Published in final edited form as:

J Consult Clin Psychol. 1989 December ; 57(6): 692–697.

Controlled Prospective Longitudinal Study of Women With Cancer: II. Psychological Outcomes

Barbara L. Andersen,
Ohio State University

Barrie Anderson, and
Department of Obstetrics and Gynecology University of Iowa

Charles deProsse
Department of Obstetrics and Gynecology University of Iowa

Abstract

The incidence and etiology of major life difficulties for women with survivable cancer were studied. Women with early stage cancer ($n = 65$) were assessed after their diagnosis but prior to treatment and then reassessed at 4, 8, and 12 months posttreatment. Two matched comparison groups, women diagnosed and treated for benign disease ($n = 22$) and healthy women ($n = 60$), were also assessed longitudinally. Results for four life areas are reported: (a) The emotional response to the life-threatening diagnosis and anticipation of treatment was characterized by depressed, anxious, and confused moods, whereas the response for women with benign disease was anxious only. In both cases, these responses were transitory and resolved posttreatment. (b) There was no evidence for a higher incidence of relationship dissolution or poorer marital adjustment; however, 30% of the women treated for disease reported that their sexual partners may have had some difficulty in reaching orgasm (i.e., delayed ejaculation) after the subjects' treatment. (c) There was no evidence for impaired social adjustment. (d) Women treated for cancer retained their employment and their occupations; however, their involvement (e.g., hours worked per week) was significantly reduced during recovery. These data and those in a companion report (Andersen, Anderson, & deProsse, 1989) suggest "islands" of significant life disruption following cancer, however, these difficulties do not appear to portend global adjustment vulnerability.

For decades the understanding of the psychological and behavioral outcomes following the diagnosis of cancer or other similar life-threatening diseases was largely clinical, consisting of case studies of patient adjustment and descriptions of difficult treatment experiences. The message from these reports was that disruption of many major life areas (e.g., mood, interpersonal relationships, and employment) occurred, and the psychological trajectory was, at best, guarded (e.g., Cohen & Wellisch, 1978; Sutherland, Orbach, Dyk, & Bard, 1952; Wortman & Dunkel-Schetter, 1979). Data now suggest that the majority of individuals may cope successfully; many former patients report renewed vigor in their approach to life, stronger interpersonal relationships, and a "survivor" adaptation (e.g., Andersen, 1986; Celia & Tross, 1986; Taylor, 1983). These outcomes do not, however, illuminate the process of adjustment, which includes coping with the life-threatening diagnosis, fearing difficult or toxic treatment, or dreading any life changes that may occur.

To examine questions of process, longitudinal designs with appropriate comparisons have been the suggested strategy (e.g., Ouellette Kobassa, 1985; Watson & Kendall, 1983), with outcomes including affective states, interpersonal relationships (e.g., marital, sexual, familial, and social), indications of general adjustment (e.g., employment), physical status (disease/treatment signs/symptoms), and for some, uniquely important indicators (e.g., intellectual functioning and school achievement for pediatric cancer patients, fertility for testicular cancer patients; Ware, 1984). The purpose of this study was to examine such outcomes following the diagnosis and treatment of cancer. In addition, we also chose cancer patients who did, in fact, experience a significant change in their life with their cancer diagnosis and treatment.

A previous report described the sexual outcomes for the sexually active women in this investigation (Andersen, Anderson, & deProse, 1989). A prospective longitudinal design was used in which women with survivable gynecologic cancer were assessed after their diagnosis but prior to treatment and then reassessed at 4, 8, and 12 months posttreatment. Sexual outcomes were compared with data from two matched comparison groups—women diagnosed and treated for benign gynecologic disease and gynecologically healthy women—who were also assessed longitudinally. Findings indicated that the frequency of intercourse declined for women treated for disease, whether malignant or benign, but there was no global behavioral disruption. Considering the sexual response cycle, diminution of sexual excitement was pronounced for women with disease; however, this difficulty was more severe and distressing for the women with cancer. Approximately 50% of the women with cancer were diagnosed with at least one sexual dysfunction during the posttreatment year; and at 12 months posttreatment, approximately 30% of the sample were sexually dysfunctional. These data suggested an instrumental role for cancer and cancer treatments in the etiology of this aspect of life disruption for women.

Here we provide an examination of mood, interpersonal adjustment (including social, familial, and marital aspects), and employment to examine whether cancer, per se, may pose a life adjustment burden beyond that which might occur with a medical diagnosis and treatment or the stresses of everyday life. The prior report documented the occurrence of clinically significant sexual dysfunction among women who came to their diagnosis with satisfactory and enjoyable sexual lives. Thus we can also address the question of added vulnerability that may accrue when at least one negative outcome has occurred: Is there specificity or globality to the life disruption that occurs after the diagnosis and treatment of a life-threatening illness?

Method

Subjects

This report includes the sexually active women from the first report (Andersen, Anderson, & deProse, 1989) as well as additional sexually inactive subjects (i.e., sexual intercourse occurred less than once a month for the prior 6 months at the initial assessment). Additional subjects increased the sample sizes from 47 to 65 for the cancer group, from 18 to 22 for the benign group, and from 57 to 60 for the healthy group. For these additional subjects, the same exclusion criteria were used, and the same recruiting strategy and general procedures of assessment were followed.

Cancer—Sixty-five women participated. Disease site and stage included cervix ($n = 22$ Stage I and 20 Stage II), endometrium ($n = 15$ Stage I), ovary ($n = 5$ Stage I), and vulva ($n = 3$ Stage I). This sampling corresponds to the nationwide distribution for site and stage of early gynecologic cancer (National Cancer Institute, 1976). All women received treatment consisting of either surgery (e.g., radical hysterectomy, $n = 35$), radiotherapy (e.g., external beam plus intracavitary cesium, $n = 4$), or a combination ($n = 26$). A demographic analysis revealed that the mean age was 46 years (range = 25–70), 63% of the sample were premenopausal, 77% of

the sample were married or living with a partner and sexually active, the mean time with the partner was 18 years (range = 1–47), and 100% of the sample were White.

Benign—Twenty-two women participated. All had benign gynecologic diagnoses (e.g., endometriosis; preinvasive conditions were excluded) and received surgical treatment (e.g., simple hysterectomy). A demographic analysis revealed that the mean age was 41 years (range = 22–59), 59% of the sample were premenopausal, 77% of the sample were married or living with a partner and sexually active, the mean time with the partner was 15 years (range = 1–35), and 100% of the sample were White.

Healthy—Sixty women with no gynecologic disease or other major health condition participated. A demographic analysis revealed that the mean age was 41 years (range = 24–61), 77% of the sample were premenopausal, 98% of the sample were married or living with a partner and sexually active, the mean time with the partner was 16 years (range 1–42), and 100% of the sample were White.

Measures—Listed here are the a priori statistical groupings of the measures. For each, tetrachoric correlations for categorical variables or Pearson correlations for continuous variables were calculated; the cutoff is .26, indicating that all of the reliabilities (internal consistency unless otherwise noted) are significant.

Emotional distress—The Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) is a 65-item inventory that asks the subject how she has felt in the past week and yields six mood subscales: Anxiety, Depression, Anger, Confusion, Vigor, and Fatigue, and a summary scale of Total Mood Disturbance. Reliability for the scales ranged from .83 to .93 with a mean of .90.

Marital adjustment—Three measures were used: (a) A modified version (four items assessing sexual interactions omitted) of the 32-item Dyadic Adjustment Scale (Spanier, 1976) was used. Reliability was .91. (b) The subject estimated the number of hours worked per week by the spouse in the home (e.g., time spent in chores, maintenance). Four-month test-retest reliability was .61. (c) The incidence and cause or causes of relationship change (e.g., separation) were tallied at each assessment.

Sexually active women also provided judgments of the occurrence and frequency of sexual difficulties for their partner for each phase of the sexual response cycle (i.e., desire, excitement, orgasm, and resolution; Kaplan, 1979; Masters & Johnson, 1966). A 5-point rating scale ranging from *no problem* (0) to *always a problem* (4) was used. Intrarater reliability for the judgments was .57.

Social adjustment and employment—A 34-item inventory was devised, similar to items in the Katz Adjustment Scales (Katz & Lyerly, 1963). For each activity women gave frequency estimates for the last month. After study completion, a factor analysis of the inventory was conducted to clarify the domains sampled. Twenty-three items from five factors (73% of the variance) were retained. Internal consistency reliabilities for the factors range from .43 to .68 and reflect the moderate heterogeneity of item content of such measures. The following factors and items were included: (a) For Child and Home Activities, five items included time with children and home care. (b) For Social Contact with Friends, four items included in person and telephone contacts, both subject and friend initiated. (c) For Social Contact with Relatives, three items assessed in-person and telephone contacts with out-of-home relatives, both subject and relative initiated. (d) For Recreational Activities, seven items included hobbies, evening-out events, and athletics. (e) For Employment, four items included hours worked full- or part-time and interactions with co-workers. In addition, a 3-point employment status (employed,

unemployed, or retired) and an 8-point occupational classification (Hollingshead & Redlich, 1958), ranging from *executive, major professional* (1) to *unskilled worker* (8), was made.

Procedure

All subjects were outpatients in the Department of Obstetrics and Gynecology at a university hospital. Medical examinations and structured interviews were conducted in the outpatient clinic; psychological data were first obtained, and descriptions of sexual functioning followed. The initial assessment occurred during the tumor/disease workup prior to treatment for the women with disease and usually the same day of an outpatient appointment for the healthy subjects. Follow-up assessments at 4, 8, and 12 months posttreatment documented current adjustment and medical status.

Results

Preliminary Analyses and Overview

As with the sexual outcome report, we assessed for data limitations. In the examination of subject mortality, the same findings emerged; that is, there were no significant psychological adjustment biases in the follow-up data, although the women with cancer completing the study were significantly older ($M = 44$ years) than the group that began ($M = 38$ years), consistent with the predominance of disease reasons for cancer subject dropout. Comparisons also were made between the sexually active and inactive subjects for the outcome variables, and there were no significant differences or trends. Therefore, the data for all groups were collapsed across the classification.

To control for experimentwise error; the majority of the analyses were repeated-measures multivariate analyses of variance (ANOVAs) with follow-up analyses of variance (ANOVAS) and planned multiple comparisons within the outcome variable groupings. Group X Time interactions were of primary importance.

Emotional Distress

To examine the emotional distress occurring specifically with a medical diagnosis and the anticipation of treatment, a one-way MANOVA that compared the three groups on the six mood scales of the POMS at the initial assessment was conducted and found significant, $F(12, 276) = 9.65, p < .01$. Table 1 provides the POMS means and standard deviations for all groups. All the follow-up ANOVAS for the subscales were significant except that for anger ($p = .27$). The ANOVA for Anxiety, $F(2, 144) = 32.9, p < .01$, and the follow-up multiple comparisons indicated that both groups with disease, cancer and benign, reported significant levels of anxious mood in comparison with the healthy group. In contrast, multiple comparisons for Depression, $F(2, 144) = 15.56, p < .01$, indicated that only the cancer group reported a significantly depressed mood. The same follow-up multiple comparison pattern was found for Confusion, $F(2, 144) = 18.75, p < .01$, with a significant level of confusion reported by the cancer group only. Finally, the two scales tapping activity level, Fatigue, $F(2, 144) = 8.14, p < .01$, and Vigor, $F(2, 144) = 14.29, p < .01$, had comparable findings. Both the cancer and benign groups had greater feelings of fatigue than the healthy women. For the Vigor comparisons, the cancer group had significantly lower levels of vigor than the healthy women. The women with benign disease had a moderate level not significantly different from the healthy group or the cancer group.

To examine whether the distress at diagnosis/pre-treatment would resolve and whether there would be differential rates of emotional recovery, a 3 (Group: cancer, benign, healthy) X 4 (Time: initial, 4, 8, and 12 months) MANOVA design was used for the POMS subscales. The Group X Time interaction was significant, $F(36, 2166) = 3.77, p < .01$, as were the follow-up

univariate ANOVA interactions for the following scales: Anxiety $F(6, 330) = 14.99, p = .01$; Depression, $F(6, 330) = 6.06, p < .01$; Confusion, $F(6, 330) = 6.11, p < .01$; Vigor, $F(6, 330) = 3.39, p < .01$; and the Fatigue scale was noteworthy ($p = .13$). Although significant effects were also found for Anger $F(6, 330) = 3.15, p < .01$, they appeared to be inconsistent with other results, because no follow-up contrasts were significant. For all the other scales, follow-up contrasts indicated that there was significant improvement in mood for the two disease groups from the initial assessment to the 4-month follow-up. This improvement resulted in there being no significant differences between the groups at the 4-month assessment (grand *Ms*: Anxiety, 9.5; Depression, 7.8; Confusion, 6.0; Anger, 7.3; Fatigue, 8.1; and Vigor, 17.6). In addition, there were no significant differences among the groups for the 8- and 12-month assessments and no significant changes from the 4- to 8-month or 4- to 12-month assessments. In combination, these analyses indicate a different pattern of emotional distress for women in the cancer and benign groups at the time of diagnosis and during anticipation of treatment; however, distress was transitory for both groups. Subjects' moods significantly improved by 4 months posttreatment, and with continued physical recovery their moods were within the range of the healthy women's)¹

Marital Adjustment

We examined the incidence and causes of relationship change. In the cancer group, there were four changes: Two relationships ended (one in divorce with the woman attributing it to long-standing problems and one in dissolution with the woman attributing it to her partner's inability to cope with her illness), but both women began new relationships by 12 months; one spouse died; and one woman reported that her husband was having an extramarital affair at 12 months. In the benign group, there were three changes: One relationship ended (with the woman attributing it to long-standing difficulties), but she also began a new relationship by 12 months; and 2 women who began the study without partners had begun relationships by 12 months. In the healthy group, there were four changes: Two relationships ended in divorce (with both women attributing it to long-standing difficulties); one couple separated but began marital counseling; and one woman reported an extramarital affair for her husband at 12 months.

To test for differential levels of self-reported adjustment, a 3 (Group: cancer, benign, healthy) X 4 (Time: initial, and 4, 8, and 12 months) ANOVA design was used; however, the Group X Time interactions were not significant. Inspection of the data indicated that all groups across time reported a satisfactory level of marital adjustment ($M = 98$) and comparable time involvement by partners in home activities ($M = 8.8$ hr/week).

Significant sexual disruption for the women with disease was anticipated and found (Andersen, Anderson, & deProse, 1989). To test for differential effects on the male partner's sexual response, a chi-square statistic was calculated for the women's judgments of difficulty for their partners during each phase of the sexual response cycle. We considered the change from *no problem* at the initial assessment to the presence/absence of a *problem* judgment at any time posttreatment.² Analyses for desire, excitement, and resolution were not significant (ps ranging from .18 for resolution to .77 for excitement); however, that for orgasm, indicating difficulties

¹A question could be raised regarding the impact of physical symptomatology on mood, particularly measures of fatigue and vigor. At the group analysis of variance (ANOVA) at the initial assessment, medical data indicated that the values for the healthy and cancer groups were not significantly different (.10 and .13, respectively) and that the values for the cancer and benign groups were not significantly different (.13 and .24, respectively). The absolute level of the values for all groups was low, reflecting good health except for the presence of any gynecologic disease. A second ANOVA examining group differences for the follow-ups was not significant (scores ranged from .10 to .20 across groups) and indicated that the general good health for the groups continued (see Andersen, Anderson, & deProse, 1989).

²The male sexual partners who began the study with a sexual problem were dropped from the analysis of that phase. We were not interested in the change of any prior sexual problem, only in the occurrence of new sexual problems for partners during the follow-up year. It is also important to note that there were no significant differences among the groups in problem frequencies at the initial assessment.

with delayed ejaculation, was noteworthy, $\chi^2(2, N = 78) = 5.04, p = .09$. Two orthogonal chisquare contrasts were conducted. The first contrasted the women with disease (cancer and benign groups combined, here-inafter referred to as the disease group) with the healthy group to determine the magnitude of sexual disruption in partners of women who received medical treatment for any disease, and the second ANOVA contrasted the cancer versus benign groups to determine the magnitude of disruption due specifically to malignant gynecologic disease and gynecologic cancer treatments. The disease versus healthy statistic was significant, $\chi^2(1, N = 78) = 4.14, p = .05$, but the cancer versus benign contrast was not. Examination of the data indicated that 31% of the partners of women in the disease group (31% of the cancer and 30% of the benign group) were viewed as having problems with orgasm at some time during the posttreatment year in contrast with only 10% of partners of women in the healthy group.

Social Adjustment

A 3 (Group: cancer, benign, healthy) X 4 (Time: initial, 4, 8, and 12 months) MANOVA for the four subscores was not significant ($p = .21$), indicating that there was no differential disruption of familial/social relationships or activities between groups or across time.

Employment

Two analyses were conducted. The first examined the categorical variables of employment status and occupation. For both variables there was no differential change between groups or across time. For example, the majority of cancer patients remained in the same status, with 2 women becoming employed and 4 becoming unemployed during follow-up. Similarly, the majority of the women with cancer remained in the same occupational category, with 2 employed at a higher skill level and 6 at a lower skill level.

Second, a 3 (Group: cancer, benign, healthy) X 4 (Time: initial, 4, 8, and 12 months) MANOVA for the Employment scale was conducted and was significant, $F(6, 336) = 3.56, p < .01$. Two follow-up ANOVAS were conducted. The first contrasted the women with disease (cancer and benign groups combined) with the healthy group to determine the magnitude of employment disruption due to any disease and medical treatment, and the second ANOVA contrasted the cancer versus benign groups to determine the magnitude of disruption due specifically to malignant gynecologic disease and gynecologic cancer treatments. The disease versus healthy ANOVA was significant, $F(3, 339) = 3.04, p < .05$, and the cancer versus benign ANOVA was also significant, $F(3, 201) = 3.03, p < .05$. Follow-up multiple comparisons indicated that both disease groups had comparable employment involvement at the initial assessment; however, by 4 months posttreatment, the women treated for benign disease had significantly increased their activity (as did the healthy women), whereas the level of employment for the women treated for cancer remained stable. This differential and lower level of employment for the cancer group remained for the 8- and 12-month follow-ups. The differential level of work activity across groups was, for example, indicated at 12 months when the hours worked per week at full-time jobs were 22, 24, and 29 hr for the cancer, benign, and healthy groups, respectively. The difference between the two disease groups was reflected at 12 months when the women with cancer reported an average monthly frequency of 10 interactions with coworkers during a 2.4 hr/week part-time job, whereas women treated for benign disease reported an average monthly frequency of 14 interactions during a 4.7 hr/week part-time job.

Discussion

The nature and etiology of major life difficulties for women with survivable cancer were studied. The emotional distress data indicate that the cancer diagnostic period is one of acute stress. Although this fact has been obvious, the more interesting findings are how the emotional responses may be quantitatively and qualitatively different from those of similar individuals

who are also ill (albeit with a benign condition) and are facing major medical treatment. The emotional crisis for cancer patients appears to be defined by depressed and confused moods. These data are consistent with surveys suggesting that depression is the most prevalent affective problem for cancer patients, with estimates of unipolar diagnoses in the order of 5–6% and estimates of adjustment disorder with depressed mood in the order of 16% (Derogatis et al., 1983; Lansky et al., 1985). The confusion of cancer patients (e.g., forgetting instructions for diagnostic tests; going to the wrong place or going at the wrong time for appointments) has been noted clinically (e.g., Mages & Mendelson, 1980); however, it has rarely been studied. The present strategy of assessing patients in the midst of their tumor evaluation and determination of treatment may have increased the likelihood of finding increased confusion reports.

Anxiety appears to be the affective problem second in frequency among cancer patients, with an estimated prevalence of 7% among outpatients undergoing treatment (Derogatis et al., 1983). It is clear that cancer patients experience significant anxiety, for example, regarding chemotherapy (see Carey & Burish, 1988, for a discussion), radiotherapy (e.g., Andersen & Tewfik, 1985), or surgery (Gottesman & Lewis, 1982). Of note in the present data is the comparable anxiety reported by individuals with benign disease also awaiting treatment. In decades of research on medical treatment anxiety, the majority of research patients have been treated for benign conditions, often with surgery (e.g., hernia repair and hysterectomy). (See Janis, 1958, for an early report; see Anderson & Masur, 1983, or Devine & Cook, 1983, for a review.) In an interesting comparison of the two samples, Gottesman and Lewis (1982) found that cancer and benign surgery patients were similar in the magnitude of crisis feelings as they anticipated and recovered from surgery when contrasted with healthy comparison subjects. Although several bases for the anxiety in the cancer patient may be suggested, these data suggest that the anticipation of difficult medical treatment may be a reasonable etiological hypothesis to pursue in future research.

In relation to sexual functioning, data from the previous report suggest that additional morbidity may accrue for women from a malignant diagnosis and the more radical treatment it imposes. In particular, difficulties with excitement (arousal) and dyspareunia during and after intercourse were pronounced. That women perceived their partners as having difficulty with ejaculation was concordant with their pattern of sexual distress. Clinically, women reported that their partners were concerned about having intercourse following treatment because it was painful to the women. In combination, these data suggest the specific effect that the woman's sexual problems may have had on her partner's sexual responding.

When one considers the severity of the couple's sexual difficulties and the generally important role of sexual activity (Byers & Heinlein, 1989), the findings on marital adjustment are noteworthy. Marital relationships among cancer patients, particularly for women with disease at a sexually relevant site (e.g., breast or gynecologic), have been viewed at risk (e.g., Silberfarb, 1984; Wellisch, Jamison, & Pasnau, 1978). Longitudinal data from Bentler and Newcomb (1978) indicate that sexual relationship difficulties are among the problems (e.g., selfishness, desire for independence, and bickering) that occur at a significantly higher frequency for couples who divorce rather than remain married. In this same study, health problems occurred at a significantly higher rate for the couples who remained married. Bentler and Newcomb interpreted the latter as a type of problem that could draw couples together and maintain a relationship rather than pull it apart. Thus, significant sexual deterioration may not have exerted the usual negative effects because the sexual difficulties were viewed by the couples as caused by an unavoidable and nonrelationship event (i.e., cancer or hysterectomy), an event they had coped with together, despite its stressful aspects.

Our findings must be viewed in the context of the samples studied and the methodology used. We have questioned, for example, whether the emotional crisis is unique to cancer or is characteristic of any traumatic diagnosis. When ill adults (e.g., those with rheumatoid arthritis, diabetes, cancer, or renal disease) at varying stages of disability have been studied long after diagnosis, few differences among groups have been found (Felton, Revenson, Hinrichsen, 1984; Cassileth et al., 1984). Other data, however, indicate that psychological distress differs (and worsens) when cancer patients are receiving active or palliative treatment or at the time of recurrence (e.g., Cassileth et al., 1985). Thus, any meaningful differences among groups with traumatic diagnoses may be more a function of at which point in the illness trajectory comparisons are made rather than variability due to disease per se. A related issue concerns the method of assessment of emotional distress. The method used was modest; however, it was suited to the recency of the diagnostic stressor, the items were understandable to the subjects, and the data are consistent with findings from cancer and medical stressor literatures. However, these data tap moods, and we cannot generalize to psychiatric/psychopathologic levels of distress.

With respect to a different issue, an important perspective absent is that of the sexual partner. The primary reason for obtaining sexual data on the partner's responsiveness from the woman was to understand her sexual functioning (e.g., determining if a woman's orgasmic difficulties were related to a husband's having premature ejaculation), and secondarily it provided an approximation for partner data. The results suggesting a matching of the male partner's sexual response to the type of sexual difficulties found for the women is a potentially important clinical finding, but it requires replication with data from couples. Similar cautions could be applied to the marital data; however the concordance across groups on the incidence and reasons for relationship change adds credibility to the questionnaire data.

In summary, the longitudinal data suggest that the diagnosis of cancer is an emotional crisis for which the hallmarks may be feelings of depression and confusion from the life threat. True to the notion of crisis, the emotional distress is time limited and dissipates with recovery. We studied individuals who did, in fact, experience significant disruption for one major life area—sexual functioning. However, companion data indicate that there is specificity, rather than globality, to further life disruption that may occur. When one considers broader aspects of the couple relationship, it appears that the women's sexual difficulties may have disrupted her partner's sexual responsiveness, but relationships remained intact and apparently satisfactory. In relation to the crisis of diagnosis and the anticipation of treatment, no apparent disruption of social ties or activities eventuated during recovery, as has been earlier suggested (e.g., Wortman & Dunkel-Schetter, 1979). Employment and career paths were not diverted, although women understandably spent less time on the job as they recovered. Some cancer groups appear to be at risk for employment or career difficulties (e.g., pediatric cancer patients; see Teta et al., 1986, for a discussion), but this may be less problematic if individuals are diagnosed at midlife, when employment patterns are established, or if the disease poses no lingering physical limitations.

Acknowledgments

The authors would like to thank individuals who provided assistance in this research. Greatest appreciation is extended to the participating patients. In addition, we thank the following professionals for their assistance: research assistants Ellen Robinson, Jennifer Karlsson, Sharon Krogman, and Suzanne Bhatt; Becky Huber; biostatisticians Barbara Broffitt, and Peter Lachenbruch; John T. Cacioppo; and Roy Pitkin, staff, resident physicians, and oncology nurse Jeannette Peck of the Department of Obstetrics and Gynecology at the University of Iowa Hospitals and Clinics.

This research was supported by New Investigator Research Award 1 R23 GA35702-01AI from the National Institutes of Health, National Cancer Institute.

References

- Andersen, BL. Women with cancer: Psychological perspectives. New York: Springer-Verlag; 1986.
- Andersen BL, Anderson B, deProse C. Controlled prospective longitudinal study of women with cancer. I. Sexual functioning outcomes. *Journal of Consulting and Clinical Psychology* 1989;57:683–691. [PubMed: 2600238]
- Andersen BL, Tewfik HH. Psychological reactions to radiation therapy: Reconsideration of the adaptive aspects of anxiety. *Journal of Personality and Social Psychology* 1985;48:1024–1032. [PubMed: 3989671]
- Anderson KO, Masur FT. Psychological preparation for invasive medical and dental procedures. *Journal of Behavioral Medicine* 1983;6:1–40. [PubMed: 6876151]
- Bentler PM, Newcomb MD. Longitudinal study of marital success and failure. *Journal of Consulting and Clinical Psychology* 1978;46:1053–1070.
- Byers ES, Heinlein L. Predicting initiations and refusals of sexual activities in married and cohabiting heterosexual couples. *The Journal of Sex Research* 1989;26:210–231.
- Carey MP, Burish TG. Etiology and treatment of the psychological side effects associated with cancer chemotherapy. *Psychological Bulletin* 1988;104:307–325. [PubMed: 3062654]
- Cassileth BR, Lusk EJ, Strouse TB, Miller DS, Brown LL, Cross PA. A psychological analysis of cancer patients and their next-of-kin. *Cancer* 1985;55:72–76. [PubMed: 3965087]
- Cassileth BR, Lusk EJ, Strouse TB, Miller DS, Brown LL, Cross PA, Tenaglia AN. Psychosocial status in chronic illness: A comparative analysis of six diagnostic groups. *The New England Journal of Medicine* 1984;311:506–511. [PubMed: 6749208]
- Cella DF, Tross S. Psychological adjustment to survival from Hodgkin's disease. *Journal of Consulting and Clinical Psychology* 1986;54:616–622. [PubMed: 3771879]
- Cohen MM, Wellisch DK. Living in limbo: Psychosocial intervention in families with a cancer patient. *American Journal of Psychotherapy* 1978;32:560–571.
- Derogatis LR, Morrow GR, Fetting J, Penman D, Piasetsky S, Schmale AM, Henricho M, Carnicke CLM. The prevalence of psychiatric disorders among cancer patients. *Journal of The American Medical Association* 1983;249:751–757. [PubMed: 6823028]
- Devine EC, Cook TD. A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research* 1983;32:267–274. [PubMed: 6554615]
- Felton BJ, Revenson TA, Hinrichsen GA. Stress and coping in the explanation of psychological adjustment among chronically ill adults. *Social Science Medicine* 1984;18:889–898. [PubMed: 6729517]
- Gottesman D, Lewis M. Differences in crisis reactions among cancer and surgery patients. *Journal of Consulting and Clinical Psychology* 1982;50:381–388. [PubMed: 7096739]
- Hollingshead, AB.; Redlich, FC. Social class and mental illness: A community study. New York: Wiley; 1958.
- Janis, IL. Psychological stress: Psychoanalytic and behavioral studies of surgical patients. New York: Wiley; 1958.
- Kaplan, HS. Disorders of sexual desire. New York: Brunner/Mazel; 1979.
- Katz MM, Lysterly SB. Methods for measuring adjustment and social behavior in the community: 1. Rationale, description, discriminative validity and scale development. *Psychological Reports* 1963;13:503–535.
- Lansky SB, List MA, Herrmann CA, Ets-Hokin EG, Das-Gupta TK, Wilbanks GD, Hendrickson FR. Absence of major depressive disorders in female cancer patients. *Journal of Clinical Oncology* 1985;3:1553–1560. [PubMed: 4056846]
- Mages, NL.; Mendelsohn, GA. Effects of cancer on patients' lives: A personological approach. In: Stone, GC.; Cohen, F.; Adler, NE., editors. *Health Psychology*. San Francisco: Jossey-Bass; 1980. p. 255–284.
- Masters, WH.; Johnson, VE. Human sexual response. Boston: Little, Brown; 1966.
- McNair, DM.; Lorr, M.; Droppleman, LF. Profile of mood states. San Diego, CA: Educational and Industrial Testing Service; 1971.

- National Cancer Institute. Cancer surveillance, epidemiology, and end results (SEER) program. In: Axtell, LM.; Asire, AJ.; Myers, MH., editors. Cancer patient survival: Report No. 5 (DHEW Publication No. NIH 77-992). Washington, DC: U.S. Government Printing Office; 1976.
- Ouellette Kobassa, SC. Longitudinal and prospective methods in health psychology. In: Karoly, P., editor. Measurement strategies in health psychology. New York: Wiley; 1985. p. 235-260.
- Perlman SD, Abramson PR. Sexual satisfaction among married and cohabiting individuals. *Journal of Consulting and Clinical Psychology* 1982;50:458-460.
- Silberfarb EM. Psychiatric problems in breast cancer. *Cancer* 1984;53:820-824. [PubMed: 6692281]
- Spanier GB. Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family* 1976;38:15-28.
- Sutherland AM, Orbach CF, Dyk RB, Bard M. The psychological impact of cancer and cancer surgery: 1. Adaptation to the dry colostomy. *Cancer* 1952;5:857-872. [PubMed: 12988176]
- Taylor SE. Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist* 1983;38:1161-1173.
- Teta MJ, Del Po MC, Kasl SV, Meigs JW, Myers MH, Mulvihill JJ. Psychosocial consequences of childhood and adolescent cancer survival. *Journal of Chronic Disease* 1986;39:751-759.
- Ware JE. Conceptualizing disease impact and treatment outcomes. *Cancer* 1984;53:2316-2323. [PubMed: 6367942]
- Watson, D.; Kendall, PC. Methodological issues in research on coping with chronic disease. In: Burish, TG.; Bradley, LA., editors. Coping with chronic disease. New York: Academic Press; 1983. p. 39-81.
- Wellisch DK, Jamison KR, Pasnau RO. Psychosocial aspects of mastectomy: 2. The man's perspective. *American Journal of Psychiatry* 1978;135:543-546. [PubMed: 645946]
- Wortman CB, Dunkel-Schetter C. Interpersonal relationships and cancer: A theoretical analysis. *Journal of Social Issues* 1979;35:120-155.

Table 1
Means and Standard Deviations for POMS Scales Within Groups at Diagnosis/Pretreatment Assessment

Scale	Group					
	Cancer		Benign		Healthy	
	M	SD	M	SD	M	SD
Anxiety	18.5 _b	8.0	12.4 _{1b}	7.5	8.8 _a	4.9
Depression	17.4 _b	13.3	7.7 _a	9.8	6.9 _a	6.4
Confusion	10.3 _b	6.1	5.4 _a	2.9	5.8 _a	3.5
Anger	9.4 _a	9.2	5.5 _a	5.7	8.7 _a	6.6
Fatigue	10.5 _b	7.5	9.6 _b	6.2	6.5 _a	4.4
Vigor	13.8 _{b,c}	6.5	16.9 _b	6.0	19.0 _{a,b}	4.7

Note. Common subscripts across groups for a scale indicate no significant differences, whereas different subscripts indicate $p < .05$. POMS = Profile of Mood States.