Are Exercise Programs Effective for Improving Health-Related Quality of Life Among Cancer Survivors? A Systematic Review and Meta-Analysis

Shiraz I. Mishra, MBBS, PhD, Roberta W. Scherer, PhD, Claire Snyder, PhD, Paula Geigle, PT, PhD, and Carolyn Gotay, PhD

Purpose/Objectives: To evaluate the effectiveness of exercise interventions on overall health-related quality of life (HRQOL) and its domains among cancer survivors who have completed primary treatment.

Data Sources: 11 electronic databases were searched from inception (dates varied) to October 2011. The authors also identified eligible trials through a search of additional sources.

Data Synthesis: 40 trials with 3,694 participants met the inclusion criteria. At 12 weeks, cancer survivors exposed to exercise interventions had greater positive improvement in overall HRQOL (standardized mean difference [SMD] 0.48; 95% confidence interval [CI] [0.16, 0.81]), emotional well-being (SMD 0.33; 95% CI [0.05, 0.61]), and social functioning (SMD 0.45; 95% CI [0.02, 0.87]); and had a significant reduction in anxiety (SMD –0.26; 95% CI [–0.44, –0.07]) and fatigue (SMD –0.82; 95% CI [–1.5, –0.14]).

Conclusions: Exercise programs have a beneficial effect on HRQOL and most of its domains and can be integrated into the management plans for cancer survivors who have completed treatment. Future research is needed to help understand specific attributes of exercise programs that are beneficial for improving HRQOL within and across cancer types.

Implications for Nursing: Evidence presented in this review supports the inclusion of exercise programs in clinical guidelines for the management of cancer survivors who have completed treatment, such as the Oncology Nursing Society's Putting Evidence Into Practice resource.

Key Words: quality of life; health status; anxiety; depression; fatigue; neoplasm; neoplasm therapy; exercise; survivors; walking; yoga; resistance training; breathing exercises; bicycling; physical activity

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The growing numbers of cancer survivors and the growing length of survival following a cancer diagnosis have raised issues related to the long-term and late effects of cancer and its treatment. Long-term effects begin at the time of initial treatment and chronically persist. Examples of long-term effects include fatigue, cognitive dysfunction ("chemobrain"), and functional deficits that result from treatment (e.g., swallowing problems in patients with head and neck cancer). Examples of late effects include heart failure related to toxicity from chemotherapy and secondary tumors. Many of these long-term and late effects have an impact on patients' health-related quality of life (HRQOL). HRQOL is a multidimensional concept reflecting patients' perceptions regarding the effect of disease and treatment on their physical, psychological, and social functioning and well-being (U.S. Food and Drug Administration, 2009). Interventions to address these HRQOL issues in cancer survivors are critically needed.

One of the interventions to address cancer survivors' HRQOL that has received considerable attention is exercise. The research on the impacts of exercise on cancer survivors' quality of life has been diverse—with focus on a variety of exercise interventions (e.g., yoga, strength training, aerobics), diversity in terms of types of cancers survived, a range of times since diagnosis, and a multitude of treatments received. In addition, the specific quality of life outcomes addressed also have varied considerably, sometimes focusing on global HRQOL, general areas of functioning (e.g., physical, emotional), or specific effects (e.g., fatigue, pain). Previous systematic reviews found an improvement in HRQOL, psychological well-being, and fatigue in cancer survivors following an exercise intervention during and after cancer treatment (Cramp & Byron-Daniel, 2012; Galvao & Newton, 2005; Knols, Aaronson, Uebelhart, Fransen, & Aufdemkampe, 2005; McNeely et al., 2006; Mustian et al., 2007; Schmitz et al., 2005; Stevinson, Lawlor, & Fox, 2004; Thorsen, Courneya, Stevinson, & Fossa, 2008), but these reviews searched only one or two databases or included nonrandomized studies in addition to randomized, controlled trials (RCTs) (Galvao & Newton, 2005; Schmitz et al., 2005; Stevinson et al., 2004; Thorsen et al., 2008).