Adherence to the Dutch physical activity guideline and health-related quality of life in long-term colorectal cancer survivors within the EnCoRe study

Eline H. van Roekel[1], Martijn J.L. Bours[1], José J.L. Breedveld-Peters[1], Kenneth Meijer[2], Silvia Sanduleanu[3], Geerard L. Beets[4,5], Matty P. Weijenberg[1]

[1]Department of Epidemiology, GROW – School for Oncology and Developmental Biology; and [2]Department of Human Movement Science, NUTRIM School for Nutrition, Toxicology and Metabolism, Maastricht University, Maastricht, The Netherlands; [3]Department of Internal Medicine, Division of Gastroenterology and Hepatology; [4]Oncology Center University Hospital Maastricht; and [5]Department of Surgery, Maastricht University Medical Center+, Maastricht, The Netherlands

Background

- Colorectal cancer (CRC) survivors can experience long-lasting consequences of their disease and/or treatment, such as fatigue and depression, which can impair their long-term health-related quality of life (HRQoL).

- Physical activity (PA) may beneficially influence the HRQoL of CRC survivors, but little research has been done in Dutch CRC survivors.

- Thus, no specific guidelines for this population are available and they are advised to follow the general Dutch PA guideline (≥5 days per week, ≥30 min of moderate-to-vigorous PA).

- Unraveling how PA is related to CRC survivors' HRQoL, within the context of personal/environmental factors, is necessary for the development of personalized lifestyle guidelines for this population.

Objective

To study cross-sectional associations between self-reported adherence to the Dutch PA guideline and HRQoL in long-term CRC survivors within the Energy for Life after ColoRectal cancer (EnCoRe) study.

Methods

- Data was used from the cross-sectional EnCoRe study, in which stage I-III CRC survivors treated between 2002-2010 at Maastricht University Medical Center+ were selected via the Netherlands Cancer Registry and recruited by mail.

- WHO's International Classification of Functioning, Disability and Health (ICF) was used as a bio-psychosocial framework to develop a conceptual model for studying lifestyle and HRQoL in CRC survivors[1], which was adapted to the current research question and used to guide data analyses (Figure 1).

- Measurement instruments:
  - Adherence to Dutch PA guideline: Short QUestionnaire to ASsess Health-enhancing physical activity (SQUASH)
  - HRQoL: European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30) (100-point scales).

- Associations between PA guideline adherence and HRQoL scores were analyzed by multivariable linear regression models, adjusting for potential confounders identified *a priori* from our ICF-based conceptual model (Figure 1) and selected by a forward selection procedure (≥10% change in effect estimate).
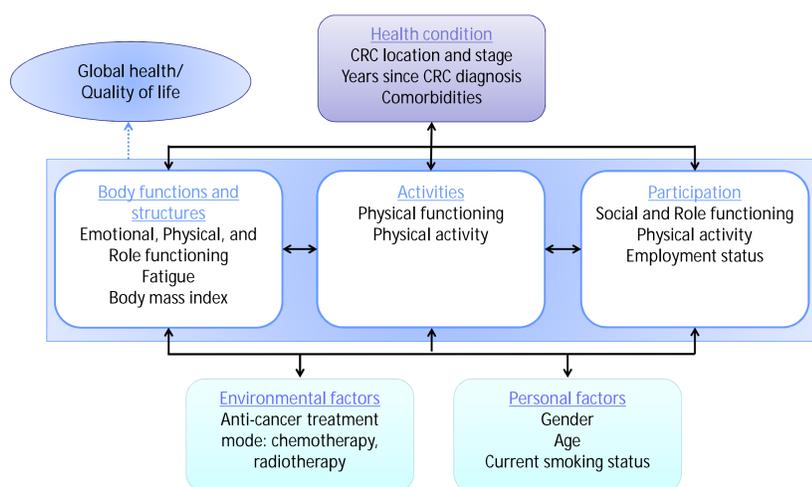
Conceptual framework

Figure 1: ICF-based conceptual framework for studying PA and HRQoL of CRC survivors

[1]van Roekel EH, Bours MJL, de Brouwer CP, Ten Napel H, Sanduleanu S, Beets GL, Kant I, Weijenberg MP. The applicability of the International Classification of Functioning, Disability and Health to study lifestyle and quality of life of colorectal cancer survivors. Cancer Epidemiol Biomarkers Prev. 2014 May 6. [Epub ahead of print]

Results

- In total, 155 CRC survivors were recruited into the study (response rate: 42%); data from 150 participants (97%) was available for the current analyses.

- Participants (93 males, 62%) were on average 69.7 years of age (SD: 8.7), 5.7 years since diagnosis (SD: 1.8), and had a mean body mass index of 27.7 kg/m^2 (SD: 4.3). Half of them (n=75) reported having multiple (≥2) comorbidities.

- Within this population, 75 individuals (50%) reported adherence to the Dutch PA guideline (56 males (75%), mean age (SD): 69.5 (7.5)). The number of participants reporting multiple comorbidities was substantially different between these groups: 29 (39%) and 46 (61%), respectively (Figure 2).
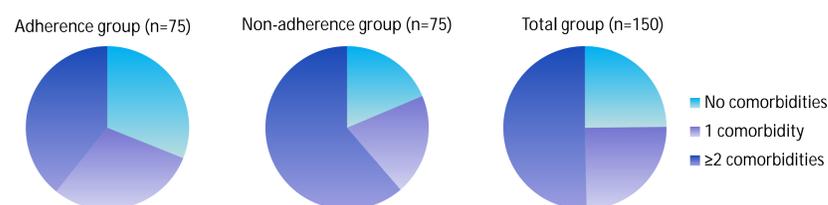

Figure 2: Reported number of comorbidities in participants reporting adherence and non-adherence to the Dutch PA guideline, and in total group of participants

- After adjusting for demographic and clinical factors, no statistically significant associations were observed between PA guideline adherence and the global health/quality of life (mean difference: 3.8, 95%CI: -2.2 – 9.7), role functioning (3.0, -5.2 – 11.2), physical functioning (3.6, -3.0 – 10.2), social functioning (1.5, -4.8 – 7.8), emotional functioning (-2.6, -8.4 – 3.3), and fatigue (-3.0, -10.2 – 4.1) subscales of the EORTC QLQ-C30 (Figure 3).

- In all multivariable models, presence of multiple comorbidities was the main covariate attenuating associations between PA and HRQoL, and was significantly associated with lower HRQoL and higher fatigue scores ($p<0.05$).
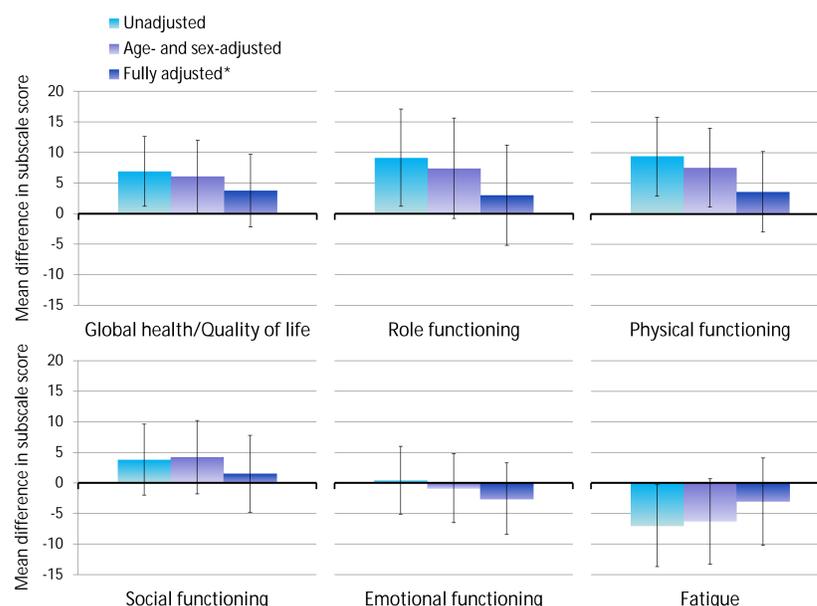

Figure 3: Mean difference in HRQoL subscale scores between individuals reporting adherence versus non-adherence to the Dutch PA guideline (error bars represent 95% CIs)
*Next to age and gender, models were additionally adjusted for presence of comorbidities (all models), years since diagnosis (all models), stage (all models expect role functioning), current smoking status (all models expect global health/quality of life and fatigue), chemotherapy (role and social functioning), body mass index (role, social and emotional functioning), tumor location (role functioning only).

Conclusion

We found that self-reported adherence to the Dutch PA guideline was not significantly associated with HRQoL in long-term Dutch CRC survivors, and that associations were mainly attenuated by the presence of multiple comorbidities. Future research should include objective PA measures obtained with activity monitors, to prevent bias by over-reporting of PA, and investigate longitudinal relationships in a prospective setting.

Correspondence to:
Eline H. van Roekel
eline.vanroekel@maastrichtuniversity.nl
T +3143 388 3428
F +3143 388 4128

Maastricht University
Department of Epidemiology
P.O. Box 616
6200 MD Maastricht
The Netherlands