Gynecologic Oncology **78,** 302–308 (2000)
doi:10.1006/gyno.2000.5908, available online at http://www.idealibrary.com on IDEAL®

Depression, Anxiety, and Quality of Life in Patients with Epithelial Ovarian Cancer[1]

Diane Bodurka-Bevers, M.D.,*[,2] Karen Basen-Engquist, Ph.D.,† Cindy L. Carmack, Ph.D.,† Mary A. Fitzgerald, M.A.,† Judith K. Wolf, M.D.,* Carl de Moor, Ph.D.,† and David M. Gershenson, M.D.*

**Department of Gynecologic Oncology and †Department of Behavioral Science, The University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, Texas 77030*

Received November 29, 1999

Objective. **The aims of this study were to evaluate psychological distress and quality of life (QOL) in patients with epithelial ovarian cancer (EOC) and to examine the relationship between these problems and health and demographic variables.**

Methods. **Of 344 consecutive patients identified, 246 completed questionnaires. Four dimensions of QOL were assessed including physical, functional, emotional, and social/family well-being, as well as concerns specific to ovarian cancer patients. Depression was measured with the Center for Epidemiologic Studies-Depression (CES-D) scale and anxiety was measured by the State Anxiety Subscale of the Spielberger State–Trait Anxiety Inventory. Performance status was evaluated by the Zubrod score.**

Results. **Sixty-five patients (26%) had early stage disease; 181 (74%) had advanced disease. One hundred twenty-one patients (49%) were under active treatment, while 124 (51%) were seen for posttherapy surveillance. Forty-eight (21%) met CES-D cutoff criteria for a clinical evaluation for depression, and 29% scored above the 75th percentile for anxiety. Performance status was related to depression, anxiety, and QOL problems, except in the domain of social well-being.**

Conclusions. **Clinically significant depression and anxiety may be more prevalent in patients with EOC than previously reported. Future studies of screening for and treating psychological distress are being designed to improve QOL in these women.**

Key Words: **depression; anxiety; quality of life; epithelial ovarian cancer.**

INTRODUCTION

Although ovarian cancer is the fourth most common gynecologic cancer in the United States, more women in the United States die from this disease yearly than all other gynecologic malignancies combined. An estimated 23,100 new cases and 14,000 deaths from ovarian cancer are projected to occur in the United States in 2000 [1]. Approximately 70% of all women with epithelial ovarian cancer have regional or distant disease at the time of diagnosis. As a result, the clinical course is usually characterized by aggressive abdominal surgeries, multiple chemotherapeutic regimens, and relatively poor survival rates. The probability of recurrent disease is relatively high, even after primary surgery and adjuvant chemotherapy; this high likelihood of recurrence can serve as a significant source of emotional distress for the patient. Other sources of stress associated with a cancer diagnosis include fear of death, progression of disease, and changes in social relationships [2]. Given the potential for both physical and psychological morbidity, assessment of quality of life (QOL) is particularly important for ovarian cancer patients.

QOL is a multidimensional construct that, at a minimum, includes physical, functional, psychological, and social domains [3]. It also may include sexuality/intimacy, spirituality, treatment satisfaction, and occupational functioning [4]. A thorough assessment of quality of life can be used as an end-point in evaluating treatment outcome or as a predictor of treatment response [5]. Measurement of quality of life can also provide information regarding rehabilitation needs and appropriate tertiary interventions [5]. Identification of factors that are related to psychological distress and quality of life can assist in targeting mental health and supportive care interventions to the groups who need it most with the goal of reducing or preventing long-term sequelae. There is a paucity of data regarding depression and anxiety in women with gynecologic malignancies, especially those with ovarian cancer. Our study focused on psychological distress and QOL in women with epithelial ovarian cancer.

Cancer patients experience a range of psychological symptoms including depression and anxiety; both of these symptoms occur more frequently in patients with cancer than in the general population [6]. In fact, approximately 25% of hospitalized cancer patients experience depressive symptoms that would meet established criteria for major depression or an adjustment disorder with depressed mood [7]. Risk factors for

[1] Presented at the 30th Annual Meeting of the Society of Gynecologic Oncologists, San Francisco, CA, March 20–24, 1999.

[2] To whom reprint requests should be addressed at Department of Gynecologic Oncology, Box 67, 1515 Holcombe Blvd., Houston, TX 77030. Fax: (713) 792-7586. E-mail: dbbevers@mdanderson.org.

0090-8258/00 $35.00

psychological morbidity in cancer patients vary according to demographic, medical, and psychosocial factors. Cancer patients at highest risk for depression include those with a history of a mood disorder or alcoholism, advanced stage of disease, uncontrolled pain, or a treatment regimen that produces depressive symptoms [7]. Several of these risk factors may be seen in ovarian cancer patients. In a sample of patients with newly diagnosed breast cancer, risk factors for psychosocial morbidity included age, performance status, and psychosocial functioning [8]. This finding may be even more pronounced in ovarian cancer patients, as they have greater problems in the areas of physical functioning, social functioning at work or with other daily activities, fatigue, and pain than do patients with breast cancer. Such increased morbidity in ovarian cancer patients may be a function of greater disease severity [9]. The prevalence of psychological distress in ovarian cancer patients is not known; however, the limited available data regarding the psychological functioning of ovarian cancer patients indicate a high prevalence of depressive and anxious symptoms [10, 11]. The impact of psychological distress on the various quality of life domains in ovarian cancer patients has yet to be investigated.

The purpose of the present study was (1) to identify the prevalence of anxiety and depressive symptoms and QOL problems in a sample of patients with epithelial ovarian cancer and (2) to examine how these psychological symptoms and QOL relate to health and demographic variables.

MATERIALS AND METHODS

Design

The results reported in this paper are a secondary analysis of data from a validation study of the FACT-O, a QOL questionnaire for patients with ovarian cancer. This instrument is composed of the FACT-G (General) with an additional ovarian-cancer-specific subscale. The protocol for this study was reviewed and approved by The University of Texas M. D. Anderson Cancer Center Surveillance Committee. Informed consent was obtained from all patients.

Sample

The sample consisted of a consecutive series of outpatients with epithelial ovarian cancer who had appointments at the M. D. Anderson Cancer Center's Gynecologic Oncology Center over a 6-month period. Additionally, as a convenience sample, 14 patients with epithelial ovarian cancer who were hospital inpatients were surveyed and included. During the 6-month data collection period, 329 women with epithelial ovarian cancer were seen for outpatient appointments in the Gynecologic Oncology Center. Two hundred thirty-two of the patients (71%) in the consecutive series completed the baseline survey, 53 (16%) refused participation, and 44 (13%) were not approached, either because the research assistant was not able to contact them or because the patients' physicians asked that they not be included in the study. Of the inpatients, 15 were contacted about the study, 14 (93%) agreed to participate, and 1 patient refused. Totaling outpatient (232) and inpatient (14) samples, 246 women completed questionnaires.

We compared several demographic variables, disease status, and treatment status between women in the consecutive series who completed the questionnaires to those who refused or who were not approached. Among women who completed the baseline battery, patients being treated for recurrent cancer, those with advanced disease, and older women were slightly underrepresented. Twenty-seven percent of the women who completed the survey were undergoing treatment for recurrent disease, as opposed to 35% of those who refused and 36% of those who were not approached. Regarding disease stage, 74% of those who completed the baseline questionnaires had advanced disease at diagnosis, as did 87% of those who refused and 80% of those who were not approached. The mean age of the women who completed the baseline questionnaires was 56.7 years; the mean ages of those who refused or were not approached for the survey were 59.5 and 60.2, respectively. Also, women who participated were more likely to be married or widowed (87%) than those who did not participate (82%). There were no differences among the three groups in terms of race/ethnicity.

Procedure

Patients were recruited for the study when they presented to the Gynecologic Oncology Center or when they were hospitalized. The baseline questionnaires were completed by outpatients at their appointments and by inpatients during their hospital stay. Participants could opt to self-administer the questionnaires or have the research assistant administer the questionnaires by interview.

Measures

Quality of life was measured using the FACT-O. The FACT-O has four general subscales (applicable to various concerns of cancer patients) and a subscale of concerns specific to ovarian cancer patients. The four general subscales assess physical, functional, social and family, and emotional well-being. The instrument consists of statements about well-being that the patients rate according to the degree that they have experienced in the past 7 days. A high score on the FACT-O indicates good quality of life, and ranges for the subscales are physical, 0–28; social, 0–28; emotional, 0–24; and functional, 0–28. The reliability and validity of the first four general subscales have been previously established [12–14]. In this study, the FACT-O subscales had the following internal consistencies (Cronbach's alpha) at baseline: physical well-being, 0.88; social and family well-being, 0.74; emotional well-being, 0.83; functional well-being, 0.85; and ovarian-cancer-specific subscale, 0.72.

Depression was measured using the Center for Epidemiologic Studies-Depression scale (CES-D). This instrument consists of 20 statements indicating depressive symptoms (16 items) or positive affect (4 items which are reverse-coded) that a patient rates according to the frequency of occurrence in the past 7 days. A high score on the CES-D indicates the presence of a significant number of depressive symptoms. Scores can range from 0 (no depressive symptoms) to 60 (high level of depressive symptoms). The cutoff score of 16 has been used to indicate a level of depressive symptoms at or above which a full clinical evaluation is warranted [15]. The CES-D has been shown to have good reliability and validity [16]. In this study the internal consistency of the CES-D was 0.87.

The State Anxiety subscale of the Spielberger State–Trait Anxiety Inventory was used to assess anxiety [17]. This 20-item scale provides information about a person's current level of anxiety. Scores on this instrument can range from 20 (no anxious symptoms) to 80 (high level of anxious symptoms). There is no clinical cutoff score, but population norms are available for comparison. The instrument is widely used in research on clinical and student populations and has good internal consistency (0.85 to 0.95) [18]. In this study it had excellent internal consistency: Cronbach's alpha was 0.94.

Performance status was assessed using a Zubrod score ranging from 0 to 4 that was self-reported by participants [19]. A score of zero indicated no symptoms, and higher scores indicated more symptoms requiring various degrees of bed rest during the waking day. Participants provided data on demographic characteristics. When participants did not provide information on race/ethnicity, age, religion, or marital status, data from their patient records were substituted.

Variables related to the patients' treatment and disease status were abstracted from the medical chart. Data were collected regarding disease stage (early or advanced), the number of courses of chemotherapy, presence or absence of disease (NED), the number of months since diagnosis, whether the patient had had a recurrence, and treatment status (whether the patient was under active treatment or receiving follow-up surveillance).

Analysis

To explore the association between the medical and demographic variables and depression, anxiety, and QOL, we conducted logistic regression analyses. Separate analyses were conducted for depression, anxiety, and each QOL domain. All of the medical and demographic variables were entered in each of the models. From each of the fitted models, we computed the adjusted percentages of subjects whose scores fell above the cutpoint criterion. The adjusted percentages were computed using the mean values of the medical and demographic covariates. The adjusted values provided sample-based estimates of the proportion of subjects meeting the cutpoint criterion for the levels of each of the covariates, adjusted for the effects of the other covariates in the model.

RESULTS

Demographic and Disease-Related Information

The self-reported demographic data for the women who completed the baseline questionnaires are presented in Table 1. The patients in this sample were primarily white and married but were diverse in education and income. The average age of the patients was 56.7 years (range: 22–76 years; data not shown).

Table 2 presents the health and medical characteristics of the sample. Twenty-six percent of the patients had early stage disease, defined as FIGO stages I and II ovarian cancer, while 74% had advanced disease, defined as FIGO stages III and IV. Approximately half of the patients (49%) were receiving treatment for ovarian cancer, while the remainder (51%) were undergoing posttherapy surveillance. The median number of months from primary diagnosis was 28.5 (range: 0.3–364 months; data not shown). Nearly half of the patients were Zubrod score 0, 30% were Zubrod score 1, 19% were Zubrod score 2, and 2% were Zubrod score 3. Fifty-seven percent had received more than one course of chemotherapy, and 37% had experienced a recurrence. Approximately half were catego-

TABLE 1
Demographic Data for the Study Population (n = 246)

Variable	Category	%	n
Race/ethnicity	White, non-Hispanic	85	209
	Hispanic	9	23
	African-American	4	9
	Asian	1	2
	Other	1	3
	Data missing	—	0
Religion	Catholic	25	61
	Protestant	70	171
	Jewish	2	4
	Other	1	3
	None	2	4
	Data missing	—	3
Marital status	Never married	6	14
	Married	72	176
	Separated or divorced	12	30
	Widowed	11	26
	Data missing	—	0
Education	<High school	7	15
	High school	27	62
	Some college	30	68
	College graduate	21	48
	Graduate school	16	36
	Data missing	—	17
Income	≤$20,000	21	44
	$20,001 to $35,000	19	41
	$35,001 to $50,000	15	33
	$50,001 to $75,000	14	31
	$75,001 to $100,000	14	31
	>$100,000	16	34
	Data missing	—	32

TABLE 2
Disease Stage, Treatment, and Performance Status for the Study Population (n = 246)

Variable	Category	%	n
Disease stage	Early	26	65
	Advanced	74	181
	Missing	—	0
Treatment status	Receiving treatment	49	121
	Posttherapy surveillance	51	124
	Missing	—	1
Performance status (Zubrod)	0	49	115
	1	30	71
	2 or more	21	48
	Missing	—	12
Courses of chemotherapy	1	43	106
	2 or more	57	138
	Missing	—	2
Disease present	Yes	52	120
	No	48	113
	Missing	—	13
Time since diagnosis	30 months or less	52	128
	More than 30 months	48	118
	Missing	—	0
Has had a recurrence	Yes	37	85
	No	63	143
	Missing	—	18

rized as having no evidence of disease, according to the data in the medical chart obtained at the time that they completed the survey.

Depression, Anxiety, and Quality of Life

The means, standard deviations, and ranges for depression, anxiety, and the FACT-O subscales (physical well-being, social well-being, emotional well-being, functional well-being, and ovarian-cancer-specific concerns) and total scale are presented in Table 3. Forty-eight patients (21%) had depression scores greater than or equal to 16 on the CES-D. The mean CES-D score for depressed women exceeding the cutoff score (scores at or above 16) was 23.6 (standard deviation = 7.2). The mean CES-D score for women scoring below the cutoff value was 6.6 (standard deviation = 4.5).

Unlike the CES-D, the Spielberger anxiety questionnaire used does not have a cutoff score to indicate potential anxiety problems that should be evaluated further. In lieu of an existing cutoff score, we used the raw score corresponding to the 75th percentile in a normative sample. The overall prevalence of anxiety scores above the 75th percentile in the study sample was 29%. The average anxiety score for patients above the 75th percentile was 50.2 (standard deviation = 9.8), while for patients scoring below this cutoff the average score was 28.1 (standard deviation = 5.9).

Health and Demographic Variables Related to Psychological Distress and QOL Problems

The association between the psychological and quality of life variables and the medical status variables (performance status, number of chemotherapy courses, disease status, months since diagnosis, whether the patient had ever had a recurrence, treatment status, and stage) and demographic variables (education, ethnicity, marital status, and age) was evaluated in multivariate models. These models used the medical status and demographic variables as predictors and the dichotomized psychological distress (anxiety score above the 75th percentile and CES-D score at or above 16) and quality of life variables as the dependent variables. The FACT-O subscale and total scores were dichotomized at the 20th percentile (below which includes those with low QOL). Table 4 presents the adjusted percentages of patients with psychological distress or quality of life problems by each level of the medical and demographic variables. Poor performance status was significantly related to high depression and anxiety and poorer quality of life on all subscales except for social and family well-being. None of the other variables showed a significant relationship to anxiety, but younger patients (50 and younger) were more likely to be depressed than older patients. Younger age was also related to poorer quality of life in the areas of physical well-being, ovarian-specific concerns, and the total FACT-O score. Treatment status was related to emotional and functional well-being; patients who were receiving active treatment for their disease had poorer quality of life in these areas than those who were being seen for posttreatment surveillance. Months since diagnosis and whether the patient was NED were related to the scores on the ovarian-specific concerns scale of the FACT-O. Those patients who were more than 30 months from diagnosis and those who had evidence of disease were more likely to score in the bottom 25% of this subscale. The social and family well-being subscale was related only to marital status, with divorced or separated patients having better quality of life in this area than the other groups.

TABLE 3
Descriptive Statistics for Psychological Distress Measures and FACT-O Subscales and Total Score

	Mean	Standard deviation	Range
Depression[a]	10.2	8.6	0–46
Anxiety[a]	34.6	12.4	20–76
Physical well-being[b]	22.0	5.8	3–28
Social/family well-being[b]	23.3	4.6	2–28
Emotional well-being[b]	18.4	4.8	4–24
Functional well-being[b]	20.7	5.9	0–28
Ovarian-cancer-specific concerns[b]	34.1	6.2	10–44
Total FACT-O[b]	116.9	22.4	38–150

[a] High scores indicate high distress.
[b] Higher scores indicate better QOL.

TABLE 4
Adjusted Percentages of Patients with Psychological Distress or Quality of Life Problems by Medical and Demographic Variables

	Depression	Anxiety	Physical well-being	Social well-being	Emotional well-being	Functional well-being	Ovarian cancer scale	FACT-O total
Medical Status								
Performance status	**	*	***		*	***	***	***
Normal activity	0.09	0.21	0.04	0.17	0.14	0.08	0.10	0.08
Some symptoms	0.19	0.31	0.19	0.23	0.22	0.23	0.22	0.24
Require ≥some bed rest	0.35	0.43	0.58	0.31	0.33	0.50	0.42	0.52
Courses of chemotherapy								
1	0.12	0.26	0.14	0.17	0.15	0.20	0.18	0.24
≥2	0.30	0.29	0.12	0.26	0.24	0.15	0.18	0.15
NED							**	
Yes	0.12	0.29	0.12	0.24	0.18	0.17	0.08	0.17
No	0.20	0.27	0.13	0.19	0.21	0.18	0.34	0.20
Months since diagnosis							*	
≤30	0.13	0.29	0.10	0.18	0.18	0.21	0.11	0.13
>30	0.19	0.26	0.17	0.26	0.21	0.14	0.29	0.26
Recurrence								
No	0.17	0.30	0.10	0.22	0.20	0.18	0.23	0.16
Yes	0.14	0.24	0.17	0.20	0.19	0.16	0.11	0.23
Treatment status					*	*		
Follow-up surveillance	0.15	0.22	0.11	0.22	0.12	0.10	0.16	0.18
Active treatment	0.16	0.35	0.15	0.21	0.30	0.28	0.20	0.19
Stage								
Early	0.21	0.32	0.12	0.21	0.16	0.17	0.18	0.13
Advanced	0.14	0.26	0.13	0.22	0.21	0.17	0.17	0.20
Demographics								
Education								
≤High school	0.23	0.21	0.13	0.16	0.17	0.22	0.26	0.18
>High school	0.13	0.32	0.13	0.24	0.21	0.15	0.14	0.18
Ethnicity								
Anglo	0.15	0.27	0.13	0.21	0.19	0.17	0.19	0.19
Non-Anglo	0.24	0.35	0.12	0.26	0.20	0.18	0.12	0.13
Marital status				*				
Divorced/separated	0.15	0.27	0.13	0.19	0.19	0.17	0.17	0.17
Other	0.18	0.30	0.13	0.41	0.20	0.20	0.18	0.24
Age*	*		*				**	*
>=50	0.26	0.24	0.24	0.28	0.22	0.25	0.39	0.30
>50	0.13	0.29	0.10	0.19	0.19	0.14	0.12	0.15

* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

DISCUSSION

This study was conducted to determine the prevalence of psychological distress and quality of life problems in patients with epithelial ovarian cancer and to evaluate the relationship of these symptoms to medical and demographic variables. We found that levels of depression and anxiety were higher in women with ovarian cancer than levels found in the general population and that these levels were higher in patients with poor performance status.

In samples from the general population used to validate the CES-D, 15–19% of women scored at or above 16, the score at or above which depressive symptoms warrant a full clinical evaluation [16]. Our sample overall had a slightly higher prevalence of scores at or above 16 (21%). However, when the prevalence of depression symptoms was viewed separately by performance status, we found that, after controlling for other variables, the patients with the poorest performance status (>2, or having symptoms and requiring at least some bed rest during the day) had a prevalence twice that of the general population and four times that of the women in the sample who were experiencing no symptoms [16, 20]. Depression scores of patients with the best performance status were very low; only 9% of these patients scored at or above 16 on the CES-D.

We found a similar pattern with anxiety scores. Twenty-nine percent of our sample scored above the 75th percentile for women in their age group (compared to the 25% that would be expected in the general population) [17]. Poor performance status was also associated with a greater prevalence of anxiety. Women whose health required that they spend at least some time resting in bed were more than twice as likely to score above the 75th percentile for anxiety than women who were not experiencing symptoms.

A similar pattern in all the QOL domains, except social well-being, indicated that ovarian cancer patients, particularly those whose symptoms require bed rest for at least part of the day, are at high risk for psychological distress and problems in physical and functional well-being. This finding echoes that of Portenoy *et al.* [11], who found that the number of symptoms reported by lung, colon, prostate, breast, and ovarian cancer patients was associated with greater psychological distress and poorer quality of life. These data suggest that patients with poor performance status should receive careful evaluation for anxiety and depression.

The mean scores for the physical well-being, functional well-being, and ovarian cancer subscales of the FACT-O in this study were slightly higher (indicating better QOL) than those reported by Cain *et al.* [21] in a sample of 162 ovarian cancer patients receiving paclitaxel and cisplatin on GOG trial 152. These differences were fairly small, ranging in magnitude from approximately one-quarter to one-half of a standard deviation. Slightly higher scores on these domains could be accounted for by the fact that half of our sample was not receiving treatment, in contrast to the entire sample on the GOG trial. When we compared patients in the current study receiving treatment versus those seen for follow-up surveillance, we found that patients on active treatment were significantly more likely to report problems in emotional and functional well-being. Likewise, those in active treatment reported more problems on the physical well-being scale and the ovarian cancer scale, although these differences were not statistically significant.

Current literature suggests a wide range of estimates of the prevalence of psychological distress in cancer patients [3, 11], and the definition and measurement of distress varies substantially from study to study. Little distinction is made between studies that address depressive or anxious symptoms and those that focus on clinical disorders as specified by Diagnostic Statistical Manual IV (DSM IV) criteria. Our results, however, agree with previous studies indicating that psychological distress is elevated in cancer patients. A review of the literature indicates that very few studies have addressed the prevalence of psychological distress in patients with ovarian cancer. A notable exception is a study by Kornblith *et al.* [10] that included 151 patients with advanced epithelial ovarian cancer. This study reported that 33% of the patients experienced high levels of psychological distress as indicated by Mental Health Inventory Psychological Distress scores that were 1.5 standard deviations above the mean of a nationwide community sample. Seventeen percent of the patients were categorized as highly depressed and 22% as highly anxious, whereas 17% reported high levels of symptoms of major depression and emotional lability. In the current study, 37% of the women scored high on the anxiety or the depression scale or both. While neither our study nor the study by Kornblith and colleagues utilized DSM IV criteria for psychological disorders, both are in agreement that further evaluation of psychological distress is warranted since it was present in at least one-third of women with ovarian cancer.

One limitation of this study is that we did not use DSM IV criteria to assess depression or anxiety. We were therefore unable to determine the number of diagnosable depressive or anxiety disorders in this population according to psychiatric criteria. However, given the lack of existing data on anxiety and depression in ovarian cancer patients, this study represents an important first step. Future research could compare these brief assessment instruments for measuring symptoms of anxiety and depression to more extensive clinical evaluations to determine their effectiveness in identifying levels of clinical distress in the ovarian cancer population.

Psychosocial interventions help patients by decreasing the psychological distress associated with cancer and improving QOL. Several reviews have been published recently documenting the effectiveness of psychosocial interventions in helping cancer patients adjust to their diagnoses and treatment [22–25]. Referral to such interventions is indicated, particularly for ovarian cancer patients with poor performance status. These interventions may improve a patient's functional well-being as well as alleviate psychological distress.

As caregivers of women with ovarian cancer, it is important that we recognize the prevalence of psychological distress symptoms and quality of life problems in our patients, especially those with poor performance status. Our results reinforce the need for a comprehensive assessment of a patient's rehabilitation needs that includes an evaluation of psychosocial functioning and symptom control in addition to the traditional physical and functional assessments. This information, combined with future studies of depression screening and treatment, may significantly improve symptoms and quality of life in women with ovarian cancer.

REFERENCES

1. Greenlee RT, Murray T, Bolden S, Wingo PA: Cancer statistics. CA Cancer J Clin 50(1):7–33, 2000
2. Aaronson NK, Meyerowitz BE, Bard M, Bloom JR, Fawzy FI, Feldstein M, Fink D, Holland JC, Johnson JE, Lowman JT: Quality of life research in oncology: past achievements and future priorities. Cancer 67:839–843, 1991
3. Gotay CC: Trial-related quality of life: using quality-of-life assessments to distinguish among cancer therapies. Monogr Natl Cancer Inst 20:1–16, 1996
4. Cella DF, Tulsky DS: Measuring quality of life today: methological aspects. Oncology 4:29–38, 1990

5. Cella DF, Tulsky DS: Quality of life in cancer: definition, purpose, and method of measurement. Cancer Invest 11(3):327–336, 1993
6. Spiegel D: Cancer and depression. Bri J Psychiatry 168:109–116, 1996
7. Massie MJ, Holland JC: Depression and the cancer patient. J Clin Psychiatry 51:12–17, 1990
8. Ganz PA, Hirji K, Sim MS, Schag CA, Fred C, Polinsky ML: Predicting psychosocial risk in patients with breast cancer. Med Care 31(5):419–431, 1993
9. Osoba D, Zee B, Pater J, Warr D, Kaizer L, Latreille J: Psychometric properties and responsiveness of the EORTC Quality of Life Questionnaire (QLQ-C30) in patients with breast, ovarian, and lung cancer. Qual Life Res 3:353–364, 1994
10. Kornblith AB, Thaler HT, Wong G, Vlamis V, McCarthy Lepore J, Loseth DB, Hakes T, Hoskins WJ, Portenoy RK: Quality of life of women with ovarian cancer. Gynecol Oncol 59:231–242, 1995
11. Portenoy RK, Thaler HT, Kornblith AB, McCarthy Lepore J, Friedlander-Klar H, Coyle N, Smart-Curley T, Kemeny N, Norton L, Hoskins W, Scher H: Symptom prevalence, characteristics and distress in a cancer population. Qual Life Res 3:183–189, 1994
12. Cella DF: Reliability and validity of the Functional Assessment of Cancer Therapy-Lung (FACT-L) quality of life instrument. Lung Cancer 12:199–220, 1995
13. Cella DF, McCain NL, Peterman AH, Mo F, Wolen D, Silberman M, Yellen SB, Winicour P, Brannon J, Eckberg K, Lloyd S, Purl S: Development and validation of the Functional Assessment of Human Immunodeficiency virus infection (FAHI) quality of life instrument. Qual Life Res 5:450–463, 1996
14. Cella DF, Tulsky DS, Gray G, Sarafian B, Linn E, Bonomi A, Blendowski C, Goodman M, Barnicle M, Steward I, McHale M, Bonomi P, Kaplan E, IV ST, Charles R, Thomas J, Harris, J: The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. J Clin Oncol 11(3):570–579, 1993
15. Weissman MM, Sholomskas D, Pottenger M, Prusoff BA, Locke BZ: Assessing depressive symptoms in five psychiatric populations: a validation study. Am J Epidemiol 506:203–214, 1977
16. Radloff LS: The CES-D scale: a self-report depression scale for research in the general population. Appl Psychol Meas 1(3):385–401, 1977
17. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA: State–Trait Anxiety Inventory for Adults: Sampler Set Manual, Test, Scoring Key, Palo Alto, CA, Consulting Psychologists Press, 1983, Vol 1
18. Smith RC, Lay CD: State and trait anxiety: an annotated bibliography. Psychol Rep 34:519–594, 1974
19. Zubrod CG, Schneiderman M, Frei E, Brindley C, Gold GL, Shnider B, Oviedo R, Gorman J, Jones R Jr, Colsky UJJ, Chalmers T, Ferguson B, Dederick M, Holland J, Selawry O, Regelson W, Lasagna L, Owens AH Jr: Appraisal of methods for the study of chemotherapy of cancer in man: comparative therapeutic trial of nitrogen mustard and triethylene thiophosphoramide. J Chron Dis 11:17–33, 1960
20. Vernon SW, Roberts RE, Lee ES: Response tendencies, ethnicity, and depression scores. Am J Epidemiol 116(3):482–495, 1982
21. Cain JM, Wenzel LB, Monk BJ, *et al.:* Palliative Care and Quality of Life Considerations in the Management of Ovarian Cancer, in Gershenson DM, McGuire WP (eds): Ovarian Cancer—Controversies in Management. New York, Churchill Livingstone, 1998, pp 281–307
22. Andersen BL: Psychological interventions for cancer patients to enhance the quality of life. J Consult Clin Psychol 60(4):552–568, 1992
23. Baum A, Herberman H, Cohen L: Managing stress and managing illness: survival and quality of life in chronic disease. J Clin Psychol Med Settings 2(4):309–333, 1995
24. Fawzy IF, Fawzy NW, Arndt LA, Pasnau RO: Critical review of psychosocial interventions in cancer care. Arch Gen Psychiatry 52:100–113, 1995
25. Meyer TJ, Mark MM: Effects of psychosocial interventions with adult cancer patients: a meta-analysis of randomized experiments. Health Psychol 14(2):101–108, 1995