

A physical activity program to improve cardiorespiratory fitness in children and adolescents following acute cancer treatment (POWER): study design of a randomized controlled trial

Sandra Goertz¹, Tim Niehues¹, Nina Brauer¹, Wolfgang Lawrenz¹, Corina S. Rueegg², Miriam Götte³

¹Pediatric Oncology, Helios Hospital Krefeld, Germany

²Department of Biostatistics, University of Oslo, Norway

³Department of Pediatric Hematology/Oncology, Pediatrics III, West German Cancer Centre, University Hospital Essen, Germany

Background

Treatment of pediatric cancer leads to

→ reduced physical activity and physical performance (e.g., Vo₂peak, Nielsen et al., 2020)

→ increased risk to develop chronic health conditions.

Supervised exercise interventions during cancer treatment is feasible and safe (Gauß et al., 2021).

Primary aim of the POWER-RCT is to evaluate the effectiveness of a partially supervised 12-week physical activity program on cardiorespiratory fitness (VO₂peak) in pediatric cancer patients who have recently completed intensive treatment.

Secondary outcomes are muscular strength, functional mobility, coordination, cognitive function, changes in blood and echocardiography parameters, physical activity levels, health related quality of life, and fatigue.



Methods

- Recruitment at Helios Hospital Krefeld
- N=56 pediatric cancer patients aged ≥7 and <23 years
- Inclusion 6 weeks post cancer therapy + Randomization 1:1 (Fig. 1)
- IG: multimodal partially supervised 12-week exercise program consisting of individual and group training sessions (Fig. 2)
- CG: brochure + physical activity tracker to measure the minutes of moderate to vigorous physical activities (Fig. 2)

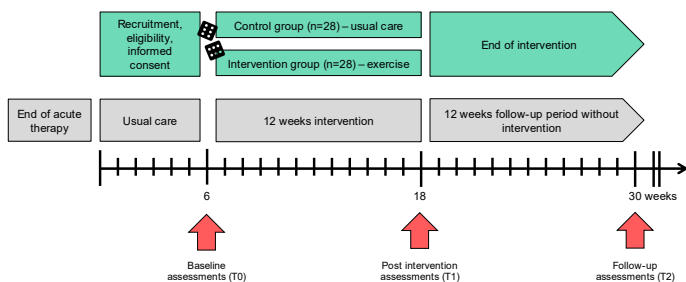


Figure 1. Study scheme

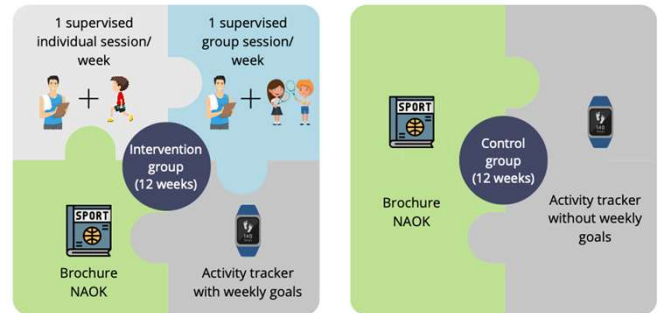


Figure 2. Contents of the intervention (left) and control group (right)

Results

- Study started in June 2021
- N=11 patients included since Oct 2022
- Ongoing recruitment
- Good feasibility and adherence



Figure 3. Preliminary results of one POWER IG participant at T0 and T1

Discussion

- The POWER trial is a comprehensive study planned by an interdisciplinary team of pediatric oncologists, sports scientists, cardiologists, and statisticians.
- It will provide insight into the benefit of exercise on cardiorespiratory performance following pediatric cancer treatment to prevent future long-term treatment effects and improve the general health state of children and adolescents with cancer.

Acknowledgments: This study was supported by Helios Kliniken GmbH, Grant-ID:2020-0250, Clinical Trial Registration Number: NCT04765020.

References:
Nielsen, M.K.F., Christensen, J.F., Frandsen, T.L., et al. (2020). Effects of a physical activity program from diagnosis on cardiorespiratory fitness in children with cancer: a national non-randomized controlled trial. BMC Med. Jul 6; 18(1):175. doi: 10.1186/s12916-020-01634-6.
Gauß, G., Beller, R., Boos, J., et al (2021). Adverse Events During Supervised Exercise Interventions in Pediatric Oncology – A Nationwide Survey. Front Pediatr, Aug, 19;9:682496. doi: 10.3389/fped.2021.682496.

Contact: Dr. rer. medic. Miriam Götte
Miriam.goette@uk-essen.de