

# Fatigue and Physical Performance in Children and Adolescents Receiving Chemotherapy

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Symptom distress in children with cancer is frequently overlooked as efforts focus on a curative approach to treatment (Docherty, 2003; Hockenberry, 2004; National Institutes of Health, 2002). Fatigue has been identified as a significant symptom that interferes with the developmental experiences of childhood (Hockenberry-Eaton & Hinds, 2000). One of the mechanisms that has been proposed as contributing to cancer-related fatigue includes loss of muscle mass and function, which can reduce physical performance (Dimeo, 2001; Dimeo et al., 2003; Lucia, Earnest, & Perez, 2003; National Comprehensive Cancer Network [NCCN], 2010). Little is known about the relationship of fatigue to physical performance in children and adolescents with cancer (Clarke-Steffen et al., 2001; Kline et al., 2000). In this study, the relationship between the changes in fatigue and physical performance was examined in a cohort of children (ages 6–12 years) and adolescents (ages 13–17 years) during the first three cycles of chemotherapy treatment.

Both children and adolescents with cancer, as well as parents and healthcare providers, have identified fatigue as one of the most distressing and prevalent treatment-related symptoms (Collins et al., 2000, 2002; Davies, Whitsee, Bruce, & McCarthy, 2002; Gibson, Garnett, Richardson, Edward, & Sepion, 2005; Hinds & Hockenberry-Eaton, 2001; Hockenberry-Eaton & Hinds, 2000). Through their focus group interviews of children, adolescents, parents, and staff, Hinds and Hockenberry-Eaton have defined fatigue as a subjective symptom with physical, mental, and emotional components characterized by a lack of energy (Hinds et al., 1999). In addition, fatigue often differs by developmental level. For example, school-age children emphasized the physical sensation of feeling weak or tired, whereas adolescents emphasized mental and emotional tiredness that alternated and sometimes merged with the physical sensation of fatigue. These physical, mental, and emotional dimensions of fatigue were confirmed by Davies et al. (2002) who found that managing energy was a core process in coping with fatigue.

**Purpose/Objectives:** To examine the relationship between physical performance and fatigue in child and adolescent cohorts during the first three cycles of chemotherapy.

**Design:** Prospective, observational design.

**Setting:** Two pediatric cancer centers in the upper Midwest region of the United States.

**Sample:** 16 children and 14 adolescents newly diagnosed with cancer.

**Methods:** Standardized instruments were administered during the first and third cycles of chemotherapy. Instruments included physical performance tests (Timed Up and Down Stairs [TUDS] and the 6-Minute Walk Test [6MWT]) and a self-report fatigue scale.

**Main Research Variables:** Fatigue and physical performance.

**Findings:** In the child cohort, physical performance appeared to improve and fatigue diminished from cycle 1 to 3 of chemotherapy. When time on TUDS decreased, fatigue tended to decrease; when 6MWT distance increased, fatigue decreased. In the adolescent cohort, fatigue seemed to decrease but physical performance measures evidenced little change. Correlations between changes in the physical performance variables and fatigue were not significant.

**Conclusions:** Fatigue may decrease early in treatment as disease symptoms resolve. Fatigue in the child cohort was related to physical performance, which is consistent with previous studies that defined fatigue in children as primarily a physical sensation. Findings in the adolescent cohort support research that defined adolescent fatigue as more complex with mental, emotional, and physical components.

**Implications for Nursing:** Knowing how fatigue relates to physical performance in children and adolescents informs the nurse in educating patients and families about symptom management.

Research is emerging on the role that coexisting conditions play in the symptom of fatigue in children. For children hospitalized during chemotherapy, the number of nocturnal awakenings significantly correlated with levels of hospital-related fatigue (Hinds, Hockenberry, Rai, et al., 2007). Children in the continuation phase of treatment for acute lymphocytic leukemia (ALL) reported prevalent fatigue and also experienced night