

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

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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:

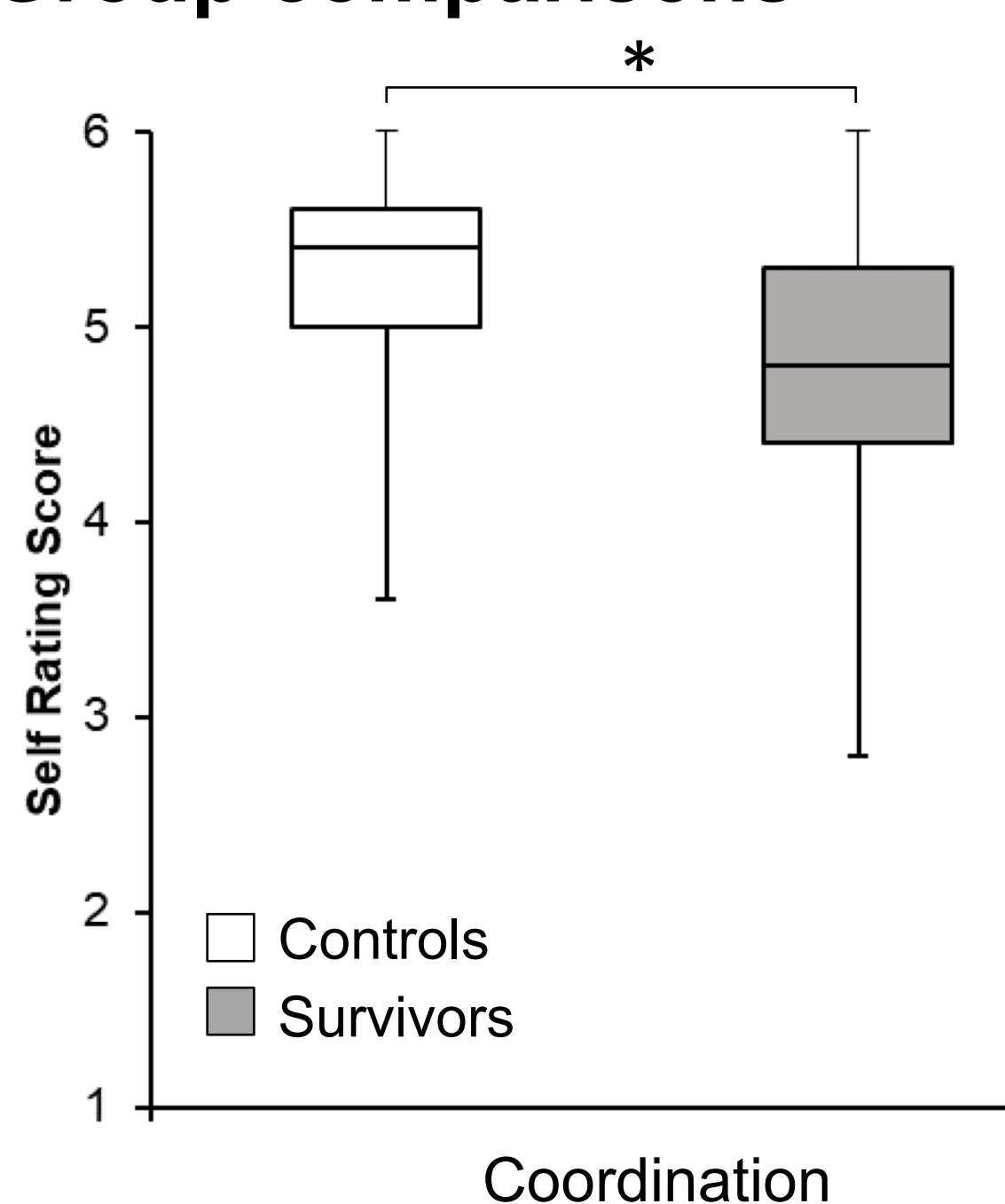
- Wilcoxon rank-sum tests

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: $F(1, 27) = 7.338, p = .012, R^2_{adj} = .185$

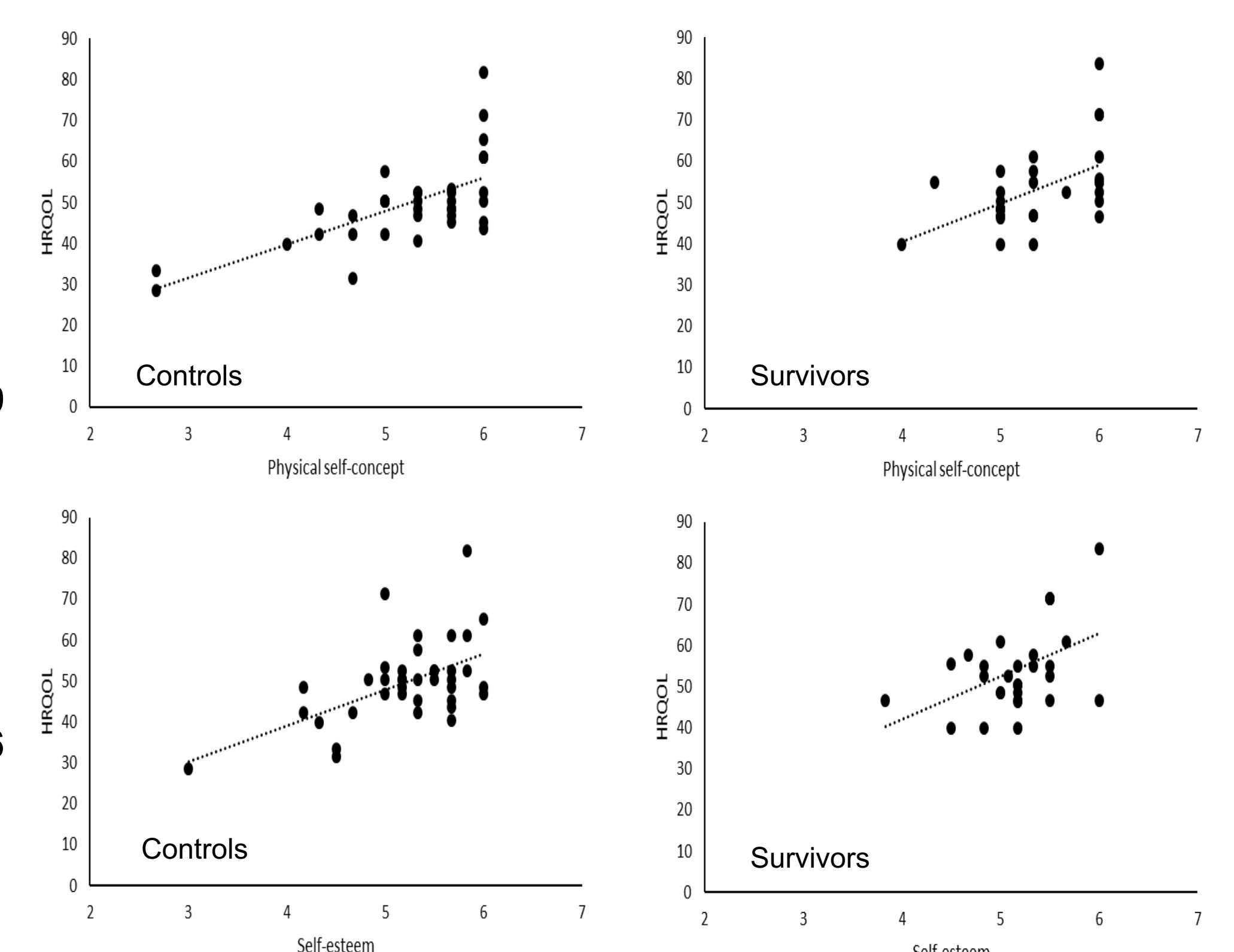


Fig. 2. Scatterplots and corresponding trend lines for controls and PCS
 a) HRQOL and physical self-concept b) HRQOL and self-esteem.

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:

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