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Problems Experienced by Ovarian Cancer Survivors During Treatment

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Abstract

Objective—To identify problems at different treatment points (early treatment, mid-treatment, early posttreatment, and late posttreatment) among women with ovarian cancer.

Design—Longitudinal and cross-sectional study design.

Setting—An academic and community clinical cancer center in the Southeastern United States.

Participants—Sixty-eight women with Stage I to IV ovarian cancer.

Methods—Variables assessed included reported problems (physical, psychosocial, pain, marital, medical interaction), social support, optimism, and responses to open-ended questions. Analysis involved mixed models for longitudinal repeated measures and unpaired t tests and content analysis to describe responses to open-ended questions.

Results—Physical and psychosocial problems were greatest during early treatment and decreased throughout the treatment trajectory. Women with greater levels of social support and optimism at baseline had fewer problems over time. Women who did not have trouble paying for basics had fewer problems related to pain and psychological problems.

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Conclusion—Problems across all domains must be addressed throughout the treatment trajectory, even after chemotherapy has ended. Nurses are well positioned to refer women appropriately to social workers and clinical navigators across all domains of care and should consider systematic assessment of patient-reported problems as a routine form of practice.

Keywords

ovarian cancer; problems; quality of life; survivorship

In the United States, it is estimated that more than 230,000 women are living as ovarian cancer survivors (Siegel, Miller, & Jemal, 2016). *Cancer survivorship*, as defined by the National Cancer Institute (2016), begins after the time of diagnosis and extends until the woman's death, regardless of cause of death. Ovarian cancer occurs without early signs or symptoms, and up to 77% of women with ovarian cancer have advanced disease at diagnosis with poor prognosis (Lockwood-Rayermann, 2006; Price et al., 2016). The clinical course for women with advanced disease often involves aggressive therapies, including surgery and multiple courses of chemotherapy that usually include six cycles of combination chemotherapy with cisplatin or carboplatin plus a taxane (Lockwood-Rayermann, 2006). Approximately 80% of women experience disease recurrence and subsequently require additional courses of chemotherapy and adjuvant modalities over a number of years (Beesley et al., 2013). Because of the usually late stage of diagnosis, poor prognosis, debilitating treatment options, and great likelihood of recurrence, the trajectory of treatment among ovarian cancer has numerous physical, psychological, and social effects.

At time of diagnosis and throughout early treatment, physical symptoms such as fatigue, nausea/vomiting, diarrhea, and pain are often the primary focus of cancer-related concerns (Portenoy et al., 1994; von Gruenigen et al., 2009). Initial tumor debulking surgery can be an intensive procedure with a significant period of recovery (Minig et al., 2013; Tangjitgamol, Manusirivithaya, Laopaiboon, Lumbiganon, & Bryant, 2016). Additionally, because of the close proximity of the ovaries to the gastrointestinal tract, initial tumor debulking can be associated with significant changes in bowel habits such as constipation or diarrhea (Minig et al., 2013; Tangjitgamol et al., 2016). A colostomy may be required to manage acute problems such as intestinal obstruction (Lockwood-Rayermann, 2006). The chemotherapy that follows can lead to prolonged periods of nausea, vomiting, fatigue, pancytopenia, alopecia, weight loss, changes in food taste, and periods of constipation or diarrhea, with certain nonreversible adverse effects such as peripheral neuropathy and premature menopause (de Moor et al., 2006; Ersek, 1997; Lockwood-Rayermann, 2006; Pokrzywinski et al., 2011).

Physical symptoms and pain have been associated with poorer health-related quality of life (HRQOL) and less vigor (Lutgendorf et al., 2002) and often contribute to prolonged psychological distress, but this connection has not been well studied in women with ovarian cancer (Norton et al., 2005). Additionally, women undergoing treatment for ovarian cancer are at greater risk for depression and anxiety and have greater depression symptoms compared with other cancer populations (Norton et al., 2004). Between 30% and 50% of women with an ovarian cancer diagnosis report moderate to severe levels of anxiety (Kornblith et al., 2010).

Ovarian cancer differs from other cancers because of the greater possibility of recurrence even after an initial period of no evidence of disease. Thus, psychological needs throughout the cancer experience are varied and often related to baseline levels of depression and anxiety as well as the amount of social support and optimism present throughout the cancer trajectory (Beesley et al., 2013; de Moor et al., 2006; Fitch & Steele, 2010; Kornblith et al., 2010). Qualitative inquiry has shown how ovarian cancer can stress relationships and life at home (Ferrell, Smith, Ervin, Itano, & Melancon, 2003), but the overall effect on marriage or long-term partnered relationships is not well understood.

Previous researchers found that greater levels of optimism (de Moor et al., 2006), active coping (Canada et al., 2006; Lutgendorf et al., 2002), greater spirituality (Canada et al., 2006), better physical function (Kornblith et al., 1995), and greater social support (Lutgendorf et al., 2002) were associated with better HRQOL in women with ovarian cancer. However, we do not know the relationship of these variables with reported problem areas over the disease trajectory.

Despite these well-known adverse effects of ovarian cancer and its treatment, there are scant empirical data to examine when problems are most likely to occur. A better understanding of the timing of specific problems may help to identify the optimal timing of interventions by clinicians (Lakusta et al., 2001). For example, at diagnosis, women may experience the psychological distress and physical adverse effects of surgery, whereas physical discomfort, functional disability, and pain may be important problems to address during treatment. Additionally, financial and relationship concerns, as well as posttraumatic stress and anxiety, may be concerns as women enter survivorship. Finally, there is a paucity of evidence to suggest the long-term survivorship needs of women with ovarian cancer.

> Because of the usually late stage of diagnosis the trajectory of treatment among ovarian cancer survivors has numerous physical, psychological, and social effects.

The purpose of our study was to use a mixed-methods design to identify specific problem areas (physical, pain, medical interaction, marital, psychosocial) that ovarian cancer survivors experience at different points along the treatment continuum: early treatment, mid-treatment, early posttreatment, and late posttreatment. An additional objective was to identify individual characteristics related to specific problem areas over time. Within each of these objectives, we used quantitative and qualitative data to address the research questions. We hypothesized that specific problems will vary over the different time points from diagnosis.

Methods

We used a longitudinal and cross-sectional descriptive study design to identify problems at different points (early treatment, mid-treatment, early posttreatment, and late posttreatment) among women with ovarian cancer. The study was approved by the institutional review boards at Wake Forest University Health Sciences and Forsyth Medical Center and by the Department of Defense Human Subjects Protection Office.

Participants

Women diagnosed with ovarian cancer were recruited after surgery (but before first chemotherapy treatment), during treatment, or after treatment. Women were recruited from the Section on Gynecologic Oncology at the Comprehensive Cancer Center of Wake Forest University and the Forsyth Medical Center Gynecologic Oncology Clinic from 2003 through 2006. A total of 68 women were enrolled in the study, of whom 49 were enrolled before or during chemotherapy; the remaining 19 were enrolled after chemotherapy was completed. Of the 19 participants recruited after chemotherapy completion, five were recruited immediately after treatment, and 14 were recruited at least 2 years after treatment (range = 2.4–4.9 years). These 14 participants are classified as *late posttreatment*. Participants recruited during treatment were followed up through the early posttreatment phase when possible. Eligibility criteria for both groups included being female, age 18 years or older, community dwelling, first time diagnosis of ovarian cancer, having physician agreement for participation, able to provide informed consent, and having chemotherapy included as part of the treatment plan. Exclusion criteria included existing psychiatric or psychological abnormality precluding informed consent/ability to complete questionnaires, concurrent malignancy if not a recurrence, and non-English speaking.

> Interventions to improve problem areas for ovarian cancer survivors should be targeted to the time immediately after diagnosis and continue beyond the end of treatment.

In all participants, treatment was initiated with tumor reductive surgery, which achieved residual disease of 1 cm or less in 70% of the participants. This surgery was followed by platin and taxane–based combination chemotherapy, using carboplatin and paclitaxel in most cases.

Measures

Questionnaires to assess problems were completed in person or by mail at time points defined as follows: enrollment (within 3 months of diagnosis but after tumor-reductive surgery), mid-treatment (between 3 and 7 months after diagnosis), early posttreatment (between 7 and 24 months after diagnosis), and late posttreatment (more than 24 months after diagnosis).

The Cancer Rehabilitation Evaluation System Short Form (CARES-SF) was administered to assess current problems (Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1992; Schag, Ganz, & Heinrich, 1991). The CARES-SF is derived from the 139-item CARES instrument (Ganz et al., 1992; Schag et al., 1991). The CARES-SF is a multidimensional evaluation in which participants rate each problem statement on a 5-point scale, ranging from 0 (*not at all*) to 4 (*applies very much*) during the past week in five domains: physical, pain, medical interactions, marital, and psychosocial. It has Cronbach's alpha internal consistency reliability estimates from 0.61 to 0.85 on subscales and is acceptable to patients (Ganz et al., 1992; Schag et al., 1991). Cronbach's alpha coefficient ranges from the present study ranged from 0.64 to 0.91 for the subscales. Several additional items from the full CARES were added for this study. These included items regarding pain (three additional items), worry (two items), difficulty communicating with friends/relatives (five items), and chemotherapy-related problems (four items). The additional items were included to further elucidate these problem areas for our study population, but the addition did change the original domain score interpretation.

Social support was assessed using the RAND Social Support Scale (Sherbourne & Al, 1991), which was designed to measure four aspects of support: emotional support, tangible support, affection, and social interaction. This measure has a high internal consistency (all Cronbach's alphas > 0.91) and Cronbach's alphas for the present study ranged from 0.71 to 0.97 on the subscales. A total support score is the mean of these four categories (19 items) with scores ranging from 0 to 100.

Optimism was measured with The Life Orientation Scale (Scheier & Carver, 1985). The Life Orientation Scale has moderate internal consistency (Cronbach's alpha coefficient = 0.76; Scheier & Carver, 1985), and Cronbach's alpha coefficient for the present study was 0.68. The Life Orientation Scale is a six-item scale that measures generalized expectations of good or bad outcomes. Respondents rate their agreement or disagreement with statements on a 5-point scale ranging from *agree to disagree*, and scores are calculated as the sum of the items.

In addition to these measures, open-ended questions were included at each time point. At baseline, these questions were used to ask participants (a) what had been going on in their lives at the time of their assessment, (b) how being diagnosed with cancer affected their lives, and (c) what would be most helpful in improving their quality of life. A slightly modified version of the open-ended questions was included in the follow-up questionnaires to better fit the time point. Participants responded to open-ended questions in written format.

Medical records were obtained for each participant, and data related to comorbidities, date of diagnosis, cancer stage, type of chemotherapy, type of surgery, and present medical problems comorbidities (cardiac, hypertension, pulmonary, gastrointestinal, renal, diabetes, thyroid, hematologic, arthritis, neurologic, psychiatric, and other) were abstracted. The questionnaire also included questions on age, race, education, marital/partner status, employment status, and financial strain.

Statistical Analyses

Descriptive statistics such as frequencies and percentages for categoric variables and means, standard deviations, and medians for continuous variables were calculated for all outcomes and covariates of interest. Covariates included cancer stage, sociodemographics (age, race, difficulty paying for basics, education, and marital status), and number of comorbidities. Mixed-effects models for longitudinal repeated measures were used to assess changes in problem areas from early treatment to early posttreatment. The SAS procedure Mixed was used for these analyses. The three time periods (baseline, mid-treatment, and early posttreatment) were treated categorically, and an unstructured covariance matrix was used to model the within-participant correlation over time. Linear contrasts were used to assess pairwise contrasts among the first three times. There was no participant overlap between the first three time periods and the late posttreatment period, so unpaired *t* tests were used to compare the last time with the three earlier ones. Square root transformations were used to reduce skewness and increase normality. Hochberg's modified Bonferroni step-up multiple test procedure was used to adjust *p* values for multiple contrasts, using a .05 level of significance for each outcome measure. Linear regression was used to assess the association between participant covariates and outcomes at each time. Because of the small sample sizes at each time point, we did not run multivariable models.

Content Analysis of Open-Ended Questions

Directed content analysis of the open-ended questions was performed to assess how participants described problems they experienced at each time point (Hsieh & Shannon, 2005). We coded responses line by line using an a priori coding strategy based on the five dimensions of perceived problems. There was one primary coder (J.K.M.) who conferred a percentage of codes with a fellow reviewer (N.A.) with 100% concordance. Additionally, specific modalities used to combat problems were also coded based on the problem they were attempting to overcome.

Results

Participant Characteristics

A total of 68 women participated in the study, 49 of whom were recruited before or during chemotherapy and 19 of whom were recruited after chemotherapy. Of the 49 participants who were recruited before or during chemotherapy, 24 answered questionnaires at one time point, 15 at two time points, and 10 at three time points. Overall, 38 questionnaires were completed within 3 months of diagnosis, 29 at mid-treatment, 22 at early posttreatment, and 14 at late posttreatment.

Characteristics of the 68 participants are shown in Table 1. Ages ranged from 30 to 86 years with a median of 59 years. Most (88%) participants were White, 57% were married or living with a partner, 50% had at least some college education, 42% found it hard to pay for basic necessities, and 71% had at least one other medical condition at baseline. The most prevalent conditions were hypertension (35%), cardiac conditions (21%), and arthritis (13%). Eighty-four percent of the participants had Stage III or IV disease, and most received two or more chemotherapy agents.

Problems

Problems over time—The mean (standard deviation) scores over time for the different problems, as measured by the CARES, are shown in Table 2. During early treatment, physical problems were the greatest (mean = 1.73), followed by psychosocial problems (mean = 1.14). Interacting with medical professionals was the least problematic (mean = 0.63). The two most problematic areas for the late posttreatment group were physical and marital problems. Physical problems decreased significantly over time, with mid-treatment, early posttreatment, and late posttreatment being significantly better than early treatment. Early posttreatment was also better than mid-treatment. Pain also decreased significantly over time, with early treatment being significantly worse than mid-treatment and early posttreatment. Psychosocial problems, marital problems, and medical interactions decreased after early treatment, but the pairwise contrasts were not significant after adjustment for multiple comparisons.

Content analysis based on open-ended questions—The number of participants who reported problems in the different areas and exemplars of these problems are shown in Table 3. As reflected in the mean scores, physical problems were the most frequently reported problem areas. Physical problems early in the treatment trajectory were representative of participants who recently had surgery and were new to chemotherapy regimens. Some of the physical problems were directly related to surgery: “The colostomy bag is causing me to think twice before scheduling any day trips away from home.” Many of the participants suggested that they lacked stamina to complete normal daily activities: “Wish I had more energy for yard work and housework. I can't do my three mile walks anymore” and “My red count has been down and I took a shot for that. I get tired easily.” Other physical problems were directly related to the chemotherapy such as nausea, alopecia, and peripheral neuropathy. Pain was evident from surgery and from tumor burden, particularly in the abdominal region.

Physical problems continued to persist as treatment continued. Fatigue and problems related to shortness of breath and tiring easily were stated. These problems were likely due to anemia, which is commonly experienced during chemotherapy. Problems related to peripheral neuropathy were also described: “My toes and finger tips tingle. This makes me feel insecure on steps.” Another participant said that sometimes her feet felt as if they were not part of her body in reference to the debilitating and persistent nature of peripheral neuropathy. Also attributed to chemotherapy was change: “Can't eat. … Certain foods taste awful.” During this phase, disruptions in sleep patterns were acknowledged, as was general lack of strength that was never recovered after surgery. Posttreatment physical problems continued to focus on lack of stamina: “I wish I had more energy for work and housework.” Many physical problems were reported during this stage even though treatment had ended, which may be indicative of the consistent desire of the participants to return to prediagnosis physical normalcy and their frustration with their lack of stamina and continued neuropathy.

Psychosocial problems existed as the magnitude of the diagnosis began to set in. One participant stated, “I feel like I'm just existing,” as she described the uncertainty that persisted with the knowledge that cancer cells were in her body. Others discussed the depression and isolation that resulted from not being able to get out and visit with family and friends as they were once able to do: “I get depressed very easily. I feel alone at times.” Another participant said that she had adjusted as much as she could to having cancer, but “I just want my life back.” The uncertainty of the future was evident in the following participant quotation: “Knowing if there is any [cancer] still there, knowing if it will return and how will I know what to look for.” Patterns similar to those found earlier in the treatment trajectory emerged after treatment in psychosocial domains such as fear of recurrence and social isolation. One participant stated, “I don't really feel like getting out to shop or visit that much.” Another participant said that during this phase, her only concern was the worry of the cancer coming back. No marital problems were described by participants through the use of the open-ended questions.

Problems with medical interactions begin to develop in the early treatment stage as uncertainty over paperwork, financial burdens, and possible mistrust existed: “Ihope they are coming clean with what they are telling me.” Concerns with medical interactions continued throughout the treatment trajectory and remained after treatment but were primarily focused on financial distress the women experienced related to medical interactions.

Although we did not specifically ask participants how they dealt with these problems, many spontaneously expressed methods they used to combat the problems they were experiencing. Participants described ways of combatting psychosocial problems that included faith/prayer, attending cancer-specific support groups, talking with others who have shared similar experiences, actively seeking support from family and friends, and changing their perspectives on life to realize “what is truly important” in their lives. To combat physical symptoms, they described how they obtained wigs and took frequent rest periods throughout the day. Several participants mentioned the positive nature of returning to work. For them, it was a return to normalcy: “I want people to stop asking me how I feel. I want to go back to nursing [her career]. I need a mind-stimulating, paying job.”

Individual characteristics related to problem areas—In addition to examining specific problem areas, we sought to identify factors related to specific problems. The univariate effects of the participant covariates on each problem area for each time period are shown in Table 4. Comorbidities made little difference during treatment; however, participants with more comorbidities reported more physical and pain problems after treatment. Participants who did not have trouble paying for basics tended to have fewer pain, medical interaction, and psychosocial problems, especially during mid-treatment and late post-treatment. Participants who did not have trouble paying for basics had fewer marital problems during late posttreatment. Greater social support was correlated with fewer physical, pain, and medical interaction problems, particularly in late posttreatment.

Discussion

Consistent with prior research, physical problems such as lack of stamina and peripheral neuropathy were greatest for our sample of ovarian cancer survivors at the time of early treatment (within 3 months of diagnosis and after surgery) and decreased throughout the treatment trajectory (Hess & Stehman, 2012). Psychosocial problems such as depression, isolation, and fear of recurrence were secondary to physical problems and also decreased over time. These results are supported by previous findings from Beesley and colleagues (2013), suggesting that the greatest psychological unmet needs early in the cancer experience for women with ovarian cancer included the cancer spreading, being informed about things to help get well, and uncertainty of the future.

> Nurses are well positioned to refer appropriately to social workers and clinical navigators across all domains of care.

Physical problems and pain decreased over time, with the greatest decline shown in the time from early treatment to mid-treatment. Women with greater levels of social support and optimism at baseline survey tended to have fewer overall problems throughout the treatment trajectory, similar to findings from previous investigators (Beesley et al., 2013; de Moor et al., 2006; Norton et al., 2005). Finally, participants who reported that they did not have trouble paying for basics had fewer problems with physical, pain, medical interaction, and psychological problems during mid-treatment and last posttreatment.

The results from content analysis from the open-ended questions were in agreement with the survey results, indicating that self-reported problems were greatest while in treatment, with physical and psychosocial domains encompassing most of these problems. Many of the physical problems described during treatment included limitations in stamina and the subsequent fatigue that was experienced. Most physical problems reported during early and late posttreatment had to do with descriptions of peripheral neuropathy, which often persists well after chemotherapy has ended. Within the psychosocial domain, fear of recurrence was often reported during treatment and posttreatment, consistent with findings from other researchers (Ferrell, Smith, Cullinane, & Melancon, 2003; Norton et al., 2005).

Although many women reported problems related to changes in relationships during cancer, marital problems were not mentioned in response to the open-ended questions. Given the personal nature of this type of problem, it is not surprising that marital problems were not highlighted in the self-report data, particularly because there were no probing questions specifically to assess relationship vitality. The effects of ovarian cancer on changes in friend/family relationships, social support, and problems specifically related to changes in marital or partnered relationships is an area about which little is known, and more research is needed (Ferrell, Smith, Cullinane, et al., 2003; Ferrell, Smith, Ervin, et al., 2003; Norton et al., 2005). Finally, several women discussed how much they wanted to return to work and introduced the notion that work and return to work had a psychologically stabilizing presence in their lives, as previously found by Ferrell, Smith, Ervin, and colleagues (2003).

In a recent review, Zhou and colleagues (2016) reported that only 15 studies have examined elements of HRQOL of ovarian cancer survivors. Additionally, there are limited data that include the time period of active treatment and the time period that extends into later survivorship stages. This time period presents challenges in managing persistent adverse effects of treatment, fears of disease recurrence, adopting new family and peer roles, and existential processing related to the cancer experience (Zhou et al., 2016). Zhou and colleagues reported that those with disease recurrence between 1 and 2 years after diagnosis and greater symptom burden at baseline were more likely to show more marked physical decline.

Because of challenges with recruitment and retention of women with ovarian cancer into longitudinal studies, little is known about the period of late posttreatment for ovarian cancer survivors. Thus, it is difficult to inform clinicians and intervention development without this knowledge. Researchers who study the general adult cancer population suggest that most long-term survivor studies report an overall high level of HRQOL for long-term survivors

(5+ years out of initial treatment), although HRQOL varies by treatment type and age of survivors (Bloom, Petersen, & Kang, 2007).

Limitations

Our study had several limitations. The sample size was small for each time period and did not allow for complete multivariate analyses of all predictors in a single model. Small sample sizes and difficulties in recruitment are common in studies involving ovarian cancer participants (Albrecht & Taylor, 2013). In an effort to increase our sample size, we allowed study entry at multiple time points instead of recruiting all participants immediately after surgery, complicating interpretation. Being able to recruit all women post-operatively and following them longitudinally would have provided for more robust analyses and easier interpretation. In addition, because women were recruited after surgery, we lacked data before diagnosis. The age of our data was also a limitation given that participants were recruited between 2003 and 2006. Unfortunately, since that time, there have not been substantial changes in standards of care or first-line therapies for ovarian cancer; therefore, we find the results to still have relevance to current practice. Additionally, the scales used in our study population had reliability estimates that ranged from poor to good. Finally, the sample was homogenous in racial representation.

Conclusions

Our findings have implications for the timing of interventions for nurses to provide along the treatment continuum for ovarian cancer survivors. Interventions to improve problem areas for ovarian cancer survivors would best be targeted to the time period immediately after diagnosis and continue well past when treatment has ended, given the physical and psychosocial problems that remain after treatment, as well as potential increased distress in medical interactions and marital problems. Our findings highlight the need for clinicians to be aware of women who present early on with lower levels of social support and have a hard time paying for basics, so that they are able to provide additional support throughout the clinical trajectory. Additionally, nurses are well positioned to provide social service referrals and additional support in the form of clinical navigators to mitigate the problems reported from medical interactions and across other domains. Further research is needed to explore how the diminished ability to pay for basics, and potential financial distress, can affect all categories of reported problems and help guide specific intervention development. Additional inquiry is also needed to explore the self-reported idea of return to work as a positive factor that may help create a sense of normalcy among these women. Finally, long-term ovarian cancer survivorship research in more racially, regionally, and socioeconomically diverse populations is an area of critical need.

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Table 1

Summary of Participant Characteristics for Participants With Data at Baseline, in Treatment, Early Posttreatment, or Late Posttreatment (*N* = 68)

Characteristic	Value
Age in years, median (range)	59.0 (30–86)
Race, % (*n*)	
White	88 (60)
Asian/Pacific Islander	1 (1)
Black	9 (6)
Hispanic	1 (1)
Marital status	
Married	50 (34)
Widowed	19 (13)
Never married	9 (6)
Marriage-like relationship	7 (5)
Divorced/separated	15 (10)
Education	
High school graduate or less	50 (31)
Some college	29 (18)
College graduate or beyond	21 (13)
Difficulty paying for basics	
Very hard	18 (11)
Somewhat hard	23 (14)
Not very hard	58 (35)
Number of comorbidities	
0	29 (20)
1	29 (20)
2	24 (16)
3+	17 (12)
Cancer stage	
I	12 (8)
II	4 (3)
III	75 (51)
IV	9 (6)
Chemotherapy agent	
Carboplatin	81 (55)
Paclitaxel	72 (49)
Gemcitabine	9 (6)
Other	36 (25)
Number of chemotherapy agents	
0	3 (2)
1	18 (12)

Characteristic	Value
2	57 (39)
3+	22 (15)

Table 2

Cancer Rehabilitation Evaluation System, *M* (*SD*)

Measure	Early Treatment (*n* = 38)	Mid-Treatment (*n* = 29)	Early Posttreatment (*n* = 22)	Late Posttreatment (*n* = 14)	Significant Time Effects
Physical	1.73 (0.90)	1.31 (0.82)	0.98 (0.68)	0.76 (0.69)	a, b, c, e [*]
Pain	1.01 (0.93)	0.67 (0.80)	0.50 (0.73)	0.52 (0.67)	a, b [*]
Medical interactions	0.63 (0.75)	0.32 (0.44)	0.29 (0.44)	0.52 (1.04)	—
Marital[a]	0.99 (0.84)	0.48 (0.51)	0.46 (0.47)	0.77 (0.96)	—
Psychosocial	1.14 (0.81)	1.01 (0.68)	1.02 (0.70)	0.68 (0.76)	—

Note. All models include age. a = early treatment vs. mid-treatment; b = early treatment vs. early posttreatment; c = early treatment vs. late posttreatment; d = mid-treatment vs. early posttreatment; e = mid treatment vs. late posttreatment; f = early posttreatment vs. late posttreatment; *M* = mean; *SD* = standard deviation.

[a] *n* = 15, 19, 14, and 8 for the four time periods, respectively.

[*] Significant results after applying Hochberg's multiple test procedure are shown.

Table 3

Qualitative Exemplars Showing Problems From Open-Ended Questions

Problem Area[a]	Qualitative Exemplars
	Early Treatment
Physical (71.4%)	Wish I had more energy for yard work and housework. I can't do my three mile walks anymore.
	I have trouble with weight gain and my skin being broken out.
	My red count has been down and I took a shot for that. I get tired easily.
	I guess the constant feeling of nausea affects me more.
	The colostomy bag is causing me to think twice before scheduling any day trips away from home.
	I still have numbness in my feet from the chemo, so I now have more practical shoes.
	No hair, no eye lashes, no eye brows. Can't eat certain foods, certain foods taste awful. I still gain weight. I'm tired a lot.
Psychosocial (19.0%)	I feel like I'm just existing. Knowing that cancer cells are in my body and wondering when they will show up is on my mind constantly. Knowing that I probably will not see my grandchildren grow up is devastating. I'm not entirely comfortable with family and friends. I do not feel normal.
	I still experience stress and some depression.
	I don't really feel like getting out to shop or visit that much.
Pain (38.1%)	I have pain in my upper abdomen region from treatment.
	I also hurt especially in my thighs, legs and shoulders, worse at night.
Medical interaction (23.8%)	I need a social worker, which I don't qualify for one. It would have been nice to have someone help with paperwork, etc.
	I hope they are coming clean with what they [medical team] are telling me. I'm sure they wouldn't lie about it.
	Mid-treatment
Physical (70.8%)	My toes and finger tips tingle. This makes me feel insecure on steps.
	I've been having shortness of breath when I do very little.
	I still get physically and emotionally tired. I have some excess weight gain that I need to lose. … I get too tired if I go shopping or visiting. I just hope to have more energy soon.
	Sometimes I have a hard time sleeping.
	Still haven't gained all my strength back from surgery.
	Can't eat, certain foods taste awful.
Psychosocial (21.5%)	I get depressed very easily. I feel alone at times.
	My work life is stressful because my manager has no compassion.
	I am rejected by a lot of people and that hurts.
Pain (3.1%)	I feel bad. I have pain, no energy.
	Early and Late Posttreatment
Physical (64.5%)	Wish I had more energy for work and housework.
	Still have some neuropathy in my hands and feet from chemotherapy.
Psychosocial (16.1%)	The only emotional effects are being aware that the cancer can return.
	The emotional effects are the worst. I want people to stop asking me how I feel. I want to go back to nursing. I need a mind-stimulating, paying job.

[a] Percentages indicate the number of women citing the category of problem per number of women interviewed at that time point.

Table 4

Univariate Effects of Demographic and Psychosocial Variables on CARES Scores for Each Time Period, β (*SE*)

Period	Covariate[a]	Physical	Pain	Medical Interactions	Marital	Psychosocial
Early treatment						
	Age	−0.08 (0.13)	−0.20 (0.13)	0.02 (0.11)	−0.17 (0.20)	−0.16 (0.12)
	Pay basics	−0.04 (0.29)	−0.39 (0.30)	−0.37 (0.24)	−0.43 (0.33)	−0.51 (0.25)
	Number of comorbidities	0.06 (0.30)	0.14 (0.31)	0.12 (0.25)	0.49 (0.39)	−0.10 (0.27)
	Social support	−0.04 (0.06)	−0.07 (0.07)	−0.04 (0.05)	**−0.24 (0.08)**	−0.03 (0.06)
	Optimism	−0.31 (0.34)	**−0.80 (0.33)**	−0.29 (0.28)	**−1.26 (0.33)**	**−0.67 (0.29)**
Mid-treatment						
	Age	−0.20 (0.15)	**−0.39 (0.12)**	0.06 (0.08)	−0.05 (0.12)	−0.22 (0.12)
	Pay basics	**−0.77 (0.29)**	**−0.77 (0.32)**	−0.40 (0.20)	−0.03 (0.28)	**−0.86 (0.26)**
	Number of comorbidities	−0.08 (0.33)	0.16 (0.32)	−0.04 (0.18)	−0.43 (0.28)	−0.22 (0.27)
	Social support	−0.05 (0.09)	−0.05 (0.08)	−0.03 (0.05)	0.004 (0.08)	−0.17 (0.06)
	Optimism	−0.41 (0.35)	−0.34 (0.38)	0.09 (0.23)	−0.02 (0.32)	**−0.82 (0.30)**
Early posttreatment						
	Age	−0.19 (0.13)	**−0.35 (0.13)**	0.04 (0.09)	0.002 (0.14)	−0.12 (0.14)
	Pay basics	0.30 (0.33)	0.07 (0.29)	−0.28 (0.25)	−0.12 (0.28)	−0.60 (0.37)
	Number of comorbidities	**0.91 (0.25)**	**0.79 (0.29)**	0.15 (0.20)	0.19 (0.31)	0.39 (0.32)
	Social support	0.01 (0.07)	0.03 (0.07)	−0.08 (0.07)	−0.06 (0.06)	**−0.14 (0.06)**
	Optimism	0.11 (0.39)	0.01 (0.33)	−0.19 (0.30)	−0.33 (0.36)	**−1.12 (0.35)**
Late posttreatment						
	Age	−0.12 (0.12)	−0.10 (0.12)	−0.10 (0.19)	−0.18 (0.22)	−0.15 (0.13)
	Pay basics	−0.74 (0.43)	**−0.92 (0.36)**	−0.95 (0.69)	**−2.55 (0.38)**	**−1.05 (0.44)**
	Number of comorbidities	**0.75 (0.34)**	0.67 (0.34)	0.52 (0.58)	0.88 (0.64)	0.68 (0.39)
	Social support	**−0.16 (0.05)**	**−0.13 (0.06)**	**−0.23 (0.08)**	−0.15 (0.09)	−0.12 (0.07)
	Optimism	−0.73 (0.34)	−0.51 (0.36)	−1.02 (0.53)	−0.88 (0.58)	−0.71 (0.39)

Note. Boldface entries represent findings with $p < .05$. Positive estimate indicates more problems. *SE* = standard error.

[a] Age (per decade), pay basics (*not hard vs. hard*), number of comorbidities (2+ vs. 0–1), social support (per 10-unit change), optimism (per 10-unit change).