

Physical Activity, Physical Self-Concept, Self-Esteem, and Health-Related Quality of Life in Pediatric Cancer Survivors and Healthy Controls

Julia Schneider, Janine Spitzhüttli, Valerie Siegart, Michael Grotzer, Maja Steinlin, Mirko Schmidt, Kurt Leibundgut, Regula Everts, and Valentin Benzing

1. Background:

Due to improved treatment and diagnosis, survival rates in pediatric cancer have increased by up to 80% in recent last years. Despite this, pediatric cancer survivors (PCS) bear a high risk for cancer related late effects. Late effects include a decrease in physical activity (Ness et al., 2009) as well as lower health-related quality of life (HRQL) (Vetsch et al., 2018) compared to typically developing children. Since physical activity is a predictor for the physical self-concept in typically developed children (Biddle & Asare, 2011), and this seems central to psychological well-being, it is therefore likely that PCS are at risk for diminished physical self-concept.

2. Aim of the study:

- To Investigate group differences between PCS and controls
- To investigate associations between the physical activity level, the physical self-concept, self-esteem and HRQOL in PCS and controls

3. Methods:

Inclusion criteria

Patients:

- Age: 7-16 years
- Cancer diagnosis (CNS±) within the last 10 years
- Termination of treatment at least 1 year prior to assessment
- Treatment including drugs, radiation, and/or surgery

Controls:

- Age: 7-16 years
- No previous cancer disease
- Neurologically healthy

Assessment

Physical activity:

- “Bewegungs- und Sportaktivitätsfragebogen” (BSA-F)

Physical self-concept & self-esteem:

- Physical Self-Description Questionnaire – Shortform (PSDQ-S)

Health-related quality of life:

- Kidscreen-10 Index

Characteristics of the study population

	Patients (n = 40)	Controls (n = 47)
Age (years)	11.59 (1.99)	11.70 (2.66)
Sex (% female)	43.90%	44.68%
Height (cm)	146.32 (13.05)	149.73 (17.20)
Weight (kg)	43.01 (14.12)	43.60 (17.41)
SES	6.46 (1.43)	6.88 (1.53)
Treatment termination (years ago)	4.81 (2.22)	
Age at diagnosis (years)	5.51 (3.22)	

Data Analyses

Group comparisons:

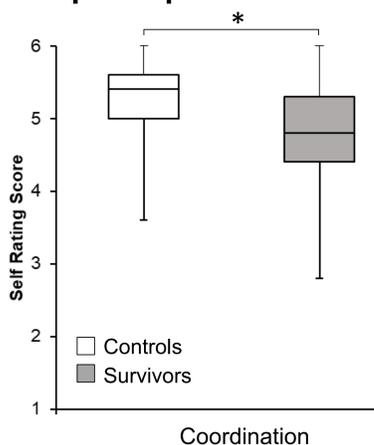
- Wilcoxon rank-sum tests

Regression analyses:

- Univariate linear regressions

4. Results:

Group comparisons



- Diminished physical self-concept in the facet of coordination in PCS
- Comparable physical activity, self-esteem, HRQOL, and other facets of the physical self-concept between controls and PCS

Fig. 1. Coordination in PCS and controls. Boxes = interquartile range; error bars = range. Bonferroni correction for multiple testing was applied (* $p < .004$).

Regression analyses

- Physical self-concept predicts HRQOL

Controls: $F(1, 35) = 28.086, p < .000, R^2_{adj} = .429$
 PCS: $F(1, 26) = 9.535, p = .005, R^2_{adj} = .240$

- Self-esteem predicts HRQOL

Controls: $F(1, 36) = 15.086, p < .000, R^2_{adj} = .276$
 PCS: $F(1, 27) = 7.338, p = .012, R^2_{adj} = .185$

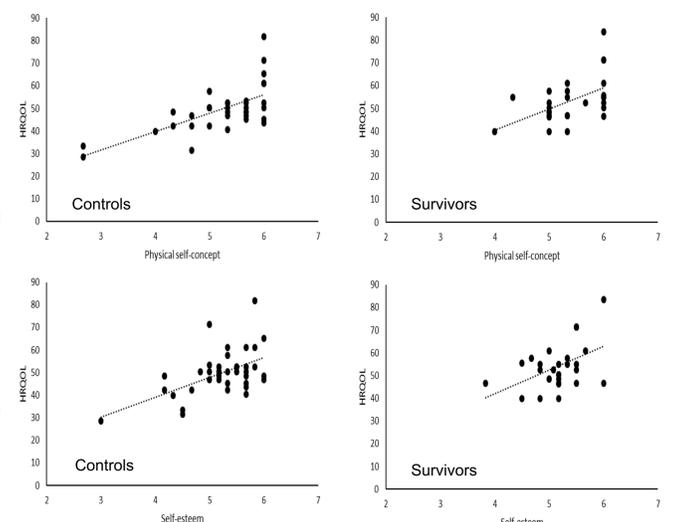


Fig. 2. Scatterplots and corresponding trend lines for controls and PCS
 a) HRQOL and physical self-concept b) HRQOL and self-esteem.

5. Conclusion:

- Pediatric cancer and its treatment seems to negatively affect the physical self-concept, in particularly the facet of coordination.
 - No significant differences between controls and PCS regarding physical activity, other facets of the physical self-concept, self-esteem, and HRQOL could be detected.
 - Results show a strong positive relation between the physical self-concept and HRQOL as well as between self-esteem and HRQOL.
- Interventions targeting the promotion of physical abilities, the physical self-concept, and coordination are needed.

6. References and funding:

Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine, 45*(11), 886-895. doi:10.1136/bjsports-2011-090185
 Ness, K. K., Hudson, M. M., Ginsberg, J. P., Nagarajan, R., Kaste, S. C., Marina, N., ... Gurney, J. G. (2009). Physical performance limitations in the childhood cancer survivor study cohort. *Journal of Clinical Oncology, 27*(14), 2382-2389. doi:10.1200/JCO.2008.21.1482
 Vetsch, J., Wakefield, C. E., Robertson, E. G., Trahair, T. N., Mateos, M. K., Grootenhuys, M., ... Fardell, J. E. (2018). Health-related quality of life of survivors of childhood acute lymphoblastic leukemia: A systematic review. *Quality of Life Research, 27*(1), 111-120. doi:10.1007/s11136-018-1788-5

We gratefully acknowledge our funders: Fondation Gaydoul, Krebsliga Schweiz, and the Dietmar Hopp Stiftung.