

■ CNE Article

Self-Care Strategies to Relieve Fatigue in Patients Receiving Radiation Therapy

Jeanne M. Erickson, PhD, RN, AOCN®, Laura Kim Spurlock, RN, BSN, Jenna Centini Kramer, MSN, ACNP-BC, OCN®, and Mary Ann Davis, RN, MSN, OCN®



© iStockphoto.com/Leigh Schindler

Despite advances in symptom management, patients commonly experience fatigue during radiation therapy (RT). Minimal research has been conducted to determine how evidence-based recommendations are put into clinical practice and used by patients to manage fatigue. The aims of the current study were to identify the self-care strategies used by patients receiving RT, explore the effectiveness of those strategies, and identify how patients learned about fatigue management. Participants reported using multiple recommended interventions to relieve fatigue. The majority of participants reported they primarily rested or slept to improve fatigue. They also reported decreasing their activity level, exercising, using stimulants and complementary therapies, and eating and drinking nutritious items. More than half of the participants reported some relief of fatigue regardless of the intervention used. The majority of participants reported that they learned how to manage their fatigue mostly through experience and trial and error. Nurses need to explore the complex dynamics of each patient's fatigue and tailor multiple evidence-based interventions to maximize each patient's functional status and quality of life. When assessing and teaching about fatigue, nurses need to explore patients' daytime activity level and daytime sleep to be sure that excessive inactivity is not contributing to fatigue.

Jeanne M. Erickson, PhD, RN, AOCN®, is an assistant professor in the School of Nursing at the University of Virginia in Charlottesville; Laura Kim Spurlock, RN, BSN, is an RN clinician II at the Lawrence and Memorial Hospital in New London, CT; Jenna Centini Kramer, MSN, ACNP-BC, OCN®, is a hematology/oncology nurse practitioner at MedStar Georgetown University Hospital in Washington, DC; and Mary Ann Davis, RN, MSN, OCN®, is a palliative care nurse coordinator at the University of Virginia Health System in Charlottesville. The authors take full responsibility for the content of the article. The authors did not receive honoraria for this work. The content of this article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from commercial bias. No financial relationships relevant to the content of this article have been disclosed by the authors, planners, independent peer reviewers, or editorial staff. Erickson can be reached at jme3a@virginia.edu, with copy to editor at CJONEditor@ons.org. (Submitted June 2012. Revision submitted October 2012. Accepted for publication October 17, 2012.)

Digital Object Identifier:10.1188/13.CJON.319-324

Fatigue is a common and distressing symptom for patients receiving radiation therapy (RT), with 95% of patients reporting fatigue to their healthcare providers (Knobf & Sun, 2005). Fatigue creates a multidimensional sense of energy depletion that has the potential to adversely affect multiple aspects of quality of life, including patient functional status, emotional well-being, motivation, mood, and social relationships (John, 2009; Lundh Hagelin, Wengström, Fürst, 2009; Poirier, 2011; Sood & Moynihan, 2005). The underlying pathophysiology of fatigue is not well understood, but fatigue may result from changes in muscle metabolism, hormonal changes, and circadian rhythm disruptions related to cancer and cancer therapy (Ryan et al., 2007; Wang, 2008). Cancer-related fatigue may be associated with changes

in sympathetic and parasympathetic nervous system activity, suggesting a picture of "accelerated aging" (Fagundes et al., 2011). Fatigue during radiation may cluster with pain and sleep disturbances and also may be associated with depression, anemia, poor appetite, anxiety, and neutropenia (Campos, Hassan, Riechelmann, & Del Giglio, 2010; Kim, Barsevick, & Tulman, 2009; Matthews, Schmiede, Cook, & Sousa, 2012; Merriman et al., 2011). Patient and clinical variables, such as age, stage of disease, dose of radiation, and psychosocial factors (e.g., anxiety, depression), have been explored as predictors of fatigue during RT. In patients with breast cancer, evidence regarding those predictors of fatigue during RT has not been consistent across studies (Dhruva et al., 2010). Although patients report fatigue throughout the course of RT, evidence suggests

that fatigue increases in severity during the early weeks of treatment, peaks around the fifth week of therapy, and declines about two months after the completion of treatment (Borthwick, Knowles, McNamara, O'Dea, & Stroner, 2003; Knobf & Sun, 2005; Nail, 2004). For about 30% of patients, acute fatigue becomes a chronic, long-term symptom that persists for months or years after the completion of RT (Ganz & Bower, 2007; Jereczek-Fossa, Marsiglia, & Orrechia, 2002).

A number of evidence-based interventions have been identified to prevent and manage fatigue. The Oncology Nursing Society's (ONS's) evidence-based guidelines recommend exercise as the only intervention supported by strong evidence to prevent and manage fatigue (Mitchell, Beck, & Eaton, 2009). Other interventions that likely are effective include screening for additional contributing and treatable factors, such as anemia, pain, nausea, and sleep disturbances, and addressing those individual problems. Teaching energy conservation, measures to promote adequate sleep, stress and activities management, and complementary and alternative therapies (e.g., relaxation, massage, healing touch) also is likely to be effective. Many pharmacotherapies, such as paroxetine, methylphenidate, donepezil, bupropion, modafinil, and sertraline, have been investigated as interventions to relieve fatigue, but their effectiveness has not yet been established. Nonpharmacologic therapies have the benefit of minimal to no side effects and the potential to address multiple symptoms (Bennett et al., 2009).

Because many of the evidence-based interventions to relieve fatigue are self-care behaviors, healthcare providers need information about how patients are incorporating those interventions into their daily activities. After an educational intervention, women receiving chemotherapy for breast cancer increased the use of self-care measures to manage fatigue, such as rest, relaxation, and exercise; however, these measures did not translate into actual self-reported decreases in fatigue (Williams & Schreier, 2004; Yates et al., 2005). Haas (2011) suggested that strategies to improve self-efficacy are needed to increase the effectiveness and implementation of self-care measures. Few studies have described the self-care behaviors for fatigue used by patients during RT. Borthwick et al. (2003) found that patients with lung cancer used exercise, education, attention restoring, and energy conservation to relieve fatigue during RT. Lundberg and Rattanasuwan (2007) studied a group of Thai Buddhist patients undergoing RT. Those patients reported relieving fatigue by getting moral support from family and friends, through religion and meditation practices, and consulting with doctors and nurses.

Because little is known about the self-care behaviors used by patients during RT to relieve fatigue, the aim of the current study was to describe the self-care strategies to manage fatigue used

TABLE 1. Radiation Treatment Characteristics of Participants (N = 29)

Cancer Site	Cancer Stage	n	Average Week of Therapy	Average Dose of Radiation (Gy)
Basal cell	IV	1	6	52.5
Brain	WHO II, III	2	5	45
Breast	0–I	4	4.25	42.1
	II–III	5	4.8	41.36
Gastrointestinal	I	2	4.5	39.5
Gynecologic	0–I	1	4	34
	II–IV	2	4	31.5
Head and neck	IIIA	3	4.3	38
Lymphoma	IIA	1	4	32.4
Melanoma	IV	1	5	40
Prostate	II–III	4	5.75	51
Sarcoma	I–II	3	5.3	45.4
WHO—World Health Organization				

by patients undergoing RT. Secondary aims were to explore the effectiveness of the self-care strategies and to identify the source of information for the self-care activities. Unfortunately, some patients believe fatigue is an unavoidable consequence of therapy and, therefore, do not take any preventive actions (Pertl, Hevey, Donohoe, & Collier, 2012). Clinicians need to work to overcome that barrier, educate patients about evidence-based interventions to manage fatigue, and help patients feel confident in their use of self-care measures (Wu & McSweeney, 2007).

Methods

Sample and Setting

The current study used a convenience sample of adults (aged 18 years or older) at the University of Virginia (UVA) Health System who were receiving external beam RT as adjuvant or primary therapy for cancer. To be eligible for the study, patients needed to understand English, have a Karnofsky performance score greater than 80 (as determined by the RT team), and complete at least two weeks of therapy. Patients were excluded if they were receiving concurrent chemotherapy or they had a cognitive, psychiatric, or communication disorder that would interfere with recall of symptoms or completion of study forms.

Thirty patients consented to participate in the study, but one patient withdrew because of time constraints before data were collected. The remaining 29 patients included 18 women (62%) and 11 men (38%). Twenty patients were Caucasian (69%) and nine were African American (31%); the mean age of the sample was 58.8 years (SD = 10.1, range = 40–80 years). Participants were receiving RT for a variety of cancers. At the time of data collection, patients were in their second through seventh week

Exploration on the Go

Learn more about self-care strategies used to manage fatigue with the Oncology Nursing Society's Putting Evidence Into Practice Fatigue resource page. To access, open a barcode scanner on your smartphone, take a photo of the code, and your phone will link automatically. Or, visit www.ons.org/Research/PEP/Fatigue.



of RT (average week = 4.7), and the patients had received a 55.6 Gy (range = 20–62.3) dose of radiation (see Table 1).

Procedures

The UVa Cancer Center Protocol Review Committee and the UVa Institutional Review Board approved the study. Clinic nursing staff introduced the study to the patients, and the study coordinator met with those patients interested in hearing more about the study to complete the informed consent process. Questions about the study were encouraged and answered. Once the consent process was completed, participants completed the Brief Fatigue Inventory (BFI) as a screening tool and were eligible to continue in the study if their response to the first question, “Have you felt unusually tired or fatigued in the prior week?” was “yes.”

Participants who indicated that they felt unusually tired or fatigued in the prior week completed a 15-minute semistructured interview conducted by the study coordinator. The interview consisted of open-ended questions to determine the self-care activities used by the participant to relieve fatigue and the effectiveness of the interventions (see Figure 1). After the participant stated his or her preferred or first intervention, the study coordinator asked for additional interventions until the participant had described all the activities used to relieve fatigue. Participants also were asked to describe the effectiveness of the intervention and the source of information about that intervention. At the conclusion of the interview, the study coordinator discussed the educational handout, “Seven Ways to Manage Cancer-Related Fatigue” (American Cancer Society, 2010) (see Figure 2) and answered any questions.

Instrument

The BFI measures the severity of fatigue and the impact of fatigue on daily functioning in the prior week (Mendoza et al., 1999). The BFI has nine items, and participants respond using a Likert-type scale from 0 (no fatigue or does not interfere) to 10 (as bad as can be imagined or completely interferes). The average of the 9 items represents a global fatigue score, and higher responses indicate worse fatigue and higher interference. The BFI had been a reliable instrument to measure fatigue in previ-

You told us that you have felt unusually tired or fatigued during this past week. It is common for people to feel tired during radiation therapy. I want to explore what helps people when they feel tired and fatigued during radiation therapy.

1. What do you do most often to relieve your fatigue or tiredness?
 - How often do you do this activity?
 - How much does it help to relieve your fatigue?
 - Where did you hear of this activity to relieve fatigue?
 - Would you recommend this activity to someone else with the same problem? Why or why not?
2. What else do you do to relieve your fatigue or tiredness?

(Continue with sequence of questions until the participant does not name any activities.)

FIGURE 1. Interview Guide to Elicit Self-Care Behaviors Used to Relieve Fatigue

Implications for Practice

- ▶ Patients receiving radiation therapy may suffer from cancer-related fatigue and use a number of strategies on a daily basis for relief, particularly sleep and rest.
- ▶ Nurses need to explore patients' daytime activity levels and daytime sleep to be sure that excessive inactivity is not inadvertently contributing to fatigue.
- ▶ Continued assessment and discussion about fatigue are necessary to legitimize the symptom of fatigue and tailor interventions to prevent and manage this dynamic symptom.

ous studies (Mendoza et al., 1999; Poirier, 2006). In the current study, internal consistency for the BFI measured with Cronbach alpha was 0.94.

Data Analysis

The study coordinator recorded notes during each interview. After the interview, participants' responses were organized under each question using a prestructured case approach, such as, “What was the first intervention named to relieve fatigue?” (Miles & Huberman, 1994). Using an open-coding approach, two experienced oncology nurses placed similar responses into categories under each question until they reached complete agreement on categorization. Participants who responded under a particular category also were counted or quantified (Wilkins & Woodgate, 2008). The categories and frequencies were verified by three coauthors.

Results

Fatigue

The entire sample's BFI scores ranged from 0–8.7, with a mean score of 4.53. Twenty-two participants (76%) indicated they felt unusually tired or fatigued during the prior week and proceeded to complete the study interview. The BFI scores for participants who reported unusually high fatigue during the previous week and completed the interview were significantly higher than the scores of those who did not report high fatigue ($t = 3.57, p = 0.001$).

Participants named between 1–6 interventions that they used to relieve fatigue, with an average of 2.7 interventions per participant. Table 2 lists the interventions that were named by study participants. The majority of participants (68%) reported that they first rested or slept to improve their fatigue, but other responses included decreasing activity level, exercising, maintaining usual activity level, using stimulant substances, and eating or drinking something nutritious, such as Boost® supplements. Additional strategies named by the participants included the support of family and friends, complementary and alternative therapies such as mind-body practices and massage, and religious practices such as praying.

Responding to how often they used interventions to relieve fatigue, most participants incorporated those strategies into their daily lifestyles. Of the 17 participants who reported that they rested or slept to relieve fatigue, 14 reported that they used this

Just as the treatment for every patient with cancer is different, the fatigue felt will be different, too. Although one person may feel very tired, another may not, and one person's fatigue may last longer than another's. Here are seven tips for patients to manage cancer-related fatigue:

- ▶ **Rest, but not too much:** Plan your day so you have time to rest. Take short naps or breaks (30 minutes or less), rather than one long rest period during the day. Too much rest can decrease your energy level. Try to sleep 7–8 hours each night. If you have trouble sleeping, talk to your healthcare team.
- ▶ **Stay active:** Stay as active as you can. Regular moderate exercise—especially walking—has been found to be a good way to ease fatigue. To help you plan your activities, keep a diary of how you feel each day. When talking about your fatigue, doctors or nurses may ask things like how bad it is (often rated from 0-10), what are the patterns to it, and what makes it better or worse? Keeping a record of how you feel makes it easy to answer these questions. Many doctors have their patients see a physical therapist or exercise physiologist to figure out the best exercise program for their situation. Talk to your doctor about the type of exercise that's best for you.
- ▶ **Save your energy:** First of all, prioritize. Decide which activities are really important to you and which ones aren't. Plan ahead. Spread your activities throughout the day. Take rest breaks between activities. Don't push yourself by standing too long or by doing activities in extreme temperatures. Even long, hot showers or baths can drain your energy. Store items that you use often within easy reach, so you won't have to strain or walk to get them.
- ▶ **Get help:** Ask your family or friends to help with the things you find tiring or hard to do. This may be things like mowing the lawn, preparing meals, doing housework, or running errands. Don't force yourself to do more than you can manage. It may be hard for others to understand that rest does not make your fatigue go away. Try to explain that the fatigue you feel is different from "normal" fatigue—this may help them understand. Many people may ask if there's anything they can do for you. People who offer to help really want to, but they may not know what to do. Making specific requests can give them something to do that really helps you and makes them feel good, too. It can help you even more to pick a "job coordinator" who can organize people to sign up for routine chores. Your coordinator can also explain if there are times when you are so tired that you don't even have the energy to talk to your friends and loved ones.
- ▶ **Get support:** Think about joining a support group. Sharing your feelings with others can ease the burden of fatigue. You can learn coping hints from others by talking about your situation. Ask your health care professional to put you in touch with a support group in your area. Or contact us to find a group near you.
- ▶ **Eat well:** Drink plenty of water and juices. Eat as well as you can. Try to eat at least 2.5 cups of fruits and vegetables each day. Get enough protein and calories to help your body heal.
- ▶ **Call your doctor:** Call your doctor if you feel too tired to get out of bed for a 24-hour period, if you feel confused, dizzy, lose your balance or fall, have problems waking up, have problems catching your breath, or if the fatigue seems to be getting worse. Fatigue caused by cancer and its treatment is short-term, experts say. It will take time to feel like yourself again, but you can expect your energy to come back even faster if you are able to stay active.

FIGURE 2. Seven Ways to Manage Cancer-Related Fatigue

Note. Reprinted by the permission of the American Cancer Society, Inc., 2012, from www.cancer.org. All rights reserved.

strategy every day, including two patients who napped twice a day and two patients who took "many small naps" during the day. Of the participants who exercised, three took daily walks and two exercised at the gym 2–4 times a week. Participants who reported using stimulant substances used them every day; one reported an intake of "four cups of coffee throughout the day."

Participants were asked about the effectiveness of the interventions they used to relieve fatigue. More than half of the participants (68%) reported at least some relief of fatigue, regardless of the intervention they were using. Most participants responded that they would recommend the interventions they were using to others, but also commented that each person has to figure out what works best for them. One person suggested, "If you were an active person before cancer, it will probably help you to try to stay active."

The majority of participants (80%) reported that they learned how to manage their fatigue from their own knowledge and experience and from trial and error. For example, one participant said that she figured out that keeping busy relieved her fatigue. Another participant shared that lying down when he felt tired was "just what I do." Only 20% of the participants recalled having a discussion about fatigue management with a nurse, physician, or nutritionist.

Discussion

About 80% of the current sample reported feeling unusually tired during the prior week, consistent with previous studies. The current sample also reported trying a number of interventions to relieve fatigue that are recommended and likely to be effective, according to the ONS Putting Evidence Into Practice (PEP) resources (Mitchell et al., 2009). A few patients reported they used caffeine as a stimulant to reduce fatigue, which is not recommended as an evidence-based intervention, although other stimulant substances, such as methylphenidate and modafinil, have been studied (Jean-Pierre et al., 2010; Minton, Richardson, Sharpe, Hotopf, & Stone, 2011). Patients also reported using nutritional interventions and enlisting the support of family and friends, which also are interventions that are recommended by the experts as consistent with sound clinical practice. With the exception of one patient who used marijuana, patients in this study did not use any interventions that were controversial or potentially harmful. Most patients reported that they received some relief of their fatigue with their chosen interventions and incorporated those strategies into their daily lifestyles, but no patient reported that their fatigue was completely alleviated.

Findings from the current study suggest that the majority of patients report sleep and rest as their primary method to relieve RT-related fatigue. How often the participants napped during the day and decreased their activity level is not known, and, although rest and an adequate amount of quality sleep are recommended, decreased physical activity also can be associated with increased fatigue as well as other negative physical and psychological consequences (Lowe, Watanabe, Baracos, & Courneya, 2009; Schmitz et al., 2010). Patients experiencing fatigue may have a natural instinct to rest or decrease activity when feeling fatigued; however, this practice may achieve the opposite of the desired effect and, in fact, cause more severe

TABLE 2. Interventions Reported by Patients to Relieve Fatigue (N = 22)

Intervention	n
Primary	
Lie down, rest, sleep	15
Decrease activity level or do quiet activities	2
Exercise	2
Eat or drink something nutritious (e.g., Boost®)	1
Maintain activity level	1
Use stimulant substances (e.g., coffee)	1
Secondary	
Maintain usual activity level	7
Rely on support of family and friends	7
Complementary and alternative therapy	5
Exercise	5
Nutrition	3
Pray or rely on religion	3
Use stimulant substances	3
Decrease activity level or do quiet activities	2
Lie down, rest, sleep	2
<i>Note.</i> Participants could choose more than one secondary intervention.	

fatigue. Nurses need to explore patient daytime activity level and daytime sleep to be sure that excessive inactivity is not inadvertently contributing to fatigue. Nurses should encourage patients to maintain an optimal level of activity through usual daily-life activities as well as mild-to-moderate exercise after ruling out the presence of factors that would contraindicate physical activity, such as anemia or risk for bone instability. Nurses should explore and address barriers to physical activity, such as low self-efficacy, deconditioning, symptoms such as pain, shortness of breath, or fear of injury (Haas, 2011; Wanchai, Armer, & Stewart, 2011). Nurses can encourage physical activity using strategies and resources, such as support from other patients, exercise and physical therapy consultations, exercise groups, and activity interventions incorporated into the RT setting.

The standard of nursing practice in the RT clinic is to teach patients about symptoms and symptom management at the start of their treatment course and to assess symptom severity at weekly intervals during treatment. However, only 20% of patients in the current study recalled learning about fatigue management from a nurse or other healthcare provider, which may indicate the persistent belief that fatigue is an unavoidable consequence that must be endured during treatment. To legitimize fatigue as a concerning symptom and help patients strategize about relief, nurses must make a concerted effort to continue assessment and ongoing discussions about the management of fatigue. Patient

education resources are available in print or electronic format from a variety of organizations, such as the American Cancer Society, ONS, and CancerCare®. Nurses have a responsibility to stay informed about evidence-based symptom management interventions, share the most current recommendations with their patients, and evaluate patient outcomes related to patient education and use of those interventions.

Patients receiving RT become fatigued not only from the actual treatment, but also from travel to daily appointments, physical symptoms such as pain, poor appetite, and emotional distress, as well as other comorbidities. Because a variety of factors contribute to fatigue during RT, nurses need to explore the complex dynamics of fatigue with each patient and tailor multiple evidence-based interventions to improve each individual patient's functional status and quality of life (Stricker, Drake, Hoyer, & Mock, 2004).

Limitations

Limitations of the study include a small, heterogeneous, convenience sample of patients who were receiving RT. Socioeconomic, cognitive, and psychiatric variables were not measured, which may provide more insight into the choice of self-care strategies reported by the participants. In addition, the teaching each patient received about fatigue management was not explored, so conclusions about the effectiveness of patient education cannot be made. In addition, several patients were interviewed during the second and third weeks of RT, which may have been before the onset of treatment-related fatigue.

Conclusions

Despite advances in symptom management, patients commonly experience fatigue during their course of RT. Although many factors contribute to fatigue, a number of evidence-based recommendations are available for nurses to tailor and recommend to patients. The current study illustrates that patients are likely to use a variety of recommended self-care measures to relieve fatigue. Nurses may need to make special efforts to explore how patients are adjusting their physical activity level when experiencing fatigue and to remind them that fatigue is an important symptom that can be prevented and managed. The current study suggests that patients may be more likely to reduce their level of physical activity rather than stay physically active, which actually may contribute to increased fatigue.

References

American Cancer Society. (2010). Seven ways to manage cancer-related fatigue. Retrieved from <http://www.cancer.org/Treatment/TreatmentsandSideEffects/PhysicalSideEffects/Fatigue/seven-ways-to-manage-cancer-related-fatigue>

Bennett, S., Purcell, A., Meredith, P., Beller, E., Haines, T., & Fleming, J. (2010). Educational interventions for the management of cancer-related fatigue in adults. *Cochrane Database of Systematic Review*, 4, CD008144. doi:10.1002/14651858.CD008144

Borthwick, D., Knowles, G., McNamara, S., O'Dea, R., & Stroner, P. (2003). Assessing fatigue and self-care strategies in patients receiving radiotherapy for non-small cell lung cancer. *European Journal of Oncology Nursing*, 7, 231-241.

- Campos, M.P., Hassan, B.J., Riechelmann, R., & Del Giglio, A. (2010). Cancer-related fatigue: A practical review. *Annals of Oncology*, 22, 1273–1279. doi:10.1093/annonc/mdq458
- Dhruva, A., Dodd, M., Paul, S.M., Cooper, B.A., Lee, K., West, C., . . . Miaskowski, C. (2010). Trajectories of fatigue in patients with breast cancer before, during, and after radiation therapy. *Cancer Nursing*, 33, 201–211. doi:10.1097/NCC.0b013e3181c75f2a
- Fagundes, C.P., Murray, D.M., Hwang, B.S., Gouin, J., Thayer, J.F., Sollers, J.J., . . . Kiecolt-Glaser, J.K. (2011). Sympathetic and parasympathetic activity in cancer-related fatigue: More evidence for a physiological substrate in cancer survivors. *Psychoneuroendocrinology*, 36, 1137–1147. doi:10.1016/j.psyneuen.2011.02.005
- Ganz, P.A., & Bower, J.E. (2007). Cancer related fatigue: A focus on breast cancer and Hodgkin disease survivors. *Acta Oncologica*, 46, 474–479. doi:10.1080/02841860701367845
- Haas, B.K. (2011). Fatigue, self-efficacy, physical activity, and quality of life in women with breast cancer. *Cancer Nursing*, 34, 322–334.
- Kim, H., Barsevick, A.M., & Tulman, L. (2009). Predictors of intensity of symptoms in patients with breast cancer. *Journal of Nursing Scholarship*, 41, 158–165.
- Knobf, M.T., & Sun, Y. (2005). A longitudinal study of symptoms and self-care activities in women treated with primary radiotherapy for breast cancer. *Cancer Nursing*, 28, 210–218.
- Jean-Pierre, P., Morrow, G.R., Roscoe, J.A., Heckler, C., Mohile, S., Janelins, M., . . . Hopkins, J.O. (2010). A phase 3 randomized, placebo-controlled trial of modafinil on cancer-related fatigue among 631 patients receiving chemotherapy: A University of Rochester Cancer Center Community Clinical Oncology Program Research base study. *Cancer*, 116, 3513–3520.
- Jereczek-Fossa, B.A., Marsiglia, H.R., & Orecchia, R. (2002). Radiotherapy-related fatigue. *Critical Reviews in Oncology and Hematology*, 41, 317–325.
- John, L.D. (2009). Self-care strategies used by patients with lung cancer to promote quality of life. *Oncology Nursing Forum*, 37, 339–347.
- Lowe, S.S., Watanabe, S.M., Baracos, V.E., & Courneya, K.S. (2009). Associations between physical activity and quality of life in cancer patients receiving palliative care: A pilot study. *Journal of Pain and Symptom Management*, 38, 785–796.
- Lundberg, P.C., & Rattanasuwan, O. (2007). Experiences of fatigue and self-management of Thai Buddhist cancer patients undergoing radiation therapy. *Cancer Nursing*, 30, 146–155.
- Lundh Hagelin, C., Wengström, Y., & Fürst, C.J. (2009). Patterns of fatigue related to advanced disease and radiotherapy in patients with cancer—A comparative cross-sectional study of fatigue intensity and characteristics. *Supportive Care in Cancer*, 17, 519–526.
- Matthews, E.E., Schmiede, S.J., Cook, P.F., & Sousa, K.H. (2012). Breast cancer and symptom clusters during radiotherapy. *Cancer Nursing*, 35(2), E1–E11. doi:10.1097/NCC.0b013e3182277222
- Mendoza, T.R., Wang, X.S., Cleeland, C.S., Morrissey, M., Johnson, B.A., Wendt, J.K., & Huber, S.L. (1999). The rapid assessment of fatigue severity in cancer patients: Use of the Brief Fatigue Inventory. *Cancer*, 85, 1186–1196.
- Merriman, J.D., Dodd, M., Lee, K., Paul, S.M., Cooper, B.A., Aouizerat, B.E., . . . Miaskowski, C. (2011). Differences in self-reported attentional fatigue between patients with breast and prostate cancer at the initiation of radiation therapy. *Cancer Nursing*, 34, 345–353.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.) Thousand Oaks, CA: Sage.
- Minton, O., Richardson, A., Sharpe, M., Hotopf, M., & Stone, P.C. (2011). Psychostimulants for the management of cancer-related fatigue: A systematic review and meta-analysis. *Journal of Pain and Symptom Management*, 41, 761–767.
- Mitchell, S.A., Beck, S.L., & Eaton, L.H. (2009). Fatigue. In L.H. Eaton & J.M. Tipton (Eds.), *Putting evidence into practice: Improving oncology patient outcomes* (pp. 149–174). Pittsburgh, PA: Oncology Nursing Society.
- Nail, L.M. (2004). My get up and go got up and went: Fatigue in people with cancer. *Journal of the National Cancer Institute*, 32, 72–75.
- Pertl, M.M., Hevey, D., Donohoe, G., & Collier, S. (2012). Assessing patients' beliefs about their cancer-related fatigue: Validation of an adapted version of the illness perception questionnaire. *Journal of Clinical Psychology in Medical Settings*, 19, 293–307.
- Poirier, P. (2006). The relationship of sick leave benefits, employment patterns, and individual characteristics to radiation therapy-related fatigue. *Oncology Nursing Forum*, 33, 593–601.
- Poirier, P. (2011). The impact of fatigue on role functioning during radiation therapy. *Oncology Nursing Forum*, 38, 457–465.
- Ryan, J.L., Carroll, J.K., Ryan, E.P., Mustian, K.M., Fiscella, K., & Morrow, G.R. (2007). Mechanisms of cancer-related fatigue. *Oncologist*, 12(Suppl.), 22–34. doi:10.1634/theoncologist.12-S1-22
- Schmitz, K.H., Courneya, K.S., Matthews, C., Demark-Wahnefried, W., Galvão, D.A., Pinto, B.M., . . . Schwartz, A.L. (2010). American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Medicine and Science in Sports and Exercise*, 42, 1409–1426.
- Sood, A., & Moynihan, T.J. (2005). Cancer-related fatigue: An update. *Current Oncology Reports*, 7, 277–282.
- Stricker, C.T., Drake, D., Hoyer, K.A., & Mock, V. (2004). Evidence-based practice for fatigue management in adults with cancer: Exercise as an intervention. *Oncology Nursing Forum*, 31, 963–974.
- Wanchai, A., Armer, J., & Stewart, B. (2011). Nonpharmacologic supportive strategies to promote quality of life in patients experiencing cancer-related fatigue: A systematic review. *Clinical Journal of Oncology Nursing*, 15, 203–214.
- Wang, X.S. (2008). Pathophysiology of cancer-related fatigue. *Clinical Journal of Oncology Nursing*, 12(Suppl.), 11–20.
- Wilkins, K., & Woodgate, R. (2008). Designing a mixed methods study in pediatric oncology nursing research. *Journal of Pediatric Oncology Nursing*, 25, 24–33. doi:10.1177/1043454207311914
- Williams, S.A., & Schreier, A.M. (2004). The effect of education in managing side effects in women receiving chemotherapy for breast cancer [Online exclusive]. *Oncology Nursing Forum*, 31, E16–E23.
- Wu, H.S., & McSweeney, M. (2007). Cancer-related fatigue: "It's so much more than just being tired." *European Journal of Oncology Nursing*, 11, 117–125. doi:10.1016/j.ejon.2006.04.037
- Yates, P., Aranda, S., Hargraves, M., Mirolo, B., Clalvarino, A., McLachlan, S., & Skerman, H. (2005). Randomized controlled trial of an educational intervention for managing fatigue in women receiving adjuvant chemotherapy for early-stage breast cancer. *Journal of Clinical Oncology*, 23, 6027–6036.

Receive Continuing Nursing Education Credits

Receive free continuing nursing education credit* for reading this article and taking a brief quiz online. To access the test for this and other articles, visit <http://evaluationcenter.ons.org/Login.aspx>. After entering your Oncology Nursing Society profile username and password, select CNE Tests and Evals from the left-hand menu. Scroll down to *Clinical Journal of Oncology Nursing* and choose the test(s) you would like to take.

* The Oncology Nursing Society is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's COA.