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Exercise Trials in Pediatric Brain Tumor: A Systematic Review of Randomized Studies

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Abstract

In pediatric brain tumor patients, treatment advances have increased survival rates to nearly 70%, while consequently shifting the burden of disease to long-term management. Exercise has demonstrated potential in improving multiple health impairments secondary to brain tumor treatment. However, these effects have not been consolidated through review. Therefore, we performed a systematic review of 6 health sciences databases (Medline, Embase, PsychINFO, CINAHL, SPORTDiscus, and Cochrane Central Database). Two reviewers screened studies against predefined inclusion criteria, namely that the study must: (i) be pediatric-specific; (ii) examine the effects of an exercise intervention; and (iii) employ a randomized or quasi-randomized trial design. The same 2 reviewers performed data extraction and analyses. From a pool of 4442, 5 articles-based on 2 independent trials-were included in our review (N=41). Exercise interventions were primarily aerobic, but included balance or muscle building components. Exercise had a positive effect on volumetric or diffusion-based neuroimaging outcomes, as well as motor performance and cardiorespiratory fitness. The effects of exercise on cognition remains unclear. Exercise did not worsen any of the outcomes studied. This review captures the state of the science, suggesting a potential role for exercise in children treated for brain tumor.