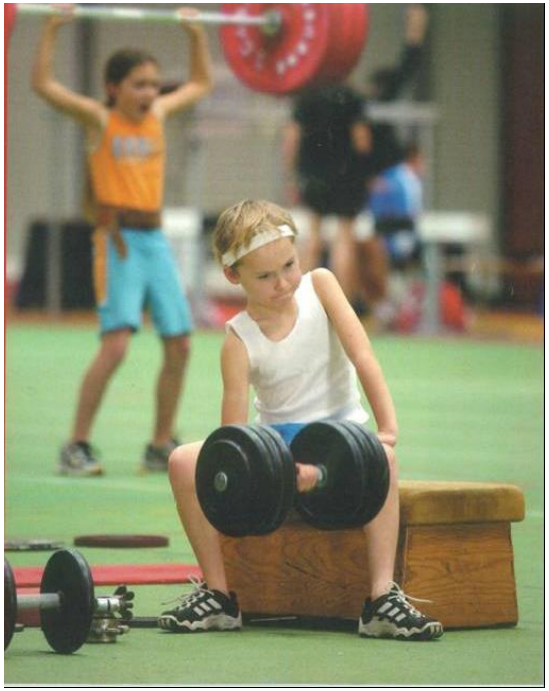
FACULTAD DE
CIENCIAS DEL DEPORTE
Universidad de Granada

ugr Universidad de Granada

Condición física, obesidad y salud cardiovascular. Niños en forma, adultos sanos"



Jonatan R Ruiz
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PROmoting FITness and Health through physical activity research group (PROFITH)

Acknowledgments

Universidad de Granada

- Manuel J Castillo
- Ángel Gutiérrez
- Francisco B Ortega
- José L Mesa
- Enrique García Artero
- Manuel Delgado
- Pablo Tercedor
- Palma Chillón
- Miguel Martin Matillas

Estudio AVENA

- Luis Moreno
- Marcela Gonzalez-Gross
- Ascensión Marcos
- Julia Wärnberg
- Ester Nova
- Domingo Gonzalez-Lamuño
- Miguel García Fuentes
- Carlos Redondo
- Idoia Labayen

Karolinska Institutet

- Michael Sjöström
- Anita Hurtig Wennlöf
- Patrick Bergman
- Maria Hagströmer
- Nico S Rizzo
- Karin Fremling
- Olle Karlson
- Emma Patterson
- Vicente Martinez-Vizcaino

Universidad de Cádiz

- José Castro
- Julio Conde
- Carmen Padilla
- Vanesa España
- David Jiménez
- Ana Carbonell
- Magdalena Cuenca

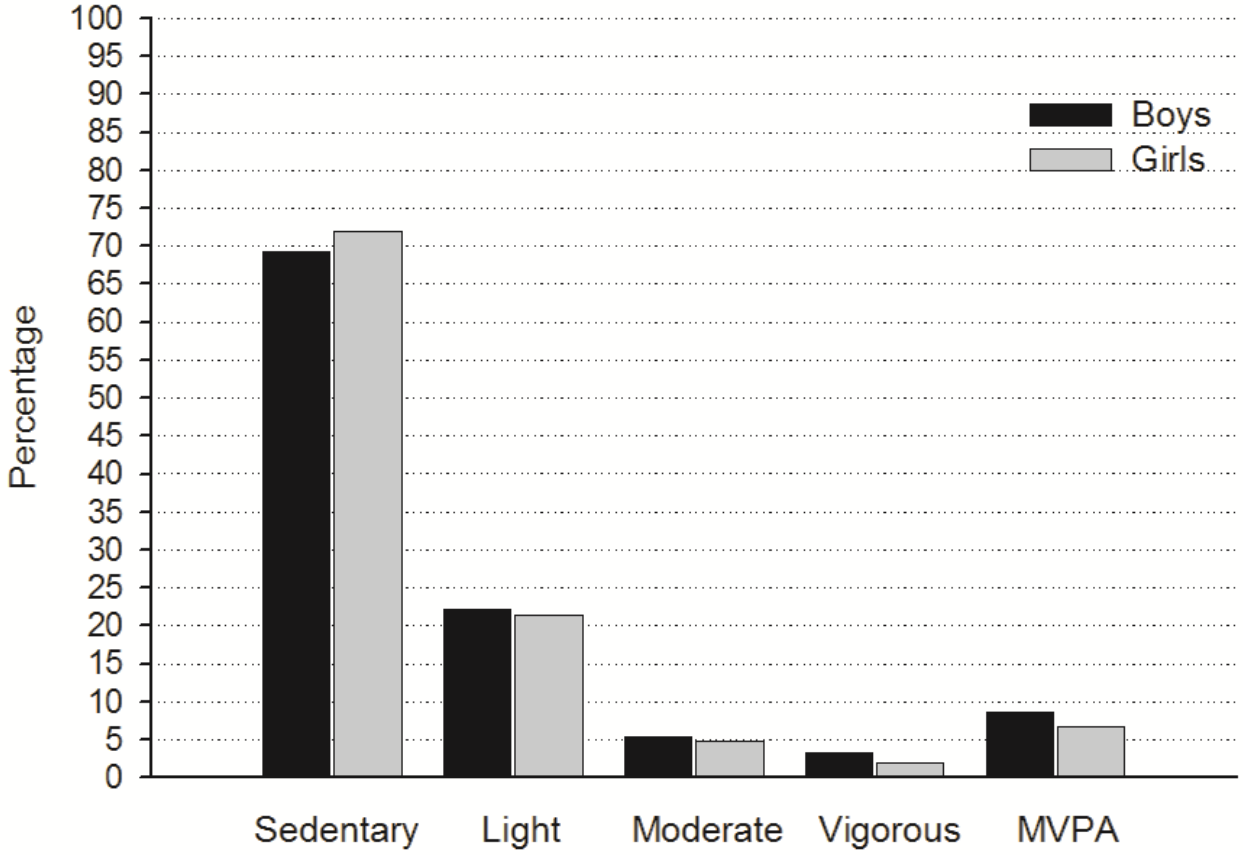
HELENA Family

Healthy Lifestyle in Europe by Nutrition in Adolescence

Let children play and nature will do the rest

Objectively measured sedentary time in European adolescents: The HELENA study

2200 adolescents
9 EU countries

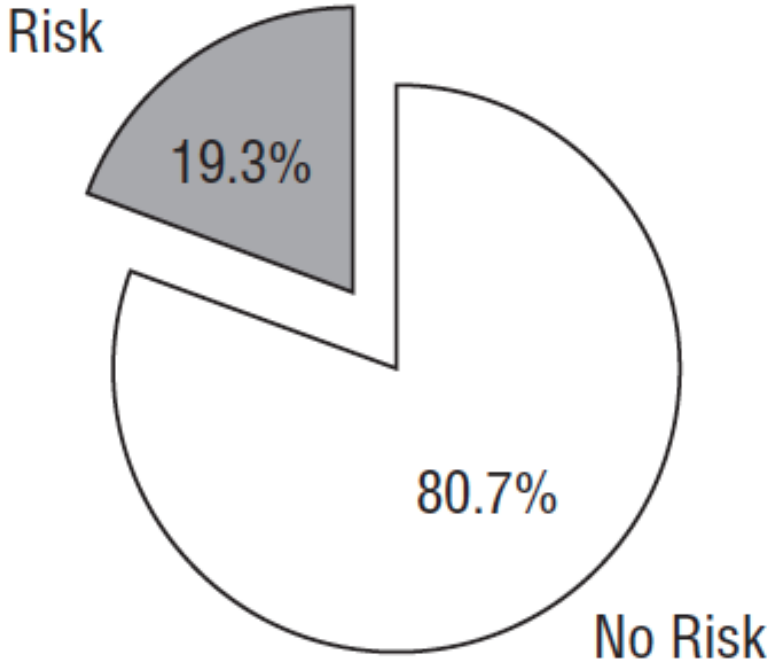


HELENA Healthy Lifestyle in Europe by Nutrition in Adolescence

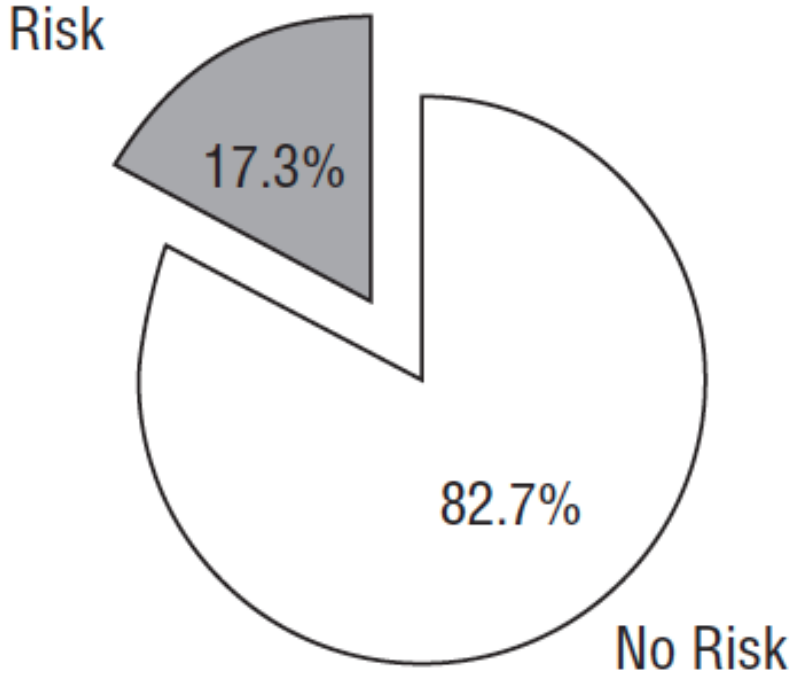
Ruiz et al 2011 AJE

Prevalence of low cardiorespiratory fitness in Spanish adolescents

% of boys with low cardiorespiratory fitness



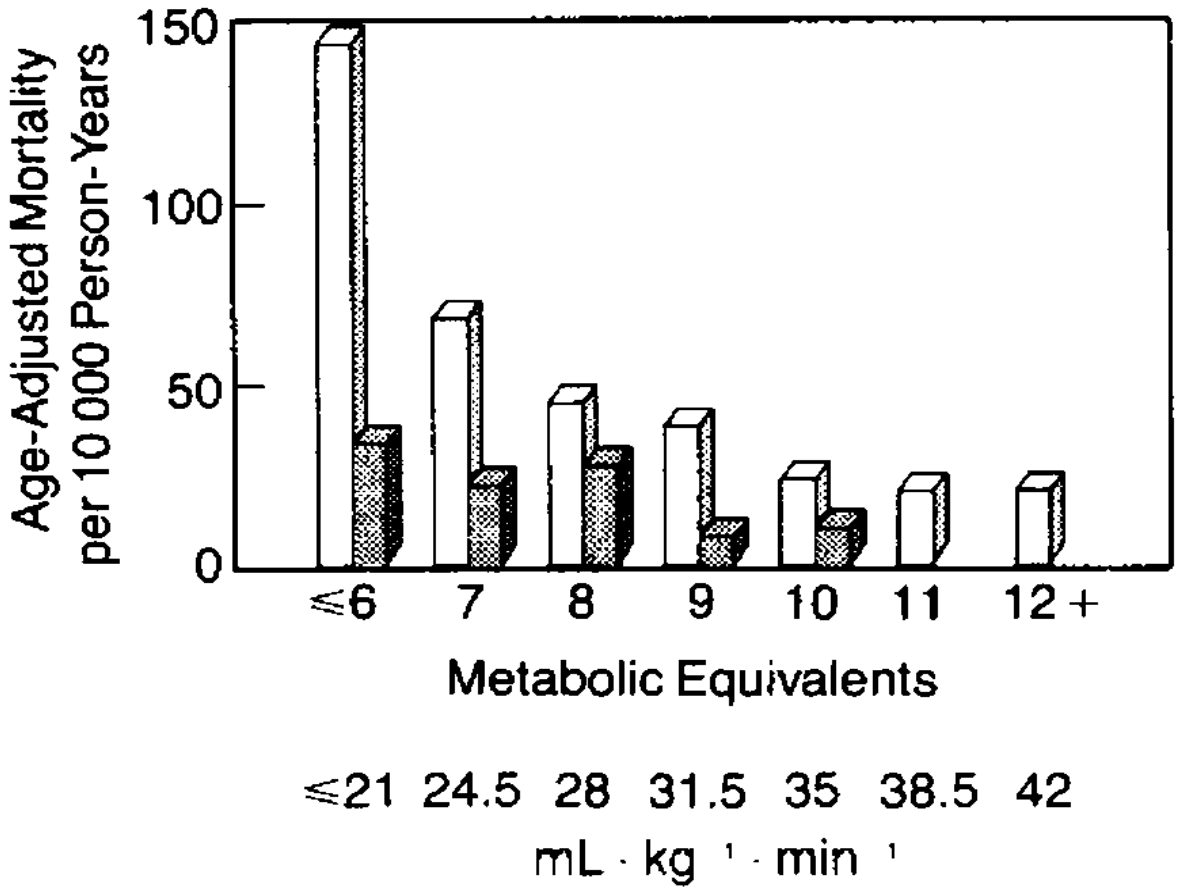
% of girls with low cardiorespiratory fitness



AVENA Study

Ortega et al 2005 REC

Cardiorespiratory fitness and all-cause mortality



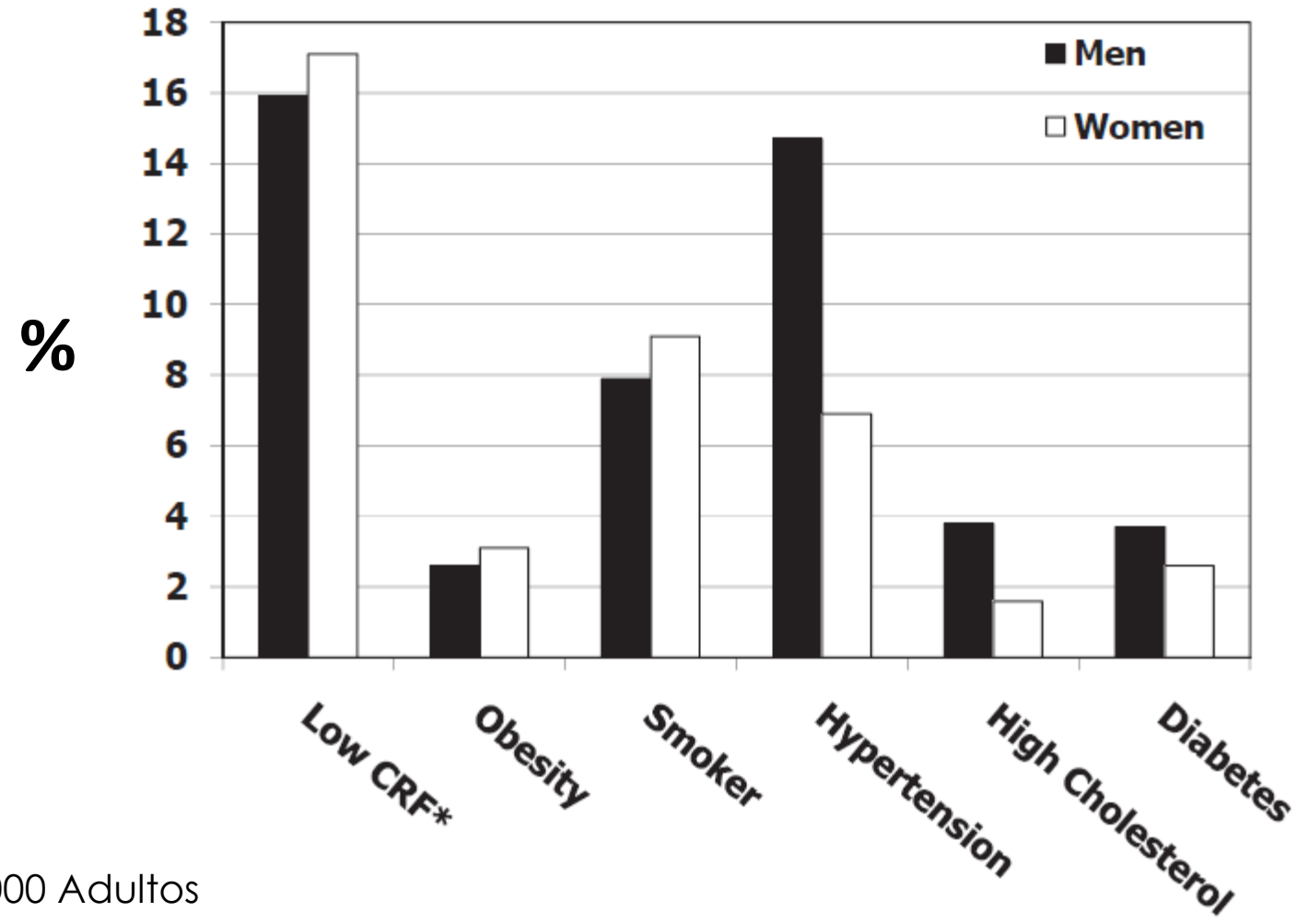
1989

ACLS
10 224 men
3 120 women
8 yrs follow-up

Citations >2000

Blair et al 1989 JAMA

Risk of mortality by pathologies

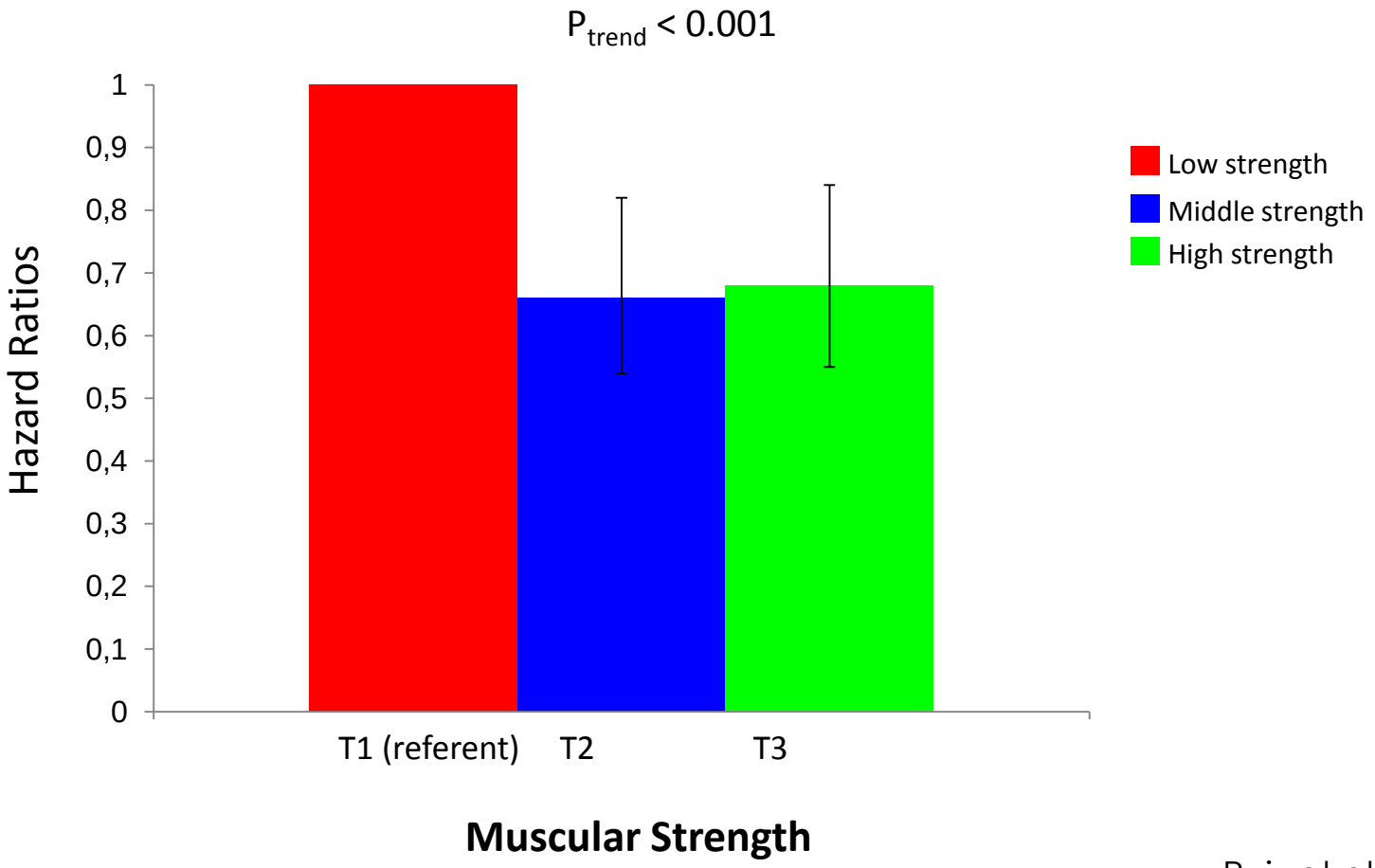


54.000 Adultos

Blair 2009 BJSM

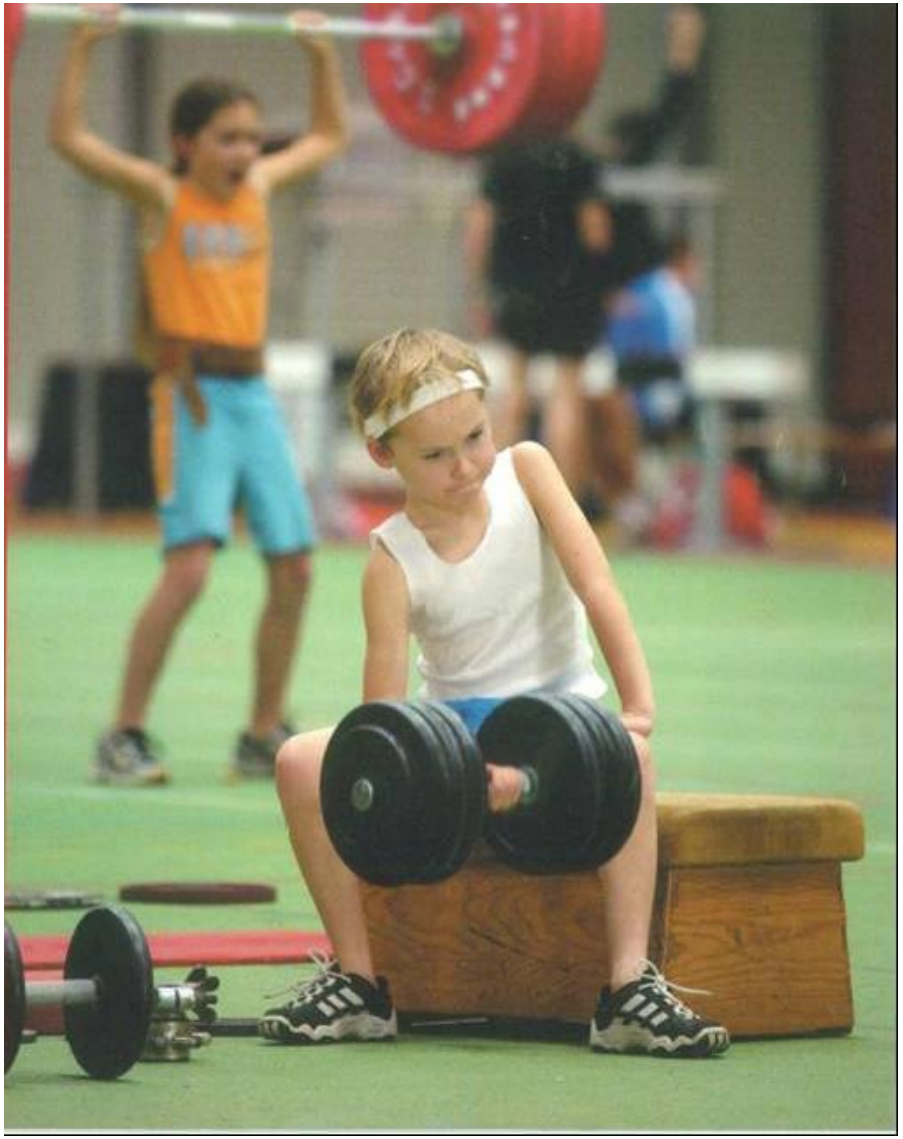
Muscular strength and risk of mortality

Aerobic Center Longitudinal Study (1980-3002)

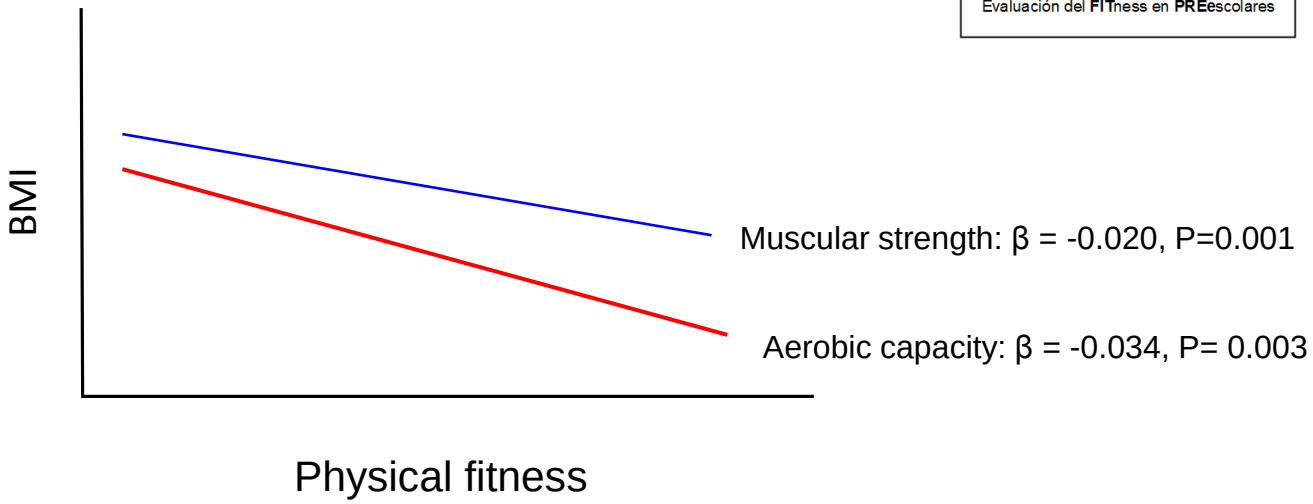


Ruiz et al 2008 BMJ

Physical fitness in children



Fitness and body composition in children aged 3-5 years



403 preschool children (57.8% boys)

Martinez-Tellez et al. *submitted*

Estudio de evaluación del FITness en PREescolares

3300 Niños de 3-6 años de 11 ciudades de España

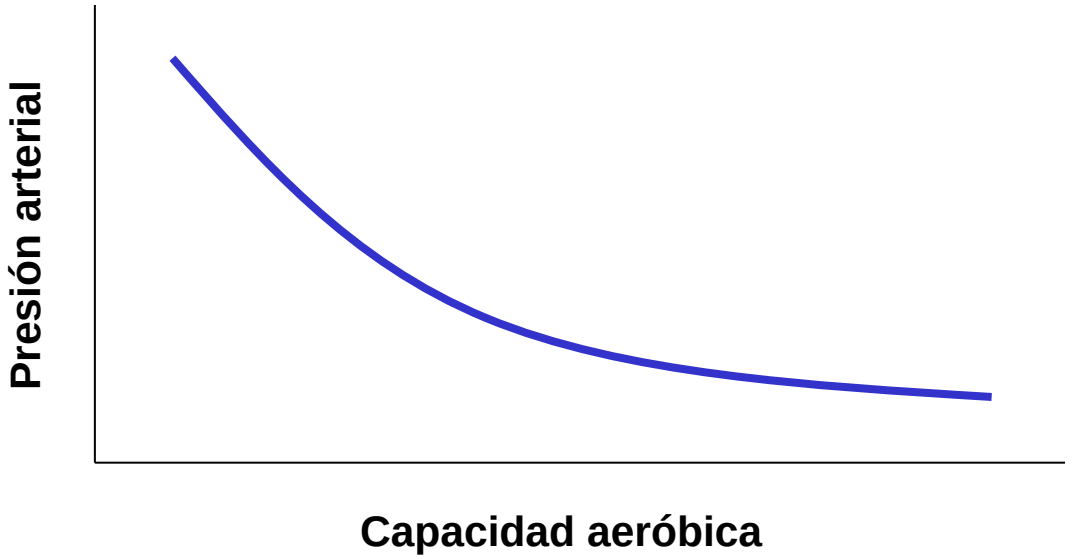
IP: Francisco B Ortega

Cardiorespiratory fitness and blood pressure

JAMA®
The Journal of the American Medical Association

1990

Blood pressure, fitness, and fatness in 5- and 6-year-old children

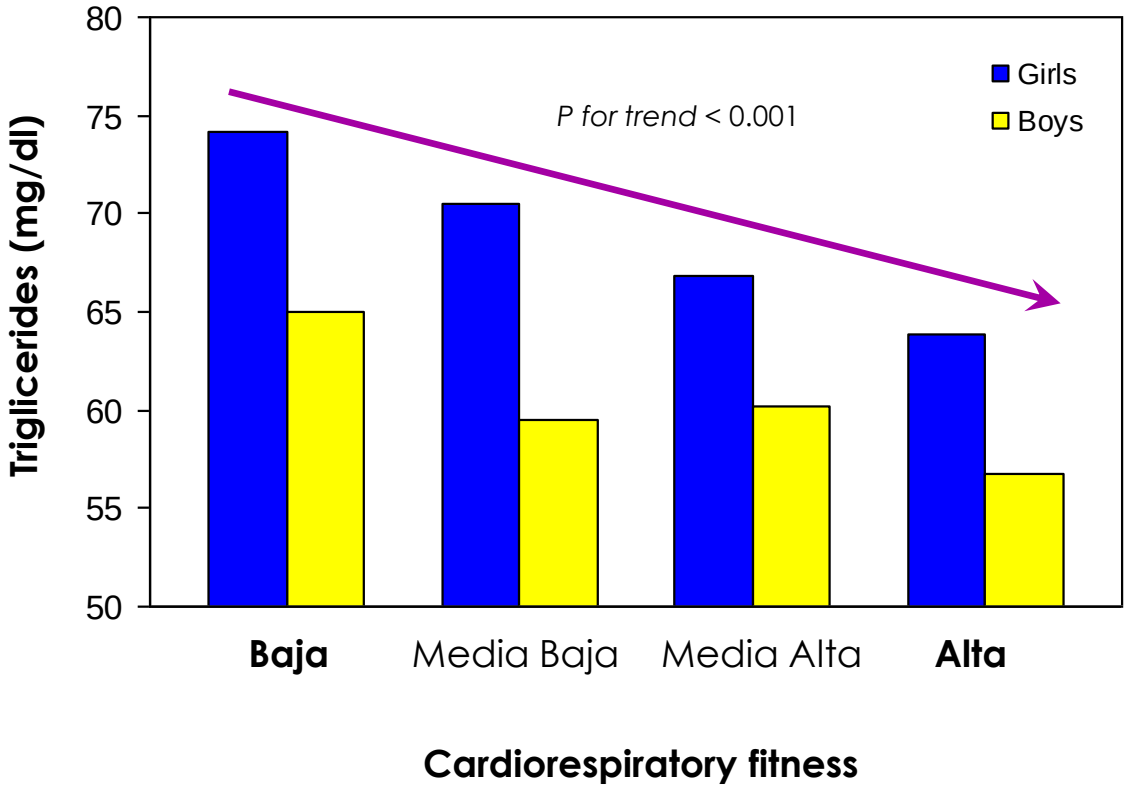


Gutin et al 1990

Cardiorespiratory fitness and TG

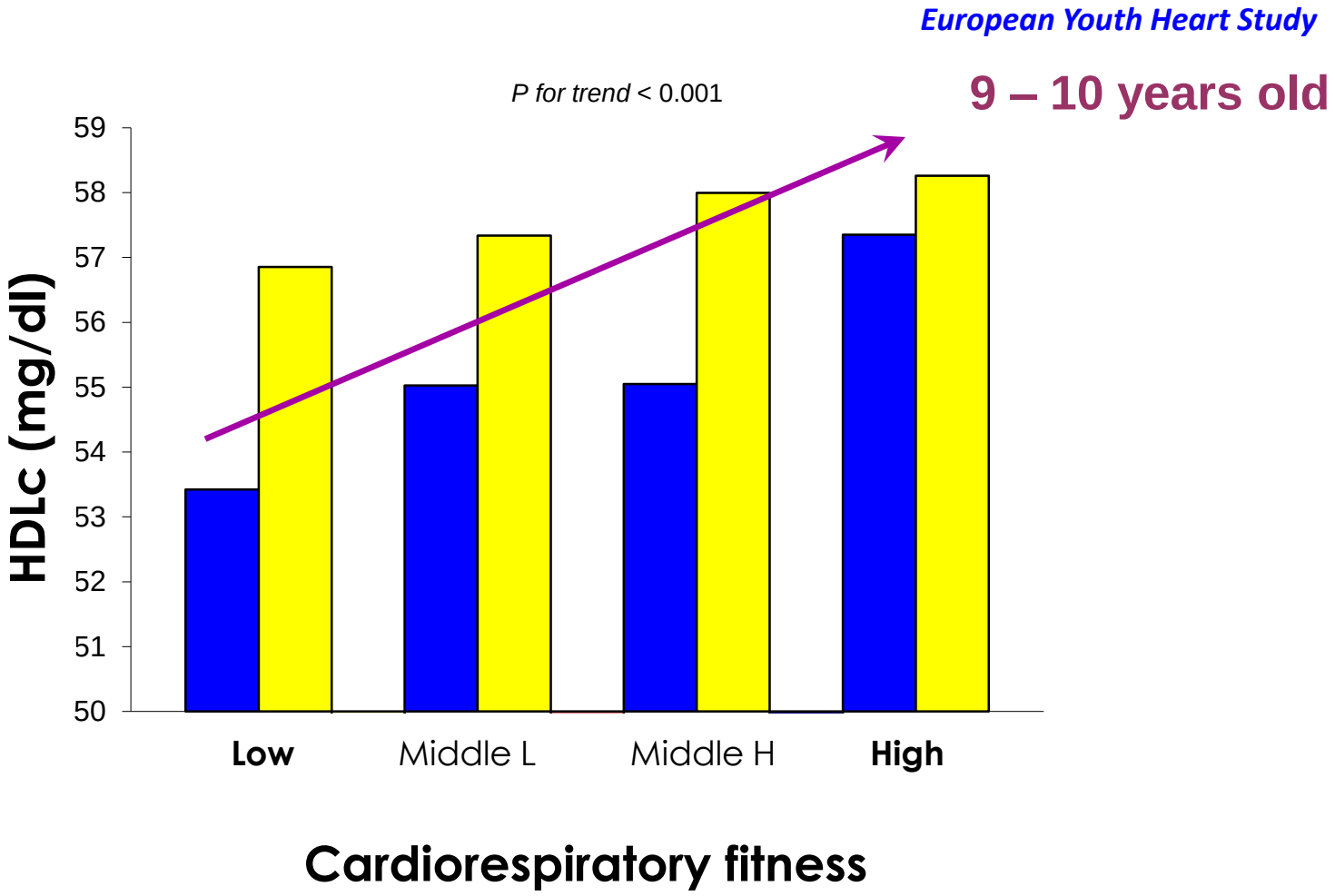
European Youth Heart Study

9 – 10 years old



Ruiz et al. Ped Res 2007

Cardiorespiratory fitness and HDLc

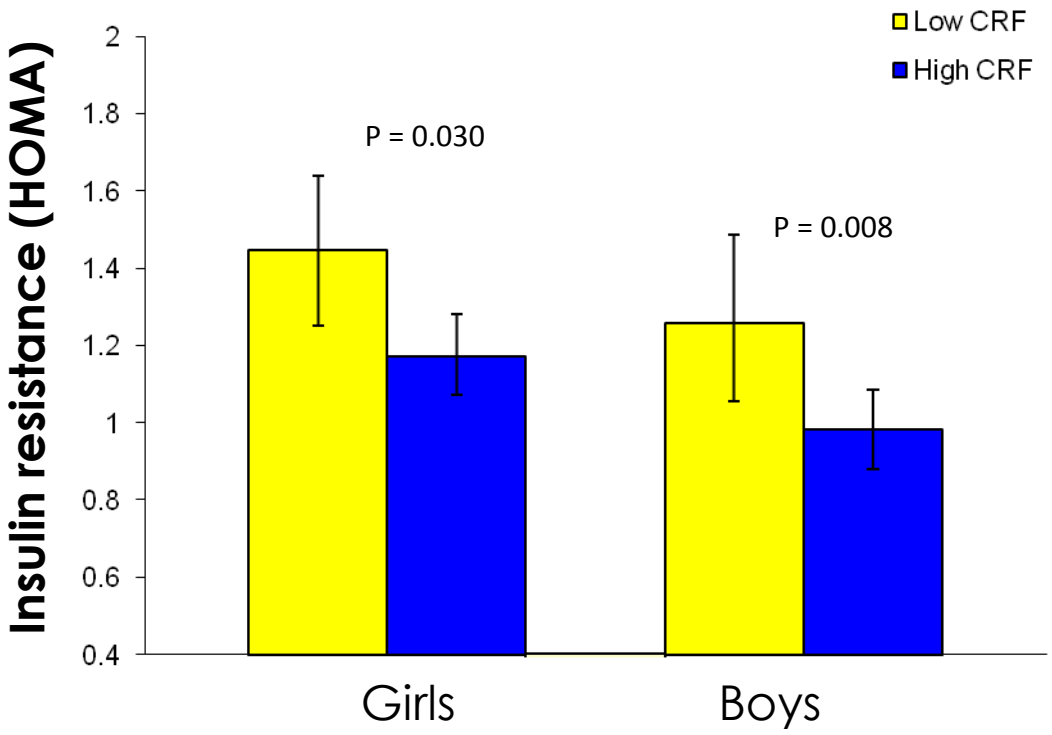


Ruiz et al. Ped Res 2007

Cardiorespiratory fitness and HOMA

European Youth Heart Study

9 – 10 years old



Ruiz et al. 2007 Diabetologia

Cardiorespiratory fitness and Ideal Cardiovascular Health in European adolescents

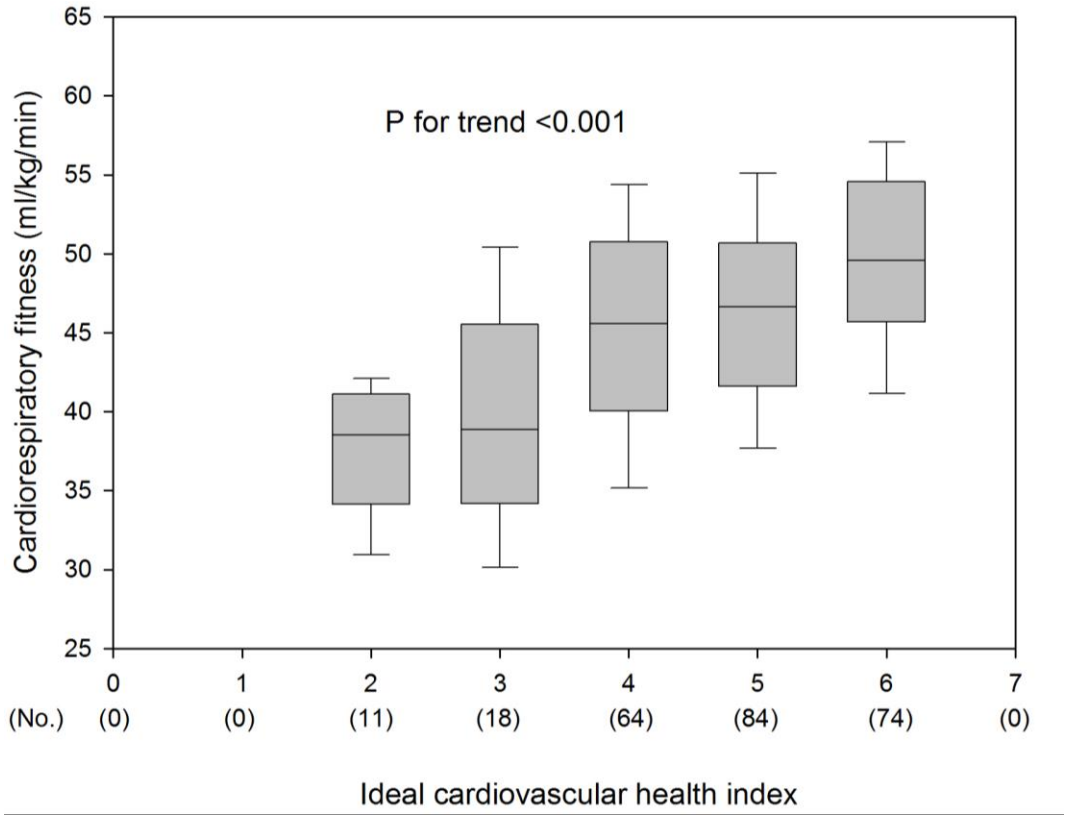
AHA ICH

Health behaviours

- Smoking (never)
- BMI (normal-weight)
- Diet (4-5 ideal)*
- PA (60 min/day MVPA)

Health factors

- TC (<170 mg/dl)
- Glucose (<100 mg/dl)
- Blood pressure (<90th)



Healthy Lifestyle in Europe by Nutrition in Adolescence

Ruiz et al 2015 Heart

2006

Physical activity and clustered cardiovascular risk in children: a cross-sectional study (The European Youth Heart Study)

Lars Bo Andersen, Maarike Harro, Luis B Sardinha, Karsten Froberg, Ulf Ekelund, Søren Brage, Sigmund Alfred Anderssen*

Background Atherosclerosis develops from early childhood; physical activity could positively affect this process. This study's aim was to assess the associations of objectively measured physical activity with clustering of cardiovascular disease risk factors in children and derive guidelines on the basis of this analysis.

Cardiovascular profile: Systolic blood pressure, triglyceride, TC/HDL, insulin resistance, sum of four skinfolds, and **aerobic fitness**

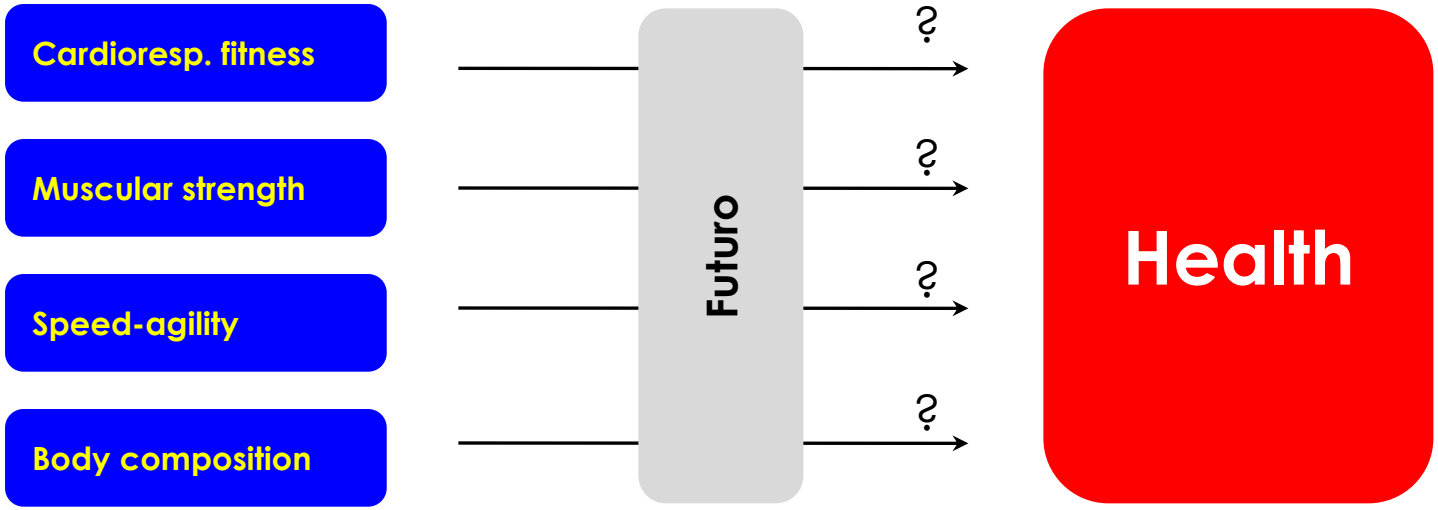
Adendersen et al. 2006 Lancet

Predictive validity of health-related fitness in youth: a systematic review

J R Ruiz,[1,2] J Castro-Piñero,[3] E G Artero,[2] F B Ortega,[1,2] M Sjöström,[1] J Suni,[4] M J Castillo[2]

2009

Does fitness in childhood predicts health in adulthood?



Ruiz et al. 2009 BJSM

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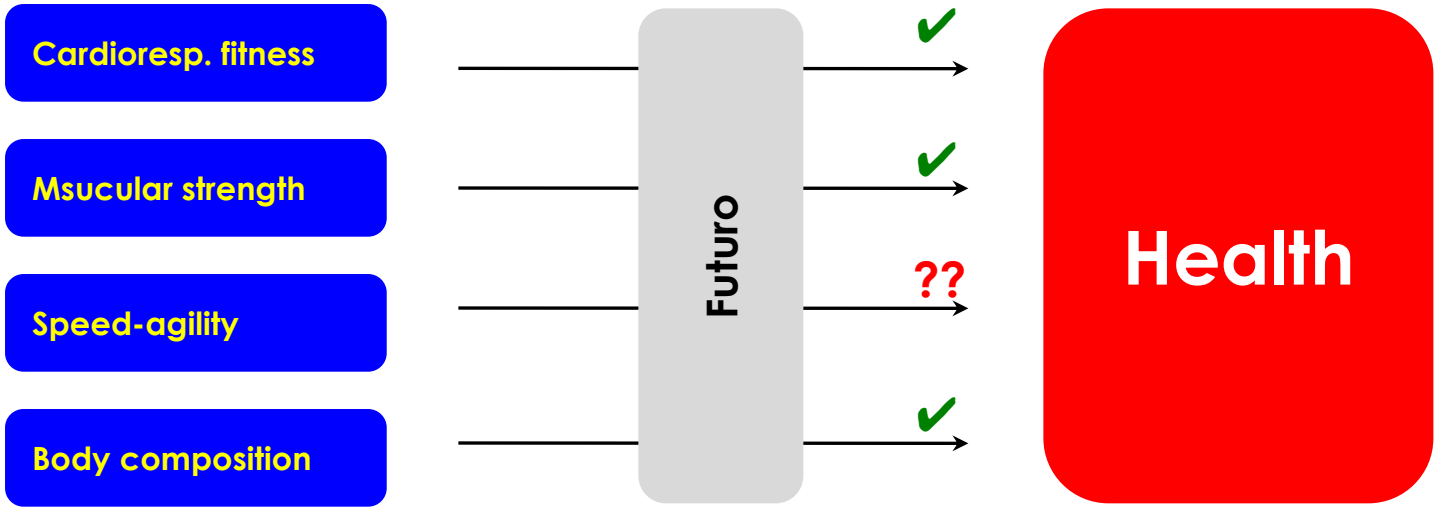
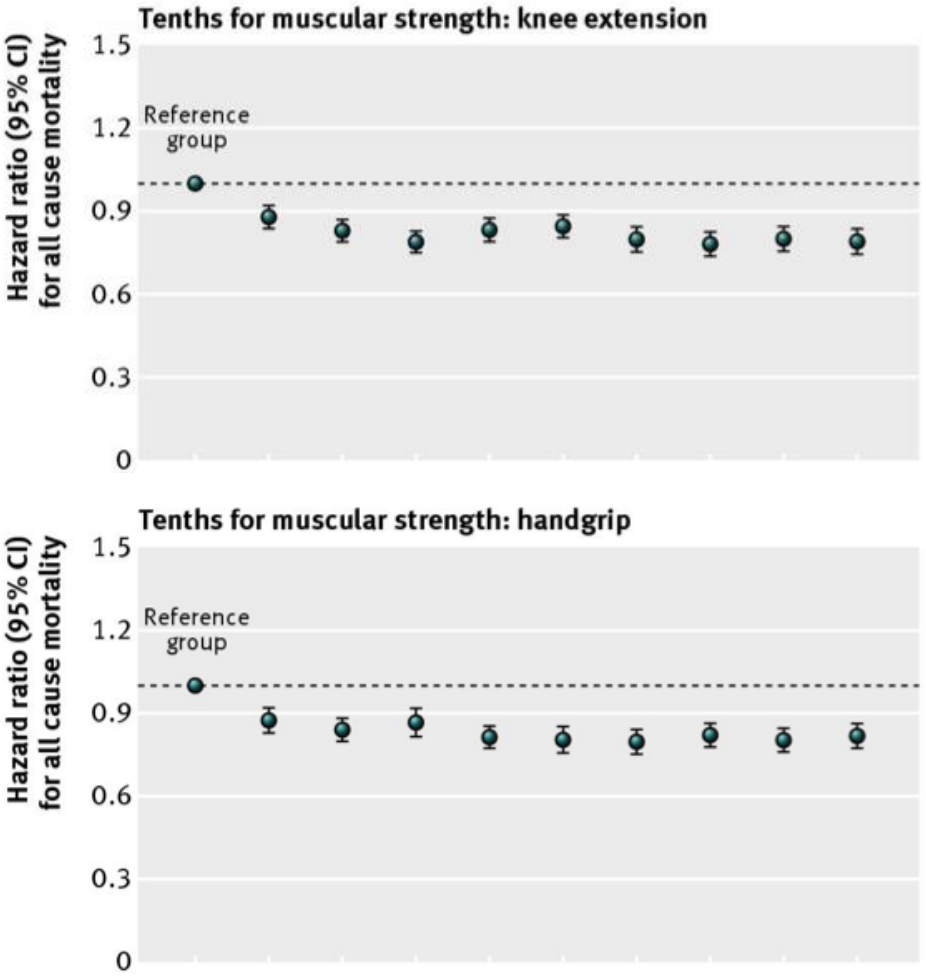


Ruiz et al. 2009 BJSM

Muscular strength in male adolescents and premature death: cohort study of one million participants

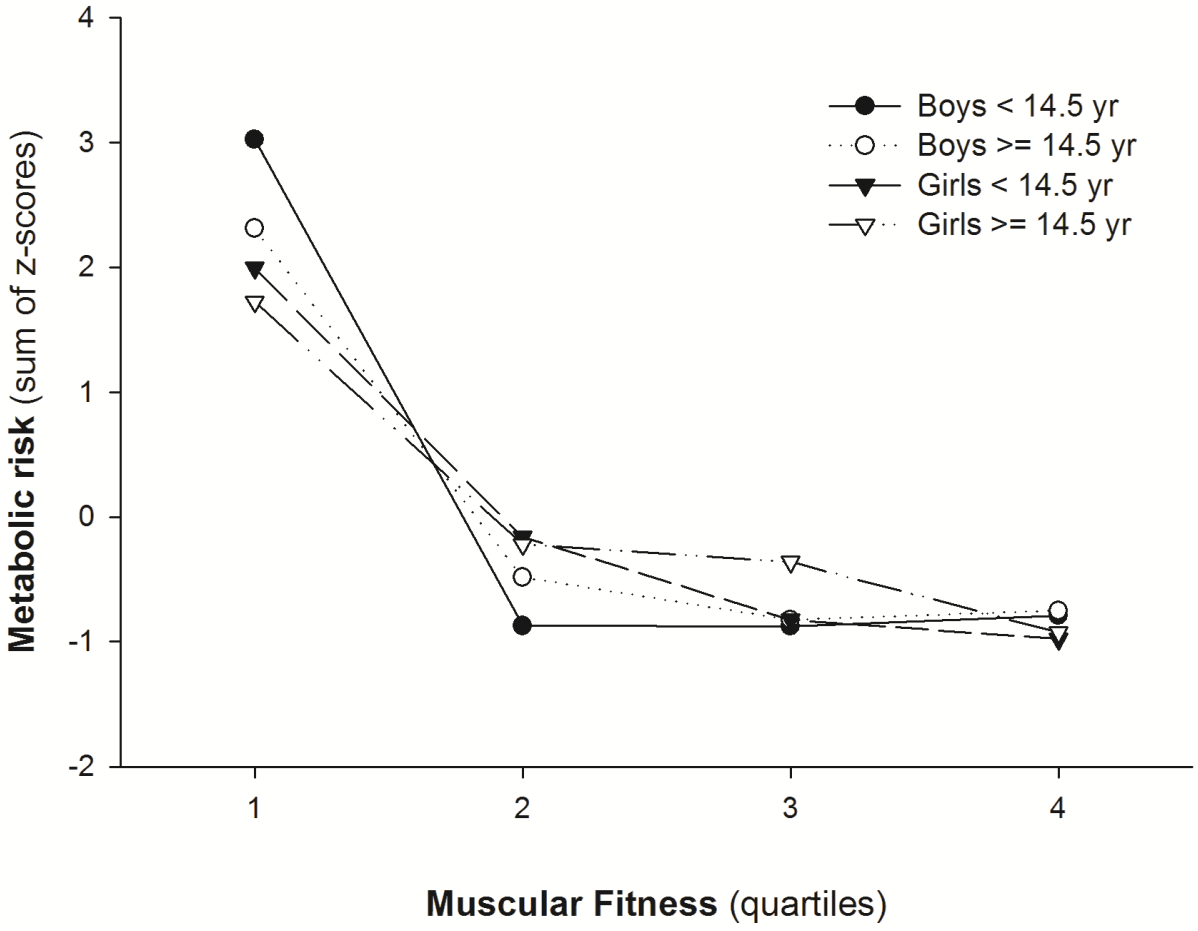
2012



median follow-up period of 24 years

Ortega et al 2012 BMJ

Muscular strength and cardiovascular profile



Fuerza

- Handgrip
- Long jump

12-17 y old

The HELENA Study

Metabolic risk: WC, SBP, TG, TC/HDLc, HOMA

Artero et al 2012 Ped Diab

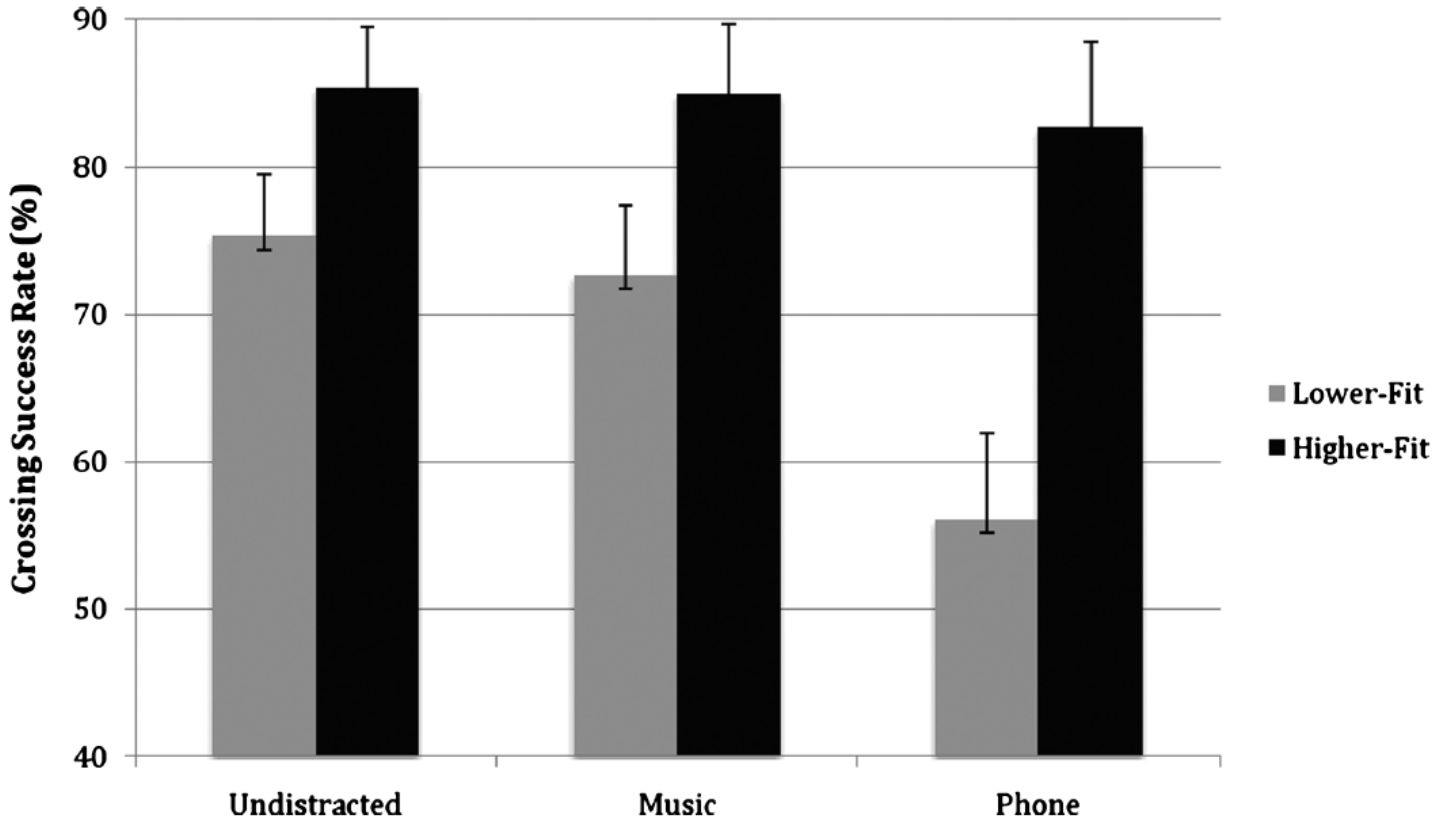
Role of Childhood Aerobic Fitness in Successful Street Crossing

The Survival of the Fittest

NEJM 2012

Chaddock et al 2012 MSSE

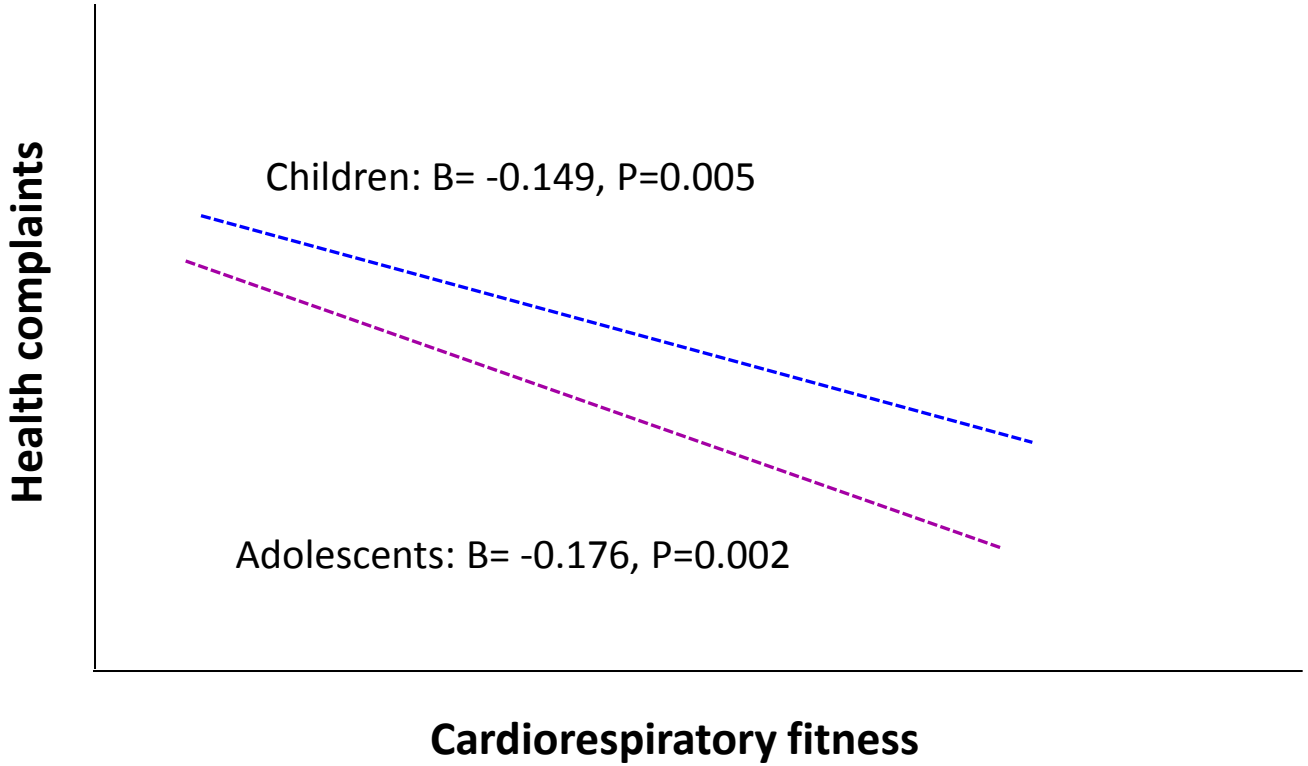
Role of Childhood Aerobic Fitness in Successful Street Crossing



Chaddock et al 2012 MSSE

Cardiorespiratory fitness and health complaints

Spanish children and adolescents

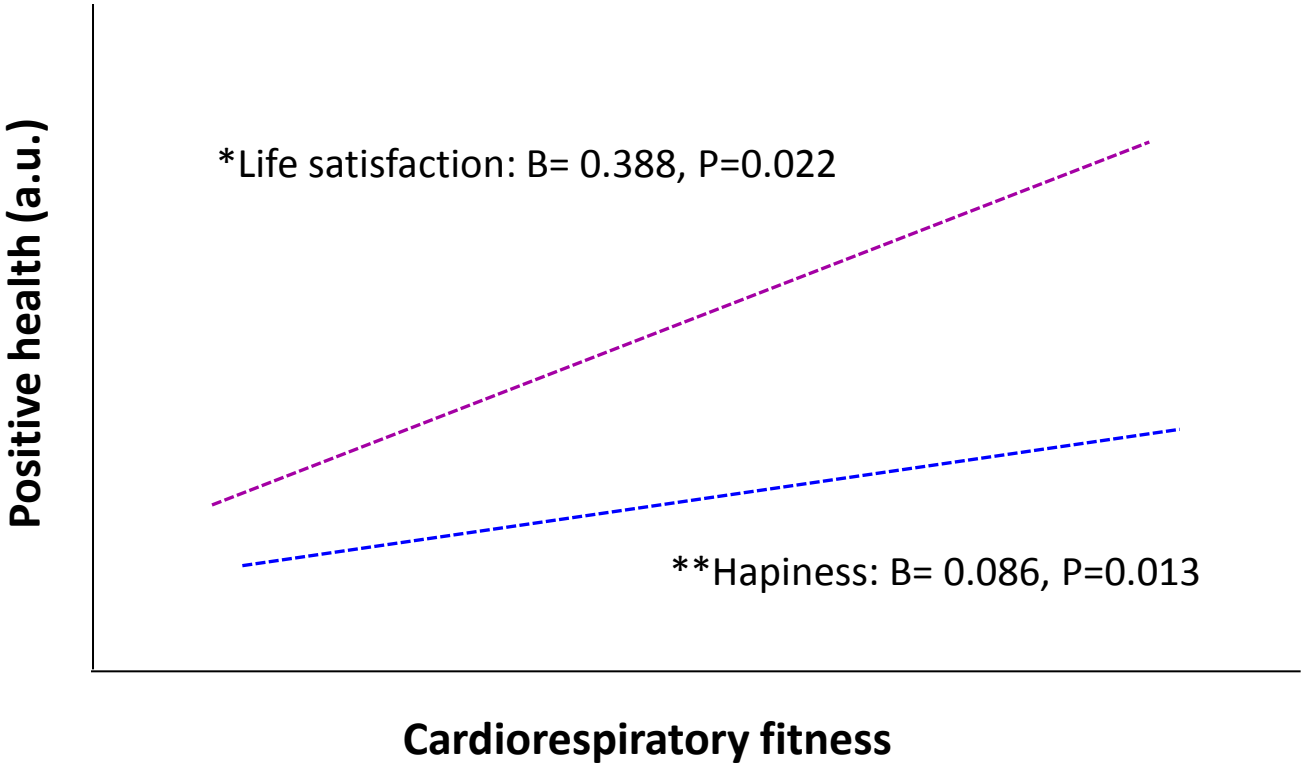


*Headache, stomach-ache, backache, feeling low, irritability or bad temper, feeling nervous, difficulties getting to sleep, feeling dizzy

Castro-Piñero et al 2011

Cardiorespiratory fitness, hapiness, and satisfaction with life

Spanish adolescents



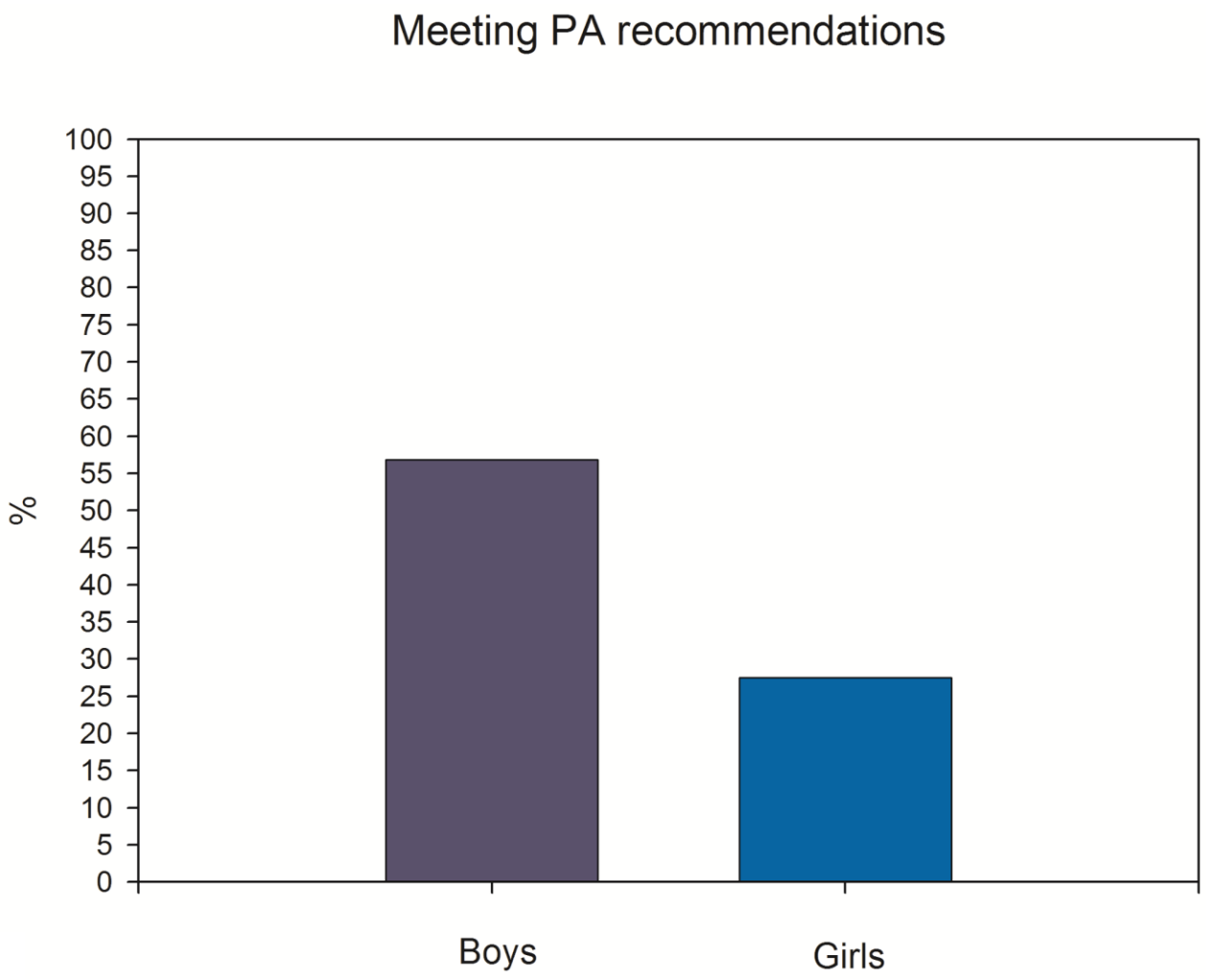
*Satisfaction With Life Scale, 1985
**Subjective Happiness Scale , 1999

Jimenez et al 2013

How can I improve my fitness?

60 min/day of moderate-vigorous PA

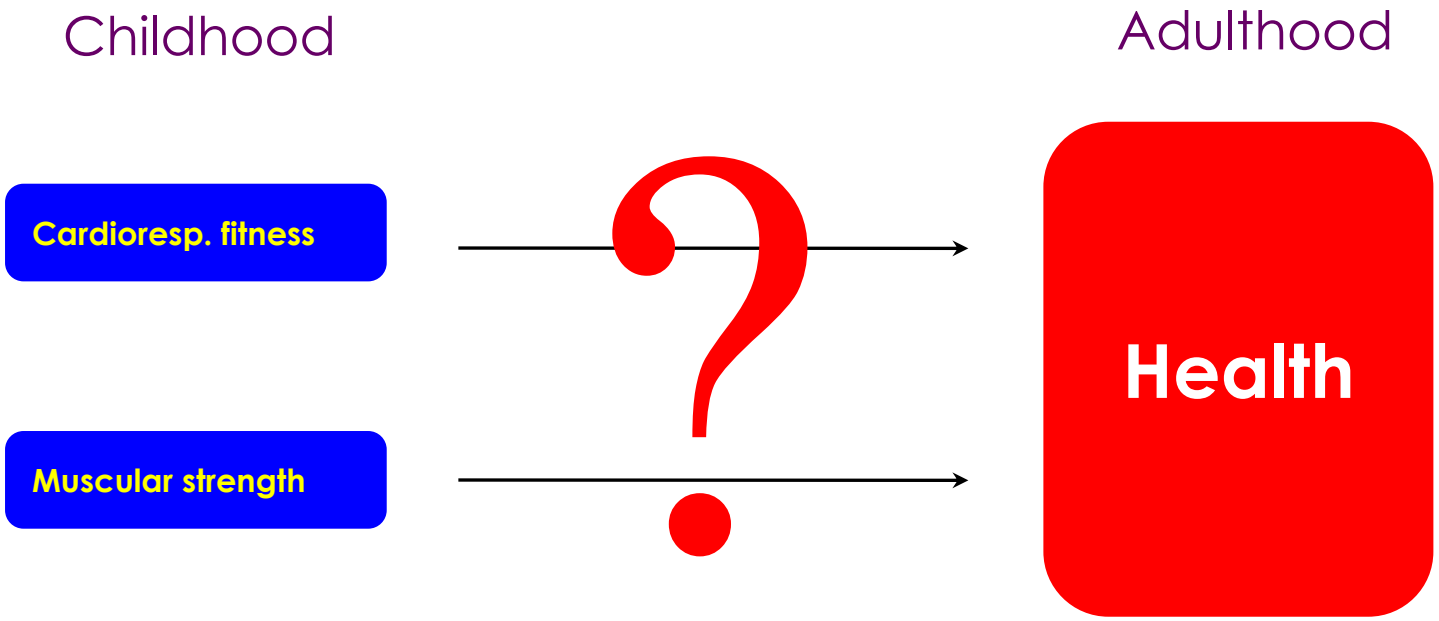
Physical activity levels in European adolescents: The HELENA study



HELENA Healthy Lifestyle in Europe by Nutrition in Adolescence

Ruiz et al 2011 AJE

How much is needed?



FITNESSGRAM Reference Guide

Aerobic Capacity Assessments

1999

Kirk J. Cureton & Sharon A. Plowman

The Cooper Institute

Cardiorespiratory fitness standards

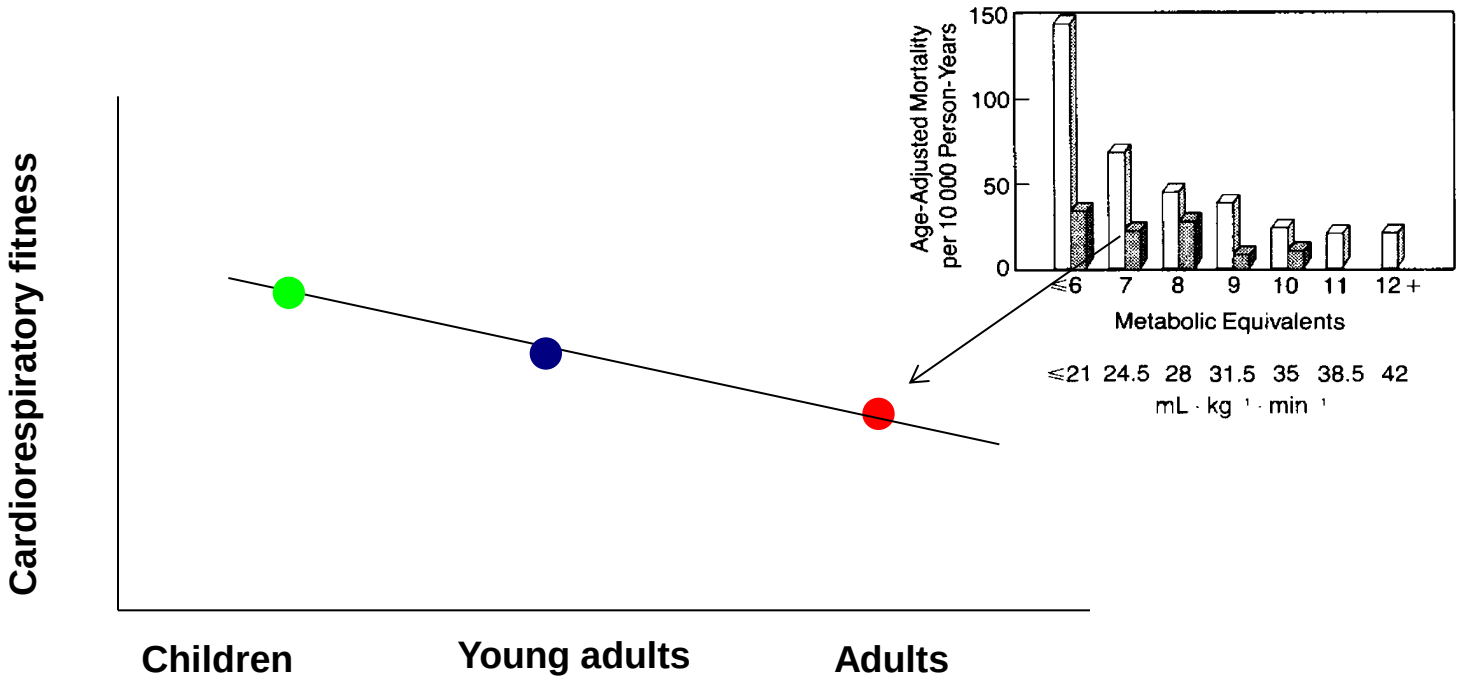
Men 17-35 yrs	35 ml/kg/min
Women 17-35	29
Boys 12-17 yrs	42 ml/kg/min
Girls 12-17	35

FITNESSGRAM Reference Guide

Aerobic Capacity Assessments

Kirk J. Cureton & Sharon A. Plowman

The Cooper Institute



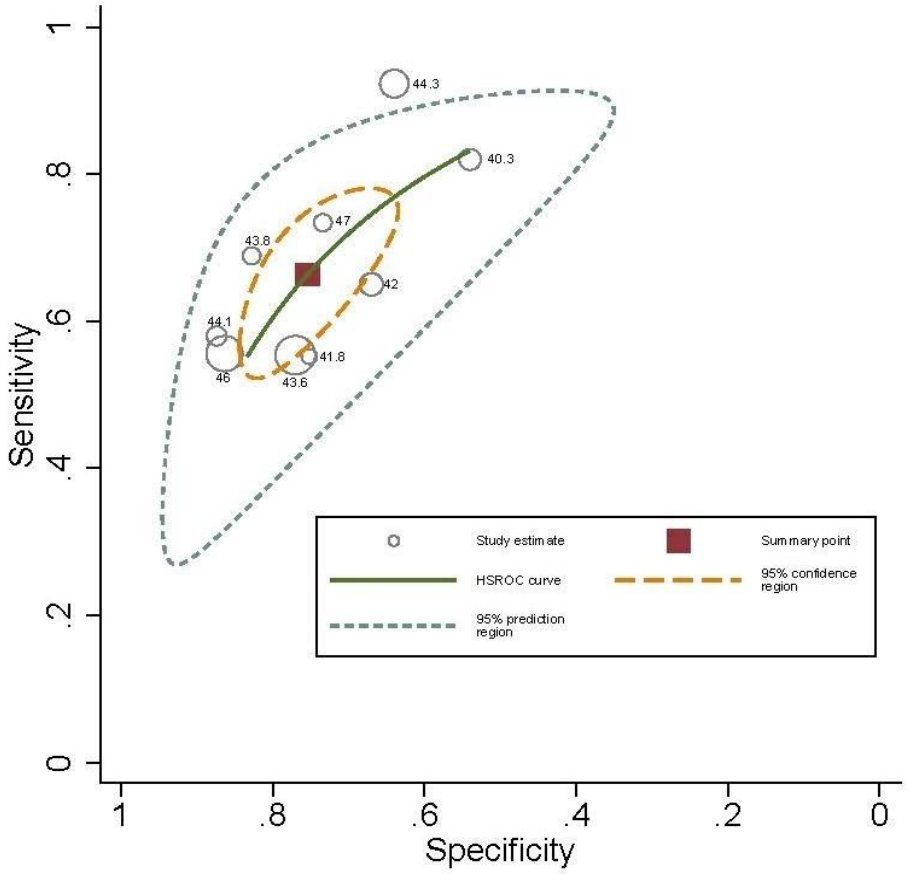
…Too many assumptions?

Cardiorespiratory fitness and CV health in children and adolescents: meta-analysis

1. Mesa JL, et al. *Nutr Metab Cardiovasc Dis*. 2006
2. Ruiz JR, et al. *Pediatr Res*. 2007
3. Lobelo F, et al. *Med Sci Sports Exerc*. 2009
4. Adegboye AR, et al. *Br J Sports Med*. 2011
5. Moreira C, et al. *J Sci Med Sport*. 2011
6. Welk GJ, et al. *Am J Prev Med*. 2011
7. Boddy LM, et al. *PLoS One*. 2012
8. Ruiz JR, et al. *Heart*. 2015

Ruiz et al. *submitted*

Cardiorespiratory fitness and cardiovascular health in boys



Healthy fitness zone

41.8 – 47 ml/kg/min

AUC: 0.706 (0.652-0.759), P<0.001

FITNESSGRAM 1999
VO_2max: 42 ml/kg/min

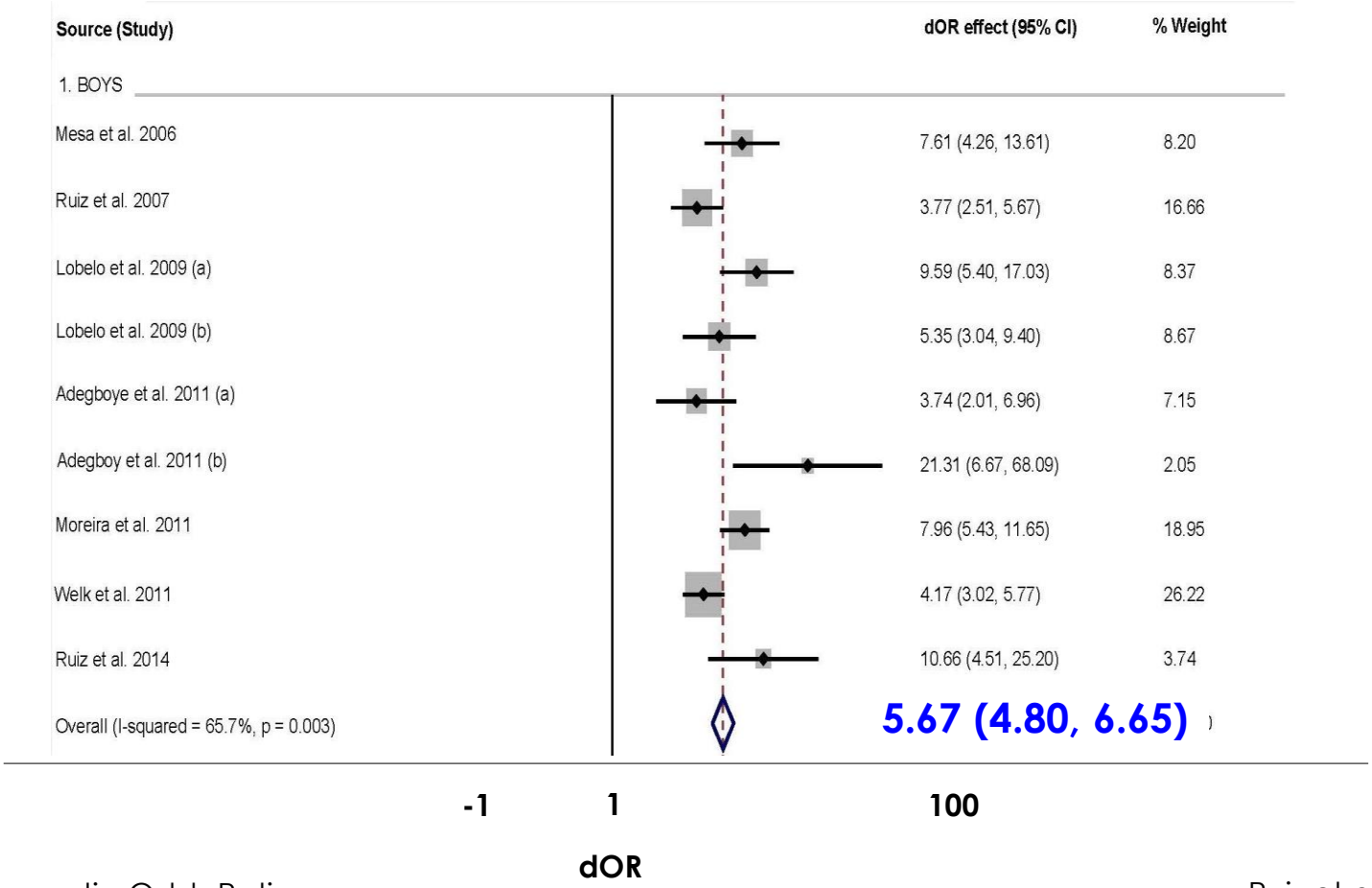
European Group of Pediatric Work Physiology 1986
VO_2max: 40 ml/kg/min

HSROC: Hierarchical summary receiver operating characteristic analysis

Ruiz et al. *submitted*

Cardiorespiratory fitness and cardiovascular health in boys

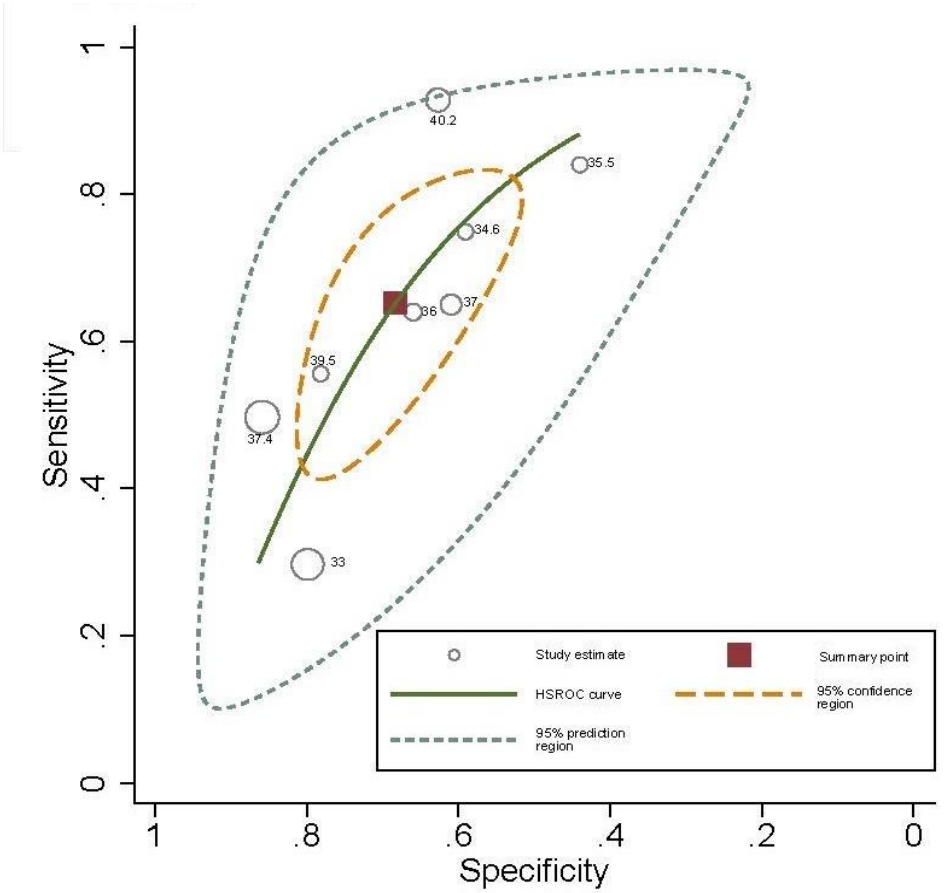
Boys



dOR: diagnostic Odds Ratio

Ruiz et al. *submitted*

Cardiorespiratory fitness and cardiovascular health in girls



Healthy fitness zone

34.6 – 39.5 ml/kg/min

AUC: 0.635 (0.579-0.690), P<0.001

FITNESSGRAM 1999
VO_2max: 35 ml/kg/min

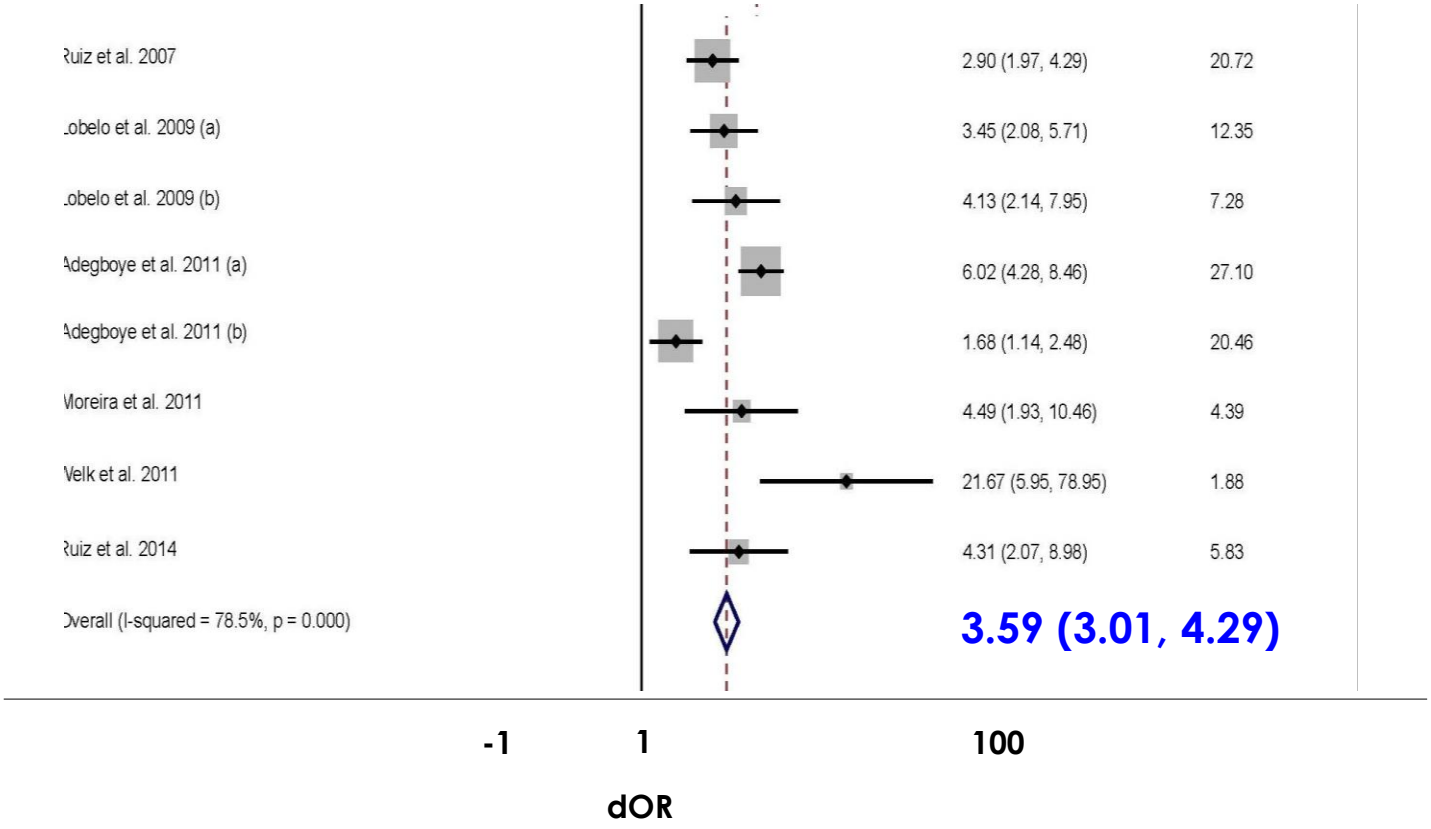
European Group of Pediatric Work Physiology 1986
VO_2max: 35 ml/kg/min

HSROC: Hierarchical summary receiver operating characteristic analysis

Ruiz et al. *submitted*

Cardiorespiratory fitness and cardiovascular health in girls

Girls



dOR: diagnostic Odds Ratio

Ruiz et al. *submitted*

Muscular strength and cardiovascular health

Test	Relative Grip Strength (kg/kg mass)		Standing Broad Jump (cm)	
Age/Sex	Boys	Girls	Boys	Girls
13 years	0.44	0.41	135.4	118.1
14 years	0.48	0.41	151.5	121.8
15 years	0.52	0.41	165.4	123.0
16 years	0.56	0.42	175.9	126.0
17 years	0.59	0.42	184.2	129.5
Z-score	≤ -0.675		≤ -0.842	
Percentile	≤ 25.0		≤ 20.0	

Artero et al. unpublished

¿Utilidad práctica?

¿Profesor de E.F.

primer agente de salud?

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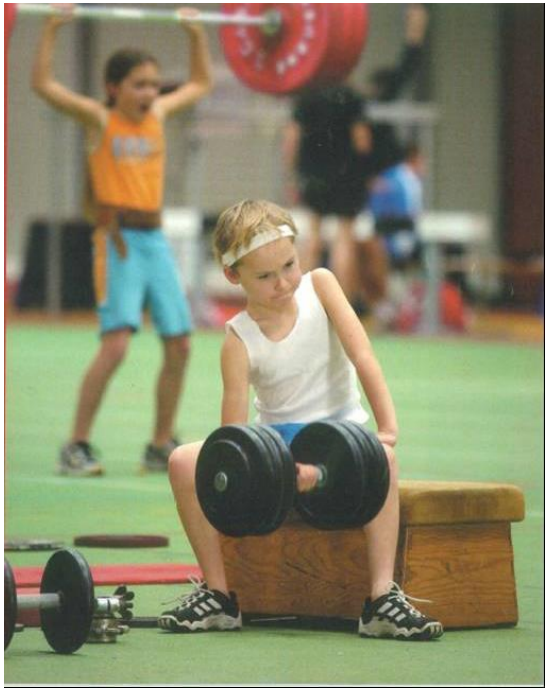
Condición física, obesidad y salud cardiovascular. Niños en forma, adultos sanos"



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PROmoting FITness and Health through physical activity research group (PROFITH)

ELMUNDO.es | España
Líder mundial en español | Martes 27/11/2012. Actualizado 18:06h.

EDUCACIÓN | Propuesta de Ana Mato

Sanidad impulsa una hora diaria de ejercicio físico en los colegios

27 Noviembre 2012

International Fitness Scale - IFIS -

Int. J. Epidemiol. Advance Access published March 24, 2011

Published by Oxford University Press on behalf of the International Epidemiological Association

International Journal of Epidemiology 2011;1–11
doi:10.1093/ije/dyr039

The International Fitness Scale (IFIS): usefulness of self-reported fitness in youth

Francisco B Ortega,[1,2]* Jonatan R Ruiz,[1,3] Vanesa España-Romero,[1,4] Germán Vicente-Rodriguez,[5,6] David Martínez-Gómez,[7] Yannis Manios,[8] Laurent Béghin,[9] Dénes Molnar,[10] Kurt Widhalm,[11] Luis A Moreno,[5,12] Michael Sjöström,[1] Manuel J Castillo[2] and on behalf of the HELENA study group†

www.helenastudy.com/IFIS

English, Spanish, French, German, Austrian German, Greek, Flemish, Hungarian, Italian, Swedish, Portuguese

Ortega et al. IJE 2011

The International Fitness Scale - IFIS -

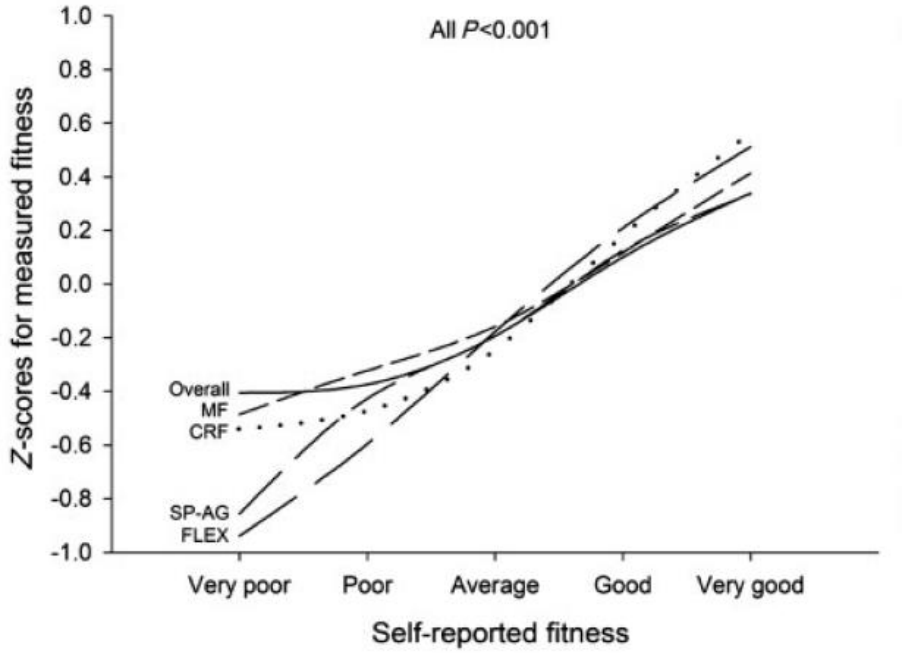
Por favor, piensa sobre tu nivel de condición física (comparado con tus amigos) y elige la opción más adecuada.

1. Tu condición física general es

- ○ Muy mala
- ○ Mala
- ○ Aceptable
- ○ Buena
- ○ Muy buena

Ortega et al. IJE 2011

The International Fitness Scale - IFIS -



Ortega et al. IJE 2011

International Journal of Obesity (2008) 32, 1–11

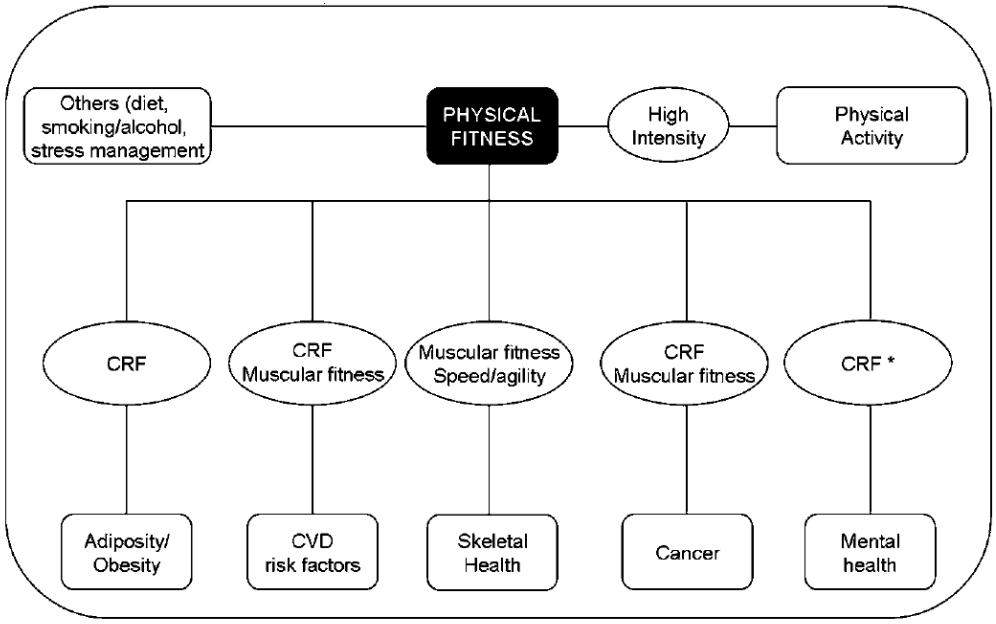
0307-0565/08 $30.00
www.nature.com/ijo

PEDIATRIC REVIEW

2008

Physical fitness in childhood and adolescence: a powerful marker of health

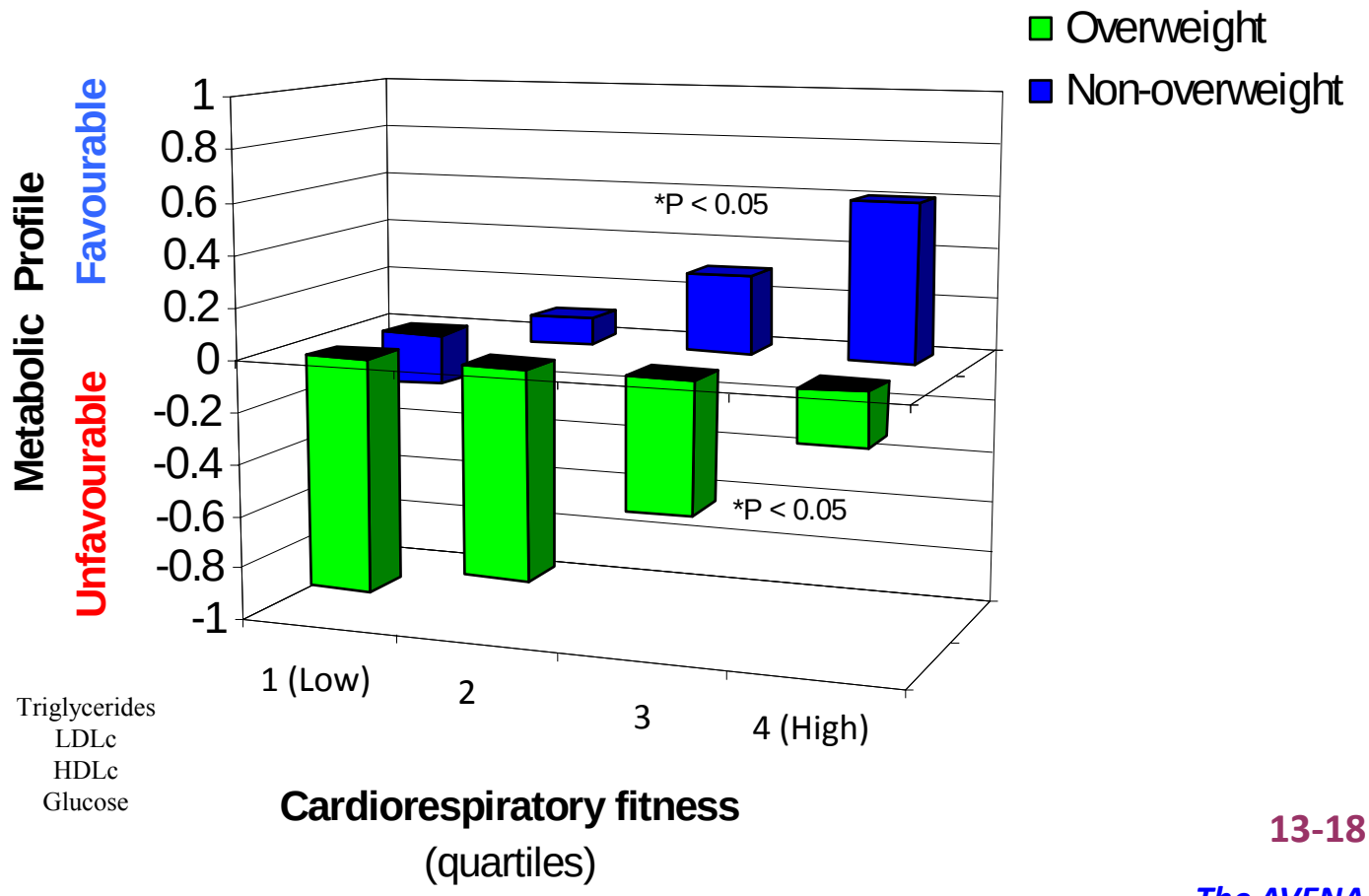
FB Ortega[1,2], JR Ruiz[1,2], MJ Castillo[1] and M Sjöström[2]



Ortega et al. 2008 IJO

Fat but Fit?

Fitness – Fatness y perfil cardiovascular



13-18 y old

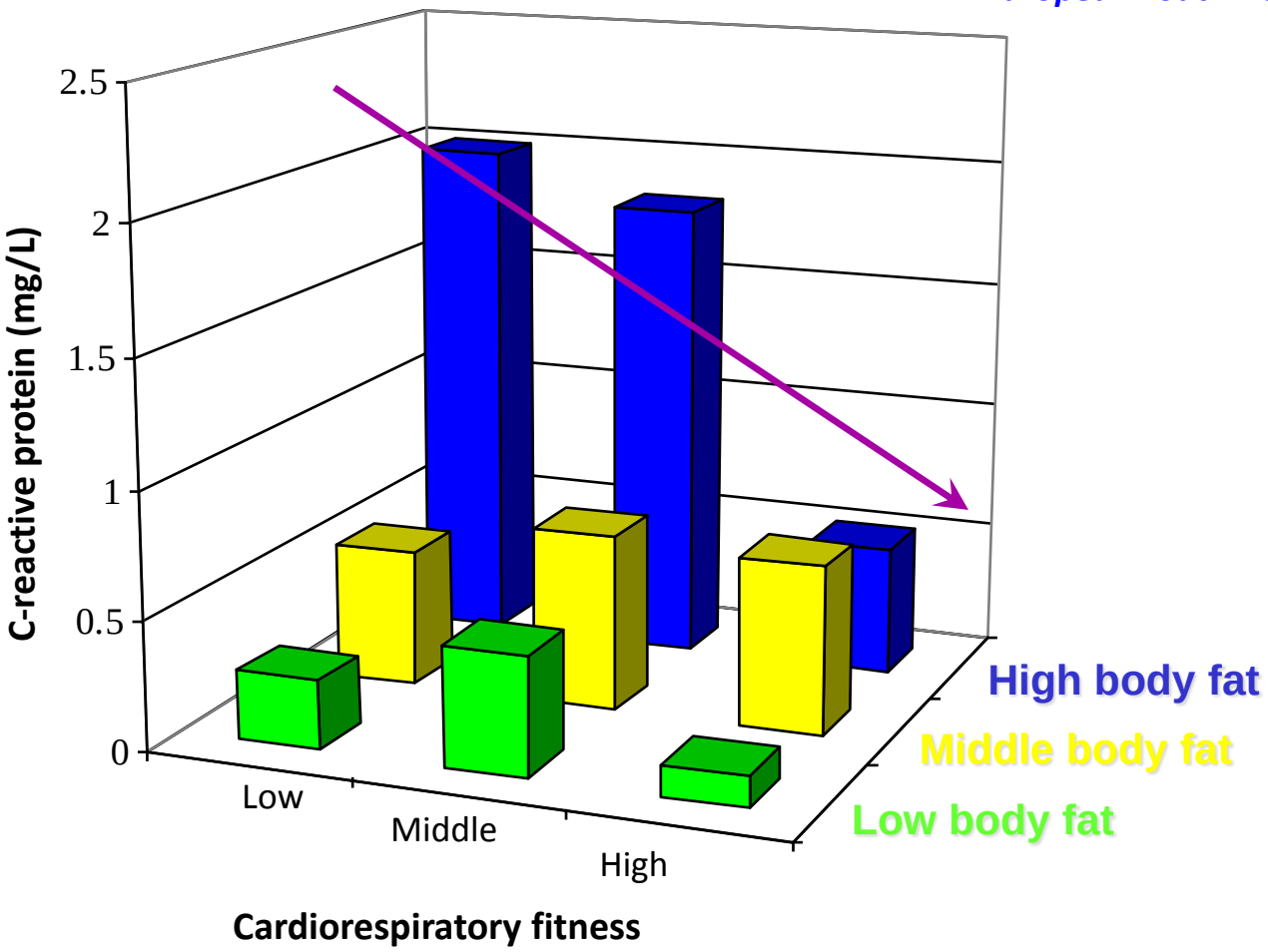
The AVENA Study

Ruiz JR, Thesis 2007

Fitness – Fatness y perfil inflamatorio

European Youth Heart Study

9-10 y old



Ruiz et al. IJO 2007