

# Adherence, Sleep, and Fatigue Outcomes After Adjuvant Breast Cancer Chemotherapy: Results of a Feasibility Intervention Study

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**Purpose/Objectives:** To evaluate outcomes of an intervention designed to promote sleep and modify fatigue after adjuvant breast cancer chemotherapy.

**Design:** Prospective, repeated measures, quasi-experimental, feasibility study.

**Setting:** Midwestern urban oncology clinics.

**Sample:** 21 female participants, ages 43–66 years ( $\bar{X} = 55.3$ ) with stage I or II breast cancer status post four cycles of doxorubicin chemotherapy. Eight had four additional cycles of paclitaxel, 10 also had radiation, and 18 took tamoxifen.

**Methods:** Each woman continued to revise her Individualized Sleep Promotion Plan (ISPP), developed during her first cycle of chemotherapy, that included sleep hygiene, relaxation therapy, stimulus control, and sleep restriction components. The daily diary, Pittsburgh Sleep Quality Index, wrist actigraph, and Piper Fatigue Scale were used for seven days 30, 60, and 90 days after the last chemotherapy treatment and one year after the first chemotherapy treatment.

**Main Research Variables:** Adherence and sleep and wake, fatigue, and ISPP components.

**Findings:** Adherence to the ISPP components remained high at all times (77%–88%) except for stimulus control (36%–56%). Sleep outcome means and the actigraph revealed that (a) sleep latency remained less than 30 minutes per night, (b) the time awake after sleep onset exceeded the desired less than 30 minutes per night, (c) sleep efficiency scores ranged from 82%–92%, (d) total rest time ranged from seven to eight hours per night, (e) feelings on arising ranged from 3.7–3.8 (on a 0–5 scale), (f) nighttime awakenings ranged from 10–11 per night, and (g) daytime naps ranged from 10–15 minutes in length. Fatigue remained low, from 2.9–3.5 on a 0–10 scale.

**Conclusions:** Adherence rates remained high for most components. Sleep and wake patterns were within normal limits except for the number and duration of night awakenings. Fatigue remained low.

**Implications for Nursing:** Future testing using an experimental design will focus on increasing ISPP adherence and decreasing nighttime awakenings. Adopting behavioral techniques to promote sleep may result in improved sleep and lower fatigue after chemotherapy.

## Key Points . . .

- Subjects were receptive to continuing their sleep intervention after chemotherapy ended.
- Healthy sleep and wake cycles can be maintained after chemotherapy ends.
- Sleep maintenance problems persisted throughout the first year after beginning adjuvant breast cancer chemotherapy.
- Fatigue levels were in the desired mild range (i.e., less than four); at one-year follow-up, no one reported severe fatigue.

fatigue, pain, wound healing, immune function, and mental health (Lee, 2001) and have contributed to decreased functional status (Winningham, 1992). Despite these reported associations, little is known about these relationships in cancer survivors.

Increasing numbers of women are being treated with adjuvant chemotherapy and radiation therapy in an attempt to decrease morbidity and mortality from breast cancer (Bach, 2001). In fact, two to three million of the estimated nine million cancer survivors in the United States are women with a history of breast cancer (American Cancer Society, 2003). Fatigue is the most frequent and distressing symptom reported

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In the general population, persistent sleep disturbances, or insomnia, are associated with a higher risk of clinical anxiety and depression (Hajak, 2000). Studies have shown that insomnia adversely affects daytime performance (Morin, 1993), including driving safety (Dement, 1999). In patients with cancer, sleep disturbances have been linked to