

INFORMATION TO USERS

The most advanced technology has been used to photograph and reproduce this manuscript from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book. These are also available as one exposure on a standard 35mm slide or as a 17" x 23" black and white photographic print for an additional charge.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

U·M·I

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 1337973

Symptomatology and life quality as predictors of emergent use

Moutafis, Roxanne Alexis, M.S.

The University of Arizona, 1989

Copyright ©1989 by Moutafis, Roxanne Alexis. All rights reserved.

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106



**SYMPTOMATOLOGY AND LIFE QUALITY
AS PREDICTORS OF EMERGENT USE**

by

Roxanne Alexis Moutafis

Copyright © Roxanne Alexis Moutafis 1989

A Thesis Submitted to the Faculty of the
COLLEGE OF NURSING
In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE
In the Graduate College
THE UNIVERSITY OF ARIZONA

1989

STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the copyright holder.

SIGNED: *Roxanne Alexis Montafis*

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

Gayle A. Traver
Gayle A. Traver, R.N., MSN
Associate Professor of Nursing

July 25, 1989
Date

ACKNOWLEDGMENTS

This thesis would never have been completed without the cooperation, assistance and support of many people. I wish to thank my many professional associates from Boehringer-Ingelheim and Galaxo for their research assistance and to Dura-Vent Inc. for providing a portable spirometer.

Most importantly I wish to acknowledge my family for their support, love and encouragement during the very difficult periods. Without my husband Matthew and daughter Sophia, completion of this thesis would not have been possible.

TABLE OF CONTENTS

	PAGE
LIST OF ILLUSTRATIONS	7
LIST OF TABLES	8
ABSTRACT	9
1. INTRODUCTION	10
Statement of the Problem	12
Purpose of the Study	13
Significance of Research	13
2. THEORETICAL FRAMEWORK	15
Adaptive Abilities	17
Sensory Symptomatology	22
Psychologic Behavior	25
Isolation	27
Definition of Constructs	31
Adaptive Ability	31
Sensory Symptomatology	31
Psychologic Behavior	31
Isolation	32
Definition of Concepts	32
Emergent Use	32
Peripheral Sensory Symptomatology	32
Emotional Behavior	32
Self-Imposed Alienation	32
Summary	33
3. METHODOLOGY	34
Research Design	34
Setting/Sample	34

TABLE OF CONTENTS (Continued)

	PAGE
Instruments	36
Bronchitis Emphysema Symptom Checklist (BESC)	39
Sickness Impact Profile (SIP)	40
Caregiver Questionnaire (CGQ)	41
Data Collection Protocol	42
Data Analysis	44
Summary	45
4. RESULTS OF ANALYSIS OF DATA	46
Description of the Sample	46
Bronchitis Emphysema Symptom Checklist (BESC)	49
Sickness Impact Profile (SIP)	51
Initial Emergent Group Categorizations	51
Research Question	58
5. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS	60
Findings	61
Discussion of the Prediction Formula	67
Limitations	70
Conclusions	72
Suggestions for Further Study	73
SUMMARY	74

TABLE OF CONTENTS (Continued)

	PAGE
APPENDIX A: SUMMARY OF TRAVER'S RESEARCH	75
APPENDIX B: ETHICAL REVIEW COMMITTEE PROJECT APPROVAL	78
APPENDIX C: HUMAN RESEARCH COMMITTEE APPROVAL	80
APPENDIX D: HUMAN SUBJECTS CONSENT FORM	82
APPENDIX E: CAREGIVER QUESTIONNAIRE	84
APPENDIX F: DEMOGRAPHIC FORM/ CHART REVIEW	86
APPENDIX G: SICKNESS IMPACT PROFILE LETTER OF PERMISSION	89
REFERENCES	91

LIST OF ILLUSTRATIONS

	PAGE
Figure	
1 Traver Prediction Formula Framework Model	16

LIST OF TABLES

	PAGE
1 Operational Measures of Instruments & Subscales by Concepts	37
2 Demographics of Sample: Diagnoses, Education & Smoking History; Frequencies, Percent	47
3 Marital Status by Sex	48
4 BESC T Scores by Subscales Means, Standard Deviations	50
5 Sickness Impact Profile Percent Impairment Scores Means, Standard Deviations	52
6 Description of High-Low Emergent Groups vs. Traver Formula Categorizations; Frequencies, Percents	55
7 Mean BESC T-Scores, Greatest Differences Between Groups 1-4 Means, Standard Deviations	57
8 Mean SIP Scores: Greatest Differences Between Groups Means, Standard Deviations	59

ABSTRACT

A nursing concern for patients with chronic obstructive airway disease (COAD) is to assist the patient/family in improving adaptation strategies and self-care abilities. Identification of emotional and behavioral characteristics impacting on symptoms and life quality may predict individuals at risk for greater utilization of health care resources.

The purpose of this descriptive study was to apply Traver's Prediction Formula for Emergent Use to a more general COAD population to determine if the formula would accurately predict those subjects who have high versus low emergent use of institutional health care resources. Fifty subjects with a range of COAD severity were studied. Subjects completed instruments which measured symptoms and life quality: the Bronchitis-Emphysema Symptom Checklist and the Sickness-Impact Profile. Findings demonstrated Traver's Formula predicted low emergent subjects with 76 percent accuracy, high emergent subjects with 53 percent accuracy and predicted the overall emergent status of subjects with 67 percent accuracy.

CHAPTER 1
INTRODUCTION

Over 21.5 million Americans live with some form of chronic lung disease (American Lung Association, 1986). Although not limited to the elderly, the incidence of chronic bronchitis and emphysema is highest after the ages of 40 and 50 respectively (Bordon, Stool & Moser, 1982).

Chronic obstructive pulmonary disease (COPD) is the leading cause of permanent disability in adults over the age of 40 (Shenkman, 1985) and is the most frequent diagnostic category awarded disability payments by the Social Security Administration (American Lung Association, 1986).

Chronic obstructive pulmonary disease traditionally refers to the grouping of two pulmonary diseases, emphysema and chronic bronchitis. It is characterized by increased resistance to flow in the airways creating dyspnea, fatigue, wheezing and productive cough (Hogkin, 1979). The term chronic obstructive airway disease (COAD) is used to include those with asthmatic bronchitis and bronchiectasis, diagnoses previously eliminated from the COPD definition. For the purpose of this study the COAD label was used to describe the total population of individuals with chronic airways disease. The

consequences of COAD are frequently progressive deterioration of the patient's physiologic, psychologic, functional and behavioral status. This deterioration frequently creates problems with psychosocial and occupational adjustment, and ultimately life quality. Quality of life is difficult to define as evidenced in the literature (Youngner, 1986; Thompson & Thompson 1985; Steele & Harmon 1983; Flynn & Frantz, 1987). Subjective and or objective measures, however, can provide insight to life quality (Flynn & Frantz, 1987). Quality of life is defined as the study of focusing on the individual's ability to interact with his or her environment (Steele & Harmon, 1983). It is that ability which is the focus of nursing care and therefore life quality variables are important when assessing, planning and implementing nursing care for COAD patients.

Chronic obstructive airway disease is viewed as a progressive disease, and individuals typically experience characteristic exacerbations, which frequently require hospitalization. The economic costs of such chronic respiratory illness are enormous when one considers lost work, health care and hospitalization costs. The American Lung Association (1986) has estimated that the direct and indirect economic cost exceeds \$41 billion annually in the United States.

Statement of the Problem

Considering that hospital services have constituted the primary expense of the national health budgets (Sherman & Flatley, 1976), it appears only logical to place emphasis on preventing or reducing the number of unnecessary rehospitalizations. As with any chronic illness, many factors may influence exacerbations and potential rehospitalizations. Psychologic, behavioral and personality factors have been found to influence the response to chronic illness as well as the management and utilization of health care resources (Kinsman, Jones, Matus & Schaum, 1976; Jones, Kinsman, Dirks, Wray & Dahlem, 1979; Kinsman, Dirks & Jones, 1982; Traver, 1988). The literature related to factors influencing rehospitalization in this population is limited. Within the chronic asthmatic population symptomatology and personality measures were key factors in predicting patients requiring repeated hospitalizations (Studenmayer, Kinsman & Jones, 1978; Dirks & Kinsman, 1981; Dirks, 1982). Symptomatology and life quality measures were studied by Traver (1988). Thirty subjects were studied to identify differences between those subjects with high versus low emergent use of institutional health care resources. The outcome led to the formulation of a prediction formula which would predict those COAD patients

most likely to be high users of institutional health care resources.

Utilization of such a formula would enable nurses to identify individuals at risk for greater utilization of health care resources and potential rehospitalization. Once the population is identified, interventions could focus on decreasing the risk of rehospitalization and unnecessary utilization of health care resources.

Purpose of the Study

The purpose of this study was to apply the prediction formula of Traver (1988) to the general COAD population to determine if the formula will accurately predict those subjects who have high versus low emergent use of institutional resources. A summary of Traver's research is provided in Appendix A. The research question was: Is Traver's prediction formula valid in a more general COAD population?

Significance of Research

A primary nursing concern with the COAD population is to assist the patient and family in improving adaptation strategies and self-care abilities. The identification of emotional and behavioral characteristics may provide not only an excellent indication of the individual's ability to adapt to chronic illness but more importantly may

provide a prospective predictive tool for identifying those patients who may be more likely to be high emergent users of health care resources. The prediction formula may also serve as a means to evaluate nursing interventions focused on altering the emergent classification of the patient.

CHAPTER 2

THEORETICAL FRAMEWORK

The theoretical framework for this study is based upon the mathematical model as presented by Traver's Prediction Formula (1988). The construct level as outlined in the Traver Prediction Formula Framework model (Figure 1) includes adaptive abilities, sensory symptomatology, psychologic behavior and isolation. The concept level includes emergent use, peripheral sensory symptomatology, emotional behavior and self imposed alienation. The operational level consists of the criteria for emergent use, the prediction formula and the instrument subscales which were used to measure the variables studied. The instruments are discussed in the methodology chapter.

The theoretical framework is introduced with a discussion of how emergent use reflects adaptive abilities. The remaining constructs and their relationship to the concepts are then discussed. A discussion of emergent use and its relevance to each of the concepts of peripheral sensory symptomatology, emotional behavior and self-imposed alienation is then presented.

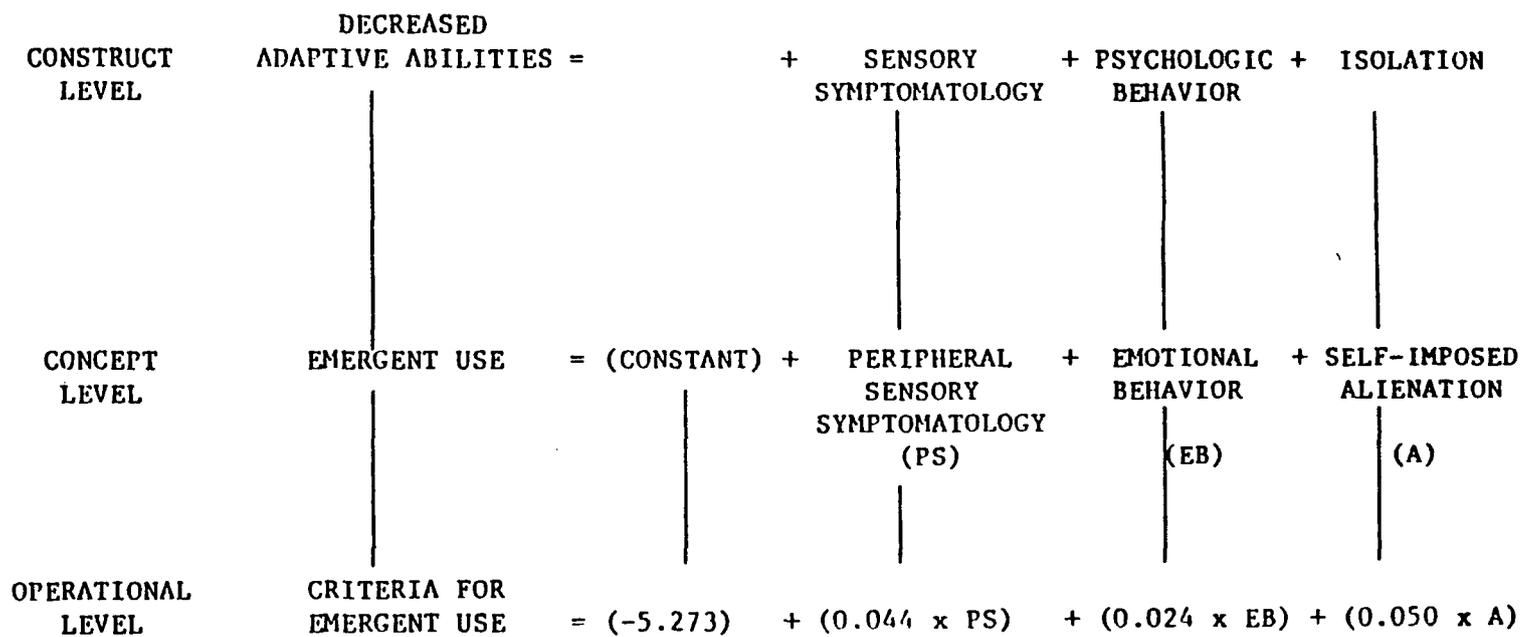


Figure 1. Traver Prediction Formula Framework Model

Adaptive Abilities

Adaptation is the process by which one improves the possibilities for interaction between himself and the environment. It involves the assimilation and accommodation necessary for adaptation to occur (Wilson & Kneisl, 1979). Living with chronic illness requires one to adapt to various life changes which often impact on quality of life. Adaptation requires adjustment to a changing physiologic status as well as the surrounding environment. Coping behaviors are used as a means by which one deals with life changes. These coping behaviors in turn provide the individual with the necessary abilities to adapt to decreased functional capacity and to improve quality of life (Dudley & Sitzman, 1979).

The greater the adaptive ability of the individual to assimilate and accommodate to the environment, the more likely he will deal more effectively with the disease process, and its medical management. Optimally, he will also decrease the number of hospitalizations and decrease utilization of health care resources. Dudley, Glaser, Jorgenson, and Logan, (1980a) present the concept of psychosocial assets, e.g., social support, coping ability and adaptive ability, as necessary for one to deal with the environment and adjust to chronic illness. Compared to subjects with low psychosocial assets, those with

greater psychosocial assets will be able to control symptoms and have a better rehabilitation outcome (Dudley & Sitzman, 1979; Dudley, Glaser, Jorgenson & Logan, 1980b).

De Aranjó, Van Arsdale, Holmes and Dudley, (1973) studied the association between psychosocial assets and environmental change in 36 chronic asthmatics. They found that patients with low coping abilities and high life change were continuously incapacitated, required significantly higher corticosteroid doses, and needed continuous medical care. Those with high coping abilities were found to deal with life change without stressing the body systems, without creating an emergence of symptoms, and required relatively small doses of steroids. The Wilcoxon rank sum test was used to compare the two groups (high and low coping) with significance set at $p < 0.01$. It was found that emotionally triggered physiological changes in ventilation and/or carbon dioxide levels were more easily adapted to by those with greater coping abilities. Such individuals were also more aware of the consequences of emotions on symptom emergence and were better able to control those symptoms.

Alleviation of emotional factors such as anxiety which trigger psychologic symptoms may lead to higher functional ability and thereby improve quality of life. In the

nocturnal oxygen therapy trial perceptions of symptoms were found to influence quality of life (McSweeney, Grant, Heaton, Adams, & Timms, 1982). The study was designed to evaluate the effects of continuous oxygen therapy versus nocturnal oxygen therapy in 203 hypoxemic COPD patients at six centers. It was found that when comparing the patients before and after some months of treatment, those patients receiving oxygen therapy had improved neuropsychologic functioning and improved perceptions of quality of life.

Investigating quality of life and its predictors in mildly hypoxemic COPD patients, Pregatano, Wright and Levin (1984) studied 100 subjects enrolled in the Intermittent Positive Pressure Breathing (IPPB) Clinical Trial. It was found that the mildly hypoxemic COPD patients showed impairment in quality of life, although relatively less impairment than those in the Nocturnal Oxygen Therapy Trial Group, (1980) study who had greater hypoxemia.

Studying 21 patients in a pulmonary rehabilitation setting, Agle, Baum, Chester and Wendt, (1973) found that regardless of physiologic impairment, those with fewer initial psychologic symptoms had greater improvement in areas of exercise tolerance, number of hospital admissions and quality of life. Following the rehabilitation period and one year follow up, positive change was measured by

improved exercise tolerance on treadmill performance and reported ability to perform activities of daily living with less discomfort. In those subjects who began the program with fewer psychologic symptoms of depression, anxiety and body preoccupation, there was an increase in the number employed and a marked decrease in the number of pulmonary hospital admissions.

A 10 year follow up study of a comprehensive rehabilitation program for severe COPD patients was conducted by Sahn, Nett, and Petty (1977) using 128 subjects. When compared to those who did not survive 10 years, the 28 ten-year survivors had a significant reduction in hospitalization for pulmonary causes, in affective distress, anxiety, depression and somatic concern. If unable to use adaptive abilities, the individual will most likely be unable to maintain a reasonable therapeutic program and will subsequently decompensate (Dudley, Wermuth, & Hague, 1973). It has been found that maladaptive or ineffective adapting abilities can perpetuate chronic illness (Staudenmayer, Kinsman, & Jones, 1978).

Staudenmayer, et al., (1978) studied 159 adult asthmatic inpatients and their attitudes towards respiratory illness and its treatment. It was suggested that individuals with low self confidence in the ability

to cope with asthma, those with a helpless or dependent adaptive style were more apt to have a poor, long term treatment outcome.

Traver (1988) studied symptomatology and life quality of patients with chronic airways obstruction and the relationship to the prevalence of emergent use of institutional health care resources. (See Appendix A for Traver's research summary). Thirty subjects, all with severe airways obstruction, were studied to identify differences in symptomatology and life quality between those with high versus low emergent use of institutional health care resources. Subjects were identified and selected as being high or low emergent according to specified criteria. Emergent use was defined as care obtained via unscheduled, non-routine methods of access to the health care system. Each group contained 15 subjects with similar gender distribution. Traver implied that emergent use reflects the patient's adaptive ability as well as his response to chronic illness which can be measured in terms of psychologic and behavioral factors and utilization of health care resources.

Based on the symptomatology and life quality data, Traver formulated a prediction equation for emergent use. High emergent users were found to have greater frequency of symptoms and greater impairment of social functioning than

were the low emergent users with fewer symptoms and greater social functioning.

Emergent use therefore for the purposes of this study, appeared to be a logical indicator of one's adaptive ability. The lesser the adaptive ability, the greater the difficulty in dealing with physiologic and or psychologic changes which often result in increased utilization of health care resources reflected as high emergent use. In the present study, subjects' adaptive abilities were operationalized by an emergent use categorization which included number of hospitalizations, emergency room visits, and frequency of phone calls to the health care provider.

Sensory Symptomatology

Physiologic, psychologic, and psychosocial factors have been found to influence symptomatology in general (Agle et al., 1973; Altose 1985; Dudley & Sitzman, 1979; Dudley et al., 1980; Killian, 1985; Mahler, Rosiello, Harver, Lentine, McGovern & Daubenspeck, 1987). These factors become important not only with regards to influencing the sensation and perception of symptoms but also with potentially producing or increasing disability (Dudley & Sitzman, 1979). Varying from person to person, perception often influences behavior which in turn may

enhance or impair one's ability to adapt to chronic illness (Agle et al., 1973; Dudley, Wermuth & Hague, 1973; NOTT, 1980; Janson-Bjerklie, Carrieri & Hudes, 1986; Traver, 1988).

In the COAD population, dyspnea is the most common chief complaint of patients and is a factor which strongly affects peripheral sensory symptomatology. Dyspnea or breathlessness creates many related sensory symptoms which are represented in the Bronchitis Emphysema Symptom Checklist (BESC) peripheral-sensory symptom sub-scale. These related symptoms include: tingling in the arms or legs, leg aches, sensations of pins and needles, numbness or cramping.

Dudley et al., (1979) stated that dyspnea which frightens a patient may create a vicious cycle which is often very difficult to stop. Dyspnea perceived as life-threatening and fear often lead to hyperventilation. Hyperventilation can then cause symptoms of numbness, tingling or sensations of pins and needles in extremities, and creates increased physiologic demands and an even greater sensation of dyspnea. Therefore, dyspnea is often associated with increased peripheral complaints, increasing the degree of somatic concern, which can and often leads to increased utilization of emergent care resources.

Following a pulmonary rehabilitation program, improvement in function correlated with psychologic factors and not physiologic state. It was found that patients reporting the least symptomatology before the program demonstrated the greatest improvement in rehabilitation, especially in terms of desensitization of the fear of dyspnea and increased patient autonomy in the control of symptoms (Agle, et al., 1973).

Conversely, Staudenmayer et al., (1979) found patients who ignored or disregarded their symptoms were twice as likely to be rehospitalized and had increased emergent use. Avoidance or denial of symptoms appears to have a detrimental effect on symptom management often leading to increased utilization of emergent care resources.

Traver's research (1988), consistent with others, demonstrated that high emergent subjects reported higher frequency of symptoms during periods of breathlessness than did the low emergent subjects. Traver's work supports the concept that increased frequency of symptoms can be related to emergent use and adaptive ability. For this study, peripheral sensory symptomatology was operationalized using the peripheral sensory subscale of the Bronchitis Emphysema Symptom Checklist (BESC) (Kinsman, 1983).

Psychologic Behavior

The COAD patient, having reached moderate to severe impairment, develops compensatory behaviors; some ultimately helpful while others actually impair adjustment to the chronic disease. Common behavioral responses to chronic illness are displayed emotionally as resentment, anger, fear, submission or depression. These factors create a counter-productive emotional state in the adaptive process.

The impact of psychologic and behavioral factors on the patient's response to chronic illness and its treatment has been documented in the literature. Kinsman (1986) presents the concept of "illness psychomaintenance" which refers to the psychologic and behavioral perpetuation and exacerbation of physical illness. Psychomaintenance focuses on the psychologic and behavioral factors maintaining the perceived severity of the illness once it has developed. In addition to reported symptoms and experiences, personality, attitudes toward treatment and interactions with others are identified as important in predicting behavior during illness (Jones, Kinsman, Dirks & Dahlem, 1979).

Various psychologic factors can initiate behaviors such as noncompliance, symptom exaggeration or minimization. Feelings often times are directed inward

creating a decreased self image. Unrealistic self-care expectations set the stage for self reprisal, manifesting themselves in irritability, nervousness, restlessness and impatience when unable to perform previously minor tasks. Physiological changes impact on one's alertness behaviors often creating periods of confusion, forgetfulness, or indecisiveness. Personality and how one has adapted to previous life changes often impact on the behavioral outcome. The subject's previously developed coping abilities can maintain illness, defeat medical management, and subsequently lead to rehospitalization. The psychological origins of the behaviors may be driven by emotional factors such as denial, feeling frightened, helplessness or hopelessness (Dirks, Kinsman, Horton, Fross & Jones, 1978).

Studying 196 patients who were recently discharged from a hospital setting, Staudenmayer, Kinsman, Dirks, Spector and Wangaard (1979) investigated the interaction of airway hyperreactivity and coping styles, and how these factors may potentially influence medical outcome. The findings showed that the combined effect of the level of airway hyperreactivity and coping style, specifically a form of anxiety which is focused directly upon breathing difficulties, was a good predictor of medical outcome in asthma.

Those individuals who are able to adapt in a positive manner are able to change life style expectations, and better adapt to physical limitations (Agle et al., 1973; Sahn et al., 1977; Dudley et al., 1980). They often experience less negative emotional behavior which helps to maintain psychosocial functioning (Traver, 1988). This group is often able to cooperate with medical and nursing regimens, require less medical support, and thereby decrease emergent use. For this study, the concept of emotional behavior was operationalized utilizing the Emotional Behavior Scale of the Sickness Impact Profile (Bergner, 1976). The scale includes items such as subjectively feeling useless, being a burden, suicidal, nervous or restless, and hopeless.

Isolation

As with any chronic illness, COAD presents a sometimes slow deteriorating physiological state. The individual may be ill most of the time and never regain what he feels is an acceptable physical or mental state of being. He is faced with a disease for which there is no cure, only palliative treatment (Agle, Baum, Chester & Wendt, 1973). Rehabilitation emphasis is not on eliminating the disease but providing an awareness and ability to manage the disease (Dudley, et al., 1979).

Often as a protective mechanism, COAD patients refrain from physical activities associated with dyspnea. Elimination or avoidance of activities within the vocational, social, recreational or personal care areas may affect overall quality of life measures. Avoidance of physical activities, emotional interactions and social situations often times becomes a means of protection (Dudley, et al., 1979). These behaviors although initiated as a protective measure, create a barrier between the individual and others, and serve as a negative force in the adaptation process.

The once active individual now experiences gradual or sudden losses, changes in self-image, independence, pride, lifestyle, functional abilities and the ability to mentally adapt to such changes. Decreased social interaction may lead to perceptions of being ignored. Loneliness is magnified, and embarrassment over current physical limitations may occur. Knowledge that the disease is progressive and irreversible often creates feelings of hopelessness and depression (Light, Merrill, Despars, Gordon, & Mutalipassi, 1985; Traver, 1988).

The individual deals with disabling emotional and physiologic changes through the defense mechanisms of isolation, denial and repression. Although these mechanisms may protect the failing respiratory system, the

patient appears to others as insensitive, self-serving, unresponsive, depressed or at the extreme, psychotic. He is often unable to express anger, fearing reprisals or isolation from those who can help him. However, in reality, many COAD individuals do not appear as depressed as this stereotype would present.

In contrast, Cassileth, Lusk, Strouse, Miller, Brown, Cross and Tenaglia (1984) hypothesized that the psychological status of chronically ill patients would not differ from that of the general public. It was found that, other than those with end stage disease, patients managed to adapt well and their psychological status represented "the population at large because adaptation represents not the demands of particular stress . . . , but rather the manifestation of enduring personality constructs and capacities" (p.510).

Studying patients in a pulmonary rehabilitation program, Shenkman (1985) wanted to identify factors contributing to attrition rates. Those patients not completing the program had higher scores in anxiety and depression, reported more feelings of dejection, helplessness- hopelessness and alienation. They rated themselves the most incapacitated by their disease, had the highest levels of fatigue and anxiety, and indicated more often a loss of interest in food, their surroundings

and other people.

Agle et al. (1973) found patients who responded positively to rehabilitation tended to have less severe symptoms of depression initially and showed improvement at one year follow up. Poor responders initially tended to have more severe psychiatric symptoms, such as depression, anxiety and excessive body preoccupation, and demonstrated little or no positive change.

Although the expression of emotion may indeed increase metabolic demands on an already compromised system creating a rapid increase of symptomatology, it also serves as a protective mechanism. However, suppression or avoidance of feelings only tends to perpetuate greater interpersonal problems and heighten frustration, anger or despair. If unable to learn adaptive strategies to effectively manage these changes in emotional state, the individual will not be able to carry out an effective therapeutic program (Dudley, et al., 1973).

The concept of self imposed alienation was operationalized using the alienation subscale of the BESC including items such as feeling lonely, ignored and feeling embarrassed.

Definition of Constructs

Adaptive Ability

Adaptive ability is defined as the individual's ability to adapt to his existing environment. Adaptation requires the use of the body and the ability to utilize coping behaviors to deal with life changes within the environment (Wilson & Kneisl, 1979).

Sensory Symptomatology

Sensory symptomatology is defined as any subjective sensory evidence perceived as a change or alteration of some bodily or mental state (Dorlands, 1973).

Psychologic Behavior

The construct of psychologic behavior is defined as any cognitive process which mediates change as evidenced by either observed or inferred mental or physical activity (Dorlands, 1973).

Isolation

Isolation is defined as the separation from contact with others (Dorlands, 1973).

Definitions of Concepts

Emergent Use

The concept of emergent use is defined as care obtained through unscheduled, non-routine methods of access to health care providers (Traver, 1988).

Peripheral Sensory Symptomatology

The concept of peripheral sensory symptomatology is defined as a type of subjective sensory evidence perceived as an alteration of some bodily state (Dorlands, 1973).

Emotional Behavior

The concept of emotional behavior is defined as a type of psychologic behavior; perceived discrepancies between performance and standards creating emotions which motivate corrective changes in behavior (Bandura, 1976).

Self Imposed Alienation

The concept of self imposed alienation is defined as a type of voluntary isolation with described feelings of isolation such as loneliness and guilt.

Summary

Living with chronic lung disease requires one to adapt to physiologic, psychologic and psychosocial changes created by the progressive disease process. Individuals who are able to adjust in a positive manner by utilizing effective adaptive abilities maintain improved quality of life through effective symptom management, alteration of life style expectations, and maintenance of psychosocial interactions. As a result, many individuals are able to function as optimally as possible, cooperating with medical and nursing regimens, decreasing emergent use and therefore requiring less utilization of health care resources.

CHAPTER 3

METHODOLOGY

The research design, sample and setting, instruments, methods of data collection, and analysis of data are presented in this chapter. Each area is discussed and a brief summary is presented at the conclusion of the chapter.

Research Design

A descriptive design was used to apply the prediction formula of Traver (1988) to a general COAD population. To obtain answers to the question under study, data were collected by use of questionnaires. Controls were specified to minimize variability for the following: age, diagnosis, pre-existing psychiatric history and ability to comprehend and provide data.

Sample/Setting

A convenience sample of 50 subjects who were outpatients having a clinical diagnosis of COAD or COPD was studied. Subjects were recruited from a sub-specialty pulmonary clinic in a teaching hospital.

Initial screening criteria for inclusion in the study included the following:

1. At least 40 years of age.
2. Clinical diagnosis of COAD or COPD.
3. A forced expiratory volume in one second (FEV1) or a peak flow less than 60 percent of predicted normal value.
4. No major psychiatric diagnosis.
5. Able to read and write English.

The lower age limit was set at 40 because the incidence of chronic bronchitis and emphysema is highest after the age of 40 (Bordon, Stool & Moser, 1980). Restricting the FEV1 to a value of less than 60 percent of predicted normal value was important because such patients would generally be considered to have clinically significant obstructive airway disease (Burrows, Knudson, Camilli, Lyle & Lebowitz, 1987). In compliance with physician request and subject tolerance, the measured peak expiratory flow rate (PEFR) (Bordon, Stool & Moser, 1980) was used as a measure of airway obstruction in patients unable to perform simple spirometry. To minimize the potential factors influencing personality or reactions to dyspnea, anxiety, and depression, patients with psychiatric diagnoses were excluded.

Prior approval was obtained from both the Ethical Review Committee of the College of Nursing, University of Arizona, and the Human Research Committee at a local hospital (Appendices A & B). Subjects consenting to participate in the study were required to read and sign the Human Subjects Consent form (Appendix C).

Instruments

To better understand the operational measures in this study, Table 1 has been included. Emergent Use as predicted by the clinical criteria method used the chart review form to obtain the number of hospitalizations and emergency room visits. The Caregiver Questionnaire (Appendix E) was used only to obtain frequency of phone calls and is discussed in greater detail later.

Using the Clinical Criteria Method, the low emergent group was identified as having to meet all of the following criteria: None or one hospitalization for pulmonary exacerbations within the last year, none or one emergency room visit within the last year for pulmonary reasons and two or less phone calls per month to the care provider. The high emergent group was identified as having to meet one or more of the following criteria: two or more hospitalizations for pulmonary exacerbations in the past year, two or more emergency room visits for

Table 1. Operational Measures of Instruments and Subscales By Concepts

Concept	Instrument	Subscale	Operational Measure
Emergent Use Criteria			
Clinical Method	Chart Review Form	N/A	# Hospitalizations # E.R. Visits
	Caregiver Questionnaire	N/A	Question #4 only (frequency of calls)
Traver Formula Method	Traver Prediction Formula	N/A	Prediction Equations
Peripheral Sensory Symptomatology	BESC	Peripheral Sensory (PS)	Numbness, tingling Leg aches, Pins & Needles feeling cramps
Self-Imposed Alienation	BESC	Alienation (A)	Feeling lonely, ignored, feeling guilty embarrassed
Emotional Behavior	SIP	Emotional Behavior (E.B.)	Feeling useless hopeless, irritable, being a burden, self blame, sudden laughing/crying

N/A = not applicable

pulmonary exacerbations in the past year, and frequent phone calls (three or more calls in one month period to the care provider).

Using the Traver Formula method as a second method to predict emergent use, subscales from two instruments were used. The peripheral sensory and alienation subscales from the Bronchitis Emphysema Symptom Checklist (BESC) and the emotional behavior subscale from the Sickness Impact Profile (SIP) were used. The peripheral sensory (PS) and alienation (A) score values from the BESC and the emotional behavior (EB) percent impairment score from the SIP were entered into the prediction equation for calculation of the predictive emergent use categorization. As in Traver's original study, subject discriminate scores falling between + .15 and -.15 were considered too close to zero to categorize and were subsequently dropped from the study. A positive value indicated high emergent use and a negative value indicated low emergent use (Traver, 1988). The BESC and SIP instruments will be discussed in greater detail.

Demographic data (Appendix F) were collected by the researcher during the initial subject interview or during subsequent chart review. The following sections discuss the instrument, the relevant subscale(s) for this study and relevant validity and reliability issues for each

instrument.

Bronchitis Emphysema Symptom Checklist (BESC)

Developed by Kinsman, et al. (1983), the BESC was based upon initial interviews with 206 patients having chronic bronchitis or emphysema. The BESC (Kinsman, et al., 1983) was developed to identify and measure self-reported symptoms and psychological experiences associated during periods of difficult breathing. Eleven symptom clusters were identified: dyspnea, congestion, helplessness- hopelessness, decahexis, anxiety, irritability, fatigue, sleep difficulties, forgetfulness and confusion, peripheral sensory complaints, and alienation. The 89 item questionnaire uses a five point Likert scale (1=never, 5=always).

Two of the subscales of the BESC were significant predictors in the Traver formula. These were the peripheral sensory and alienation subscales. Subjects were asked to identify symptoms associated with typical periods of breathing difficulty for their breathing problems. The peripheral sensory subscale includes peripheral sensory symptoms such as tingling in arms and legs, leg aches, things smelling differently, feelings of pins and needles, numbness, and cramps. The alienation subscale includes such items as feeling lonely, embarrassed, feeling ignored, and feeling guilty.

Raw score means were calculated for each of the 11 symptom categories and then converted to T scores based on the normative data of Kinsman et al., (1983). The internal consistency reliabilities of the scales has been previously established ($r = 0.81 - 0.94$) (Kinsman, et al., 1983). Numerous studies have used the BESC with the COAD population (Jason-Bjerklie, et al., 1985; Shenkman, 1985; & Traver, 1988).

Sickness Illness Profile (SIP)

Developed by Bergner et al. (1976), the SIP is a quality of life measure for chronic disease. It reflects the subject's perception of performance in various categories of behavior and provides a rating of impairment of quality of life functions. The subject responds to 136 statements relating to physical, psychosocial and more complex behaviors, which describe him currently and which can be directly related to his health status. Each item in the SIP is weighted according to the relative level of severity on a scale of dysfunction. A score calculated for each subscale represents the percent impairment for that subscale.

The emotional behavior (EB) subscale was the one significant SIP subscale in the Traver prediction equation. Items such as feeling useless, being a burden to others, sudden laughing or crying, acting irritable to

self or others, and feeling hopeless are among the emotional behaviors identified.

The SIP has demonstrated high test-retest reliability ($r = 0.88$) for overall scores (Bergner, et al., 1976). In the past, the SIP has been used in several studies with similarly compromised COAD patients (NOTT study, 1980; McSweeney, et al., 1982; Prigatano, et al., 1984; Traver 1988). The validity of the SIP has been documented in the literature (Bergner, et al., 1976). Permission was obtained to administer the SIP before data collection was initiated (Appendix G).

Caregiver Questionnaire (CGQ)

The Caregiver Questionnaire (CGQ) was developed as an operational measure of emergent use to be further studied and developed. Composed of five descriptive behaviors or characteristic items, the CGQ reflects the adaptive abilities of the subject in regards to: compliance, dyspnea, panic, and frequency of phone calls which the caregiver judged as inappropriate for changes in respiratory status.

The caregiver was asked to read the descriptive behaviors and characteristics listed, and using a five point likert scale, circle the letter representing the frequency with which the subject displayed the stated

descriptive behavior or characteristic. The CGQ was submitted to a panel of experts consisting of four pulmonary clinical nurse specialists and a pulmonary specialist physician to assure content validity. For the purpose of this study, only question 4 relating to the frequency of phone calls to the caregiver, was included in the data analysis. Due to the inconsistency of the data obtained for appropriateness of phone calls, this criterion was subsequently dropped from the clinical criteria method of classification.

Data Collection Protocol

Consent of the clinic physician or primary caregiver was obtained prior to recruiting subjects. Subject eligibility for participation in the study was established through contact with the health care providers within the clinical setting or by chart reviews. Subjects were approached in person by the investigator, and given a verbal summary of the study purpose, significance, subject involvement and risks. Upon willingness to participate, directions for instrument completion were given by the researcher at that time or by appointment. During a 20 minute orientation to the study packet, confidentiality, instruments, instrument completion, handling of questions and return of the packet were reviewed. Packets were

identified by code number and given to each subject. Each contained the questionnaires and scales in the following order; the MRC, PDS, BESC and lastly, the SIP. Order was specified to facilitate speed and increase probability of completion. Subjects' right to refuse to participate in the study was inherent in the protocol format. Subjects were provided a phone number as a resource for questions and a self addressed stamped envelope was included to facilitate data return.

Subjects were allotted two weeks to complete and return the materials. Follow-up calls were made to subjects within the first week to answer any questions. Subjects not returning packets after two weeks were called again to encourage packet completion and return.

Collection of demographic and chart data was done by the investigator. Spirometry values (forced vital capacity [FVC] and forced expiratory volume in one second [FEV1]) and/or peak flow values were obtained from a clinic visit that occurred during a clinically stable period and within six months of data collection. A Breon Spirometer and a Wright Peak Flow Meter were used for obtaining spirometry values. Using the regression formula of Knudson, Lebowitz, Holberg and Burrows (1983), percent predicted values (%FVC and %FEV1) were calculated.

Absolute peak expiratory flow rate (PEFR) values were converted to the percent predicted value for peak flow utilizing the Wright and McKerrow (1959) formula. Diagnoses, use of home oxygen, number of emergency room visits and hospitalizations within the last year due to exacerbations of COAD and frequencies of phone calls were also recorded.

Data Analysis

Following data collection, demographic and chart data were analyzed. Means, frequencies and standard deviations were computed to describe the sample in relation to demographic variables.

Raw mean scores were calculated for each of the 11 BESC symptom categories. The raw score mean was then converted to t-score based upon a mean of 50 and a standard deviation of 10 ($T = 10 Z \text{ score} + 50$) (Kinsman et al., 1983).

Scoring of the SIP was based upon the calculation of a percent impairment (0 -100%) score for each of the 12 parameters and three summary scores (physical, psychosocial and total impairment) (Bergner, 1976). High and low emergent groups were then identified by two methods: according to the clinical criteria method, and second by application of Traver's (1988) Emergent Use

Prediction Formula:

$$-5.273 + (0.044 \times PS) + (0.020 \times EB) + (0.050 \times A).$$

The peripheral sensory and alienation values from the BESC and the emotional behavior percent impairment score from the SIP were entered into the prediction equation and the predictive emergent category value was calculated. A positive value indicated high emergent use and a negative value indicated low emergent use (Traver, 1988). The two methods were then compared as to percent predicted accuracy and the results described.

Summary

This chapter discussed the research design, sample/setting and instruments used. The peripheral sensory subscale and the alienation subscale of the BESC, and the emotional behavior subscale of the SIP were discussed. Subject recruitment, data collection protocol, and data analysis were also discussed.

CHAPTER 4
RESULTS OF ANALYSIS OF DATA

The data analysis results are presented in this chapter. The sample is described and the comparison of the clinical emergent use categorizations and the Traver Prediction Formula Categorization presented. Data were analyzed using the SPSS PC computer program (Norusis, 1986).

Description of the Sample

Fifty of the 55 questionnaires were returned for a 91 percent response rate. The sample consisted of 37 females and 13 males experiencing various forms of COAD (Table 2). The ages of the subjects ranged from 40 to 84 years with a mean age of 63.2 years (standard deviation 13.1 years). The majority of the sample were married, had a significant support group, and had had previous pulmonary rehabilitative education (Tables 2, 3).

Twenty-four of the 50 subjects reported being ex-smokers, 23 had never smoked and only three currently smoked. Fourteen of the 50 subjects used continuous home oxygen. Seventy-four percent of the sample reported having previous pulmonary rehabilitative education. The majority of the subjects participated in a rehabilitation

**Table 2. Demographics of Sample: Diagnoses, Education
and Smoking History
(N = 50)**

DEMOGRAPHIC	FREQUENCY	PERCENT
Diagnosis*		
Emphysema	25	N/A
Chronic Bronchitis	35	N/A
Asthma/Asthmatic Bronchitis	30	N/A
Bronchiectasis	9	N/A
Education		
Formal only	17	34
Informal only	6	12
Both (Combination)	14	28
None	13	26
Total	50	100
Smoking History		
Never Smoked	23	40
Currently Smoking	3	6
Ex-Smokers	24	54
Total	50	100

*Subjects could have multiple diagnoses.
N/A = not available

Table 3. Marital Status By Sex**(N = 50)**

	MALES	FEMALES
Single	2	1
Married	8	18
Divorced	1	12
Widowed	2	6
Total	13	37

program in a formal setting provided by a health care professional versus obtaining informal education via pamphlets, brochures or magazines. Twenty-six percent reported no previous pulmonary rehabilitative education.

Chi square statistics were performed on demographic variables by sex with a significance level set at $p < .05$. The only significant difference which was found between men and women was for having reported a smoking history. The men smoked more and the majority of the women never smoked ($\chi^2 = 0.0244$, d.f. = 1).

Seventy-eight percent of the sample reported none or one pulmonary exacerbation requiring hospitalization within the past year. Twenty-two percent reported two or more admissions within the past year; 80 percent reported none or one emergency room visit for pulmonary exacerbations within the last year and 20 percent reported two or more emergency room visits.

Bronchitis Emphysema Symptom Checklist (BESC)

Mean raw scores for the 11 subscales were calculated and converted to T scores based on a normative mean score which equals 50, the higher the score, the more frequent the symptoms (Table 4). Overall, the subjects' mean T scores were highest in alienation and anxiety.

**Table 4. BESC T Scores By Subscales
(N = 50)**

Subscale	Mean Score	Standard Deviation
STUDY CONCEPT SUBSCALES		
Peripheral Sensory Complaints	50.39	10.57
Alienation	53.90	7.48
OTHER SUBSCALES ON BESC		
Dyspnea	49.51	6.89
Fatigue	49.70	10.10
Sleep Difficulties	48.93	10.04
Congestion	50.30	12.01
Irritability	47.93	8.99
Anxiety	52.03	8.64
Decathexis	49.1	10.49
Helplessness/ Hopelessness	49.99	8.66
Poor Memory	50.78	10.90

Sickness Impact Profile (SIP)

The SIP measures 12 categories of physical and psychosocial activities which are likely to be affected by illness and impact on quality of life aspects. The scores provide a percent impairment of life quality. Three summary scores are calculated as follows: the physical summary score is the sum of body care and movement, mobility and ambulation scores; the psychosocial score is the sum of emotional behavior, social interaction, alertness behavior and communication scores; the total summary score is the sum of all the activity scores. The scores are shown in Table 5.

Overall, the highest mean impairments, those greater than 20 percent, were identified in work, home management, and recreation and pastime. Thirty percent of the sample reported working outside of the home. The majority stated they were retired and of those half retired due to their health. As a group, the sample reported almost 11 percent physical impairment, 10 percent psychosocial impairment, and an overall total impairment of 12 percent.

Initial Emergent Group Categorizations

The emergent use categorizations were derived by two methods, the clinical criteria method and the Traver Formula method, and later compared. Initially, clinical

**Table 5. Sickness Impact Profile Percent Impairment Scores
(N = 50)**

Activity	Mean Score	Standard Deviation
STUDY CONCEPT SUBSCALE		
Emotional Behavior	9.94	13.96
OTHER SUBSCALES ON SIP		
Sleep/rest	18.85	18.83
Body Care and Movement	5.80	7.71
Home Management	25.45	23.06
Mobility	12.54	13.37
Social Interaction	11.73	11.94
Ambulation	18.10	14.77
Alertness Behavior	13.81	22.78
Communication	4.36	8.60
Work	27.37	32.82
Recreation/Pastime	24.77	20.99
Eating	4.80	8.27
<u>Summary Scores</u>		
Physical	10.97	12.56
Psychosocial	10.25	11.75
Total	12.37	10.18

low and high emergent groups were identified.

Traver's Emergent Use Formula served as the alternate method for classification as discussed in Chapter 3. Positive discriminant scores indicated high emergent use and negative values indicated low emergent use.

All 50 subjects were clinically classified as follows: low emergent 32 and high emergent 18. Traver's Formula was then calculated for each subject. As in Traver's original study, scores falling between + .15 and - .15 were considered to be too close to zero and were excluded from consideration. In this study, there were four such subjects. These four subjects were excluded from further consideration in this study. Therefore, based on the remaining 46 subjects, a clinical high group emerged with 17 subjects and a clinical low group of 29 subjects. Application of Traver's formula identified 16 high and 30 low emergent subjects. When the two methods were compared, Traver's formula accurately predicted 22 of the 29 clinically low emergent group for 76 percent accuracy. Of the clinically high emergent group, 9 of the 17 were correctly predicted for 53 percent accuracy. Overall, Traver's Formula correctly predicted the emergent status of the subjects with 67 percent accuracy.

Lastly in an effort to examine those subjects grouped as low or high by Traver's formula, four groups were

formed and examined based on 46 subjects. Group 1 Hi (n = 9) consisted of those subjects who rated high emergent on both the clinical and Traver formula criteria; Group 2 Low (n = 22) consisted of those rated low emergent by both methods; Group 3 Traver Hi (n = 7) consisted of subjects rated high by the Traver Formula but low emergent clinically; and Group 4 Traver Low (n = 8) consisted of those subjects rated low by the Traver formula and rated high emergent by the clinical criteria (Table 6). The mean age of Group 1 Hi was 64.4 years, Group 2 Low was 66.2 years, Group 3 Traver Hi was 58.7 years, and Group 4, Traver Low was 57.7 years. Seventy-eight percent of Group 1 Hi reported a smoking history and 56 percent currently used oxygen. Thirty-six percent of the Low Emergent Group 2 reported a smoking history and 14 percent currently used oxygen.

Mean BESC T-Scores and mean SIP percent Impairment Scores were calculated for each of the four groups as a method for comparison. As expected the BESC results indicated similar levels of symptomatology in Groups 1 and 3 and in Groups 2 and 4. Likewise, Group 1 and Group 3 mean score results were very similar and greater than those of Group 2 and 4 respectively.

The mean BESC T-scores for Group 1 were higher than Group 2 for all variables except dyspnea, which remained

**Table 6. Description of High-Low Emergent Groups
VS. Traver Formula Categorizations
(N = 46)**

GROUP	FREQUENCY	PERCENT
Group 1 - High Emergent	9	20
Group 2 - Low Emergent	22	48
Group 3 - Traver High Emergent	7	15
Group 4 - Traver Low Emergent	8	17

about equal for each group. Major differences were seen in the symptomatology areas of anxiety, helplessness-hopelessness, memory and irritability between Groups 1 and 2, and Groups 3 and 4 (Table 7) when the equation subscales are excluded. Those categories with a T score range of nine or greater were reported. When studying the misclassified Groups 3 and 4, Traver High and Low respectively, and comparing the groups to the "true high and low" Groups 1 and 2, some obvious differences arise in the BESC variables. Within Group 4, the anxiety subscale score is greater than in the "true low" Group 2. This may be due to the caregivers categorizing the subjects as high emergent, perhaps because of anxiety displayed; 37 percent of the group made frequent calls to the caregiver. The Traver formula method categorized these subjects as low emergent because in Traver's original study anxiety was not a significant factor in the discriminant analysis.

Group 3, Traver Hi, also had higher mean scores for helplessness-hopelessness and irritability mean scores than did the true High Group 1. Characteristics identified by the irritability subscale symptoms include short tempered, touchy, edgy, and cranky. These characteristics may impact on how the caregiver ranked that subject. These characteristics when coupled with the

Table 7. Mean BESC T-Scores Greatest Differences Between Groups 1-4

VARIABLE	MEAN (S.D.)	MEAN (S.D.)
	GROUP 1 Hi	GROUP 2 Low
	N = 9	N = 22
Anxiety	56.22 (4.74)	48.89 (8.33)
Helplessness- Hopelessness	55.94 (8.41)	44.93 (6.73)
Memory	55.61 (10.62)	47.71 (11.80)
Irritability	47.93 (9.00)	44.47 (8.96)
	GROUP 3 TRAVER HIGH	GROUP 4 TRAVER LOW
	N = 7	N = 8
Anxiety	57.83 (10.49)	51.33 (7.98)
Helplessness- Hopelessness	57.28 (6.31)	51.48 (7.11)
Memory	56.41 (6.51)	49.24 (9.11)
Irritability	53.70 (8.65)	46.60 (7.98)

helplessness-hopelessness subscale symptoms, possibly represent individuals not likely to make frequent calls to the caregiver. Perhaps the helplessness-hopelessness and irritability variables need to be further studied as factors influencing care utilization.

The mean SIP scores (Table 8) demonstrated greater percent impairment among Groups 1 Hi and Group 3 Traver Hi when compared to Groups 2 Low and Group 4 Traver Low. The greatest differences appeared in the areas of work, home management, recreational pastime and alertness behavior. Those scales noted to have a 20 percent or more range of impairment were reported. The high Groups 1 and 3 revealed higher overall impairment summary scores for physical disability, psychosocial impairment, and overall total impairment than did the low Groups 2 and Group 4-Traver Low.

Research Question

The research question was: Does Traver's Emergent Use Formula accurately predict those patients who will be high versus low emergent users of health care resources? It was found that Traver's formula accurately predicted 76 percent of the low emergent group and 53 percent of the high emergent group. Overall, Traver's Formula predicted the emergent status of the subject sample with 67 percent accuracy.

Table 8. Mean SIP Scores: Greatest Differences Between Groups

VARIABLE	MEAN (S.D.)	MEAN (S.D.)
	GROUP 1 Hi	GROUP 2 Low
	N = 9	N = 22
Work	51.23 (30.61)	23.26 (31.18)
Home Management	50.77 (28.31)	16.51 (14.69)
Recreational Pastime	37.97 (20.46)	17.71 (18.17)
Alertness Behavior	35.24 (34.28)	5.50 (14.67)
	GROUP 3 TRAVEL HIGH	GROUP 4 TRAVEL LOW
	N = 7	N = 8
Work	31.23 (36.46)	8.76 (24.78)
Home Management	33.33 (22.54)	15.77 (14.34)
Recreational Pastime	31.51 (22.56)	24.31 (22.56)
Alertness Behavior	21.08 (20.10)	7.22 (11.06)

CHAPTER 5

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The relationship between the theoretical framework and study findings, the conclusions based on these findings and recommendations for further research are included in the final chapter.

The purpose of this study was to apply Traver's prediction formula of emergent use to the general COAD population to determine if the formula would accurately predict high versus low emergent users of institutional health care resources. Traver had selected severely impaired subjects who were characterized as demonstrating extreme high or extreme low emergent use. The emergent use theoretical framework was based on physiological, psychological and behavioral theories related to individual adaptation to chronic illness.

Adaptation is the process by which one improves the possibilities for interaction between himself and the environment, utilizing assimilation and accommodation necessary for adaptation to occur (Wilson & Kneisl, 1979). Physiologic and psychologic awareness, positive compensatory behaviors and defense mechanisms provide the individual with the necessary abilities to adapt to the changing environment (Dudley & Sitzman, 1979). The greater the adaptive ability of the individual to

assimilate and accommodate to the environment by initiating therapeutic behaviors, the more likely he will deal more effectively with the disease process and its medical management through enhanced symptom control and decreased emergency utilization of health care resources. The research question in this study asked whether Traver's predictive formula for emergent use would accurately predict the emergent use categorization of institutional health care resources in a general COAD population. The instruments used in the study evaluated the primary areas of reported symptomatology, and life quality measures through behavior performance and perception of life quality. The BESC evaluated the subject's perception of symptomatology during episodes of difficult breathing. The SIP provided the self assessment of the impact of the disease as well as the subject's perception of his overall quality of life. Adaptive ability was reflected by combining the three instrument subscales and provided the emergent use categorization of the subject.

Findings

The convenience sample studied represented a general COAD population which included a wide range of disease severity, functional ability and adaptive ability. When comparing the sample in this study as a group to COAD subjects in previous studies (McSweeney et al., 1982;

Prigetano et al., 1984; Kinsman et al., 1983; Shenkman 1985; Janson-Berklie, 1986; and Traver, 1988), the mean T scores for symptomatology and life quality were very similar. The greatest overall functional impairment as revealed through the SIP occurred in the areas of home management, employment and recreational-pastime. The BESC revealed the greatest mean symptomatology T-scores for alienation, anxiety, poor memory and peripheral sensory complaints.

When grouped by emergent status, there were obvious differences and surprising similarities. Both high groups and low groups reported almost identical mean T-scores in the BESC symptom category of dyspnea, regardless of high or low emergent classification. This finding indicates a similar sensation of dyspnea symptomatology for all groups.

A probable explanation is the fact that dyspnea has been shown to be the chief complaint of those experiencing COAD and perhaps the only difference between groups may be in the intensity of the sensation.

When comparing the BESC dyspnea mean T scores for the sample studied to previous research, the current low and high emergent groups consistently had mean T scores for dyspnea close to Kinsman's normative population and equal to Traver's low emergent group. Perhaps the consistency of the BESC dyspnea scores among the subjects in the

present study lies in the nature of the sample. The clinical facility in which the current study was conducted receives referrals primarily for pulmonary rehabilitation purposes. Almost 75 percent of the sample studied had participated in some form of pulmonary rehabilitation. The effect of the pulmonary rehabilitation may have influenced their ability to control and reduce the degree of dyspnea and perhaps altered their perception of the dyspnea experienced.

The greatest differences between the current Group 1 (high) and Group 2 (low) BESC mean T scores were seen in anxiety, memory hopelessness-helplessness and irritability subscales. Group 1 (high) and Group 3 (Traver high) scores were almost identical, with mean scores much greater than the normative mean. The low groups (2 and 4) BESC mean scores were lower than or slightly above the normative mean.

The current results were very similar to Traver's original outcomes. Group 2 mean T scores were very similar to Traver's low emergent findings. The high emergent Group 1 symptomatology mean T scores in this study were again very similar to Traver's original high emergent group. The similarities between the current high groups 1 and 3 support the theoretical framework; it is reasonable to expect greater symptomatology in the high

emergent group perhaps due to increased symptom awareness and perception leading to anxiety and fear.

The two variables with greatest difference between the high and low groups, for both the clinical criteria method classification and by the Traver formula method, were the peripheral-sensory and alienation symptomatology which are two of the three factors in Traver's Emergent Use formula. When comparing the BESC mean scores of the Formula components between the current versus Traver's results, the peripheral sensory symptomatology and memory mean scores for Group 1 in this study revealed a much higher mean T Score than did Traver's high emergent group. This occurred despite 67 percent of the current Group 1 (high) having reported some kind of pulmonary rehabilitation. This finding suggests that those subjects may not have responded as well to the rehabilitation process because of greater psychologic symptoms which may have impaired their learning abilities, as described by Agle et al., (1973). The outcomes may be attributed in part to the type of patient referred to the clinic facility. The outpatient facility from which this convenience sample was obtained specializes in adaptive rehabilitation, providing increased patient and family awareness focused on improving symptom assessment, intervention, management, and prevention. The clinic population primarily is either

relatively end stage COAD with increased symptom awareness, moderate panic and anxiety, or early to moderate disease with focus on adaptation.

The SIP was able to provide an indication of the impact of disease as measured by behavior performance and the individual's perception of his quality of life. The current high emergent Groups 1 and 3 mean percent results were similar to Prigitano et al., (1984) and to Traver's (1988) reported mean impairment score for emotional behavior, the third factor in the prediction formula. Group 1 high mean summary scores for physical disability, psychosocial impairment and total impairment were almost identical to Traver's reported high emergent impairment outcomes.

High Groups 1 and 3 revealed greater mean impairment scores for each of the subscales when compared to the low Groups 2 and 4. The greatest range occurred in emotional behavior, employment, home-management, recreation-pastime and alertness-behavior. These results were similar to those of Prigitano et al., (1984) who reported similarly higher percent impairment scores in employment and recreation-pastime.

When compared to Traver's (1988) study, the high emergent group in this study revealed greater impairment in the areas of employment, home management, alertness

behavior, mobility and ambulation. The increase in impairment may be a result of patients who are initially referred to the facility for the purpose of improving the functional abilities in their activities of daily living, improving dysfunctional breathing patterns and decreased ambulation abilities. Therefore, the clinic population may initially have had a much greater functional impairment than a normative COAD population.

The mean impairment results for low Groups 2 and 4 were again very similar. The true low Group 2 in this study reflected previously published data for elderly normals, (McSweeney et al., 1982; Prigatano, et al., 1984) especially in the areas of communication, alertness behavior, emotional behavior, eating and social interaction. Other category mean scores indicated greater impairment when compared to those listed by McSweeney et al. (1982).

Although the remaining mean impairment scores were somewhat less than those reported in Traver's study, they were greater than the normative elderly normals, (McSweeney, et al., 1980), indicating a mild impairment at the time of testing. The greatest difference in impairment between Traver's low emergent group and the current low Group 2 appears again in home management, mobility, ambulation and recreation-pastime. The current

low Group 2 mean scores are less than those reported by Traver. This may reflect an overall positive effect of the adaptive rehabilitation received by almost 75 percent of each of the current low Groups 2 and 4, or perhaps may reflect the physician referral population who are in the early stages of their COAD for adaptive rehabilitation.

Although much higher mean percent impairment scores were seen in the current high emergent Group 1 in home management (50.77 percent) and employment (51.23 percent) than in Traver's original high group (31.95 percent and 36.93 percent), it is noted that the mean percent overall physical impairment, psychosocial-impairment and total impairment mean scores remained almost identical between the two studies. The differences may be reflective of the characteristics of the patients referred to the clinical setting as individuals are referred specifically for improving their adaptive abilities. The greater impairment in the two areas of home management and employment of the current high Group 1 may reflect a group with greater physician or subject perceived disability than those studied by Traver.

Discussion of the Prediction Formula

As presented earlier, the research question in this study asked whether Traver's Predictive formula for

emergent use would accurately predict the emergent use of health care resources. Traver's prediction formula used the variable subscales of peripheral sensory complaints and alienation mean T scores from the BESC and the emotional behavior score on the SIP to calculate emergent use categorization. The instruments used evaluated the subjects' response to disease, symptomatology during episodes of difficult breathing and the subjects' self assessment of the impact of disease.

As discussed in the findings, Groups 1 and 2 were immediately categorized as High and Low emergent respectively, according to the clinical criteria method as well as the Traver formula method. Groups 3 and 4 emerged as misclassifications. It was decided to label Groups 3 and 4 the Traver High and Low Groups. These groups were then compared to the "true" high emergent Group 1, and Group 2, the low emergent. When categorized by high and low emergent use, the current study Groups 1 and 2 respectively were similar to Traver's reported outcomes as expected. The peripheral-sensory and alienation subscale scores from the emergent use formula appeared as the two variables with greatest range between the high and low group scores. The third component in the Traver Formula, the emotional behavior subscale score from the SIP, had similar results as those reported in Traver's high and low

classifications.

However, the misclassified Groups 3 and 4 presented interesting results. Group 3 (Traver High) BESC variable subscales of anxiety, helplessness-hopelessness, and irritability demonstrated greater mean BESC scores than did the "true high and low" Groups 1 and 2. These results support the concept that individuals with greater symptomatology in these areas might have the potential for greater emergent use although they may not have had increased utilization of health care resources at that point in time. Therefore this may explain why the clinical criteria method classified these seven subjects as low emergent. Conversely, the Traver formula method was able to discriminate various subscales which possibly reflected individuals who may have had helpless or dependent adaptive abilities which would have indicated a potential high emergent status.

Group 4 (Traver Low) demonstrated greater mean BESC scores for anxiety, helplessness-hopelessness, memory and irritability than the "true low" Group 2. The higher subscale scores could have influenced the caregiver's judgment as to the ranking of these subjects as high emergent. The anxiety, irritability and dependent qualities may have been reflected in the contact with the caregiver.

However, according to the Traver formula method these eight subjects were classified as low emergent because of the lower subscale scores for those subscales included in the formula equation. Although the variable subscale scores shown in Table 8 reflect scores greater than those in Group 2, the scores were at or below Kinsman's normative mean. Group 4 mean scores indicated greater similarity with the Traver formula method than by the clinical criteria method. Perhaps the variable subscale scores reflected only a slight elevation above the normative mean with little impairment of coping abilities and may have indicated a middle emergence category which needs to be identified in future studies.

Limitations

Application of findings from this study are limited by the convenience sample used from a specialized clinical setting. The majority of the referrals to this facility include subjects with a wide range of severity of disease, functional impairment and adaptive ability. The vast majority of the sample were elderly females who may have had different needs than the males in the sample. The sample was not equal, reflecting a much greater female segment than the known gender prevalence which includes a greater male segment. Therefore, no generalizations can be made for the general COAD populations.

Although the primary instruments, the BESC, and SIP have been found to be valid and reliable, the caregiver questionnaire was modified and piloted on a small COAD population. Further clarification of question five on the caregiver questionnaire is needed to discriminate the appropriateness of frequent phone calls to the caregiver. This modified tool also needs to be further tested for reliability and validity. The low emergent criteria for hospitalizations and emergency room visits being one or less was a change from Traver's original study criteria. The change occurred to permit adequate group formations and it is recognized that this may have influenced the findings.

The familiarity of the researcher with the majority of the sample may have influenced the objectivity of the subjects to respond truthfully and may have influenced the objectivity of the researcher's findings. The familiarity of the researcher and subjects more than likely influenced the high response rate.

The inability to obtain a standard pulmonary function measurement on all subjects limited the ability to explore possible relationships between the groups in regards to dyspnea and other variables.

The prediction formula may not have predicted as accurately because of the differences in the current

sample. The overwhelming female population in this study accounted for 74 percent of the subjects. This may have influenced the predictability outcome as it has been found in the literature that females have significantly higher reported frequency of symptoms, especially with areas of panic, fear, irritability, loneliness and hyperventilation (Janson-Bjerklie et al., 1986). Other factors which may have influenced the wide range of impairment in this study are the overall younger population, the lack of male representation in the sample, and the greater proportion of asthmatics in this study, than in Traver's reportings (Traver 1988 & Traver, G.A. personal communication, July 10, 1989).

Conclusions

This study revealed Traver's Prediction Formula as a good predictor of low emergent use. However, although the predictability for high emergent use is only slightly better than by chance, the formula remains a useful tool. Current findings supported the peripheral-sensory and alienation component of the formula and presented data to suggest further investigation into the helplessness, anxiety and irritability variables. A discriminant analysis on the sample may have identified one or more of these factors as significant.

Suggestions for Further Study

1. Increase sample size to expand male representation.
2. Control for age and sex.
3. Perform a discriminate analysis on all variables to determine predictive variables for the high group, and whether different formulas are necessary for female and male subjects.

Summary

A nursing concern for patients with chronic obstructive airway disease (COAD) is to assist the patient/family in improving adaptation strategies and self-care abilities. Identification of emotional and behavioral characteristics impacting on symptoms and life quality may predict individuals at risk for greater utilization of health care resources.

The purpose of this descriptive study was to apply Traver's Prediction Formula for Emergent Use to a more general COAD population to determine if the formula would accurately predict those subjects who have high versus low emergent use of institutional health care resources.

Fifty subjects with a range of COAD severity were studied.

Subjects completed instruments which measured symptoms and life quality: the Bronchitis-Emphysema Symptom Checklist and the Sickness-Impact Profile. Findings demonstrated Traver's Formula predicted low emergent subjects with 76 percent accuracy, high emergent subjects with 53 percent accuracy and predicted the overall emergent status of subjects with 67 percent accuracy.

APPENDIX A

SUMMARY OF TRAVER'S (1988) RESEARCH

SUMMARY OF TRAVER'S RESEARCH (1988)

Traver (1988) studied symptomatology and life quality of patients with chronic obstructive airways disease (COAD) and the relationship to the prevalence of emergent use of institutional health care resources. Thirty subjects with severe COAD participated to identify differences in symptoms and life quality between those with high and low emergent use of health care resources. Emergent use was defined as care obtained through unscheduled, non routine methods of access to health care providers.

Subjects were selected from two university affiliated subspecialty pulmonary clinics. All subjects were required to meet the following criteria: (1) physician diagnosis of chronic airways obstruction, (2) forced expiratory volume in 1 second (FEV_1) less than 1500 ml and less than 60% of the predicted FEV_1 , (3) no other major physically disabling disease that was unrelated to the pulmonary diagnosis, and (4) no major psychiatric diagnosis. Primary care providers identified subjects who met criteria for the high or low emergent groups.

Subjects in the high emergent group had to meet one or more of the following criteria: (1) two or more hospitalizations for pulmonary exacerbations in the past year, (2) two or more emergency room visits for pulmonary exacerbations in the past year, and (3) frequent phone calls that the care provider judged as inappropriate in relation to changes in respiratory status (3 or more calls in a 1-month period). Subjects in the low emergent group were required to meet all of the following criteria: (1) no hospitalizations for pulmonary exacerbations in the past year, (2) no emergency room visits for pulmonary exacerbations in the past year, and (3) infrequent phone calls, all of which the care provider judged as appropriate for changes in respiratory status. There were 15 subjects in each group, specifically chosen to have similar numbers of men and women in each of the high and low emergent groups.

Demographic and physiologic data were obtained from the subject's chart: spirometry values, information regarding current treatment program, other diagnoses, blood gases, use of home oxygen, dates of hospitalization, and emergency room visits. Three data collection tools were used; the Bronchitis-Emphysema Symptom Checklist (BESC) and the Sickness Impact Profile (SIP) were completed by the subjects, and the Katz Adjustment Scales (KAS_T) was completed by the spouse, if living in the home.

Data were analyzed by using T tests for differences between the high and low emergent groups. After identifying significant variables, significance set at $p < 0.025$, discriminant analyses were performed.

Specific variables that were important in differentiating the two groups were identified.

Findings demonstrated consistently more symptoms and impairment of life quality in the "high emergent" group. The differences reached statistical significance for irritability, anxiety, helplessness, nervousness, peripheral sensory complaints, alienation, social interaction, and emotional behavior. Discriminant analysis provided a prediction formula that yielded 80% correct prediction for the two groups. If subjects with discriminant scores in the range -0.15 to 0.15 were dropped, because the scores were considered too close to zero to be classified, the prediction accuracy increased to 88%.

APPENDIX B
NURSING ETHICAL REVIEW COMMITTEE
PROJECT APPROVAL



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

COLLEGE OF NURSING

79

MEMORANDUM

TO: Roxanne A. Moutafis, RN, BSN

FROM: Linda R. Phillips, PhD, RN, FAAN *LRP*
Director of Research

DATE: March 16, 1988

RE: Human Subjects Review: "Symptomatology and Life Quality as Predictors of Emergent Use"

Your project has been reviewed and approved as exempt from University review by the College of Nursing Ethical Review Subcommittee of the Research Committee and the Director of Research. A consent form with subject signature is not required for projects exempt from full University review. Please use only a disclaimer format for subjects to read before giving their oral consent to the research. The Human Subjects Project Approval Form is filed in the office of the Director of Research if you need access to it.

We wish you a valuable and stimulating experience with your research.

LRP/ms

APPENDIX C

HUMAN RESEARCH COMMITTEE APPROVAL



April 15, 1988

Roxanne A. Moutafis, R.N., B.S.N.
P. O. Box 35875
Tucson, AZ 85740

Dear Roxanne:

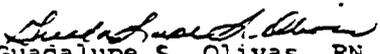
You have been granted access to Tucson Medical Center to conduct your research project entitled, "Symptomatology and Life Quality as Predictors of Emergent Use." Your proposal materials have been reviewed and approved by administrative staff of the division of Patient Care Resources, TMC Chest Clinic, and Human Research Committee (HRC).

To facilitate your data collection activities and to minimize the impact of these activities on the unit, several individuals have been designated as your clinical liaison contact: Sandy Younker-Hellman, Director, Chest Clinic.

Attached are the data collection policies and procedures which you are expected to follow. Upon completion of your study, you are expected to provide us with a formal copy of your study and to present your findings to interested staff. Accordingly, guidelines for presentation are also attached. Additionally, you may be asked to provide us with a brief written synopsis of your study for potential publication in the department's newsletter.

We wish you a successful research experience, and we look forward to your sharing your results with us.

Sincerely,


Guadalupe S. Olivas, RN, Ph.D
Coordinator
Publications and Research

GSO:dll
Attachments

cc: S. Younker-Hellman, Director, Chest Clinic

APPENDIX D

HUMAN SUBJECTS CONSENT FORM

HUMAN SUBJECTS CONSENT FORM

Approved by TMC Human Research Committee

Ronald Spark, M.D., Chairman

Date: 5-4-88 *ki*Symptomatology and Life Quality As Predictors of Emergency Use

The purpose of this research is to study symptomatology and life quality, as measured by functional abilities, of patients with chronic lung disease. These measures will be used in an attempt to predict individuals who may be more likely to use institutional emergency health care services. Individuals with chronic lung disease who are outpatients, at least 40 years of age and able to read and write English, will participate in the study. (2)

You are being asked to voluntarily complete four questionnaires: the Perceived Dyspnea Scale, a Breathlessness Scale, the Bronchitis Emphysema Symptom Checklist and the Sickness Impact Profile. Your name will not appear on the questionnaires and only the primary investigators will have access to your identity. Responses will be identified by code number and all information will be kept confidential.

Completion of the attached questionnaires will require approximately forty-five minutes of your time. Other chart information will require your written consent in order to obtain documented diagnosis, pulmonary function and blood gas results.

There are no risks or discomforts involved in this study. The information obtained will be useful in identifying those individuals who may be more likely to use emergency health care services. Results of this study will be published sometime in the future and information obtained from this study may be used for future research.

There is no cost to participate and you have the freedom to withdraw from participation in the study at any time. Whatever your decision, the health care you receive will not be affected in any way.

You may complete the questionnaires at this time or complete them at home. Please return them in the self-addressed envelope within two weeks. For any questions, please feel free to call Roxanne Moutafis, R.N., at 327-5461, extension 5110, Monday through Friday, 9am to 4pm. Your participation would be greatly appreciated.

By signing below you are acknowledging having read the subject consent, the nature of the study, demands, risks, benefits and are giving your consent for access to your outpatient medical records. This consent form will be filed in your permanent medical record and a copy of this form is available to you upon request. (3)

Subject's Signature_____
Date_____
Witness Signature_____
Date

APPENDIX E
CAREGIVER QUESTIONNAIRE

CAREGIVER QUESTIONNAIRE

Please read the following descriptive phrases and behaviors listed below and circle the letter which indicates whether it Never (1), Almost Never (2), Sometimes (3), Almost Always (4), or Always (5) applies to your patient.

- | | <u>Never</u> | <u>Almost
Never</u> | <u>Sometimes</u> | <u>Almost
Always</u> | <u>Always</u> |
|---|--------------|-------------------------|------------------|--------------------------|--------------------------|
| 1. Compliant with treatment regimen. | 1 | 2 | 3 | 4 | 5 |
| 2. Able to control dyspnea effectively. | 1 | 2 | 3 | 4 | 5 |
| 3. Experiences panic associated with dyspnea | 5 | 4 | 3 | 2 | 1 |
| | <u>Never</u> | <u>Almost
Never</u> | <u>Sometimes</u> | <u>More
Frequent</u> | <u>Very
Frequent</u> |
| 4. Patient makes unscheduled calls to clinic | 5 | 4 | 3 | 2 | 1 |
| | <u>Never</u> | <u>Almost
Never</u> | <u>Sometimes</u> | <u>Almost
Always</u> | <u>Always</u> |
| 5. If calls made to clinic were sometimes, more frequent or very frequent, would you consider them to be appropriately reflecting a change in their respiratory status? | 1 | 2 | 3 | 4 | 5 |

APPENDIX F

DEMOGRAPHIC FORM/CHART REVIEW

DATE _____
 SUBJECT CODE # _____
 HOSPITAL ID # _____
 TMC _____
 UMC _____

DEMOGRAPHIC FORM

DATE OF BIRTH _____ AGE _____

MALE _____

FEMALE -----

MARITAL STATUS: SINGLE
 MARRIED
 DIVORCED
 WIDOWED

SUPPORT AVAILABLE: YES
 NO

SMOKING HISTORY YES
 NO

PACKS PER YEAR: 1 Pack
 2 Packs
 3 or more Packs

CURRENTLY SMOKING? YES
 NO

HOW LONG AGO DID YOU QUIT? 1-2 Years
 3-4 Years
 5 or More years ago

PREVIOUS PULMONARY EDUCATION? YES
 NO

(HOSPITAL - OUTPATIENT)
 (From Dr. Nurse etc.) - FORMAL EDUCATION WHERE

(LITERATURE - LECTURES - INFORMAL
 BROCHURES)

DATE _____
 SUBJECT CODE # _____
 HOSPITAL ID # _____
 TMC _____
 UMC _____

CHART REVIEW DATA

DIAGNOSIS: EMPHYSEMA
 CHRONIC BRONCHITIS
 ASTHMATIC BRONCHITIC
 OTHER _____

PFT's:	FVC	PEFR	DATE
	FEV ₁		_____
	PO ₂		
	P _{CO2}		
	pH		

O₂ USE:

HOSPITALIZATIONS PAST 12 MONTHS _____ (____/____/____) to
 ____/____/____).

APPENDIX G

SICKNESS IMPACT PROFILE

LETTER OF PERMISSION

THE JOHNS HOPKINS UNIVERSITY
School of Hygiene and Public Health

Health Services Research and
Development Center

624 North Broadway
Baltimore, Maryland 21205
Tel. (301) 955-

December 14, 1987

Roxanne A. Moutafis, BSN
The University of Arizona
Health Sciences Center
Tucson, Arizona 85724

Dear Ms. Moutafis:

This letter grants you permission to use the Sickness Impact Profile in your research. In return, I would appreciate receiving a detailed description of the research you will be doing and a final report of the results when it is completed.

Sincerely yours,



Marilyn Bergner, Ph.D.
Professor

MB:dep

REFERENCES

- Agle, D., Baum, G., Chester, E., & Wendt, M. (1973). Multi-discipline treatment of chronic pulmonary insufficiency 1. Psychologic aspects of rehabilitation. Psychosomatic Medicine, 35, 41-49.
- Aitken, R. (1969). A growing edge of measurement of feelings. Proceedings Royal Social Medicine, 62, 989-993.
- Altose, M. (1985). Assessment and management of breathlessness. Chest, 88, 77S-83S.
- American Lung Association. (1986). Lung disease: Facts at-a-glance. Tucson: Author.
- Bandura, A. (1976). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.
- Bergner, M., Bobbitt, R., Pollard W., Martin, D., & Gilson, B. (1976). The sickness impact profile: Validation of a health status measure. Medical Care, 14, 57-67.
- Bordon, R., Stool, E., & Moser, K. (1980). Manual of clinical problems in pulmonary medicine. Boston, Little, Brown & Co.
- Burrows, B., Knudson, R., Camilli, A., Lyle, S., & Lebowitz, M. (1987). The "horse-racing effect" and predicting decline in forced expiratory volume in one second from screening spirometry. American Review of Respiratory Disease, 135, 788-793.
- Burrows, B., Knudson, R., Quan, S., & Kettel, L. (1983). Respiratory disorders: A pathophysiologic approach. Chicago, Year Book Medical Publishers, Inc.
- Cassileth, B., Lusk, E., Strouse, T., Miller, D., Brown, L., Cross, P., & Tenaglia, A. (1984). Psychosocial status in chronic illness. New England Journal of Medicine, 311, 506-511.
- DeAranjo, G., Van Arsdale, Jr., P., Holmes, T., & Dudley, D. (1973). Life change, coping ability and chronic intrinsic asthma. Journal of Psychosomatic Research, 17, 359-363.

- Dirks, J. (1982). Bayesian prediction of psychomaintenance related to rehospitalization in asthma. Journal of Personality Assessment, 46, 159-163.
- Dirks, J., & Kinsman, R. (1981). Clinical prediction of medical rehospitalization: Psychological assessment with the battery of asthma illness behavior. Journal of Personality Assessment, 45, 608-613.
- Dirks, J., Kinsman, R., Horton, D., Fross, K. & Jones, N. (1978). Panic-fear in asthma: Rehospitalization following intensive long-term treatment. Psychosomatic Medicine, 40, 5-13.
- Dorland's Illustrated Medical Dictionary. (1974). Philadelphia, Penn: W. B. Saunders and Company.
- Dudley, D., Glaser, E., Jorgenson, B., & Logan, D. (1980a). Psychosocial concomitants to rehabilitation in chronic obstructive pulmonary disease. Part 1. Psychosocial and psychological considerations. Chest, 77, 413-420.
- Dudley, D., Glaser, E., Jorgenson, B., & Logan, D. (1980b). Psychosocial concomitants to rehabilitation in chronic obstructive pulmonary disease. Part 2. Psychosocial treatment. Chest, 77, 544-551.
- Dudley, D., & Sitzman, J. (1979). Psychosocial and psychophysiologic approach to the patient. Seminars in Respiratory Medicine, 1, 59-83.
- Dudley, D., Wermuth, C., & Hague, W. (1973). Psychosocial aspects of care in the chronic obstructive pulmonary disease patient. Heart and Lung, 2, 389-393.
- Flynn, M., & Frantz, R. (1987). Coronary artery bypass surgery: Quality of life during early convalescence. Heart and Lung, 16, 159-167.
- Hogkin, J. (1979). Chronic obstructive pulmonary disease. Current concepts in diagnosis and comprehensive care. Park Ridge, American College of Chest Physicians.
- Janson-Bjerklie, S., Carrieri, V., & Hudes, M. (1986). The sensations of pulmonary dyspnea. Nursing Research, 35, 154-159.

- Jones, N., Kinsman, R., Dirks, J., Wray, N., & Dahlem, N. (1979). Psychological contributions to chronicity in asthma: Patient response styles influencing medical treatment and its outcome. Medical Care, 17, 1103-1118. p73
- Killian, K., Mahutte, C., & Campbell, J. (1981). Magnitude scaling of externally added loads to breathing. American Review of Respiratory Disease, 123, 12-15.
- Kinsman, R., Dirks, J., & Jones, N. (1982). Psychomaintenance of chronic physical illness: Clinical assessment of personal styles affecting medical management: In Miller et. al., (eds). Handbook of Clinical Health Psychology. New York, Plenum Publishing, Corporation.
- Kinsman, R., Fernandez, E., Schocket, M., Dirks, J., & Covino, N. (1983). Multidimensional analysis of the symptoms of chronic bronchitis and emphysema. Journal of Behavioral Medicine, 6, 339-357.
- Kinsman, R., Jones, N., Matus, I., & Schaum, R. (1976). Patient variables supporting chronic illness. Journal of Nervous and Mental Disease, 63, 159-165.
- Knudson, R., Lebowitz, M., Holberg, C., & Burrows, B. (1983). Changes in the normal maximal expiratory flow-volume curve with growth and aging. American Review of Respiratory Disease, 127, 725-734.
- Light, R., Merrill, E., Despars, J., Gordon, G., & Mutalipassi, L. (1985). Prevalence of depression and anxiety in patients with COPD: Relationship to functional capacity. Chest, 87, 35-38.
- Mahler, D., Rosiello, R., Harvy, A., Lentine, T., McGovern, J., & Daubenspeck, J. (1987). Comparison of clinical dyspnea ratings and psychophysical measurements of respiratory sensation in obstructive airway disease. American Review of Respiratory Disease, 135, 1229-1233.
- McSweeney, A., Grant, F., Heaton, R., Adams, K., & Timms, R. (1982). Life quality of patients with chronic obstructive pulmonary disease. Archives of Internal Medicine, 142, 473-478.

- Nocturnal Oxygen Therapy Trial Group. (1980). Continuous or nocturnal oxygen therapy in hypoxemic chronic obstructive lung disease. Annals of Internal Medicine, 93, 391-398.
- Norusis, M. (1986). Advanced statistics SPSS/PC +. Chicago: SPSS, Inc.
- Prigatano, G., Wright, E., & Levin, D. (1984). Quality of life and its predictors in patients with mild hypoxemia and chronic obstructive pulmonary disease. Archives of Internal Medicine, 144, 1613-1619.
- Sahn, S., Nett, L., & Petty, T. (1977). Ten year follow-up of a comprehensive rehabilitation program for severe COPD. Chest, 77, 311-314.
- Shenkman, B. (1985). Factors contributing to attrition rates in a pulmonary rehabilitation program. Heart and Lung, 14, 53-58.
- Sherman, H., & Flatley, M. (1976). Dissecting the hospital stay. Medical Care, 18, 715-730.
- Steele, S., & Harmon, V. (1983). Values clarification in nursing. Connecticut, Appleton-Century-Crofts.
- Staudenmayer, H., Kinsman, R., Dirks, J., Spector, S., & Wangaard, C. (1979). Medical outcome in asthmatic patients: Effects of airways hyperreactivity and symptom-focused anxiety. Psychosomatic Medicine, 41, 109-118.
- Staudenmayer, H., Kinsman, R., & Jones, N. (1978). Attitudes towards respiratory illness and hospitalization in asthma. Journal of Nervous and Mental Disease, 166, 624-634.
- Thompson, J., & Thompson, H. (1985). Bioethical decision making for nurses. Connecticut, Appleton-Century-Crofts.
- Traver, G.A. (1988). Measures of symptoms and life quality to predict emergent use of institutional health care resources in chronic obstructive airways disease. Heart and Lung, 17, 689-697.

- Wilson, H., & Kneisl, C. (1979). Psychiatric Nursing. California, Addison-Wesley Publishing Company.
- Wright, B., & McKerrow, C. (1959). Maximum forced expiratory flow rate as a measure of ventilatory capacity: With a description of a new portable instrument for measuring it. British Medical Journal, 2, 1041.
- Youngner, S. (Ed.) (1986). Human values in critical care medicine. New York, Praeger.