Chemotherapy-Related Cognitive Change: A Principle-Based Concept Analysis

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Purpose/Objectives: To present the results of a principle-based concept analysis of cognitive change in patients with cancer following chemotherapy treatment.

Data Sources: 86 English-language articles retrieved through OVID, PubMed, CINAHL®, and Web of Knowledge searches through June 2010. No time limits were imposed.

Data Synthesis: Analysis was based on the philosophical principles: epistemologic, pragmatic, linguistic, and logical. Conceptual components were identified and a theoretical definition of chemotherapy-related cognitive change emerged; the term was not clearly defined or well differentiated in the scientific literature. Implicit meanings are found in patients' subjective accounts, descriptions of the cognitive domains studied, and the choice of neuropsychological assessment instruments. Antecedents relative to chemotherapy-related cognitive change include disease and treatment factors. Moderators may include anxiety, depression, and fatigue. Consequences or outcomes of the experience of chemotherapy-related cognitive change include adjustment to illness, impact on quality of life, and potential for emotional distress.

Conclusions: The principle-based concept analysis generated conceptual insights about chemotherapy-related cognitive change that are based on sound scientific evidence. The product of this method of analysis is a theoretical definition that reflects the state of the science.

Implications for Nursing: When the impact of cognitive change following chemotherapy is better understood, meaningful and timely interventions can be developed to improve quality of life for cancer survivors.

Chemotherapy agents used in the treatment of malignant diseases cause a variety of side effects, some debilitating and others life threatening. Change in cognitive function, a side effect of chemotherapy, is not well understood (Schagen, Muller, Boogerd, Mellenbergh, & van Dam, 2006) and is seldom discussed with patients prior to treatment. Although the symptoms are subtle, patients who report those changes are very aware of the differences in their abilities to think clearly (Boehmke & Dickerson, 2005) and commonly use the phrase chemobrain to describe this phenomenon (Staat & Segatore, 2005). Ongoing research suggests that the symptoms of cognitive change make it difficult to carry out normal daily activities in personal and professional life (Boykoff, Moieni, & Subramanian, 2009; Castellon & Ganz, 2009; Jansen, Miaskowski, Dodd, & Dowling, 2005; Mitchell, 2007; Taillibert, Voillery, & Bernard-Marty, 2007).

A clear understanding of cognitive changes following chemotherapy can guide the development of reliable instruments to identify and measure the changes. Understanding the state of the science also is necessary to determine the long-term consequences of cognitive change and its impact on quality of life (QOL). Theoretical insights are needed to identify appropriate research methods for additional scientific inquiry.

Methods

Penrod and Hupcey (2005a) described a principle-based concept analysis to determine the state of the science concerning chemotherapy-related cognitive change. The method is based on four philosophical principles: epistemologic, pragmatic, linguistic, and logical, and includes analysis of the scientific literature to derive a theoretical definition that is closest to the probable truth. The approach enables the researcher to identify gaps and inconsistencies in the state of the science and, subsequently, will lead to advancement of the concept through selection of appropriate research questions and methodologies (Hupcey & Penrod, 2005).

Data Sources

A systematic review of the literature was conducted in June 2010 to determine the use of the concept "chemotherapy-related change in cognitive function."