

# Predictors of the Trajectories of Self-Reported Attentional Fatigue in Women With Breast Cancer Undergoing Radiation Therapy

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**A**ttentional fatigue is a decreased capacity to direct attention (Cimprich, 1992b). The capacity is defined by three concepts: selectivity, which is the ability to highlight one stimulus while ignoring others; sustained focus, which is the maintenance of selectivity over time; and limited capacity, which is a ceiling on the number of stimuli that can be processed successfully at any one time (Cimprich, 1992b; Kaplan & Kaplan, 1982; Posner & Boies, 1971). Attentional fatigue is not physical fatigue, so a person can experience the former with or without the latter (Cimprich, 1992a). The cognitive changes associated with chemotherapy often referred to as “chemo brain” include but are not limited to attentional fatigue (Hess & Insel, 2007).

Anatomically, attention is believed to reside in the anterior and posterior attention systems of the frontal and parietal cortices (Cimprich, 1995; Posner & Dehaene, 1994; Posner & Petersen, 1990). The hypothesis was supported by findings from an imaging study that evaluated for changes in the prefrontal and anterior cingulate cortices of women with breast cancer prior to chemotherapy (Cimprich et al., 2010) and found significantly larger differences in the activation of the right inferior frontal gyrus compared to healthy controls. In addition, in the women with breast cancer, more areas of the brain were activated during the completion of tasks that required them to direct their attention.

Two types of attention exist: involuntary and voluntary (James, 1983; Kaplan & Kaplan, 1982). Some stimuli that originate in our thoughts or in the world around us (i.e., our internal and external environments) engage involuntary attention without effort (Cimprich, 1992b; James, 1983; Kaplan & Kaplan, 1982). Such stimuli include nature, things that affect survival, and things that fascinate us (Cimprich, 1992b; James, 1983; Kaplan & Kaplan, 1982). Other stimuli must be selected consciously for processing by voluntary attention, which requires effort that reduces our capacity to direct attention

**Purpose/Objectives:** To examine how attentional fatigue changed from the time of simulation to four months after the completion of radiation therapy and to investigate whether specific variables predicted initial levels and trajectories of attentional fatigue.

**Design:** Descriptive, longitudinal study.

**Setting:** Two radiation therapy departments.

**Sample:** 73 women with breast cancer who received primary or adjuvant radiation therapy.

**Methods:** Participants completed questionnaires prior to, during, and after radiation therapy. Descriptive statistics and hierarchical linear modeling were used for data analysis.

**Main Research Variables:** Attentional fatigue; demographic, clinical, and symptom characteristics.

**Findings:** Large amounts of interindividual variability were found in the trajectories of attentional fatigue. At baseline, higher levels of attentional fatigue were associated with younger age, not working, a higher number of comorbidities, and higher levels of trait anxiety. The trajectory of attentional fatigue improved over time for women with higher body mass index at baseline.

**Conclusions:** This study is the first to identify predictors of interindividual variability in attentional fatigue in women with breast cancer undergoing radiation therapy. The predictors should be considered in the design of future correlational and interventional studies.

**Implications for Nursing:** Nurses could use knowledge of the predictors to identify patients at risk for higher levels of attentional fatigue. In addition, nurses could use the information to educate patients about how attentional fatigue may change during and following radiation therapy for breast cancer.

further (Cimprich, 1992b; James, 1983; Kaplan & Kaplan, 1982). Voluntary attention is required to act purposefully (Lezak, 1982), to monitor self, and to inhibit emotional reactions (Cimprich, 1992b). As involuntary attention is drawn to a greater diversity and intensity of sensory information, experienced as distraction, a person must expend greater effort to direct voluntary attention (Cimprich, 1992b; Kaplan & Kaplan, 1982).