

# Adherence to physical activity recommendations and sedentary time in adult survivors of childhood acute lymphoblastic leukemia – associations with fatigue and HRQoL

Laura Jess, MSc, RPT<sup>1</sup>, Katarina Aili, PhD, RPT<sup>2</sup>, Jens M Nygren, PhD<sup>2</sup>, Maria Bäck, PhD, RPT<sup>3</sup>, Marianne Jarfelt, PhD, MD<sup>1</sup>

<sup>1</sup>Department of Oncology, Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, <sup>2</sup>School of Health and Welfare, Halmstad University, Halmstad, Sweden, <sup>3</sup>Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

## Background

Regular physical activity and reduced sedentary are crucial in preventing and treating noncommunicable diseases. However, data in adult survivors of childhood ALL, who face a heightened risk for health issues, is limited.

## Purpose

To investigate physical activity levels and associations between physical activity levels, sedentary time, fatigue, and health-related quality of life (HRQoL) in adult survivors of childhood acute lymphoblastic leukemia (ALL).

## Method

This national cross-sectional study included 426 adult survivors of childhood ALL (diagnosed 1985–2007, 49% women, median age 32 [min–max 19–49]), who completed a questionnaire on physical activity (BHW-Q), sedentary time (SED-GIH-Q), fatigue (MFI-20), and HRQoL (SF-36). Associations were analyzed using linear regression.

## Results

Overall, 44% of participants did not meet physical activity recommendations. Median weekly vigorous activity was 45 min and moderate activity 120 min. Median sedentary time was 8 h/day.

Not meeting recommendations was significantly associated with greater fatigue (**MFI-20 score  $\beta = 1.7$ , 95% CI 0.1 to 3.3,  $p = 0.033$** ) and lower physical and mental health components of HRQoL (**SF-36 PCS  $\beta = -3.3$ , 95% CI -5 to -1.5,  $p < 0.001$ ; SF-36 MCS  $\beta = -4.2$ , 95% CI -6 to -1.8,  $p < 0.001$** ). Sedentary time  $\geq 7$  hours per day was significantly associated with a lower mental HRQoL (**SF-36 MCS  $\beta = -3.6$ , 95% CI -5.9 to -1.2,  $p = 0.003$** ).

No significant association was found between sedentary time and the SF-36 PCS score ( $\beta = -1$ , 95% CI -2.7 to 0.7,  $p = 0.260$ ) or the total MFI-20 score ( $\beta = 0.9$ , 95% CI -0.7 to 2.5,  $p = 0.253$ ).

## Conclusion

Many adult survivors of childhood ALL had insufficient levels of physical activity and accumulated considerable sedentary time. Insufficient physical activity was associated with greater fatigue and lower HRQoL, while greater sedentary time was associated with lower mental HRQoL. However, given the cross-sectional design, causality cannot be inferred.

### Self-reported physical activity, sedentary time, health-related quality of life, and fatigue among the participants (n=426)

<b>Duration of physical activity (BHW-Q) (n=425)</b>	
Median duration of VPA (min/week), median (Q1, Q3)	45 (15, 105)
Median duration of MPA (min/week), median (Q1, Q3)	120 (45, 175)
Not meeting physical activity guidelines, n/N (%)	188/425 (44%)
<b>Sedentary time (SED-GIH-Q) (hours/day) (n=425)</b>	
Median sedentary time (hours/day), median (Q1, Q3)	8 (5, 11)
Sedentary $\geq 7$ hours a day, n/N (%)	225/425 (53%)
<b>HRQoL (SF-36 Domains), mean (SD)</b>	
Physical functioning (n=422)	92.4 (15)
Role physical (n=422)	80.1 (33.7)
Bodily pain (n=422)	75.7 (26)
General health (n=422)	64.9 (25)
Vitality (n=422)	51.7 (24.1)
Social functioning (n=421)	72.4 (21.4)
Role emotional (n=422)	71 (39.7)
Mental health (n=422)	68 (21.3)
<b>SF-36 PCS (n=422)</b>	51.9 (9.1)
<b>SF-36 MCS (n=422)</b>	44.6 (12.3)
<b>Fatigue (MFI-20 Subscales), mean (SD)</b>	
General fatigue (n=407)	11.2 (2.1)
Physical fatigue (n=406)	12.1 (2.1)
Reduced activity (n=407)	12.9 (2.5)
Reduced motivation (n=407)	12.1 (2.7)
Mental fatigue (n=407)	10.5 (2.2)
<b>Total MFI-20 score (n=406)</b>	58.7 (7.8)

Data are presented as number/total number (percent), mean (SD), or median (Q1, Q3). Abbreviations: BHW-Q The Swedish National Board of Health and Welfare questions about physical activity. SED-GIH-Q The Swedish School of Sport and Health Sciences question for assessing sedentary time. SF-36 Short-Form Health Survey 36. SF-36 PCS Physical Component Summary, SF-36 MCS Mental Component Summary, MFI-20 Multidimensional Fatigue Inventory-20.

## Take home message

Physical activity and sedentary behavior are associated with fatigue and HRQoL in adult survivors of childhood ALL and may represent important targets in clinical practice

