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Differences in Self-Reported Attentional Fatigue Between Patients With Breast and Prostate Cancer at the Initiation of Radiation Therapy

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Abstract

Background—Attentional fatigue is experienced as a decreased ability to concentrate, engage in purposeful activity, and maintain social relationships when there are competing demands on attention. Breast and prostate cancer are the two most common cancers in women and men, respectively. Most previous studies on self-reported attentional fatigue evaluated patients with breast cancer.

Objective—To determine if self-reported attentional fatigue differed in patients with breast cancer and prostate cancer before radiation therapy (RT), and to determine the relationships between attentional fatigue and other symptoms in these two groups.

Methods—Patients (n = 155) completed questionnaires before RT. Descriptive statistics, Pearson's correlations, and analysis of covariance were used for data analyses.

Results—After controlling for age, patients with breast cancer reported significantly higher levels of attentional fatigue. In both groups, more attentional fatigue correlated significantly with more anxiety, depression, sleep disturbance, and physical fatigue. These correlations were stronger for patients with breast cancer.

Conclusions—This study is the first to identify differences in self-reported attentional fatigue between these two groups before RT. Additional research is warranted to determine factors that contribute to these differences, as well as mechanisms that underlie the development of attentional fatigue.

Implications for Practice—Clinicians should consider the capacity of their patients to direct attention when learning about RT and other treatments. It is important to simplify confusing health care terminology and reinforce teaching that is most important both verbally and in writing. Appropriate interventions for anxiety and depression may decrease attentional fatigue in these patients.

Purposeful concentration during challenging situations results in attentional fatigue.¹ At the time of diagnosis or treatment for breast or prostate cancer, which are particularly challenging situations, multiple competing demands on attention can lead to attentional

fatigue.² Patients experience this symptom as a diminished ability to concentrate, difficulty engaging in purposeful activity, and strained interpersonal relationships.^{3,4} Therefore, attentional fatigue interferes with understanding, and successful navigation of, the diagnosis and treatment for cancer.²

According to William James, who wrote the *Principles of Psychology*⁵ in the late nineteenth century, “Everyone knows what attention is” (p. 381). James proposed in *The Principles* that there are two types of attention: involuntary attention, which is effortlessly drawn to nature, things that affect survival, and things that fascinate us; and voluntary attention, which requires effort to direct when there are competing stimuli. Voluntary attention is necessary for concentration, purposeful action, and monitoring one’s behavior in social interactions. Greater effort is required to direct voluntary attention in the presence of distractions that capture involuntary attention, which leads to a decreased capacity to direct attention (i.e., attentional fatigue).⁵

After the diagnosis of cancer, involuntary attention is drawn to the threatening information received and to the unfamiliar treatment environment, both of which pertain to survival.¹ The capacity to purposefully direct attention during this time may be significantly diminished (i.e., moderate-to-high levels of attentional fatigue), contributing to difficulty understanding the implications of one’s diagnosis, choosing among treatment alternatives, and maintaining social support.^{1,6}

Although the two may coincide, attentional fatigue is not physical fatigue.¹ Therefore, interventions for physical fatigue may not significantly improve attentional fatigue. In addition, the broader cognitive changes colloquially referred to as “chemo brain” include, but are not limited to, attentional fatigue.⁷

Breast and prostate cancer are the two most common cancers in women and men, respectively.⁸ The American Cancer Society estimates that 207,090 women will be diagnosed with breast cancer in the United States in 2010, and that as many as 2.5 million survivors are alive today.^{9,10} Approximately 217,730 men will be diagnosed with prostate cancer in 2010,⁸ with more than two million survivors currently alive.¹¹ It is interesting to note that the overwhelming majority of the studies on self-reported attentional fatigue, which are summarized below, evaluated only patients with breast cancer.

Studies Using the Attentional Function Index

Multiple studies over the past twenty years sought to characterize self-reported attentional fatigue using the Attentional Function Index (AFI)⁴ in patients with breast cancer before and after surgery, as well as during radiation therapy (RT) and chemotherapy. Across these cross-sectional^{1,12–15} and longitudinal^{2,16,17} studies, significant correlates of higher levels of self-reported attentional fatigue included higher levels of mood disturbance (i.e., anxiety and depression)^{1,12–17} and physical fatigue,¹⁵ and lower levels of psychological well-being and physical functioning.¹⁵ In addition, a higher number of symptoms¹² and higher levels of symptom distress¹³ were associated with higher levels of attentional fatigue. Finally, younger age, not working, and a higher number of comorbidities¹⁷—as well as pre-menopausal status,¹³ assessment closer to the time of surgery,² and the administration of chemotherapy¹⁶—were all correlated with higher levels of attentional fatigue in patients with breast cancer. No studies have used the AFI to assess attentional fatigue in patients with prostate cancer.

Studies Using Other Subjective Measures of Attentional Fatigue

Other subjective measures of cognitive changes, which in part evaluate for attentional fatigue, include the Cognitive Failures Questionnaire,¹⁸ a Dutch questionnaire for cognitive problems in daily life,¹⁹ the European Organization for Research and Treatment of Cancer-Quality of Life Questionnaire-C30 Cognitive Functioning Scale (EORTC-CF),²⁰ the Functional Assessment of Cancer Therapy-Cognitive Scale (FACT-OG),²¹ a German questionnaire for self-perceived deficits in attention (FEDA),²² and the Multiple Ability Self-Report Questionnaire.²³ Given that most of these measures assess attentional fatigue using only a single item, it is not known how well these measures evaluate the symptom or correlate with the AFI.

In patients with breast cancer, significant correlates of higher levels of attentional fatigue in studies that used these measures included higher levels of physical fatigue,^{24,25} anxiety and depression,^{26–28} and psychological distress;^{24,27,29} a lower quality of life;^{25,29} and the administration of chemotherapy.³⁰ Only two studies have evaluated for self-reported attentional fatigue using these measures in patients with prostate cancer. In the first study, no differences in attentional fatigue were found in patients who underwent short-term estradiol therapy while on long-term androgen deprivation therapy, compared to placebo.³¹ In the second study, patients who underwent androgen deprivation therapy did not differ from healthy controls on attentional fatigue.³²

Of note, no studies were found that evaluated for self-reported attentional fatigue or its correlates in patients with prostate cancer undergoing RT, and only one study has evaluated the predictors of the initial levels of attentional fatigue in patients with breast cancer at the initiation of RT.¹⁷ Therefore, the purposes of this study were to determine if self-reported attentional fatigue differed in patients with breast cancer and prostate cancer before RT and to determine the relationships between attentional fatigue and other symptoms in these two groups.

Methods

Participants and Settings

This descriptive, cross-sectional study recruited 73 patients with breast cancer and 82 patients with prostate cancer who met the following inclusion criteria: were ≥ 18 years of age; had the ability to read, write, and understand English; had a Karnofsky Performance Status (KPS) score of ≥ 60 ; and were scheduled to receive primary or adjuvant RT. Participants were excluded if they had metastatic disease, had more than one cancer diagnosis, or had a diagnosed sleep disorder. They were recruited from RT departments located in a Comprehensive Cancer Center and a community-based oncology program. This study was approved by the Human Subjects Committees of the University of California, San Francisco and the second study site.

Three hundred twenty-two patients with breast or prostate cancer were approached and 155 consented to participate (48% response rate). The response rate was higher in patients with breast cancer (54%) than in patients with prostate cancer (44%). The major reasons for refusal were being overwhelmed or too busy. No differences were found in any demographic or clinical characteristics between patients who did and did not choose to participate.

Theoretical Framework

The theoretical framework for this study was the Theory of Symptom Management.^{33–35} As it relates to this study, the symptom experience includes an individual's perception of

attentional fatigue, evaluation of the meaning of the symptom, and response to the symptom. Symptom management strategies include both the self-care strategies that individuals use for themselves and treatments that clinicians may prescribe. Symptom status outcomes specify that outcomes emerge from symptom management strategies as well as from the symptom experience. The Theory of Symptom Management places the experience of symptom management in the context of the domains of nursing science—namely person, health and illness, and environment. The focus of this study is on the symptom experience, specifically how the self-evaluation of attentional fatigue differs between patients with breast and prostate cancer.

Instruments

The study instruments included a demographic questionnaire, the KPS scale,³⁶ the AFI, a descriptive numeric rating scale (NRS) for worst pain intensity from the Brief Pain Inventory, the Center for Epidemiologic Studies-Depression scale (CES-D), the General Sleep Disturbance Scale (GSDS), the Lee Fatigue Scale (LFS), and the Spielberger State-Trait Anxiety Inventories (STAI-S and STAI-T). The demographic questionnaire provided information on age, living arrangements, marital status, years of education, employment status, race, and whether children were living at home. Additional clinical characteristics were collected, including number of comorbidities, stage of disease, previous treatments prior to RT, and total dose of RT.

Self-reported attentional fatigue at the present time was measured using the AFI. Originally developed for use with a visual analogue scale, the AFI was modified for this study to employ a 0 to 10 NRS. In a recent psychometric evaluation of the AFI, three redundant items were deleted from the original 16-item instrument.⁴ The revised 13-item AFI includes three subscales: effective action (seven items), attentional lapses (three items), and interpersonal effectiveness (three items). Analyses for this study were conducted using the modified instrument. Mean AFI subscale and total scores were calculated, with higher scores indicating greater capacity to direct attention and, therefore, lower levels of attentional fatigue. Based on a previously conducted analysis of the frequency distributions of total AFI scores,¹³ attentional fatigue can be categorized as high, moderate, or low (i.e., participants who score < 5.0 experiencing high levels of attentional fatigue, participants who score 5.0 to 7.5 experiencing moderate levels of attentional fatigue, and participants who score > 7.5 experiencing low levels of attentional fatigue). The AFI has established reliability and validity.⁴ It was used in studies of patients with breast cancer,^{1,2,12,13} as well as in studies of men with lung cancer⁴ and community-dwelling elderly men.³⁷ In the current study, Cronbach's alpha for the AFI was 0.93. For the three subscales, Cronbach's alphas were 0.95 for effective action, 0.77 for attentional lapses, and 0.80 for interpersonal effectiveness.

Worst pain during the past week was evaluated using a descriptive NRS from the Brief Pain Inventory that ranged from 0 (no pain) to 10 (excruciating pain).^{38,39} A descriptive NRS has well-established validity and reliability as a measure of pain intensity.⁴⁰ Because 50% of patients with breast cancer and 74% of patients with prostate cancer did not report pain, the symptom was recoded as present or absent for subsequent analyses.

Depressive symptoms during the past week were evaluated using the CES-D, which consists of 20 items selected to represent the major symptoms in the clinical syndrome of depression.⁴¹ Scores can range from 0 to 60, with a score of ≥ 16 indicating the need for an individual to seek a clinical evaluation for depression. The CES-D has well-established reliability and concurrent and construct validity.^{41–43} In the current study, Cronbach's alpha for the CES-D was 0.83.

Sleep disturbance during the past week was evaluated using the GSDS, which consists of 21 items that evaluate various aspects of sleep disturbance.⁴⁴ Each item is rated on a NRS that ranges from 0 (never) to 7 (every day). The 21 items are summed to yield a total score that can range from 0 (no disturbance) to 147 (extreme sleep disturbance). The GSDS has well-established validity and reliability.^{44–46} In the current study, Cronbach's alpha for the GSDS total score was 0.81.

The severity of physical fatigue at the present time was measured using the 13-item LFS.⁴⁷ Each item is rated using a 0 to 10 NRS, and a total score is calculated as the mean of the 13 items. Higher scores indicate higher levels of fatigue severity. Respondents were asked to rate each item based on how they felt prior to going to bed (i.e., evening fatigue) and within 30 minutes of awakening (i.e., morning fatigue) for two consecutive nights and days. The LFS has been used with healthy individuals, as well as with patients with cancer and HIV.^{44,48,49} The LFS has well-established validity and reliability.^{47,50} In the current study, Cronbach's alphas for the LFS for evening and morning fatigue were 0.95 and 0.96, respectively.

Anxiety was evaluated using the STAI-S and STAI-T, which consist of 20 items each that are rated from 1 to 4.⁵¹ The score for each scale is summed and can range from 20 to 80, with a higher score indicating greater anxiety.⁵² The STAI-S measures an individual's transitory emotional state at the present time, while the STAI-T measures an individual's predisposition to anxiety and estimates how that person generally feels.⁵³ The STAI-S and STAI-T have well-established criterion and construct validity and internal consistency reliability coefficients.^{51–53} In the current study, Cronbach's alphas for the STAI-S and STAI-T were 0.91 and 0.86, respectively.

Study Procedures

At the time of the simulation visit (i.e., approximately one week before the start of RT), a research nurse approached patients to discuss participation in the study. After obtaining written informed consent, participants were asked to complete the demographic and study questionnaires. Clinical characteristics were collected by chart review.

Data Analysis

Descriptive statistics and frequency distributions were generated on the sample characteristics and symptom severity scores using SPSS version 18.0. Based on analyses of the demographic characteristics, the patients with breast cancer were found to be significantly younger than the patients with prostate cancer. Due to age-related differences in self-reported attentional fatigue,^{13,15} age was added as a covariate in the subsequent analysis of covariance of group differences in AFI scores. A chi-square test was used to evaluate for overall group differences among the categories of attentional fatigue (i.e., low, moderate, high), and a Bonferroni correction was applied to its three post-hoc contrasts. After a review of relevant scatter plots to confirm the assumption of linear relationships, bivariate Pearson's correlations were calculated within each group to determine how closely other symptoms correlated with attentional fatigue.

An alpha level of 0.05 was used to test for statistical significance. Cohen's *d* effect sizes were calculated, with an effect size of 0.2 considered a small difference, 0.5 a moderate difference, and 0.8 a large difference between the groups.⁵⁴

Results

Patient Characteristics

As shown in Table 1, patients with breast cancer were significantly younger ($P < 0.001$), less likely to be married/partnered ($P < 0.001$), and more likely to have children at home ($P = 0.045$) than patients with prostate cancer. In addition, patients with breast cancer had a significantly lower KPS score ($P < 0.001$) than patients with prostate cancer. A higher proportion of patients with breast cancer had locally advanced disease ($P < 0.001$) and were treated with surgery ($P < 0.001$) and chemotherapy ($P < 0.001$) before RT.

Occurrence of Attentional Fatigue

As shown in Figure 1, significant differences were found in the percentage of patients with breast cancer who reported low (33%), moderate (48%), and high (19%) levels of attentional fatigue compared to patients with prostate cancer (55%, 38%, and 7%, respectively; $\chi^2=9.34$, $P = 0.009$). Post-hoc contrasts revealed that a significantly higher percentage of patients with prostate cancer reported AFI scores of > 7.5 (i.e., low levels of attentional fatigue) compared to patients with breast cancer ($P = 0.018$).

Differences in AFI Subscale and Total Scores Between Breast and Prostate Cancer Patients

Patients with breast cancer reported significantly lower mean total AFI scores (6.56, $sd=1.82$) than patients with prostate cancer (7.53, $sd=1.48$) ($P < 0.001$). Patients with breast cancer also reported significantly lower mean effective action subscale scores (6.34, $sd=2.21$) than patients with prostate cancer (7.72, $sd=1.74$) ($P < 0.001$). As shown in Figure 2, after controlling for age, patients with breast cancer still reported significantly lower total AFI scores ($P = 0.04$) and effective action ($P = 0.008$) subscale scores than patients with prostate cancer. No significant differences were found in the AFI subscale scores of attentional lapses and interpersonal effectiveness between the two groups.

Correlations Between AFI Scores and Other Symptom Severity Scores

As summarized in Table 2, in both groups, higher levels of attentional fatigue were correlated significantly with higher levels of depression and anxiety and more sleep disturbance and physical fatigue. However, these correlations were stronger in patients with breast cancer (range $r=-0.33$ to -0.72) than in patients with prostate cancer (range $r=-0.29$ to -0.60). Although more patients with breast cancer reported pain than patients with prostate cancer (50% versus 26%, $P = 0.003$), the presence of pain did not correlate significantly with attentional fatigue in either group.

Discussion

To our knowledge, this study is the first to identify differences in self-reported attentional fatigue between patients with breast cancer and patients with prostate cancer at the initiation of RT. While no studies have reported AFI scores in patients with prostate cancer, the mean AFI score for patients with breast cancer in this study was similar to AFI scores obtained prior to surgery^{12–14} and chemotherapy.¹⁶ While no studies have determined what constitutes a clinically meaningful difference in AFI total and subscale scores, between-group differences in AFI total scores and effective action subscale scores were of small-to-moderate effect sizes ($d=0.32$ and $d=0.42$, respectively). Findings from quality of life studies suggest that clinically meaningful differences are estimated to be at least a difference of one-half a standard deviation (SD) between the groups, with an effect size of 0.2 being a small difference, 0.5 being a moderate difference, and 0.8 being a large difference.⁵⁵

Potential Reasons for Differences in Attentional Fatigue Between the Groups

Before RT, 67% of women with breast cancer reported moderate-to-high levels of attentional fatigue. In contrast, only 45% of men with prostate cancer reported moderate-to-high levels of this symptom. As noted previously, the focus of this study was on the concept of the symptom experience within the Theory of Symptom Management, specifically how the self-evaluation of attentional fatigue differed between patients with breast and prostate cancer. Potential reasons for these differences fall within the person, health and illness, and environment domains that can influence the symptom experience.

In two studies,^{13,15} younger age was found to be significantly correlated with higher levels of attentional fatigue in patients with breast cancer. It is possible that the lower AFI scores (i.e., higher levels of attentional fatigue) in patients with breast compared to prostate cancer may be explained by younger patients being more distressed with changes in their capacity to direct attention than older patients, who may have developed coping strategies for age-related changes in attentional capacity.¹³ Since patients diagnosed at a younger age have a greater likelihood of working outside the home and/or caring for children than older patients, they may have more attentional demands that could contribute to higher levels of attentional fatigue.

The fact that patients with prostate cancer reported lower levels of attentional fatigue could be partially explained by differences in the length of time since diagnosis and treatments received prior to RT. Patients with prostate cancer were diagnosed approximately nine months prior to RT. In contrast, patients with breast cancer were diagnosed approximately five months prior to RT. In patients with prostate cancer, this difference may provide time for the initial distraction of diagnosis to give way to more normal attentional function. In addition, a higher proportion of patients with breast cancer had locally advanced disease before RT. Given the theoretical nature of attentional fatigue described previously, directing attention in the face of more advanced disease may require more effort, which contributed to higher levels of the symptom in the patients with breast cancer.

While all patients with breast cancer in the study underwent surgery and 55% had chemotherapy before RT, only 10% of patients with prostate cancer underwent surgery and none had chemotherapy. Time closer to surgery² and the administration of chemotherapy¹⁶ were found to correlate with higher levels of attentional fatigue in previous studies of patients with breast cancer. Therefore, these treatment differences may partially explain the higher levels of attentional fatigue reported by the patients with breast cancer.

Implications of Differences in Attentional Fatigue Between the Groups

Patients with breast cancer scored significantly lower on the effective action subscale of the AFI. However, no differences were found between the groups on the attentional lapses or interpersonal effectiveness subscales. These findings suggest that purposeful action at the initiation of RT may be more difficult for patients with breast cancer. However, both groups of patients may have similar levels of difficulty with sustained concentration and maintaining interpersonal relationships.

The finding that higher levels of state and trait anxiety were associated with higher levels of attentional fatigue is consistent with previous reports.^{12–14} Sixty-three percent of patients with breast cancer scored above the cut point of 31.8⁵² for significant levels of trait anxiety, while 44% of patients with prostate cancer scored above this cut point ($P = 0.024$). In addition, while 43% of patients with breast cancer scored above the cut point of 32.2 for significant levels of state anxiety, only 24% of patients with prostate cancer achieved this cut point score ($P = 0.016$). Lehto and Cimprich hypothesized that anxiety may worsen

attentional fatigue by reducing one's ability to sustain focus.¹⁴ These data suggest that this relationship occurs in both diagnostic groups.

The finding that higher levels of depressive symptoms were associated with higher levels of attentional fatigue is consistent with previous reports.^{1,12,13,15,16} Thirty-three percent of patients with breast cancer scored at or above the CES-D cut point of 16.0 for clinically significant levels of depressive symptoms, while only 7% of patients with prostate cancer scored at or above this cut point ($P < 0.001$). More depressive symptoms before RT may partially explain the higher levels of attentional fatigue in patients with breast cancer, as depressive symptoms and attentional fatigue are often correlated.^{15,16} Patients with breast cancer compared to those with prostate cancer had greater variance in CES-D scores ($sd=8.94$ versus $sd=5.75$), which may explain the stronger correlations between CES-D and AFI scores for these patients ($r=-0.72$ versus $r=-0.55$).

The moderate-to-strong correlations between the AFI and these symptom scores suggest that clinicians should routinely assess patients who are about to undergo RT for breast and prostate cancer for anxiety and depression as well as attentional fatigue. Future research needs to evaluate whether interventions for one or more of these symptoms have an impact on reducing attentional fatigue, anxiety, and/or depression in these patients. In addition, these correlations suggest that these symptoms may represent a symptom cluster that needs to be evaluated in future studies.

The weak-to-moderate associations between sleep disturbance and attentional fatigue in both groups suggest that interventions targeted at improving sleep may lessen attentional fatigue. In contrast, the weaker correlations between AFI scores and morning and evening ratings of physical fatigue suggest that improvements in physical fatigue may have only a minimal impact on attentional fatigue. This finding is consistent with the concept that attentional fatigue is not physical fatigue and that a person can experience one symptom with or without the other.¹

Limitations

Results of this study are limited in their generalizability by the demographic characteristics of the sample, especially that most of the participants were white and well educated. While gender differences in symptoms are reported in some studies,^{56,57} it was not possible to separate the contribution of gender from that of diagnosis in this study. Since many patients who declined to participate stated that they were overwhelmed, it is possible that this study underestimates the levels of attentional fatigue in the population of patients with breast and prostate cancer awaiting RT.

A larger sample and analyses at other time points would have the potential to identify additional relationships among the variables. This study did not collect data on menopausal status, which was shown to influence self-reported attentional fatigue in patients with breast cancer.¹³ Although previous studies collected data on attentional fatigue using both objective measures (e.g., the attention domain of the Repeatable Battery for the Assessment of Neuropsychological Status^{16,58}) and the AFI,^{1,2,12-14,16} the current study employed only the AFI. In addition, while no studies used the AFI in patients with prostate cancer, two studies employed both objective measures and other subjective measures of attention.^{31,32}

Implications for Research

The identification of differences in self-reported attentional fatigue between patients with breast and prostate cancer represents one step toward characterizing group differences in self-reported attentional fatigue. While differences between the groups were statistically significant, it is unknown whether they represent clinically meaningful differences. Future

studies need to determine what constitutes a clinically meaningful difference in AFI scores beyond estimation of an effect size.⁵⁵ Although this symptom requires better characterization in both groups, the paucity of information about attentional fatigue in patients with prostate cancer calls for additional studies in this population. These studies could be aimed at characterizing the symptom over the course of RT and other treatments, identifying predictors of attentional fatigue using hierarchical linear modeling, and determining genetic correlates of the symptom.

A case-control study that categorizes and evaluates patients who report moderate-to-high levels of attentional fatigue as cases might provide a better characterization of this symptom. A possible interventional study aimed at alleviating the symptom in patients with prostate cancer could include testing the natural restorative environment intervention that was tested previously in patients with breast cancer.⁵⁹

An additional reason for the differences in attentional fatigue between the groups could be related to gender differences in levels of proinflammatory cytokines (e.g., IL-1 β , IL-6, TNF α).^{60–63} For example, in a study by Deswal and colleagues,⁶⁴ men and women differed in levels of IL-6. However, findings on gender differences in levels of proinflammatory cytokines are not consistent across studies.^{64–67} Therefore, the contribution of proinflammatory cytokines to group differences in levels of attentional fatigue warrants additional investigation.

Implications for Practice

A strong capacity to direct attention is important to the maintenance of purposeful activity³ and interpersonal relationships.⁴ This capacity is especially important at the time of diagnosis and treatment for breast and prostate cancer. Clinicians should consider the capacity of their patients to direct attention when learning about RT and other treatments, as an unfamiliar treatment environment and information pertaining to survival may contribute to attentional fatigue.⁶⁸ It would be important to simplify confusing health care terminology and reinforce teaching that is most important verbally and in writing. As much as possible, clinicians should foster a health care environment with minimal distractions.

Clinicians could use findings from this study to educate their patients about anticipation and recognition of attentional fatigue. In addition, appropriate interventions for anxiety and depression may improve attentional fatigue in these patient populations.

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Figure 1. Differences in percentages of patients with breast and prostate cancer who reported low (i.e., AFI scores > 7.5), moderate (i.e., AFI scores 5.0–7.5), and high (i.e., AFI scores < 5.0) levels of attentional fatigue. Abbreviation: AFI, Attentional Function Index.

Figure 2.

After controlling for age, differences in AFI subscale and total scores between patients with breast and prostate cancer. All age-adjusted values are plotted as means $\pm$ SEM. Lower AFI scores indicate higher levels of attentional fatigue. Abbreviations: AFI, Attentional Function Index; SEM, standard errors of the means.

Table 1

Differences in Demographic and Clinical Characteristics Between Patients With Breast and Prostate Cancer (n = 155).

	Breast Cancer (n = 73) Mean (SD)	Prostate Cancer (n = 82) Mean (SD)
Demographic Characteristics		
Age (years) ^a	54.3 (11.4)	67.1 (7.8)
Education (years)	16.2 (2.7)	16.0 (3.2)
Children at home ^b	26%	11%
Employed	46%	46%
Racial group		
White	66%	77%
Other	34%	23%
Lives alone ^b	41%	23%
Married/partnered ^a	37%	72%
Clinical Characteristics		
Karnofsky Performance Status scale score ^a	88.6 (11.1)	95.6 (6.9)
Number of comorbidities	5.2 (2.5)	4.6 (2.5)
Months since diagnosis ^b	5.3 (2.7)	8.9 (12.7)
Stage of disease ^a		
Localized	56%	91%
Locally advanced	44%	9%
Chemotherapy prior to radiation therapy ^a	55%	0%
Surgery prior to radiation therapy ^a	100%	10%
Breast conserving surgery	74%	-
Lymph node dissection	49%	-
Hormone replacement therapy prior to diagnosis	44%	-
Androgen deprivation therapy prior to radiation therapy	-	51%
Gleason score	-	6.8 (0.9)
Pretreatment PSA level (nanograms/milliliter)	-	10.9 (7.9)

Abbreviation: PSA, prostate-specific antigen; SD, standard deviation.

^a $P < .001$.

^b $P < .05$.

Table 2

Pearson's Correlations Between AFI Scores and Other Symptom Scores

Symptom	Breast Cancer (n = 73)	Prostate Cancer (n = 82)
Trait anxiety	−0.71 ^a	−0.60 ^a
State anxiety	−0.62 ^a	−0.54 ^a
CES-D	−0.72 ^a	−0.55 ^a
GSDS	−0.56 ^a	−0.42 ^a
Morning physical fatigue	−0.49 ^a	−0.31 ^b
Evening physical fatigue	−0.33 ^b	−0.29 ^b

Abbreviations: AFI, Attentional Function Index; CES-D, Center for Epidemiologic Studies-Depression scale; GSDS, General Sleep Disturbance Scale.

^a $P < .001$.

^b $P < .05$.