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THE RELATIONSHIP BETWEEN THE LEVEL OF DEPRESSION, SYMPTOMS, AND PHYSICAL FUNCTION AMONG A GROUP OF NEWLY DIAGNOSED ELDERLY PATIENTS WITH CANCER OF THE LUNG

By

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ABSTRACT

THE RELATIONSHIP BETWEEN THE LEVEL OF DEPRESSION, SYMPTOMS, AND PHYSICAL FUNCTION AMONG A GROUP OF NEWLY DIAGNOSED ELDERLY PATIENTS WITH CANCER OF THE LUNG

By

Janice Lynn Cooper

The focus of this study was to search for relationships between level of depression, the level of symptoms, and physical functioning of elderly people recently diagnosed with lung cancer. It was a secondary analysis of data from a longitudinal study of people 65 years of age and older newly diagnosed with breast, lung, colo-rectal and prostate cancer conducted at Michigan State University by Barbara A. Given, R.N., Ph.D., F.A.A.N., Principal Investigator. The sample included 78 patients age 65 and older who were newly diagnosed with lung cancer. The levels were measured with the CES-D, Given and Given Symptom Experience Scale, and the Physical Function Concept Scale from the Medical Outcome Studies Short Form-36. A significant relationship was found between the level of symptoms and the level physical functioning. Implications of the findings for research and practice are presented.

To my Father and brother Mark, who fought courageous battles with cancer.

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INTRODUCTION

The incidence of death from lung cancer has markedly increased in recent decades until lung cancer has become the leading cause of death from cancer in both men and women. Although the incidence is now decreasing for men, approximately 14% of the 640,000 men who will be diagnosed with cancer in 1995 are expected to have lung cancer while 13% of 575,000 newly diagnosed female cancer patients are expected to have lung cancer (SEER Cancer Statistics Review, 1973-1991).

The incidence of lung cancer increases after the age of fifty peaking at ages 75 to 79 and then declines (SEER Cancer Statistics Review, 1973-1991). The average age of onset is 60 (Faber, 1991). In 1996 an estimated 158,700 people in the United States will die from lung cancer. (Parker, Tong, Bolden, & Wingo, 1996). Cancer of the lung interferes with the quality of the patient's life. For this reason, this study searches for relationships between symptom distress, physical functioning, and depression for the elderly person newly diagnosed with lung cancer.

Only 21% of newly diagnosed lung cancer patients have localized disease and only 12% of them are asymptomatic (Faber, 1991). Common symptoms for people with lung cancer include cough, hemoptysis, pain, poor appetite, weight loss, trouble sleeping, fatigue, and dry mouth. The majority of people with lung cancer do not need to stay indoors or need assistance with functions such as taking medicine, money management, driving, or climbing stairs. However, up to 50% of people newly diagnosed with lung cancer are unable to walk several blocks, need assistance with housework, and have difficulty bending, lifting, and stooping. Approximately 30% need assistance making meals and have difficulty climbing stairs (Given, Given, & Stommel, 1994). These dependencies may be caused by symptoms, age, or comorbid diseases.

Elderly persons with may be diagnosed with late stage lung cancer or may already have other chronic illnesses and disabilities impacting on their life. For people over 75 years of age, approximately 40% will have multiple chronic illnesses and/or dementia. People over 85 years of age are at the greatest risk for disability and chronic illness (Knobf, Fulmer, & Mion, 1993). These chronic illnesses and disabilities may decrease independent function and emotional well-being of the elderly person. The symptoms caused by the lung cancer, along with the symptoms caused by comorbid diseases, can cause symptom distress for the elderly person newly diagnosed with cancer. The distress from symptoms can severely interfere with their physical function, decrease their quality of life, decrease compliance with the treatment plan, and increase their need for assistance from others.

The aging process, cancer, and comorbid diseases when combined may seriously impair the physical functioning of the elderly person diagnosed with cancer. Impairments in physical functioning may interfere with the person's ability to comply with their treatment plan and/or further jeopardize their health status (Mor, Masterson-Allen, Houts, & Siegel, 1992).

Treatment options for lung cancer vary depending on the stage and type of cancer. Treatment options may include surgery, radiation therapy, and chemotherapy. The treatments may cause side effects and symptoms which further disrupt physical function abilities. Physical function impairments in people with cancer may reduce quality of life and increase need for dependence on others (Greene, Nail, Fieler, Didgeon, & Jones, 1994).

Major depression affects between one to two percent of people 65 and older in the community. More than ten percent of elderly people in the community have significant symptoms of depression (Blazer, 1989). Blazer (1989) describes that for the majority of elderly people with depressive symptoms, the symptoms occur associated with physical illness, adjustment to life stresses, or mild but biologically derived depressive episodes. Diagnosis with lung cancer would be associated with both physical illness and adjustment to life stressors which could precipitate depression.

Ell, Mantell, Hamovitch (1988) measured levels of psychologic distress in patients with breast, colorectal, and lung cancer and found psychologic distress decreased with advancing age until age 75 when distress started increasing again. Godding, McAnulty, Wittrock, Britt, and Khansur (1995) studied a group of 69 male patients with an average age of 64.3 years who had lung, head/neck, prostate, lymphoma, melanoma, or gastrointestinal cancers. Thirty-nine percent of the men reported symptoms of moderate-to-severe depression with 13% of the men reporting severe depressive symptomatology.

Cassileth, et al. (1984) found lower psychological distress in people older than 60 than for those younger than 40 and 40 to 60 during a study of 758 patients with chronic physical illness including arthritis, diabetes, cancer, renal disease, and dermatologic disorder. The study also indicated that cancer patients able to maintain normal activity had better mental health scores than those who were experiencing symptoms or were confined to bed.

The rate of depression is higher in cancer patients than in the elderly community as a whole. Depression occurs in approximately 20% to 25% of all cancer patients and increases as illness advances with increasing pain and disability (Breitbart, 1994). Depression can contribute to decreased self-esteem, decreased quality of life, and impaired social functioning (Badger, 1993).

Since the greatest share of cancer treatment occurs in out-patient settings, assessments of clients must be thoroughly, but quickly completed. Assessments of the client's physical function needs to be done easily with results that will assist the health professional to help the elderly maintain their function and independence and manage on an out-patient basis. The health care professional needs to understand that the diagnosis of lung cancer is a stressful event in the person's life that may be accompanied by feelings of depression. In addition, the person with cancer may already be experiencing symptom distress and physical function impairment. An understanding of any relationship between the level of depression, symptoms, and physical function will help the health professional better understand the needs of the person with cancer. Therefore, **the focus of this study was to search for relationships between level of depression, the level of symptoms, and physical functioning of elderly people recently diagnosed with lung cancer.**

Concept Definitions

Elderly

For the purposes of this study, elderly were defined as people 65 years of age and older. Sixty-five and older is commonly used to describe elderly in research studies and position papers (Boyle, et al., 1992; Knobf, Fulmer, & Mion, 1993).

Lung Cancer

For this study, lung cancer included both small cell tumors and non-small cell tumors. This study included elderly people with a new primary diagnosis of lung cancer including all stages whether or not they chose to have treatment.

Newly Diagnosed

This study included the first eight weeks after the diagnosis of cancer as the period considered newly diagnosed. During the initial eight weeks, the person may undergo many tests and procedures and consultations with specialists. Treatment options are usually discussed, decisions are made about treatment plans and the plan may have been initiated and completed. This initial stage of illness has been identified as being especially important in the process of adapting to cancer (Northouse, 1989).

Level of Depression

A sad or depressed mood is a normal response to feelings of loss and stressful situations. The degree of depression varies from person to person, and some people may even develop a major depression requiring treatment (Valente, Saunders, & Cohen, 1994). Depressed or sad moods may affect a person's appetite, tolerance of situations, self-concept, concentration, feelings of hopefulness, energy level, degree of fear, feelings of loneliness, and enjoyment of life.

Symptoms

Rhodes and Watson (1987) define symptoms as "distinctive features interpretive of a disease category used to diagnose a patient's condition" (p. 242) and state symptoms "have often included signs or objective clinical manifestations" (p. 242). Symptom distress is described by Rhodes and Watson as physical and mental anguish or suffering resulting from experiencing the occurrence of symptoms and/or the perceiving of feeling states. The University of California, San Francisco School of Nursing Symptom Management Faculty (1994) proposes that a person's experience with symptoms is dynamic and involves their perception of the symptoms, evaluation, and response.

Physical Function

Physical function includes the patient's mobility and ability to perform certain physical tasks including vigorous activities such as running, lifting heavy objects, and strenuous activities. The level of physical function was assessed by the Physical Function Concept Scale from the Medical Outcome Studies Short Form-36 (MOS SF-36).

In summary, this study included people 65 years of age and older within eight weeks of diagnosis with lung cancer. The study assessed levels of depression, symptoms, and physical function.

Theoretical Framework

Given and Given (1996) have proposed a conceptual model for family caregiver burden from cancer care (See Figure 1). The model describes factors contributing to the responses and outcome of the caregiver to the care of family members with cancer. The model was adapted to show the relationships between symptoms, physical function and depression (See Figure 2).

Given and Given (1996) propose that the background of both cancer patients and their families along with their characteristics are factors which influence the nature of the cancer and care situation. Formal and informal care systems also influence the nature of the cancer and care situation. The nature of the cancer and care situation influences the demands on the caregiver and

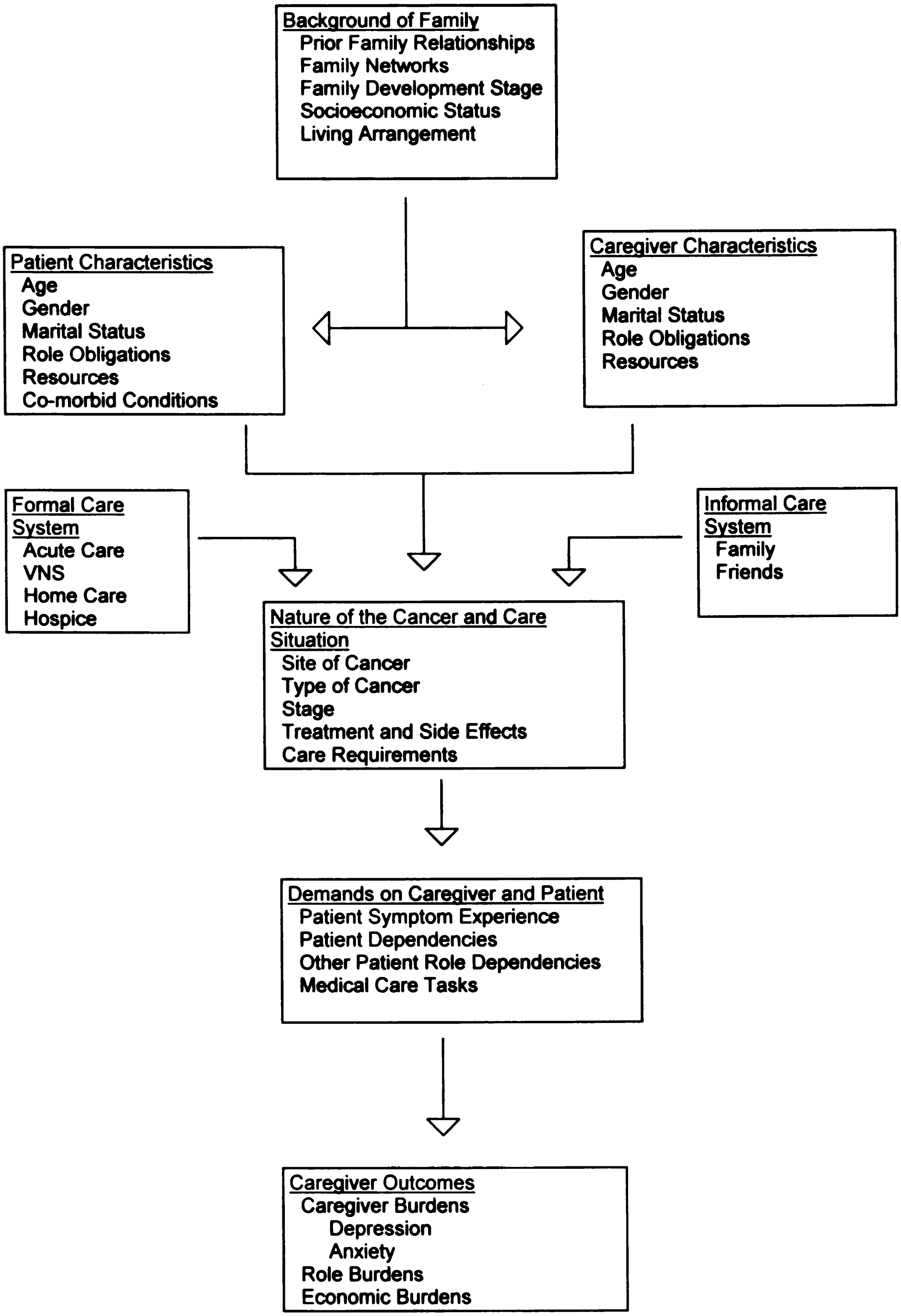

Figure 1 Continuing Cancer Care Demands and Family Caregiver Burden (Given & Given, 1996)

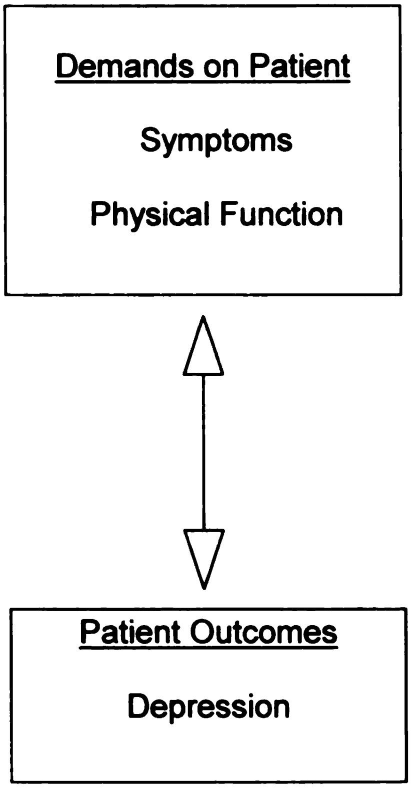

Figure 2 Adaptation of Cancer Care Demands from Figure 1 (Given & Given, 1996)

patient. These demands in turn result in multidimensional responses from the patient.

Background of Family/Patient

The background of the family and patient affects how they react to the stress of the new diagnosis of cancer. Given and Given (1996) indicate that the patient and family bring a history of interactions to the cancer experience that may strengthen or complicate the experience. Factors include the closeness, intensity, and quality of the prior relationships.

The developmental stage of the patient has an impact on how the patient responds to the cancer experience. Havighurst (1972) describes people 60 years of age until death as in the developmental stage of later maturity. Developmental tasks for later maturity include: adjusting to decreasing physical strength and health, adjusting to retirement and a reduced income; establishing an explicit affiliation with one's age group; adjusting to death of spouse or partner; adopting and adapting social roles in a flexible way; and establishing satisfactory physical living arrangements (Kopac, 1993; Matteson, 1990).

Patient Characteristics

Characteristics that affect the patient's response to the cancer experience include age, gender, marital status, role obligations, resources, co-morbid conditions. The older the patient, the greater the chance that the person has already experienced loss of physical strength, loss of health and vigor, and sensory losses. Age may affect the physiological response to the cancer experience.

The older person is also more likely to have experienced the loss of their spouse, brothers, sisters, other relatives, and friends and this narrows the number of people available for caregiving and emotional support. Older people may have already suffered material losses including income, reduced living circumstances and opportunities resulting in less financial resources for medical bills and home care (Kane, 1991). Through their history of losses the older person may have developed patterns for coping with losses. These patterns may include effective coping mechanisms or ineffective coping mechanisms including depression.

The gender of the cancer patients may affect their response to the cancer experience. Gender may affect marital status, financial income, and types of daily chores. Seventy-seven percent of elderly men are married compared to 41% of elderly women (Kopac, 1993). This may mean that the single woman will find it more difficult to find a caregiver. In 1991 the median income for elderly men was $14,357 while the median income for elderly women was only $8,189 (Kopac, 1993). Gender affects the different types of daily tasks that may need to be reassigned to others while patients are experiencing any ill effects from cancer (Given & Given, 1996). Gender may also affect how the body responds to the cancer experience. For example, men may experience greater cancer-related weight loss than women, despite the fact that men may consume more food (Brown, 1993).

Mor, Allen, and Malin (1994) argue that elderly people have fewer competing role obligations and demands in their lives during their coping with cancer than younger people. They hypothesize that fewer role obligations may lead to less disruption in the lives of older people resulting from the cancer experience interfering with role obligations. If this is true, it could explain why elderly people report less psychological distress than younger people.

The risk of comorbid conditions increases with age. Comorbid diseases may negatively affect or complicate the cancer treatment and prognosis, influence treatment choices, decrease the patient's independent function and emotional well-being, and will influence the intensity of symptom distress and physical impairment caused by the lung cancer (Given, McCorkle, & Given, 1993; Knobf, Fulmer, & Mion, 1993; Silliman, Schonwetter, & Burns, 1994). Age, gender, marital status, role obligations, resources, and co-morbid diseases have physiological, emotional, and economical impacts on the person's response to cancer.

Nature of the Cancer and Care Situation

Factors that influence the nature of the cancer and care situation include: the site of the cancer, the type of cancer, the stage, any treatment and side effects produced by the treatment, and care requirements (Given & Given, 1996). The site, cell type, and stage at diagnosis will influence the treatment options and the amount, type, and intensity of the symptom distress and physical impairment experienced by the patient (Given, McCorkle, & Given, 1993).

The stage of the cancer also affects the symptom distress. Patients may be asymptomatic from their tumor site in the lung but experience symptom distress from distant metastasis (Choi, Mathisen, Huberman, & Mark, 1990). Comis and Martin (1987) describe the stage of small cell lung cancer and performance status as the most important disease-related prognostic factors. The type of treatment that the patient receives will influence the side effects experienced and this affects performance.

Demands on Patient

Given and Given (1996) report that patient symptom experience, dependencies, other patient role dependencies, and medical care tasks combine and increase demands on the caregiver. This writer suggests that these same experiences can increase the emotional and physical difficulty for the patient making life more difficult for the patient as well as the caregiver. This added difficulty on the patient creates demands on the patient's life.

As previously discussed, the nature of the cancer, treatment, and comorbid diseases result in symptoms. The symptoms experienced may have profound functional and emotional consequences (Sarna, 1993). Sarna (1993) found that fatigue, pain and insomnia were reported with the highest frequency of occurrence in women with lung cancer. Fatigue, pain and insomnia were also ranked as the most severe symptoms. The symptom experience increases the difficulty for the patients to accomplish their usual tasks and roles increasing the demands and changes that the cancer experience places on their lives.

Newly diagnosed patients usually have lower functional needs than terminal patients (Mor, Guadagnoli, & Wool, 1988). However, newly diagnosed elderly patients may already have physical function impairment needs resultant from comorbid diseases and age. Faber (1991) reports that at the time of diagnosis only 12% of lung cancer patients are asymptomatic and only 21% have localized disease, therefore the elderly person newly diagnosed with lung cancer may already have more functional impairment than other newly diagnosed cancer patients. The physical and emotional needs caused by the cancer experience or comorbid diseases become areas of demand on the patient as well as on the caregiver.

Depression as a Patient Outcome

Given and Given (1996) propose caregiver outcomes in their model. However, this study will adapt the model to address patient outcomes. Given and Given propose that depression is a characteristic of care giver outcome. This study focuses on depression as a characteristic of patient outcome. Depression has been found to be highly correlated with cancer patient's immobility and symptom distress (Given & Given, 1996; Kurtz, Kurtz, Given, & Given, 1995). Given and Given (1992) report that functional status and symptom distress add to the variation in depression. Cassileth, et al. (1984) found that cancer patients with normal physical performance had less depressive scores than patients who had more symptom distress or were bedridden. Godding, McAnulty, Wittrock, Britt, and Khansur (1995) found that quality of life was the single most important predictor of depression. This study suggests that increased symptoms and increased functional impairment interferes with quality of life for lung cancer patients and may increase the patient's depression. Therefore, this study proposes that the level of symptoms and level of physical function influences the level of depression of the patient with lung cancer.

Individuals with lung cancer undergoing cancer treatments frequently experience poor appetite, weight loss, trouble sleeping, and fatigue. Symptoms of depression include appetite disturbance, weight loss, and sleep disturbance (Blazer, 1990). This researcher questions whether the lung cancer patient can make the distinction between the cause of their symptoms. The similarity between the symptoms of lung cancer and depression may lead the patient to believe their weight loss and fatigue mean their disease is worse rather than that the symptoms are at least partially caused by depression. Another factor influencing a patient's physical functional level may be fatigue resulting from depression. This researcher proposes that depression is a characteristic of the patient outcome from the cancer experience. However, the symptoms of depression may also influence the symptom level and physical function level. Therefore, this researcher proposes that the arrow in the conceptual framework between Demands on Patient and Patient Outcomes should point both directions (see Figure 2). In summary, this study proposes that there is a positive relationship between the levels of symptoms, physical function, and depression. An increase in the levels of symptoms, physical function or depression would increase the other levels. A decrease in the levels of symptoms, physical function or depression would decrease the other levels.

Literature Review

The focus of this review will be on what is known about the relationships between symptoms, physical function, and depression in individuals with cancer. Kurtz, Given, Kurtz, and Given (1994) found that symptoms were a significant predictor of dependencies in ADLs and that there were significant correlations between depression, immobility, and dependencies in ADLs. Kurtz, Kurtz, Given, and Given (1995) found that patient immobility and symptom distress were highly correlated with levels of depression for 150 adult cancer patients. The patients were interviewed again six months later and the change in depression was positively correlated with changes in immobility and symptoms.

Kurtz, Kurtz, Given, and Given (1993) found a significant correlation between symptoms and loss of physical functioning in 279 adult cancer patients. Symptoms, most specifically poor appetite, were a significant predictor of loss of physical functioning in the patients with lung cancer. Sarna, Lindsey, Dean, Brecht, and McCorkle (1994) found that weight loss with advanced lung cancer was associated with decreased functional status.

Given, Stommel, Given, Osuch, Kurtz, and Kurtz (1993) found that patients' immobility, symptom distress, and the number of dependencies in ADLs were moderately to highly correlated with levels of depression reported by the patients. Patient symptom experience had a statistically significant impact on both physical function and depression in a study of 111 cancer patients 50 years of age and older reported by Given, Given, and Stommel (1994). In the same study, physical function did not significantly help predict the level of depression.

Donaldson, McCorkle, Georgiandou, and Benoliel (1986) report that psychological distress decreased by the second month after diagnosis for lung cancer even though the patients did not report a change in the level of symptom distress. Cassileth, et al. (1984) found that cancer patients with normal physical function had better levels of mental health than cancer patients who had higher levels of symptom distress or were bedridden.

In summary, correlations have been found between the level of depression, symptoms, and physical function in adult cancer patients. This leads to the following hypotheses for this study: 1) There is a positive relationship between the level of depression and level of symptoms in the newly diagnosed elderly person with lung cancer; 2) There is a positive relationship between the level of depression and level of physical function in the newly diagnosed elderly person with lung cancer; and 3) There is a positive relationship between the level of symptoms and level of physical function in the newly diagnosed elderly person with lung cancer.

The Oncology Nursing Society released a Position Paper on Cancer and Aging that addresses the importance of meeting the needs of the elderly person with cancer (Boyle, Engelking, Blesch, Dodge, Sarna and Weinrich, 1992). The Oncology Nursing Society advocates determining whether research findings can be generalized to the elderly and performing comprehensive gerontological assessments. This study will explore whether the relationships that have been found between the levels of depression, symptoms, and physical function might be found in elderly patients with lung cancer. The results will help health care providers determine if their comprehensive assessment of the elderly person newly diagnosed with lung cancer indicates that the person is at risk for problems with increased levels of depression, symptoms, and difficulties with mobility.

Methods

The purpose of this study was to **search for relationships between level of depression, level of symptoms, and level of physical functioning of elderly people recently diagnosed with lung cancer**. The following section will present the methods and procedures proposed for this study.

Research Question

What is the relationship between the level of depression, level of symptoms, and physical functioning of elderly people recently diagnosed with lung cancer?

Hypotheses

The three hypotheses include:

1) There is a positive relationship between the level of depression and level of symptoms in the newly diagnosed elderly person with lung cancer.

2) There is a positive relationship between the level of depression and level of physical function in the newly diagnosed elderly person with lung cancer.

3) There is a positive relationship between the level of symptoms and level of physical function in the newly diagnosed elderly person with lung cancer.

Research Design

This study was cross-sectional using data from the first wave of a panel study of people 65 years of age and older newly diagnosed with breast, lung, colo-rectal and prostate cancer (Grant #2 RO1 NR/CAO1915-05, "Family Home care for Cancer - A Community-Based Model", Principal Investigator - Barbara A. Given, R.N., Ph.D., F.A.A.N.). The study was funded jointly by the National Institute of Nursing Research and the National Cancer Institute (Given, 1991).

Sample Procedure

The longitudinal study included people 65 years of age and older admitted into community-based hospitals affiliated with the Human Health Programs at Michigan State University. The people were admitted for a new diagnosis of lung, breast, colo-rectal, or prostate cancer and planned continuing cancer treatment (Given, 1991). Only people from the original study who were 65 years of age and older and diagnosed with lung cancer within eight weeks of their intake into the study were selected for this study.

The longitudinal study recruited patients from community based hospitals affiliated with the Human Health Programs at Michigan State University. The hospitals were from Lower Michigan and included Saginaw, Grand Rapids, Flint, and Kalamazoo (Given, 1991).

Patients were recruited for the longitudinal study by recruiters at the participating community-based hospitals. The recruiters, who were hired by the agency, reviewed medical records, surgery schedules, and admission records to identify patients who would meet the criteria for inclusion in the study. After the patient was identified as appropriate for the study, the patient was approached and the study details and expectations for participation explained to the patient. If consent was obtained, the information was sent to Michigan State University and the patient enrolled in the study (Given, 1991).

The criteria for entry into this study were: 1) 65 years of age or older, 2) diagnosis of lung cancer within the last six to eight weeks, 3) no diagnosis of cancer or hospitalization for cancer within the last two years, 4) cognitively intact, 5) English speaking, and 6) able to read.

Data Collection Procedures

Trained recruiters identified patients who met the panel study criteria by reviewing medical records. After the patient was identified, the recruiter explained the study and obtained patient consent. The recruiters obtained information from the oncologist, pathology, and the out-patient setting where the patient planned to receive continuing treatment (Given, 1991).

After the data was forwarded to Michigan State University and enrollment completed, trained data collectors contacted the patient for interviews. Self-administered questionnaires were also mailed to the patients. Patients were interviewed at intake and then in six to eight weeks, three months, six months, and twelve months (Given, 1991). This study used data collected from Wave I Patient Self Administered Booklet and Wave I Patient Telephone Interview at six to eight weeks after enrollment in the study.

Data collectors were carefully trained to ensure inter and intra data collector reliability. Training included videotaping mock interviews and taping and listening to interviews during the first three months. The data collectors were retrained each time a new observation period was begun. Group meetings of all data collectors were held three times a year. In addition, quality assurance included monthly taping and auditing of ten percent of the interviews.

Operational Definition of Variables and Instrumentation

Elderly

For the purposes of this study, elderly were defined as people 65 years of age and older. Age was obtained from the medical record and by asking the patient their birth date (Given, 1991).

Lung cancer

Lung cancer was defined for this study as primary tumors in the lung, including both small and non-small cell tumors. This information is obtained from the pathology reports and from medical record audits and enrollment data.

Newly diagnosed

Newly diagnosed included people diagnosed with cancer within eight weeks of intake into the panel study. The time of diagnosis was obtained from the medical records and enrollment data. Patients cannot have had treatment for this cancer or any other cancer within the last two years.

Level of depression

Depression was defined in this study as a depressed or sad mood. The level of depression was measured by the Center for Epidemiological Studies-Depression Scale (CES-D), a 20 item self-report questionnaire that includes assessments of frequency and severity of depressed moods feelings of guilt and worthlessness, feelings of hopelessness and helplessness, loss of energy, and disturbances of sleep and appetite (Badger, 1993; Given, 1991). This is a widely used scale for studies focusing on levels of depression within clinical and general populations.

The CES-D was designed by several researchers including Myers and Weissman (1980) and Roberts and Vernon (1983) from the Center for Epidemiologic Studies, National Institute of Mental Health to measure depression in studies comparing the relationship of depression to other variables

(Radloff, 1977). Items for the CES-D were selected from scales already developed to depict multidimensional major symptoms found in the clinical syndrome of depression. Major contributors included the Minnesota Multiphasic, Beck Depression Inventory, and the Schedule for Affective Disorders (Callahan & Wolinsky, 1994; Myers & Weissman, 1980; Roberts & Vernon, 1983).

The CES-D is divided into four separate, correlated domains or factors: Depressive Affect, Somatic Symptoms, Well-being, and Interpersonal Relations. Depressive Affect and Somatic Symptoms are both represented by seven items, Well-being is represented by four items while the Interpersonal Relations is represented by two items. Refer to Appendix A to view the division of items into the four factors (Callahan & Wolinsky, 1994; McCallum, Mackinnon, Simons, and Simons, 1995).

The CES-D has a correlation of .90 with a tool developed by Zung (1965) and a correlation of .81 with the Beck Depression Inventory (Weissman, Prusoff, & Newberry, 1975). Badger (1993) reports an internal consistency coefficient of .93. Callahan and Wolinsky (1994) report Cronbach's alpha results ranging from .80 to .87 when subjects were divided into groups by race and sex.

The content of the CES-D is valid for this study in that the four dimensions include the areas of a person's life described earlier in this proposal which can be affected by depressed or sad moods. The CES-D is more sensitive for identifying current depressive symptomotology than a lifetime of depressive illness (Roberts and Vernon, 1983). The CES-D can identify 78% of clinically depressed elderly subjects when a score of 16 is used to determine depression; increasing the score to 20 to determine depression increases the percentage of identification of clinically depressed elderly to 82% (Himmelfarb & Murrell, 1983).

Factor analysis usually supports the four factor solution (Callahan & Wolinsky, 1994; Hertzog, VanAlstine, Usala, Hultsch, & Dixon, 1990; Stommel, Given, Given, Kalaian, Schulz, & McCorkle, 1993). Stommel, Given, Given, Kalaian, Schulz, and McCorkle (1993) found that a gender-bias free model can be constructed when the interpersonal factor is left out and the remaining items are grouped into three factors: depressive mood, well-being, and somatic symptoms. This reduces the tool to a 15 item tool that correlates highly with the 20 item tool (0.98). The Cronbach's alpha for the 15 item tool is 0.88 and 0.89 for the 20 item tool.

The CES-D has been found to be a useful instrument for measuring depression in the elderly (Badger, 1993, McCallum, Mackinnon, Simons, & Simons, 1995). Davidson, Feldman, and Crawford (1994) report the four-factor model fit well for frail elderly. Radloff and Teri (1986) and Reed (1989) established adequate reliability and validity for use of the CES-D with elderly persons. MacCallum, Mackinnon, Simons, and Simons (1995) argue that the relative stability of the CES-D across age groups is related to the fact that depression symptoms are similar across age groups. Davidson, Feldman, and Crawford (1994) studied the use of the CES-D for measuring depression symptoms in elderly with poor health and/or high levels of functional limitations and report that scores were not distorted by a disproportionate influence of somatic items although functional limitations were associated with higher somatic scores. Foelker and Shewchuk (1992) evaluated the use of the CES-D for false positives resulting from somatic complaints not related to depression and concluded that the CES-D is a valid measurement. The CES-D has been used to measure emotional distress and depressive symptoms in several studies on individuals with cancer (Given & Given, 1992; Given, Given, & Stommel, 1994; Given, Stommel, Given, Osuch, Kurtz, and Kurtz, 1993; Mor, 1992; Mor, Allen, and Malin, 1994).

This study will use the entire 20 item scale for a single measure of level of depression. McCallum, Mackinnon, Simons, and Simons (1995) report that the CES-D has good validity as a single depression scale. Subjects answer each item on a four point scale which ranges from a score of zero for "Rarely or None of the Time" to a score of three for "Almost All of the Time". The scores for the four positive affect items will be reverse coded. The score of each item is added together and the sum becomes the score for each patient. The summated score can range from zero to sixty; a score of sixteen or above is indicative of clinical depression (Callahan & Wolinsky, 1994; Given, Given, & Stommel, 1994).

Level of symptoms

Rhodes and Watson's (1987) definition for symptoms is "distinctive features interpretive of a disease category used to diagnose a patient's condition" (p. 242) was used in this study. In addition, Rhodes and Watson

(1987) state symptoms "have often included signs or objective clinical manifestations" (p. 242). The level of symptoms was measured by the Given and Given Symptom Experience Scale (SEI). The Given and Given Scale assesses for the presence of 34 symptoms including: pain, anorexia, weight loss, insomnia, fatigue, constipation, diarrhea, and vomiting (Kurtz, Given, Kurtz, & Given, 1994). The symptoms in the SEI include the symptoms most commonly found in patients with cancer and undergoing cancer therapy (Donehower, 1991; Faber, 1991).

The patients were asked if they have had the symptom within the last two weeks. If no, the answer was coded zero points. If yes, the answer received one point and the patient was asked the severity of the symptom. The answers are on a three point scale with one representing mild, two representing moderate, and three representing severe. If they had not experienced the symptom, their score was zero. The score for the presence of the symptom was multiplied by the score for the severity of the symptom. This score was then added for each symptom to determine the total symptom score. If the patient indicated the presence of a symptom but the subsequent severity score was missing, the presence of the symptom score was multiplied by the mean severity for that symptom.

Level of physical function

Physical function included the patient's mobility and ability to perform certain physical tasks including vigorous activities such as running, lifting heavy objects, and strenuous activities. The level of physical function was assessed by the patient's responses to the Physical Function Concept Scale from the Medical Outcome Studies Short Form-36 (MOS SF-36).

The MOS SF-36 was developed to be a comprehensive, psychometrically sound, and brief standardized health status survey (Ware & Sherbourne, 1992). The Physical Function Concept Scale is one of the eight multi-item health concepts scales which are part of the MOS SF-36. The physical function concept contains ten items measuring both the presence and extent of physical limitations with a three-level response continuum (Ware & Sherbourne, 1992). In the primary study, one item assessing bathing and dressing, was inadvertently omitted resulting in a nine item physical function scale.

McHorney, Ware, Lu, and Sherbourne (1994) report inter item correlations scores ranged from 0.49 to 0.80 for the physical function scale items with a Cronbach's alpha of 0.93 . McHorney, Ware, Lu, and Sherbourne divided patients into 24 subgroups which differed in sociodemographic characteristics, diagnosis, and disease severity. The internal consistency reliability coefficients for the physical function scale ranged from .90 for patients with uncomplicated medical diseases to 0.94 for the subgroups of less than eight years of education, nine to eleven years of education, poverty, and symptomatic depression. The internal-consistency reliability coefficient was 0.92 for subgroups of people 65 to 74 years of age and 75 years old and older.

Reuben, Valle, Hays, and Siu (1995) compared the physical function concept scale from the MOS SF-36 with three other tools measuring physical function in community-based elderly people. The internal consistency reliability for the physical function concept scale was 0.90. Correlations between the four tools compared were highest between the SF-36 physical functioning scale and the FSQ Intermediate Activities of Daily Living (0.76).

McHorney, Ware, and Raczek (1993) tested the validity of the SF-36. Correlation with the principal component of physical health was highest for the physical functioning concept scale (0.88). McHorney, Ware, and Raczek found that physical functioning (RV = 1.00) was the scale which performed best in differentiating the severity of chronic medical problems.

Patients rate their current limitations in performing specific physical activities. Each activity limitation is rated on a three-point scale ("yes, limited a lot" = 3, "yes limited a little" = 2, and "no, not limited at all" = 1). The score was summed for a composite scores of limitations ranging from 10 to 30. The scale score is then transformed to a standardized zero to 100 scale using a scoring algorithm. A score of zero indicates worst function and 100 indicates best function (Reuben, Valle, Hays, & Siu, 1995).

Data Analysis

The data included descriptive information on the sample demographic data. Descriptive statistics are also included for the number of symptoms experienced by patients, and the average severity. Measures of central tendency, including the mean, are used to describe the CES-D scores, number of symptoms, severity of symptoms, and Physical Functioning Concept Scale.

The data were analyzed to determine the significance of the relationships between the scores for the CES-D, SEI, and SF-36. The statistical relationships between the levels of depression, symptoms, and physical function were calculated using a Pearson's r. The relationships examined include the level of depression and the level of physical function; the level of depression and the level of symptoms; and the level of symptoms and the level of physical function. The data results are presented in table format to promote ease of understanding of the relationships between depression, symptoms, and physical function.

Procedures for Protection of Human Subjects

Prior to any secondary data analysis, permission was obtained from the University Committee on Research Involving Human Subjects at Michigan State University. The original study procedure was approved by the University Committee on Research Involving Human Subjects at Michigan State University. A copy of of the original approval is available in Appendix B and a copy for the approval for this study in Appendix C.

Results

Sample

The sample is a subset of 47 people of age 64 and older with lung cancer. The patients range in age from 64 to 86 years of age with a mean age of 72 years. The sample was evenly divided between male and female. Refer to Table 1 for Sample Characteristics.

Symptoms

Patients (N=47) were asked whether they experienced a variety of 37 symptoms, up to 20 symptoms were reported. The average number of symptoms experienced was 10.8 symptoms. The patients were asked to rank the severity of each symptom they experienced. Severity was ranked as mild (one point), moderate (two), or severe (three). The mean severity of a symptom ranged from 1.0 to 2.3. Severe fatigue was reported by the highest number of patients (76%) and received a mean severity of 1.8. The need to void at night was the symptom reported second most frequently by 68% of the patients and had a mean severity score of 1.4. Severe cough, reported by 62% of the patients, was the next most frequently reported symptom and received an mean severity of 1.4. Refer to Table 2 for the most frequently reported symptoms. The highest mean severity for an individual symptom was 2.3 for lack of sexual interest but this was only reported by 12 of the patients. The second highest mean severity was 2.0 for constipation and difficulty swallowing. However, constipation was only reported by 10 patients and difficulty swallowing was reported by 16 patients. Refer to Table 3 for the seven symptoms with the highest mean severity ranking.

The level of symptoms was calculated by multiplying the score for the presence of the symptom by the score for the severity of the associated

Table 1 Sample Characteristics

	(N=47)	(Percent)
Sex: Males	23	50%
Females	23	50%
Patient Race: Caucasian	41	91.1%
African American	3	6.7%
Native American	1	2.2%
Age: 64-74	31	69%
75-84	13	29%
≥ 85	1	2%
Marital Status: Married	23	62.2%
Divorced/Separated	3	8.1%
Widowed	11	29.7%
Lives With: Spouse	23	62.2%
Other	4	10.8%
Alone	10	27.0%
Educational Level: completed grade school	6	16.2%
completed some high school	14	37.8%
completed high school	10	27.0%
completed some college	5	13.5%
completed college	2	5.4%
Treatment: Surgery only	8	17.8%
Chemotherapy only	5	11.1%
Radiation therapy only	22	48.9%
Surgery and chemotherapy	3	6.7%
Surgery and radiation therapy	3	6.7%
Chemotherapy and radiation therapy	1	2.2%
None	3	6.7%

Table 2 Most Frequently Reported Symptoms (N=47)

Symptom	Reporting Symptom		Mean Severity
	#	%	
Fatigue	28	76	1.8
Up at night to void	25	68	1.4
Cough	23	62	1.4
Poor appetite	21	57	1.7
Weakness	21	56	1.6
Difficulty breathing	19	51	1.9
Weight loss	18	49	1.7

Table 3 Symptoms With the Highest Severity (N=47)

Symptom	Mean Severity	Mild #	Moderate #	Severe #
Lack of sexual interest	2.3	3	2	7
Difficulty swallowing	2.0	5	6	5
Constipation	2.0	2	6	2
Difficulty breathing	1.9	6	9	4
Fatigue	1.8	10	14	4
Pain	1.8	9	3	5
Diarrhea	1.8	2	3	1

symptom. This score was then added for each symptom for the level of symptom score. If the patient indicated the presence of a symptom but the subsequent severity score was missing, the presence of the symptom score was multiplied by the mean severity for that symptom. The score for the level of symptoms could range from zero to 111 with higher scores indicating a higher number of symptoms and severity. The actual scores ranged from one to 35 with a mean score of 17.4 which is low for a scale with a possible score of 111.

Physical Function

The scores for the nine physical function items ranged from one (limited a lot) to three (not limited at all). The mean score for each item was calculated by dividing by the number of patients answering the item. The mean scores ranged from 1.4 to 2.1. This indicates that the responses were located somewhere between "limited a lot" and "limited a little". The lowest mean score indicating the highest degree of limitation was for vigorous activities (1.4). Thirty-one patients (72%) reported "limited a lot" for vigorous activities while six patients (14%) reported no limitation. Walking more than one mile was the activity with next lowest mean (1.6). Moderate activities received the next lowest mean score (1.7). Refer to Table 4 for the results of the Physical Function Sub Scale from the Medical Outcome Studies Short Form-36 (MOS SF-36).

If an item was not answered by the patient, the mean response was substituted. The total score for the physical function scale was standardized using the algorithm of John E. Ware (1994). The final standardized scores range

Table 4

Physical Function Scores Ranked from Highest to Lowest Limitation (n=47)

Item	Not limited		Limited a little		Limited a lot		Mean
	n	%	n	%	n	%	
Vigorous activities	6	14	6	14	31	72	1.4
Walk >1mile	11	26	3	7	28	67	1.6
Moderate activities	11	27	6	14	26	61	1.7
Climb several stairs	11	26	6	14	25	60	1.7
Lift, carry groceries	14	33	7	16	22	51	1.8
Walk several blocks	13	30	10	23	20	47	1.8
Walk one block	20	47	5	12	18	42	2.1
Bend, kneel, stoop	18	42	9	21	16	37	2.1
Climb one stair	18	43	8	19	16	38	2.1

from five to 100 with a mean score of 43.2 (N=47). Table 5 shows the distribution of the standardized scores. The standardized score could range from zero (worst functioning) to 100 (best functioning) so a mean of 43.2 indicates that the majority had substantial limitations in physical function.

Depression

The four items of the depression scale with the highest mean scores included two of the somatic symptom items and two of the four positive affect items. Restless sleep, a somatic symptom item, received the highest mean score (1.4 on a response scale of 0 to 3). Another somatic symptom item, "felt that everything was an effort" received the third highest mean score (1.1). The positive affect items were reversed scored. The item "was happy" received the second highest mean score (1.5) while hopeful about future received the fourth highest mean score of 1.1. The mean scores of the four positive affect items were among the seven highest mean scores. The mean scores for the somatic symptom items were in the highest thirteen mean scores. The mean scores for the depressive affect items were within the lowest eleven mean scores. The interpersonal distress items received the two lowest mean scores. Refer to Table 6 for mean scores of the CES-D.

Overall depression is indicated by the summated score of the depression items that could range from zero to sixty. If an item of the CES-D was missing, the mean from the available items was substituted for that case. Scores of 16 or above are indicative of clinical depression (Callahan & Wolinsky, 1994; Given, Given, & Stommel, 1994). Results ranged from one to 38 with a mean score of

Table 5

Range of Physical Function Scores From Best Function to Worse (n=47)

Score (0-100) Mean = 43	Frequency	Percent
100	5	12
95	1	2
89	1	2
80	1	2
75	3	7
65	2	5
60	1	2
55	2	5
50	2	5
35	3	7
33	1	4
30	3	7
25	2	5
20	1	2
17	1	2
15	3	7
10	3	7
5	7	17

Table 6

Mean Scores of CES-D Ranked Highest to Lowest (n=47)

Mean Score	Item	Factor
1.4	My sleep was restless.	Somatic
1.3	I was happy.	Positive
1.1	I felt that everything I did was an effort.	Somatic
1.0	I felt hopeful about the future.	Positive
.91	I had trouble keeping my mind on what I was doing.	Somatic
.91	I enjoyed life.	Positive
.89	I felt that I was just as good as other people.	Positive
.85	I could not get "going."	Somatic
.85	I felt depressed.	Depressive
.85	I did not feel like eating; my appetite was poor.	Somatic
.85	I was bothered by things that usually don't bother me.	Somatic
.76	I felt sad.	Depressive
.74	I talked less than usual.	Somatic
.70	I felt fearful	Depressive
.68	I felt that I could not shake off the blues even with the help of my family and friends.	Depressive
.57	I felt lonely.	Depressive
.40	I had crying spells.	Depressive
.30	I thought my life had been a failure	Depressive
.23	People were unfriendly.	Interpersonal
.19	I felt that people disliked me.	Interpersonal

15.5 (N=47). Forty-six percent of the patients (N=47) reported scores indicative of clinical depression.

Relationships Between Levels of Depression, Symptoms, and Physical Function

Pearson's r correlation coefficients indicate that there was a moderate negative statistically significant relationship between the levels of symptoms and physical function (r = -.47, p = .004). However, using the standardized scoring for the physical function scale means that higher values indicate better functioning. Therefore the negative correlation confirms the hypothesis that the greater the functional limitations, the greater the reported level of symptoms. The negative relationship between the levels of physical function and depression (r = -.05, p = .76) is also a positive relationship but it is not statistically significant. The relationship between the levels of symptoms and depression (r = -.02, p = .92) was negibibly negative and not statistically significant. Refer to Table 7 for the correlation coefficients.

Table 7 Correlation Coefficients

	Level of Physical Function	Level of Depression
<u>All Subjects</u> Level of Symptoms	r= -.47 N= 36 P= .004	r= -.02 N= 37 P= .92
Level of Physical Function		r= -.05 N= 42 P= .76

Discussion

This study of Wave One included three hypotheses: 1) There is a positive relationship between the level of depression and level of symptoms in the newly diagnosed elderly person with lung cancer; 2) There is a positive relationship between the level of depression and level of physical function in the newly diagnosed elderly person with lung cancer; and 3) There is a positive relationship between the level of symptoms and level of physical function in the newly diagnosed elderly person with lung cancer. Hypotheses one and two indicated no statistical significance. Hypothesis three did indicate a significant relationship as a moderate positive relationship between the levels of symptoms and physical function.

Although Faber (1991) estimates that 12% of patients newly diagnosed with lung cancer are asymptomatic, no one in this sample identified themselves as symptom free. Eleven percent of the sample (N=47) reported five or less symptoms. The patients were approximately six to eight weeks after diagnosis and 93% of the patients had experienced some form of treatment. The symptoms may have been caused or aggravated by the treatment and/or depression. For example, both fatigue and poor appetite can be signs of depression and caused by cancer treatments.

Except for nocturia, the seven most frequently reported symptoms are congruent with common symptoms reported by people newly diagnosed with lung cancer. Sarna (1993) found that fatigue, pain and insomnia were reported with the highest frequency of occurrence and ranked the most severe of symptoms in women with lung cancer. This sample reported fatigue as number one in occurrence, pain as the ninth symptom, and trouble sleeping was reported as the eleventh most frequently occurring symptom. Fatigue and pain ranked high in the mean severity but insomnia had a lower mean severity within this sample.

The mean scores for the physical function items ranged from 1.4 to 2.1 indicating the majority experienced a little limitation to a lot of limitation in each of the items. The greatest limitations were reported in the vigorous activities with the least limitations reported in the moderate activities. The mean standardized score (43.2) indicated there were substantial limitations in the functional status even though the subjects were newly diagnosed within the last six to eight weeks.

Forty-six percent of the patients (N=47) reported scores indicative of clinical depression. Breitbart (1994) reports that depression occurs in approximately 20% to 25% of all cancer patients and increases as illness advances with increasing pain and disability. Therefore, the 46% was higher than expected considering that only 17% reported pain and the majority did not report severe physical limitation.

In summary, the study supported only the hypothesis that there was a positive relationship between the levels of symptoms and physical function. Subjects were evenly divided by sex and the majority were young-elderly. The reported symptoms were representative of symptoms commonly reported by lung cancer patients. The majority of the patients reported substantial limitation in their functional status. Forty-six percent of the patients reported scores indicative of clinical depression which is close to double the expected percent.

Interpretations Relative to Framework

The conceptual framework suggests that there should be positive relationships between the levels of depression, physical function, and symptoms. This study supported only the positive relationship between symptoms and physical function. The focus on the relationships was probably too narrow and did not allow for other contributing variables.

The Given and Given (1996) model suggests many other factors that could modify the relationships between the levels of symptoms, physical function, and depression. Age is one of the patient characteristics which could modify the patient outcomes. Havighurst (1972) describes adjusting to decreasing physical strength and health as a developmental task for the elderly. Seventy-two percent of the patients reported a lot of limitation in vigorous activities. Since the study did not provide information on the pre-existing functional limitations of the patients, it is not known what percentage of the patients already had limitation from other health problems. The relationship between physical function and depression may have been insignificant because the patients may have already experienced chronic limitations in their functional status to which they had adjusted as part of their developmental task.

Patient characteristics also include resources which may affect the outcomes. Resources could be a variety of things such as financial, support network, community, spiritual, and coping skills. Demographic data on patient resources was not available to this study. The majority of elderly patients live on marginally fixed incomes and the impact of out-of-the pocket expenses associated with cancer and its treatment can be devastating (Boyle, et al. 1992). The worries about paying for treatments, home care, and other out-of-pocket expenses in addition to their normal living costs, could increase their level of depression even if their levels of symptoms and physical function were currently low.

The social support system is an important resource for the elderly cancer patient. Boyle, et al (1992) reports that the quantity, nature, and quality of available social support systems are frequently correlated with the sense of well-being of the elderly cancer patient. Lack of a social support system may increase the level of depression independently of the current level of symptoms and functional status. The patients living alone (27%) may be experiencing concerns about how they will be able to manage when they become sicker and may be fearful of having to make other living arrangements.

Coping skills is another resource for the patients. Coping is a learned skill which is heavily influenced by intrapersonal strengths and social network supports. Patterns of coping found in the elderly are fundamentally the same as their coping abilities in their past (Dugan & Scallion, 1987). These learned coping skills would be a personal characteristic which could modify their response to the cancer experience and fear of death. For example, a history of developing depression when coping with stressful events predisposes cancer patients to develop depressive disorders (Depression Guideline Panel, 1993a; Nail, 1996). Information on past history of depressive symptoms was not available to this study. However, a history of depressive disorder could increase the level of depression even if the patient is not experiencing symptom distress or physical function impairment.

Optimism is a concept which should be added to the model. People who are optimistic have generalized expectations of positive outcomes and usually deal better with stressors (Lauver & Tak, 1995; Carver, et al., 1994). Spiritual resources may also provide comfort and hope for the cancer patient. Therefore, one wonders if an optimistic attitude or spiritual resources could lower the level of depression independently of the levels of symptoms and physical function.

Hardiness has been identified as a motivating factor in resolving stressful situations and in adapting to health problems (Pollack, 1989). This could indicate that hardiness is another set of patient characteristics that might have an effect on the relationships between the levels of depression, symptoms, and physical function.

Cancer patients age 60 to 74 have been reported to have the lowest psychological distress (Cassileth, et. al., 1984; Ell, Mantell & Hamovitch, 1988). A surprisingly high percentage (46%) report scores indicative of clinical depression even though the majority of the subjects (69%) are between the ages of 64 and 74. The timing of the study may have been a reason for the high depression scores. The patients were studied within the first six to eight weeks of diagnosis when they may still be depressed from the receiving the diagnosis of lung cancer. A diagnosis of lung cancer is often viewed by patients as more life threatening than many other types of cancer. The diagnosis of cancer starts a process of grieving and mourning over multiple actual and potential losses (Dugan & Scallion, 1987). The patients in this study may have been reacting to the grieving process rather than reacting to their current level of symptoms and physical function. This study may have captured the levels of depression, symptoms and physical function just prior to the decrease in psychological distress that Donaldson, McCorkle, Georgiandou, and Benoliel (1986) found in their study of lung cancer patients in the second month after diagnosis. A longitudinal study capturing the levels at intervals throughout the cancer experience would provide interesting insight into the effect of timing on levels of depression.

The type of lung cancer, stage, treatment and side effects may also modify the level of symptoms, physical function, and depression. Seven percent of the patients elected not to have any type of treatment. The 18 percent who had surgery as their only treatment modality should have been at least two to four weeks post operative and recovering by the time of the study. Patients receiving radiation therapy only (49%) or chemotherapy with (9%) or without

(11%) other forms of treatment would probably be experiencing fatigue by this point in their treatment. Seventy-six percent did report fatigue but the mean severity (1.8) was close to moderate. The patients would probably experience more severe fatigue after receiving further radiation therapy and chemotherapy. Some of the patients in this study may not have progressed far enough into their treatments to experience all the side effects of their treatments. Comparing the patients by the type of treatment plan and at various times during the treatment cycles would provide additional insight.

The conceptual framework suggests that patient dependencies have an effect on the outcome. Mor, Guadagnoli, and Wool (1988) argue that newly diagnosed patients usually have lower functional needs than terminal patients. The highest mean scores were for more vigorous activities while many patients were not reporting limitations in the less strenuous activities important for daily living. Given, Given, and Stommel (1994) found that physical function did not significantly help predict the level of depression. However, Given, Stommel, Given, Osuch, Kurtz, and Kurtz (1993) found that patient's immobility, symptom distress, and the number of dependencies in ADL's were moderately to highly correlated with levels of depression reported by the patients. The researcher wonders if the results of this analysis would have been different if the level of physical function had been measured more in terms of immobility and number of dependencies in ADL's.

In summary, the focus of this study may have been too narrow. The Given and Given model (1996) suggests several other factors that could interact and modify the relationships between the levels of depression, symptoms and physical function.

Limitations of the Study

The sample was a secondary analysis of a convenience sample. The convenience sample limits the generalizability of the study. The sample included 31 patients (69%) from the "young-old" (65-74 years), 13 patients (29%) from the "middle-old" (75-84 years), and 1 patient (2%) from the "old-old" (85 and older). A larger sampling of middle-old and old-old would have provided more information about the older elderly. The sample was biased because it consisted only of patients motivated to participate in the study. Probability or random sampling would have been more appropriate methods for obtaining a sample because it would have increased the variability within the sample representing the natural variability among elderly cancer patients. The sample size of 47 was a limitation. A larger sample size would have increased the variability and enhanced the potential for statistically significant findings.

The demographic data from the data set was limited. More detailed demographic data would have been helpful, including stage of the cancer, comorbid diseases, history of depression, social support system, previous functional status, and financial resources. This data would have been useful to look for comparisons in modifying factors.

The interpretation of the results is limited substantially by the inability to compare the results among elderly patients with other types of cancer. The survival prognosis for lung cancer is often worse than other types of cancer. This may make the diagnosis of lung cancer more frightening and influence the level of depression experienced by the patient. Comparing elderly patients newly diagnosed with lung cancer with elderly patients newly diagnosed with other types of cancer would provide a chance to explore for a possible diagnosis effect.

Recommendations for Future Research

This study is an investigation into only a small piece of the whole picture of the cancer experience. Larger samples obtained from random sampling should be studied longitudinally over a period of the disease process. This would provide information on whether there are relationships between variables and whether these relationships change as the disease progresses. Modifying factors, including age, sex, gender, social support system, history of depression, optimism, hardiness, spiritual resources, financial resources, spiritual resources, timing within their cancer experience, and stage of the disease should be explored for relationships to depression, symptoms, and physical function. Comparing the elderly with younger age groups would provide information to indicate if age is a factor in coping with the diagnosis of lung cancer and associated symptoms.

Fatigue and loss of appetite can be indicators for depression as well as symptoms of the disease and treatment. Therefore, further analysis could eliminate these items from the symptom scale and observe for any change in the relationships. Eliminating fatigue and loss of appetite items from the depression and symptom scales could help avoid confounding depression indicators with physical symptom indicators.

Another area of research would be the relationships between symptoms, physical function and depression among other types of cancer patients. Lung cancer frequently has a poor survival prognosis while survival prognosis for other types of cancer may be better. Comparison between types of cancer diagnosis would yield important information. Research could also compare cancer diagnosis with other chronic illness. For example, Chronic Obstructive Lung Disease also includes symptoms such as coughing, dyspnea, and fatigue. However, patients may view their illness differently and this may make a difference in the relationships between symptoms, physical function, and depression.

Miaskowski (1997) reports that oncology out-patients with unrelieved cancer pain were significantly more anxious, angry, and depressed than those without pain. Further research could study whether there are other specific symptoms or functional impairments which would be more likely to increase depression.

A history of depression is a risk factor for depression in cancer patients (Depression Guideline Panel, 1993a; Nail, 1996). It would be interesting to investigate how the relationships between the levels of depression, symptoms, and physical function vary between groups of cancer patients with a previous history of depression and cancer patients without a previous history of depression.

Research should investigate how the relationships between levels of symptoms, physical function, and depression change over the progression of treatment and disease. When choosing between treatment options patients often ask how the treatment will affect them. Patients are interested in how the treatments will affect their functional status and what side effects or symptoms they will experience. Evaluation of the levels of symptoms, physical function, and depression should be included as treatment plans are researched. Longitudinal studies could be done on groups of patients divided by their treatment choice including surgery, radiation, chemotherapy protocol, combination treatments, and no treatment. Comparison of symptoms, physical function, and depression between the different treatment choices would provide valuable information to aid patients making decisions on their treatment plan.

Future research could also explore the role of optimism, hardiness, spirituality, and coping mechanisms play on level of depression throughout the disease process. Research might also investigate whether these concepts play a role in how the patient view and cope with their current level of physical function and symptoms. There is a potential for a wealth of research investigations into the complex experience of living and coping with cancer.

Implications for Advanced Nursing Practice

The APN can make a significant contribution to increasing the quality of life of cancer patients. The primary care APN can serve as a link between the patient, family members, and other health care team members to ensure the patient has all their needs met satisfactorily and experience the best quality of life possible. The APN is active in assessing needs, mutual goal setting, planning to meet the varied patient needs, and evaluation of the results. Research and documentation on the effects of the various cancer treatments on the lives of elderly cancer patients would provide the information to help provide the primary care APN with necessary information on symptom management, functional status, and depression.

The results of this study suggest that elderly cancer patients newly diagnosed with lung cancer will be at risk for experiencing fatigue, coughing, poor appetite, weakness, dyspnea, nocturia, and weight loss. The APN should anticipate these symptoms and develop management strategies. The patients and caregivers should be educated to anticipate symptoms, when and how to call the APN, and measures to cope with the symptoms.

The APN should initiate a nutritional assessment and dietary counseling for all newly diagnosed lung cancer patients and caregivers. Patients and caregivers need counseling on anticipating problems that may cause poor appetite and weight loss. The management of symptoms that could interfere with appetite is essential. Interventions should include management of constipation, nausea, vomiting, taste changes, pain, fatigue, and dyspnea. The APN should work with the patient and caregiver to set mutual goals for dietary intake. The caregiver should have counseling in how to encourage the patient to eat without overly zealously pushing the patient to eat which can cause discord between the patient and caregiver. Interventions for maintaining appetite and weight may include pharmacological agents for appetite stimulation, oral dietary supplements, and enteral feedings.

Fatigue was reported by 76 percent of the patients in this study. All patients and caregivers should receive anticipatory instructions on fatigue and basic management interventions. Basic interventions include energy conservation techniques and the need for exercise. Patients and caregivers should be instructed on a personalized exercise plan to maintain strength and mobility. Patients should receive on-going assessment and management of fatigue. The fatigue in patients with lung cancer can have many different causes which can make management difficult. The APN should assess the patient carefully for treatable causes of fatigue, such as anemia, sleep disturbances, electrolyte imbalance, malnutrition, cachexia, pain, and infection. Interventions should be instituted for management of treatable causes.

Poor appetite and fatigue are symptoms that are also found frequently in patients with depression. It is often difficult to determine whether the symptoms result from the cancer or depression. Nail (1996) suggests guidelines which can be used for differentiating fatigue and depression in cancer patients. These guidelines can also be useful for differentiating the poor appetite of disease from poor appetite caused by depression. The guidelines suggest that the APN should look first for treatable causes of the poor appetite and fatigue and institute appropriate management strategies. If unable to find treatable causes of the symptoms, assess for a pattern in the symptoms which might correspond to the pattern expected with their treatment cycle. If a pattern is found, the APN should institute appropriate management strategies. If no pattern or treatable cause is found or management strategies fail, treatment strategies for depression should be considered. The high percentage of clinically depressed in this study suggest that at times the APN may need to judge whether it would be better to institute the depression interventions before seeking for a physical cause of the fatigue and poor appetite. If seriously concerned, the APN should treat the patient for depression, evaluate for suicidal risk, and then look for other treatable causes of the fatigue and poor appetite.

Research results suggest that the elderly lung cancer patient is experiencing significant functional impairment. The elderly cancer patient may have difficulty with vigorous activities necessitating help with grocery shopping, yard work, running errands, and other active chores. Assessment of financial and social support resources is vital. It is important for the APN to explore with the patient creative ways to adjust to limitations in vigorous activities and to help organize different ways for assistance for vigorous activities. Many elderly patients do not qualify to receive assistance with grocery shopping, yard work, or running errands and cannot afford to pay for assistance. The APN can serve as a link to providers of home care services, insurance carriers, and planners for government legislation to ensure that services become available for those needing the assistance.

Forty-six percent of the patients reported scores indicative of clinical depression. This high percentage leads this writer to suggest that screening for depression and suicidal risk should be on-going when working lung cancer patients. An untreated depression could lead to increased distress, decreased physical and social functioning, and decreased adherence to medical recommendations. The APN should screen all lung cancer patients for factors which increase their risk of depressive disorders. An easy question for screening is "Have you ever had depression"? Some of the risk factors for depression can be decreased or eliminated. For example, poorly controlled pain is a risk factor predisposing the cancer patient to develop depression (Miaskowski, 1997). The APN should ensure that all patients have effective pain management or refer the patients to resources who can assist with pain management.

The APN may need to consult with a mental health specialist or provide a referral if the patient is actively suicidal, suffering very severe depression, fails to respond to medication trials, severe psychotic features indicate that hospitalization should be considered, psychosocial problems persist, or specialized treatments are needed (Depression Guideline Panel, 1993b). The value of cognitive strategies should not be underestimated. Valente, Saunders, and Cohen (1994) report that cognitive strategies can significantly alleviate depression within brief periods of time.

The Given and Given (1996) model suggests that higher levels of symptoms and physical function will increase the levels of depression. This study supported only the positive relationship between the level of symptoms and the level of physical function. The APN should be aware that the level of symptoms and functional impairment will not necessarily predict which lung cancer patients will be depressed. The APN should expect and be prepared to deal with significant levels of depression in newly diagnosed lung cancer patients. The patients can also be expected to experience fatigue, poor appetite, and other symptoms along with significant levels of functional impairment. The APN is in the unique role to have influence on many of these factors. With skillful intervention, the quality of life of the patient may be maximized.

APPENDICES

APPENDIX A

CES-D Items Divided Into the Four Factors

Depressive Affect:

I felt that I could not shake off the blues even with the help of my family and friends.
I felt depressed.
I thought my life had been a failure.
I felt fearful.
I felt lonely.
I had crying spells.
I felt sad.

Somatic Symptoms:

I was bothered by things that usually don't bother me.
I did not feel like eating; my appetite was poor.
I had trouble keeping my mind on what I was doing.
I felt that everything I did was an effort.
My sleep was restless.
I talked less than usual.
I could not get "going."

Well-being or Positive:

I felt that I was just as good as other people.
I felt hopeful about the future.
I was happy.
I enjoyed life.

Interpersonal distress:

People were unfriendly.
I felt that people disliked me.

APPENDIX B

MICHIGAN STATE
UNIVERSITY

June 6, 1995

TO: Barbara A. Given
A230 Life Sciences

RE: IRB#: 92-280
TITLE: FAMILY HOME CARE FOR CANCER--A COMMUNITY-BASED MODEL
REVISION REQUESTED: 05/25/95
CATEGORY: FULL REVIEW
APPROVAL DATE: 06/05/95

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revisions listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

D. E. Wright

David E. Wright, Ph.D.
UCRIHS Chair

DEW:kaa/lcp

OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on
Research Involving
Human Subjects
(UCRIHS)

Michigan State University
232 Administration Building
East Lansing, Michigan
48824-1046

517/355-2180
FAX: 517/432-1171

APPENDIX C

MICHIGAN STATE
UNIVERSITY

June 17, 1996

TO: Jan Cooper
1444 N. Robinhood Dr.
Muskegon, MI 49445

RE: IRB#: 96-336
TITLE: THE RELATIONSHIP BETWEEN THE LEVELS OF DEPRESSION SYMPTOMS, AND PHYSICAL FUNCTION AMONG A GROUP OF ELDERLY PATIENTS NEWLY DIAGNOSED WITH LUNG CANCER
REVISION REQUESTED: N/A
CATEGORY: 2-H
APPROVAL DATE: 05/23/96

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revisions listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:bed

cc: Sharon King

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