

Exchanging sedentariness for low-intensity physical activity can prevent weight gain in children

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Substituting Sedentary Time with Physical Activity may Decrease Fatness and Improve Fitness in Children

A recent study showed that high levels of sedentary time and low levels physical activity were related to a higher body adiposity in 6-8-year-old Finnish children. The study further suggested that replacing sedentary time with physical activity is associated with decreased body adiposity and increased cardiorespiratory fitness. The study conducted at the University of Eastern Finland in collaboration with the University of Cambridge was recently published in the Sports Medicine.

Pediatric overweight and obesity is a major public health problem



Physical activity to decrease fatness and improve fitness?



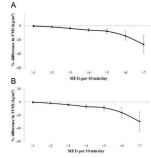
Sedentary time and physical activity was measured objectively by combined wrist rate and movement sensing. Body adiposity by dual-energy X-ray absorptiometry, and cardiorespiratory fitness by maximal cycle ergometer test in 410 Finnish children aged 6-8 years.

Higher levels of physical activity at any intensity was related to lower fatness

A higher time spent physical activities exceeding 2 metabolic equivalents (METs) was associated with a lower (A) total adiposity and a lower (B) central adiposity.

The strength of the relationship between physical activity and body adiposity increased with increasing physical activity intensity.

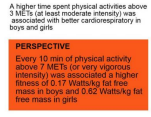
PERSPECTIVE
Every 10 min of physical activity above 2 METs (or very vigorous intensity) was associated with approximately 2-3% lower total and central body adiposity.



Higher levels of at least moderate physical activity was related to better fitness

A higher time spent physical activities above 3 METs (at least moderate intensity) was associated with better cardiorespiratory in boys and girls.

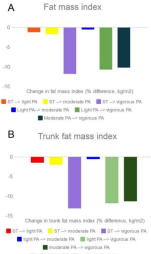
PERSPECTIVE
Every 10 min of physical activity above 3 METs (or very vigorous intensity) was associated with a higher fitness of 0.17 Watts/kg fat free mass in boys and 0.82 Watts/kg fat free mass in girls.



Substituting sedentary time with physical activity was associated with decreased fatness

Substituting 10 min of sedentary time with 10 min of physical activity at any intensity was associated with statistically significant decreases in (A) total body adiposity and (B) abdominal adiposity. Exchanging sedentary time with vigorous physical activity had the strongest associations.

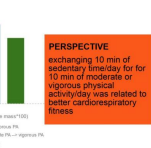
PERSPECTIVE
Exchanging 10 min of sedentary time for 10 min of vigorous physical activity equated to approximately 13 % lower total and trunk fatness.



Substituting sedentary time with at least moderate intensity physical activity was associated with improved fitness

Changes in cardiorespiratory fitness (Watts/kg fat free mass*100) were significantly higher when substituting 10 min of sedentary time with 10 min of at least moderate intensity physical activity compared to substituting with light or moderate intensity physical activity.

PERSPECTIVE
Exchanging 10 min of sedentary time for 10 min of moderate or vigorous physical activity was related to better cardiorespiratory fitness.



Conclusions

- A higher intensity of physical activity was necessary to confer benefits to cardiorespiratory fitness (3 METs) than to improve body composition (2 METs).
- ...but both associations were ultimately characterised by a dose-dependent phenomenon.
- Light physical activity can also benefit child body composition but at least moderate intensity physical activity is required for higher fitness.
- Vigorous physical activity will provide the greatest time investment returns for both fitness and fatness, but sedentary time should not be ignored as it was positively associated with both total and trunk adiposity.

For more information

Original open access publication: ["Childhood Physical Activity and Sedentary Time with Body Composition and Cardiorespiratory Fitness in Mid-Childhood: The FINN Study." Sports Medicine 2018](https://doi.org/10.1007/s00133-018-1500-4), available at <https://www.tandfonline.com/doi/full/10.1007/s00133-018-1500-4>

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Credit: University of Eastern Finland

As little as 10 minutes of high-intensity physical activity per day reduces the amount of adipose tissue and enhances cardiorespiratory fitness in 6-8-year-old children, according to a new study from the University of Eastern Finland. The higher the intensity of physical activity, the stronger the association with the amount of adipose tissue. Exchanging sedentary behaviour -mainly sitting - for even low-intensity physical activity reduces the amount of adipose tissue. In order for physical activity to enhance cardiorespiratory fitness, the intensity needs to be at least moderate.

The results published in *Sports Medicine* are part of the Physical Activity and Nutrition in Children (PANIC) Study carried out in the University of Eastern Finland. The study was conducted in collaboration with the University of Cambridge.

The study investigated the associations of physical activity and sedentary time with body adiposity and [cardiorespiratory fitness](#) in 410 Finnish 6-8-year-old children. Physical activity and sedentary time were assessed using a combined heart rate and movement sensor, Actiheart. Body adiposity, on the other hand, was measured using dual-energy X-ray absorptiometry (DXA), and cardiorespiratory fitness was assessed using a maximal exercise test on a cycle ergometer. Various confounding factors including diet quality and sleep length were controlled for in the analyses.

The study showed that the more children spent time doing physical activities, the lower their total body and central body adiposity were. The

association between physical activity and body adiposity grew in tandem with physical activity intensity. Children engaging in as little as 10 minutes of high-intensity physical activity every day had 26-30% less central body fat than children who did not engage in high-intensity physical activity. The intensity of physical activity had to be at least moderate in order for it to be associated with enhanced cardiovascular fitness.

The findings indicate that exchanging 10 minutes of sedentariness for 10 minutes of high-intensity physical activity decreases the total body and central body adiposity by 13 per cent. Moreover, replacing sedentariness with light or moderately intensive physical activity also seems to decrease the amount of [adipose tissue](#), but not as much as high-intensity physical activity. Exchanging 10 minutes of sedentariness for moderate- or high-intensity physical activity enhances cardiovascular fitness. The findings indicate that even small changes to exercise-related lifestyle habits can have an impact on children's weight management and cardiovascular fitness. Increasing the amount of [physical activity](#) at various intensity levels and reducing the amount of [sedentary time](#) seem to be an important way of preventing overweight and enhancing cardiovascular fitness in childhood.

More information: Paul J. Collings et al. Cross-Sectional Associations of Objectively-Measured Physical Activity and Sedentary Time with Body Composition and Cardiorespiratory Fitness in Mid-Childhood: The PANIC Study, *Sports Medicine* (2016). [DOI: 10.1007/s40279-016-0606-x](#)

Provided by University of Eastern Finland

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