

# The Effects of Nonpharmacologic Interventions on Cognitive Function in Patients With Cancer: A Meta-Analysis

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**Problem Identification:** To evaluate the effects of nonpharmacologic interventions on cognitive functioning in adult patients with cancer.

**Literature Search:** EMBASE, MEDLINE®, Cochrane Library CENTRAL, CINAHL®, and Korean databases.

**Data Evaluation:** Cochrane's risk of bias for randomized studies and the RevMan, version 5.3, program of the Cochrane Library were used.

**Synthesis:** Fourteen controlled trials with a total of 977 participants met the inclusion criteria. Overall, nonpharmacologic interventions had beneficial effects on subjective cognitive functioning and memory, but not on attention, executive functioning, and verbal ability. In the subgroup analyses by approach type, psychological interventions had a significant effect on perceived cognitive function.

**Conclusions:** The findings suggest that nonpharmacologic interventions, particularly psychological interventions, may have a positive impact on perceived cognitive functioning and memory in patients with cancer. Additional research with adequate power is required to determine the effectiveness of behavioral intervention as a cognitive rehabilitation strategy.

**Implications for Practice:** Cognitive function would be most improved in patients with cancer when a multimodal intervention approach (education, retraining, and physical activity) is employed.

Cognitive impairment is one of the most frequently reported adverse effects of chemotherapy (Hutchinson, Hosking, Kichenadasse, Mattiske, & Wilson, 2012). Data suggest that 15%–45% of patients who undergo chemotherapy experience loss of memory and attention problems, are unable to concentrate or multitask, or lose cognitive control, which negatively affects their quality of life (Hermelink et al., 2008; Matsuda et al., 2005; Schagen et al., 1999; Vardy & Tannock, 2007; Wefel & Schagen, 2012). Neuroimaging studies have shown reduced gray and white matter volume in multiple brain sites following chemotherapy, including the prefrontal, hippocampal, and parahippocampal areas (de Ruiter et al., 2011).

An increase in the awareness of chemotherapy-related cognitive impairments is reflected by the growth in the number of review articles focused on the structural and functional concomitants of chemotherapy in the human brain (Kaiser, Bledowski, & Dietrich, 2014). Five meta-analyses have suggested that cancer treatments are associated with cognitive deficits in patients compared with population norms and controls. These deficits are primarily in executive functioning, verbal ability, and visuospatial ability, albeit with a relatively small to medium effect size in each of these domains (Falletti, Sanfilippo, Maruff, Weih, & Phillips, 2005; Jansen, Miaskowski, Dodd, Dowling, & Kramer, 2005; Jim et al., 2012; Prabhu et al., 2014; Stewart, Bielajew, Collins, Parkinson, & Tomiak, 2006).