# EFFECTS OF NURSING THERAPEUTICS ON DYSPNEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

SUPALUCK PARINYAVUTICHAI



A THEMATIC PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF NURSING SCIENCE (ADULT NURSING)

FACULTY OF GRADUATE STUDIES

MAHIDOL UNIVERSITY

2001

ISBN 974-665-916-2

Thematic paper

entitled

# EFFECTS OF NURSING THERAPEUTICS ON DYSPNEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Supaluck Parinyavutichai

Mrs. Supaluck Parinyavutichai
Candidate

Pensri Rabieb.

Assoc. Prof. Pensri Rabieb,M.S.
Major – Adivisor

Siriorn Sindhu

Asst. Prof. Siriorn Sindhu, D.N.Sc.
Co-advisor

Liangchai Limlomwongse

Prof. Liangchai Limlomwongse
Ph.D.
Dean
Faculty of Graduate Studies

Kobkul Phancharoenworakul

Assoc. Prof. Kobkul Phancharoenworakul
Ph.D
Chairman
Master of Nursing Science
Faculty of Nursing

Thematic paper
entitled

# EFFECTS OF NURSING THERAPEUTICS ON DYSPNEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

was submitted to the Faculty of Graduate studies, Mahidol University
for the degree of Master of Nursing Science (Adult Nursing)
on
May 2, 2001

Supaluck Parinyavutichai
.....
Mrs. Supaluck Parinyavutichai
Candidate

Pensri Rabieb.
.....
Assoc. Prof. Pensri Rabieb, M.S.
Chairman

Siriorn Sindhu
.....
Asst. Prof. Siriorn Sindhu, D.N.Sc.
Member

Chanokporn Jitpanya
.....
Mrs. Chanokporn Jitpanya,Ph.D.
Member

Suvimol Kimpee
.....
Asst.Prof.Suvimol Kimpee, M.Ed.
Member

Liangchai Limlomwongse
.....
Prof. Liangchai Limlomwongse, Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Kobkul Phancharoenworakul
.....
Assoc. Prof.Kobkul Phancharoenworakul, Ph.D
Dean
Faculty of Nursing
Mahidol University

# ACKNOWLEDGEMENT

I would like to express my sincere gratitude and deepest appreciation to Associate Professor Pensri Rabieb, my major advisor, for her valuable guidance,valuable supervision, assistance and encouragement throughout this study. I am very grateful to have opportunity to be her advisee.

I also would like to express very grateful appreciation to Assistant Professor Dr. Siriorn Sindhu, my co – advisor, for her valuable advice, valuable guidance during this study.

My gratitude is extended to Assistant Professor Suvimol Kimpee and Dr. Chanokporn Jitpanya for their valuable advice and comments about this study.

Spacial thanks are due to the head –nurses and staff nurses of an observe room, the Out Patient Department, Siriraj Hospital for their kind assistance and facilitation of data collection. Especially, I would like to thank all of the patients who willingly participated in this study.

I am particularly indebted to the Nursing Department and Out Patient Nursing Devision at Siriraj Hospital, for providing me with the time and opportunity for this study.

In particular, I am very appreciative of my friends of master's degree at Faculty of nursing, Mahidol University for their encouragement and support. I especially want to thank Mrs. Boonma Lauhapan, my aunt, who encouraged me throughout my study.

Finally, I am very grateful to my parents, my sisters, my husband and my dear sons for their great physical and psychological support. I especially thank them for their encouragement and understanding throughout my study.

Supaluck Parinyavutichai

**4237306 NSAN/ M :MAJOR : ADULT NURSING ; M.N.S. (ADULT NURSING)**
**KEY WORD :NURSING THERPEUTICS/ DYSPNEA/ CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

**SUPALUCK PARINYAVUTICHAI : EFFECTS OF NURSING THERAPEUTICS ON DYSPNEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE : PENSRI RABIEB, M.S., SIRIORN SINDHU, D.N.Sc. 83 p. ISBN 974-665-916-2**

Chronic obstructive pulmonary disease ( COPD) affects the physiology, psychology, and neuropsychology of patients. Dyspnea is the most important symptom which make the COPD patients endure suffering. When the patients had severe dyspnea, they could not manage it by themselves. Eventually, the patients must go to hospital and usually require immediate attention for symptoms of dyspnea that threaten life or function. Delay would be harmful to the patient.

This study was presented as 8 individual case studies which aimed to describe the effects of nursing therapeutics on dyspnea in patients with COPD. The samples were patients with COPD who had symptoms of dyspnea and were treated in the observation room, Out Patient Department, Siriraj Hospital during January to March, 2001. All of the patients received the nursing therapeutics developed for this study, as follows : a) positioning technique helping the patient to achieve a leaning forward position and supine position which are the most comfortable and provide the best physiologic benefit, b) pursed lip breathing ( PLB) that help the patients feel relief and gain better control of breathing by demonstrating PLB to the patients and encouraging them to mimic this technique along with the investigator. These included bronchodilator therapy which was used to reduce bronchospasm. The instrument for data collection was designed by the investigator. Data were analyzed by content analysis.

The results from this study showed that all of the patients were elderly males. Most of the patients had dyspnea 3 – 4 times / week. Most of the patients' own perceptions of dyspnea were difficult or labored breathing, suffocation, and chest tightness. All of the patients perceived infection of the respiratory tract and usual activities as precipitating factors. The symptoms of dyspnea affected both physiological, and psychological response, such as feeling of weakness, fear of death and helplessness. When the patients had severe dyspnea, they could not use inhaled bronchodilator drug in order to manage dyspnea.

The results from nursing therapeutics showed that the satisfaction of the majority of patients with nursing therapeutics were high. All of the patients' own negative perceptions of dyspnea were decreased. The nursing therapeutics in this study appeared to increase peak expiratory flow rate ( PEFR) and oxygen saturation (O Sat), while respiration rate was decreased.

The nursing therapeutics in this study can be used as basic information and guidance for developing the effectiveness of nursing therapeutics to manage symptoms of dyspnea.

4237306 NSAN/M : สาขาวิชา : การพยาบาลผู้ใหญ่ ; พย.ม. (การพยาบาลผู้ใหญ่)

ศุภลักษณ์ ปริญญาวุฒิชัย: ผลของการบำบัดทางการพยาบาลต่ออาการหายใจลำบากในผู้ป่วยโรคปอดอุดกั้นเรื้อรัง (EFFECTS OF NURSING THERAPEUTICS ON DYSPNEA IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASEU). คณะกรรมการควบคุมสารนิพนธ์ : เพ็ญศรี ระเบียบ, M.S., ศิริอร สินธุ, D.N.Sc. 83 หน้า ISBN 974-665-916-2

โรคปอดอุดกั้นเรื้อรัง เป็นโรคที่ก่อให้เกิดผลกระทบต่อบุคคลทั้งด้านร่างกาย, จิตใจ, อารมณ์ อาการหายใจลำบาก เป็นอาการสำคัญที่ทำให้ผู้ป่วยโรคปอดอุดกั้นเรื้อรัง ต้องทนทุกข์ทรมานมาก เมื่อมีอาการรุนแรง ผู้ป่วยจะไม่สามารถจัดการอาการหายใจลำบากได้ด้วยตนเอง จำเป็นต้องมาโรงพยาบาลเพื่อขอรับการรักษาเป็นประจำ การศึกษาแบบกรณีศึกษาครั้งนี้ มีวัตถุประสงค์เพื่อศึกษา ผลของการบำบัดทางการพยาบาลต่ออาการหายใจลำบากในผู้ป่วยโรคปอดอุดกั้นเรื้อรัง กลุ่มตัวอย่างเป็นผู้ป่วยโรคปอดอุดกั้นเรื้อรังที่มีอาการหายใจลำบาก และรับไว้รักษาในหน่วยพักรอดูอาการ ตึกตรวจรักษาผู้ป่วยนอก โรงพยาบาล ศิริราช มหาวิทยาลัย มหิดล ระหว่างเดือน มกราคม ถึงเดือน มีนาคม 2544 จำนวน 8 ราย กลุ่มตัวอย่างทุกรายได้รับการบำบัดทางการพยาบาล โดย1.การจัดท่าให้ผู้ป่วยอยู่ในท่านั่งโน้มตัวไปข้างหน้าแล้ววางแขนทั้งสองข้างบนโต๊ะคร่อมเตียง และท่านอนหงายศีรษะสูงเล็กน้อย เพื่อช่วยให้กล้ามเนื้อช่วยในการหายใจและกระบังลมทำงานได้ดีขึ้น 2. การสอนและแสดงวิธีการหายใจด้วยวิธีเป่าปากและกระตุ้นให้ผู้ป่วยได้ทำตามพร้อมๆกับผู้ศึกษา ร่วมกับการใช้ยาพ่นขยายหลอดลมเพื่อลดการหดเกร็งของหลอดลม ผู้ป่วยทุกคนได้รับการประเมินอาการหายใจลำบาก ด้วยเครื่องมือประเมินที่ผู้ศึกษาสร้างขึ้นเอง ข้อมูลที่ได้นำมาวิเคราะห์โดยการวิเคราะห์เชิงเนื้อหา

ผลการศึกษาพบว่า กลุ่มตัวอย่าง เป็นผู้ป่วยสูงอายุ เพศชายทั้งหมด ส่วนใหญ่มีอาการหายใจลำบาก 3 – 4 ครั้ง / สัปดาห์ ผู้ป่วยมีการรับรู้ว่าตนเองมีอาการหายใจขัด / ไม่สะดวก, หอบเหนื่อย, และแน่นอึดอัดในอกตามลำดับ อาการร่วมอื่นๆที่พบร่วมด้วย ได้แก่ อ่อนเพลีย, ไม่มีแรง, กลัวตาย, และไร้ความสามารถ ปัจจัยกระตุ้นส่วนใหญ่ที่ทำให้มีอาการหายใจลำบากรุนแรง คือ การติดเชื้อของทางเดินหายใจ และการออกแรงทำกิจกรรมต่างๆ เมื่อเกิดอาการหายใจลำบากที่รุนแรง ผู้ป่วยจะไม่สามารถใช้ยาพ่นขยายหลอดลม ในการจัดการอาการดังกล่าวได้

ผลของการบำบัดทางการพยาบาลในการศึกษาครั้งนี้ พบว่า ผู้ป่วยทุกคนมีความพึงพอใจในระดับสูงต่อการบำบัดทางการพยาบาลที่ได้รับ ผู้ป่วยทุกคนรับรู้ด้วยตนเองถึงอาการหายใจลำบากลดลง, ความกลัวตายลดลง ผลของการบำบัดทางการพยาบาลครั้งนี้ทำให้ ระดับความเข้มข้นของออกซิเจนในเลือดแดงเพิ่มขึ้น, ความเร็วสูงสุดในการหายใจออกเพิ่มขึ้น ขณะที่อัตราการหายใจลดลง

การบำบัดทางการพยาบาลที่นำมาศึกษาครั้งนี้ สามารถใช้เป็นข้อมูลพื้นฐาน และแนวทางสำหรับการพัฒนาวิธีการบำบัดทางการพยาบาลให้มีประสิทธิภาพ เพื่อจัดการอาการหายใจลำบากในผู้ป่วยโรคปอดอุดกั้นเรื้อรัง

# CONTENTS


| | Page |
|---|---|
| ACKNOWLEDGEMENT | iii |
| ABSTRACT (English) | iv |
| ABSTRACT (Thai) | v |
| LIST OF TABLES | viii |
| LIST OF FIGURE | ix |
| CHAPTER I INTRODUCTION | 1 |
| Background and significance | 1 |
| Conceptual framework | 2 |
| Statement of question | 7 |
| Purposes of the study | 7 |
| Scope of the study | 7 |
| Definition of terms | 7 |
| Expected benefits | 9 |
| CHAPTER II LITERATURES REVIEW | 10 |
| Chronic obstructive pulmonary disease | 10 |
| Mechanism of dyspnea | 12 |
| Dyspnea Assessment | 19 |
| Nursing therapeutics on dyspnea in patients with COPD | 23 |
| CHAPTER III METHODOLOGY | 31 |
| The study design | 31 |

# CONTENTS (Continued)


| | Page |
|---|---|
| Population and Sampling | 31 |
| Setting | 31 |
| Instrumentation | 32 |
| Data collection | 35 |
| Protection of the patient rights | 37 |
| Data analysis | 37 |
| CHAPTER IV RESULTS | 38 |
| CHAPTER V DISCUSSION | 62 |
| CHAPTER VI CONCLUSION | 70 |
| Summary of the study | 70 |
| Recommendations for practical application | 72 |
| Recommendations for further studies | 72 |
| BIBLIOGRAPHY | 73 |
| APPENDIX A Information consent | 78 |
| APPENDIX B Instruments | 79 |
| BIOGRAPHY | 83 |

## LIST OF TABLES


| Table | | Page |
|---|---|---|
| 1 | Number of Demographic data of patients | 39 |
| 2 | Number of Demographic data of the patients (continued) | 41 |
| 3 | Number of the patients' perception on dyspnea categorized by severity of illness | 42 |
| 4 | Number of the patients' response to dyspnea categorized by severity of illness | 43 |
| 5 | Number of the patients' perception concerning precipitating factors of dyspnea categorized by severity of illness | 45 |
| 6 | Number of the patients' perception concerning frequency of dyspnea categorized by severity of illness | 47 |
| 7 | Number of self – management strategies of dyspnea categorized by severity of illness | 48 |
| 8 | Number of satisfaction level of patients receiving nursing therpeutics | 59 |

## LIST OF FIGURES


| Figure | | Page |
|---|---|---|
| 1 | Conceptual Framework of the study | 6 |
| 2 | Horizontal Visual Analogue Scale | 21 |
| 3 | Severity of Dyspnea measured by VAS for pre & post nursing therpeutics | 50 |
| 4 | Severity of Dyspnea measured by Respiration Rate for pre & post nursing therpeutics | 51 |
| 5 | Severity of Dyspnea measured by PEFR for pre & post nursing therpeutics | 52 |
| 6 | Comparison of means oxygen saturation from 8 patients for pre & post PLB in session 1. | 53 |
| 7 | Comparison of means oxygen saturation from 8 patients for pre & post PLB in session 2. | 54 |
| 8 | Comparison of means oxygen saturation from 8 patients for pre & post PLB in session 3. | 54 |
| 9 | Comparison of means oxygen saturation from 8 patients for pre & post PLB in session 4. | 55 |
| 10 | Comparison of means Respiration Rate from 8 patients for pre & post PLB in session 1. | 56 |
| 11 | Comparison of means Respiration Rate from 8 patients for pre & post PLB in session 2. | 56 |

## LIST OF FIGURES (Continued)


| Figure | | Page |
|---|---|---|
| 12 | Comparison of means Respiration Rate from 8 patients for pre & post PLB in session 3. | 57 |
| 13 | Comparison of means Respiration Rate from 8 patients for pre & post PLB in session 4. | 58 |

# CHAPTER I

# INTRODUCTION

## Background and Significance

The general course of chronic obstructive pulmonary disease (COPD) is one of steady deterioration, marked by exacerbation or flare-ups of pronounced symptoms that often necessitate hospitalization. Nurses caring for patients with this disease need to understand both the physical and the emotional manifestations of COPD to successfully manage the symptoms.

Dyspnea is a symptom frequently reported by patients with COPD, and it plays a central role in their distress. Dyspnea is defined as the subjective sensation of difficult or labored breathing, perceived and interpreted by the patient. The definition implies that the patient's perception of breathlessness, not the observer's assessment, determines whether dyspnea is present. Because dyspnea is hallmarked by subjectivity, knowledge of the patient's perception of the experience is important to the management of dyspnea. Dyspnea contributes to a lower quality of life, a decreased functional status, and increased risk of death.

Dyspnea is the most frequent reason COPD outpatients seek medical advice, yet few obtain relief. Most symptom relief is obtained from pharmacological intervention, but there is no known medication specific for dyspnea relief. Bronchodilators, which are

prescribed to alleviate airway obstruction, provide only partial relief of dyspnea (Mahler,Matthay, Synder, Wells, & Loke cited in Gift, 1992).

When patients come to the hospital or are admitted in the hospital, they want to receive good care and treatment. Healthcare providers should understand patients' perceptions and their management which alleviates symptoms of dyspnea.

The healthcare providers from whom patients expect to receive help and comfort when dyspnea appears are doctors and nurses. Nurses are closer to the patients than other people, so they are able to assess the condition of the patients and improve it more than anyone else. If nurses are also able to know and understand the situation of suffering from dyspnea and the patients' management, then they can not also manage dyspnea efficiently but also respond to the real needs of patients. This is the reason why the investigator was interested in studying about nursing therapeutics to manage symptoms of dyspnea so that the findings can be a reference for nurses in their work of helping dyspneic patients with COPD.

**Conceptual Framework**

Chronic obstructive pulmonary disease (COPD) is characterized by airflow limitation caused by chronic bronchitis or emphysema. Reversible bronchostriction often plays a role in the cause of COPD, but its true magnitude remains to be determined. Most of the time COPD progresses

asymptomically, followed by a period of time when the symptoms, although present, can be ignored or misinterpreted as a natural process of aging. At this point, symptoms may

be experienced only when the patient engages in a physical challenge, such as stair climbing. Over the course of disease progression, lower levels of exertion are sufficient to inflict similar respiratory discomfort. In the last few years of life, dyspnea becomes unbearable, and life becomes restricted to the home. Often, a mortal fear of breathlessness drives the behavioral response as the patient retreats from an active lifestyle to a sedentary existence. Avoidance of activity gives way to physical deconditioning, which further incapacitates the patient in a vicious downward spiral. Further progression of the disease may subject the patient to chest tightness, wheezing, cough with episodic purulent secretions, claustrophobia, depression, anxiety, and insomnia. Eventually, dyspnea at rest leaves no further room for retreat. Patients seek medical intervention during exacerbation or when their dyspnea becomes undeniable and intolerable. Ultimately, other organ systems decompensate from tissue hypoxia, cor pulmonale, undesirable responses to medications, and other associated and additional factors as yet to be identified. Toward end stage, the patient is beset by exacerbation of accelerating frequency and intensity.

The basic pathophysiologic in COPD consists of increased resistance to airflow, loss of elastic recoil, decreased expiratory flow rate, and overinflation of the lung. The alveolar walls frequently rupture in the process (emphysema). The hyperinflated lungs flatten the curvature of the diaphragm and enlarge the rib cage. The altered configuration of the chest cavity places the respiratory muscles, including the diaphragm, at a mechanical disadvantage and impairs their force-generating capacity. Consequently, the metabolic work of breathing increases, and the sensation of dyspnea heightens.

Nursing therapeutics is defined as all nursing activities and actions deliberately designed to care for nursing clients. In this study, nursing therapeutics is integrated nursing interventions which are directed toward treating dyspnea in COPD patients in a timely manner. From the research previously conducted, intergrated nursing interventions such as Pursed-Lips Breathing (PLB), Positioning Technique, and Bronchodilator Therapy can be recommended to decrease dyspnea :

1.Pursed-Lips Breathing (PLB), performed as forced expiration against pursed lips, is a compensatory breathing strategy instinctively employed during a sternous activity to improve exercise tolerance in normal subjects. In normal healthy subjects, PLB has been shown to increase tidal volume, reduce minute inspiratory ventilation at rest and during exercise, prolong expiratory time, and cause expiratory muscle recruitment. Beneficial ventilation and gas exchange response to PLB have been reported in subjects with COPD. These improvements result from increased minute ventilation, increased tidal volume, and a corresponding reduction in the respiratory rate.

2.Positioning Technique is the most frequently reported position used in the relief of dyspnea. The patient learns forward on the edge of a chair with arms and upper body supported on an over-bed table. The bracing of the arms has been shown to increase ventilatory capacity, probably because of improved function of the accessory muscle expanding the rib cage. Patients do not report using the prone position, which has been shown to result in an increase in $PO_2$. The supine position has also been shown to improve ventilation in patients with COPD. Nevertheless patients should be encouraged to try additional positions for their effectiveness in dyspnea relief.

3.Bronchodilator therapy is one in which, as a first step, every effort is made to reduce the resistive and elastic load on the inspiratory muscles by optimizing bronchodilation. In some instance, adjunct anti-inflammatory medication may confer additional benefits. Relief of dyspnea can be achieved with various bronchodilators in the presence of only small improvement in $FEV_1 < 15\%$. In this setting, improvement may be more closely linked to reduced gas trapping with concomitant enhancement of inspiratory muscle function.

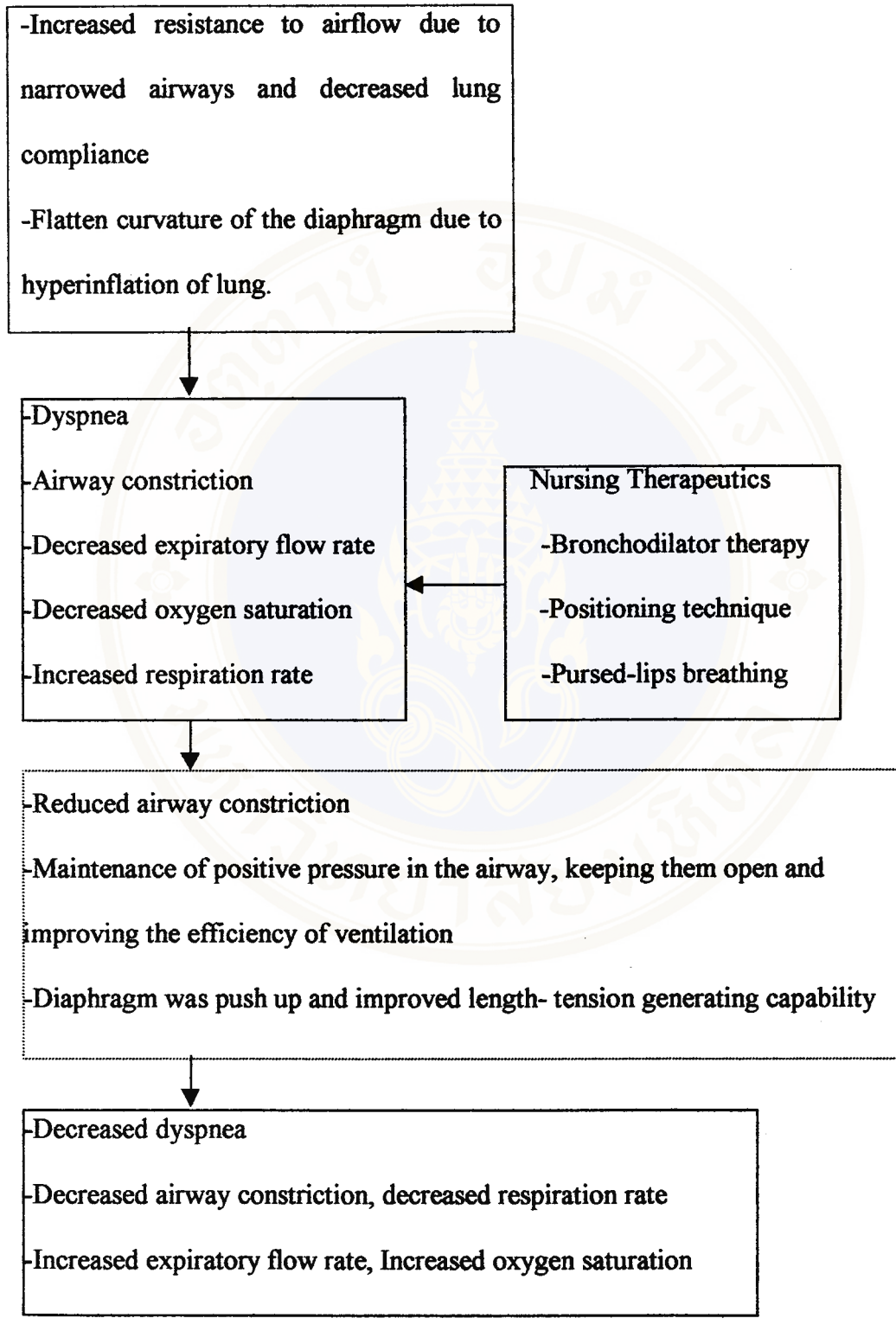


**Figure 1. Conceptual Framework**

**Statement of Question**

Did nursing therapeutics manage the symptom of dyspnea in COPD patients?

**Purpose of the study**

The purpose of this study was to describe the outcome of nursing therapeutics in dyspneic patient with COPD.

**Scope of the study**

This study was a case study which examined effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD). The population were patients diagnosed with chronic obstructive pulmonary disease, aged 15 years or older, who had symptoms of dyspnea and were treated as in-patient at Siriraj Hospital from January to March,2001.

**Definition of terms**

Dyspnea experiences refer to symptoms and feelings that patients perceive when dyspnea appears. They cover symptom perceptions which means the perception of symptoms which causes changes in the body, symptoms evaluation which means the decision about dyspnea and the response to dyspnea which is a behavior problem which physical, psychological and emotional aspects. Data regarding dyspnea experiences were collected by use of open – ended questionnaires developed by the investigator.

Nursing therapeutics is defined as integrated nursing interventions which are directed toward helping dyspneic patients to breathe more easily including :

1.Pursed-Lips Breathing - the patient inhales deeply and then exhales slowly through lips that are pursed (as one would do when whistling). It is generally believed that the benefits from pursed-lips breathing result from added positive airway pressure during expiration and prolongation of expiration that is twice as long as inspiration.

2.Positioning technique - a major effect of the supine and leaning forward position is to improve the function of the low flat diaphragm. Because the hydrostatic effect of the abdominal contents tend to push the diaphragm up, lengthening its muscle fibers and thus increases its tension generating potential. A further effect of leaning forward, particularly when the upper extremities an shoulder girdle are stabilized, may be to increase the effectiveness or efficiency of the inspiratory accessory muscles.

3.Bronchodilator therapy - in the hospital, aerosolized bronchodilators are usually delivered by nebulizers. The frequency of administration aerosolized bronchodilators will depend upon the severity of the illness. As the patient improves, the frequency of administration should be dictated by the duration of the drug administered. Administration of the aerosol bronchodilators by nebulizer should be performed by respiratory care personnel or other trained hospital personnel to treat patients who are acutely ill, confused, or feeble.

In this study, data regarding effects of nursing therapeutics were collected by use of the measurement of perception of dyspnea, the measurement of airway obstruction, the measurement of oxygen saturation, and respiration rate.

**Expected outcomes and benefits**

1. Nurses might understand the patients better and be more concerned about their abilities to cooperate in the treatment process.
2. Development of nursing therapeutics concerning dyspnea management in patients with COPD may be implemented.

# CHAPTER II

# LITERATURE REVIEW

This chapter reviews the literature related to effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease. A review of related literature will be presented in sequence as follows :

1. Chronic obstructive pulmonary disease
2. Mechanism of dyspnea
3. Dyspnea assessment
4. Nursing therapeutics on dyspnea in patient with COPD

**Chronic obstructive pulmonary disease (COPD)**

COPD is characterized by airflow limitation caused by chronic bronchitis or emphysema. COPD is common, costly, and preventable disease that has implications for global health. It is the fourth leading cause of death in the United States, excluded only by heart attacks, cancers, and stroke. Among 28 industrialized countries, the United States ranks 12$^{th}$ in COPD mortality for men and seventh for woman. It has been estimated that by the year 2020, COPD will be fifth among the conditions that will be the highest burden to society on a worldwide scale. Hospitalization rates are rising dramatically. Economic costs are enormous, estimated at more than $14 billion in the United States alone. At best, current treatment, although very valuable in selected patients, are only palliative. (Hurd, 2000 :1s)

In Thailand death resulting from COPD is the fourth among the group of respiratory disease. In 1997, the death rate per 100,000 population was 33.8 for COPD. However, data on the death certificates for the cause of deaths is inaccurate because the majority of death occurred from outside the hospitals. Therefore, in 1997-1998, the cause of death was investigated and it was found that the COPD deaths ranked the fifth and the death rate per 100,000 population was 33.5 for COPD, which was nearly 10 times higher than the manifestation in death certificates. The gender-adjusted death rate per 100,000 population was 44.1 for men, and 22.9 for women. Furthermore, the age-adjusted death rates for COPD were over 35 years and higher in men than in women (Chuprapawan, J., 2000 : 255).

**Pathophysiology of COPD**

The basic pathophysiologic process in COPD consists of increased resistance to airflow, loss of elastic recoil, decreased expiratory flow rate, and over inflation of the lung. The alveolar walls frequently rupture in the process(emphysema). The hyperinflated lungs flatten the curvature of the diaphragm and enlarge the rib cage. The altered configuration of the chest cavity places the respiratory muscles, including the diaphragm, at a mechanical disadvantage and impairs their force-generating capacity. Consequently, the metabolic work of breathing increases and then the alterations in regional ventilation and blood perfusion result in hypoxemia. In some cases, the increased dead space, decreased alveolar volume, and hypoventilation that is observed in hypercapnia and the sensation of dyspnea heightens (Celli, 2000 : 153).

Dyspnea, the sensation of difficult, uncomfortable breathing, is the most incapacitating and distressing symptom experienced by the patients with COPD.

Dyspnea contributes to a lower quality of life, a decreased functional status, and an increased sick of death (Gift, 1992 : 242). The experience of dyspnea is usually very distressing and may be perceived as life threatening. A number of therapies are used to help alleviate this distressing sensation, but none of them eliminates dyspnea completely (Gift, 1989 : 323).

**Mechanism of Dyspnea**

It is thought that the sensation of dyspnea takes place using the same receptors and nerve pathways involved in the normal control to respiration. Breathing is mostly and unconscious, automatic process controlled by centers in the brainstem that takes place without awareness or discomfort. This process can be overridden by the cortex if voluntary control is desired and can be influenced by other parts of the brain such as the limbic system or the hypothalamus (Gift, 1990 : 956).

Control of breathing may be divided into three interrelated categories : neural, mechanical, and chemical. Associated physiological process direct respiratory muscle activity and affect adjustments in breathing pattern so that respiratory muscles perform a minimum amount of work for any given level of ventilation, Such control mechanisms allow the respiratory and other body systems to work together and to adapt to changing conditions during breathing. In addition, these mechanisms allow alterations to compensate for any respiratory problem that might arise in the clinical setting .

**1.Neural control** Breathing is coordinated by the respiratory centers in the brain stem, the medullary respiratory center and the apneustic and pneumotaxic centers. These centers are not discrete structures but rather poorly defined collections

of neurons with complex, interrelated, and incompletely understood functions. Impulses from the brain stem are involuntary and produce the automatic process of breathing. Within certain limits, however, the cerebral cortex of the brain can override the brain stem activity to produce voluntary breathing, such as voluntary hyperventilation and breath holding.

- Medullary respiratory center - The interaction between the inspiratory and expiratory components of the medullary respiratory center results in the rhythmic inspiratory and expiratory phases of respiration. These components maintain their inherent rhythmicity by inhibiting each other reciprocally, thus the expiratory component is temporarily inhibited.

- Apneustic and Pneumotaxic centers - Located in the pons just anterior to the medulla, these centers affect the activity of the mudullary respiratory center. The apneustic center stimulates inspiration, even when the brain stem is served just above this center. This center is inhibited by vagus nerve stimulation, by the pneumotaxic center, or by the expiratory center in the medulla. The pneumotaxic center is thought to inhibit inspiration by inhibiting the apneustic center and possibly by directly inhibiting the inspiratory component of the medullary center. In so doing, it regulates the respiratory rate.

- Nervous stimulation of main effector muscles - Rhythmic neural stimulation from the medulla descends within the spinal cord and innervates the thoracic cage via two sets of nerves. First, high cervical spinal nerves join together to form the phrenic nerve and exit the spinal cord at level C3-C5. Innervating the two hemidiaphragm, the right and left phrenic nerves coordinate abdominal breathing. Second, intercostal nerves exit from the thoracic region and innervate the intercostal

muscles, those responsible for movement of the mind and upper sections of the thoracic cage.

One can see that the medulla's role in breathing is crucial. As the central controller of respiration, it coordinates respiratory muscle activity through appropriate nervous activity. Without properly functioning nervous control, and breathing becomes uncoordinated the thoracic muscles may try to initiate inspiration while the abdominal muscles are still completing exhalation.

**2. Mechanical control** Signals from mechanical receptors in the lungs, airway, and chest wall alter the tension of their respective receptor organs and trigger reflexes. These reflexes modify the complex activities of the medulla and pons, ultimately producing changes in depth and rate of respiration. Most reflexes can be defined as follow :

- Pulmonary stretch receptors are located within bronchial and bronchiolar smooth muscle and in smooth muscles around the trachea. Lung distention stimulates these stretch receptors, which in turn stimulate the medullary center to inhibit further inspiration and inflation. This so-called Hering-Breuer reflex decreases depth of respiration by prolongation of the expiratory component of the medullary center although this reflex is thought to prevent over distention of the lung.

- Irritant receptors are located in airway epithelium from the trachea down to respiratory bronchioles and seem to be more active in certain locations. The receptors are stimulated by long irritants (e.g. cigarette smoke, noxious gases, inhaled dusts, and cold air, collapse of bronchial walls and airway narrowing due to COPD. The effect of receptor stimulation is reflex hyperventilation and coughing when the

tracheobronchial tree is exposed to sudden. Mechanical deformation or noxious chemical stimuli.

- Juxtacapillary or J receptors are located in alveolar walls close to capillaries. They are stimulated by alveolar wall distortion, as in engorged pulmonary capillaries and increased interstitial fluid volume. Also, J receptor are thought to play a role in the sensation of shortness of breath in interstitial lung disease. Stimulation produces rapid, shallow breathing, and intense stimulation may cause cessation of breathing

- Chest wall receptors are located in the wall of the thorax. These receptors are believed to be responsible for the sensation of dyspnea In the presence of disease, receptor input about the position of the chest wall produces changes in intercostal muscle activities and modification of breathing pattern. For example. With intercostal muscle contraction during acute airway obstruction, chest wall receptor stimulation produces a reflex in crease in inspiratory effort. This response is capable of producing normal alveolar ventilation.

**3. Chemical control** The body has central and peripheral chemoreceptors that respond to changes in the chemical composition of surrounding body fluid. Chemical changes alter the rhythmic inspiratory and expiratory phases of respiration established by the respiratory centers in the brain.

- Central Chemoreceptors - These receptors are located near the ventral surface of the medulla near the exit of the ninth and tenth cranial nerves. They respond to changes in hydrogen ion ($H^+$) concentration in brain extra cellular fluid-an increase in $H^+$ stimulates ventilation and a decrease inhibits it. Although local blood flow and cell metabolism near these receptors alter $H^+$, the amount of $CO_2$ in cerebrospinal

fluid (CSF) is the chief factor governing central chemoreceptor activities. Molecular $Co_2$ readily diffuses across the blood-brain barrier into CSF. Other ions, such as and bicarbonate ($HCO_3^-$), do not readily cross the blood brain barrier. When blood is high in bicarbonate ions, 36 to 48 hours are necessary for these ions to cross the barrier. When $PaCO_2$ rises, $CO_2$ readily diffuses in CSF, and $H^+$ ions are liberated from cerebral blood vessels. The extra supply of H+ decreases blood and CSF pH. This stimulates the central chemoreceptors and produces a compensatory hyperventilation which, in turn eliminates the extra $CO_2$ from the body.

The central chemoreceptors are important receptors exerting minute-by-minute control of breathing. An acute change in CSF chemical composition affects ventilation more than the same degree of change if arterial blood. Because of its different composition, and because it is more acidic and contains less protein than blood-CSF is less able to adapt of chemical changes.

- Peripheral chemoreceptors - These receptors are located peripherally in the aortic bodies above and below the aortic arch and in the carotid bodies at the bifurcation of the common carotid artiries. In humans, the carotid rather than the aortic bodies are more active in the control of breathing. Peripheral chemoreceptors respond to chemical changes in arterial blood. The following chemical changes all stimulate breathing and lung ventilation : (1) decreased $PaO_2$, (2) excess $H^+$ (decreased blood pH), and (3) increased $PaCO_2$ (in the carotid bodies only). The greater the drop in $PaO_2$ below normal, the greater the increase in respiratory rate. In response to changes in $PaCO_2$, peripheral chemoreceptors contribute only 20% of the total ventilatory response; most the ventilatory response is attributed to central chemoreceptor activity. Most importantly, chemical changes sensed by peripheral chemoreceptors act

synergistically. For example, the increase in chemoreceptor activity as a result of the lack of oxygen is potentiated by a simultaneous increase in $PaCO_2$ or decrease in blood pH.

**4.Other factors** The rhythmicity of normal breathing may be altered by other nervous and physical factors. Peripheral nerve receptors may send impulses up the spinal card to the brain, which trigger changes in respiratory rate and depth. The sensation of cold, pain, and pressure to the skin have this effect. Other factors include passive movements of joints, emotional states such as anxiety, or anger ; and various activities that normally interrupt breathing such as sneezing, coughing, glottis closure with swallowing, gagging, and vomiting.

**The mechanisms that produce dyspnea fall into four major categories** (Ambrase, 1998 : 42) :

1. **Chemical stimulation** Addressed $PaO_2$ or an increased $PaCO_2$ stimulates the respiratory center in the brain to alter the respiratory pattern. To maintain normal concentrations of $PaO_2$ and $PaCO_2$, a person may need to breath forcefully, which causes the respiratory muscles to work harder.

2. **Neural stimulation** Neural stimulation can further be divided as follows :

2.1 The stretch receptors are sensitive to increases in lung volume. When stimulated, they cause a decreased in lung volume.

2.2 The irritant receptors are stimulated by dust, noxious chemicals, contraction of bronchial smooth muscle, and stretching of the bronchial wall. Irritant receptor stimulation causes airway constriction rapid, shallow breathing.

3. **Mechanical stimulation** Pulmonary diseases can cause a decrease in lung volume, narrowed airways and decreased lung compliance. If the lungs or airways contain mucus or edematous, the respiratory muscles must work harder to overcome the increased airway resistance and maintain adequate lung volume. When compliance is decreased, the respiratory muscles must exert greater effort to achieve adequate ventilation.

4. **Emotional causes** Unlike organic dyspnea, which occurs along with measurable changes in pulmonary function, neurotic dyspnea occurs in the absence of disease. Although the patient complains of severe dyspnea, his or her pulmonary function studies are normal. A person with neurotic dysnea can experience irregularity in both the rate and depth of respiration. Unfortunately, this type of dyspnea is cyclic - Dyspnea makes the patient anxious about his or her ability to breathe, and as the patient becomes more anxious, he or she becomes more dyspena.

Dyspnea is initiated by a variety of stimuli that may operate individually or require several stimuli to be stimulated simultaneously. These stimuli include chemical changes such as pH changes, increase $CO_2$ or decreased $O_2$, that stimulate the chemorceptors ; chemical changes in the pulmonary circulation that stimulate the juxtacapillary receptors ; inhaled irritants, such as noxious fumes that stimulate the irritant receptors in the nose, nasopharynx, larynx and trachea ; and mechanical stimuli resulting from respiratory muscle force or tension, or from an increased magnitude of the central motor command output to the respiratory muscle that stimulates the pulmonary stretch receptors, the muscle spindles of the intercostal muscles, or the tendon organs of the diaphragm. Afferent impulses are transmitted to the brain stem to control respiration and to the higher centers of the brain resulting in the conscious

awareness of dyspnea. Much evidence indicates that dyspnea may be an imbalance among various inputs such as the dissociation between chemical drive and afferent signals produced by motion of the lung and chest wall (Gift, 1990 : 956). Furthermore, there are others factors affecting the perception of dyspnea. Older adults report lower levels of dyspnea than do younger individuals. There is some indication that women may report higher levels of dyspnea than men. Disease states influence the perception of dyspnea as well. For example, those with diabetes mellitus tend to have a diminished perception of dyspnea.

**Dyspnea Assessment**

There are a variety of techniques used to assess dyspnea, most of which simply examine the intensity of the sensation. Some are more appropriate for a rehabilitation setting, where as others can be used in a variety of setting. The success of nursing therapeutics in this study depends upon how well we understand the characteristics of the patient's dyspnea. This section summarizes the assessment tools taken during the initial and ongoing assessment of the patient to evaluate these characteristics.

**1. Clinical Indicator of Dyspnea**

Although dyspnea is a subjective symptom, it is helpful for the nurse to identify clinical signs that indicate the presence of dyspnea in those who are unable to communicate. The sign that appears to be most relevant is the degree of sternocleidomastiod muscle retraction. When there is great dyspnea the accessory muscle of respiration may be called into play. During inspiration, the sternocleidomastoid and other neck muscle contract, the nares are dilated by the alae

nasi and there are often gasping movements of the mouth. In addition, the sternum is displaced outwards and the ribs and clavicles are more horizontal than normal. This can be assessed by absorbing the clavicle to determine if it rises with inspiration and then evaluating the degree of rise on scale from 0 to 3 (Gift, 1990 : 960).

- The rate and depth of respiration should be observed without the patient's knowledge, as consciousness of the act of breathing tends to make it irregular. The rate varies in normal individuals between 16 and 20 times/min at rest, but is faster in children and slower in old people. It bears a definite ratio to the pulse rate of about 1 : 4, which is usually constant in the same individual. An increased rate (tachypnea) and depth (hyperpnea) occur when there is an increased demand for ventilation, as the lungs are associated with hypoxia or hypercapnia (Ogilvie, Colin & Evans, C.C., 1987 : 169-195). In addition, auscultating the breath sounds is diminished, and expiration is prolonged and there may be wheezing, but the wheeze may only by apparent during a forced expiration.

**2. Self-report Measurements**

The self-report measurements most often used are the Graphic Rating Scale (GRS), the Visual Analogue Scale (VAS), and the Borg Scale. The GRS is an ordinal scale with numbers and descriptors asking patients to indicate their level of dyspnea. The scale, although simple , is limited in sensitivity to the numbers on the scale, and the descriptors are subject to interpretation by the different individuals using the scale.

Dyspnea is a subjective experience that can be described as a crisis situation ; consequently, a self-report measurement that is easy to understand and use in suck a situation was needed. The patients with COPD tend to be elderly and have poor eyesight, and since an individual's visual field narrows in a crisis situation, the most

useful measurement of dyspnea would be one that is easy to see and interpret. The measure of dyspnea was the visual analogue scale with established validity, reliability, and sensitivity (Gift, 1989 : 323). The visual analogue scale consisted of 100 mm. lines with the anchors "no shortness of breath" at the low end and "shortness of breath as bad as it con be" at the high end. The patients with COPD are instructed to indicate their present degree of breathlessness by marking an X at some point on the 100 mm. scale.


**Figure 2. Horizontal Visual Analogue Scale (from Gift, 1989 : 325)**

**3. The measurement of airway obstruction**

The measurement of airway obstruction chosen is the Wright Peak flow Meter, which is designed to measure peak expiratory flow rate (PEFR) and used to assess the progress of COPD patients during a dyspenic episode. The peak flow meter is a simple device that records PEFR in liters per minute. PEFR is a measurement of maximal airflow rate that can be attained during a forced expiration and reflects the degree of airflow obstruction, so it is an indicator of airflow obstruction. The patient is instructed to take a deep breath and blow into the device as hard as possible. This maneuver is repeated three times, and the highest value is recorded. The values obtained with this device are used to determine the effectiveness of therapy in patients with COPD using objective data (Janson-Bjerklie, 1988 : 543 ; Gift, 1988,596).

**4. the measurement of oxygen saturation**

Continuous measurement of arterial oxygenation can be done by instruments including noninvasive transcutaneous oxygen tension monitors and oximeters. Pulse oximeters are the most recently available noninvasive arterial oxygen saturation ($SaO_2$) monitors (Szaflarski, N.L. & Cohen N.H., 1989 : 445). Pulse Oximeter offer several distinct advantages over other monitors of oxygenation for critically ill patients. It requires no calibration, skin preparation, or tissue heating. Initial $SaO_2$ readings are generally available within 15 seconds of sensor application. Real-time $SaO_2$ reading are displayed as long as a pulse is detected by the sensor. In general, no data are reported when pulsation are lost. A variety of sensor have been developed to monitor $SaO_2$ on the ear, finger, and toe, as well as on the bridge of the nose (which senses pulsation from the anterior ethmodial artery). This variety is needed to accommodate critically ill adults who have limited monitoring sites because of impaired peripheral perfusion, burns, amputations, wounds, edema, gangrene, infection, sutures, lines, and dressing. Disposable sensors may help reduce nosocomial infection in the ICU. A considerable number of studies have examined the use of pulse oximeter in conjunction with pursed lips breathing to improve $SaO_2$ while also investigating the concomitant response of respiratory rate (Szaflarski, N.L. & Cohen, N.H., 1989 : 448-449; Ehrhardt, B.S., 1990 : 50-54; Tiep, B.L., et. Al., 1986 : 218).

In this study, the VAS, Wright Peak Flow Meter, Pulse Oximeter, and clinical signs were conducted to evaluate the effectiveness of nursing therapeutics on dyspnea in patients with COPD.

**Nursing therapeutics to reduce dyspnea in patients with COPD**

Nursing therapeutics is defined as all nursing activities and action deliberately designed to care for nursing clients. While the nursing process address patterns in assessing, diagnosing, and intervening, nursing therapeutics considers the content of nursing interventions and the goal of such intervention (Meleis, 1997 : 111). The therapeutic goals for treating dyspnea is to decrease the distress of dyspnea because the ideal approach to treat dyspnea is to treat the underlying cause and eliminate the symptom. Unfortunately, that is rarely possible, especially in those treated for chronic airway obstruction. Therefore, the nursing therapeutics to decrease dyspnea is directed at altering one or more of the proposed causes of the symptom. In the following section, the rational for each of the potential management strategies along with relevant supporting information Based on clinical results are described. Although most of these investigations have examined the problem of dyspnea in patients with COPD, it is possible that these therapeutic options may also be applied with patients with other causes of chronic respiratory disease. In this study, the conduct of appropriate nursing therapeutics on dyspnea in patients with COPD were categorized by characteristics of nursing intervention such as conventional therapeutics, and potential therapeutics as follows ( Sindhu, S.,2000:20 –21).

**1. The conventional therapeutics** The conventional therapeutics is to treat the underlying cause and eliminate the cause of health problem. Patients with COPD have a limited ventilatory rescue. One of the cornerstones in the treatment of COPD is the use of pused-lips breathing (PLB). Clinically, the goal of PLB is to relieve and control dyspnea. Previously reported responses to PLB are increases in tidal volume (Vt), arterial oxygen level, and arterial oxygen saturation ($SaO_2$) as well as reductions

in respiratory rate (RR) and arterial carbon dioxide level. Although it has been speculated that PLB leads to and improvement in the efficiency of breathing, on improvement in oxygen uptake, carbon dioxide production, alveolar arterial gradient, or diffusing capacity have been demonstrated. It has been suggested also that PLB leads to the maintenance of a positive pressure in the airways, keeping them open and improving the efficiency of ventilation/perfusion matching by expanding lung volume, minimizing the dead space to tidal volume ratio and recruiting more alveolar units at the lung base. As a result, PLB temporally raised oxygen saturation for the period of time the maneuver is being performed. With the biofeedback guidance of pulse oximeter, PLB is useful in dyspenic patients to increase their oxygen saturation. Because many patients are reassured by PLB, it is useful in self-recovery when panic begins to set in. Also, PLB during on dyspenic episode is an effective way to control over dyspnea under controlled adverse conditions. (Thorman, et al., 1965 : 100 ; Tiep ; et al., 1985 : 218 ; Spahya & Grassino, 1996 : 1772 ; Ugalde, 2000 : 472)

To guide the patient in pursed-lips breathing, stand directly in front of and breathe along with him or her. Tell the patient to inhale deeply through the nose ("smell the flowers") and exhale slowly through pursed-lips at least twice as long as inhaling ("blow out the candle"). The pursed- lip should resist the speed of exhaled air. This sequence can be repeated as needed be or several times a day. Some patients may discover alternative ventilatory patterns that bring them relief, while others will settle on dysfunctional patterns. It is not prudent to simply instruct patients to change their breathing pattern without evaluating the possible reason for the existence of that pattern. It is helpful to measure dyspnea and arterial oxygenation to determine the effectiveness of PLB as well (Tiep, 1997 : 1642).

**2. Potential therapeutics** The potential therapeutics is provided to support even more effective in ameliorating the conventional therapeutics, such as positioning technique, and bronchodilator therapy. During dyspenic episodes, the most frequently reported positions used in the relief of dyspnea are leaning forward with arms supported on an over-bed table and supine position. Additionally, the bronchodilator therapy is commonly used in chronic lung disease to decrease bronchospasm and improve mucociliary clearance, but it rarely eliminates the symptom completely.

**2.1 Positioning technique** During dyspenic episodes, nurses should help the patients find the position that's most comfortable and provides the best physiologic benefit. The most frequently reported position used in the relief of dyspnea is leaning forward on the edge of a chair with arms and upper body supported on an over-bed table. The bracing of the arms has been show to increase ventilatory capacity, probably because of improved function of the accessory muscles expanding the rib cage. The supine position has been shown to improve ventilation in patients with COPD, but its effect on dyspnea has not been studied. Patients should be encouraged to try additional position for their effectiveness in dyspnea relief (Gift, 1990 : 961-2).

Diaphragmatic function is apparently improved by the leaning forward and supine position. Because of the hydrostatic effect of the abdominal contents, the essentially liquid contents of the abdomen exerts a hydrostatic pressure effect upon the structures bounding, including the diaphragm. In the supine position the abdomen's hydrostatic zero level is just below the anterior abdominal wall, and the resulting hydrostatic effect tend to push the diaphragm up (cephalad), lengthening its muscle fibers, and thus increasing its tension-generating potential. This surely is the

explanation for the improved diaphragmatic function observed in the supine position in patients with low, flattened, and thus overly shortened diaphragms.

In the leaning forward seated posture the flexion of the hips and the formation of a lap during sitting compresses the abdominal contents. That such abdominal compression expands the rib cage has been confirmed by Goldmen and Mead who described this effect to interaction of the rib cage with the diaphragm, which is stretched by such abdominal compression. A further effect of leaning forward, particularly when the upper extremities and shoulder girdle are stabilized, may be to increase the effectiveness or efficiency of the inspiratory accessory muscles.

Finally, The leaning forward and supine positions appear to improve diaphragmatic function by improving the diaphragm's length-tension status. Thus, the diaphragm generated more pressure for the same or lesser neurogenic input, making its output parameters (shortening and force) more appropriate to each other and to its neurogenic input. The improved function of the diaphragm allow the accessory muscles to reduce the amount of work they do, which decreases the stimulus to respiratory centers arising from mechanoreceptors or chemoreceptors in these muscles (Sharp, et al., 1980 : 201-210).

**2.2 Bronchodilator therapy** In medication therapy for the management of acute COPD recommend inhaled bronchodilators as first therapy in order to reduce bronchospasm and improve mucociliary clearance, but nursing therapeutics of this study, bronchodilator therapy is the potential therapeutics that is provide to support even more effective in ameliorating the symptom of dyspnea. In the hospital, aerosolized – bronchodilators are usually delivered by nebulisers. Administration of the aerosol bronchodilators by nebuliser should be performed by respiratory care

personnel or other trained hospital personnel for patients who are acutely ill, confused, or feeble. The frequency of administration of aerosolized bronchodilators will depend upon the severity of the illness but may be required as often as every hour in these dyspenic patients. As the patient improves, the frequency of administration should be dictated by the duration of action of the drug administered as follows :

1. Beta - adrenergic agonists : Short – acting β - agonists such as albuterol and terbutaline are bronchodilators utilized in the intermittent relief of symptomatic bronchospasm and bronchial edema. The increasingly common practice of designating these drug only for PRN rescue, rather than regularly scheduled dosing, is derived from concern raised in asthmatics and recent studies in COPD demonstrating tolerance from regular use. The data from these studies are suggestive, but not conclusive in this population. A typical plan in for ipratropium to be used on a regular schedule plus PRN with inhaled beta-agonist used PRN only. It has been shown to decrease bronchospasm after-inhaled administration for 5-10 minutes.

2. Anti cholinergies : Ipratropium bromide, a quaternary ammonium derivative of atropine, suppresses vagally mediated airway smooth muscle contraction and reduces mucus secretion, It is at least as effective as beta-adrenergic agomist, but is slower in onset and maintains activity longer. Ipratropium also diminishes sputum production without altering viscosity. It is well tolerated when taken regularly with no demonstrated attenuation. Ipratropium is not ideal as a single rescue agent for patients in respiratory distress, Thus, it is commonly recommended as first line therapy prescribed on a regular schedule relegating beta-agonists as a PRN rescue drug for immediate symptom relief. Often, ipratropium bromide is used as a companion agent to the beta agonists during rescue to affect longer – lasting relief of airway obstruction.

Three sets of guidelines for the management of COPD that are widely recognized from the European Respiratory Society (ERS), American Thoracic Society (ATS), and British Thoracic Society (BTS) are reviewed and compared. None of the documents uses classic evidence – based documentation, and in many instances, the recommendations are empiric because of a lack of scientific evidence. Overall, there is strong agreement between these documents. All three guidelines recommended inhaled bronchodilators as first – line therapy. Anti cholinergics are noted to be well tolerated, although potential problem with Beta – agonists are mentioned (Ferguson, 2000 : 23 S). Both have been shown to decrease dyspnea when they are used separately and are even more effective in ameliorating dyspnea when they are used together (Gift, 1990 : 960-961).

In this study, the nursing therapeutics will be successful depend on nurse – patient relationship which is most often used at the beginning of nursing interventions. All patients with breathlessness, whether it is the result of physical or psychological causes, deserve to be treated with empathy and compassion. If nurses listen to the anguish associated with this symptom and stay with them until the sensation passes, as well as bear the confusion, fear, frustation and anxiety the patients speak of, the outcome will be therapeutic for both the nurses themselves and their patients (MacDonald, 1998 : 71-72 ; Suwanvaecho, S., 1999:6-19). Researchers have also asked the patients what helped them during an acute episode of dyspnea. Their answer "To be cared for by a knowledgeable and compassionate nurse." The patients need to know that the nurse understand how frightened they were. Nurses who acknowledge the patient's fear, remained calm, and demonstrate breathing techniques to help moderate their fear (Ambrose, 1998 : 43).

Overall, most of the time the course of COPD progresses asymptomatically, followed by a period of time when the symptoms, although present, can be ignored or misinterpreted as natural process of aging. At this point, symptom may be experienced only when the patient engages in a physical challenge, such as stair climbing. Over the course of disease progression, lower levels of exertion are sufficient to inflict similar respiratory discomfort. In the lost few years of life, dyspnea becomes unbearable, and life becomes restricted to the home. Often, a mortal fear of breathlessness drives the behavioral response as the patient retreats from an active lifestyle to a sedentary existence. Avoidance of activity gives way to physical deconditioning, which further incapacitates the patient in a vicious downward spiral. Further progression of the disease may subject the patient to chest tightness, wheezing, cough with episodic purulent secretions, depression, anxiety and isomnia. Eventually, dyspnea at rest leaves no further room for retreat. Patients seek medical intervention during exacerbations or when their dyspnea becomes undeniable and intolerable. Dyspnea is a symptom frequently reported by patients with COPD, and it plays a symptom frequently reported by patients with COPD, and it plays a central role in their distress. Dyspnea is defined as the subjective sensation of shortness of breath, perceived and interpreted by the patient himself or herself. The experience of dyspnea is usually very distressing and may be perceived as life threatening. A number of therapies are used to help alleviate this distressing sensation, but none of them eliminates dyspnea completely. Therefore, the investigator was interested in searching for precise mechanism for the generation of dyspnea, the identification of physiologic and psychologic correlation of dyspnea and the efficacy of techniques used to manage dyspnea. It is also the investigator's hope to establish effective nursing

therapeutics to reduce dyspnea in patients with COPD, such as pursed – lips breathing , positioning technique, and bronchodilator therapy. In addition, it is important to monitor the effectiveness of the measurement designed to relieve dyspnea in individual patients to determine the effectiveness of care given to such patients. Dyspnea assessment devices should be incorporated into patient management. Although most of these investigation have examined the problems of dyspnea in patients with COPD, it is possible that these nursing therapeutics may also be beneficial to patients with other causes of chronic respiratory disease as well.

# CHAPTER III

# METHODOLOGY

The design of this study was a case study which examined effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD). Because case studies are also useful in demonstrating the effectiveness of specific therapeutic techniques and the case study design also has potential for revealing important findings that can generate new hypothesis for testing.

**Population and sampling**

The population of this study were patients diagnosed with chronic obstructive pulmonary disease, aged 15 years or older, who had symptoms of dyspnea and were treated as in-patient at Siriraj Hospital.

The samples of this study were 8 dyspneic patients with COPD, who had no problems of cardiovascular disease, lung cancer and tuberculosis lung.

**Setting**

The setting of this study was an observation room, the outpatient department, Siriraj Hospital, Bangkok, which admitted not only COPD patients, but also other diseases for observation.

**Instruments**

The instruments of this study were composed of two parts as follows :

1. The instrument for proceeding in this study was the nursing therapeutics on dyspnea in patients with COPD which consisted of two steps :

**1.1 Stage of Nurse-Patient Relationship** – The investigator approached and established a helping-trusting relationship with the subjects in order to relieve anxiety, fear and depression. Dyspnea or breathlessness can have both physical and psychological origins, and simply by listening with empathy and compassion, nurses can do so much to alleviate patients' fear and anxiety. Feeling breathless can be quite overwhelming, and sense of hopelessness and powerlessness can follow. The failure to express these emotions can exacerbate patients' physical symptom, so nurses should encourage them to talk about their feelings and give them an opportunity to explain the anger, frustration and despair associated with their symptoms. Once these emotions have been released, more rhythmic breathing should automatically follow.

**1.2 Stage of nursing interventions consisted of three parts** :

1.2.1 **Positioning Technique** :- During an episode of dyspnea, helping COPD patients find the position that is most comfortable and provides the best physiologic benefit. In this study, all patients were recommended the supine position and leaning forward position.

1.2.2 **Bronchodilator therapy** After positioning, nurses should make sure that the patient is using his or her nebuliser correctly. Nurses are in good position to make a realistic assessment of the patient capabilities, and inhaler technique and to give advice accordingly.

1.2.3 **Pursed-Lips Breathing** To facilitate bonchodilatation and mucociliary clearance, the pursed lips breathing must be delivered after inhaled bronchodilator drug lasted for15 minutes. The frequency of administration of pursed lips breathing in this study was 4 sessions / day for total of 12 sessions.

2. **The instrument for data collection** consisted of six parts as follows : (See the appendix B).

Part I - Demographic data

Part II - Dyspnea experiences data

Part III - The measurement of perception of dyspnea chosen was the visual analogue scale.

Part IV - The measurement of airway obstruction chosen was the Wright Peak Flow Meter.

Part V - the measurement of oxygen saturation chosen was the Pulse Oximeter.

Part VI - The patients' satisfaction on nursing therapeutics

**Part I - Demographic data**

Demographic data was composed of basic personal information such as age, gender, religion, marital status, educational background, employment status, way of medical fee payment, history of medication therapy, and history of smoking .

**Part II - Dyspnea experiences data**

There were open – ended questionnaires developed by the investigator and contained questions about frequency of dyspnea, cause of dyspnea, characteristics of dyspnea, and other symptoms which were associated with dyspnea.

**Part III – The measurement of perception of dyspnea**

The visual analogue scale (VAS) is used as a measurement of perception of dyspnea used in chronic Obstructive Pulmonary Disease Clinic (COPD Clinic), Medical Department of Siriraj Hospital. The visual analogue scale for perception of dyspnea consists of 100 mm. lines with anchors "no shortness of breath" at the low end and "shortness of breath" at the high end. The subjects were instructed to indicate their present degree of breathlessness by marking an X at some point on the scale :


no shortness of breath shortness of breath

**Part IV– the measurement of airway obstruction**

The measurement of airway obstruction chosen was the Wright Peak Flow Meter, which is designed to measure peak expiratory flow rate (PEFR) and used to assess the dilatation of bronchiole in COPD patients during an acute episode (used at the COPD clinic, Medical Department of Siriraj Hospital). The PEFR was recorded last to prevent the possible bronchostrictor or bronchodilator effect of a force expiratory measure from interfering with other measurement. The Wright Peak Flow Meter was used, and the highest reading of three attempts were recorded. This

measurement was easy to obtain and caused the subjects less discomfort than other measurement of airway obstruction.

**Part V – The measurement of oxygen saturation**

The measure of oxygen saturation chosen was the Pulse Oximeter used in the COPD Clinic, Medical Department of Siriraj Hospital. The pulse oximeter, in conjunction with purse lips breathing, was used as a monitoring display with a goal toward increasing arterial oxygen saturation ($SaO_2$) in this study.

**Part VI - The patients' satisfaction on nursing therapeutics**

The patients' satisfaction on nursing therapeutics was used to evaluate and describe satisfaction on pursed – lip breathing , positioning technique, bronchodilator therapy, and nurse – patient relationship.

**Data collection**

Data collection was conducted by the investigator from January to March, 2001 as follows :

1. The investigator approached the human subject committee and asked for permission to collect data by submitting the document from the Faculty of Graduate Studies, Mahidol University, to the Dean of the Medical Faculty, the Director of Nursing, the Head of Outpatient Nursing Division and the Head Nurse of the Observation Room in Outpatient Department Building, Siriraj Hospital, Mahidol University.

2. In selecting the subjects, the investigator checked the medical records of admitted patients to identify COPD patients having dyspnea.

3. To protect the rights of the individuals who volunteered as subjects, each patient was asked to sign a consent form, which included explanation about the purpose of the study, assurance of confidentiality and freedom of withdrawal from the study at any time.

4. After the written consent from was signed, the medical record of all subjects were reviewed for demographic information and health history. Baseline data consisting of the clinical signs, VAS, and PEFR were collected for all subjects. The subjects were then randomly assigned to treatment applied to measure RR, and $SaO_2$ taken before and after each session as indicated.

5. In this study, all patients were recommended the supine position and leaning forward position. After positioning, the investigator assisted the patient to use a nebuliser efficiently according medication treatment. The pursed - lips breathing must be delivered after inhaled bronchodilator drug lasted for15 minutes. The frequency of administration of pursed lips breathing in this study was 4 sessions / day for total of 12 sessions. The pulse oximeter, in conjunction with pursed lips breathing, was used as a monitoring display with a goal toward increasing arterial oxygen saturation ($SaO_2$) in each session. At the end of the fourth session, the subjects again completed the clinical signs, VAS, and PEFR .

6.If the subjects felt dyspnea, while receiving nursing therapeutics. The investigator stopped the study immediately and helped the subjects to relieve dyspnea.

**Protection of Human Subjects**

1. A request for permission to conduct the study was also submitted to the Human Subjects Committee of Siriraj Hospital, Mahidol University.

2. When the investigator obtained permission to conduct this study from Siriraj Hospital, the investigator began to collect data from patients with COPD.

3. The investigator introduced herself and told the subjects about the objectives of this study before they received the nursing therapeutics.

4. The subjects were informed of their rights and that they could request information from the investigator at any time if they did not understand anything about this study.

5. The subjects could withdraw from the study at anytime if they wanted, and their withdrawal would not affect them or the treatment they received in any way (See appendix A)

**Data Analysis**

1. Demographic analysis was done by categorizing data and using frequency distribution.

2. The data from Clinical signs, VAS, and PEFR were analyzed by categorizing data and summarized by using frequency distribution for each category.

3. The data concerning pursed lips breathing by measuring RR, and $SaO_2$ were represented by arithmetic mean, standard deviation, and compared between scores obtained before and after each session were compared as indicated .

# CHAPTER IV

# RESULT

This study was a case study which examined effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD) on 8 patients at an observation room, Outpatient Department, Siriraj Hospital. The results of this study are presented as follows:

Part 1 Descriptive data of the patients

1.1 Demographic characteristics

1.2 Dyspnea experiences

Part 2. effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD)

**Part 1. Descriptive data of the patients**

**1.1 Demographic characteristics**

**Table 1. Number of demographic characteristics (N = 8)**

| Variable | N |
|---|---|
| Sex | |
| Male | 8 |
| Female | - |
| Age | |
| 40 – 65 years | 5 |
| > 65 years | 3 |
| Marital status | |
| Married | 6 |
| Divorce / Widow / Separate | 2 |
| Educational attainment | |
| Primary education | 5 |
| Secondary education | 1 |
| Diploma | 2 |
| Profession | |
| Employment | 1 |
| Stayed at home | 7 |
| Health payment | |
| Able to refund | 4 |
| His own payment | 4 |

**Table 1. Number of demographic characteristics (N = 8)(continued)**

| Variable | N |
|---|---|
| Smoking background | |
| Ever smoking | 8 |
| Never | - |
| Duration of smoking | |
| 10 - 20 years | 1 |
| 21 – 30 years | 2 |
| 31 – 40 years | 2 |
| 41 – 50 years | 3 |
| Quantity of smoking | |
| 10 cigarettes up to 20 cigarettes | 6 |
| 2 cases up to 3 cases | 1 |
| 5 cases | 1 |

From table 1 showed the personal background of 8 patients; All of the subjects were elderly male, 50-75 years of age. The majority of subjects were married with primary education, stayed at home 7 persons. The rest 1 person has employment. Receiving the health welfare payment from the office or able to refund from social insurance 4 persons as well as 4 persons have to pay by their own money. All of the subjects have ever smoked in the duration of 20-50 years. Six of them smoked the 10 cigarettes up to 20 cigarettes, one of them smoked 2 cases up to 3 cases/day, and another one of them smoked 5 cases/day. Now, everybody is not smoking due to the easier tired and dyspnea. Six of the subjects have ever infected from tuberculosis.

**Table 2. Number of demographic characteristics (N = 8) (continued)**

| Variable | N |
|---|---|
| The Severity of the illness measured by PFT. | |
| Severe degree of irreversible airway obstruction | 5 |
| Moderate degree of irreversible airway obstruction | 2 |
| Mild degree of irreversible airway obstruction | 1 |
| Duration of illness (years) | |
| 4 – 5 | 6 |
| >5 – 10 | 2 |
| Long term treatment | |
| - Berodual MDI, Theodur (200), Meptin (25)+ Oxygen therapy | 4 |
| - Berodual MDI, Theodur (200), Meptin(25) | 2 |
| - Berodual MDI, Theodur (200) | 2 |
| Short term treatment | |
| -Ventolin MDI | 4 |
| -Ventolin MDI + Oxygen therapy | 4 |

From table 2 showed that majority of the patients with COPD (6 patients) were measured pulmonary function test and found that majority of severe degree of irreversible airway obstruction (5 patients). Two group of treatment that is long term treatment and short term treatment as the patient receiving dyspnea. The majority of patients (6 persons) treated by administration of bronchodilator drug, such as Berodual

MDI, Theodur (200), Meptin (25). On the other hand, the short term treatment with all patients applied Ventolin MDI. The four patients used oxygen with long term and episodes of dyspnea.

**1.2Dyspnea experiences**

The dyspnea experiences data consist of the perceptions of dyspnea, the respones to dyspnea, the self evaluation of dyspnea, the precipitating factors, and the severity of dyspnea.

1.2.1**The perception of dyspnea** All of the patients was described various symptoms while they were in dyspnea which the result from narrowing of bronchia and increasing the resistance in respiratory system, such as breathlessness / not enough breathe was the most perceptions of dyspnea. The rest were so tired/gasp for breathe, stifling, cough and sputum, respectively (table 3).

**Table 3. Number of the patient's perception of dyspnea categorized by severity of illness (N=8)**

| Perceptions of dyspnea* | Degree of irreversible airway obstruction | | | |
|---|---|---|---|---|
| | Severe | Moderate | Mild | Total |
| Breathlessness /not enough breathe | 5 | 2 | 1 | 8 |
| So tired/gasp for breathe | 5 | 2 | - | 7 |
| Stifling, tight as the chest | 3 | 2 | - | 5 |
| Cough/Very cough | 5 | - | - | 5 |
| Sputum/phlegm | 5 | - | - | 5 |

* A patient perceived more than one symptom.

From table3 showed 5 perceptions of dyspnea on severe degree of irreversible airway obstruction. On the other hand, the patient perceived as only one symptom on mild degree of irreversible airway obstruction.

**1.2.2 The response to dyspnea** When the patients got dyspnea then the response to dyspnea by the patients were perceived the symptoms, such as weakness, anorexia, can not speak, no power, anxiety, fear and fear of death as follows :

"Starting cough with sputum or phlegm in the throat, try to cough in order to sputum out of the throat, then feeling breathless and tight at the chest, after that he try to go to hospital, feel fear due to having ever intubated for 2 times".

"So tired just walk to the toilet for urination, tight at the chest, not enough breathe after that inhaling bronchodilator drug and oxygen. But it is no good, then I try to go to hospital".

**Table 4. Number of the patient's response to dyspnea categorized by severity of illness (N=8)**

| Perceptions of dyspnea* | Degree of irreversible airway obstruction | | | Total |
|---|---|---|---|---|
| | Severe | Moderate | Mild | |
| Physical response | | | | |
| - Feel of weakness, lack of energy | 5 | 2 | 1 | 8 |
| - Anorexia | 4 | 1 | - | 5 |
| Psychological response | | | | |
| - Fear of death and helplessness | 5 | 2 | 1 | 8 |
| - Uneasy and uncomfortable | 5 | 1 | - | 6 |

From table 4 showed that all of patients responded to dypsnea that is feeling of weakness, lack of energy, fear of death and helplessnes. The majority of patients were most symptoms of dypsnea on severe degree of irreversible air way obstruction.

**1.2.3 Self evaluation of dypsnea**

All of the patients were self evaluated symptom of dyspnea by the precipitating factors of dyspnea and the severity of dyspnea.

1.The precipitating factors of dypsnea were categorized in 3 group of factors of dypsnea according to Janson-Bjerklie and associates (Janson-Bjerklie, et. al. 1986) such as the situational factors, the personal factors and the precipitating factors. This study was found that all patients able to inform the precipitating factors of dypsnea for example.

"The day after the yesterday, I walked outside the house in the morning just a minute I got the tight at the chest, breathlessness and then got cough with catarrh, suffer from catarrh, including so tired. I must inhale drug."

"I went upstairs 2-3 steps, my feeling was so tired or I took a bath, with stopping protection the weaken"

"I still worked normally but I have to inhale drug every time, as well as the hot or cold weather, I felt breathing more difficult."

"I could not work, my boss assigned me to received telephone call, when I spoke too much, I was so tired, I still worried, felt breathing more difficult, not enough breathe and inhaled drug immediately."

The consideration concerning 3 groups of precipitating factors found that personal factors were the most precipitating factors. The rest were precipitating factors and situational factors respectively (Table 5).

**Table 5. Number of the patients' perception concerning precipitating factors of dyspnea categorized by severity of illness (N = 8)**

| Perceptions factors | Degree of irreversible airway obstruction | | | Total |
|---|---|---|---|---|
| | Severe | Moderate | Mild | |
| Personal factors* | | | | |
| Physical factor * | | | | |
| - Infection | 5 | 2 | 1 | 8 |
| - Weakness | 3 | 2 | - | 5 |
| - Sleeplessness | 2 | 1 | - | 3 |
| Emotional factors | | | | |
| - Fear of death, helplessness | 5 | 1 | - | 6 |
| Behavior/Actions* | | | | |
| - Coughing | 5 | 2 | 1 | 8 |
| - Walking | 5 | 2 | 1 | 8 |
| - Lying down | 4 | 1 | - | 5 |
| Precipitating activities * | | | | |
| - Walking upstairs | 5 | 2 | 1 | 8 |
| - Usual activities | 5 | 1 | - | 6 |
| Situational factors* | | | | |
| - Dust | 5 | 2 | 1 | 8 |
| - Weather such as hot, cold | 5 | 2 | 1 | 8 |

* A patient perceived more than one factor.

From table 5 showed all of patients informed the precipitating factors from 1 group to 3 groups. Five patients with severe degree of irreversible airway obstruction stated that sometime dypsnea came from 3 precipitating factors.

**1.2.4 The Severity of dyspnea**

The patients decided the severity of dypsnea from frequency of dyspnea, duration of dypsnea and self management strategies of dypsnea. All of patients got dypsnea experiences at severe and mild degree of irreversible airway obstruction. The increasing severity of dypsnea was slighted by inhaling inhaled bronchodilator and oxygen for example:

"Severity of the symptom showed not easy in breath, tight at the chest, could not breathe, inhaling inhaled bronchodilator drug for many times but not so well, fear, fear of death. 1-2 times per month was increased to 3-4 times per week or almost everyday"

"Sometime I was so tired no power, could not walk, after inhaling inhaled bronchodilator drug for many times but not so well. I must go to hospital."

**Table 6. Number of the patients' perception concerning frequency of dyspnea categorized by severity of illness (n = 8)**

| Frequency of dyspnea | Degree of irreversible airway obstruction | | | Total |
|---|---|---|---|---|
| | Severe | Moderate | Mile | |
| 1 – 2 times / week | - | 2 | 1 | 3 |
| 3 – 4 times / week | 3 | - | - | 3 |
| more than 4 times / week | 2 | - | - | 2 |

From table 6 showed that 3 patients got severe degree of irreversible airway obstruction has 3-4 times/week on frequency of dyspnea. The rest was more than 4 times/week on frequency of dyspnea.

**Dyspnea management by the patients before visiting emergency department**

This study was conducted with 8 patients which stated the cause of severity of illness, such as cough and sputum, some case has fever which was the infection of respiratory system. The increasing severity was slight until could not managed by himself. Even the previous method was approved such as use of inhaled bronchodilator drug more than the usual. The severity of the symptom or side effect of inhaled bronchodilator drug tended to fear of death. According to breathlessness, the patients could not manage dyspnea. Therefore, they must go to hospital.

**Table 7. Number of Self-management strategies of dyspnea categorized by severity of illness (n = 8)**

| Self-management strategies of dyspnea | Degree of irreversible airway obstruction | | | Total |
|---|---|---|---|---|
| | Severe | Moderate | Mild | |
| Stop activity and provide position | 5 | 2 | 1 | 8 |
| Environmental adjustment | 5 | 2 | 1 | 8 |
| Use of inhaled bronchodilator drug | 1 | 2 | 1 | 4 |
| Use of inhaled bronchodilator drug and oxygen | 4 | - | - | 4 |
| Sputum elimination efficiency | 3 | - | - | 3 |

* A patient may be manage more than one strategies

From table 7 showed that majority of the patients applied combination of strategies for self management strategies of dyspnea. 5 self management strategies of dyspnea used with this study on severe degree of irreversible airway obstruction were as follows:

1. To stop activities and provide position : All of the patients mentioned the strategies application were stopping activities and providing position for example: "If I was doing and so tired, I have to stop at once when stop the symptom feel better"

"Now, I could not worked, I walked a little, I was so tired, My boss assigned me to receive telephone call"

2. Using inhaled bronchodilator drug and with oxygen: All of the patients applied this method for decreasing dyspnea, the reason was the use of inhaled bronchodilator drug when there was mild severity, they could manage dyspnea. If using inhaled bronchodilator drug when there was severe dyspnea, they would be suffer and not easy for self management. Lastly, the patient has to go to clinic or hospital. All of the patients applied using inhaled bronchodilator drug such as Ventolin MDI. There were 3 patients on severe degree of irreversible airway obstruction and 1 patients on moderate degree of irreversible airway obstruction always use oxygen for example:

"Gasp for breath, must be stop at once. I have to sit down with opening electric fan, using inhaled bronchodilator drug by 2 times, and waiting for half an hour. If it was no good. I have to go to hospital eventually."

"This morning I have took a bath after that I have to sit down with inhaling oxygen for a while. I feel tight at the chest, breathless, after that inhaling inhaled bronchodilator drug for many times but it was no good. lastly I went to hospital"

3.The environmental adjustment: All of the patients was adjusted when tight at the chest by transferring to the good ventilation, wind blow or sat down near air conditioner or blow with electric fan for example:

"When I went to the toilet which had hot weather, I didn't want hot weather. Therefore, I have to wait for a while."

"Starting tired, I will open the electric fan or sit near the window"

4.The sputum elimination efficiency: The 3 patients on severe degree of irreversible airway obstruction applied warm water or drank much water in order to eliminate the sputum for example :

"If there was the phlegm in the throat, I felt not easy in breath, could not cough, must be applied warm water"

"When starting the cough, there was the phlegm and I must drink water so much for decreasing the phlegm."

**Part 2. Effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD)**

This study was conducted with 8 patients with chronic obstructive pulmonary disease (COPD) classified to 3 level of severity of dypsnea. The 5 patients (subject no.1,2,3,6,8) were severe degree of irreversible airway obstruction; The 2 patients (subject no.4,5) were moderate degree of irreversible airway obstruction; and the 1 patient (subject no.7) was mild degree of irreversible airway obstruction. All of the patients were treated as nursing therapeutics. The evaluation of effects of nursing therapeutics was the use of scientific instrument such as VAS, Peak Flow Meter, and Pulse Oximeter including Clinical Sign. The results were as follows :

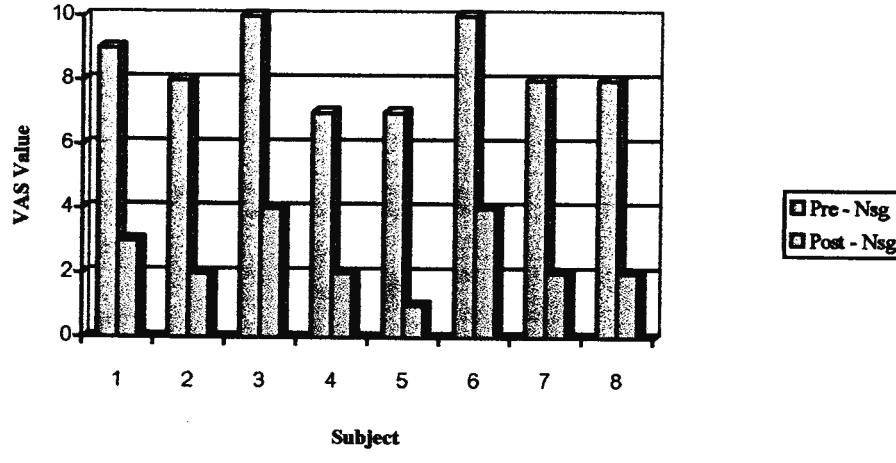


**Figure3.Severity of Dyspnea measured byVAS for pre &post nursing therapeutics**

From figure 3 showed that severity of dyspnea before nursing therapeutics evaluated by VAS found the higher degree. The 2 patients (subject no.3,6) were severe degree of irreversible airway obstruction which got 10 level of severity of dyspnea and deoreased the 4 level after treatment. The 2 patients (subject no.4,5) were moderate degree of irreversible airway obstruction which got 7 level of severity of dypsnea and decreased to 2,1 after treatment. After receiving nursing therapeutics found that all of patients was decreased the level of severity of dypsnea.

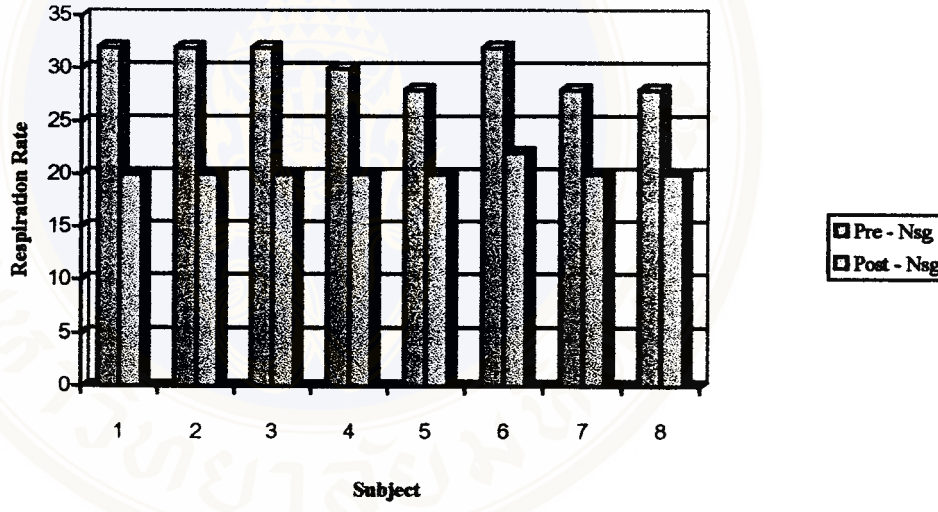


**Figure4.Severity of Dyspnea measured by Respiration Rate for pre &post nursing therapeutics**

From figure 4 showed that all of the respiration rate of the patients before treatment in higher speed by 4 patients (subject no.1,2,3,6) have respiration rate 32 times/minute. But the 3 patients, has severe (subject no.8), moderate (subject no.5) and mild (subject no.7) degree of irreversible airway obstruction maintained respiration rate 38 times/minute. And, the end of nursing therapeutics, all of the patients decreased respiration rate as the normal level that is 20-21 times/minute.

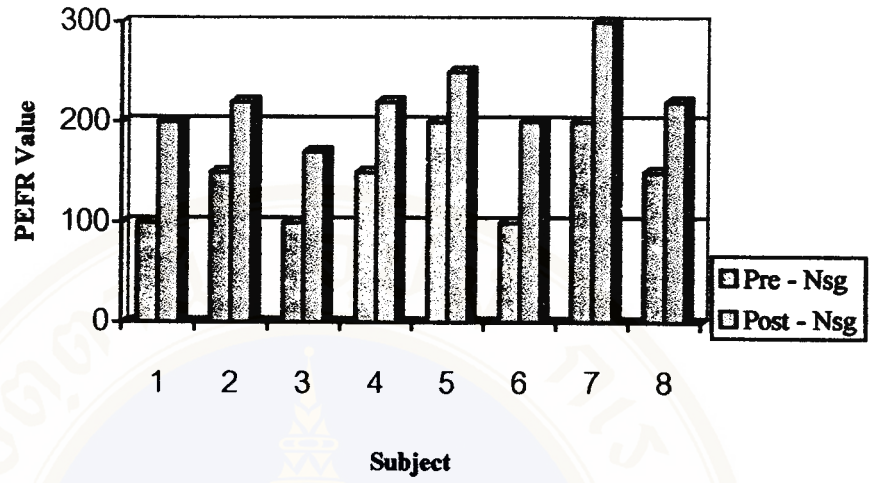


**Figure5.Severity of Dyspnea measured by PEFR for pre &post nursing therapeutics**

From figure 5 showed that all of the patients got the higher degree of airway obstruction. The 3 patients (subject no.1,3,6) on severe degree of irreversible airway obstruction measured by PEFR valued 100 liter/minute. So, the patients got the higher degree of severity of dyspnea which 2 patients have moderate (subject no.5) and mild (subject no.7) degree of irreversible airway obstruction by PEFR valued 200 liter/minute. Therefore, the patients got the lower degree of severity of dypsnea, and the end of nursing therapeutics have a little change of increasing of PEFR. It means COPD patients could not reversible as the usual.

Moreover, when the patients got the dypsnea, the investigator has observation on shallow, rapid breathing and use of accessory muscle of respiration by observing for a rise in the clavicle during inspiration before and after receiving nursing therapeutics. It found that all of the patients got the lower breath up to the normal level, the absence of rising in the clavicle during inspiration after receiving nursing therapeutics.

Additionally, oxygen saturation and respiratory rate were conducted to elucidate the efficacy of pursed lip breathing. The pulse oximeter, in conjunction with purse lips breathing, was used as a monitoring display with a goal toward increasing arterial oxygen saturation ($SaO_2$) in this study.

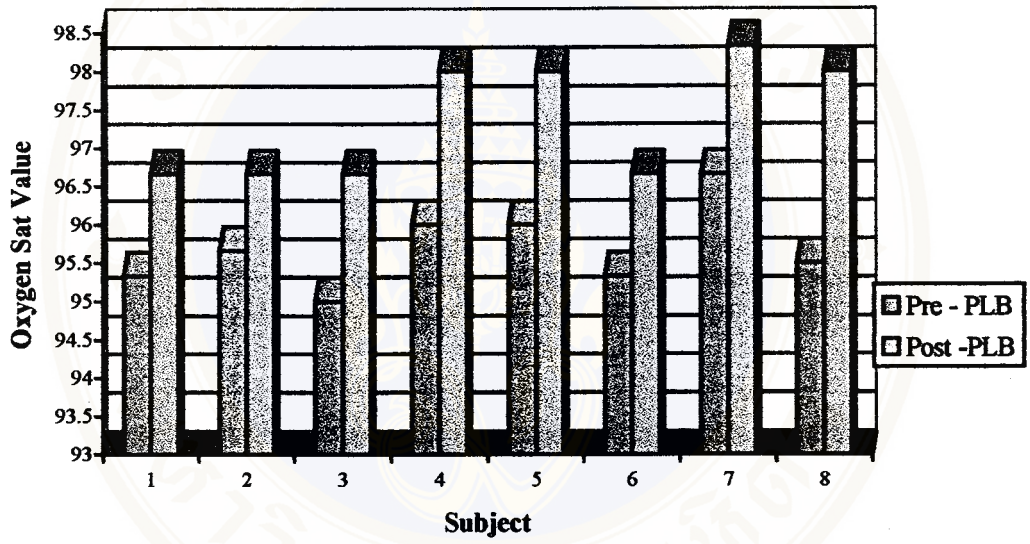


**Figure6. Comparison of Means Oxygen Saturation from 8 patients for pre & post PLB in session 1.**

From figure6. showed the comparative study on means of oxygen sat of 8 patients for pre and post pursed lip breathing in session 1. It showed that after the pursed lip breathing, there was increasing of oxygen sat.

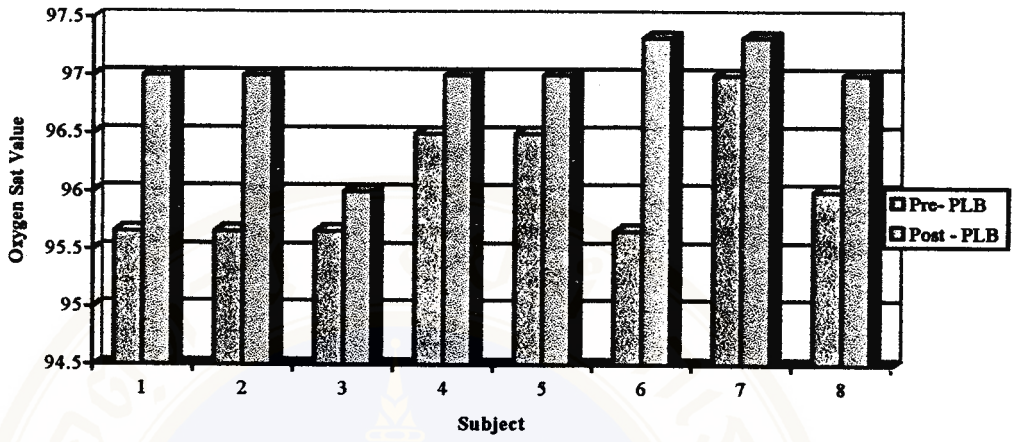


**Figure7. Comparison of Means Oxygen Saturation from 8 patients for pre & post PLB in session 2.**

From figure 7.showed the comparative study on means of oxygen sat of 8 patients for pre and post PLB in session 2. It showed that after the pursed lip breathing, there was increasing of oxygen sat.

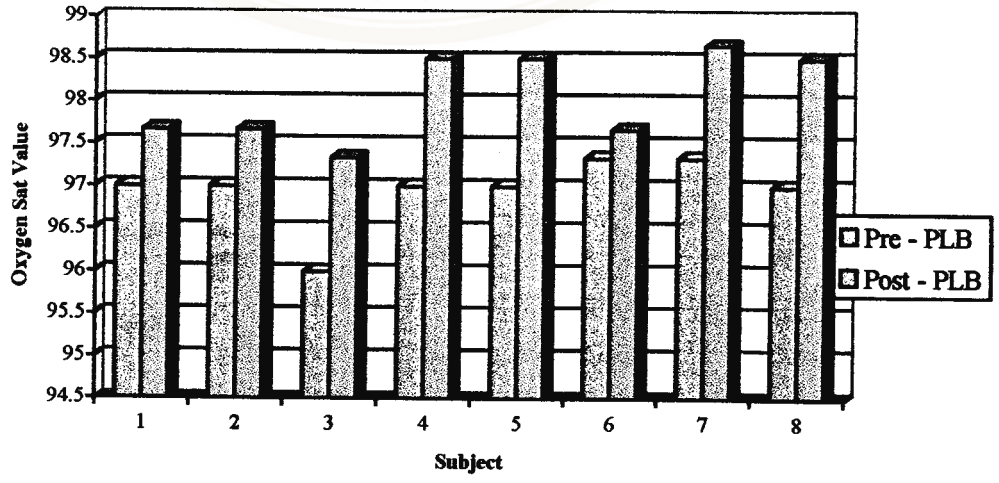


**Figure8. Comparison of Means Oxygen Saturation from 8 patients for pre & post PLB in session3.**

From figure 8.showed the comparative study on means of oxygen sat of 8 patients for pre and post PLB in session 3. It showed that after the pursed lip breathing, there was increasing of oxygen sat.

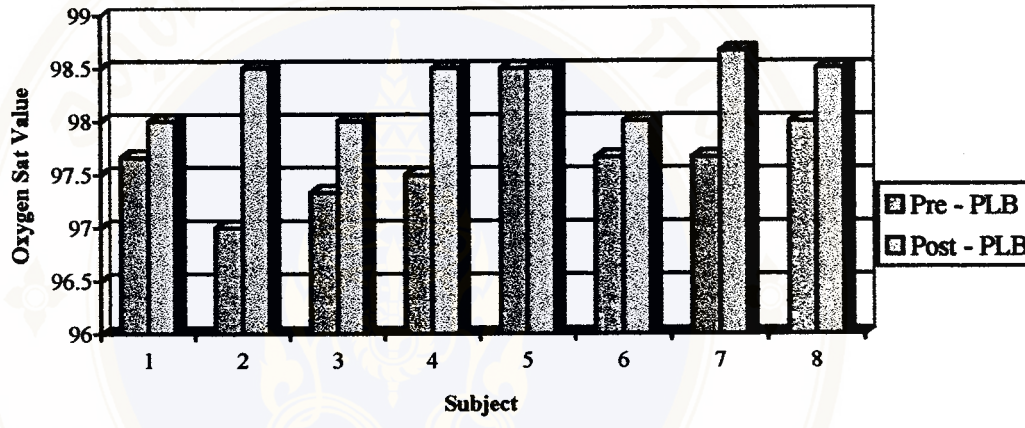


**Figure9. Comparison of Means Oxygen Saturation from 8 patients for pre & post PLB in session4.**

From figure 9.showed the comparative study on means of oxygen sat of 8 patients for pre and post PLB in session 4. It showed that after the pursed lip breathing, there was increasing of oxygen sat.

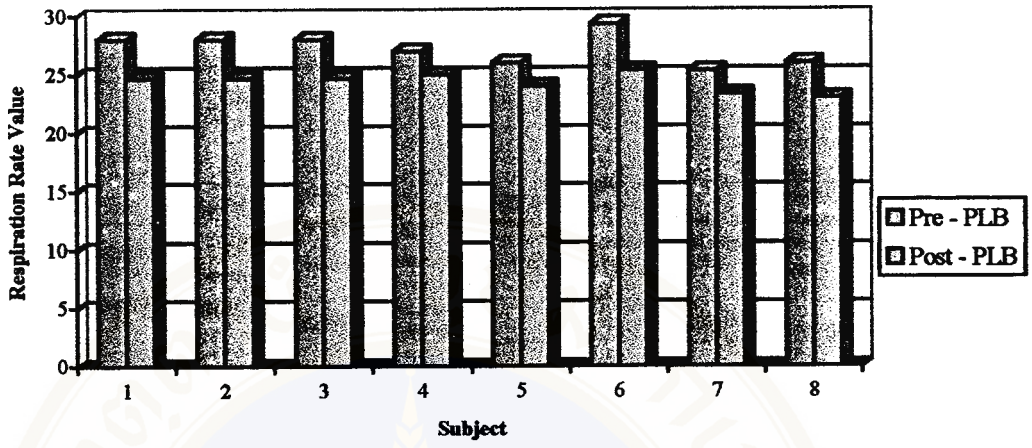


**Figure10. Comparison of Means Respiration Rate Value from 8 patients for pre & post PLB in session 1.**

From figure 10. showed the comparative study on means of respiratory rate (RR) values of 8 patients for pre and post PLB in session 1. It showed that after the pursed lip breathing, there was decreasing of RR values .

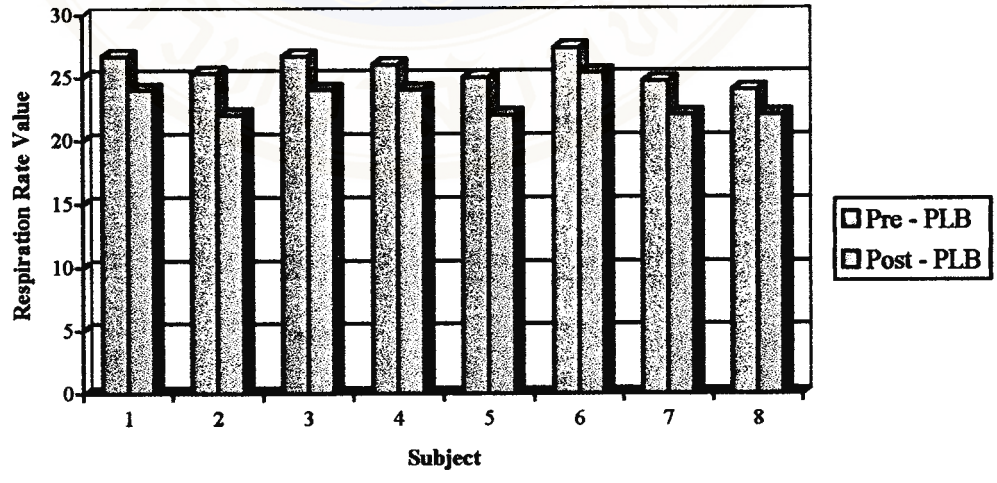


**Figure11. Comparison of Means Respiration Rate Value from 8 patients for pre & post PLB in session 2.**

From figure 11. showed the comparative study on means of respiratory rate (RR) values of 8 patients for pre and post PLB in session 2. It showed that after the pursed lip breathing, there was decreasing of RR values .

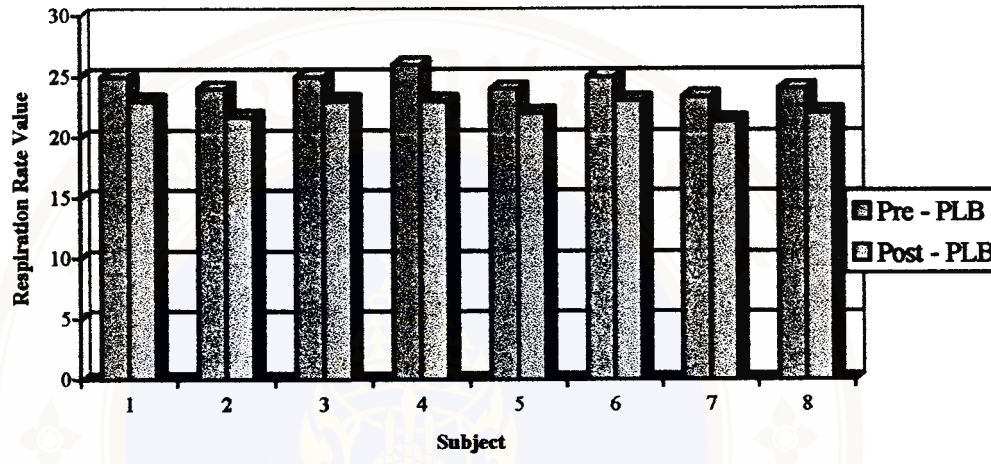


**Figure12. Comparison of Means Respiration Rate Value from 8 patients for pre & post PLB in session 3.**

From figure 12. showed the comparative study on means of respiratory rate (RR) values of 8 patients for pre and post PLB in session 3. It showed that after the pursed lip breathing, there was decreasing of RR values .

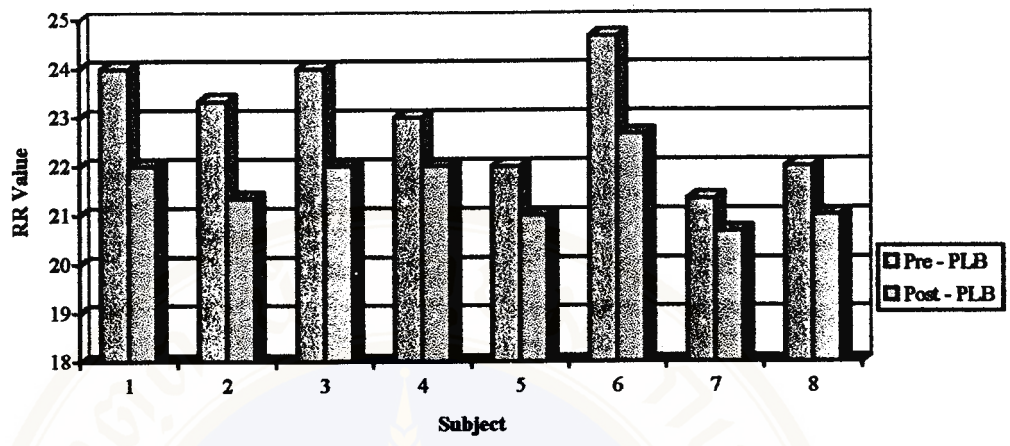


**Figure13. Comparison of Means Respiration Rate Value from 8 patients for pre & post PLB in session 4.**

From figure 13. showed the comparative study on means of respiratory rate (RR) values of 8 patients for pre and post PLB in session 4. It showed that after the pursed lip breathing, there was decreasing of RR values up to normal level .

**Additional findings**

This study was evaluated the patients' satisfaction toward nursing therapeutics such as pursed-lip breathing , positioning technique, bronchodilator therapy and nurse-patient relationship were as follows :

**Table 8. Number of Satisfaction level of patients receiving nursing therapeutics (N = 8)**

| Satisfaction level | High | Moderate | Low | Total |
|---|---|---|---|---|
| Nurse – patient relationship | 6 | 2 | - | 8 |
| Positioning technique | 5 | 3 | - | 8 |
| Bronchodilator therapy | 5 | 3 | - | 8 |
| Pursed – Lip breathing | 6 | 2 | - | 8 |

From table 8 showed that majority of the patients were high satisfaction level on nurse-patient relationship, positioning technique, bronchodilator therapy and pursed lip breathing.

All of the patients were interviewed by the investigator about their feelings associated with nursing therapeutics that they received at the end of each nursing intervention. The patients described many thoughts as follows:

1. Nurse – patient relationship: The initial stage of establishment relationship found that all of patients with anxiety concerning dypsnea. The investigator encouraged the patients to speak the problem that related with dypsnea and patients' need. Giving the information and helping the patients cope with this frightening symptom in order to reduce anxiety and cooperated well nursing therapeutics for example:

"When I felt gasping for breath , fear to stop breath, I had to go to hospital. After reaching the hospital, I remained calm because it closed the doctor, and the nurse who could help me cope with this frightening symptom."

"Stayed alone in the house with gasp for breath, feel fear of stopping breath, though using inhaled bronchodilator drug for many times. It was no good. And then I must go to hospital."

2. Positioning technique: The results of this study found that all of the patients tend to leaning forward to improve overall respiratory muscle strength and reduce their symptoms at first, after that dyspnea was decreased, the patients tend to supine position which the head was higher than the horizontal line 60° to relax.

3. Bronchodilator therapy: All of the patients stated that they must receive inhaled bronchodilator drug continuously every 2 hours/time during episodes of dyspnea but they still felt weakness, and lack of energy. Because it was only useful in alleviating dyspnea, so it might not succeed as the target setting. The combination with various method decreased the dypsnea for example :

"Every time at the hospital, the doctor prescribed inhaled bronchodilator drug continuously every 2 hours/time during episodes of dyspnea for 1-2 days. After that he told me that my symptom improved, and readiness for discharge. But I still felt weakness and smothering in breath."

"In fact, the use of inhaled bronchodilator drug was very useful when we were tired, we have to use it. If I delay until severe dyspnea, the use of inhaled bronchodilator drug will not be effectiveness to manage it."

4. Pursed lip breathing: From the researcher asked the patients. "Have you ever used pursed lip breathing (PLB)?" The patients told that they never used before.

The investigator informed the objectives and the significance of PLB. The investigator demonstrated PLB to the patients, and encouraged them to mimic this technique along with the investigator. After performing PLB, the patients told that :

"Okay, I feel comfortable situation, no braethlessness, I feel better than yesterday."

"Easy for the breath, talking was no tired, my throat has no phlegm because it move out by pursed-lip breathing."

"Good, I feel easy for the breath, was no so tired, when I talked ; I was not tired. It feel better."

"Good, I feel easy for the breath, better than the first time. This time I was okay"

# CHAPTER V

# DISCUSSION

This study was a case study which studied effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD). The discussion were as follows;

1. Profile of the patients with chronic obstructive pulmonary disease (COPD)
2. Dyspnea experiences
3. Effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease (COPD)

## 1. Profile of the patients with chronic obstructive pulmonary disease (COPD)

All of patients were elderly male, and 50-75 years of age. The majority of patients have primary education attainment and stayed at home, has diagnosed as chronic obstructive pulmonary disease for 5-10 years ago. After the patients were measured pulmonary function test and found that the patients got severe degree of irreversible airway obstruction. All of patients has ever smoke 20-50 years with 10 cigarettes up to 5 cases/day. Now every patients stopped smoking due to difficult breath and so tired. Six patients has ever infected from tuberculosis. This data was agreed with Rangsan Putsapakhom and Praphan Yongchaiyut (1989 : 241-2541 concerning the chronic obstructive pulmonary disease (COPD) found that this disease found more in 40 years of age, male more than female, and there was a relationship

between smoking and pulmonary infection in smoker age more than 10 years. The majority of patients were examined, and found the abnormal function particular in small airways function. The severity degree will increase depend on aging and amount of cigarette. The smoker smoke large amount of cigarette was severe more than small amount of cigarette. In general, smoking background was the most pulmonary destruction. (Somchai Bowonkitti & Nantha Maranet, 1988 : 117)

All of the patients were treated in the same line of the medical therapeutics on chronic obstructive pulmonary disease that is the constant period, the patients were treated by using bronchodilator drug to control dyspnea such as Berodual MDI, Theodur (200 mg), Meptin (25 μg). On the other hand, the exacerbation period, the patients was treated by using inhaled bronchodilator drug that has been shown faster such as Ventolin MDI. Some of the patients used oxygen with inhaled bronchodilator drug in order to protect hypoxemia (Amphonphan Theranut, 1999 : 75-81). The majority of COPD patients had severe degree of irreversible airway obstruction. Therefore, the result of therapeutics was not good enough like asthma. The need of using inhaled bronchodilator drug in order to reduce bronchospasm, and enhancing the mucocilliary function of bronchial membrane. Some of treatment such as theophylline affecting the diaphragm better function. Moreover, Oxygen therapy is used to prevent hypoxemia which is the precipitating factors of dyspnea.

**2. Dyspnea experiences**

2.1 The patients with severe degree of irreversible airway obstruction were more severity of dyspnea than mild degree of irreversible airway obstruction.

From the result the patients with severe degree of irreversible airway obstruction have perceived very severe dyspnea by acceptance of difficult breath, gasp for breath, tight at the chest, cough and sputum as well as the patients with mild degree of irreversible air way obstruction were perceived only dyspnea. The patients with severe degree of irreversible airway obstruction were perceived severity of dyspnea when had activities of daily life such as walking, take a bath etc. According to the activities perception would bring about severe degree of dyspnea. The patient mentioned that "This morning, I went to bathroom then, I have to be back as well as I was so tired, trying to sat down, inhaling oxygen, tight at the chest, difficult breath, using inhaled bronchodilator drug for many times. It was not so good. Then I must go to hospital" This is congruent with Prigatano, Wright and Levin (1984 : 1613-1619) studied on quality of life and factors predicting quality of life on 985 patients with COPD found that the severity of illness tended to lower oxygen in blood. The patients, therefore, were perceived severe dyspnea. From the study of Ronrawi Akkhanit (1991 : 34) dealing with feeling on self esteem and self care of 100 patients with COPD has cured at pulmonary clinic, OPD. Ramathibodi Hospital found that severity of illness was negative associated with feeling of self esteem that is the higher severity of disease was lower in self esteem due to the unable self care or need some other help.

2.2 The infection of respiratory system and severity of dyspnea affected perceptions of the patients could not control the symptom and decided to go to hospital.

From the result found that all of the patients tried to manage symptom of dyspnea by themselves but various strategies could not manage symptom of dyspnea

and lastly the patient went to hospital. All of patients mentioned that dyspnea was occurred from infection in respiratory system as the precipitating factors tended to severity of illness up to the patients could not applied self care. Even, all of the patients used inhaled bronchodilator drug for many times, but it could not decrease dyspnea. The patient mentioned that "Two days ago, I walked outside, the weather was not good, hot and mist I walked for a while ; then I could not walk; tired and catarrh; I went back to my home, and using inhaled bronchodilator drug for a while. After that I had cough and next phlegm at my throat and very difficult for breath, fear of death"

This is congruent with Wisanu Thammalikhitkul (cited in Somchai Bowonkitti and Nantha Maranet, 1988 : 125-132) studied on infection and acute exacerabation found that the infection of respiratory system was caused of acute exacerabation especially the virus was more infections than bacteria by virus infection before bacteria infection.

2.3 The patients were perceived fear of death, helplessness responded to dyspnea as well as the patient who had severe dyspnea tend to endure suffer and threaten life.

All of the patients were perceived acute exacerbation with severe dyspnea, uncontrolled, helplessness, and fear of death. The patient stated that "As exacerbation, I could not work. It was very bad, so tired, difficult breath, tight at the chest, and fear of death" This is congruent with Devito (1990 : 186-190) studied on perception of dyspnea experiences in 96 patients found that majority of the patients were fear as the response to severity of dyspnea, uncontrolled, fear of death. The patient, therefore, were severity of dyspnea. The rest was the emotional situation such

as helplessness during severity which was one of the anxiety. The study also found that dyspnea triggered fear which made the problem worse by making breathing more difficult. The patient said that they felt helpless because they could not control their breathing, they might stop breathing which contributed the anxiety – dyspnea cycle. (Renfroe, 1988 : 408; Acosta, 1988 : 299 : Breslin, 1966 : 275)

2.4The patients with COPD who had symptom of dyspnea applied using inhaled bronchodilator drug to alleviate bronchospasm but the severity of dyspnea was increased; the management by using inhaled bronchodilator drug was not good enough, and then the patients must go to hospital.

From the result all of patients have to managed the dyspnea by themselves which various method before decided to the hospital and all of patients applied the same method (Table 7), such as stopping the activities and providing position , using inhaled bronchodilator drug, and environmental adjustment. But the severity of dyspnea was increased, the patients could not managed the symptom. The use of inhaled bronchodilator drug applied for mild severity was better than for severe dyspnea. The patient mentioned the "When I got difficult breath, using inhaled bronchodilator drug with Ventolin for 2 times, waiting for a while, and then inhaling drug again 2 times. If it could not improved, I went to hospital" This is congrent with Carrieri & Janson-Bjerklie (1986 : 284-305) studied on dyspnea management in 68 dyspnic patients with pulmonary disease found that majority of the patients self adjusted inhaled bronchodilator drug and stayed in good ventilation.

**3. The effects of nursing therapeutics on dyspnea in patients with COPD**

The result of this study found that dyspnea was the most cause of patients with COPD must be remedy at emergency department after the patients help themselves especially, inhaling inhaled bronchodilator drug. There was no succeed in the symptom, the patients could not control and fear of death. The feeling of helplessness was often met in patients with chronic obstructive pulmonary disease.

Though searching for the appropriate strategies for dyspnea especially, with chronic obstructive pulmonary disease which could not reversible as the usual. The important problems of dyspnea were the narrower of bronchia from the initial stage up to airway obstruction. The membrane of alveolar was destroyed. Therefore, the gas exchange had defection. There was only decreasing the symptom and protection of exacerbation. One of the enhancing breathing was the pursed-lip breathing (PLB) applied from basic physiological principles. The patient decreased the breath slowly, try to made a small mouth and try to exhale twice as long as inhale . This approach the patients felt smooth in breath which increasing oxygen Sat, tidal volume as well as respiratory rate was decreased, and could control situation ordinarily resulting in fear (Thoman, et. al., 1965 : 100; Tiep, et. al., 1986 : 218; Sphagia & Grassino, 1996 : 1772; Ugalde, 200:472).

From the result found that all of the patients have never instructed this technique. The investigator was described the significance of PLB technique by teaching and demonstrating including the monitoring the patients with PLB adjustment 4 times/day. After 15 minute of receiving inhaled bronchodilator drug, the results found that all of the patients were high satisfaction by describing the feeling after PLB suvh as smoothly respiration, easy to breath, slowly in breathing, not tired, easy to

move sputum. A patient mentioned that "I feel easy to breathe, when talking was not so tired, now if feed better, easy to remove phlegm" Furthermore, all of patients found oxygen. Sat in red blood increasing as well as the respiration rate was normal agreed to the international research paper.

The study applied bronchodilator therapy and positioning technique increasing the potential of purse-Lip breathing efficiency due to inhaled bronchodilator drug to reduce bronchospasm. This study found that majority of the patients were higher satisfaction after receiving inhaled bronchodilator drug . The patient mentioned that "Every time I got the symptom, I stayed at this room 1-2 days. And then I went back to my home by doctor recommendation. In fact I worried, I feel fear but I could not informed the doctor" This information was agree with Kroenke et. al. (1988.) found that 39 percent of the patients COPD was decreased symptom of dyspnea. While 80 percent of patients with disease of digestive system were absent the symptom.

From the result of study found that positioning technique was decreased severity of dyspnea that is the leaning forward when the severity decreasing the patients in the supine position was decreased the severity. According to the relaxed positioning of both positioning applied from the basic physiological principles i.e. the hydrostatic pressure was increased then to be increased the pressure at the chest (Sharp, et. al, 1980 : 201-211 ; Gift, 1990 : 961) was found that majority of patients was high satisfaction.

The nursing therapeutics will be success depend on nurse-patient relationship which is the first step in nursing therapeutics. The nurse must understand and sympathised with COPD patient. Acknowledging the patient's problem in order to

establishment the mental supporting toward dyspnea. The patient will decrease fear, anxiety and easy in manage dyspnea. The result found that majority of patients were higher satisfaction. A patient stated that "When I got dyspnea, I was so tired, hurried to hospital, fear of death, reaching the hospital was the good situation". This is congruent with Suphap Suwanwetcho (2000) studied on health and need of pulmonary disease perception found that one of the need was the friends in order to supporting the mental health, not stayed alone and without anxiety. The patients, therefore, needed someone for suggestion directly in order to establishment reassurance and decreasing fear and anxiety concerning dyspnea.

Additionally, the majority of patients' satisfaction with nursing therapeutics were high. These satisfactions may be due to the willingness to decrease the symptoms of dyspnea, feeling better breathing slower and clearer after receiving nursing therapeutics. Thus, the investigator suggests that nurses can utilize this nursing therapeutics in clinical practice.

# CHAPTER VI

# CONCLUSION

This study was presented as 8 individual case studies aimed to examined effects of nursing therapeutics on dyspnea in patients with COPD. The samples were the elderly men who were treated as in an observe room, Outpatient Department, Siriraj Hospital during January to March 2001. The instrument for data collection was designed by the investigator. Data were analyzed by content analysis.

The samples of this study received nursing therapeutics developed for this study were as follows : a) positioning technique by helping patients to provide position as a leaning forward position and supine position in order to improve overall respiratory muscle strength and to reduce their symptom. b) pursed lip breathing (PLB) by demonstrating PLB to the patients and encouraging them to mimic this technique along with the investigator in order to reduce dyspnea and gain better control breathing. These included bronchodilator therapy in order to reduce brochospsm. In addition, nurse – patient relationship was helpful to establish a helping – trusting relationship in order to reduce anxiety which contributed to the anxiety - dyspnea cycle. All of the patients were evaluated symptoms of dyspnea and the effects of nursing therapeutics on dyspnea. The results of this study are as follows :

1.Profile of patients with chronic obstructive pulmonary disease: All of the patients were the elderly male, aged between 50-75 years old and were married. The most common educational level of the subjects was the primary level of pratom 1-4. Most of the subjects were unemployed. Half of the subjects paid for treatment by

government fund or social insurance. All of the patients had a previous smoking history but every patients stopped smoking at the present. Most of the subjects had severe degree of irreversible airway obstruction and had a duration of illness between four to five years.

**2.**Dyspnea experiences : All of the patients perceived symptoms of dyspnea that was the results from the narrowed airway, and the patients' own perception of dyspnea such as difficult or labored breathing, suffocation, tight at the chest. All of the patients perceived that infection in respiratory tract, and activities of daily living as precipitating factors. Most of the patients who had degree of irreversible airway obstruction perceived very severe dyspnea. While the patients who had moderate and mild degree of irreversible airway obstruction perceived moderate or severe dyspnea. The symptoms of dyspnea affected both physiological and psychological response, such as feeling of weakness, fear of death, and helplessness. Therefore, they must go to hospital, and required immediate attention for symptoms of dyspnea that threaten life or function; delay would be harmful to them.

**3.** The results of this study indicated that most of the subjects were high satisfaction with pursed lip breathing that is conventional therapy in this study. The patients described the feeling after PLB such as smoothly respiration, easy to breathe, slowly in breathing, not tired, easy to move sputum out. This approach the patients felt smooth in breath which increased oxygen saturation, while the respiration rate was decreased. The patients reported that when the investigator demonstrated pursed-lips breathing and encouraged them to mimic the techniques along with the investigator , their fear was lessened, and often breathing was less

difficult. Pursed-lip breathing that required the patients merely to imitate the nurse seemed to be the most effective when subjects were afraid.

4. The result of this study indicated that after receiving nursing therapeutics, all of the patients were decreased the level of severity of dyspnea, decreased respiratory rate, while oxygen saturation and peak expiratory flow rate were increased. Moreover, when the patients got the dypsnea, the investigator has observation on shallow, rapid breathing and use of accessory muscle of respiration by observing for a rise in the clavicle during inspiration before and after receiving nursing therapeutics. It found that all of the patients got the lower breath up to the normal level, the absence of rising in the clavicle during inspiration after receiving nursing therapeutics.

**Recommendation for practical application**

The results of this study can be used as basic knowledge and guidelines for nursing therapeutics to relieve dyspnea in patient with COPD.

**Recommendation for further studies**

Replication of this study should be undertaken with more subjects than in this study and should be compared between a study group and a normal nursing group.

# BIBLIOGRAPHY

Agostoni,E.(1970).Kinemetics. In Campbell,EJM., Agostoni,E., Davis,J.N.eds.,**The respiratory muscle mechanics and neural control**.(27 – 34).(2nd ed).Philadelphia and London:WB. Saunder.

Altose, M.D.(1985).Assessment and Management of Breathlessness. **Chest.88(2)**:77s-83s.

Ambrose,S.M.(1998).Chronic Dyspnea.**Nursing98.(May)**:41-46.

Breslin,H.E.(1996).Respiratory Muscle Function in Patients with Chronic Obstructive Pulmonary Disease. **Heart&Lung.25(4)**:271-285.

Beare,P.G.&Myers,J.L.(1994).**Principle and Practice of Adult Health Nursing.**( 2nd ed).St. Louis:Mosby-Year Book.

Carrieri,V.K.,Janson-Bjerklie,S.(1986).Strategies Patients Use to Manage the Sensation of Dyspnea.**Western Journal of Nursing Research.8(3)**:284-305.

Celli,R.B.(2000).The Importance of Spirometry in COPD and Asthma.**Chest.117 (2)**:15s-18s.

Clark,J.S., et al.(1992).Noninvasive Assessment of Blood Gases. **American Review of Respiratory Disease.145(1)**:220-232.

DeVito,J.A.(1990).Dyspnea during hospitalization to acute phase of illness as recalled by patients with chronic obstructive pulmonary disease.**Heart&Lung.19**:186-191.

Ehrhardt,B.S.&Graham,M.(1990).Pulse Oximetry.**Nursing90.(March)**:50-54.

Euswas,P.(1993).The Actualized Caring Moment : A Grounded Theory of Caring in Nursing Practice. In Gout,D.A.(ed.).**A Global Agenda for Caring**.(309-326).Texus : Northeastern Press.

Ferguson,T.G.(2000).Recommendation for the Management of COPD.**Chest.117 (2)**:23s-28s.

Frozena,C.L.(1998).Easing end –stage respiratory symptom in dying patients. **Home Healthcare Nurse.16(4)**:257-260.

Gift,G.A., et al.(1986).Psychologic and physiologic factors related to dyspnea in subject with chronic obstructive pulmonary disease. **Heart&Lung.15(6)**:595-601.

Gift,G.A.(1989).Validation of a Vertical Visual Analogue Scale as a Measure of Clinical Dyspnea. **Rehabilitation Nursing.14(6)**:323-325.

Gift,G.A.(1990).Dyspnea. **Nursing Clinic of North America.25(4)**:955-965.

Gift,G.A., et al.(1992). Relaxation to Reduce Dyspnea and Anxiety in COPD Patients. **Nursing Research.41(4)**:242-246.

Gift,G.A.(1993). Therapies for Dyspnea Relief. **Holistic Nurse Practice.7(2)** :57-63.

Gift,G.A. & Paugh,C.L.(1993). Dyspnea and Fatique. **Nursing Clinic of North America.28(2)** :373-383.

Hanania,N.A., et al.(1994).Medical Personnel's Knowledge of and Ability to Use Inhaling Device.**Chest.105(1)** :111-16.

Janson-Bjerklie,S. & Shnell,S.(1988). Effect of peak flow information on pattern of self-care in adult asthma. **Heart&Lung.17(5)** :543-548.

Maquire,P.G., et al.(1991). Comparison of a Hand –held Nebulizer with a Metered Dose Inhaler –Spacer Combination in Acute obstructive pulmonary disease. **Chest.100(5)** :1300-05.

Malley,W.J.(1990). Clinical Blood Gases. **Application and Noninvasive Alternations**. Philadelphia:W.B. Saunder Company.

McDonald,P.(1998). Waiting to exhale. **Nursing Time.91(39)** :71-72.

Mueller,R., et al.(1970).Ventilation and arterial blood gas changes induced by pursed –lips breathing. **Journal Applied Physiology.28** :784-89.

Newhouse,T.M.(1982).Principle of Aerosol Therapy.**Chest.82(1)** :39s-41s.

Newman,S.P.(1985).Aerosol deposition consideration in inhalation therapy. **Chest.85** :125s.

O'Donell,E.D.(1994). Breathlessness in Patients witrh Chronic Airflow Limitation. **Chest.106(3)**:904-912.

Ogilive,C. & Evans,C.C.(1987).The respiratory system. **Chamberlain's Symptom and Sign in Cli nical Medicine**.(166-170).(11th ed.) Bristol.IOP. Publishing Ltd.

Parshall,B.M.(1999). Acute Emergency Visit for Chronic Cardiorespiratory Disease: Does Dyspnea Matter?. **Nursing Research.48(2)** :62-69.

Schwartztein,M.R.(1986). Cold Facial Stimulation Reduces Breathlessness Induced in Normal Subject. **American Review of Respiratory Disease.136** :58-61.

Sharp,T.J., et al.(1980). Postural Relief of Dyspnea in Severe Chronic Obstructive Pulmonary Disease. **American Review of Respiratory Disease.122** :201-211.

Sonnesso,G.(1991). Are you ready to use Pulse Oximetry?. **Nursing91.(August)** :60-64.

Spahigo,A.J. & Grassino,A.(1996). Effect of pursed-lips breathing and expiratory resistive loading in health subjects. **American Physical Society.80(5)** :1772-84.

Steele,B. & Shaver,J.(1992).The Dyspnea Experience :Nociceptive Properties and a Model for Research and Practice. **Advance in Nursing Science.15(1)** :64-67.

Thoman,R.L., et al.(1966). The Efficiency of Pursed-Lips Breathing in Patients with Chronic Obstructive Pulmonary Disease. **American Review of Respiratory Disease.93** :100-6.

Tiep,B.L., et al.(1986). Pursed-Lips Breathing Training Using Ear Oximetry. **Chest.90 (2)** :218-221.

Ugald,V., et al.(2000). Pursed-Lips Breathing Improves Ventilation in Myotonic Muscular Dystrophy. **Archives Physical Medicine Rehabilitation.81(April)** :472-8.

Weiser,P.C.(1993). Dyspnea :symptom assessment and management. In Hodgkin,J.E. (eds.) **Pulmonary Rehabilitation Guidelines to success**.(492-506). Philadelphia:J.B. Lippincott.

จรวยพร ธรณินทร์.(2525).กายวิภาคและสรีรวิทยาของการออกกำลังกาย.กรุงเทพ:บริษัท สำนักพิมพ์ไทยวัฒนาพานิช จำกัด

จันทร์เพ็ญ ชูประภาวรรณ.(2543).ชุดปัญหาวิกฤต.สถานะสุขภาพคนไทย.(หน้า225-257).พิมพ์ครั้งที่ 1.กรุงเทพมหานคร:อุษาการพิมพ์.

ชูศักดิ์ เวชแพศย์.(2520).สรีรวิทยา.(หน้า165).พิมพ์ครั้งที่4.กรุงเทพ:โรงพิมพ์อักษรสมัย.

นันทา มาระเนตร.(2532).สรีรระบบทางเดินหายใจ. ในนันทา มาระเนตร(บรรณาธิการ),โรคระบบทางเดินหายใจ.(หน้า80 –82).กรุงเทพ:แอดก้าอินเตอร์เนชั่นแนล.

บัวรอง ลิ่วเฉลิมวงศ์.(2542).ระบบการหายใจ. ในเลียงชัย ลิ้มล้อมวงศ์ (บรรณาธิการ),สรีรวิทยา. (หน้า214-223).พิมพ์ครั้วที่4.กรุงเทพมหานคร: Text and Journal Publication Co.Ltd.

บุญญรัตน์ เอื้อสุดกิจ.(2535).การติดตามระบบการหายใจและการเปลี่ยนแปลง. ใน พูนเกษม เจริญพันธ์ และสุมาลี เกียรติบุญศรี(บรรณาธิการ),การดูแลรักษาโรคระบบหายใจในผู้ใหญ่.(หน้า 113-124).กรุงเทพ:โรงพิมพ์ อักษรสมัย.

ศิริอร สินธุ.(2543).การคิดวิเคราะห์ปัญหาและการพัฒนาวิธีการบำบัดทางการพยาบาลในหน่วยวิกฤต.ภาวะวิกฤตในหออภิบาล การบำบัดรักษาพยาบาลเล่ม2.(หน้า20-21). กรุงเทพมหานคร:บริษัท ศิริยอดการพิมพ์ (ประเทศไทย) จำกัด.

สุภาพ สุวรรณเวโช.(2543).การรับรู้เกี่ยวกับสุขภาพและความต้องการของผู้ป่วยหอบหืดและปอดอุดกั้นเรื้อรังในระยะหอบเหนื่อย.รามาธิบดีพยาบาลสาร.6(1):6-19.

อัมพรพรรณ ธีรานุตร.(2542).การฟื้นฟูสมรรถภาการทำงานของปอด.โรคปอดอุดกั้นเรื้อรัง:การดูแลตนเองและการฟื้นฟูสภาพ.(หน้า199-200).พิมพ์ครั้งที่1.ขอนแก่น:โรงพิมพ์ ศิริภัณฑ์ออฟเซ็ท.

# APPENDIX

# Appendix A

## The Consent form

My name is Supaluck Parinyavutichai. I am a master's degree student at the faculty of Nursing, Mahidol University. I am studying the research that is entitied "Effects of nursing therapeutics on dyspnea in patients with chronic obstructive pulmonary disease" I also would like you to participate in this study because your experiences are the valuable and useful to improve nursing.

Your decision to participate in this study is absolutely voluntary and you may refuse or withdrawal from the study at any time by no way affects the services that you may receive from the hospital. If you have any symptoms such as dyspnea, and suffocation, while receiving nursing therapeutics, the study will be stopped and you will receive help immediately. And if you have any question regarding this study, please ask and discuss it with me at all times.

Thank you for considering my request.

Sincerely yours,

Supaluck Parinyavutichai

---

**For the participant**

I voluntarity agree to give my consent to participate in this study

... ... ... ... ... ... ... ... ... ... .

(Signature of the patient)

date.....

# APPENDIX B

## เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล

ส่วนที่ 1.ข้อมูลส่วนบุคคลของผู้ป่วย

1. อายุ.....ปี
2. เพศ.....
3. ศาสนา.....
4. สถานภาพสมรส.....
5. ระดับการศึกษา.....
6. อาชีพ.....
7. วิธีเสียค่ารักษาพยาบาล.....
8. วันที่ได้รับการวินิจฉัย.....
9. การวินิจฉัยโรค.....
10. ระยะเวลาของการเจ็บป่วย.....
11. ประวัติการรักษาด้วยยาที่ผู้ป่วยได้รับ.....
12. ประวัติการสูบบุหรี่.....

ส่วนที่2. ข้อมูลเกี่ยวกับประสบการณ์อาการหายใจลำบาก

1. เมื่อเกิดอาการหายใจลำบาก คุณมีอาการอย่างไรบ้าง.....
2. ก่อนที่จะเกิดอาการหายใจลำบาก มีอาการอะไรนำมาบ้าง.....
3. คุณคิดว่าอะไรบ้างที่เป็นสาเหตุให้คุณเกิดอาการหายใจลำบาก.....
4. อาการหายใจลำบากของคุณ เกิดขึ้นบ่อยครั้งแค่ไหนภายในหนึ่งเดือน.....
5. ขณะมีอาการหายใจลำบาก คุณมีความรู้สึกอย่างไรบ้าง.....
6. เวลาที่มีอาการหายใจลำบาก คุณใช้วิธีการอะไรบ้างในการจัดการกับอาการดังกล่าว.....
7. หลังจากที่คุณได้ใช้วิธีการต่างๆในการจัดการกับอาการหายใจลำบาก แต่ละวิธีได้ผลอย่างไรบ้าง.....
8. เมื่อมีอาการหายใจลำบากอย่างรุนแรง คุณสามารถควบคุมอาการดังกล่าวได้หรือไม่ เพราะเหตุใด.....

ส่วนที่ 3. แบบวัดการรับรู้อาการหายใจลำบาก

แบบวัดนี้ เป็นแบบวัดการรับรู้อาการหายใจลำบาก ตามความรู้สึกของท่านขณะนี้ ตั้งแต่ไม่มีความรู้สึกหายใจลำบากเลย จนถึงมีความรู้สึกหายใจลำบากมากที่สุด โปรดทำเครื่องหมาย X ลงบนเส้นตรงข้างล่างนี้ ระหว่างเลข 0 – 10 ตามระดับความรู้สึกหายใจลำบากของท่าน


ไม่รู้สึกหายใจลำบาก รู้สึกหายใจลำบากมากที่สุด

| VAS | วันที่ 1. | วันที่ 2. | วันที่ 3. |
|---|---|---|---|
| ก่อนให้การบำบัดทางการพยาบาล | | | |
| หลังให้การบำบัดทางการพยาบาล | | | |

ส่วนที่ 4. มาตราวัดอัตราเร็วสูงสุดในการหายใจออกในเวลา 1 นาที (PEFR) (สำหรับผู้ศึกษา)

มาตราวัดนี้ เป็นการวัดอัตราเร็วสูงสุดในการหายใจออกในเวลา 1 นาที (PEFR) โดยใช้ Wright Peak Flow Meter เพื่อดูการอุดกั้นของทางเดินหายใจ ก่อนและหลังให้การบำบัดทางการพยาบาล โดยให้ท่านหายใจเข้าลึกๆแล้วเป่าลมหายใจออกอย่างเต็มที่เข้าไปในเครื่องนี้ 3 ครั้ง ค่าที่อ่านได้สูงสุด จะเป็นค่าที่วัดได้ในขณะนั้น

| PEFR(ลิตร / นาที) | วันที่ 1. | วันที่ 2. | วันที่3. |
|---|---|---|---|
| ก่อนให้การบำบัดทางการพยาบาล | | | |
| หลังให้การบำบัดทางการพยาบาล | | | |

ส่วนที่ 5. แบบบันทึกการวัดค่าความเข้มข้นของออกซิเจนในเลือดแดง ( $O_2$ Sat)

แบบบันทึกนี้ เป็นการวัดค่าความเข้มข้นของออกซิเจนในเลือดแดง ( $O_2$ Sat) โดยใช้ Pulse Oximeter ก่อนและหลังการหายใจด้วยวิธีห่อปาก (PLB)

| $O_2$ Sat / PLB | ครั้งที่1. | | ครั้งที่2. | | ครั้งที่3. | | ครั้งที่4. | |
|---|---|---|---|---|---|---|---|---|
| | ก่อน | หลัง | ก่อน | หลัง | ก่อน | หลัง | ก่อน | หลัง |
| วันที่1. | | | | | | | | |
| วันที่ 2. | | | | | | | | |
| วันที่ 3. | | | | | | | | |

นอกจากนี้ได้มีการประเมินอัตราการหายใจของผู้ป่วยร่วมด้วย เพื่อติดตามผลของการทำ PLB

| RR / PLB | ครั้งที่1. | | ครั้งที่2. | | ครั้งที่3. | | ครั้งที่4. | |
|---|---|---|---|---|---|---|---|---|
| | ก่อน | หลัง | ก่อน | หลัง | ก่อน | หลัง | ก่อน | หลัง |
| วันที่1. | | | | | | | | |
| วันที่ 2. | | | | | | | | |
| วันที่ 3. | | | | | | | | |

ส่วนที่ 6. แบบวัดความพึงพอใจของผู้ป่วยต่อการบำบัดทางการพยาบาล

1. ระดับความพึงพอใจของผู้ป่วยต่อ ท่าทีของพยาบาลในการช่วยเหลือท่านเกี่ยวกับอาการหายใจลำบาก อยู่ในระดับ (สูง, ปานกลาง, ต่ำ, ไม่พอใจ).....

- ผู้ป่วยมีความรู้สึกอย่างไร ต่อท่าทีของพยาบาลในการช่วยเหลือท่านเกี่ยวกับอาการหายใจลำบาก.....

2. ระดับความพึงพอใจของผู้ป่วย ต่อการได้รับยาพ่นขยายหลอดลม อยู่ในระดับ (สูง, ปานกลาง, ต่ำ, ไม่พอใจ).....

- ผู้ป่วยมีความรู้สึกอย่างไร ต่อการได้รับยาพ่นขยายหลอดลม.....

3. ระดับความพึงพอใจของผู้ป่วย ต่อการช่วยเหลือผู้ป่วยจัดท่าที่ทำให้ผู้ป่วยหายใจดีขึ้น อยู่ในระดับ (สูง, ปานกลาง, ต่ำ, ไม่พอใจ).....

- ผู้ป่วยมีความรู้สึกอย่างไร ต่อการช่วยเหลือผู้ป่วยจัดท่าที่ทำให้ผู้ป่วยหายใจดีขึ้น.....

4. ระดับความพึงพอใจของผู้ป่วย ต่อการได้รับสอนให้หายใจด้วยวิธีห่อปาก(PLB) อยู่ในระดับ (สูง, ปานกลาง, ต่ำ, ไม่พอใจ).....

- ผู้ป่วยมีความรู้สึกอย่างไร ต่อการได้รับสอนให้หายใจด้วยวิธีห่อปาก (PLB).....

# BIOGRAPHY

| | |
|---|---|
| **NAME** | Mrs. Supaluck Parinyavutichai |
| **DATE OF BIRTH** | 25 May 1958 |
| **PLACE OF BIRTH** | Bangkok, Thailand |
| **INSTITUTIONS ATTENED** | Mahidol University, 1978 – 1981: Bachelor of Nursing<br>Mahidol University, 1999 – 2001: Master of Nursing Science (Adult Nursing) |
| **POSITION & OFFICE** | 1981 – Present<br>Out Patient Nursing Division<br>Department of Nursing, Siriraj Hospital<br>Faculty of Medicine, Mahidol University<br>Position : Registered Nurse |