

# Alterations and Interdependence in Self-Reported Sleep-Wake Parameters of Patient–Caregiver Dyads During Adjuvant Chemotherapy for Breast Cancer

Grigorios Kotronoulas, PhD, MSc, BSN, RN, Yvonne Wengström, PhD, OCN®, and Nora Kearney, MSc, RGN

Kotronoulas is a research fellow in the School of Health Sciences at the University of Surrey in Glasgow, Scotland; Wengström is a professor of nursing in the Department of Neurobiology, Care Science, and Society at the Karolinska Institutet in Huddinge, Sweden; and Kearney is professor emeritus in the School of Health Sciences at the University of Surrey in Guildford, England.

This research was funded by a PhD scholarship from the Alexander S. Onassis Public Benefit Foundation and an education grant from the Hellenic Society of Medical Oncology in Athens, Greece.

Mention of specific products and opinions related to those products do not indicate or imply endorsement by the *Oncology Nursing Forum* or the Oncology Nursing Society.

Kotronoulas, Wengström, and Kearney contributed to the conceptualization and design. Kotronoulas completed the data collection, provided statistical support, and contributed to the analysis. Kotronoulas, Wengström, and Kearney contributed to the manuscript preparation.

Kotronoulas can be reached at [g.kotronoulas@surrey.ac.uk](mailto:g.kotronoulas@surrey.ac.uk), with copy to editor at [ONFEditor@ons.org](mailto:ONFEditor@ons.org).

Submitted April 2015. Accepted for publication June 15, 2015.

**Key words:** sleep; sleep-wake problems; dyadic research; breast cancer; caregiver; sleep assessment

ONF, 43(3), 288–301.

doi: 10.1188/16.ONF.288-301

**Purpose/Objectives:** To longitudinally explore changes, similarities, differences, and interrelations in the sleep-wake parameters of patient–caregiver dyads throughout adjuvant chemotherapy for breast cancer.

**Design:** Observational, repeated-measures, dyadic study.

**Setting:** Four ambulatory oncology clinics in Scotland.

**Sample:** 48 dyads consisting of patients and their primary informal caregivers.

**Methods:** Four dyadic, self-reported sleep-wake assessments took place before chemotherapy (T0), during chemotherapy cycles 1 (T1) and 4 (T2), and after chemotherapy (T3). Dyads completed the Pittsburgh Sleep Quality Index. Multilevel hierarchical linear modeling was used to explore dyadic data.

**Main Research Variables:** Perceived sleep quality, sleep onset latency (SOL), total sleep time, habitual sleep efficiency, wake after sleep onset, daily disturbance, daytime napping duration, overall sleep-wake impairment.

**Findings:** The majority of dyads had at least one poor sleeper throughout the study; 25%–35% were dyads of concurrent poor sleepers. Curvilinear patterns of change were evident for patients' (but not caregivers') sleep-wake parameters, steadily deteriorating from pre- to midtreatment, then leveling off close to baseline. Average trajectories were significantly different between the dyad members but indicative of a trend for concurrent deterioration at T2. Dyad members' perceived sleep quality, SOL, and overall sleep-wake impairment were closely interrelated; wake variables remained uncoupled.

**Conclusions:** Despite overall differences in magnitude, sleep problems may be concurrently present in both dyad members, covary, and peak midway through chemotherapy.

**Implications for Nursing:** Dyadic sleep assessments can shed light on potential areas of sleep interaction to enable interventions to support care dyads at risk of sleep distress during chemotherapy for breast cancer.

**W**omen with early-stage breast cancer are susceptible to sleep impairment and daytime dysfunction (Fiorentino & Ancoli-Israel, 2006), particularly those who receive neo-/adjuvant chemotherapy to minimize the risk of cancer recurrence (Costa et al., 2014; Kotronoulas, Wengstrom, & Kearney, 2012). Deficits in perceived sleep quality, sleep onset latency (SOL), nocturnal awakenings, and total sleep time (TST) may be present even before chemotherapy initiation, become exacerbated over treatment continuation, and persist after the last chemotherapy cycle (Ancoli-Israel et al., 2014; Berger, Wielgus, Hertzog, Fischer, & Farr, 2010; Savard et al., 2009; Savard, Ivers, Savard, & Morin, 2015; Van Onselen et al., 2013). Sleep-wake deficits in informal caregivers of patients with cancer are also prominent; at least 4 of 10 informal caregivers may report at least one sleep problem (Kotronoulas, Wengstrom, & Kearney, 2013b; Stenberg, Cvancarova, Ekstedt, Olsson, & Ruland, 2014). Diminished TST,