Symptom Clusters in Patients With Brain Tumors Undergoing Proton Beam Therapy

Ulrica Langegård, MSc, RN, Birgitta Johansson, PhD, RN, Thomas Bjork-Eriksson, PhD, MD,
Per Fransson, PhD, RN, Emma Ohlsson-Nevo, PhD, RN, Katarina Sjövall, PhD, RN,
and Karin Ahlberg, PhD, RN

OBJECTIVES: To explore symptom clusters during proton beam therapy in patients with primary brain tumors and investigate associations among symptom clusters, demographic variables, and comorbidity in this patient population.

SAMPLE & SETTING: Data were collected from 187 adult patients with primary brain tumors during their treatment periods in the Skandion Clinic in Uppsala, Sweden. Symptoms were assessed with the Radiotherapy-Related Symptoms Assessment Scale, and comorbidity was evaluated with the Self-Administered Comorbidity Questionnaire.

METHODS & VARIABLES: The study used a quantitative and longitudinal design. Exploratory factor analysis was used to determine the underlying structure of symptom clusters.

RESULTS: Three clusters were identified: mood, reduced appetite, and reduced energy. The mood cluster had the highest factor loadings (0.71–0.86). In addition, demographic and comorbidity characteristics were associated with symptom clusters in this group of patients.

IMPLICATIONS FOR NURSING: Building knowledge about how these symptoms interact and are clustered will support healthcare professionals to more efficiently relieve symptom clusters during proton beam therapy.

Clinical experiences and studies have shown that patients with tumors often experience multiple concurrent symptoms during their disease trajectories. However, the majority of symptom research focuses on single symptoms. Dodd, Miaskowski, and Paul (2001) studied symptom clusters and suggested that research should focus on evaluating associations among multiple symptoms and the possible synergistic adverse effects on patients' future morbidity. The concept has continued to be discussed in scientific contexts (Dodd, Miaskowski, & Lee, 2004; Dong et al., 2016; Fox, Lyon, & Farace, 2007; Kim, McGuire, Tulman, & Barsevick, 2005; Miaskowski, Dodd, & Lee, 2004; Xiao, 2010). Symptom clusters refer to stable groups of symptoms that are relatively independent of other symptom clusters (Kim et al., 2005). Fatigue, insomnia, pain, and depression constitute the most prevalent symptom cluster in cancer (Barsevick, 2007). There are several nursing theories and models of symptom experience and management (Brant, Beck, & Miaskowski, 2010). Most symptom management models assume that the healthcare provider will only focus on one symptom at a time. However, an exception is the theory of unpleasant symptoms (TUS) developed by Lenz, Pugh, Milligan, Gift, and Suppe (1997). This theory postulates that symptoms co-occur and do not exist in isolation. Therefore, the TUS provides a good basis for research regarding symptom clusters.

Proton beam therapy (PBT) is a radiation therapy modality in which proton particles penetrate deep into the target and stop at a certain depth, depending on their energy (Durante & Loeffler, 2010). With PBT, the risk of damage to healthy tissues is potentially reduced. In addition, the dose targeted at the tumor may be increased in some cases, meaning control over the tumor is potentially increased (Schulz-Ertner & Tsujii, 2007). PBT may also have fewer medical side effects than