

Quality of Life and Health Status of Dyads of Women With Lung Cancer and Family Members

Linda Sarna, DNSc, RN, FAAN, Mary E. Cooley, PhD, CRNP, CS,
Jean K. Brown, PhD, RN, FAAN, Roma D. Williams, PhD, CRNP,
Cynthia Chernecky, PhD, RN, Geraldine Padilla, PhD, and Leda Layo Danao, PhD

Purpose/Objectives: To describe and compare the quality of life (QOL) and health status of dyads of women with lung cancer and their family members and to explore the correlates of family members' QOL.

Research Approach: Descriptive, cross-sectional.

Setting: Interview, self-report.

Participants: 51 dyads consisting of women with lung cancer and their family members.

Methodologic Approach: One-time assessment of family members' and patients' QOL, health status, and demographics and patients' clinical characteristics.

Main Research Variables: Family and patient QOL and health status.

Findings: QOL of the dyads was not significantly related. Poorer physical QOL of family members was associated with older age, comorbid conditions, less education, and alcohol use. Poorer emotional QOL of family members was associated with younger age, depressed mood, and not being a spouse. Fifty-nine percent of family members had comorbid conditions. Significantly more family members continued to smoke and use alcohol.

Conclusions: The QOL of family members of patients with lung cancer is diminished when their own health status is compromised. Further study is needed.

Interpretation: Additional study is needed to identify family members at risk for diminished QOL and with compromised health status because these factors might affect ability to support patients with lung cancer.

Key Points . . .

- More than 80,000 American families will be affected by the experience of having a female family member diagnosed with lung cancer in 2006.
- Knowledge about the impact of the disease is limited.
- Family members' own health issues may affect their quality of life (QOL) as well as the experience of coping with patients' illness.
- The assessment of family members' QOL and health status may provide important information about their capacity to support their family members with cancer.

Lung cancer emerged as the leading cause of cancer death among women in the mid-1980s (Jemal et al., 2006). In 2006, 81,770 American families are projected to experience the collateral impact of lung cancer in female family members (Jemal et al.). Lung cancer is one of the most common and deadly cancers for men and women, and incidence increases with age in the majority of patients diagnosed with the disease at age 70 or older (Basche & Kelly, 2003). Thus, spouses of

The experience of cancer is not limited to people with the disease but rather has wide-ranging impact on families' physical and emotional well-being (Ferrell, Grant, Borneman, Juarez, & ter Veer, 1999; Given, Given, & Kozachik, 2001; Northouse, Templin, Mood, & Oberst, 1998). However, such impact can be variable and is not related consistently to patients' health status and quality of life (QOL) (Chen, Chu, & Chen, 2004; Given et al., 1993; Hagedoorn, Buunk, Kuijer, Wobbes, & Sanderman, 2000; Kim, Duberstein, Sorensen, & Larson, 2005; Pinquart & Sorensen, 2003). If an individual suffers from serious health problems, he or she may have diminished QOL and be less able to provide the needed physical care and emotional support to a family member coping with a diagnosis of cancer. The assessment of the physical and emotional well-being of family members may provide important information about their capacity for patient support (Given et al., 2001; Given & Sherwood, 2006). In one study of emotional impact on 135 dyads (survivors and family caregivers), family members reported significantly higher levels of psychological distress than survivors (Matthews, 2003).

Linda Sarna, DNSc, RN, FAAN, is a professor in the School of Nursing at the University of California, Los Angeles; Mary E. Cooley, PhD, CRNP, CS, is a nurse scientist in the Phyllis F. Cantor Center for Research in Nursing and Patient Care Services at the Dana-Farber Cancer Institute in Boston, MA; Jean K. Brown, PhD, RN, FAAN, is a professor and associate dean for academic affairs in the School of Nursing at the University at Buffalo in the State University of New York; Roma D. Williams, PhD, CRNP, is a retired associate professor in the School of Nursing at the University of Alabama in Birmingham; Cynthia Chernecky, PhD, RN, is a professor in the School of Nursing at the Medical College of Georgia in Augusta; Geraldine Padilla, PhD, is a professor and associate dean for research in the School of Nursing at the University of California, San Francisco; and Leda Layo Danao, PhD, is a senior research scientist in the Jonsson Comprehensive Cancer Center at the University of California, Los Angeles. This research was funded by a grant from the ONS Foundation's Center for Leadership, Information and Research (#018652, Linda Sarna, principal investigator). (Submitted February 2004. Accepted for publication February 27, 2006.)

Digital Object Identifier: 10.1188/06.ONF.1109-1116

such patients, if present, also are likely to be older and more likely to experience health problems that could affect their QOL. Because family members play an important role in the support of patients during the continuum of care, such information may be useful in planning supportive nursing care for women with lung cancer and their families. However, no known studies have focused on these individuals. The purposes of this study were to describe and compare the QOL and health status of dyads of women with non-small cell lung cancer (NSCLC) and their family members and to describe factors related to family members' QOL.

Literature Review

Quality of Life and Family Members

The profound impact of lung cancer on QOL has been reported widely (Earle, 2004; Montazeri, Gillis, & McEwen, 1998; Sarna et al., 2002). Because of the limited length of survival for the majority of those diagnosed with lung cancer and the severity of symptomatology, those patients may experience more severe disruptions in QOL as compared with other patients with cancer. For example, in comparison with other patients with cancer, patients with lung cancer have been reported to have the highest level of psychological distress (Zabora, BrintzenhofeSzoc, Curbow, Hooker, & Piantadosi, 2001). However, Svobodnik et al. (2004) reported that in a study of 650 lung cancer survivors, women ($N = 311$) with all stages of disease had significantly better QOL when compared to men. Reports about the family impact after a diagnosis of lung cancer have been relatively limited, and none has focused specifically on family members of women with lung cancer. Bakas, Lewis, and Parsons (2001), in a study of 78 family caregivers of patients with lung cancer (76% female caregivers; the sex distribution of the patients is unknown), found that responding to emotional needs was reported as one of the most difficult responsibilities of family members.

Gender-related differences in the response to lung cancer have been reported, which might affect the QOL of family members when patients are female. For example, several studies have reported that in comparison with men, women with lung cancer have higher levels of anxiety and greater concerns after diagnosis (Hill, Amir, Muers, Connolly, & Round, 2003; Hopwood & Stephens, 1995; Hopwood & Thatcher, 1990). Because the roles of wife and mother may be disrupted by disease and treatment, family members may be affected by different demands and responsibilities. In a previous study of women with NSCLC (Sarna, 1993), difficulty with household chores and the ability to care for self were primary concerns. No known studies have specifically described the QOL and health status of family members of women with lung cancer.

Role and gender also have been important variables linked to emotional distress of family members (Given et al., 1993; Kurtz, Kurtz, Given, & Given, 1995). Although studies about women in a caregiving role are more common, the limited data about men in a caregiving role suggest that they may be more likely to focus on instrumental rather than emotional aspects of care (Baider & Bengel, 2001). In a meta-analysis of 229 studies on caregiving, gender differences were very small, but other than depression, the dimensions of health status were not detailed or considered as moderator variables affecting QOL (Pinquart & Sorenson, 2006). Older women with cancer are

less likely to receive support when compared to older men with cancer who receive care from wives and daughters (Pitceathly & Maguire, 2003; Stommel, Given, & Given, 1998).

Although the impact of advanced lung cancer on QOL has been studied extensively, few reports focused on people who are potentially cured but living in the aftermath of treatment and the threat of recurrence (Earle, 2004; Montazeri et al., 1998). Even people potentially cured of lung cancer may experience long-term disruptions in QOL (Handy et al., 2002; Sarna et al., 2002; Svobodnik et al., 2004); the disruptions have the potential to negatively affect the QOL of family members. No known reports have described the QOL of family members of survivors of lung cancer.

Health Status of Family Members

The health status of family members may influence their ability to provide emotional support and physical care to patients with cancer during the course of the disease; older family members, especially, may be at higher risk for chronic illnesses. In a study of 120 spouses (66% female) of patients with lung cancer (16% with advanced-stage disease), a personality predisposition (neuroticism) was related to increased risk of depression. In that sample, 30% of spouses were categorized as depressed, according to Center for Epidemiologic Studies Depression Scale (CES-D) scores (Kim et al., 2005). Other comorbid conditions were not considered as factors influencing either depression or caregiver burden. Poor health status of family members was one factor contributing to economic risks affecting patients with cancer and their families, further compromising QOL (Yun et al., 2005).

Smoking status of people with cancer can affect treatment side effects and outcomes, but data still are limited as to the smoking status of patients after diagnosis or the smoking status of members of patients' households (Garces et al., 2004; Gritz, 2000; Sarna, 1995). Tobacco-induced morbidity, such as cardiovascular disease and chronic obstructive pulmonary disease (COPD), may affect family members' health status (Centers for Disease Control and Prevention, 2003). Smoking status of family members also is important because people with cancer who smoke are less likely to quit if they live with other smokers (Schnoll et al., 2002). Additionally, women who have never smoked are at risk for lung cancer if exposed to secondhand smoke (Liu et al., 2000). Because alcohol use is higher among smokers (Hymowitz et al., 1997), this risk behavior also may negatively affect health status and physical and emotional QOL of family members (Resnick et al., 2003).

Conceptual Framework

The present study's focus is on the physical and emotional aspects of QOL and health status of family members of women with NSCLC (see Figure 1). As with the model proposed by Kurtz et al. (2004), the authors postulated that family members' QOL was related to demographic characteristics (e.g., relationship to patient, age, sex, race and ethnicity, marital status, years of education, employment status), patients' health status (e.g., comorbid conditions, presence of depressed mood, smoking status, alcohol use), clinical characteristics (e.g., time since diagnosis, type of lung cancer, type of treatment, metastasis), and patients' QOL. The present model postulated that family members' health status was a correlate of their QOL.

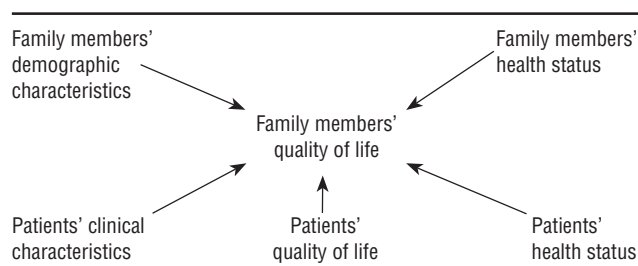


Figure 1. Research Model to Explore Factors Affecting Quality of Life of Family Members of Women With Lung Cancer

Methods

Design

The primary purpose of this study was to describe and compare QOL and health status (number and type of comorbid conditions, depressed mood, tobacco use, exposure to secondhand smoke, and alcohol use) of family members and women with lung cancer. A secondary aim was to describe factors related to family members' QOL. The study was nested in a larger prospective study describing QOL and symptoms of women living with lung cancer (Sarna et al., 2005). Family members met the following criteria: a spouse, partner, sister, brother, parent, or adult child who was identified by a patient as directly involved with her illness experience. This study was approved by the institutional review boards at each data-collection site: West Coast (University of California, Los Angeles), East Coast (Yale University, University of Buffalo in the State University of New York), and South (University of Alabama at Birmingham, Medical College of Georgia).

Sample

A convenience sample of 50 dyads (50 women with lung cancer and 50 family members) was targeted as the minimum sample size for this exploratory study. For ease of comparison, women with a diagnosis of lung cancer will be termed patients in this report. The sample size was based on practical considerations, given the exploratory nature of the study. The study was not restricted to spouses because the researchers did not want to exclude women who were not married. Three close friends were identified by women as "family," were allowed to participate, and are included in the analysis. In the larger prospective study (Sarna et al., 2005), 36% of the patients were not partnered.

Instruments

QOL was assessed with the generic **Short Form-36** (SF-36). The instrument includes eight subscales (physical function, role limitations caused by physical problems, role limitations caused by emotional problems, social function, emotional well-being, energy and fatigue, pain, and general health perceptions) that cover varying aspects of QOL (Hays & Morales, 2001; Ware, Kosinski, & Dewey, 2000; Ware, Kosinski, & Keller, 1994). Higher scores indicate better QOL. Two summary scores of physical and emotional well-being are created from the subscale scores. The scores include physical QOL (physical component scores [PCS]) and emotional QOL (mental component scores [MCS]) (possible range = 0–100). The summary scores are available for comparison with the

older population and for those with a previous heart attack or COPD, among other conditions (Ware et al., 1994). Cronbach's alphas for all items of the SF-36 for all participants, family members (alpha = 0.93), and women with NSCLC (alpha = 0.96) were acceptable.

The presence of comorbid diseases was assessed by a self-report using a listing of conditions from the **Charlson Comorbidity Index** (Charlson, Pompei, Ales, & MacKenzie, 1987). Eighteen common comorbid conditions such as heart disease (heart attack), asthma, stroke, COPD, peptic ulcer, diabetes, poor kidney function, and rheumatoid arthritis are listed. The total number of conditions was tallied. For this article, the numbers and type of specific conditions are reported.

Health status also included assessment of the risk behaviors of depressed mood, tobacco use, exposure to secondhand smoke, and alcohol use. Depressed mood was assessed using the **CES-D** (Lewisohn, Seeley, Roberts, & Allen, 1997; Radloff, 1977; Radloff & Teri, 1986). Total possible scores can range from 0–60, with scores 16 or greater indicating depression. The Cronbach's alphas for this sample of family members (0.87) and women with lung cancer (0.90) were acceptable.

Assessment of tobacco history, current smoking status, and exposure to secondhand smoke was obtained through self-report surveys based on questions from the Lung Health Survey (Ferris, 1978). Smoking status at the time of diagnosis as well as at the time of the interview was obtained for family members and patients. Additional questions included quit attempts and assistance with cessation. Alcohol use was evaluated using an item from the CAGE questionnaire describing alcohol use during the prior three months (Mayfield, McLeod, & Hall, 1974).

Demographic data (age, gender, marital status, education, employment status) were obtained from family members and patients. The relationship of family members to patients (e.g., spouse, parent) was noted. Patients' clinical characteristics (i.e., type of lung cancer, time since diagnosis, type of treatment, current treatment status, and presence of metastatic disease) were obtained from medical records.

Procedures

Sequential patients participating in the QOL study of women with lung cancer (Sarna et al., 2005) were asked to deliver an institutional review board–approved invitational letter to the family member of their choice who had direct experience with their illness. The letter included the statement, "Because family members are often very involved in support and care of someone with cancer, we would also like to get some information from some of the family members about their experience," and requested their participation in a one-time assessment. Recruitment continued at each site until the sample target was achieved. After receiving the letter, interested family members telephoned the research team at each site for further information about the study and were screened for eligibility. All family members who received an invitational letter and met the criteria agreed to participate. Family members completed consent forms and questionnaires describing their QOL, health status (e.g., comorbid diseases, tobacco use, alcohol use), and demographic characteristics. Patients completed the same questionnaires. Patients' disease and treatment characteristics were obtained from their medical records.

To ensure scientific integrity of the data collection, the principal investigator visited each site to review procedures. Additionally, the investigators participated in monthly telephone calls and used frequent e-mail communications. Further information about the challenges of conducting multisite research related to the larger study is described elsewhere (Cooley et al., 2003).

Data Analysis

Descriptive statistics were used to describe the QOL, health status, and demographic characteristics of family members and patients and the clinical characteristics of patients. For analysis, some variables were collapsed. Smoking status was classified as ever, current, former, or never smoker, and alcohol use in the previous three months was used as a dichotomous variable (yes or no). A cut-point for the CES-D was used to indicate the depressed group (≥ 16). The total number of physical comorbid conditions, frequency of specific types of conditions, and prevalence of one, two, or more conditions were noted.

Likelihood ratio chi-square and paired *t* tests were used to compare health status (number of comorbid conditions, types of common comorbid conditions, presence of depressed mood, alcohol use, and tobacco status) and QOL (SF-36 subscale scores, PCS, and MCS) of family members and patients. The analysis of correlates of family members' QOL was conducted separately for PCS and MCS scores. The QOL data for patients were from the baseline interview of the prospective study (Sarna et al., 2005). QOL scores (PCS and MCS) of family members were compared to summary scales for the older population (55–64 years of age), for people with a history of a myocardial infarction, and for people with COPD (Ware et al., 1994). Because of the frequency of heart disease, a post hoc analysis was conducted to describe QOL differences among family members if that comorbidity was present. The demographic characteristics of family members were compared with those of the patients.

Pearson correlations for continuous variables and chi-square for categorical variables were used to examine the relationship that family members' QOL (PCS and MCS) had with family members' health status and demographics and patients' health status, clinical characteristics, and QOL.

Because of the importance of self-report in assessing QOL, cases with missing values were deleted from analysis. Data analysis was conducted using SPSS® for Windows, version 11.5 (SPSS Inc., Chicago, IL). Alpha was set at 0.05.

Results

Sample

As a result of concurrent recruitment at the various sites, 52 family members were enrolled in the study. One had incomplete data; thus, data from 51 dyads are included in this report.

A majority ($n = 29$, 57%) of family members participating in the study were spouses. Others included adult children ($n = 14$, 28%), siblings ($n = 4$, 8%), one parent (2%), and close friends (identified as family members) ($n = 3$, 6%). Most ($n = 33$, 65%) were male. The age range for family members varied widely (27–82 years of age, $\bar{X} = 59$, $SD = 14$). Most of the family members were Caucasian ($n = 47$, 92%); the other ethnicities were African American ($n = 1$), Pacific Islander

($n = 2$), and mixed race ($n = 1$). The sample was distributed across the data sites (51% East Coast, 26% West Coast, and 24% South).

Family members were significantly younger than patients with NSCLC (family members: $\bar{X} = 59$ years, $SD = 14$; patients: $\bar{X} = 65$ years, $SD = 11$; paired $t = 2.64$, $df = 47$, $p < 0.05$). Years of education (family members: $\bar{X} = 14$ years, $SD = 3$; patients: $\bar{X} = 13$, $SD = 3$) were comparable. Although more family members than patients were employed (44% and 26%, respectively), the difference was not significant.

The majority of women with NSCLC had adenocarcinoma ($n = 41$, 80%) and had received surgical treatment ($n = 40$, 78% lobectomy). Eighteen (35%) had metastatic disease and currently were receiving chemotherapy. The average time since diagnosis was 22 months ($SD = 17$, range = 6–60).

Comparison of Patient Sample With Women in the Lung Cancer Quality-of-Life Study

Because the sample was nested in the larger QOL study (Sarna et al., 2005), the researchers examined the similarities and differences of the women with lung cancer who participated in the present study compared to the women from the parent study whose family members did not participate ($n = 179$). No significant differences existed in the majority of the demographic characteristics (age, education, race and ethnicity, or employment status) of patients in the present study and patients in the larger study. However, a significantly higher percentage of patients in the family study were married (71% versus 41%, likelihood ratio = 13.87, $df = 1$, $p < 0.001$). Additionally, when comparing patients in this study with patients who did not participate, no significant differences existed in clinical characteristics (type of NSCLC, type of treatment, presence of metastasis, and time since diagnosis), health status (number of comorbid conditions, smoking history, and current smoking status), or percentage of patients in the depressed mood category (CES-D score ≥ 16). However, patients in the present study had higher mean CES-D scores (16.0 versus 11.9, $t = -2.70$, $df = 228$, $p < 0.01$) and significantly lower emotional QOL (MCS = 46.3 versus 50.6, $t = 2.62$, $df = 225$, $p < 0.01$) than patients whose family members did not participate. Thus, patients who participated in this family study were more likely to be married and had poorer emotional QOL than women in the larger study who did not participate.

Quality of Life

The mean QOL scores on the subscales of the SF-36 and the physical (PCS) and emotional (MCS) domains of QOL are displayed in Table 1. As compared to the women with NSCLC, family members had significantly higher QOL on all subscales and on the PCS and MCS. Findings were similar only when dyads with spouses were compared (data not displayed). When compared to published normative standards (Ware et al., 1994), mean physical QOL score (PCS) of family members (51.6) is similar to the 50th percentile PCS score (49.9) of the older population and is higher than the norm for those who have had a heart attack (PCS = 43.6) and COPD (PCS = 36.5). The mean MCS score (51.6) for family members, depicting emotional well-being, is lower than the 50th percentile norm for the older population (MCS = 54.4), lower for those who had had a heart attack (53.1), and higher than for those with COPD (50.9).

Table 1. Comparison^a of Quality of Life of Dyads of Women With Lung Cancer and Family Members

Short Form-36 ^b	Family Member		Patient		Paired T Test
	\bar{X}	SD	\bar{X}	SD	
Subscale					
Physical function	80.5	22.3	47.6	28.6	7.1*
Role physical	81.1	34.4	46.0	45.0	4.4*
Bodily pain	78.9	23.3	66.7	27.3	2.8*
General health	75.2	18.3	56.5	23.3	5.1*
Vitality	64.4	20.5	44.4	23.7	4.9*
Social function	85.1	19.7	76.0	42.7	2.2*
Role emotional	80.7	43.4	55.6	43.0	3.4*
Mental health	79.5	15.8	66.3	20.9	4.1*
Summary domain					
Mental component	51.6	10.3	46.3	11.5	5.3*
Physical component	51.6	10.6	41.0	10.0	2.6*

N = 51 dyads

* $p < 0.05$

^a Paired t tests, df = 48–50

^b Lower score equals poorer quality of life.

Health Status

Health status characteristics of the dyads are displayed in Table 2. Significantly more patients had comorbid conditions, although the average number of conditions was similar (family members: $\bar{X} = 1.0$, SD = 1.5; patients: $\bar{X} = 1.5$, SD = 1.5). The majority (57%) of family members with comorbid conditions had more than one condition. Significant differences existed between family members and patients in some types of comorbid conditions. More than one-fifth of the family members reported having had a previous heart attack, compared to 6% of patients. Family members were less likely to have COPD or peptic ulcer disease than patients. Significantly more patients had depressed mood (CES-D score ≥ 16) than family members.

In comparison to patients, family members were significantly more likely to be current smokers and to have consumed alcohol in the prior three months. More than three-fourths of patients and about one-half of family members had a history of smoking. Years of smoking ranged from 10–56 years for family members and 3–50 years for patients (\bar{X} for family members = 29 years, SD = 14; \bar{X} for patients = 37 years, SD = 11). All of the patients who were smoking at the time of diagnosis (n = 11) reported trying to quit; four received assistance with cessation and two continued to smoke. Seven family members reported smoking at the time of diagnosis, three reported receiving assistance to quit, and two (spouses) reported quit attempts. Nine family members reported smoking at the time of the interview (n = 7 spouses, n = 2 children).

Correlates of Family Members' Quality of Life

Family members' health status and demographic characteristics and patients' health status, clinical characteristics, and QOL were examined in relationship to family members' physical and emotional QOL. The PCS and MCS scores of family members and patients were not significantly related. Significant correlates of family members' physical and emotional QOL (PCS and MCS) are discussed in the following paragraphs.

Physical quality of life: Poorer physical QOL (PCS) of family members was related to older age ($r = -0.47$, $p < 0.05$), and less education ($r = 0.40$, $p < 0.05$). Greater number of comorbid conditions was significantly related to poorer physical QOL ($r = -0.36$, $p < 0.05$). Family members who had experienced a heart attack had significantly lower PCS scores than those who did not ($\bar{X} = 46.1$ with a heart attack versus $\bar{X} = 53.2$ without a heart attack, paired $t = 2.1$, $p < 0.05$). Family members who consumed alcohol had significantly lower physical QOL (PCS) ($\bar{X} = 50.3$ who used alcohol versus $\bar{X} = 55.2$ who did not use alcohol, paired $t = -2.0$). Two of the patients' clinical characteristics were related to family members' physical QOL. Family members of patients with metastasis had higher scores than those who did not ($\bar{X} = 59.0$ with metastasis versus $\bar{X} = 49.9$ without metastasis, paired $t = 2.52$, $p < 0.05$), as did those with family members undergoing treatment as compared to those who were not undergoing treatment ($\bar{X} = 58.3$ undergoing treatment versus $\bar{X} = 50.3$ off treatment, paired $t = 2.2$, $p < 0.05$). In this small sample, family members of patients with metastasis who were undergoing treatment reported significantly higher PCS.

Emotional quality of life: Emotional QOL (MCS) of the family members was significantly related to age ($r = 0.42$, $p < 0.05$), with younger family members having lower MCS. Nonspouses had significantly lower MCS scores ($\bar{X} = 46.9$ nonspouses, SD = 12.3; $\bar{X} = 55.10$ spouses; paired $t = -2.9$, $p < 0.05$). Depressed mood (CES-D score) was significantly related to lower MCS scores ($r = -0.81$, $p < 0.05$).

Discussion

Quality of Life

The study is the first to report data from a matched sample of women with lung cancer and family members. Not surprisingly, family members reported significantly higher QOL than women with lung cancer. Neither the physical nor emotional QOL of

Table 2. Health and Emotional Variables of Dyads of Women With Lung Cancer and Family Members

Variable	Family Members		Patients		Test ^a
	n	%	n	%	
Comorbid conditions	30	59	34 ^b	67 ^b	—
Heart attack	12	24	3	6	6.5*
Asthma	6	12	11	22	NS
COPD	2	4	19	38	19.9*
Peptic ulcer	1	2	6	12	4.2*
Depressed mood	7	14	21	41	10.0*
Smoking status					10.4*
Current	9	18	2	4	—
Former	25	49	39	78	—
Never	17	33	9	18	—
Exposure to second-hand smoke	19	42	10	20	NS
Alcohol use	36	71	22	43	8.0*

N = 51 dyads

* $p < 0.05$, df = 1

^a Chi-square or t test

^b In addition to lung cancer

COPD—chronic obstructive pulmonary disease; NS—not significant

the patients was significantly related to family members' QOL in the one-time assessment. The findings are similar to those of Chen et al. (2004) in a sample of 121 patient-spouse dyads. In their study (which did not include patients with lung cancer), neither physical nor emotional aspects of patients' QOL were significantly related to family members' QOL.

The differences in physical QOL between patients and family members were not surprising because the patient sample was significantly older and one of five had advanced-stage disease. The present study did reveal new information about a potential at-risk group that could benefit from further support and resources. Family members at risk for lower physical QOL were older, had more comorbid conditions, had less education, and had consumed alcohol. These characteristics need further investigation.

The link between demands of caring and increased levels of depression among family members has been reported (Kim et al., 2005). In the present study, family members were not necessarily caregivers. As with the current findings, Rossi Ferrario, Zotti, Massara, and Nuvolone (2003), in a study of 50 patients with cancer (22% "affecting the respiratory system") and family members, found that patients reported significantly more emotional distress. The current findings did reveal that family members had poorer emotional QOL than general population norms and norms for those who had had a heart attack. Relatively few family members had depressed mood, according to the CES-D. Entry criteria for patients in the present study included living with the diagnosis for a minimum of six months through five years. Thus, family members had the experience of living with the impact of patients' lung cancer beyond the initial phases of diagnosis and treatment. Because many of the women with lung cancer could be described as survivors, they and their family members may have experienced positive aspects of the disease, including reappraisal of meaning of life, which could enhance emotional QOL (Maliski, Sarna, Evangelista, & Padilla, 2003).

Other factors related to lower ratings of emotional QOL among family members included younger age and not being a spouse. The special needs of family members who are not spouses deserve attention. In the present study, 28% of the family members were adult children. The majority of the studies describing family caregivers and cancer have focused on marital relationships. In a study of long-term survivors, women with NSCLC were significantly more likely to live alone as compared with men (Sarna et al., 2002). Younger family members such as children of patients with lung cancer and family friends may have less access to support. This is especially relevant because a higher percentage of women with lung cancer are of younger age as compared to men with the disease (Fu, Kau, Severson, & Kalemkerian, 2005). Nurses providing comprehensive care must be vigilant in the early identification of signs of depression in patients and family members.

Unlike many other QOL studies that focused on patients with cancer and their families, other than women with breast cancer, all of the patients in the current study were women and the family members mostly men. The researchers did not detect statistically significant gender differences in appraisals of QOL, but the sample was small; important differences may be present. Further research is needed to explore the potential gender differences in QOL of family members.

Health Status

The findings of this study revealed that the health status of some family members of women with lung cancer was significantly compromised, with 59% reporting at least one condition. The number of family members with serious comorbidities was not entirely unexpected considering the average age of the sample and the history of tobacco use (67% of the family members). More than one-fifth of family members had experienced a life-threatening condition, a heart attack. Smoking-related diseases increase with age because of the effect of cumulative damage (Burns, 2003). A greater proportion of the women with lung cancer had concurrent COPD.

Although more family members never smoked, the current smoking status of some family members could put patients at risk for comorbidity (Centers for Disease Control and Prevention, 2003). Almost all of the women with lung cancer who smoked at the time of diagnosis had quit, which was similar to findings of lung cancer survivors (Evangelista, Sarna, Brecht, Padilla, & Chen, 2003). However, the current study's data reveal that fewer family members had made quit attempts. Evidence from a population-based study indicated that increased psychiatric comorbidity is associated with smoking (John, Meyer, Rumpf, & Hapke, 2004). However, in post-hoc analysis of correlates of tobacco use, smoking was not significantly associated with depressed mood or alcohol use (which also was significantly more common among family members). Future research is needed to assist all family members of patients with lung cancer in smoking cessation (Schnoll et al., 2002). Even older smokers can obtain important health benefits from quitting (Fiore et al., 2000). Current smoking was not significantly related to QOL (PCS or MCS) as has been reported in patients with lung cancer (Garces et al., 2004).

Limitations

The study findings should be interpreted in light of several methodologic limitations. Results are based on a one-time descriptive survey; thus, the relationship of changes in family members' health status over time and fluctuations in QOL, especially in response to patients' changing conditions, is unknown. Because a nonrandom sample of family members agreed to participate and only one family member per patient was chosen to participate, other family members might have had different health issues and QOL. Family members who had poor health or were having problems dealing with the diagnosis might not have been solicited to participate. Alternatively, family members in better health might have self-selected themselves to participate. Women with NSCLC who contributed family members to this study had poorer psychological QOL than women in the larger study (Sarna et al., 2005). Thus, the study may have captured the experiences of family members of women in greater distress. The small sample size did not allow for adequate testing of relationships and interactions of multiple variables. The majority of the women in the study did not have advanced lung cancer, thus limiting generalizability to most of the families affected by the disease. Additionally, only a small percentage of women in the study were from racial ethnic minorities. Older women and African Americans have been described as receiving less support than Caucasian men with cancer (Stommel et al., 1998). Furthermore, because the study focused only on family members of women with lung

cancer, whether differences exist in family members' QOL when patients are men is unknown.

Implications

Lung cancer continues to be a major threat to many American women and their families. Although lung cancer is the leading cause of cancer death among women, knowledge about the impact of the disease experience on families is limited. As the evidence base for the most effective strategies to support families providing care to patients with cancer continues to grow (Given & Sherwood, 2006), additional efforts are needed to include knowledge about the experience and needs of families affected by lung cancer. The results of this exploratory study add to the literature by describing the QOL and health status of family members and factors associated with greater distress.

Nurses caring for patients with lung cancer should consider the health status and QOL of family members during the continuum of care. Clearly, more research is needed to explore the interaction of health status and QOL of family members in modulating patients' QOL and vice versa. Family members' own health issues may affect the experience of coping with patients' illness as well as the provision of care. Further prospective studies are needed to identify families that are at risk, including those with and without spouse caregivers.

The authors acknowledge David Elashoff, PhD, for assistance with statistical analysis and Tonia Ames, RN, MSN, Laura Balmer, MS, RN, ANP, Arceli Caldea, RN, MN, Lorraine Evangelista, RN, PhD, and Nina Hurley, RN, for assistance with data collection.

Author Contact: Linda Sarna, DNSc, RN, FAAN, can be reached at lsarna@ucla.edu, with copy to editor at ONFEditor@ons.org.

References

- Baider, L., & Bengel, J. (2001). Cancer and the spouse: Gender-related differences in dealing with health care and illness. *Critical Reviews in Oncology/Hematology*, 40, 115–123.
- Bakas, T., Lewis, R.R., & Parsons, J.E. (2001). Caregiving tasks among family caregivers of patients with lung cancer. *Oncology Nursing Forum*, 28, 847–854.
- Basche, M., & Kelly, K. (2003). Treatment of non-small cell lung cancer in older persons. *Oncology*, 17, 31–39.
- Burns, D.M. (2003). Tobacco-related diseases. *Seminars in Oncology Nursing*, 19, 244–249.
- Centers for Disease Control and Prevention. (2003). Cigarette smoking-attributable morbidity—United States, 2000. *Morbidity and Mortality Weekly Report*, 52, 842–844.
- Charlson, M.E., Pompei, P., Ales, K.L., & MacKenzie, C.R. (1987). A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. *Journal of Chronic Diseases*, 40, 373–383.
- Chen, M.L., Chu, L., & Chen, H.C. (2004). Impact of cancer patients' quality of life on that of spouse caregivers. *Supportive Care in Cancer*, 12, 469–475.
- Cooley, M.E., Sarna, L., Brown, J.K., Williams, R.D., Chernecky, C., Padilla, G., et al. (2003). Challenges of recruitment and retention in multisite clinical research. *Cancer Nursing*, 26, 376–384.
- Earle, C.C. (2004). Outcomes research in lung cancer. *Journal of the National Cancer Institute Monographs*, 33, 56–77.
- Evangelista, L.S., Sarna, L., Brecht, M.L., Padilla, G., & Chen, J. (2003). Health perceptions and risk behaviors of lung cancer survivors. *Heart and Lung*, 32, 131–139.
- Ferrell, B.R., Grant, M., Borneman, T., Juarez, G., & ter Veer, A.T. (1999). Family caregiving in cancer pain management. *Journal of Palliative Medicine*, 2, 185–195.
- Ferris, B.G. (1978). Epidemiology standardization project. (American Thoracic Society). *American Review of Respiratory Disease*, 118(6, Pt. 2), 1–120.
- Fiore, M.C., Baily, W.C., Cohen, S.J., Dorman, S.F., Goldstein, M.G., Gritz, E.R., et al. (2000). *Treating tobacco use and dependence. Clinical Practice Guideline*. Rockville, MD: U.S. Department of Health and Human Services Public Health Service.
- Fu, J.B., Kau, T.Y., Severson, R.K., & Kalemkerian, G.P. (2005). Lung cancer in women: Analysis of the national Surveillance, Epidemiology, and End Results database. *Chest*, 127, 768–777.
- Garces, Y.I., Yang, P., Parkinson, J., Zhao, X., Wampfler, J.A., Ebbert, J.O., et al. (2004). The relationship between cigarette smoking and quality of life after lung cancer diagnosis. *Chest*, 126, 1733–1741.
- Given, B., & Sherwood, P.R. (2006). Family care for the older person with cancer. *Seminars in Oncology Nursing*, 22, 43–50.
- Given, B.A., Given, C.W., & Kozachik, S. (2001). Family support in advanced cancer. *CA: A Cancer Journal for Clinicians*, 51, 213–231.
- Given, C.W., Stommel, M., Given, B., Osuch, J., Kurtz, M.E., & Kurtz, J.C. (1993). The influence of cancer patients' symptoms and functional states on patients' depression and family caregivers' reaction and depression. *Health Psychology*, 12, 277–285.
- Gritz, E.R. (2000). Facilitating smoking cessation in cancer patients. *Tobacco Control*, 9(Suppl. 1), 150.
- Hagedoorn, M., Buunk, B.P., Kuijer, R.G., Wobbes, T., Sanderman, R. (2000). Couples dealing with cancer: Role and gender differences regarding psychological distress and quality of life. *Psycho-Oncology*, 9, 232–242.
- Handy, J.R., Jr., Asaph, J.W., Skokan, L., Reed, C.E., Koh, S., Brooks, G., et al. (2002). What happens to patients undergoing lung cancer surgery? Outcomes and quality of life before and after surgery. *Chest*, 122, 21–30.
- Hays, R.D., & Morales, L.S. (2001). The RAND-36 measure of health-related quality of life. *Annals of Medicine*, 33, 350–357.
- Hill, K.M., Amir, Z., Muers, M.F., Connolly, C.K., & Round, C.E. (2003). Do newly diagnosed lung cancer patients feel their concerns are being met? *European Journal of Cancer Care*, 12, 35–45.
- Hopwood, P., & Stephens, R.J. (1995). Symptoms at presentation for treatment in patients with lung cancer: Implications for the evaluation of palliative treatment. The Medical Research Council (MRC) Lung Cancer Working Party. *British Journal of Cancer*, 71, 633–636.
- Hopwood, P., & Thatcher, N. (1990). Preliminary experience with quality of life evaluations in patients with lung cancer. *Oncology*, 4, 158–162.
- Hymowitz, N., Cummings, K.M., Hyland, A., Lynn, W.R., Pechacek, T.F., & Hartwell, T.D. (1997). Predictors of smoking cessation in a cohort of adult smokers followed for five years. *Tobacco Control*, 6(Suppl. 2), S57–S62.
- Jemal, A., Siegel, R., Ward, E., Murray, T., Xu, J., Smigal, C., et al. (2006). Cancer statistics, 2006. *CA: A Cancer Journal for Clinicians*, 56, 106–130.
- John, U., Meyer, C., Rumpf, H.J., & Hapke, U. (2004). Smoking, nicotine dependence and psychiatric comorbidity—A population-based study including smoking cessation after three years. *Drug and Alcohol Dependence*, 7, 287–295.
- Kim, Y., Duberstein, P.R., Sorensen, S., & Larson, M.R. (2005). Levels of depressive symptoms in spouses of people with lung cancer: Effects of personality, social support, and caregiving burden. *Psychosomatics*, 46, 123–130.
- Kurtz, M.E., Kurtz, J.C., Given, C.W., & Given, B. (1995). Relationship of caregiver reactions and depression to cancer patients' symptoms, functional states and depression—A longitudinal view. *Social Science and Medicine*, 40, 837–846.
- Kurtz, M.E., Kurtz, J.C., Given, C.W., & Given, B.A. (2004). Depression and physical health among family caregivers of geriatric patients with cancer—A longitudinal view. *Medical Science Monitor*, 10, CR447–CR456.
- Lewisohn, P.M., Seeley, J.R., Roberts, R.E., & Allen, N.B. (1997). Center for Epidemiologic Studies Depression Scale (CES-D) as a screening instrument for depression among community-residing older adults. *Psychology and Aging*, 12, 277–287.

- Liu, N.S., Spitz, M.R., Kemp, B.L., Cooksley, C., Fossella, F.V., Lee, J.S., et al. (2000). Adenocarcinoma of the lung in young patients: The M.D. Anderson experience. *Cancer*, 88, 1837–1841.
- Maliski, S., Sarna, L., Evangelista, L., & Padilla, G. (2003). The aftermath of lung cancer: Balancing the good and the bad. *Cancer Nursing*, 26, 237–244.
- Matthews, B.A. (2003). Role and gender differences in cancer-related distress: A comparison of survivor and caregiver self-reports. *Oncology Nursing Forum*, 30, 493–499.
- Mayfield, D., McLeod, G., & Hall, P. (1974). The CAGE questionnaire: Validation of a new alcoholism screening instrument. *American Journal of Psychology*, 131, 1121–1123.
- Montazeri, A., Gillis, C.R., & McEwen, J. (1998). Quality of life in patients with lung cancer: A review of the literature from 1970 to 1995. *Chest*, 113, 467–481.
- Northouse, L.L., Templin, T., Mood, D., & Oberst, M. (1998). Couples' adjustment to breast cancer and benign breast disease. A longitudinal analysis. *Psycho-Oncology*, 7, 37–48.
- Pinquart, M., & Sorenson, S. (2006). Gender differences in caregiver stressors, social resources, and health: An updated meta-analysis. *Journal of Gerontology*, 61B, 33–45.
- Pitceathly, C., & Maguire, P. (2003). The psychological impact of cancer on patients' partners and other key relatives: A review. *European Journal of Cancer*, 39, 1517–1524.
- Radloff, L.S. (1977). The CES-D scale: A self report depression scale for research in the general population. *Applied Psychology Measure*, 1, 385.
- Radloff, L.S., & Teri, L. (1986). Use of the Center for Epidemiologic Studies-Depression Scale with older adults. *Clinical Gerontologist*, 5, 119–136.
- Resnick, B., Perry, D., Applebaum, G., Armstrong, L., Cotterman, M., Dillman, S., et al. (2003). The impact of alcohol use in community-dwelling older adults. *Journal of Community Health Nursing*, 20, 135–145.
- Rossi Ferrario, S., Zotti, A.M., Massara, G., & Nuvolone, G. (2003). A comparative assessment of psychological and psychosocial characteristics of cancer patients and their caregivers. *Psycho-Oncology*, 12, 1–7.
- Sarna, L. (1993). Women with lung cancer: Impact on quality of life. *Quality of Life Research*, 2, 13–22.
- Sarna, L. (1995). Smoking behaviors of women after diagnosis with lung cancer. *Image—The Journal of Nursing Scholarship*, 27, 35–41.
- Sarna, L., Brown, J.K., Cooley, M.E., Williams, R.D., Chernecky, C., Padilla, G., et al. (2005). Quality of life and meaning of illness of women with lung cancer [Online exclusive]. *Oncology Nursing Forum*, 32, E9–E19. Retrieved September 1, 2006, from <http://www.ons.org/publications/journals/ONF/Volume32/Issue1/pdf/320131.pdf>
- Sarna, L., Padilla, G., Holmes, C., Tashkin, D., Brecht, M.L., & Evangelista, L. (2002). Quality of life of long-term survivors of non-small cell lung cancer. *Journal of Clinical Oncology*, 20, 2920–2929.
- Schnoll, R.A., Malstrom, M., James, C., Rothman, R.L., Miller, S.M., Ridge, J.A., et al. (2002). Correlates of tobacco use among smokers and recent quitters diagnosed with cancer. *Patient Education and Counseling*, 46, 137–145.
- Stommel, M., Given, C.W., & Given, B.A. (1998). Racial differences in the division of labor among primary and secondary caregivers. *Research in Aging*, 20, 242–257.
- Svobodnik, A., Yang, P., Novotony, P.J., Bass, E., Garces, Y.I., Jett, J.R., et al. (2004). Quality of life in 650 lung cancer survivors 6 months to 4 years after diagnosis. *Mayo Clinic Proceedings*, 79, 1024–1030.
- Ware, J.E., Kosinski, M., & Dewey, J.E. (2000). *How to score version two of the SF-36 Health Survey*. Lincoln, RI: QualityMetric Incorporated.
- Ware, J.E., Kosinski, M., & Keller, S.D. (1994). Interpretation: Norm-based. In *SF-36 physical and mental health summary scales: A user's manual* (pp. 8:3–8:38). Boston: Health Assessment Lab.
- Yun, Y.H., Rhee, Y.S., Kang, I.O., Lee, J.S., Bang, S.M., Lee, W.S., et al. (2005). Economic burdens and quality of life of family caregivers of cancer patients. *Oncology*, 68, 107–114.
- Zabora, J., BrintzenhofeSzoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology*, 10, 19–28.