea (44.20%), chronic cough (42.90%) and sputum production (39.20%) several days per week. Similarly, the findings of a study by Kessler et al. (2011) revealed that most persons with moderate to severe COPD have variability in their symptoms in which the mornings are typically the worst time of the day for ease of breathing. Moreover, the GOLD (2017) reports that the most common symptoms of COPD are dyspnea, chronic cough and chronic sputum production. Twenty-five out of thirty participants reported experience with activity limitations due to the effects of COPD. The participants were unable to perform activities as in the past and felt easily tired when performing activities requiring large amounts of energy. This was consistent with the activity component of the SGRQ-C in which most of the participants felt breathless while walking fast (98.80%), walking up one flight of stairs or uphill (70.40%) and walking slower than people of the same age (79.20%). Similarly, a study conducted in 2007 found that approximately one-third of the persons with COPD had dyspnea when doing light

housework (O'Donnell et al., 2007) and another study found that nearly 70 percent of the participants had dyspnea when walking up a flight of stairs (Witheethamsak et al., 2010).

Table 5.1 - Integration of findings on HRQOL from the quantitative and qualitative results

Subscale of HRQOL	Mean HRQOL Scores	Qualitative Categories	Quotations
Symptoms	9.38	Experiences with physical symptoms	"I feel very painful. I get dyspnea, shortness of breath, difficulty breathing and I cough until I have insomnia if I have sticky mucous." (Participant 13)
Activity	4.97		"I can't do things as before. I don't dare to do activities that need a long of energy because I'm afraid of getting tired." (Participant 9)
Psychosocial Impact	8.54	Experiences with psychological symptoms	"The symptoms of COPD are uncertain. I don't know when I'll have difficulty breathing. I'm afraid there'll be no one to help me." (Participant 17)
		Perceived social isolation	"I don't go out far from home like before because I'm afraid that I'll have difficulty breathing on the way." (Participant 26)
		Adherence to self-care practices related to COPD	"I take the medications and use the inhaler the doctor at the hospital gave me every day and I follow the nurses' recommendations." (Participant 10)

Experiences with physical symptoms cause effects on the psychosocial impact component. Most of the participants reported inability to go out of the home for entertainment (76.70%), inability to exercise safely (86.70%) and shortness of breath, which caused the participants to feel afraid and anxious (55.00%).

These findings concurred with more than half of the participants who sensed psychological effects due to uncertain symptoms, easily changing emotions, stress and anxiety. Similarly, a study by Park and Larson (2016) found that the suffering from physical symptoms tends to exacerbate over time and can result in emotional reactions to symptoms potentially leading to permanent psychological symptoms such as anxiety and depression, the most frequently cited distress symptoms in persons with COPD. Furthermore, Wahls (2012) found that dyspnea, fatigue and reduction of physical activity can lead to a loss of previous role identification and inability to earn a living with social isolation.

Adherence to self-care practices related to COPD involves both physical and psychological self-care. This is supported by the results of Srirat et al. (2014) who found Thai persons with COPD who have experienced multiple symptoms to report the most effective strategies used to relieve physical symptoms were using prescribed drugs and inhalers, effective coughing and deep breathing exercises. The most effective strategies used for relieving psychosocial symptoms were accepting fate and getting used to symptoms, receiving assistance and advice from family members and healthcare providers and practicing meditation or prayer. Therefore, Thai persons with COPD who have moderate levels of HRQOL and experience with perceived physical symptoms, psychological symptoms and social isolation require physical and psychological self-care. Nurses and healthcare teams should assess HRQOL and recommend persons with COPD to implement appropriate self-care leading to increased HRQOL.

5.2.2 Age

The second integrated finding of this study concerns the relationship between age and HRQOL among Thai persons with COPD. The participants reported the perceived effects of COPD with the levels of age and mean scores of SGRQ-C. Most of the participants were elderly persons with COPD among whom the highest mean SGRQ-C score was in middle-old age (mean = 23.93). Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, elderly persons with COPD have higher levels of perceived effects of COPD and a likelihood for poor HRQOL compared to other adults with COPD. This is supported by the results of the American Thoracic Society, which reported that the aging process brings about a

decrease in lung elasticity, a progressive condition of the stiffness of the chest wall and a decrease in respiratory muscle strength, thereby causing chronic lung disease (Eisner et al., 2010). Similarly, the impact of increasing age among elderly persons with COPD involves sleep troubles, dyspnea and loss of muscle mass resulting in declining functional performance and HRQOL (Incalzi et al., 2014).

These quantitative results found that a correlational analysis identified no significant correlations between age and HRQOL (r = 0.099, p = .127), but age had a significantly negative correlation with functional performance (r = -0.383, p = .000). Moreover, age could not predict HRQOL among Thai persons with COPD, thereby indicating that age had a statistically insignificant negative direct effect on HRQOL by using SGRQ-C scores (β = -.008, p = .800) while it had positive indirect effects on HRQOL through social support (β = .020, p = .630), pulmonary function (β = .032, p = .309) and functional performance (β = .034, p = .251). In contrast, Corlateanu et al. (2016) found that both the elderly age group and the adult age group have a significantly positive correlation with HRQOL among persons with COPD in Greece. In addition, elderly persons with COPD experience deteriorating psychosocial aspects of life and a decline in functional performance. In Thailand, Boonreung et al. (2017) showed that poor HRQOL and higher depression among persons with COPD were predictors of severe acute exacerbation (AE). None of the personal factors (age, gender, education, income and smoking habits) were predictors of severe AE.

These results differed from the qualitative findings which revealed the participants to perceive differences in age as unable to predict disease prognosis. The qualitative findings complemented and expanded the quantitative findings as shown Table 5.2. Most of the participants explained that older adults have more effects from COPD than younger adults due to more negative changes in pulmonary function and symptoms. The age factor was found significant in the study of Hanania et al. (2010) which revealed that persons with COPD in the United States appeared to have greater prevalence among persons aged 65 and over compared to those aged 40 years old and over. In contrast, four out of thirty participants reported younger adults to have more effects from COPD than the elderly because younger adults have responsibilities as family leaders who take care of family expenses, thereby causing adults to be unable to work like before. Martinez et al. (2016) found that younger persons with COPD

showed a significantly lower level of HRQOL compared to older persons with COPD as a result of perception on dyspnea, which is experienced differently among age groups. Older persons with COPD feel lower levels of dyspnea, because they have tolerance and adaptation after the long-term effects of COPD.

Table 5.2 - Integration of the findings on age and HRQOL from quantitative and qualitative results

Age Group (years)	Mean HRQOL Score	Qualitative Sub-categories	Quotations
40 - 59	21.36	Effects of COPD in adulthood	"My life is much worse. I can't work like before. I get tired easily when I do hard work. I had to move to work at a lighter department, so I have less income." (Participant 21)
60 - 69	22.28	Effects of COPD in old age	"The Older persons with COPD are many effects and it's difficult to treat because their bodies are old. Even though my mind fights, my body won't." (Participant 19)
70 - 79	23.92		
More than 79	23.81		
		Age unrelated to effects of COPD	"It shouldn't be related to age. It's probably more related to self-care. I take medications and use the inhaler every day. My symptoms are much better than younger patients who don't take care of themselves." (Participant 8)

Two out of thirty participants reported age to be unrelated to the effects of COPD. However, HRQOL was found to be correlated with consistent physical and psychological self-care causing symptoms of COPD to improve to a remissive stage. These results are in agreement with the findings of Ekici, Bulcun, Karakoc, Senturk and Ekici (2015) who found that age is not correlated with HRQOL among persons with COPD. Both exercise behavior and behaviors to prevention exacerbation are positively correlated with good levels of HRQOL among Thai persons with COPD

(Phuwilai et al., 2012). However, the results of the quantitative phase indicated that age had an insignificant negative direct effect and positive indirect effect on HRQOL. Therefore, the findings of the qualitative data provided some suggested potential explanations for the novel findings on age group and HRQOL among Thai persons with COPD. Therefore, nurse and healthcare team can become more aware of age group and need to be considered when planning appropriate care to increase HRQOL among Thai persons with COPD.

5.2.3 Gender

The third integrated finding of this study concerns the correlation between gender and HRQOL among Thai persons with COPD. The participants reported the perceived effects of COPD to be correlated with gender and mean SGRQ-C scores. Most of the participants were males (85%) and 15 percent were females. The highest mean SGRQ-C scores were found in females (mean = 23.69), followed by males (mean = 22.75). Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, women with COPD with higher levels of perceived effects of COPD and were more likely to have poor HRQOL than men. This is supported by the findings of Wangsom (2010) who found that most persons with COPD were males. However, gender differences among persons with COPD involving nutritional status, pulmonary function, functional performance and HRQOL are often worse in women when compared with men (Ferrari et al., 2010; Odencrants, Bjuström, Wiklund & Blomberg, 2013; Van Haren-Willems & Heijdra, 2010).

The quantitative results found a correlational analysis to have identified no significant correlation between gender and HRQOL ($r = 0.039$, $p = .550$), but gender had a significantly negative correlation with nutritional status ($r = -.141$, $p = .029$). This study expressed the categorical variable of gender as "0" for men with COPD and "1" for women with COPD. The results indicated that nutritional status was worse among women when compared with men. Moreover, gender could not predict HRQOL among Thai persons with COPD, which means gender had a statistically insignificant negative direct effect on HRQOL by using SGRQ-C scores ($\beta = -.037$, $p = .215$), while it had negative indirect effects on HRQOL through social support ($\beta = -.072$, $p = .086$), pulmonary function ($\beta = -.057$, $p = .077$) and functional performance ($\beta = -.034$, $p = .263$). However, Ferrari et al. (2010) found that nutritional status and

functional performance were lower in women than men, which led to HRQOL in women being poorer than in men with COPD.

Table 5.3 - Integration of the findings on gender and HRQOL based on the quantitative and qualitative results

Gender	Mean HRQOL Scores	Qualitative Sub-Categories	Quotations
Male	22.75	Effects of COPD in men	"Most men smoke. So, I think men's lungs are worse and men have more severe symptoms than women." (Participant 21)
Female	23.69	Effects of COPD in women	"Women have more symptoms like difficulty breathing, coughing with mucus and being easily tired when performing activities." (Participant 24)
		Gender unrelated to the effects of COPD	"It shouldn't be related to women or men. It's probably because I always take care of myself." (Participant 8)

These results differed from the qualitative findings revealing the participants to perceive the differences in gender aspect to be unable to predict disease prognosis. The qualitative findings complemented and expanded the quantitative findings as shown in Table 5.3. Eight out of thirty participants explained that women have more effects from COPD than men due to multiple concurrent symptoms of disease including difficulty breathing and coughing leading to anxiety. Therefore, women have more effects of COPD than men. Similarly, a study by De Torres et al. (2007) found that men and women with COPD have different coping mechanisms. Women with COPD express more dyspnea than men, despite the same degree of airway obstruction. One study suggested that non- respiratory factors such as anxiety, depression or coping mechanisms probably play an important role in the perception of HRQOL in women (Wahls, 2012).

In contrast, most of the participants reported perceiving cigarettes as a cause of COPD and loss of pulmonary function. The participants and most men had smoking behaviors with family duties and responsibilities causing the symptoms of the

disease to be more severe with more effects in men than in women. Previous studies have revealed that gender is associated with HRQOL with more significant impact in men than in women. Acute exacerbation is more frequent in men (Kuwalairat et al., 2017; Pothirat et al., 2017). However, the findings of this study differed from those of several studies showing that HRQOL is different in women compared with men where chronic sputum is associated with HRQOL in women, but not men, thereby resulting in the HRQOL of women being poorer than that of men with COPD (GOLD, 2017; Raherison et al., 2014; Wahls, 2012).

Two out of thirty participants reported gender to be unrelated to the effects of COPD. However, HRQOL was found to be correlated with consistent physical and psychological self-care requirements, which caused the symptoms of COPD to improve to a remissive stage. This result was similar to the findings of the study of Roche et al. (2014) who found that women with COPD express more anxiety than men, despite the fact that levels of HRQOL and exacerbation are not significantly different between men and women. The above findings also agree with those of a study by Ahmed et al. (2016) who showed that gender was not associated with HRQOL, while an increase in smoking index and low socioeconomic status were found to be associated with HRQOL among Indians with COPD. Similarly, Sharma and Joshi (2015) showed that gender was not associated with HRQOL, despite the fact that knowledge about COPD and absence of hospital admission were associated with HRQOL among Nepalese persons with COPD.

However, the results of the quantitative phase indicated that gender had an insignificant negative direct effect and a negative indirect effect on HRQOL, while the findings of the qualitative data provide associations and potential explanations for extensive knowledge of gender and HRQOL among Thai persons with COPD. Hence, nurses and healthcare teams can become more aware of gender, which needs to be considered when planning appropriate care to increase HRQOL among Thai persons with COPD.

5.2.4 Nutritional Status

The fourth integrated finding of this study concerns the relationship between nutritional status and HRQOL among Thai persons with COPD. The participants reported the perceived effects of COPD with the ratios of FFMI and mean

SGRQ-C scores. Most of the participants (67.50 %) had normal levels of nutritional status, while slightly more than 17 percent had cachexia. The highest mean SGRQ-C score was at the level of cachexia (mean = 31.75), while the lowest mean SGRQ-C score was at a normal level. Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, malnutrition among persons with COPD is correlated with high perceived effects of COPD and poor HRQOL. Similarly, a normal level of nutritional status in the participants indicated high levels of HRQOL. This is supported by the results of Chaudhary et al. (2015) who showed that persons with severe to very severe COPD had malnutrition and significant decreases in mean FFMI, BMI, SGA and MNA levels were observed with increasing severity of COPD. Dyspnea among persons with COPD interferes with eating and the work of breathing leads to energy depletion and subsequent changes in body composition, loss of skeletal muscle mass and weight loss due to malnutrition (Hinkle & Cheever, 2014).

The quantitative results found that a correlational analysis identified nutritional status as having a significantly negative correlation with HRQOL by using SGRQ-C scores (r = -.771, p = .000), while higher levels of nutritional status indicate lower levels of perceived effects of COPD and leading to better HRQOL among Thai persons with COPD. Nutritional status had significantly positive correlations with social support (r = .643, p = .000), pulmonary function (r = .609, p = .000) and functional performance (r = .526, p = .000), respectively. Moreover, nutritional status effectively predicted HRQOL, which had a significantly negative direct effect on HRQOL by using SGRQ-C scores (β = -0.320, p = .000) and significantly negative indirect effects on HRQOL through social support (β = -.779, p = .000), pulmonary function (β = -.436, p = .000) and functional performance (β = -.340, p = .000). These results correspond with the findings of Sehgal et al. (2017) who showed that malnutrition and loss of muscle mass can cause a decrease in respiratory muscle function, a decline of functional performance, an increase in the level of dyspnea, a decrease in the performance of pulmonary function and poor HRQOL among persons with COPD. Similar results from several studies revealed that nutritional status by using FFMI values which were significantly correlated with pulmonary function, dyspnea severity and HRQOL among persons with COPD. (Luo et al., 2016; Pothirat et al., 2016;

Sehgal et al., 2017). Moreover, malnutrition is a significant health problem for persons with COPD in developing countries.

The qualitative findings showed the participants to have perception consistent with quantitative results, which revealed nutritional status to be related to HRQOL among persons with COPD. The qualitative findings complemented and expanded the quantitative findings as shown Table 5.4.

Table 5.4 - Integration of the findings on nutritional status and HRQOL from the quantitative and qualitative results

Nutritional Status	**Mean HRQOL Scores**	**Qualitative Categories**	**Quotations**
Normal	19.12		
Semi-starvation	24.60	Effects of COPD causes persons to receive insufficient nutrients	"When I cough frequently, I get a lot of mucous in my throat. I sometimes cough until I choke. So, I eat less and my weight has gradually dropped." (Participant 19)
Muscle Atrophy	29.61		
Cachexia	32.24		
		Self-care with regard to food consumption	"I followed the nurses' recommendations. I ate a little at a time, but I ate frequently. I eat five meals a day and I eat only healthy foods. That lets me eat more." (Participant 26)

Approximately half of the participants provided data indicating that the effects of COPD cause persons to receive insufficient nutrients, perceived low dietary intake due to coughs with mucus, abdominal discomfort, weight loss and normal food consumption without weight gain or with weight loss on some occasions. Concurrently, the participants explained that receiving insufficient nutrients caused symptoms to become more severe. When the participants perceived lower weight, the participants had weakness, were easily exhausted when performing activities and

perceived more frequent illnesses. This finding is supported by the results of Nguyen et al. (2019) who found that approximately half of the participants had mild or moderate malnutrition, whereby lack of social support and inadequate dietary intake are the commonly cited reasons for malnutrition. Moreover, malnutrition is a major risk factor for declining functional performance and poor HRQOL among persons with COPD. Most elderly persons with COPD and living alone show loss of FFMI due to inadequate dietary intake and decline of muscle strength (Rawal & Yadav, 2015).

Concerning the aforementioned effects, ten out of thirty participants reported having more self-care with regard to food consumption by eating small amounts of healthy food frequently and avoiding foods that cause symptom exacerbations. The findings also corresponded with the study of Pattarakantakul and Donlao (2017) who found that a nutritional promotion program consisting of primarily high calorie intake had increased ratios of BMI, serum protein, serum albumin and HRQOL among Thai persons with COPD. Similarly, Rawal and Yadav (2015) reported that nutritional supplement therapy among persons with COPD is as follows: high-fat and low carbohydrate diet, fruits and vegetables, omega-3 polyunsaturated fatty acids, Vitamins D and C. The above therapy is not only effective for maintaining malnutrition, but is also beneficial in improvement of pulmonary function, prevention of acute exacerbation, increased muscle strength and exercise tolerance leading to enhancing functional performance and HRQOL among persons with COPD. Therefore, nutritional status is a significant predictor of HRQOL that has a significantly negative direct effect and a significantly negative indirect effect on HRQOL by using SGRQ-C scores. The findings of qualitative data indicate that the effects of COPD caused insufficient nutrients among Thai persons with COPD. Thus, people in this group require more awareness of self-care regarding food consumption. Nurses and healthcare teams can recommend appropriate self-care practices leading to improved HRQOL.

5.2.5 Social Support

The fifth finding of this study concerns the relationship between social support and HRQOL among Thai persons with COPD. The MSPSS was used to measure social support among Thai persons with COPD, which consists of the following three components: family members, friends and healthcare providers. The participants reported the perceived effects of COPD with mean scores of MSPSS and

mean SGRQ-C scores. Most of the participants had high (59.20%) and moderate (40.8%) levels of social support. The highest mean SGRQ-C score was a moderate level of social support (mean = 30.06) and the lowest mean SGRQ-C score was a high level. Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, a moderate level of social support among Thai persons with COPD who had high perceived effects of COPD was likely to result in poor HRQOL compared with high levels of social support. Similarly, most persons with moderate to very severe COPD need the help of a caregiver to accomplish daily tasks they can no longer manage alone due to dyspnea intensity with exertion (O'Donnell et al., 2007).

The quantitative results found that a correlational analysis identified social support as being negatively correlated with HRQOL by using SGRQ-C scores ($r = -.807$, $p = .000$) in which higher levels of social support indicate lower levels of perceived effects of COPD resulting in greater HRQOL among Thai persons with COPD. Social support had significantly positive correlations with pulmonary function ($r = .580$, $p = .000$) and functional performance ($r = .569$, $p = .000$). Moreover, social support effectively predicted HRQOL, which had a significantly negative direct effect on HRQOL by using SGRQ-C scores ($\beta = -.412$, $p = .000$) and significantly negative indirect effects on HRQOL through pulmonary function ($\beta = -.529$, $p = .000$) and functional performance ($\beta = -.457$, $p = .000$). This is supported by the findings of a study by Barton et al. (2015) who found social support, family support and social networks to be associated with improved dyspnea management among persons with COPD. Similarly, Naklamai et al. (2011) revealed that social support and uncertainly in illness are correlated with HRQOL among Thai persons with COPD. Moreover, Lenferink et al. (2018) found that the role of social support among persons with COPD involved self-management interventions including group meetings, partner involvement and case manager support, all of which can increase perceived social support. Consequently, social support was positively correlated with fewer AEs, reduced hospitalizations and increased HRQOL among persons with COPD.

As regards each subscale of social support, the highest mean MSPSS score was found in support from family members (mean = 19.74), followed by the healthcare provider (mean = 17.59) and friend components (mean = 14.74). The qualitative findings showed the participants to have perceptions consistent with

quantitative results, which revealed social support to be correlated with HRQOL among persons with COPD. The qualitative findings complemented and expanded upon the quantitative findings as shown in Table 5.5.

Table 5.5 - Integration of findings on social support and HRQOL from the quantitative and qualitative results

Subscale of Social Support	Mean Social Support Score	Qualitative Categories	Quotations
Family Members	19.74	Social support creates convenience	"I have my children and husband to help me with heavy housework like mopping bathrooms and floors." (Participant 25)
Friends	14.74	Social support creates encouragement	"My children, husband and close friends listen to my problems and give me good advice. The doctors and nurses are nice. It gives me courage to live with this disease." (Participant 3)
Healthcare Providers	17.59	Social support helped participants to receive good recommendations	"The doctor and nurses recommended that I quit smoking. Now, I've quit smoking completely. My symptoms are much better." (Participant 28)

The findings concurred with most of the participants in the qualitative phase, who reported receiving the most support from family members, followed by support from healthcare providers, friends or neighbors. Chronic illness with COPD has physical and psychosocial effects. More than half of the participants reported having less psychological security and perceiving concern, encouragement, rest, listening to problems and consolation, thereby giving the participants more spirit to live with the disease. Furthermore, persons with COPD had discomfort in living and lacked readiness to prepare basic necessary equipment. More than half of the participants perceived receiving care, attention, assistance with housework, preparation of

necessary items, responsibility for expenses, medication preparations and preparations to take the participants to the hospital, thereby creating convenience and safety in living. Similarly, DiNicola et al. (2013) discussed the contribution of perceived social support to the anxiety of persons with COPD. The results showed that the following five components were rated as strong predictors of anxiety in persons with COPD: instrumental support, emotional support, companionship, failure to provide needed help and unsympathetic or insensitive behavior. Similarly, Gardener et al. (2018) showed that support needs among persons with COPD are correlated with three categories. First, physical support needs include: 1) understanding about COPD; 2) managing symptoms and medications and 3) healthy lifestyles. Second, psychological and emotional support needs include 1) managing feelings and anxiety; 2) living positively with COPD; 3) thinking about the future and 4) anxiety and depression. Third, social support needs include 1) practical support; 2) finance, working and housing; 3) social and recreational life; 4) navigating services; 5) maintaining independence and 6) families and close relationships.

Persons with COPD require greater awareness of self-care to reduce symptoms and prevent disease severity. Self-care recommendations from social support are able to control symptoms into remission. All of the participants perceived receiving accurate recommendations about taking medications, using inhalers, eating, exercising, quitting smoking, breathing and coughing effectively and avoiding exacerbation triggers. This caused the participants to breathe more conveniently and have no need to go to the hospital before appointment dates. Chen et al. (2017) showed that living with others and having social support were positively correlated with physical activity. This study recommended that healthcare providers apply social support into interventions, which can facilitate appropriate care for persons with COPD. Similarly, Wangsom (2010) found that a dyspnea management program and family support on dyspnea on HRQOL among persons with COPD. This intervention program focused on family support, including emotional support, appraisal support, information support and instrumental support over four weeks. The results revealed that the interventions were effective in helping reduce dyspnea and enhancing HRQOL among Thai persons with COPD.

Therefore, social support was effective in predicting HRQOL, which involved significantly negative direct effects and significantly negative indirect effects on HRQOL by using SGRQ-C scores. The findings of the qualitative data indicated that support from family members, friends and healthcare providers created encouragement, convenience and receipt of good recommendations. These findings were consistent with the social support theory. House (1981) defined social support as an individual's perception of the patterns of social relationships potentially increasing health-related quality of life consisting of the following four patterns: emotional support, instrumental support, informational support and appraisal support. Hence, appropriate holistic care by using the collaboration of multidisciplinary teams can lead to increased HRQOL among Thai persons with COPD.

5.2.6. Pulmonary Function

The sixth integrated finding of this study concerns the relationship between pulmonary function and HRQOL among Thai persons with COPD. The participants reported the perceived effects of COPD with the ratios of PEFR and mean SGRQ-C scores. Approximately half of the participants (54.20%) were classified with moderate stages of the disease, while slightly more two percent had very severe stages of the disease. The highest mean SGRQ-C score was a very severe stage of the disease (mean = 34.20), while the lowest mean SGRQ-C score was a mild stage. Higher SGRQ-C scores indicate higher levels of perceived effects of COPD. Therefore, persons with very severe COPD had high perceived effects of COPD and poor HRQOL. Similarly, persons with mild COPD had high levels of HRQOL. This is supported by the findings of Cukic et al. (2013) who found that airflow limitations among persons with COPD are progressive, involving both the FVC and FEV_1 values and showing a significant decrease during a follow-up period of four years. In Thailand, Boonreung et al. (2017) found that most participants were classified with moderate stages of COPD with mean FEV_1/FVC values of 56.47 percent in which pulmonary function significantly predicted severe AE.

The quantitative results found that a correlational analysis identified pulmonary function as having a significantly negative correlation with HRQOL ($r = -.703$, $p = .000$) in which higher levels of pulmonary function indicate lower levels of perceived effects of COPD leading to improved HRQOL among Thai persons with

COPD. Pulmonary function had a significantly positive correlation with functional performance (r = .473, *p* = .000). Moreover, pulmonary function effectively predicted HRQOL, which had a significantly negative direct effect on HRQOL by using SGRQ-C scores (β = -.210, *p* = .000) and a significantly negative indirect effect on HRQOL through functional performance (β = -.228, *p* = .000). These results correspond with the findings of Justine et al. (2013) who showed that dyspnea was a key factor in predicting HRQOL among persons with COPD. However, pulmonary function was poorly correlated with PHCS and had no correlation with the MHCS. This implies that changes in pulmonary function may affect HRQOL among persons with COPD. In Thailand, Witheethamsak & Duangpaeng (2017) found that most persons with COPD in Chonburi Province were classified with moderate stages of COPD with a mean PEFR-predicted value of 66.67 percent. Pulmonary function, health status perception and self-efficacy were positively correlated with functional performance among persons with COPD.

Table 5.6 - Integration of the findings on pulmonary function and HRQOL based on the quantitative and qualitative results

Level of Pulmonary Function	**Mean HRQOL Score**	**Qualitative Categories**	**Quotations**
Mild	12.36		
Moderate	19.45		"If I have a cold and sticky mucous, I'd cough until I get tired. I'd be unable to breathe fully and I'd wheeze." (Participant 27)
Severe	28.80	Deterioration of pulmonary function	"I feel irritable. I don't dare to do much because I'm afraid of difficulty breathing. I need to be careful with myself all the time. I feel hopeless because this disease is incurable." (Participant 29)
Very Severe	34.20	Dealing with degenerative pulmonary function	"I drink warm water and water mixed with lime every day. It helps me to cough sticky mucous out. I try to take care of myself. I take medications and use the inhaler every day." (Participant 8)

The qualitative findings showed the participants to have consistent perceptions with the quantitative results, which revealed pulmonary function to be correlated with HRQOL among persons with COPD. The qualitative findings complemented and expanded upon the quantitative findings as shown in Table 5.6.

All of the participants reported that this disease occurred in the lungs, causing the lungs to be deteriorated. Thus, the participants perceived deterioration of pulmonary function to have caused physical symptoms resulting in difficulty breathing, coughing with mucus, becoming easily fatigued when performing activities requiring large amounts of energy. In addition, coughs, dust and smoke triggered symptoms to become more severe. Furthermore, deterioration of pulmonary function causes psychological

symptoms. The participants perceived fear when having difficulty breathing, anxiety to the point that the participants were unable to sleep, hopelessness from chronic illness and fear of revulsion from others caused by symptoms of COPD. The pathophysiology of COPD involving both airflow obstruction and parenchymal destruction can lead to airflow limitations, thereby decreasing lung compliance and causing hyperinflation. This mechanism leads to increases in the elastic and threshold loads on the inspiratory muscles increasing the work of breathing and resulting in respiration difficulty with long-term effects on fatigue, sleep alteration, pain, emotional reactions, memory function decline and respiratory muscle weakness (GOLD, 2017; Srirat et al., 2014). The above finding also corresponds with the findings of a study by Justine et al. (2013) who found dyspnea to be a key factor in predicting HRQOL among persons with COPD.

According to the aforementioned findings, every participant reported self-care with regard to pulmonary function for dealing with degenerative pulmonary function, symptoms alleviation and prevention. Interestingly, Ngoenthae, Arpanantikul and Duangbubpha (2017) conducted a study to identify the activities performed among Thai persons with COPD exacerbation as a part of their self-care experiences. The results showed the self-care experience involving both the exacerbation and remission periods to be as follows: first, the most useful methods of the exacerbation period were making minimum body movement, managing dyspnea, reducing airway obstruction and receiving assistance and advice from family members and others. Second, the most useful methods during the remission period were preventing aggravation of dyspnea by using prescribed drugs and inhalers, avoiding exposure to allergic substances and performing daily activities as usual.

Therefore, pulmonary function was a significant predictor of HRQOL, which involved significantly negative direct effects and significantly negative indirect effects on HRQOL by using SGRQ-C scores. The findings of the qualitative data indicate that deterioration of pulmonary function causes physical and psychological symptoms among Thai persons with COPD. Thus, people in this group require more awareness of self-care with regard to pulmonary function leading to practice of self-care to reduce and prevent symptoms. Nurses and healthcare teams can develop appropriate care and recommendations for self-care leading to improved HRQOL.

5.2.7 Functional Performance

The seventh finding of this study concerns the relationship between functional performance and HRQOL among Thai persons with COPD. The FPI-SF was used to measure functional performance, which consists of the following six components: personal hygiene care, household maintenance, physical exercise, recreation, spiritual activities and social interaction. The participants reported the perceived effects of COPD with functional performance and mean SGRQ-C scores. Most of the participants (44.20%) had high levels of functional performance, while slightly more than two percent had rather low levels. The highest mean SGRQ-C score indicated a rather low level of functional performance (mean = 35.29), while the lowest mean SGRQ-C score was at a high level. Higher SGRQ-C scores indicated higher levels of perceived effects of COPD. Therefore, the rather low level of functional performance in persons with COPD who had high perceived effects of COPD is likely to result in poor HRQOL. Similarly, dyspnea is one of the most frequent disorders that can affect the physical health in a way that requires additional energy in breathing, which can impede the persons with COPD from participating in many activities in their daily lives (Leidy & Knebel, 2012; O'Donnell et al., 2007). Consequently, most Thai persons with COPD have a rather high level of functional performance (Witheethamsak et al., 2010).

The quantitative results found that a correlational analysis identified functional performance as being negatively correlated with HRQOL by using SGRQ-C scores ($r = -.620$, $p = .000$) in which higher levels of functional performance indicate lower levels of perceived effects of COPD leading to greater HRQOL among Thai persons with COPD. Moreover, functional performance effectively predicted HRQOL, which had a significantly negative direct effect on HRQOL ($\beta = -.125$, $p = .003$). Interestingly, the difficulties in performing these activities restrict interactions with the environment, thereby leading to a tendency for a decrease in spiritual activity and poor HRQOL among persons with COPD (Leidy & Knebel, 2012). Multiple factors contributing to functional performance among persons with COPD are as follows: 1) physiological factors include severity of disease, body composition and pulmonary function; 2) physical symptom cluster include dyspnea, fatigue and insomnia; 3) psychological symptom cluster involving both anxiety and depression; 4) psychological

factors involving both self-efficacy and health perception; 5) situational factors involving both social support and regimen adherence and 6) socio-demographic factors including age, gender, education level, marital status and socioeconomic status (Gimeno-Santos et al., 2017, Intarasorn & Jitpanya, 2016; Wongderm & Duangpaeng, 2014). Most previous studies have shown that a slow decline in functional performance is associated with a drop in functional capacity and increased body fat, which is correlated with HRQOL among persons with COPD (Kapella et al., 2011; Prakash, Puri, Kumar, Malik & Behera, 2014; Santos et al., 2014).

The qualitative findings showed the participants to have perceptions that were consistent with the quantitative results, which found functional performance to be correlated with HRQOL among persons with COPD. The qualitative findings complemented and expanded upon the quantitative findings as shown Table 5.7.

All of the participants perceived becoming weary as a result of degenerative disease when symptoms increased in severity to have reduced functional performance, thereby causing activity limitations and a likelihood to become easily fatigued when performing energetic activities or performing activities urgently. This prevented the participants from performing activities as in the past.

Table 5.7 - Integration of findings on functional performance and HRQOL from the quantitative and qualitative results

Subscale of Functional Performance	Mean score of Functional Performance	Qualitative Categories	Quotations
Personal Hygiene	3.88		
Household Maintenance	3.12		"I wasn't able to do activities like before. If I have to do something that takes a lot of energy, I will have symptoms of fatigue and be unable to breathe fully immediately." (Participant 24)
Physical Exercise	2.76	Becoming weary as a result of degenerative disease	
Recreation	3.39		"I feel myself becoming irritable and uncomfortable when I am not able to perform activities normally. I get difficulty breathing immediately when I lift heavy objects and reach to pick up an object in a high place." (Participant 23)
Spiritual Activities	3.34		
Social Interactions	3.22		
		Dealing with degenerating functional performance	"I have to remind myself to do activities slowly and think before I do activities. For example, I walk upstairs slowly and breathe through my mouth." (Participant 20)

The results from the subscales of the FPI-SF revealed that the highest mean score for functional performance was the personal hygiene care component (mean = 3.88), while the lowest mean score for functional performance was the physical exercise component (mean = 2.76). Most of the participants had walked up one flight of stairs or uphill (66.70%), walked around the home and neighborhood (65.40%) and performed light exercise (59.20%) with some difficulty. These results correspond with the findings of a study by Leidy and Knebel (2012) who reported that personal hygiene activities were given top priority, while physical exercise and spiritual activities were

given the lowest priority in Americans with COPD. Most participants described the physical exercise in the form of activities such as running, moving and lifting weights in which they had difficulty with performance due to dyspnea. In Thailand, Witheethamsak et al. (2010) showed that symptom clusters have a negative correlation with functional performance whereby the physical symptom cluster was the most influential factor for predicting functional performance among persons with COPD.

When the effects of COPD reduced functional performance and caused long-term psychosocial symptoms, the participants perceived more dependence on family members in performing activities. The participants had a sense of being a burden on the family with emotional turmoil, discomfort and irritability. Approximately half of the participants reported fearing to travel far from home or socializing due to fear of difficulty breathing. This is supported by the results of Wahls (2012) who found that reduction of physical activity can lead to a loss of previous role identification, an inability to earn a living and social isolation. This problem can have considerable impacts on families and caregivers as many persons with COPD require significant care which may affect families and other types of relationships (Gardiner et al., 2010; Kwon & Kim, 2016).

The aforementioned effects caused persons with COPD to have appropriate self-care in living with COPD and dealing with degenerating functional performance. All of the participants reported performing self-care in daily activities by performing activities themselves, planning to perform activities by using labor-saving equipment, doing activities as the participants were able to and doing activities slowly. Approximately half of the participants reported asking for support from family members or surrounding people if the participants were unable to perform activities by themselves. Bailey et al. (2012) discussed how to lower the performance of physical activity during the exhalation phase of respiration, which is believed to reduce the respiratory rate and prolong the duration of exhalation leading to a decrease in dyspnea. The findings also correspond with the findings of a study by Ngoenthae et al. (2017) who discussed the self-care activities most frequently used by Thai persons with COPD. These include preventing aggravation of dyspnea by using prescribed drugs and inhalers, avoiding exposure to allergic substances and performing daily activities as usual.

Therefore, functional performance was a significant predictor of HRQOL in which the effects of COPD caused activity limitations and created psychosocial impacts among Thai persons with COPD. Thus, the participants had proper self-care with regard to functional performance in living with COPD. Nurses and healthcare teams can offer specific care and guidance in self-care that can lead to increased HRQOL.

5.3 Conclusion

COPD is a major cause of morbidity and mortality worldwide. The symptom clusters of the disease can also have long-term effects on HRQOL among persons with COPD. Therefore, HRQOL is an important consideration for persons living with COPD. This convergent parallel mixed methods study was aimed at examining the factors predicting HRQOL and exploring a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. The research framework was a revised version of Wilson and Cleary's health-related quality of life and an integrative literature review. The simple random sampling consisted of 240 participants who were Thai persons with COPD coming for follow-up in the chest clinics at the outpatient departments of hospitals in Health Region 4 of Thailand from August to December 2018. The research instruments were self-reported questionnaires consisting of the following six parts: 1) a demographic data form for persons with COPD; 2) the SGRQ-C for investigating HRQOL; 3) the FFMI for measuring nutritional status; 4) the MSPSS for measuring social support in persons with COPD; 5) the PEFR for measuring pulmonary function and 6) the FPI-SF for measuring functional performance. Concurrently, purposive sampling produced 30 participants with different levels of SGRQ-C scores from qualitative interviews using a semi-structured interview format.

With regard to monitoring the quality of the three instruments used in this study (SGRQ-C, MSPSS and FPI- SF), the instruments were examined for content validity by five experts. Reliability was tested in 30 persons with COPD whose characteristics were similar to the research participants. Cronbach's alpha coefficient values were 0.914 (SGRQ-C), 0.870 (MSPSS) and 0.928 (FPI- SF). Similarly, the questions in the semi-structured interview guide were evaluated and revised based on

the suggestions of the experts. Next, the semi-structured interview questions were tested before use in three persons with COPD whose characteristics were similar to those of the research participants. Moreover, the trustworthiness of the qualitative phase was based on Lincoln and Guba's (1985) work for ensuring rigor in the research process. The researcher built credibility by spending a long time with the participants and member checking, triangulation of methods and transcribing the data by herself. The researcher built dependability by evaluation of the research process with qualitative research experts and dissertation committee audit. The researcher built confirmability by an audit of the research process; the findings were based on participants' responses and not researcher bias. The researcher established transferability by providing a detailed description of the findings that can be used as an important guideline for healthcare professionals and other researchers in areas related to COPD.

Quantitative data were collected and analyzed by the computer software Statistical Package for the Social Sciences (SPSS) for Windows. The demographic data form, each item of the SGRQ-C, the MSPSS and the FPI- SF were analyzed by descriptive statistics. The relationships among age, gender, nutritional status, social support, pulmonary function and functional performance were analyzed by using Pearson's product-moment correlation coefficient. Hierarchical stepwise multiple regression analysis was also applied to examine the factors predicting HRQOL among Thai persons with COPD. The qualitative data were analyzed by the computer software ATLAS.ti for Windows by using content analysis. A side-by-side joint display was used to merge data and comparison results from the quantitative and qualitative phases, which presented both similarities and dissimilarities within each predictor variable.

The results of the study indicated that the majority of the participants (65.68%) had moderate levels of HRQOL associated with experiences with physical and psychological symptoms, perceived social isolation and adherence to self-care practices related to COPD. The first research hypothesis shown that social support, nutritional status, pulmonary function and functional performance were significantly negatively correlated with HRQOL by using SGRQ-C scores. In contrast, no statistically significant correlations were found between age, gender and HRQOL. Concerning the relationships among each factor of HRQOL, age had a significantly negative correlation with functional performance. Gender had a significantly negative

correlation with nutritional status. Nutritional status had significantly positive correlations with social support, pulmonary function and functional performance. Social support had significantly positive correlations with pulmonary function and functional performance. Pulmonary function had a significantly positive correlation with functional performance. Therefore, Hypothesis 1 was partially supported in terms of the causal factors in HRQOL among Thai persons with COPD.

In the second research hypothesis, four steps of hierarchical stepwise multiple regression analysis found that social support was the strongest predictor of HRQOL among persons with COPD, followed by nutritional status, pulmonary function and functional performance with the standardized regression coefficient β values, which accounts for 80.10 percent of the variance in HRQOL, which is interpreted as a high level. Concerning the direct and indirect effects of the causal factors of HRQOL, age was statistically insignificant with a negative direct effect on HRQOL by using SGRQ-C scores, while it had insignificant positive indirect effects on HRQOL through social support, pulmonary function and functional performance. Most of the participants were elderly persons with COPD (mean = 68.60). Differences in age were unable to predict disease prognosis, while the effects of COPD in old age caused deteriorating physical and psychosocial impacts in line with older age. Gender had a statistically insignificant negative direct effect on HRQOL with insignificant negative indirect effects on HRQOL through social support, pulmonary function and functional performance. Eighty-five percent were males and the indication was that differences in gender were unable to predict disease prognosis.

Nutritional status by using the FFMI had a significantly negative direct effect on HRQOL and significantly negative indirect effects on HRQOL through social support, pulmonary function and functional performance. Sixty-seven percent had normal levels of nutritional status. Due to insufficient nutrients from COPD, the participants gained more awareness of self-care in relation to food consumption.

Social support by using SGRQ-C scores had a significantly negative direct effect on HRQOL and significantly negative indirect effects on HRQOL through pulmonary function and functional performance. Fifty-nine percent had high levels of social support, which can create encouragement, build convenience and produce good conditions among persons with COPD. Pulmonary function by using the PEFR had a

significantly negative direct effect on HRQOL and a significantly negative indirect effect on HRQOL through functional performance. Approximately half of the participants were classified with moderate stages of the disease. As a result of the physical and psychological symptoms of deteriorating pulmonary function, the participants practiced self-care to reduce and prevent symptoms. Functional performance using FPI-SF scores had a significantly negative direct effect on HRQOL. Forty-four percent had high levels of functional performance. On account of activity limitations and psychological symptoms from reducing functional performance, the participants had proper self-care with regard to functional performance in living with COPD. Therefore, nutritional status, social support, pulmonary function and functional performance had significantly negative direct effects and significantly negative indirect effects on HRQOL among Thai persons with COPD. Consequently, Hypotheses 2 and 3 were partially supported in terms of the causal factors in HRQOL among Thai persons with COPD.

The results of this study support the hypotheses. However, the results of the quantitative phase indicated that age and gender were not significant predictors of HRQOL, while the findings of the qualitative data provided suggested potential explanations for the novel findings of these factors among Thai persons with COPD. Nurses and healthcare teams can modify the above predicting factors and implement appropriate care leading to increased HRQOL among persons with COPD.

5.4 Strengths and Limitations

The participants in this study were Thai persons with COPD coming for follow- up sessions at chest clinics in the outpatient departments of hospitals in Thailand's Health Region 4. The results of this study contain both strengths and limitations. The strengths of this study were two-fold. First, the results of the quantitative phase found that most of the participants had moderate levels of HRQOL, because nutritional status, social support, pulmonary function and functional performance were found to be significant predictors of HRQOL among Thai persons with COPD. The findings of the qualitative phase provided some support for the quantitative results, thereby suggesting potential explanations for the novel findings of the aforementioned four factors among Thai persons with COPD. Second, the researcher was experienced in the

convergent parallel mixed methods design involving both quantitative and qualitative data collection, analysis and integration. This method enabled the triangulation and integration of the results of the quantitative phase, while the findings of the qualitative phase can provide multiple perspectives and a comprehensive in-depth understanding of the factors associated with HRQOL among Thai persons with COPD. Therefore, nurses and healthcare teams should be concerned with and promote these factors potentially leading to improved HRQOL among Thai persons with COPD.

The limitations in this study consisted of the following: First, most of the subjects were far-sighted elderly with COPD, thereby causing incomplete reading and questionnaires. Therefore, the researcher and the research assistant read the questionnaires for the participants to reply, which might have caused the data to deviate from reality, because the participants were conscious and considerate of the researcher and the research assistant. Second, this study was conducted and collected data in Health Region 4 in Thailand. Therefore, the findings will benefit HRQOL development among persons with COPD in Health Region 4. However, this might have caused the data obtained by the study to lack diversity and not represent overall HRQOL among persons with COPD in Thailand.

Third, the researcher collected data while the participants waited for follow-up by the doctor. However, at the chest clinics in the outpatient departments, patients had to receive multiple health assessments before meeting doctors, thereby causing the responses to the questionnaires or interviews to be consistent with potential effects on the findings. Fourth, this study used a convergent parallel mixed methods design. The selection of participants in the qualitative phase considered participants in the quantitative phase with only a difference in SGRQ-C scores. Predictor variable scores were not considered. Therefore, the data obtained from the interviews may not be diverse.

5.5 Research Recommendations

According to the findings, nutritional status, pulmonary function, functional status and social support efficiently predict HRQOL, while age and gender are not significant predictors of HRQOL among Thai persons with COPD. Therefore, the research recommendation are as follows:

5.5.1 In recommendations for further research, future studies should be conducted in larger samples and multiple health regions in Thailand by using the

structural equation model (SEM). In addition, further studies should be conducted among participants to provide more diverse data in the qualitative phase with high levels of nutritional status, pulmonary function, functional performance and social support to provide a comprehensive in-depth understanding of all factors, obtain more diverse data and gain overview data on the factors influencing HRQOL among Thai persons with COPD, thereby leading to significant basic importance for increasing HRQOL among Thai persons with COPD. Moreover, quasi-experimental research should be conducted by applying these results to the planning of a program to promote HRQOL among Thai persons with COPD.

5.4.2 For practical recommendations, this study expands knowledge regarding the factors influencing HRQOL among Thai persons with COPD, which indicate that nutritional status, pulmonary function, functional performance and social support are significant predictors of HRQOL. However, the findings of the qualitative data provide some suggestions on potential explanations for the novel findings on age, gender and HRQOL among Thai persons with COPD. Therefore, nurses and healthcare teams should be concerned with and promote these factors potentially leading to improved HRQOL among Thai persons with COPD.

5.4.3 In terms of policy recommendations, this study should provide basic information and a scientific framework for researchers and community hospital administrators as well as healthcare policymakers in order to enhance HRQOL among Thai persons with COPD.

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APPENDICES

APPENDIX A

List of Experts

1. Associate Professor Dr. Patthraporn Kessung
   Office: Faculty of Education, Loei Rajabhat University
2. Associate Professor Dr. Choochat Phuangsomjit
   Office: Education School of Sukhothai Thammathirat Open University
3. Assistant Professor Dr. Pitchayapa Ruchiwit
   Office: Faculty of Medicine, Thammasat University
4. Assistant Professor Dr. Supaporn Duongpaeng
   Office: Faculty of Nursing, Burapha University
5. Associate Professor Dr. Yaowarat Matchim
   Office: Faculty of Nursing, Thammasat University
6. Assistant Professor Dr. Manaporn Chatchumni
   Office: School of Nursing, Rangsit University
7. Miss Chomnapa Kittisup
   Office: Central Chest Institute of Thailand

APPENDIX B

Certificate of Ethical Approval

The Ethics Review Sub-Committee for Research Involving Human Research Subjects of Thammasat University, No. 3 (Faculty of Health Sciences and Science and Technology)

Rachasuda Building ,1 Floor, Research and Behavior Center, Faculty of Nursing, Prathumthani 12121, Thailand, Tel: 0-2986-9213 Fax: 0-2516-5381 E-mail: ecsctu3@nurse.tu.ac.th

COA No. 082/2561

Certificate of Approval

Project No. : 086/2561

Title of Project : Factors Influencing Health-related Quality of Life among Thai Persons with Chronic Obstructive Pulmonary Disease: A Mixed Methods Study

Principle Investigator : Mrs. Atchanat Wangsom

Place of Proposed Study/Institution: Faculty of Nursing, Thammasat University

The Ethics Review Sub-Committee for Research Involving Human Research Subjects of Thammasat University, No. 3 (Faculty of Health Sciences and Science and Technology), Thailand, has approved, constituted in accordance with the International Conference on Harmonization – Good Clinical Practice (ICH-GCP), the above study project

Signature: ..... Signature: .....

(Prof. Dr. Pranom Othaganont)
Chairman of the Human Ethics Sub-Committee of Thammasat University, No. 3

(Asst.Prof.Dr. Laksana Laokiat)
Secretary of the Human Ethics Sub-Committee of Thammasat University, No. 3

Date of Approval : 18 July 2018 **Approval Expire date :** : 17 July 2019

Progressing Report Due : 18 January 2019

The approval documents including

1) Research proposal
2) Patient/Participant Information Sheet and Informed Consent Form
3) Researcher
4) Other research tools eg: Questionnaire
5) Other relevant documents

บันทึกข้อความ

ส่วนราชการ โรงพยาบาลธรรมศาสตร์ฯ งานวิเคราะห์แผน งบประมาณ และวิจัยสถาบัน โทร. ๙๔๕๑
ที่ ศธ ๐๕๑๖.๑๐/ ๙๓๒๗ **วันที่** ๓๑ สิงหาคม ๒๕๖๑
เรื่อง แจ้งผลพิจารณาขอดำเนินการเพื่อวิจัยในโรงพยาบาล

เรียน คณบดีคณะพยาบาลศาสตร์

ตามที่ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ กำลังดำเนินงานวิจัย เรื่อง ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุกกั้นเรื้อรัง : การศึกษาวิจัยแบบผสานวิธีการ ซึ่งได้ผ่านการรับรองจากคณะอนุกรรมการจริยธรรมการวิจัยในคน มธ.ชุดที่ ๓ แล้ว มีความประสงค์ขอเข้าเก็บข้อมูลเพื่อการวิจัย โดยแจกแบบสอบถามและสัมภาษณ์กับญาติและผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ที่งานการพยาบาลตรวจโรคอายุรกรรม ๑,๒ แบ่งเป็นแจกแบบสอบถามจำนวน ๔๐ ราย และสัมภาษณ์จำนวน ๔ ราย นั้น

ในการนี้ โรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ พิจารณาแล้วอนุญาตให้เข้าเก็บข้อมูลเพื่อวิจัยในโรงพยาบาลได้และเมื่อเสร็จสิ้นแล้วให้ผู้วิจัยดำเนินการดังนี้

๑. ส่งผลงานวิจัยที่สำเร็จแล้วมายังโรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ
๒. ระบุชื่อ โรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติในกิตติกรรมประกาศ (Acknowledgement)
๓. ส่งสำเนางานวิจัยที่ได้รับการตีพิมพ์วารสาร

จึงเรียนมาเพื่อโปรดทราบ

(รองศาสตราจารย์ นายแพทย์พฤหัส ต่ออุดม)
ผู้อำนวยการโรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ

ที่ ปท ๐๐๓๒.๒๐๓.๓ / ๑๖๐๗๗

โรงพยาบาลปทุมธานี
ถนนปทุมธานี-ลาดหลุมแก้ว ปท ๑๒๐๐๐

๖ กันยายน ๒๕๖๑

เรื่อง อนุญาตให้เก็บข้อมูลงานวิจัยและรับรองจริยธรรมการวิจัยในมนุษย์

เรียน คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

ตามที่ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ขออนุญาตให้นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) เข้าเก็บข้อมูลเพื่อการศึกษาวิจัย เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง : การศึกษาวิจัยแบบผสมผสานวิธีการ" นั้น

ในการนี้ โรงพยาบาลปทุมธานี โดยคณะกรรมการวิจัยได้พิจารณาแล้วและมีมติอนุมัติในหลักการและรับรองด้านจริยธรรมการวิจัยในมนุษย์

จึงเรียนมาเพื่อโปรดทราบและดำเนินการต่อไป

ขอแสดงความนับถือ

(นายสุรัตน์ สุขประเสริฐ)
นายแพทย์(ด้านเวชกรรม สาขาศัลยกรรม) ระดับเชี่ยวชาญ
รองผู้อำนวยการฝ่ายการแพทย์ ปฏิบัติราชการแทน
ผู้อำนวยการโรงพยาบาลปทุมธานี

ที่ สห ๐๐๓๒.๓๐๕/๒๓๐๓

โรงพยาบาลพรหมบุรี
อ.พรหมบุรี สห ๑๖๑๒๐

๒๐ กรกฎาคม ๒๕๖๑

เรื่อง อนุญาตให้เก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและเก็บข้อมูลเพื่อการวิจัย

เรียน คณะบดีพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

อ้างถึง หนังสือที่ ศธ ๐๕๑๖.๒๕/กท๗๓ ลงวันที่ ๑๒ กรกฎาคม ๒๕๖๑

ตามหนังสือที่อ้างถึงนั้น คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ขอให้ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์(หลักสูตรนานาชาติ) กำลังดำเนินการพัฒนาดุษฎีนิพนธ์ เรื่อง ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้องรัง : การศึกษาวิจัยแบบผสมผสานวิธีการ เข้าเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัย และเก็บข้อมูลเพื่อการวิจัย นั้น

โรงพยาบาลพรหมบุรี อนุญาตให้นางอัชฌาณัฐ วังโสม เข้าเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัย และเก็บข้อมูลเพื่อการวิจัย ได้

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

(นายณัฐ หาวารี)
ผู้อำนวยการโรงพยาบาลพรหมบุรี

กลุ่มการพยาบาล
โทร. ๐ ๓๖๕๙ ๙๗๑๘ ต่อ๑๒๐
โทรสาร.๐ ๓๖๕๓ ๐๘๐๕

โรงพยาบาลสิงห์บุรี
เลขที่ ๗๙๙๑
รับวันที่ ๑ ส.ค. ๒๕๖๑
เวลา ๑๐.๕๖ น.

ที่ ศธ ๐๕๑๖.๒๕/ว๓.๗๙

คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์
ตำบลคลองหนึ่ง อำเภอคลองหลวง
จังหวัดปทุมธานี ๑๒๑๒๐

๑๖ กรกฎาคม ๒๕๖๑

๑๒๘๔
๒ ส.ค. ๒๕๖๑
๑๑.๐๐

เรื่อง ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

เรียน ผู้อำนวยการโรงพยาบาลสิงห์บุรี

ตามที่ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ กำลังดำเนินการพัฒนาดุษฎีนิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ" นั้น

ในการนี้ คณะพยาบาลศาสตร์ จึงใคร่ขอความอนุเคราะห์ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

ทั้งนี้ได้ส่งเอกสารประกอบการพิจารณา ดังนี้

๑. โครงการวิจัย

๒. หนังสือรับรองจริยธรรมการวิจัย

สามารถสอบถามรายละเอียดได้ที่ นางอัชฌาณัฐ วังโสม เบอร์โทร ๐๖๔-๒๓๕๑๔๖๔ อีเมล์ atchanat.wa@rsu.ac.th

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักขอบคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.ธีรนุช ห้านิรัติศัย)
รองคณบดีฝ่ายบริหารและวิชาการ
ปฏิบัติการแทนคณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

เรียน ผู้อำนวยการ
เพื่อทราบ
เห็นควรมอบกลุ่มงาน การพยาบาล
ดำเนินการ
- ๑ ส.ค. ๒๕๖๑

สำนักงานเลขานุการคณะพยาบาลศาสตร์
โทร. ๐-๒๙๘๖-๙๒๑๓ ต่อ ๗๓๕๒
โทรสาร ๐-๒๕๑๖-๕๓๘๑

๒ ส.ค. ๒๕๖๑

เห็นชอบ

(นางสาววนิดา สาดตระกูลวัฒนา)
ผู้อำนวยการโรงพยาบาลสิงห์บุรี
- ๑ ส.ค. ๒๕๖๑

(นางทองเปลว ชมเจันทร์)
รักษาการแทน
๒ ส.ค. ๒๕๖๑

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพระนครศรีอยุธยา
46/1 หมู่ 4 ถ.อู่ทอง ต.ประตูชัย อ.พระนครศรีอยุธยา จ.พระนครศรีอยุธยา
โทร 035-211888 ต่อ 2318

เอกสารรับรองโครงการวิจัย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพระนครศรีอยุธยา ดำเนินการให้รับรองโครงการวิจัยตามแนวทางหลักจริยธรรมการวิจัยในคนที่เป็นมาตรฐานสากลได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice หรือ ICH-GCP

ชื่อโครงการ : ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง : การศึกษาวิจัยแบบผสมผสานวิธีการ

เลขที่โครงการวิจัย : 027/2561

ผู้วิจัยหลัก : นางอัชฌาณัฐ วังโสม

สังกัดหน่วยงาน : คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

วิธีทบทวน : คณะกรรมการเต็มชุด (Full Board)

รายงานความก้าวหน้า : ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง/ปี หรือส่งรายงานฉบับสมบูรณ์หากดำเนินโครงการเสร็จสิ้นก่อน 1 ปี / ส่งรายงานความก้าวหน้าอย่างน้อยทุก 6 เดือน / ส่งรายงานความก้าวหน้าอย่างน้อยทุก 3 เดือน

เอกสารรับรอง : - โครงร่างวิจัย/ - แบบยินยอมเข้าร่วมการวิจัย
- แบบสอบถามเพื่อการวิจัยคนไทยโรคปอดอุดกั้นเรื้อรัง : การศึกษาวิจัยแบบผสมผสานวิธีการ

ลงนาม.....
(ดร.พญ.ประกายทิพ สุศิลปรัตน์)
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์

ลงนาม.....
(นายธีร์รัฐ พงศ์เลิศอารี)
กรรมการและเลขานุการ
คณะกรรมการจริยธรรมการวิจัยในมนุษย์

วันที่รับรอง : 10 ก.ค. 2561
วันหมดอายุ : - 9 ก.ค. 2562

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)

ที่ ศธ ๐๕๑๖.๒๕/๓๓ ๓๔

คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์
ตำบลคลองหนึ่ง อำเภอคลองหลวง
จังหวัดปทุมธานี ๑๒๑๒๐

๑๖ กรกฎาคม ๒๕๖๑

เรื่อง ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

เรียน ผู้อำนวยการโรงพยาบาลเสนา

ตามที่ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ กำลังดำเนินการพัฒนาดุษฎีนิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ" นั้น

ในการนี้ คณะพยาบาลศาสตร์ จึงใคร่ขอความอนุเคราะห์ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

ทั้งนี้ได้ส่งเอกสารประกอบการพิจารณา ดังนี้

๑. โครงการวิจัย

๒. หนังสือรับรองจริยธรรมการวิจัย

สามารถสอบถามรายละเอียดได้ที่ นางอัชฌาณัฐ วังโสม เบอร์โทร ๐๖๔-๒๓๕๑๔๖๔ อีเมล์ atchanat.wa@rsu.ac.th

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักขอบคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.ธีรนุช ห้านิรัติศัย)
รองคณบดีฝ่ายบริหารและวิชาการ
ปฏิบัติการแทนคณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

สำนักงานเลขานุการคณะพยาบาลศาสตร์
โทร. ๐-๒๙๘๖-๙๒๑๓ ต่อ ๗๓๕๒
โทรสาร ๐-๒๕๑๖-๕๓๘๑

กลุ่มการพยาบาล
รับเลขที่ 563
วันที่ 1 9 ก.ย. 2561
เวลา 15.15 น.

โรงพยาบาลบางใหญ่
รับเลขที่ ....
วันที่ ๑ ๘ ก.ย. ๒๕๖๑
เวลา ....น.

ที่ ศธ ๐๕๑๖.๒๕/วค.

คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์
ตำบลคลองหนึ่ง อำเภอคลองหลวง
จังหวัดปทุมธานี ๑๒๑๒๐

๑๗ กันยายน ๒๕๖๑

เรื่อง ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

เรียน ผู้อำนวยการโรงพยาบาลบางใหญ่

ตามที่ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ กำลังดำเนินการพัฒนาดุษฎีนิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ" นั้น

ในการนี้ คณะพยาบาลศาสตร์ จึงใคร่ขอความอนุเคราะห์ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

ทั้งนี้ได้ส่งเอกสารประกอบการพิจารณา ดังนี้

๑. โครงการวิจัย

๒. หนังสือรับรองจริยธรรมการวิจัย

สามารถสอบถามรายละเอียดได้ที่ นางอัชฌาณัฐ วังโสม เบอร์โทร ๐๖๔-๒๓๕๑๔๖๔ อีเมล์ atchanat.wa@rsu.ac.th

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักขอบคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.ธีรนุช ห้านิรัติศัย)
รองคณบดีฝ่ายบริหารและวิชาการ
ปฏิบัติการแทนคณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

สำนักงานเลขานุการคณะพยาบาลศาสตร์
โทร. ๐-๒๙๘๖-๙๒๑๓ ต่อ ๗๓๕๒
โทรสาร ๐-๒๕๑๖-๕๓๘๑

ที่ ศธ ๐๕๑๖.๒๕/ว๓.๗๗

คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์
ตำบลคลองหนึ่ง อำเภอคลองหลวง
จังหวัดปทุมธานี ๑๒๑๒๐

๑๒ กรกฎาคม ๒๕๖๑

เรื่อง ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

เรียน ผู้อำนวยการโรงพยาบาลบางบัวทอง

ตามที่ นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ กำลังดำเนินการพัฒนาดุษฎีนิพนธ์ เรื่อง "ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ" นั้น

ในการนี้ คณะพยาบาลศาสตร์ จึงใคร่ขอความอนุเคราะห์ขออนุญาตเก็บข้อมูลเพื่อการทดสอบเครื่องมือวิจัยและขออนุญาตเก็บข้อมูลเพื่อการวิจัย

ทั้งนี้ได้ส่งเอกสารประกอบการพิจารณา ดังนี้

๑. โครงการวิจัย

๒. หนังสือรับรองจริยธรรมการวิจัย

สามารถสอบถามรายละเอียดได้ที่ นางอัชฌาณัฐ วังโสม เบอร์โทร ๐๖๔-๒๓๕๑๔๖๔ อีเมล์ atchanat.wa@rsu.ac.th

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักขอบคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.ธีรนุช ห้านิรัติศัย)
รองคณบดีฝ่ายบริหารและวิชาการ
ปฏิบัติการแทนคณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

สำนักงานเลขานุการคณะพยาบาลศาสตร์
โทร. ๐-๒๙๘๖-๙๒๑๓ ต่อ ๗๓๕๒
โทรสาร ๐-๒๕๑๖-๕๓๘๑

๑ ส.ค. ๒๕๖๑

APPENDIX C

Participant Information Sheet and Informed Consent Form

ข้อมูลสำหรับอาสาสมัครวิจัย (Participant Information Sheet)

โครงการวิจัยเรื่อง ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ

ชื่อผู้วิจัย นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

อาจารย์ที่ปรึกษา ศาสตราจารย์ ดร.ประนอม โอทกานนท์

สถานที่ติดต่อผู้วิจัย

สถานที่ปฏิบัติงาน คณะพยาบาลศาสตร์ มหาวิทยาลัยรังสิต 52/347 หมู่บ้านเมืองเอก ถ.พหลโยธิน ต.หลักหก อ.เมือง จ.ปทุมธานี 12000

ที่อยู่ปัจจุบัน 83/503 หมู่บ้านเสนาแกรนด์โฮม ต.บางพูน อ.เมือง จ.ปทุมธานี 12000

โทรศัพท์ 02-1167433 โทรศัพท์มือถือ 064-2351464

E-mail: atchanat.wa@rsu.ac.th

เรียน อาสาสมัครวิจัยทุกท่าน

ท่านเป็นหนึ่งใน 240 คน ที่ได้รับเชิญจากผู้วิจัยให้เข้าร่วมเป็นอาสาสมัครของการศึกษาวิจัยครั้งนี้ ก่อนที่ท่านตกลงเข้าร่วมการศึกษาดังกล่าว ขอเรียนให้ท่านทราบถึงเหตุผลและรายละเอียดของการศึกษาวิจัย ในครั้งนี้

โรคปอดอุดกั้นเรื้อรังมีอาการแสดงทั้งทางด้านร่างกายและจิตใจ ซึ่งส่งผลกระทบต่อการดำเนินชีวิตของผู้ป่วย ปัจจัยที่มีผลต่อคุณภาพชีวิตของผู้ป่วยสามารถพัฒนาได้โดยบุคลากรทางการแพทย์ ครอบครัว และผู้ป่วยเอง ดังนั้นข้อมูลความสัมพันธ์ระหว่างปัจจัยต่างๆ ที่มีผลต่อคุณภาพชีวิต จึงเป็นข้อมูลพื้นฐานที่สำคัญในการพัฒนาการรักษาพยาบาลผู้ป่วยโรคปอดอุดกั้นเรื้อรัง การศึกษาวิจัยครั้งนี้มี

วัตถุประสงค์เพื่อศึกษาข้อมูลและความสัมพันธ์ระหว่างปัจจัยด้านอายุ เพศ ภาวะโภชนาการ สมรรถภาพการทำงานของปอด การปฏิบัติหน้าที่ของร่างกาย การสนับสนุนทางสังคม และคุณภาพชีวิตของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

ท่านมีคุณสมบัติเป็นอาสาสมัครวิจัย สามารถให้ข้อมูลปัจจัยที่มีผลต่อคุณภาพชีวิตของท่าน คือ อายุมากกว่า 40 ปี เพศชายหรือเพศหญิง สื่อสารภาษาไทยได้ และเข้ารับการตรวจเพื่อติดตามอาการ ณ คลินิกโรคปอดของโรงพยาบาล จำนวน 240 คน แบ่งกลุ่มอาสาสมัครเป็น 2 กลุ่ม โดยการจับฉลาก อาสาสมัครวิจัยกลุ่มที่ 1 จำนวน 240 คน และกลุ่มที่ 2 จำนวน 30 คน ซึ่งจะได้รับเลือกมาจากกลุ่มที่ 1 ท่านอาจจะเป็นผู้หนึ่งในจำนวนอีก 30 คน ที่ผู้วิจัยคัดเลือกภายหลังท่านตอบแบบสอบถามเสร็จสิ้นแล้ว โดยใช้เกณฑ์คะแนนที่ได้จากการตอบแบบสอบถามว่ามีระดับคุณภาพชีวิตที่แตกต่างกัน แต่ละกลุ่มมีภารกิจและบทบาท ดังนี้

กลุ่มที่ 1 ผู้วิจัยหรือผู้ช่วยวิจัยหนึ่งคนเป็นผู้เก็บรวบรวมข้อมูล ให้ท่านตอบแบบสอบถามเกี่ยวกับปัจจัยที่มีผลต่อคุณภาพชีวิตของท่าน รวมจำนวน 55 ข้อ หนึ่งครั้ง ใช้เวลาประมาณ 30 นาที

กลุ่มที่ 2 ผู้วิจัยเป็นผู้เก็บรวบรวมข้อมูลเพียงคนเดียว โดยหลังจากท่านตอบแบบสอบถามจากกลุ่มที่ 1 เสร็จแล้ว ให้ท่านตอบการสัมภาษณ์เกี่ยวกับปัจจัยที่มีผลต่อคุณภาพชีวิตของท่านและบันทึกเสียงหนึ่งครั้งใช้เวลาประมาณ 30 นาที

ในระหว่างการเก็บรวบรวมข้อมูล ผู้วิจัยจะหยุดพักเป็น 3 ช่วง ช่วงละ 5 นาทีเพื่อให้ท่านได้พักและผ่อนคลาย หากระหว่างการเก็บรวบรวมข้อมูลท่านรู้สึกเหนื่อยหรือต้องการพัก ผู้วิจัยจะให้ท่านหยุดพักและให้การดูแลเบื้องต้น หากอาการไม่ดีขึ้น ผู้วิจัยจะรายงานพยาบาล แพทย์ประจำคลินิกโรคปอดเพื่อการดูแลรักษาลำดับต่อไป

การให้ข้อมูลแก่อาสาสมัครวิจัยโดยผู้วิจัยชี้แจงเป็นเอกสาร และมอบ “ข้อมูลสำหรับอาสาสมัครวิจัย” หากท่านอ่านไม่ออก ผู้วิจัยหรือญาติจะอ่านให้ฟังพร้อมตอบข้อสงสัย และถ้าท่านเขียนไม่ได้ ให้ญาติเขียนหรือผู้ลงนามแทนได้

ผู้วิจัยศึกษาข้อมูลบางส่วนจากสอบถามญาติ และแฟ้มประวัติของท่านเพื่อเป็นการรบกวนท่านให้น้อยที่สุด ซึ่งการศึกษาข้อมูลแฟ้มประวัติหลังจากได้รับอนุญาตจากผู้อำนวยการโรงพยาบาลและ

แพทย์เจ้าของไข้ ในการคัดกรองอาสาสมัครวิจัยครั้งนี้ หากพบว่าท่านไม่มีคุณสมบัติเป็นอาสาสมัครวิจัย และอยู่ในสถานการณ์ที่ต้องได้รับการช่วยเหลือหรือการแนะนำ ผู้วิจัยจะให้การดูแลหรือคำแนะนำเบื้องต้นและหากอาการไม่ดีขึ้นจะติดต่อทีมแพทย์ พยาบาลประจำคลินิกต่อไป

ข้อมูลที่เกี่ยวข้องกับท่านจะเก็บเป็นความลับ เมื่อเสร็จสิ้นการวิจัยข้อมูลทั้งจากแบบสอบถามและเทปบันทึกเสียงจะถูกทำลาย การบันทึกข้อมูลต่างๆ จะถูกเก็บไว้ในคอมพิวเตอร์ขอรับรองว่าไม่มีการแพร่งพรายสู่สาธารณชนหรือไม่มีการเปิดเผยชื่อของท่านตามกฎหมาย การเสนอผลการวิจัยจะเสนอเป็นภาพรวมและใช้สำหรับวัตถุประสงค์ทางวิชาการเท่านั้น

การศึกษาวิจัยครั้งนี้อาจไม่ก่อประโยชน์ต่อท่านโดยตรง แต่ข้อมูลความคิดเห็นของท่านจะเป็นข้อมูลพื้นฐานที่สำคัญสำหรับบุคลากรทางการแพทย์ เพื่อพัฒนาคุณภาพชีวิตของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง การเข้าร่วมเป็นอาสาสมัครวิจัยครั้งนี้ท่านจะไม่มีค่าตอบแทนการเป็นอาสาสมัครวิจัย ผู้วิจัยจะมอบของที่ระลึกมูลค่าประมาณ 100 บาทสำหรับท่าน

ท่านสามารถเลือกตัดสินใจเข้าร่วมเป็นอาสาสมัครวิจัยได้อย่างอิสระ หรือสามารถปฏิเสธที่จะเข้าร่วม หรือถอนตัวจากการวิจัยได้ทุกขณะ โดยไม่ต้องให้เหตุผล และจะไม่มีผลกระทบต่อการรักษาพยาบาลของท่านแต่อย่างใด

หากท่านไม่ได้รับการปฏิบัติตามข้อมูลดังกล่าวสามารถร้องเรียนได้ที่: คณะอนุกรรมการจริยธรรม การวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ ชุดที่ 3 อาคารราชสุดา ชั้น 1 ศูนย์ส่งเสริมสุขภาพ คณะพยาบาล ศาสตร์ มหาวิทยาลัยธรรมศาสตร์ศูนย์รังสิต โทรศัพท์ 02-986-9213 ต่อ 7373 โทรสาร 02-5165381 ขอขอบพระคุณในความร่วมมือของท่านในการศึกษาวิจัยครั้งนี้

หนังสือแสดงความยินยอมเข้าร่วมการวิจัยของอาสาสมัครวิจัย: อาสาสมัครวิจัยกลุ่มที่ 1

Informed Consent Form

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ อาสาสมัครวิจัย….....……

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

โครงการวิจัยชื่อ ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ

ชื่อผู้วิจัย นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

สถานที่ปฏิบัติงาน คณะพยาบาลศาสตร์ มหาวิทยาลัยรังสิต 52/347 หมู่บ้านเมืองเอก ถ.พหลโยธิน ต.หลักหก อ.เมือง จ. ปทุมธานี 12000 โทรศัพท์มือถือ: 064-2351464

ข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงอาสาสมัครวิจัยโดยตลอด และ**ได้รับคำอธิบาย**จากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้าจึง**สมัครใจ**เข้าร่วมเป็นอาสาสมัครวิจัยกลุ่มที่ 1 ในโครงการวิจัยนี้ ตามที่ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัยโดยข้าพเจ้ายินยอมสละเวลาตอบแบบสอบถามเกี่ยวกับปัจจัยที่มีผลต่อคุณภาพชีวิต จำนวน 55 ข้อ หนึ่งครั้ง ข้อคำถามสั้นกระชับ ใช้เวลาประมาณ 30 นาที โดยผู้วิจัยจะศึกษาข้อมูลบางส่วนจากการสอบถามญาติ และจากแฟ้มประวัติของข้าพเจ้า เมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับข้าพเจ้าจะถูกทำลาย ผลการวิจัยจะมีการเผยแพร่ในเชิงวิชาการเท่านั้น

ข้าพเจ้ามีสิทธิ**ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบต่อการได้รับการรักษาพยาบาลในโรงพยาบาลหรือในทางใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัยและข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่: คณะอนุกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ ชุดที่ 3 อาคารราชสุดา ชั้น 1 ศูนย์ส่งเสริมสุขภาพ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ศูนย์รังสิต โทรศัพท์ 02-986-9213 ต่อ 7373 โทรสาร 02-5165381

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารข้อมูลสำหรับอาสาสมัครวิจัย และสำเนาหนังสือแสดงความยินยอมเข้าร่วมการวิจัยของอาสาสมัครวิจัยไว้แล้ว

ลงชื่อ.....	ลงชื่อ.....
(นางอัชฌาณัฐ วังโสม)	(.....)
ผู้วิจัยหลัก	อาสาสมัครวิจัย
วันที่……../……./……	วันที่……../……./……

ลงชื่อ.....	ลงชื่อ.....
(.....)	(.....)
พยาน	พยาน
วันที่……../……./……	วันที่……../……./……

หนังสือแสดงความยินยอมเข้าร่วมการวิจัยของอาสาสมัครวิจัย: อาสาสมัครวิจัยกลุ่มที่ 2

Informed Consent Form

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ อาสาสมัครวิจัย….....……

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

โครงการวิจัยชื่อ ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ

ชื่อผู้วิจัย นางอัชฌาณัฐ วังโสม นักศึกษาระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาพยาบาลศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์

สถานที่ปฏิบัติงาน คณะพยาบาลศาสตร์ มหาวิทยาลัยรังสิต 52/347 หมู่บ้านเมืองเอก ถ.พหลโยธิน ต.หลักหก อ.เมือง จ. ปทุมธานี 12000 โทรศัพท์มือถือ: 064-2351464

ข้าพเจ้า **ได้รับทราบ**รายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงอาสาสมัครวิจัยโดยตลอด และ**ได้รับคำอธิบาย**จากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้าจึง**สมัครใจ**เข้าร่วมเป็นอาสาสมัครวิจัยกลุ่มที่ 2 ในโครงการวิจัยนี้ ตามที่ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัย โดยหลังจากเสร็จสิ้นการตอบแบบสอบถามแล้วข้าพเจ้ายินยอมสละเวลาตอบข้อสัมภาษณ์พร้อมกับบันทึกเสียงอีกหนึ่งครั้งใช้เวลาประมาณ 30 นาที โดยผู้วิจัยจะศึกษาข้อมูลบางส่วนจากการสอบถามญาติ และจากแฟ้มประวัติของข้าพเจ้า เมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับข้าพเจ้าจะถูกทำลาย ผลการวิจัยจะมีการเผยแพร่ในเชิงวิชาการเท่านั้น

ข้าพเจ้ามีสิทธิ**ถอนตัว**ออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ **โดยไม่ต้องแจ้งเหตุผล** ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบต่อการได้รับการรักษาพยาบาลในโรงพยาบาลหรือในทางใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัยและข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะ**เก็บรักษาเป็นความลับ** โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงอาสาสมัครวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่: คณะอนุกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ ชุดที่ 3 อาคารราชสุดา ชั้น 1 ศูนย์ส่งเสริมสุขภาพ คณะพยาบาลศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ศูนย์รังสิต โทรศัพท์ 02-986-9213 ต่อ 7373 โทรสาร 02-5165381

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารข้อมูลสำหรับอาสาสมัครวิจัย และสำเนาหนังสือแสดงความยินยอมเข้าร่วมการวิจัยของอาสาสมัครวิจัยไว้แล้ว

ลงชื่อ.....	ลงชื่อ.....
(นางอัชฌาณัฐ วังโสม)	(.....)
ผู้วิจัยหลัก	อาสาสมัครวิจัย
วันที่……../……../……	วันที่……../……../……
ลงชื่อ.....	ลงชื่อ.....
(.....)	(.....)
พยาน	พยาน
วันที่……../……../……	วันที่……../……../……

APPENDIX D
Research Instruments

เรื่อง ปัจจัยที่มีอิทธิพลต่อคุณภาพชีวิตของผู้ป่วยคนไทยโรคปอดอุดกั้นเรื้อรัง: การศึกษาวิจัยแบบผสมผสานวิธีการ

คำชี้แจง แบบประเมินเพื่อเก็บรวบรวมข้อมูลขั้นตอนวิจัยเชิงปริมาณ ประกอบด้วย 6 ชุด ได้แก่

ชุดที่ 1 แบบสอบถามข้อมูลส่วนบุคคล (Demographic data form)

ชุดที่ 2 แบบสอบถามคุณภาพชีวิต
(St. George's respiratory questionnaire for COPD patients: SGRQ-C)

ชุดที่ 3 แบบบันทึกภาวะโภชนาการ (Fat-free mass index record form)

ชุดที่ 4 แบบบันทึกสมรรถภาพปอด (Peak expiratory flow rate record form)

ชุดที่ 5 แบบประเมินการปฏิบัติหน้าที่ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง
(Functional performance inventory short form: FPI-SF)

ชุดที่ 6 แบบประเมินการสนับสนุนทางสังคมแบบพหุมิติ
(Multi-dimensional scale of perceived social support: MSPSS)

เลขที่แบบสอบถาม .....

ชุดที่ 1 แบบสอบถามข้อมูลส่วนบุคคล (Demographic data form)

คำชี้แจง: โปรดเติมคำลงในช่องว่าง หรือเติมเครื่องหมาย ✓ หน้าข้อความที่ตรงกับความเป็นจริงของท่าน

1. เพศ

☐ ชาย ☐ หญิง

2. อายุ ……..... ปี

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11. โรคร่วม

☐ ไม่มี

☐ มี โปรดระบุ

☐ โรคความดันโลหิตสูง ☐ โรคเบาหวาน

☐ โรคหลอดเลือดสมอง ☐ โรคกระดูกพรุน

☐ โรคกรดไหลย้อน ☐ โรคกล้ามเนื้อและกระดูก

☐ โรคซึมเศร้า ☐ โรคโลหิตจาง

☐ อื่นๆ ระบุ……

เลขที่แบบสอบถาม .....

ชุดที่ 2 แบบสอบถามคุณภาพชีวิต

(St. George's respiratory questionnaire for COPD patients: SGRQ-C)

คำชี้แจง: แบบประเมินชุดนี้มีวัตถุประสงค์เพื่อต้องการทราบว่าอาการของโรคปอดอุดกั้นเรื้อรังมีผลต่อการดำเนินชีวิตในช่วง 1 เดือนที่ผ่านมามากน้อยเพียงใด เมื่อท่านอ่านข้อความแล้ว กรุณาตอบคำถามโดยทำเครื่องหมาย x ลงในช่องที่ตรงกับความเป็นจริงมากที่สุดเพียงข้อเดียว

ข้อคำถาม ส่วนที่ 1	5 - 7 วันใน 1 สัปดาห์	3 - 4 วันใน 1 สัปดาห์	เฉพาะเวลาที่เป็นหวัดลงคอ	ไม่เคย
1. ท่านไอ				
2. ท่านมีเสลด				
3. ท่านหายใจไม่สะดวก				
4. ท่านมีอาการหายใจมีเสียงดังวี้ด				

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14. ท่านคิดว่าผลกระทบจากปัญหาการหายใจลำบากต่อชีวิตประจำวันของท่านเป็นอย่างไร (เลือกตอบเพียง 1 ข้อ)	ท่านสามารถทำทุกอย่างที่อยากทำได้	ปัญหาการหายใจลำบาก ทำให้ท่านต้องเลิกทำกิจกรรมที่อยากทำ 1-2 อย่าง	ปัญหาการหายใจลำบาก ทำให้ท่านต้องเลิกทำกิจกรรมส่วนใหญ่ที่อยากทำ	ปัญหาหายใจลำบาก ทำให้ท่านต้องเลิกทำกิจกรรมทุกอย่างที่อยากทำ

เลขที่แบบสอบถาม .....

ชุดที่ 3 แบบบันทึกภาวะโภชนาการ (Fat-free mass index record form)

สำหรับผู้วิจัย: ผู้วิจัยบันทึกระดับภาวะโภชนาการ นำข้อมูลมาจากการบันทึกค่า FFMI และ BMI จากแฟ้มประวัติ ในวันที่มาตรวจตามนัด

วัน ……เดือน ……..... ปี ……..

น้ำหนัก..... กิโลกรัม ส่วนสูง.....เมตร

ค่าดัชนีมวลกาย (BMI) = น้ำหนัก/ส่วนสูง^2

= ……Kg/m^2

Fat-free mass (FFM)..... Kilograms

Fat-free mass index (FFMI) = Fat-free mass/height^2

= ……. Kg/m^2

เลขที่แบบสอบถาม .....

ชุดที่ 4 แบบบันทึกสมรรถภาพปอด (Peak expiratory flow rate record form)

สำหรับผู้วิจัย: ผู้วิจัยบันทึกสมรรถภาพปอด นำข้อมูลมาจากการบันทึกค่า PEFR จากแฟ้มประวัติ ในวันที่มาตรวจตามนัด

วัน …… เดือน …… ปี ……..

PEFR …… L/min

ได้รับการรักษาโดยยาขยายหลอดลม ชนิดพ่น หรือ ชนิดรับประทาน ดังนี้

1. ……..

2…….

3…….

4…….

เลขที่แบบสอบถาม .....

ชุดที่ 5 แบบประเมินการปฏิบัติหน้าที่ของผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

(Functional performance inventory short form: FPI-SF)

คำชี้แจง: แบบประเมินชุดนี้มีวัตถุประสงค์เพื่อประเมินการปฏิบัติหน้าที่ของท่าน เกี่ยวกับการดูแลร่างกาย การดูแลรักษาบ้าน การออกกำลังกาย การพักผ่อนและนันทนาการ กิจกรรมทางด้านจิตวิญญาณ และกิจกรรมทางสังคม ซึ่งเกิดจากภาวการณ์เจ็บป่วยด้วยโรคปอดอุดกั้นเรื้อรังในช่วง 1 เดือนที่ผ่านมา ขอให้ท่านพิจารณากิจกรรมในแต่ละข้อว่าท่านปฏิบัติกิจกรรมดังกล่าวได้มากน้อยเพียงใด จากนั้นใส่เครื่องหมายกากบาท (X) ตรงจุดใดจุดหนึ่งบนแบบวัดที่ตรงกับความเป็นจริงมากที่สุด หากท่านเลือกที่จะไม่ทำกิจกรรมนั้นๆ เนื่องจากสาเหตุอื่นที่ไม่ใช่ปัญหาสุขภาพ โปรดระบุสาเหตุดังกล่าวในช่องว่าง ซึ่งค่าตัวเลขที่กำหนดบนแบบวัด มีเกณฑ์ในการประเมิน ดังนี้

1 หมายถึงท่านทำกิจกรรมนั้นไม่ได้เลยเนื่องจากสุขภาพของคุณไม่อำนวย

2 หมายถึงท่านทำกิจกรรมนั้นด้วยความยากลำบากมาก

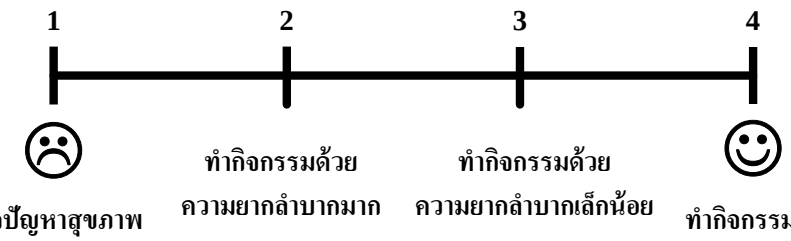
3 หมายถึงท่านทำกิจกรรมนั้นด้วยความยากลำบากเล็กน้อย

4 หมายถึงท่านทำกิจกรรมนั้นได้อย่างง่ายดาย ไม่ลำบาก

1. การแต่งตัวและถอดเสื้อผ้า

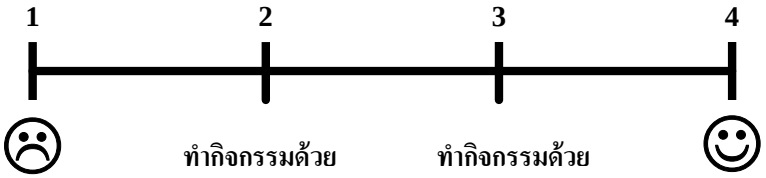
ท่านเลือกที่จะไม่ทำกิจกรรมนี้ เนื่องจากสาเหตุอื่น (โปรดระบุ).....

2. การอาบน้ำ แปรงฟัน และล้างหน้า



ท่านเลือกที่จะไม่ทำกิจกรรมนี้ เนื่องจากสาเหตุอื่น (โปรดระบุ).....

3. การดูแลเท้า



ท่านเลือกที่จะไม่ทำกิจกรรมนี้ เนื่องจากสาเหตุอื่น (โปรดระบุ).....

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29. เดินทางไกลเพื่อไปเยี่ยมญาติหรือเพื่อน

ท่านเลือกที่จะไม่ทำกิจกรรมนี้ เนื่องจากสาเหตุอื่น (โปรดระบุ).....

เลขที่แบบสอบถาม .....

ชุดที่ 6 แบบประเมินการสนับสนุนทางสังคมแบบพหุมิติ

(Multi-dimensional scale of perceived social support: MSPSS)

คำชี้แจง: แบบประเมินชุดนี้มีวัตถุประสงค์เพื่อประเมินการได้รับการช่วยเหลือจากบุคคลรอบข้างของท่านครอบคลุมถึงครอบครัว เพื่อน และบุคลากรทางสุขภาพ ในช่วง 1 เดือนที่ผ่านมา เมื่อท่านอ่านข้อความแล้ว กรุณาตอบคำถามโดยทำเครื่องหมายกากบาท (X) ตรงจุดใดจุดหนึ่งบนแบบวัดที่ตรงกับความเป็นจริงมากที่สุด ซึ่งค่าตัวเลขที่กำหนดบนแบบวัด มีเกณฑ์ในการประเมินดังนี้

0 หมายถึง ไม่เห็นด้วยที่สุด

1 หมายถึง ไม่เห็นด้วยอย่างมาก

2 หมายถึง ไม่เห็นด้วยเล็กน้อย

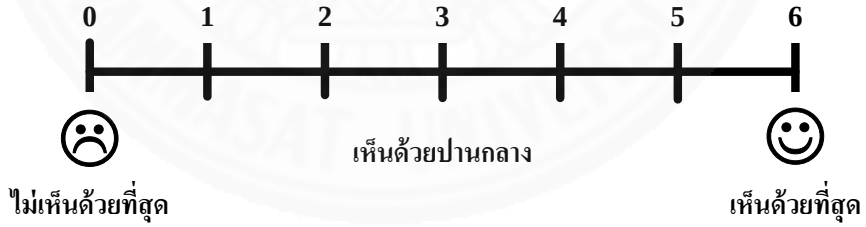
3 หมายถึงเห็นด้วยปานกลาง

4 หมายถึงเห็นด้วยเล็กน้อย

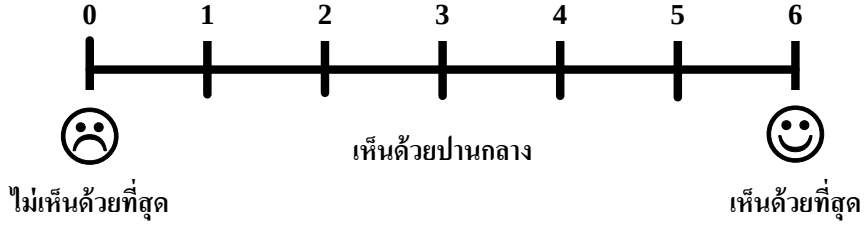
5 หมายถึงเห็นด้วยอย่างมาก

6 หมายถึง เห็นด้วยที่สุด

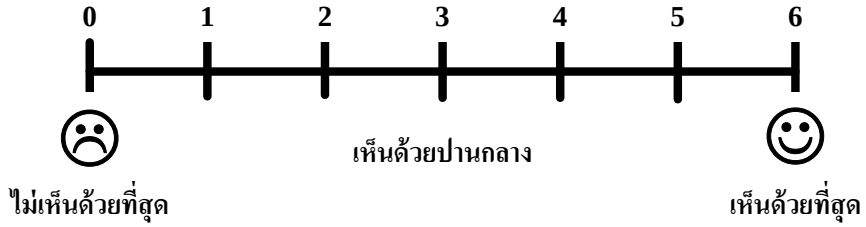
1. ท่านมีบุคลากรทางสุขภาพ เช่น แพทย์ พยาบาล นักกายภาพบำบัด ซึ่งพร้อมจะช่วยเหลือเมื่อท่านต้องการ



2. ท่านมีบุคลากรทางสุขภาพ เช่น แพทย์ พยาบาล นักกายภาพบำบัด ซึ่งสามารถรับฟังความสุขและความทุกข์ของท่านได้



3. ครอบครัวของท่านพยายามอย่างยิ่งที่จะช่วยเหลือท่าน



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12. ท่านสามารถปรึกษาปัญหาของท่านกับเพื่อนของท่านได้

APPENDIX E

Semi-Structured Interview Guide

เลขที่แบบสอบถาม: …….....

วัน: ……. เวลา: …….....

สถานที่: …….....

คำชี้แจง: ผู้วิจัยขอขอบคุณท่านที่เสียสละเวลามาให้ข้อมูล ผู้วิจัยต้องการทราบว่าท่านดำเนินชีวิตและมีสุขภาพเป็นอย่างไรในช่วง 1 เดือนที่ผ่านมา ผู้วิจัยจะสอบถามเกี่ยวกับปัญหาการหายใจ น้ำหนักตัวปัจจุบัน การทำกิจกรรมประจำวัน และบุคคลรอบข้างที่ให้การช่วยเหลือท่าน ระยะเวลาในการสัมภาษณ์ประมาณ 30 นาที โดยในระหว่างสัมภาษณ์ ผู้วิจัยจะขออนุญาตบันทึกเสียงและจดบันทึกข้อมูล โดยในการเก็บรวบรวมข้อมูลครั้งนี้ผู้วิจัยจะไม่ได้ระบุชื่อของท่าน และจะวิเคราะห์ข้อมูลในภาพรวม หากท่านรู้สึกเหนื่อยหรืออยากหยุดพัก ท่านกรุณาแจ้งผู้วิจัย ซึ่งผู้วิจัยจะหยุดพักและจะสัมภาษณ์ท่านอีกครั้งเมื่อท่านพร้อม

1. แนวคำถามทั่วไป

1.1 เริ่มตั้งแต่ตื่นนอนจนกระทั่งเข้านอน โดยส่วนใหญ่ในชีวิตประจำวันท่านทำอะไรบ้าง

1.2 ท่านทราบหรือไม่ว่าป่วยเป็นโรคอะไร ตั้งแต่ท่านเป็นโรคปอดอุดกั้นเรื้อรัง ชีวิตของท่านมีเปลี่ยนแปลงอย่างไรบ้าง

2. คำถามหลัก

2.1 ท่านช่วยเล่าเกี่ยวกับสิ่งที่มีความสำคัญต่อการดำเนินชีวิตของท่าน

เมื่อท่านป่วยเป็นโรคปอดอุดกั้นเรื้อรัง อะไรที่ทำให้ชีวิตของท่านดีขึ้นหรือแย่ลง และสิ่งนั้นช่วยทำอย่างไร

2.2 ท่านช่วยเล่าเกี่ยวกับสิ่งที่มีความสำคัญต่อสุขภาพของท่าน

เมื่อท่านป่วยเป็นโรคปอดอุดกั้นเรื้อรัง อะไรที่ทำให้สุขภาพของท่านแข็งแรงขึ้นหรือแย่ลง และสิ่งนั้นช่วยทำอย่างไร

2.3 ท่านช่วยเล่าเกี่ยวกับบุคคลรอบข้างที่ให้ความช่วยเหลือท่าน

เมื่อท่านป่วยเป็นโรคปอดอุดกั้นเรื้อรัง ใครทำให้ท่านรู้สึกว่าชีวิตมีคุณค่าหรือมีสิ่งดีๆ และเขาช่วยเหลือท่านอย่างไร

2.4 ท่านช่วยเล่าเกี่ยวกับปัญหาการหายใจของท่าน

ท่านรู้สึกอย่างไรเกี่ยวกับปัญหาการหายใจของท่าน โรคปอดอุดกั้นเรื้อรังมีผลกระทบต่อปัญหาการหายใจของท่านอย่างไร

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2.9 มีอะไรอีกบ้างที่ท่านอยากจะเล่าให้ผู้วิจัยฟัง

3. Closing

ขอบคุณท่านมากที่เสียสละเวลา ให้ความร่วมมือ และให้ข้อมูลเกี่ยวกับการดำเนินชีวิตและสุขภาพของท่านในวันนี้ ข้อมูลของท่านเป็นประโยชน์มากสำหรับงานวิจัย

APPENDIX F

Testing Assumptions of Multiple Regression Analysis

The assumptions were tested before using multiple regression analysis included normal distribution, homoscedasticity, multicollinearity and autocorrelation. These result for each assumption were presented as follows:

1. Normal distribution

The Kolmogorov-Smirnov was selected to test the normal distribution of residual. If the *p* value is more than 0.05, H_0 is not rejected that mean the residual is normally distributed (Hair et al., 2010). Table 1 shows that age, nutritional status, pulmonary function, functional performance, social support and HRQOL are normally distributed. However, gender is not normally distributed because it is nominal variables, which the numbers defined in each category are simply code.

Table 1. - One-Sample Kolmogorov-Smirnov Test (N = 240)

One-Sample Kolmogorov-Smirnov Test

		Age	Gender	Nutritional status	Pulmonary function	Functional performance	Social support	HRQOL
N		240	240	240	240	240	240	240
Normal Parameters[a,b]	Mean	68.79995	.15000	16.96578	55.95476	3.28767	52.07089	22.88752
	Std.Deviation	9.487361	.357818	1.803324	16.980824	.427193	9.315341	8.430308
Most Extreme Differences	Absolute	.029	.512	.007	.007	.019	.031	.035
	Positive	.029	.512	.006	.006	.019	.031	.035
	Negative	-.029	-.338	-.007	-.007	-.019	-.031	-.035
Kolmogorov-Smirnov Z		.452	7.939	.102	.101	.294	.485	.550
Asymp. Sig. (2-tailed)		.987	.000	1.000	1.000	1.000	.973	.923

a. Test distribution is Normal.

b. Calculated from data.

2. Homoscedasticity

Scatter plot was selected to test the homoscedasticity. The residuals can be plotted against the predicted values and against the independent variables. When standardized predicted values were plotted against observed values, the data would from a straight line from lower left corner to upper right corner was approximately straight was presented as follow:

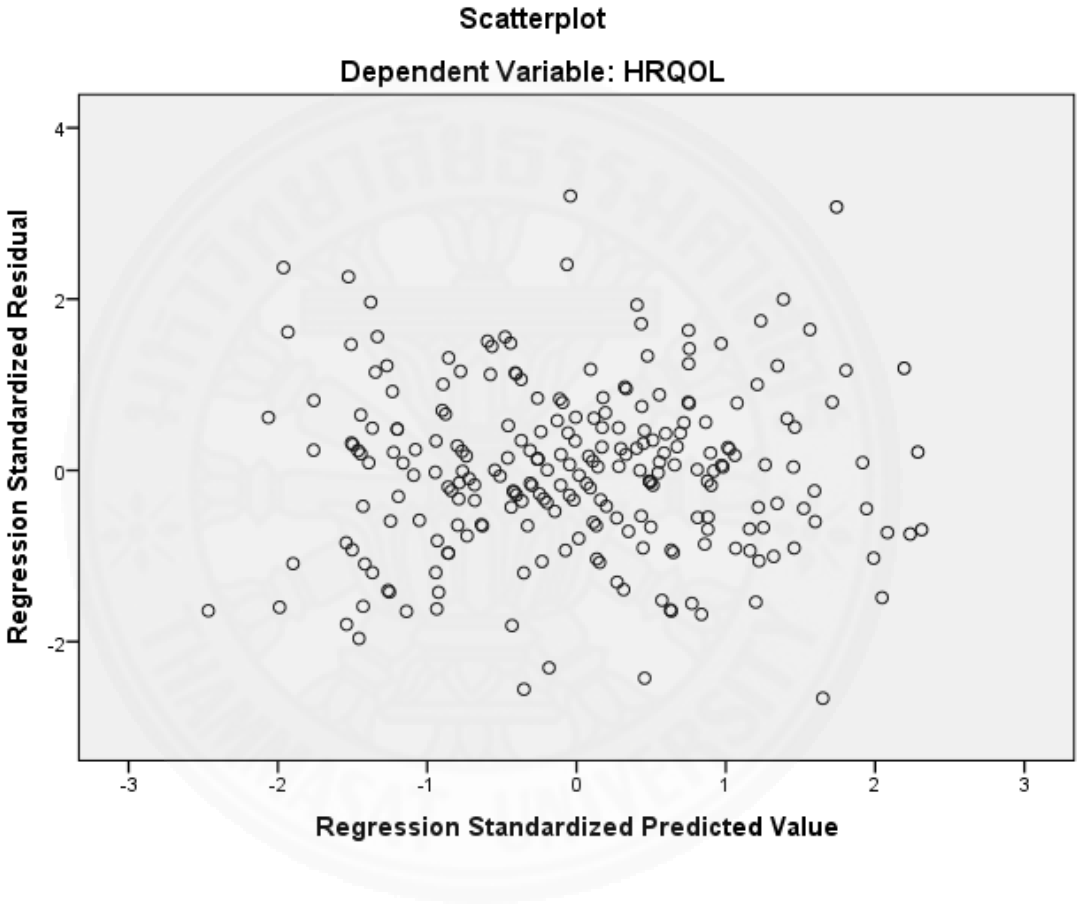

Figure 1. - Scatter plot of residuals against the predicted values of HRQOL

3. Multicollinearity

The Pearson's product moment correlation was using to test the relationship between independent variables. Table 4.5 shows that the highest correlation coefficients among independent variables was 0.643. Therefore, the correlation coefficients among all independent variables of this study were no multicollinearity because it need to be lower than 0.65 (Burn & Grove, 2005) and 0.80 (Steven, 2002). Moreover, tolerance of a variable is used as a measure of collinearity, which variables with high tolerance have small variance inflation factors and vice versa (Hair et al., 2010). Table 2 shows that the tolerance values among all independent variables ranged from 0.465 to 0.961. Therefore, multicollinearity is not a problem in this analysis.

Table 2. - Collinearity statistics of independent and dependent variables

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
4 (Constant)	82.180	3.874		21.213	.000		
Age	-.007	.029	-.008	-.254	.800	.803	1.245
Gender	-.872	.702	-.037	-1.242	.215	.961	1.041
Nutritional status	-1.494	.199	-.320	-7.511	.000	.471	2.121
Social support	-.373	.039	-.412	-9.616	.000	.465	2.148
Pulmonary function	-.104	.020	-.210	-5.304	.000	.546	1.833
Functional performance	-2.459	.811	-.125	-3.032	.003	.505	1.980

a. Dependent Variable: HRQOL

4. Autocorrelation

The Durbin-Watson was selected to test the autocorrelation of residual. If Durbin-Watson value between 1.5 and 2.5, it mean that the residual was autocorrelation. Table 3 revealed that the Durbin-Watson value was 1.868 then the residual was autocorrelation.

Table 3. - Durbin-Watson value of residual

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.775[a]	.601	.595	5.361	1.868
2	.874[b]	.764	.760	4.128	
3	.891[c]	.793	.789	3.872	
4	.895[d]	.801	.796	3.806	

a. Predictors: (Constant), age, gender, nutritional status

b. Predictors: (Constant), age, gender, nutritional status, social support

c. Predictors: (Constant), age, gender, nutritional status, social support, pulmonary function

d. Predictors: (Constant), age, gender, nutritional status, social support, pulmonary function, functional performance

e. Dependent variable: HRQOL

APPENDIX G

Descriptive of Study Variables

Percentage of the SGRQ-C of Thai persons with COPD in each item

Symptom component	More than 5 days per week (%)	3 or 4 days per week (%)	With chest infections (%)	Not at all (%)
1. I cough	22.50	42.90	32.50	2.10
2. I bring up phlegm (sputum)	27.50	39.20	31.30	2.10
3. I have shortness of breath	17.10	44.20	35.40	3.30
4. I have attacks of wheezing	3.80	23.30	55.00	17.90
5. How many attacks of chest trouble have you had	0.40	15.40	63.30	20.80
6. How often do you have good days (with little chest trouble)?	**Every day (%)**	**3 to 5 days per week (%)**	**1 or 2 days per week (%)**	**Not at all (%)**
	20.00	51.70	27.90	0.40
7. If you have a wheeze, is it worse in the morning?	**More than 5 days per week (%)**	**3 or 4 days per week (%)**	**1 or 2 days per week (%)**	**Not at all (%)**
	1.70	9.60	44.20	44.60

Psychosocial impact component	The most important problem I have (%)	Causes me moderate problems (%)	Causes me a few problems (%)	Causes no problem (%)
8. How would you describe your chest condition?	12.50	47.90	36.30	3.30
10. More questions about your cough and breathlessness.	**True**		**False**	
10.1 My cough hurts	14.20		85.80	
10.2 My cough makes me tired	60.80		39.20	
10.3 I get breathless when I talk	27.50		72.50	
10.4 I get breathless when I bend over	10.40		89.60	
10.5 My cough or breathing disturbs my sleep	42.90		57.10	
10.6 I get exhausted easily	18.30		81.70	
11. Questions about other effects your chest trouble may have on you.	**True**		**False**	
11.1 My cough or breathing is embarrassing in public.	38.30		61.70	

Psychosocial impact component	True	False
11.2 My chest trouble is a nuisance to my family, friends or neighbors	30.80	68.80
11.3 I get afraid or panic when I cannot get my breath	54.60	45.40
11.4 I feel that I am not in control of my chest problem	35.00	65.00
11.5 I have become frail or an invalid because of my chest	3.30	96.70
11.6 Exercise is not safe for me	86.70	13.30
11.7 Everything seems too much of an effort	5.00	94.60
13. We would like to know how your chest trouble usually affects your daily life.	**True**	**False**
13.1 I cannot play sports or games	96.30	3.80
13.2 I cannot go out for entertainment or recreation	76.70	23.30
13.3 I cannot go out of the house to do the shopping	10.00	90.00
13.4 I cannot do housework	5.00	95.00
13.5 I cannot move far from my bed or chair	0.40	99.60

14. Tick the statement which you think best describes how your chest affects you.	It does not stop me doing anything I would like to do	It stops me doing one or two things I would like to do	It stops me doing most of the things I would like to do	It stops me doing everything I would like to do
	12.90	55.00	28.30	3.80

Activity component	True	False
9. Questions about what activities usually make you feel breathless.		
9.1 Getting washed or dressed	2.10	97.90
9.2 Walking around the home or outside on the level	13.30	86.70
9.3 Walking up a flight of stairs or hills	70.40	29.60
12. Questions about how activities may be affected by your breathing.	**True**	**False**
12.1 I take a long time to get washed or dressed	3.30	96.70

Activity component	True	False
12.2 I cannot take a bath or shower, or I take a long time	6.30	93.80
12.3 I walk more slowly than other people, or I stop for rests	79.20	20.80
12.4 Jobs such as housework take a long time, or I have to stop for rests	34.20	65.80
12.5 If I walk up one flight of stairs, I have to go slowly or stop	81.30	18.80
12.6 If I hurry or walk fast, I have to stop or slow down	98.80	1.30
12.7 My breathing makes it difficult to do things such as walk up hills, carry things up stairs, light gardening such as weeding, dance.	52.10	47.90
12.8 My breathing makes it difficult to do things such as carry heavy loads, dig the garden, jog or walk at 5 miles per hour.	55.80	44.20

Percentage of the FPI-SF of Thai persons with COPD in each item

	Do with			Don't do because health reasons (%)	Don't do because choose not to (%)
	No difficulty (%)	Some difficulty (%)	Much difficulty (%)		
Body care					
1. Dressing and undressing	87.90	12.10			
2. Showering or bathing	75.80	23.30	0.80		
3. Caring for your feet	91.70	8.30			
4. Washing your hair	91.70	7.5	0.80		
5. Shaving or applying make up	92.10	7.10	0.40		
Maintaining the household					
6. Preparing meals/cooking	31.30	35.00	1.70	0.80	31.30
7. Grocery shopping	35.40	56.70	2.50	0.40	5.00
8. Carrying groceries	27.90	61.30	9.60	0.80	0.40
9. Vacuuming or sweeping	31.70	62.10	4.60	0.80	0.80
10. Moving furniture, changing sheets, or washing windows	9.20	60.00	16.30	2.50	12.10
11. Clean the bathroom/mop the floor	11.30	45.00	19.20	3.80	20.80
12. Water the plants	29.20	60.40	7.10	0.80	2.50
Physical exercise					
13. Regular stretching, moving, or lifting light weights	35.80	59.20	4.60	0.40	
14. Walking up and down a flight stair	17.50	66.70	11.30	4.60	
15. Short walks around the neighborhood or mall	19.60	65.40	13.30	1.70	
16. Long fast walks (more than 20 minutes)	3.30	12.50	38.80	45.40	
Recreational					
17. Taking vacations	19.20	71.30	7.10	2.50	
18. Indoor activities such as shopping	42.50	49.20	5.40	2.90	
19. Sitting outside	61.30	37.90	0.80		
20. Reading	60.40	37.10	2.50		
Spiritual activities					
21. Attending religious services	37.90	49.60	6.70	5.80	
22. Going to religious ceremonies	39.20	47.10	6.30	7.50	

	Do with			Don't do because health reasons (%)	Don't do because choose not to (%)
	No difficulty (%)	Some difficulty (%)	Much difficulty (%)		
23. Personal reading, meditation or prayer	55.00	39.60	4.20	1.30	
24. Visits from spiritual friends or teachers	57.10	36.70	4.20	2.10	
Social activities					
25. Dinner or other activity: in your home	55.40	37.10	4.60	2.90	
26. Dinner or other activity: outside	40.00	51.20	5.80	2.90	
27. Going to the store, giving rides, doing repairs or other favors	37.10	46.30	10.80	5.00	0.80
28. Helping in the care of children	31.70	52.50	10.00	4.60	1.30
29. Distant or overnight travel to visit others	32.50	52.10	10.40	5.00	

Percentage of the MSPSS of Thai persons with COPD in each item

	Very strongly disagree (%)	Strongly disagree (%)	Mildly disagree (%)	Neutral (%)	Mildly agree (%)	Strongly agree (%)	Very strongly agree (%)
Support from family							
3. My family really tries to help me.		0.80	0.80	5.80	15.80	38.80	37.90
4. I get the emotional help and support I need from my family.		0.80	1.70	14.60	32.10	17.90	32.90
8. I can talk about my problems with my family.		0.80	1.70	7.50	14.20	42.50	33.30
11. My family is willing to help me make decisions.		0.80	1.30	3.80	15.40	38.30	40.40
Support from friends							
6. My friends really try to help me.	0.80	0.80	7.10	26.70	32.10	21.70	10.80
7. I can count on my friends when things go wrong.	0.40	1.30	17.10	35.00	22.50	12.90	10.80
9. I have friends with whom I can share my joys and sorrows.	0.80	1.70	10.40	33.80	32.10	16.30	5.00
12. I can talk about my problems with my friends.	0.80	1.70	21.30	28.70	22.10	17.50	7.90
Support from healthcare provider							
1. There are the healthcare providers who are around when I am in need.			0.40	7.50	28.70	32.90	30.40
2. There are the healthcare providers with whom I can share my joys and sorrows.				25.00	30.00	25.80	19.20
5. I have the healthcare providers who are a real source of comfort to me.				29.20	35.80	28.70	6.30
10. There are the healthcare providers in my life who cares about my feelings.				28.70	27.90	35.40	7.90

APPENDIX H

Categories, sub-categories and codes of factors and HRQOL among Thai persons with COPD

Themes	Categories	Sub-categories	Codes
HRQOL	Experiences with physical symptoms	a. Experience with perceived symptoms	1) Shortness of breath 2) Productive cough 3) Insomnia
		b. Experience with activity limitation	1) Unable to perform activities as before 2) Shortness of breath on exertion 3) Avoiding activities
	Experiences with psychological symptoms	a. Uncertainty in illness	1) Uncertainty about changes in symptoms 2) Uncertainty about life 3) Fear of death
		b. Emotional changes	1) Anxiety 2) Frustration 3) Fear of dependence on others
	Perceived social isolation	a. Fearing of going outside the home	1) Fear of difficulty breathing when going outside the home
		b. Fear others will hate and despise	1) Fear of disgust from others caused by symptoms of COPD
	Adherence to self-care practices related to COPD	a. Experience with physical self-care	1) Taking prescription drugs continuously improve symptoms 2) Dealing with shortness of breath as appropriate 3) Controlling food consumption as appropriate 4) Continuing to exercise every day
		b. Experience with psychological self-care	1) Using relaxation techniques
Age	Differences in age were unable to predict disease prognosis	a. Effects of COPD in adulthood	1) Burdens of duties and responsibilities
		b. Effects of COPD in old age	1) More difficulty treating COPD 2) More severe symptoms

Themes	Categories	Sub-categories	Codes
		c. Age unrelated to effects of COPD	1) Age was unrelated to effects of COPD
Gender	Differences in gender aspects were unable to predict disease prognosis	a. Effects of COPD in women b. Effects of COPD in men c. Gender unrelated to effects of COPD	1) Multiple concurrent symptoms 2) Anxiety 1) More severe symptoms 2) Burdens of duties and responsibilities 1) Gender unrelated to the effects of COPD
Nutritional status	Effects of COPD causes persons to receive insufficient nutrients	a. Perceiving less weight due to the effects of COPD b. Higher energy requirements c. Symptoms of insufficient nutrients	1) Eating less due to coughing with mucous 2) Eating less due to abdominal discomfort 1) Normal consumption without weight gain 1) Weakness 2) Perceiving more frequent exacerbation
	Self-care with regard to food consumption	a. Controlling food consumption as appropriated	1) Eating little but more frequently 2) Eating healthy foods 3) Avoidance of exacerbating foods
Social support	Social support creates encouragement	a. Receiving encouragement from family member, friend and healthcare provider	1) Support in taking to rest 2) Listening to problems 3) Perceived concern
	Social support creates convenience	a. Receiving convenience in living from family member, friend and healthcare provider	1) Support with housework 2) Perceived receipt of care 3) Preparations of necessary items 4) Responsibility for expenses
	Social support helps participants receive good recommendations	a. Receiving good recommendations from family member, friend and healthcare provider	1) Receiving accurate recommendation about COPD 2) Sharing experiences in living with COPD

Themes	Categories	Sub-categories	Codes
Pulmonary function	Deterioration of pulmonary function	a. Deterioration of pulmonary function causing physical symptoms	1) Difficulty breathing 2) Coughing with mucus 3) Shortness of breath on exertion
		b. Deterioration of pulmonary function causing psychological symptoms	1) Anxiety 2) Disrupted sleep 3) Hopelessness from chronic illness
	Dealing with degenerative of pulmonary function	a. Experience with physical self-care	1) Dealing with shortness of breath as appropriated
		b. Experience with psychological self-care	1) Use of relaxation techniques
Functional performance	Becoming weary as a result of degenerative disease	a. Experience with activity limitation	1) Inability to perform activities like before 2) Shortness of breath on exertion
		b. Emotional changes	1) Fear of dependence on others 2) Frustration
		c. Fearing go to outside the home	1) Fear of difficulty breathing when going outside the home
	Dealing with degenerative of functional performance	a. Self-care with regard to functional performance	1) Planning to perform activities 2) Asking for help from other 3) Continuing exercise every day

BIOGRAPHY

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