Physical activity, sedentarism and sleep time and psychological health in young paediatric cancer survivors. A compositional data analysis from the iBoneFIT Project

Andrea Rodriguez-Solana [1], Luis Gracia-Marco* [1 2 3], Jairo H Migueles[1 4], Andres Marmol-Perez [1 5], Cristina Cadenas-Sanchez[1 3], Jose J Gil-Cosano [1 6], Francisco J Llorente-Cantarero [3 7 8], Felix Delgado-Ferro[9] Esther Ubago-Guisado [1]

[1]Department of Physical Education and Sports, Faculty of Sport Sciences, Sport, and Health University Research Institute (iMUDS), University of Granada, Granada, Spain. [2]Instituto de Investigación Biosanitaria, ibs.Granada, Granada, Spain. [3]Centro de Investigación Biomédica en Red Fisiopatología de la Obesidad y Nutrición (CIBERobn), Instituto de Salud Carlos III, Madrid, Spain. [4]Department of Biosciences and Nutrition, Karolinska Institute, Stockholm 171 77, Sweden. [5]Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital, Memphis, Tennessee, USA. [6]Department of Communication and Education, Universidad Loyola Andalucía, Dos Hermanas, Sevilla, Spain. [7]Instituto de Investigación Biomédica Maimonides (IMIBIC), Córdoba, Spain. 8Departamento de Didácticas Específicas, Facultad de Educación, Universidad de Córdoba, Córdoba, Spain. 9Department of Signal Theory, Telematics and Communications, Research Center on Information and Communication Technologies, University of Granada, Periodista Daniel Saucedo Aranda s/n, 18014 Granada, Spain

Abstract

Introduction. Introduction: The survival rate of childhood cancer has increased to 85%. However, due to cancer treatment, a decrease in physical activity and psychological health levels has been observed. Previous studies have shown that physical activity is associated with psychological health, and some of them have indicated that the distributions of 24-hour movement behaviours are associated with anxiety and depression in apparently healthy children and adolescents. Since young paediatric cancer survivors are less active and more sedentary than their healthy peers, this study aims to examine the associations of 24-hour movement behaviours (moderate-to-vigorous physical activity [MVPA], light physical activity [LPA], sedentary behaviour [SB] and sleep time) with psychological health in young paediatric cancer survivors.

Methods. Study design: A cross-sectional study included 116 participants (12.1±3.3 years; 42% female) from the iBoneFIT project. Psychological health (i.e., well-being and distress) were assessed by questionnaires and time spent in movement behaviours by accelerometer. Participants were classified according to their somatic maturity (pre or peri/post-pubertal). The adjusted models' coefficients were used to predict the effect of reallocating time proportionally across behaviours on the outcomes.

Results and Conclusions. Results: Concerning well-being, reallocating time to LPA from the remaining movement behaviours (MVPA, SB, and sleep time) was positively associated with happiness (B=1.545, p=0.022) in the pre-pubertal group. Additionally, reallocating time to SB was positively associated with positive affect (B=2.860, p=0.006), whereas reallocating time to sleep time was negatively associated (B=-4.090, p=0.005). In the peri/post-pubertal group, reallocating time to MVPA was positively associated with happiness and optimism (B=0.778, p=0.032 and B=0.920, p=0.008, respectively). Concerning psychological distress, reallocating time to LPA or SB was negatively associated with depression (B=-1.786, p=0.032 and B=-2.294, p=0.029, respectively), whilst reallocating time to sleep time was positively associated with depression (B=4.707, p=0.002) in the pre-pubertal group. In the peri/post-pubertal group, reallocating time to MVPA was negatively associated with depression and anxiety (B=-0.779, p=0.026 and B=-0.749, p=0.014, respectively). Conclusions: Our results underline the importance of promoting LPA and MVPA in pre-pubertal cancer survivors as well as MVPA in peri/post-pubertal cancer survivors to improve their psychological health.

Keywords: Childhood cancer; Exercise; Inactivity; Mental health