Durham Research Online

Deposited in DRO:
07 February 2014

Version of attached file:
Accepted Version

Peer-review status of attached file:
Peer-reviewed

Citation for published item:

Further information on publisher’s website:
http://dx.doi.org/10.1016/j.jpeds.2013.01.017

Publisher’s copyright statement:
NOTICE: this is the author’s version of a work that was accepted for publication in Journal of Pediatrics. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in Journal of Pediatrics, 162, 5, 2013, 10.1016/j.jpeds.2013.01.017

Additional information:

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the full DRO policy for further details.
Muddying the waters: Moderate-to-vigorous intensity physical activity calculation in epidemiological studies of youth

Ash C. Routen¹,²

1. School of Education, Durham University, Durham, County Durham, DH1 1TA, UK.
2. Wolfson Research Institute, Durham University, Queens Campus, Thornaby, Stockton on Tees, TS17 6BH, UK.

Corresponding author:
Ash C. Routen MSc.
School of Education,
Durham University, Durham, County Durham, UK, DH1 1TA.
Telephone: +44(0)191 3348344
Fax: +44(0)191 3348311
Email: ash.routen@durham.ac.uk

Potential conflicts of interest: There are no conflicts of interest to declare
Dear Editor,

Recently Martikainen et al. [1] examined an interesting and under-researched issue— the association between physical activity and psychiatric difficulties in prepubertal children. The authors concluded that both higher daily activity volume, and moderate-to-vigorous (MVPA) intensity physical activity are associated with reduced odds of social, emotional, and behavioural problems [1]. However, for the benefit of future readers it should be noted that these results may be biased by the choice of MVPA cut-points used to reduce this accelerometer-measured data.

The Heil MVPA cut-points [2] utilised by Martikainen et al. [1] were derived using the Actical accelerometer, which has different hardware specifications (i.e. frequency filtering, sensor orientation and data integration) to the Actiwatch [3] used by Martikainen et al [1]. Therefore the MVPA data used by Martikainen et al. [1] in their analyses is likely quite inaccurate. The recently derived Ekblom et al. [4] cut-points are the only device-specific published thresholds for the Actiwatch when worn on the wrist, as per the children in the study of Martikainen et al. [1]

The use of the Heil MVPA cut-points [2] could have resulted in the calculation of odds ratio’s that deviate from the ‘true’ odds for differences in the probability of psychiatric problems between MVPA tertile groups (i.e. high vs. low MVPA). In future, as several youth-specific MVPA cut-points exist for the most popular accelerometer devices, researchers should
analyse data using multiple published intensity cut-points to determine whether results differ by threshold choice. The selection of cut-points for use in such analyses could be informed by consulting the findings of ‘cross-validation’ studies e.g. Trost et al. [5]. This issue of cut-point non-equivalence is not new in the field of physical activity measurement [6], but is worth highlighting again for the benefit of accelerometer end-users engaged in the epidemiologic study of youth populations.


