Cardiorespiratory fitness and physical activity on a multidisciplinary school-based intervention in children (Project PANK): a randomized controlled trial.

Batalau, R., Cabrita, P., Cruz, J., Gonçalves, P., Guerreiro, T., Santos, M., Gonçalves, R., Leal, J. & Palmeira, A.

- Research project approval was granted by the Portuguese Data Protection Committee (case n.º 10221/2012, authorization n.º 9130/2012) and the Ministry of Education (survey n.º 0339300001).
- Individual research grant (SFRH/BD/85518/2012)

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Project PANK: Rationale, design and baseline results of a multidisciplinary school based intervention in children with cardiovascular and metabolic risk factors. A Randomized Controlled Trial.

***Batalau, R.,** Cruz, J., Gonçalves, P., Cabrita, P., Guerreiro, T., Santos, M., Gonçalves, R., Leal, J., & Palmeira, A..*

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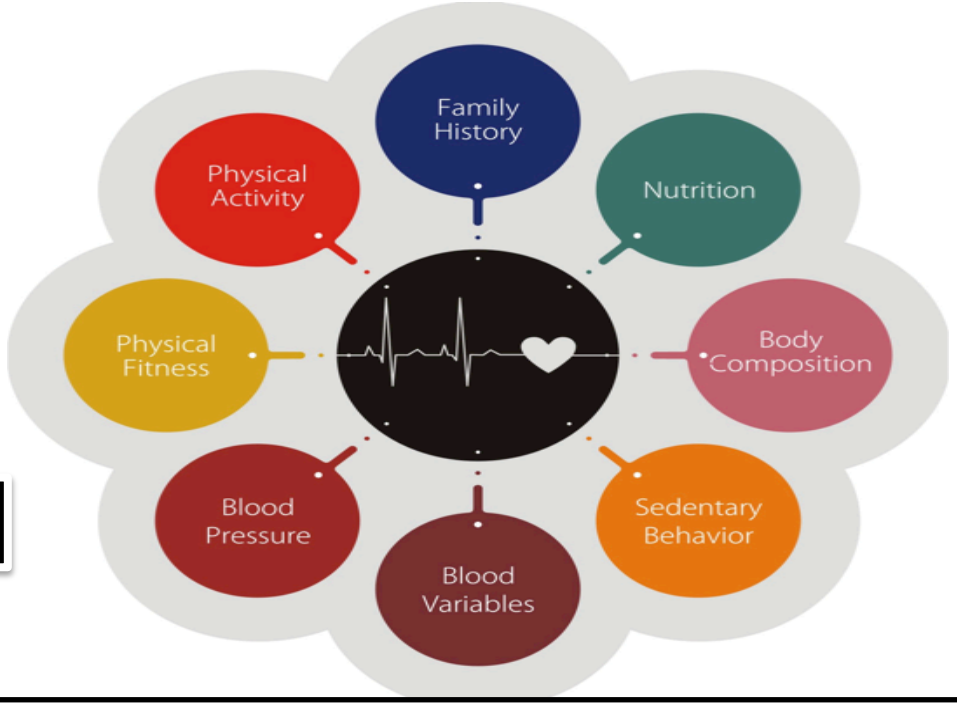
Introduction

Cardiovascular

Metabolic

Risk Factors



Steele, R., Brage, S., Corder, K., Wareham, N., & Ekelund, U. (2008). Physical activity, cardiorespiratory fitness, and the metabolic syndrome in youth. J Appl Physiol. 105:342-351.

Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents (2012). U.S. Department of Health and Human Services. National Institutes of Health.

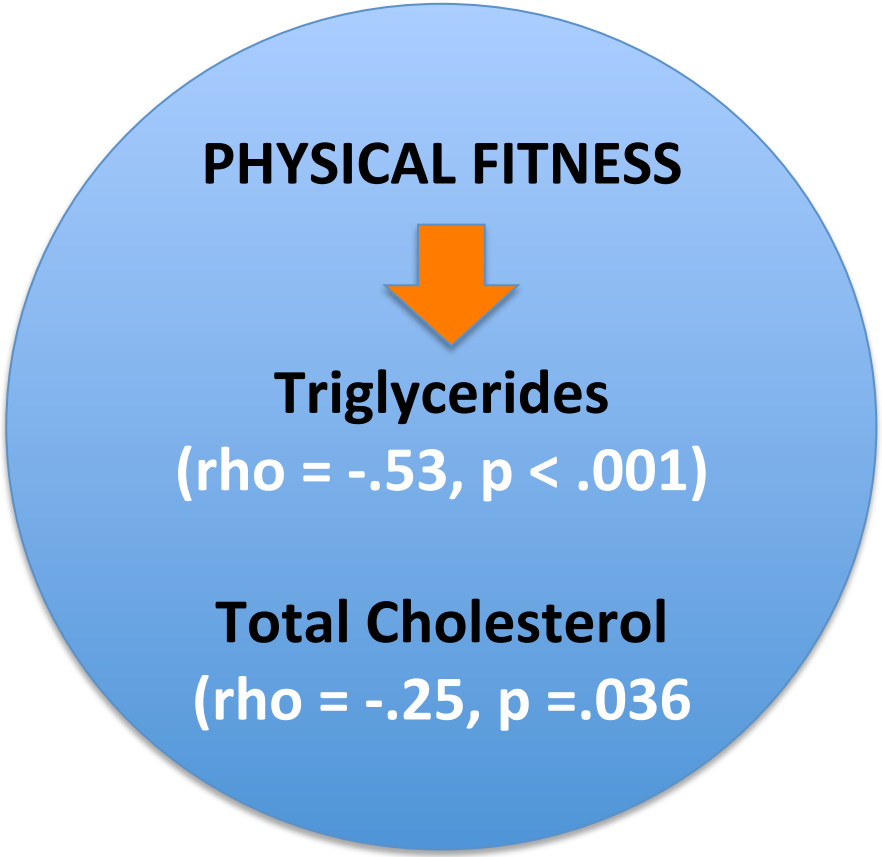
Methods

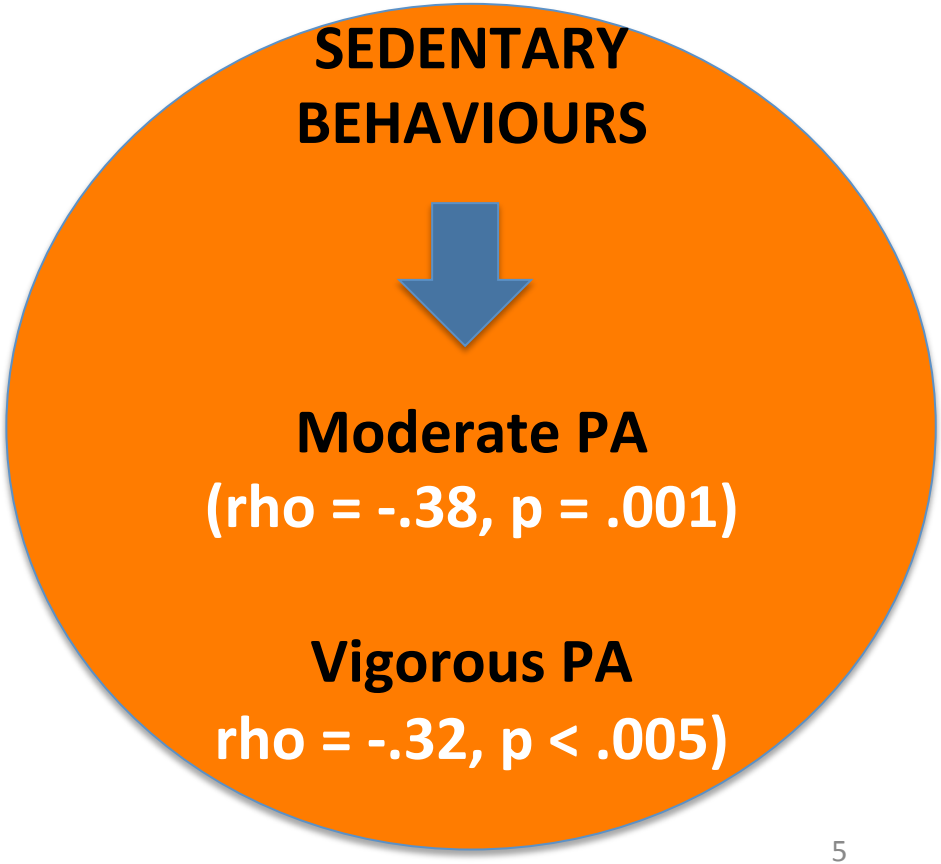
Project PANK (Physical Activity and Nutrition for Kids)

Participants (N=77, aged 7-10 years) were recruited after a cross-sectional study. Overweight and obesity condition were the main inclusion criteria.

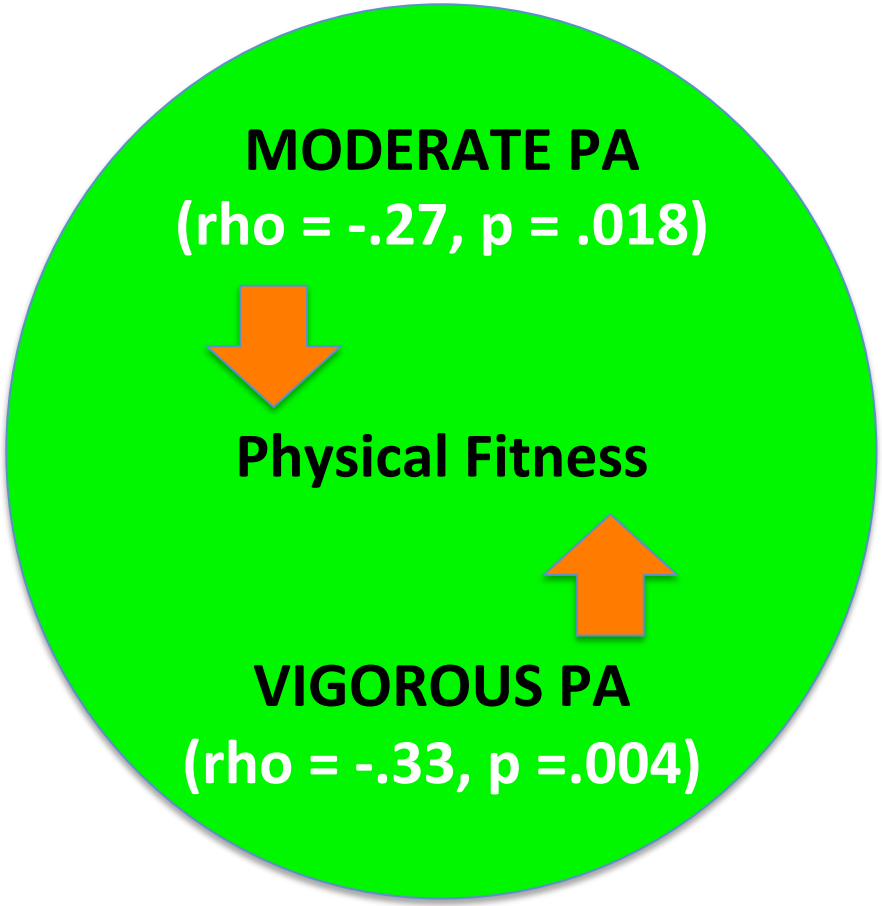
ALGARVE - South of Portugal

Results (baseline data) - 1





Results (baseline data) - 2



OBESE CHILDREN

fasting glucose
(t=-2.05,p=.044)

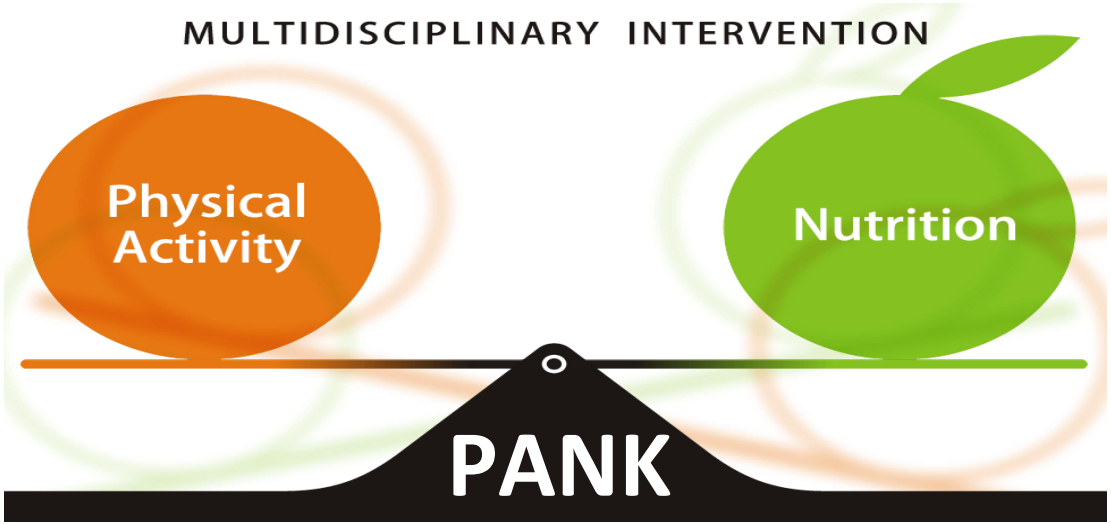
waist circumference
(t=-7.17,p<.001)

waist to height ratio
(t=-.6457,p<.001)

Discussion

- The association found between **obesity** and **higher values of fasting glucose** justifies the importance of multidisciplinary interventions to promote the reversion of overweight/obesity conditions and to decrease abdominal fat.

- It seems to be equally important the **increase of MVPA** to improve the **physical fitness** in order to control other **blood variables**.



Interventions on Diet and Physical Activity What Works. (2009). Summary Report. World Health Organization.

Introduction

Most european children do not meet PA recommendations…

International Journal of Behavioral Nutrition and Physical Activity

BioMed Central
The Open Access Publisher

Levels of physical activity and sedentary time among 10- to 12-year-old boys and girls across 5 European countries using accelerometers: an observational study within the ENERGY-project

International Journal of Behavioral Nutrition and Physical Activity 2012, 9:34 doi:10.1186/1479-5868-9-34

Introduction

So, obesity programmes focusing on PA have been suggested…

Centers for Disease Control and Prevention

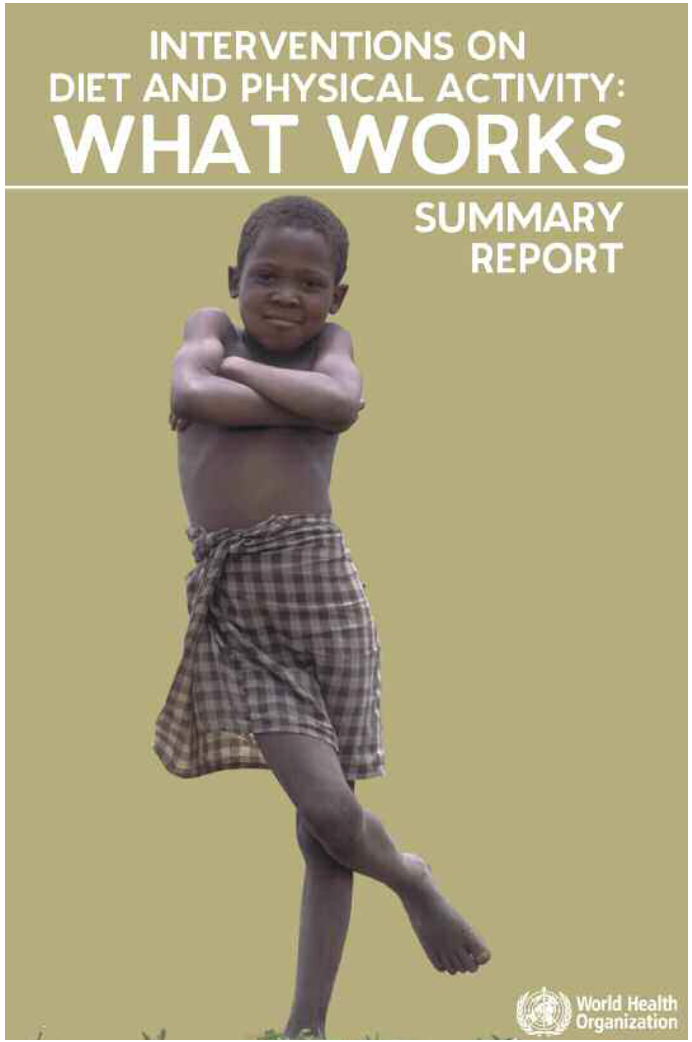
MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 60 / No. 5

September 16, 2011

School Health Guidelines to Promote Healthy Eating and Physical Activity



Introduction

This study is a part of Project PANK, a 6 months school-based multidisciplinary intervention to improve variables associated with cardiovascular and metabolic risk factors (CMRF).

CARDIORESPIRATORY FITNESS

PHYSICAL ACTIVITY

Methods

N=77, 7-10 y, both genders

Overweight and obese children

Intervention group (IG=40)

A. 3 PA meetings for children and parents.
B. An additional PA class (1h) and 6 educational sessions related to PA.
C. At the same time, IG had a nutrition intervention with 3 meetings for children and parents and 6 educational sessions.

Control group had no intervention (CG=37).

Methods

INTERVENTION GROUP

The CRF was assessed at baseline, after 3 and 6 months.

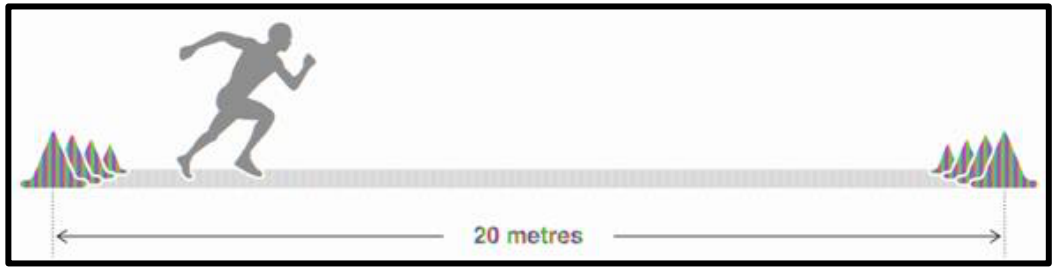
PA was assessed 6 times.

CONTROL GROUP

The CRF and PA were assessed at baseline and after the program.

Methods

CRF - (20m shuttle run test). VO2max was estimated by **Fernhall et al. (1998)** (Fer) **and Matsuzaka et al. (2004)** (Mat) models.



PA by accelerometers (GT3X) during 7 days.
Evenson et al. (2008) cut-points were used.

Methods

Methodological Advances

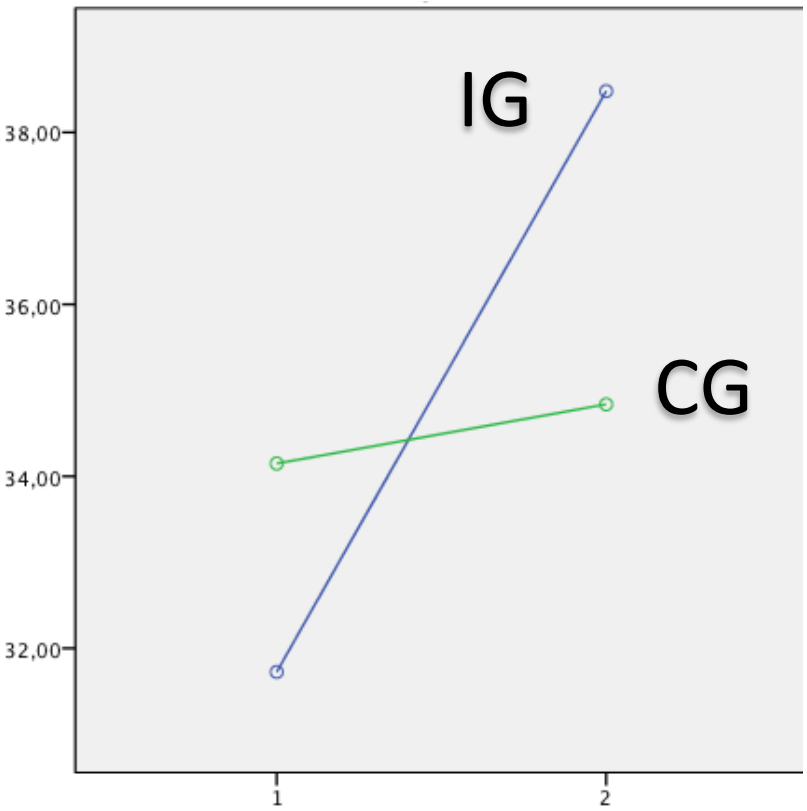
Comparison of Accelerometer Cut Points for Predicting Activity Intensity in Youth

STEWART G. TROST[1], PAUL D. LOPRINZI[1], REBECCA MOORE[2], and KARIN A. PFEIFFER[2]

[1]Department of Nutrition and Exercise Sciences, Oregon State University, Corvallis, OR; and [2]Department of Kinesiology, Michigan State University, East Lansing, MI

Conclusions: On the basis of these findings, we recommend that researchers use the EV ActiGraph cut points to estimate time spent in sedentary, light-, moderate-, and vigorous-intensity activity in children and adolescents. **Key Words:** ACTIGRAPH, OBJECTIVE ASSESSMENT, VALIDITY, CHILDREN, ADOLESCENTS, EXERCISE

Results - 1



Moderate PA

(in minutes)

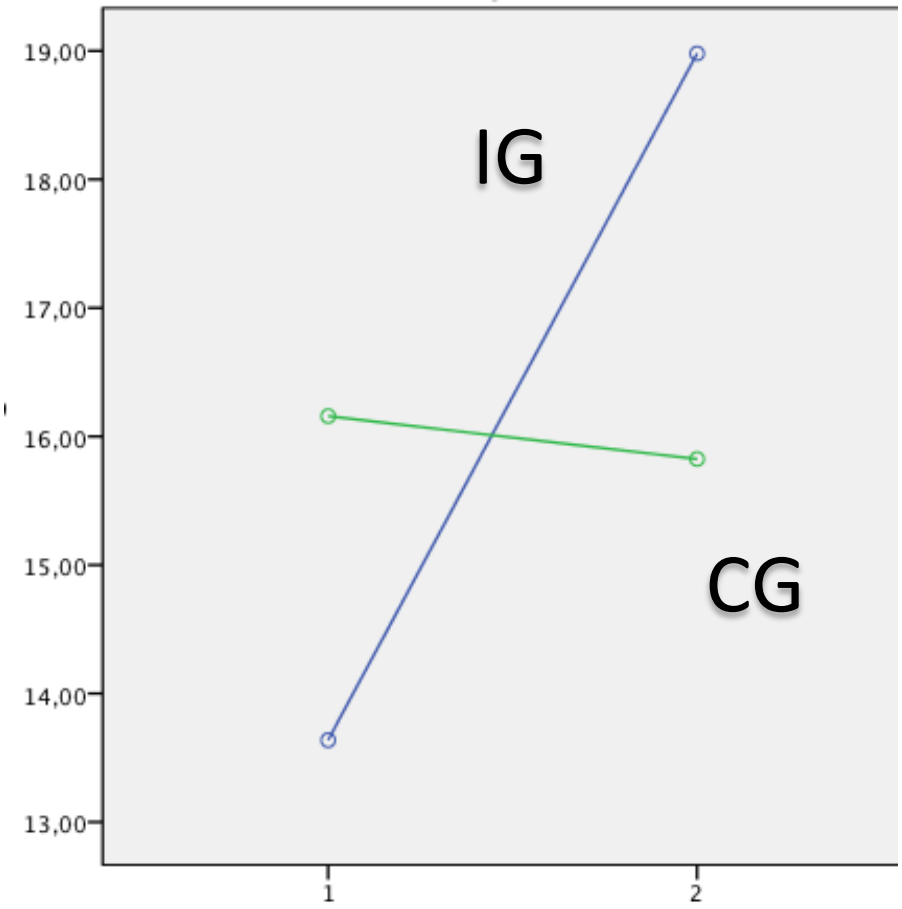
(p=.014, ŋp2=.083)

(in %)

(p=.039, ŋp2=.059)

Results - 2

PHYSICAL ACTIVITY



Vigorous PA

(in minutes)

(p=.003, ŋp2=.123)

(in %)

(p=.007, ŋp2=.101)

Results - 3

IG presented a higher number of **moderate-to-vigorous PA bouts of 1-5 minutes** when compared to CG (p=.008).

Influence of Bouts of Physical Activity on Overweight in Youth

Amy E. Mark, PhD, Ian Janssen, PhD

Conclusions: Moderate-to-vigorous physical activity that took place in bouts conferred benefits on adiposity status that were independent of the total volume of MVPA in this large sample of youth.

(Am J Prev Med 2009;36(5):416–421) © 2009 American Journal of Preventive Medicine

Results

There is good evidence that school-based physical activity interventions have a positive impact on four of the nine outcome measures. Specifically positive effects were observed for duration of physical activity, television viewing, VO2 max, and blood cholesterol.

School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18 (Review)

Dobbins M, DeCorby K, Robeson P, Husson H, Tirilis D

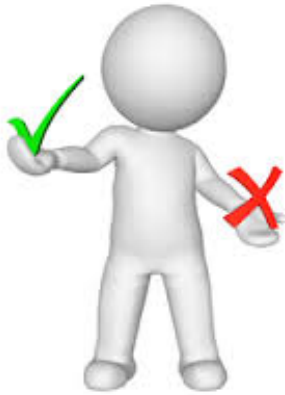
THE COCHRANE COLLABORATION®

Results - 4

INTERVENTION GROUP

MODERATE PA

31,73 min. >>>>> 38,45 min.

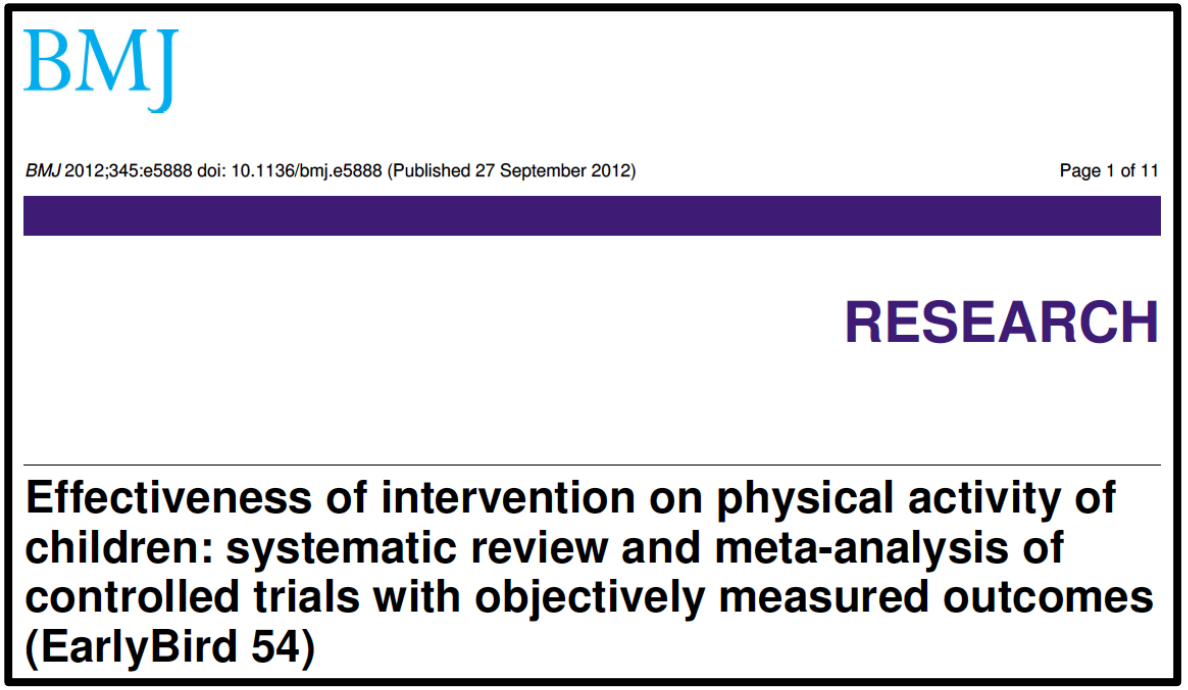


VIGOROUS PA

13,64 min. >>>>> 18,98 min.

Results

4 MINUTES



BMJ

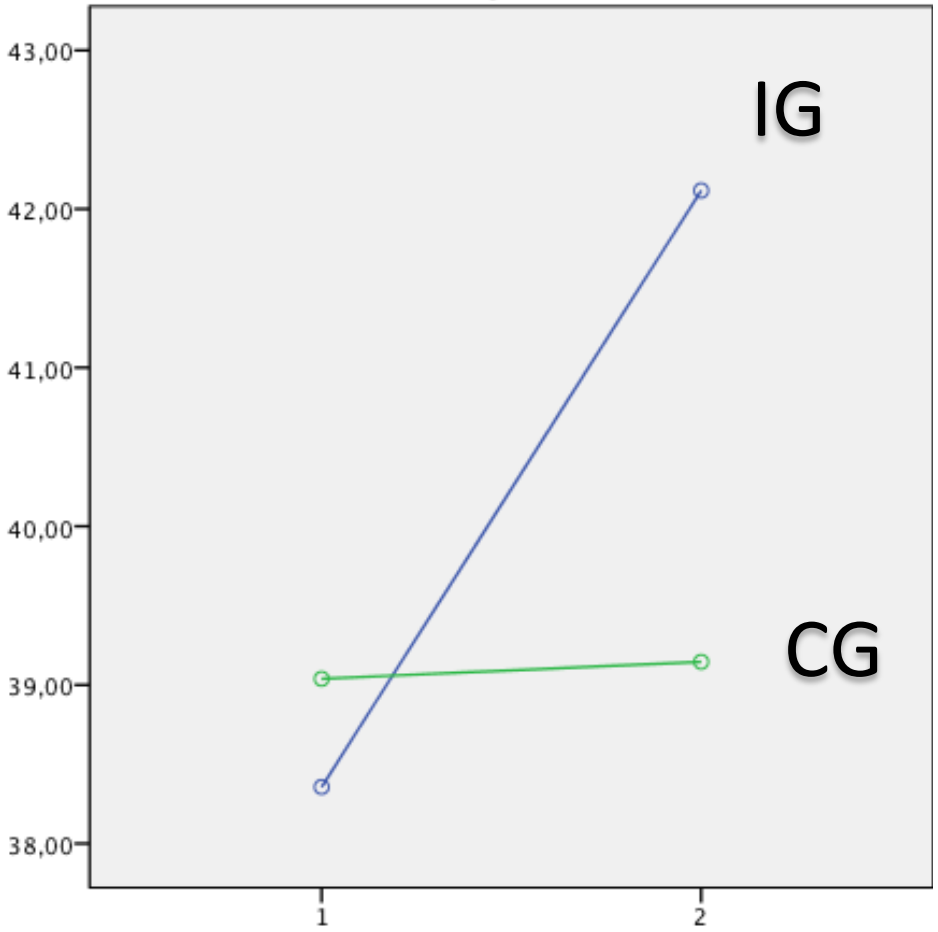
BMJ 2012;345:e5888 doi: 10.1136/bmj.e5888 (Published 27 September 2012)

RESEARCH

Effectiveness of intervention on physical activity of children: systematic review and meta-analysis of controlled trials with objectively measured outcomes (EarlyBird 54)

Conclusions This review provides strong evidence that physical activity interventions have had only a small effect (approximately 4 minutes more walking or running per day) on children's overall activity levels. This finding may explain, in part, why such interventions have had limited success in reducing the body mass index or body fat of children.

Results - 5

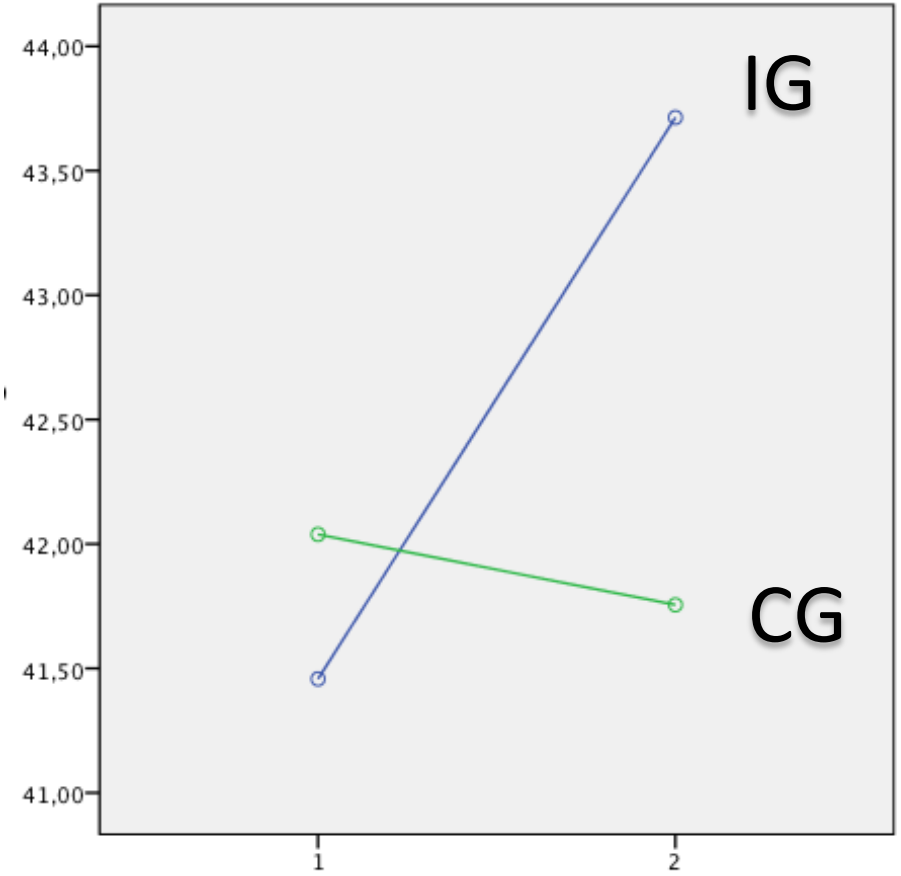


(Fernhall, 1998)

$p < .001$

Results - 6

CARDIORESPIRATORY FITNESS



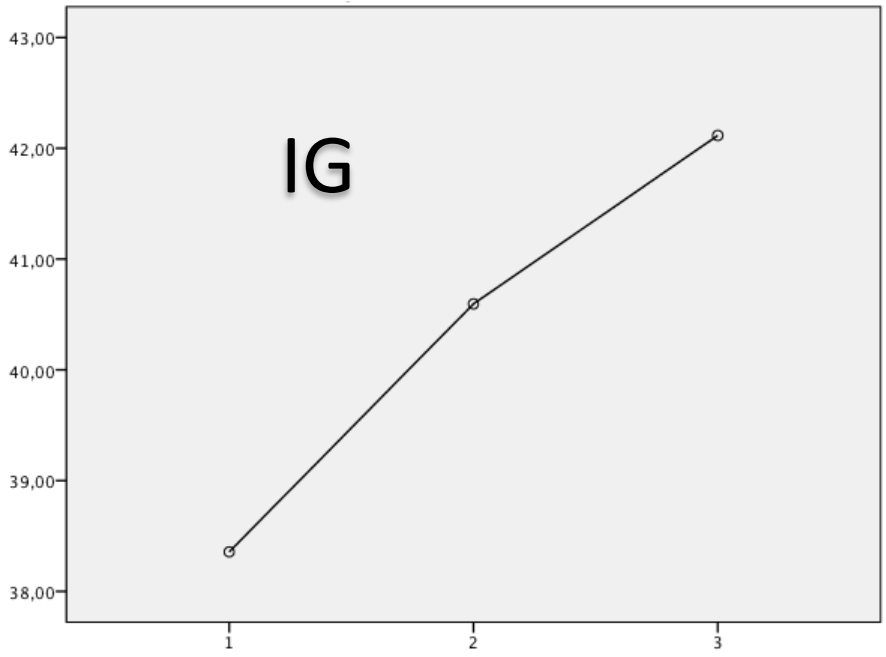
(Matsuzaka, 2004)

$p < .001$

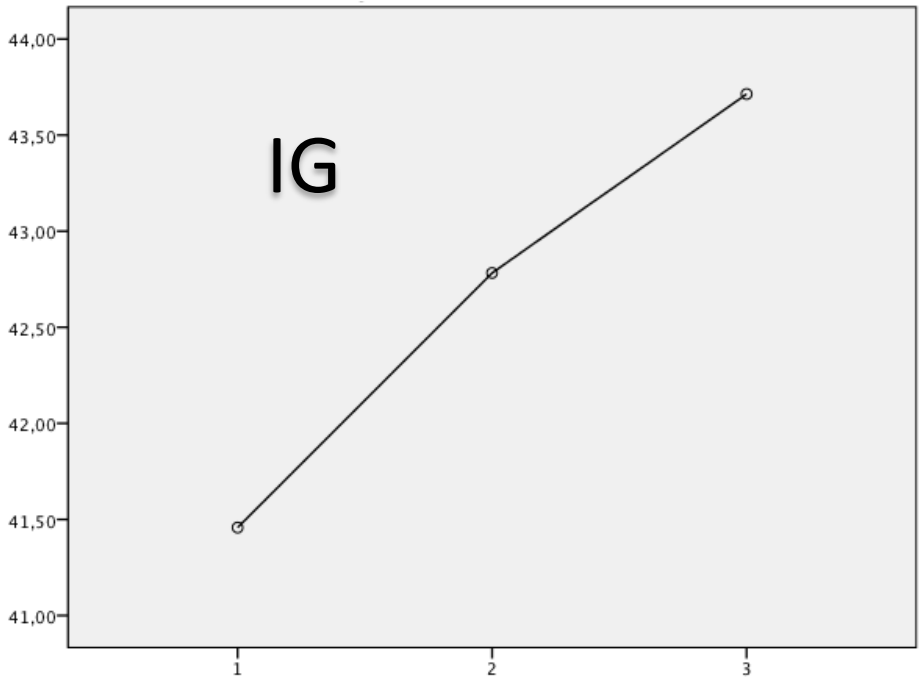
Results - 7

CARDIORESPIRATORY FITNESS

(Fernhall, 1998)

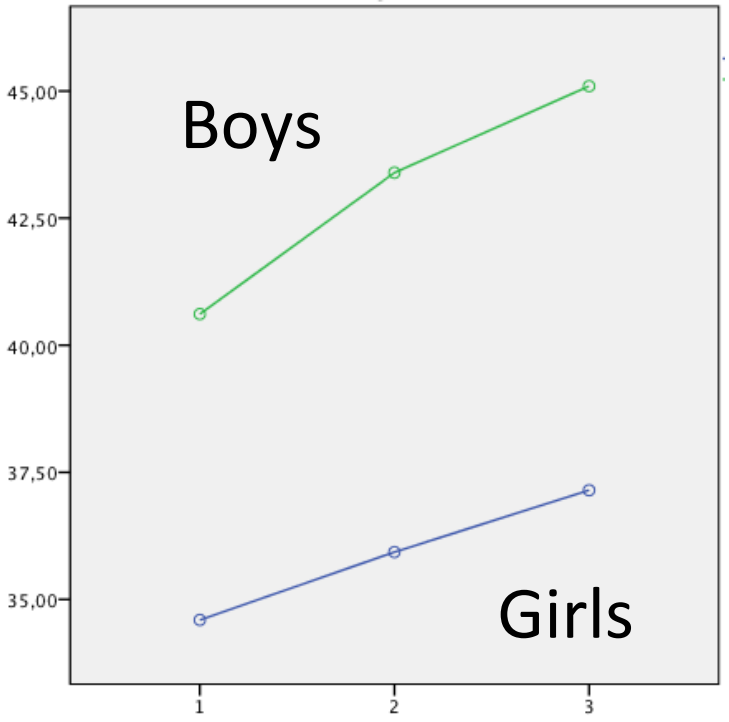


(Matsuzaka, 2004)

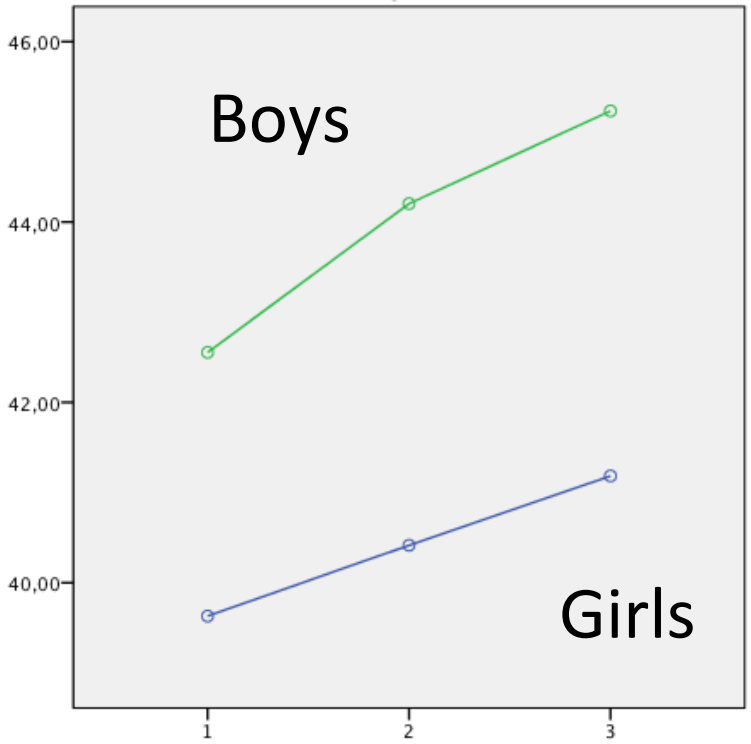


Results - 8

(Fernhall, 1998)

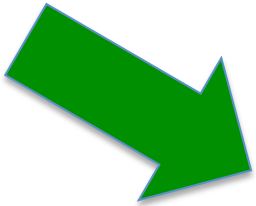


(Matsuzaka, 2004)



Results - 9

VIGOROUS PHYSICAL ACTIVITY



CARDIORESPIRATORY FITNESS

Partial correlation shows a **positive association between the variance in vigorous PA** since baseline to the end of intervention performed by IG and the **variance of the CRF** (Fer: p=,021; Mat: p=,010).

Discussion

The PANK **was effective** in improving PA.

Our results corroborate that it is possible to achieve **improvements in CRF by increasing PA**.

The results in PA confirm that to achieve health benefits, the PA should be of at least a moderate intensity, but **vigorous intensity activities** may provide even greater benefit for children (Janssen and Leblanc, 2010).

Discussion

NEXT STEP???

Considering the suggested independent impact of PA on metabolic syndrome and insulin resistance, alternatively or simultaneously mediated by the CRF and adiposity of youth (Guinhouya, et al., 2011)…

…we will explore the possible influence of these results in the several CMRF studied.

Discussion

NEXT STEP???

BLOOD VARIABLES

BLOOD PRESSURE

BODY COMPOSITION

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