

The Role of Physical Activity in Supporting Physical and Mental Health in Pediatric Cancer Patients and Survivors: A Systematic Review and Meta-Analysis

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Background

- Children with cancers are at risk of acute and long-term impairments in both physical and mental health due to the disease itself and its treatment.
- Physical activity (PA) is increasingly recognized as a strategy to prevent or reduce these impairments.
- There is conflicting evidence for the impact across varied health domains. (Braam et al., 2016; Götte et al., 2014; Morales et al., 2020)

Study Aim

- Evaluate the effects of PA interventions on selected physical and mental health outcomes in pediatric oncology

Methods

- Systematic search in APA PsycINFO, PubMed, SPORTDiscus, Web of Science, Embase, and Scopus in May 2025
- Inclusion criteria
 - Randomized controlled trials (RCTs) and clinical controlled trials (CCTs)
 - PA interventions during or after cancer treatment
 - Assessing physical and mental health outcomes
- Two reviewers independently: screened studies for eligibility, extracted data, and will assess risk of bias.
- Statistical Analysis
 - Separate random-effects meta-analyses for each outcome
 - Standardized mean differences (SMDs) with 95% confidence intervals

Results

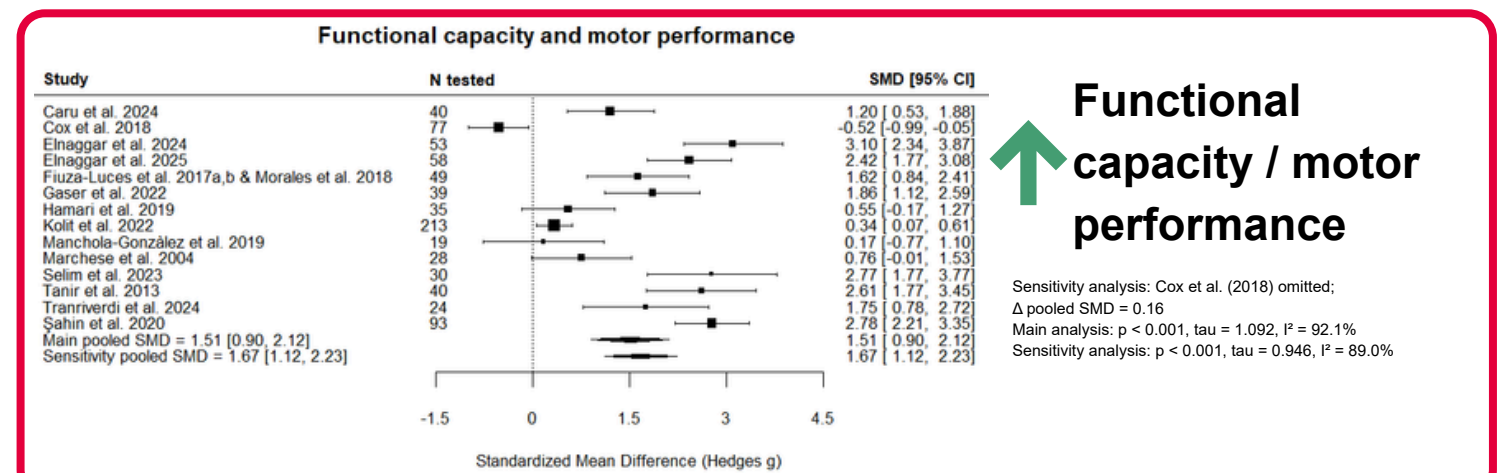
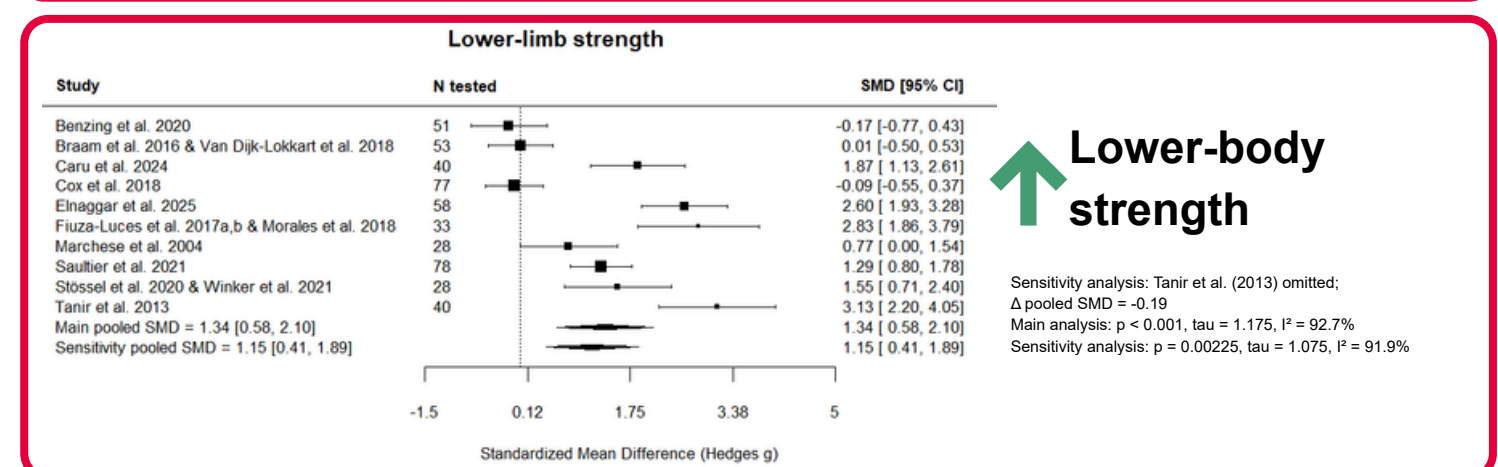
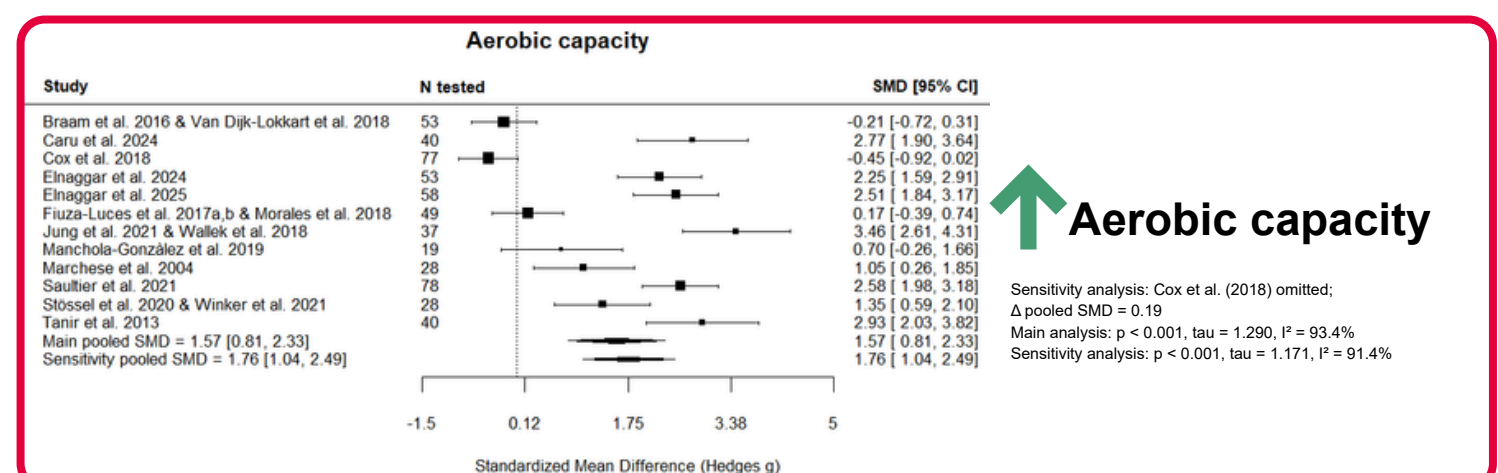
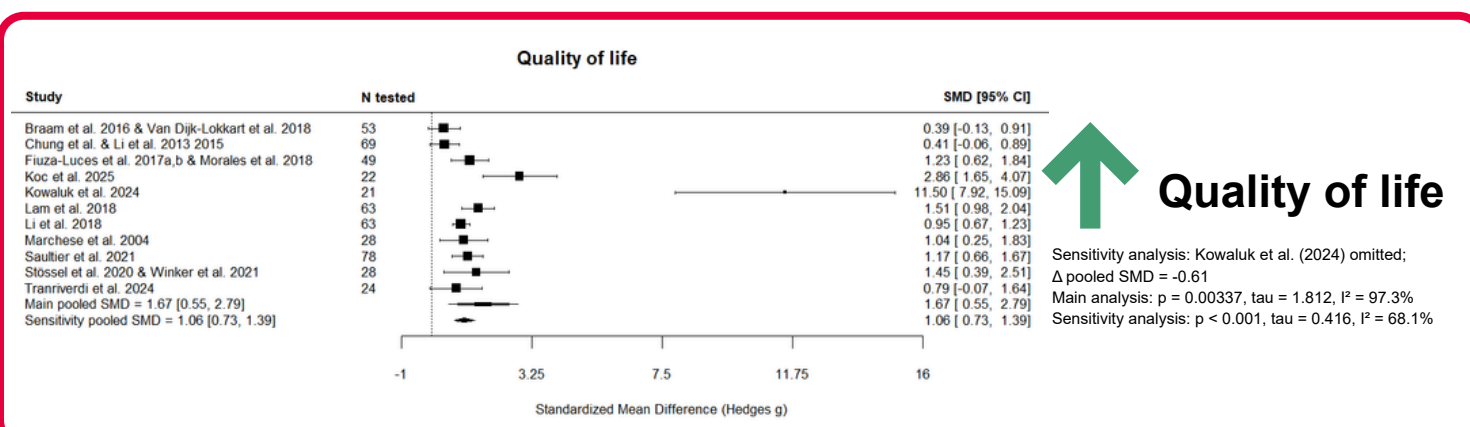
- Of 9,952 identified records, 44 RCTs and CCTs included

Descriptive statistics for review (studies $n = 38$)

Participants (n): 1,843	Intervention duration (days): 4-945
Age range (years): 3-18	Supervision (n): Supervised (26) vs. unsupervised (12)
Patients(n): Survivors (18), inpatients (16), both (4)	Settings: Home, hospital, and outdoor camp
Diagnoses (n): Mixed diagnoses (20), leukemia (13), brain/CNS tumors (5)	Adverse effects (n): 0

Metaanalysis (studies $n = 23$)

- No significant pooled effects for mental health outcomes
- PA significantly improved quality of life, aerobic capacity, lower-body strength, and functional capacity and motor performance



Discussion & Conclusion

- PA appears to be safe and improve overall health.
- Further high-quality RCTs are needed to better understand the effects of PA on mental health in this population.



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Limitations

- High heterogeneity
- Single-study influence, especially for quality of life
- Risk of bias and data requests ongoing

References:
 • Braam, K. L., van der Torre, P., Takken, T., Veening, M. A., van Dulmen-den Broeder, E., & Kaspers, G. J. (2016). Physical exercise training interventions for children and young adults during and after treatment for childhood cancer. *Cochrane Database of Systematic Reviews*, 3(3), 1465-1858. <https://doi.org/10.1002/14651858.CD008796.pub3>
 • Götte, M., Taraks, S., & Boos, J. (2014). Sports in pediatric oncology: The role(s) of physical activity for children with cancer. *Journal of Pediatric Hematology/Oncology*, 36(2), 85-90. <https://doi.org/10.1097/mpo.0000000000000101>
 • Morales, J. S., Valenzuela, P. L., Herrera-Olivares, A. M., Rincón-Castanedo, C., Martín-Ruiz, A., Castillo-García, A., Fuiza-Luces, C., & Lucia, A. (2020). What are the effects of exercise training in childhood cancer survivors? A systematic review. 39(1), 115-125. <https://doi.org/10.1016/j.ctv.2018.08.012>