

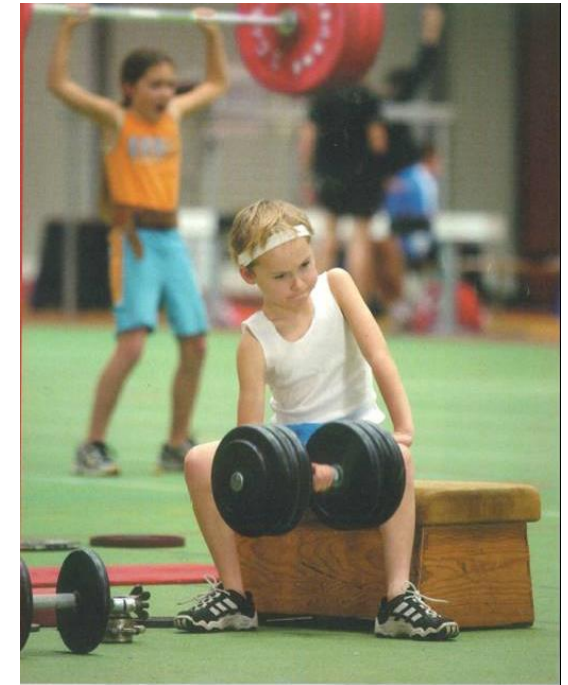


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Condición física, obesidad y salud cardiovascular. Niños en forma, adultos sanos"



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

Acknowledgments

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➤ HELENA Family

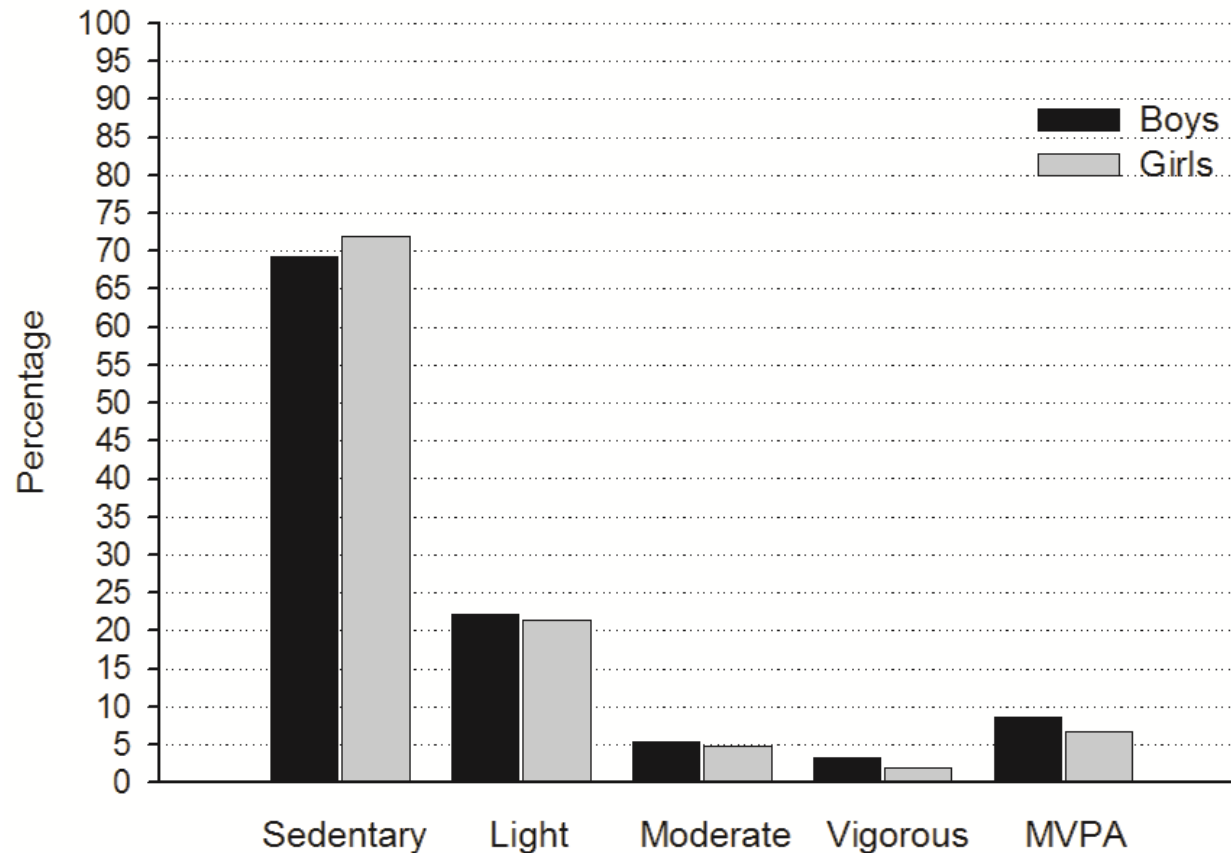


**Let children play and nature
will do the rest**



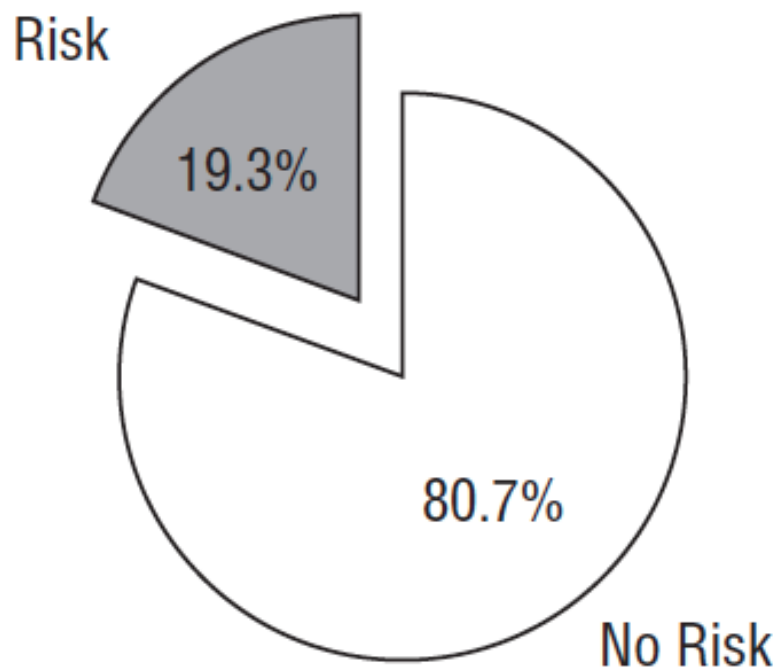
Objectively measured sedentary time in European adolescents: The HELENA study

2200 adolescents
9 EU countries

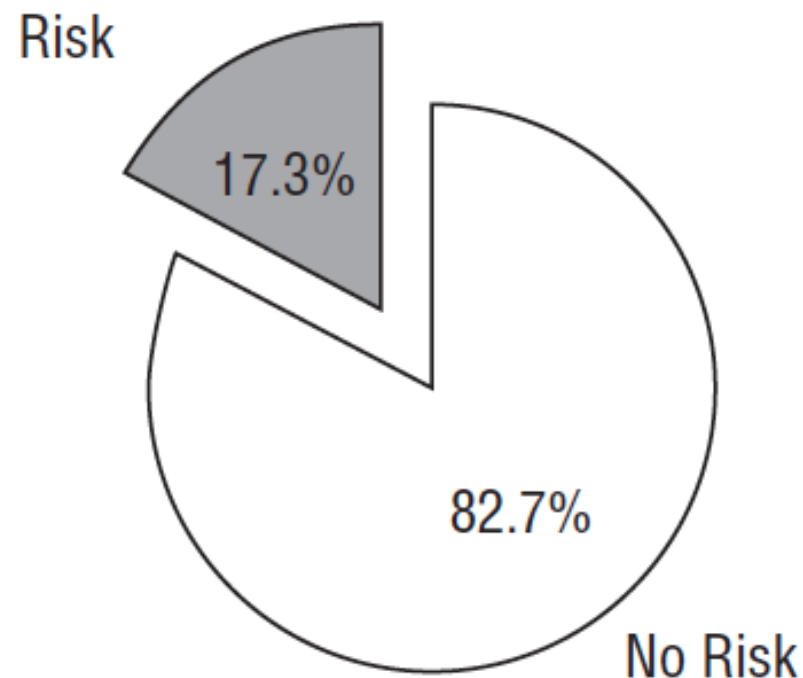


Prevalence of low cardiorespiratory fitness in Spanish adolescents

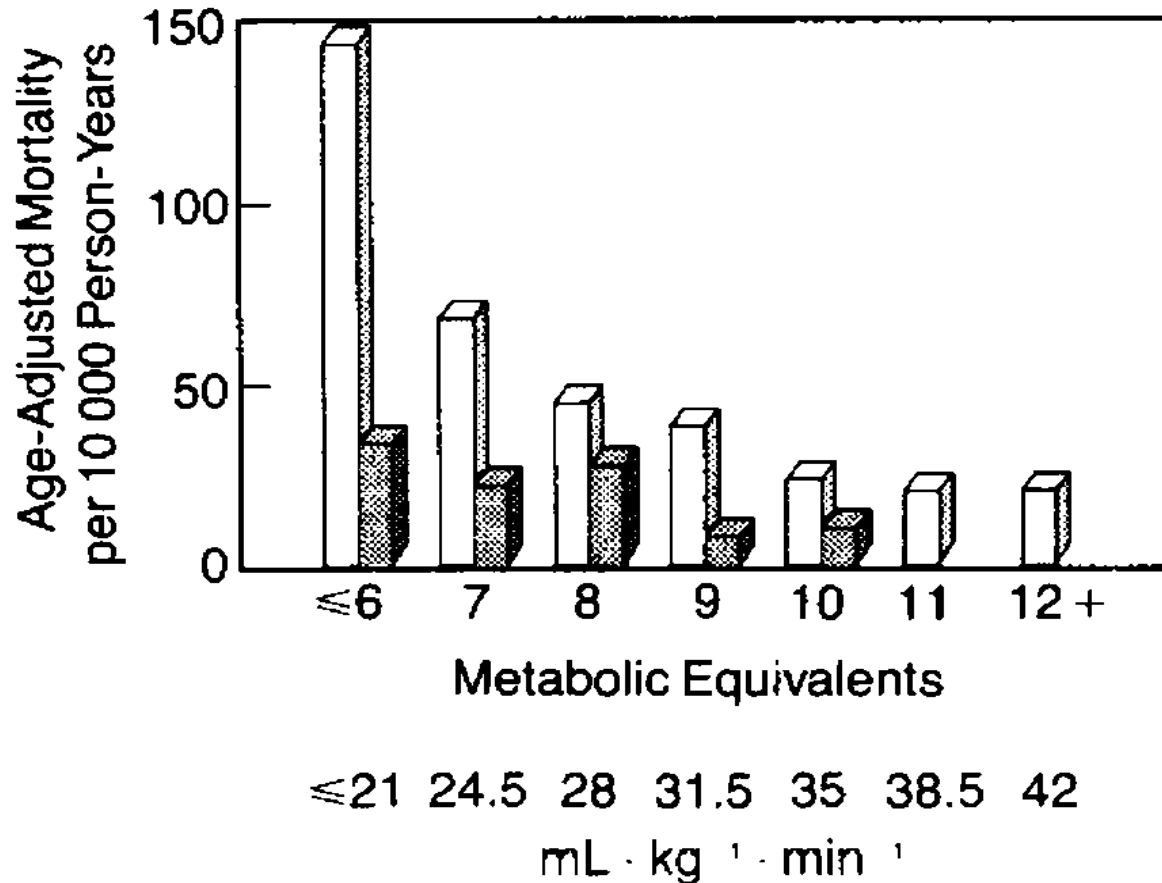
% of boys with low cardiorespiratory fitness



% of girls with low cardiorespiratory fitness



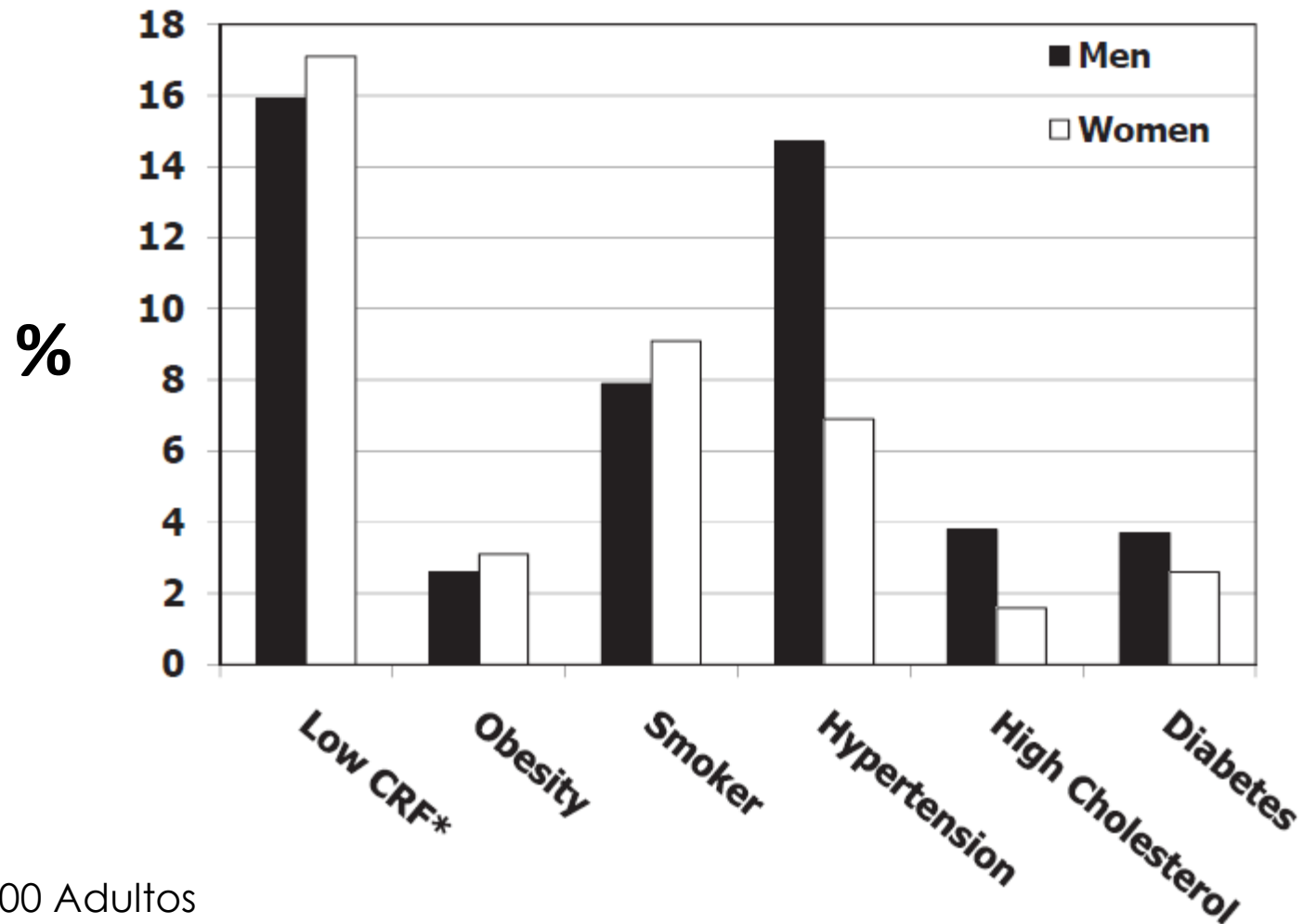
Cardiorespiratory fitness and all-cause mortality



1989

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

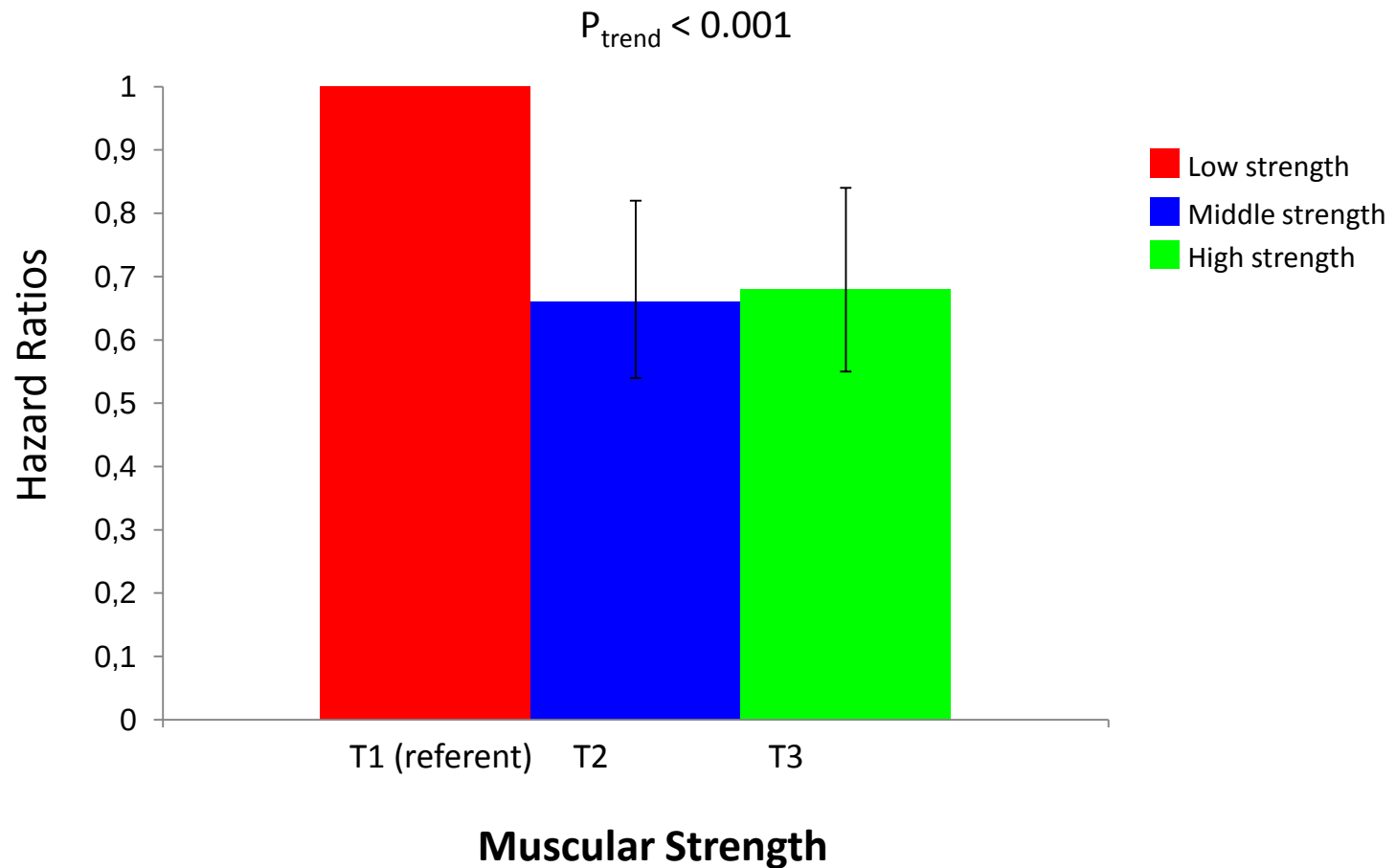
Risk of mortality by pathologies



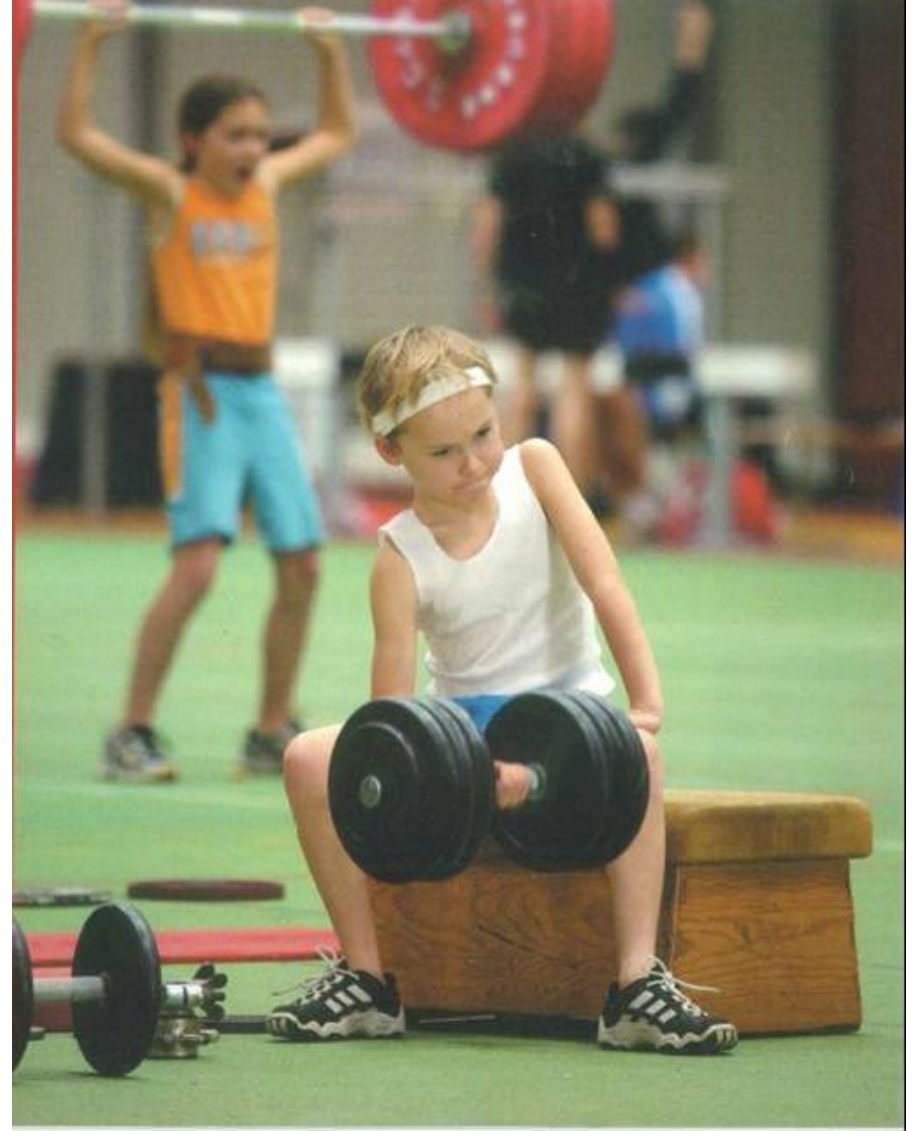
54.000 Adultos

Muscular strength and risk of mortality

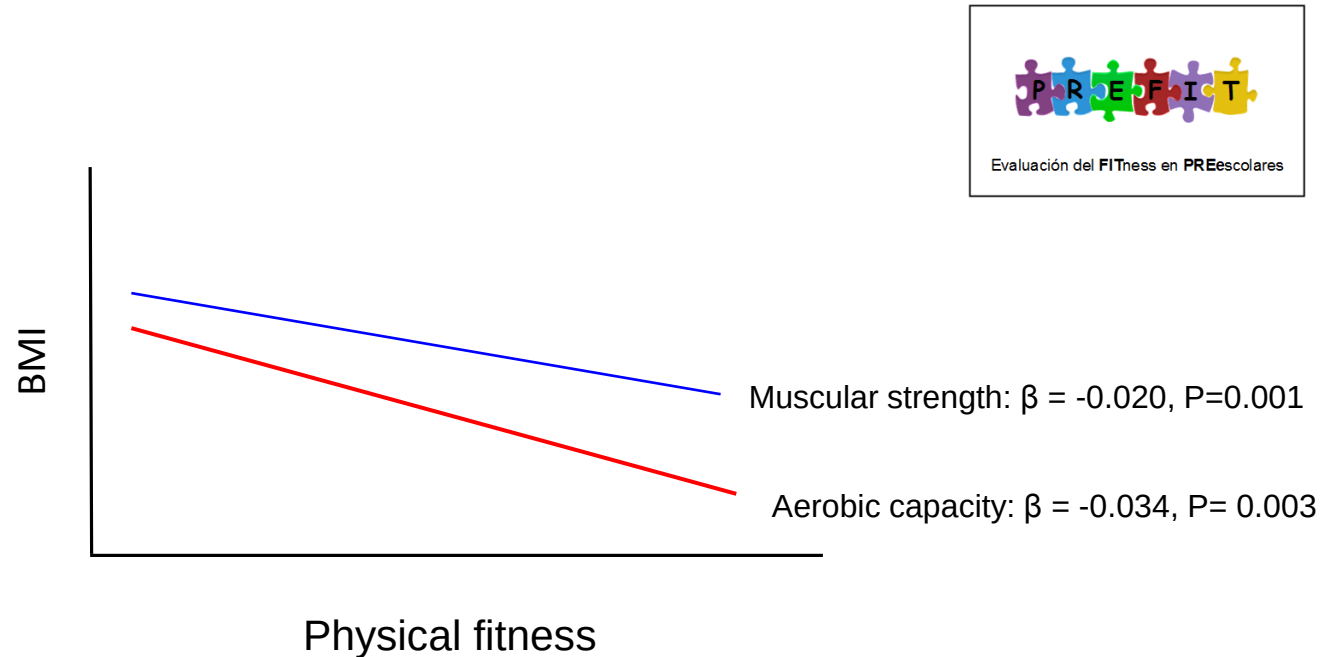
Aerobic Center Longitudinal Study (1980-3002)



Physical fitness in children



Fitness and body composition in children aged 3-5 years



Estudio de evaluación del FITness en PREescolares



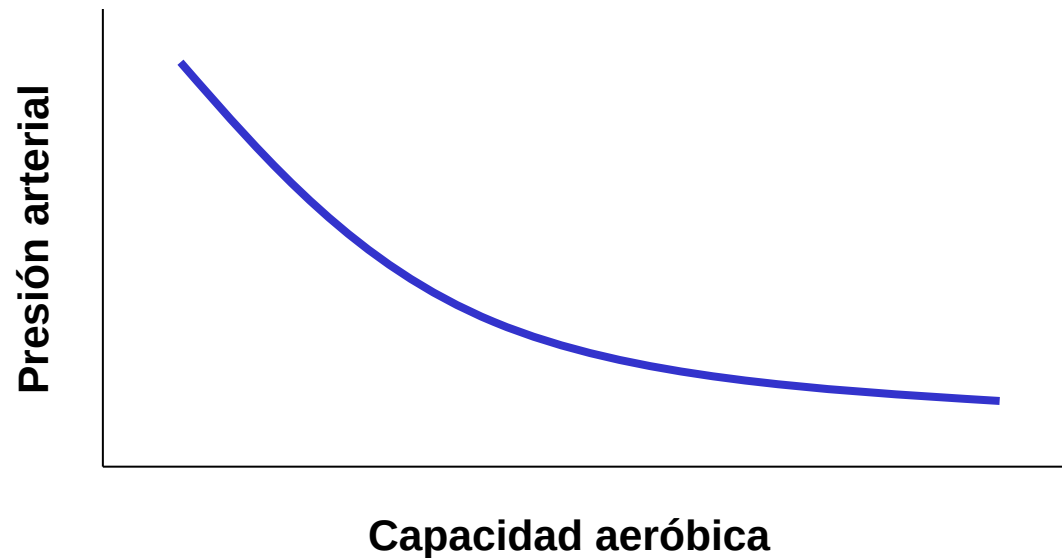
3300 Niños de 3-6 años de 11 ciudades de España

Cardiorespiratory fitness and blood pressure



1990

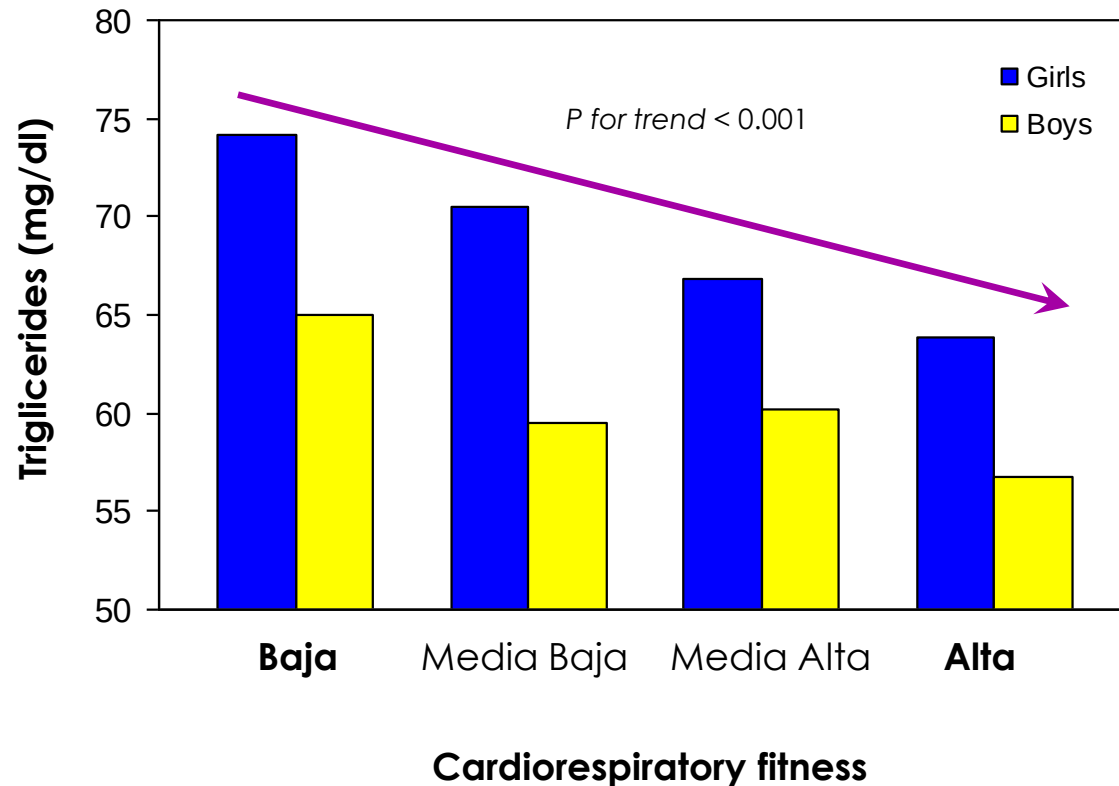
Blood pressure, fitness, and fatness in 5- and 6-year-old children



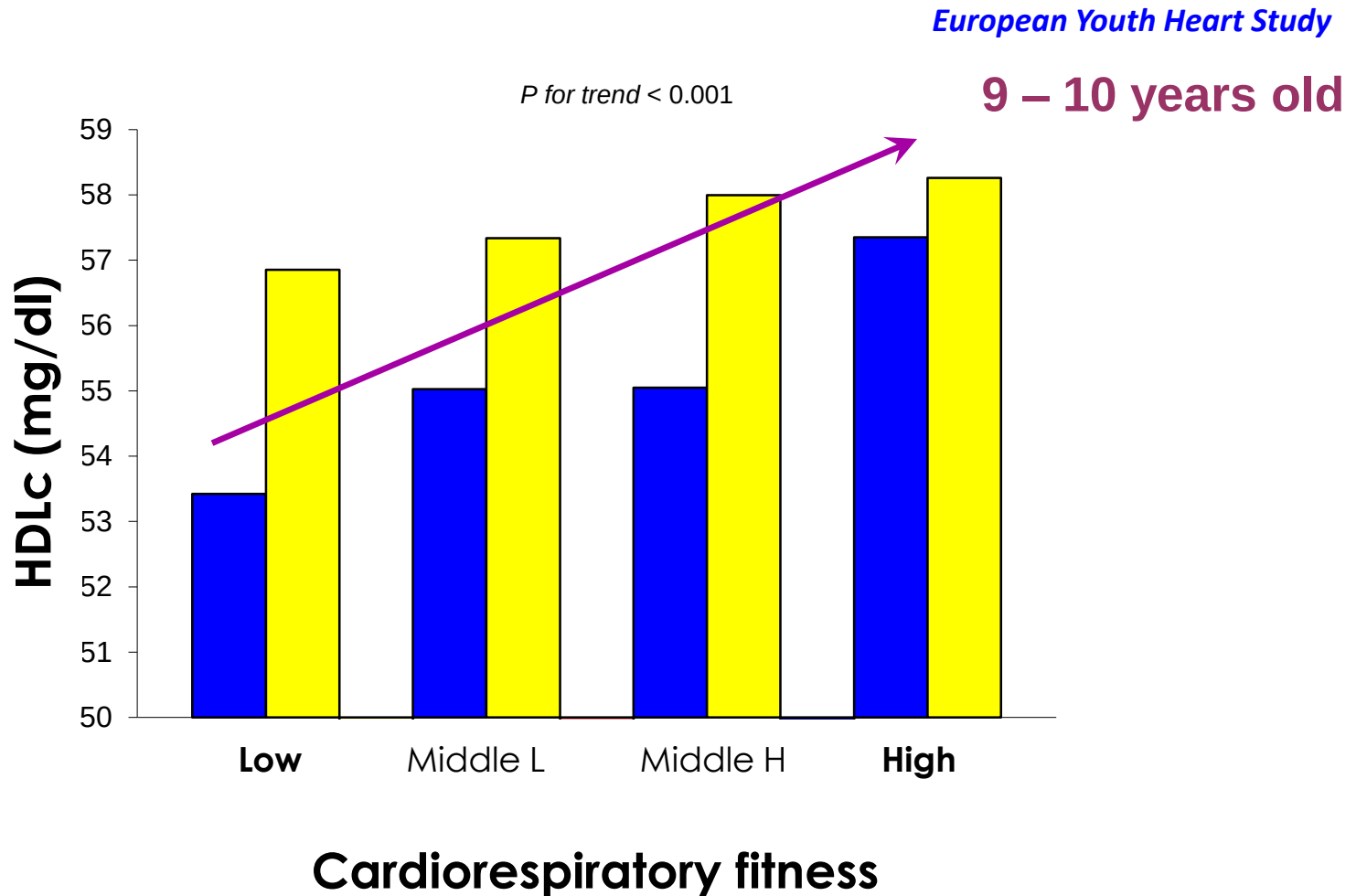
Cardiorespiratory fitness and TG

European Youth Heart Study

9 – 10 years old



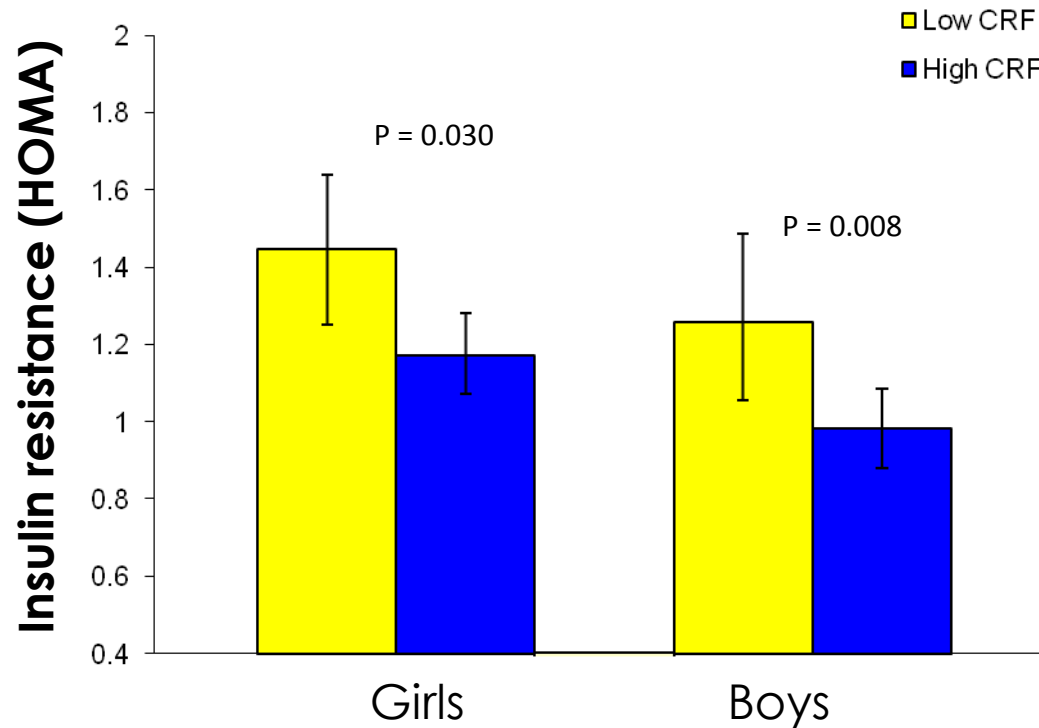
Cardiorespiratory fitness and HDLc



Cardiorespiratory fitness and HOMA

European Youth Heart Study

9 – 10 years old



Cardiorespiratory fitness and Ideal Cardiovascular Health in European adolescents

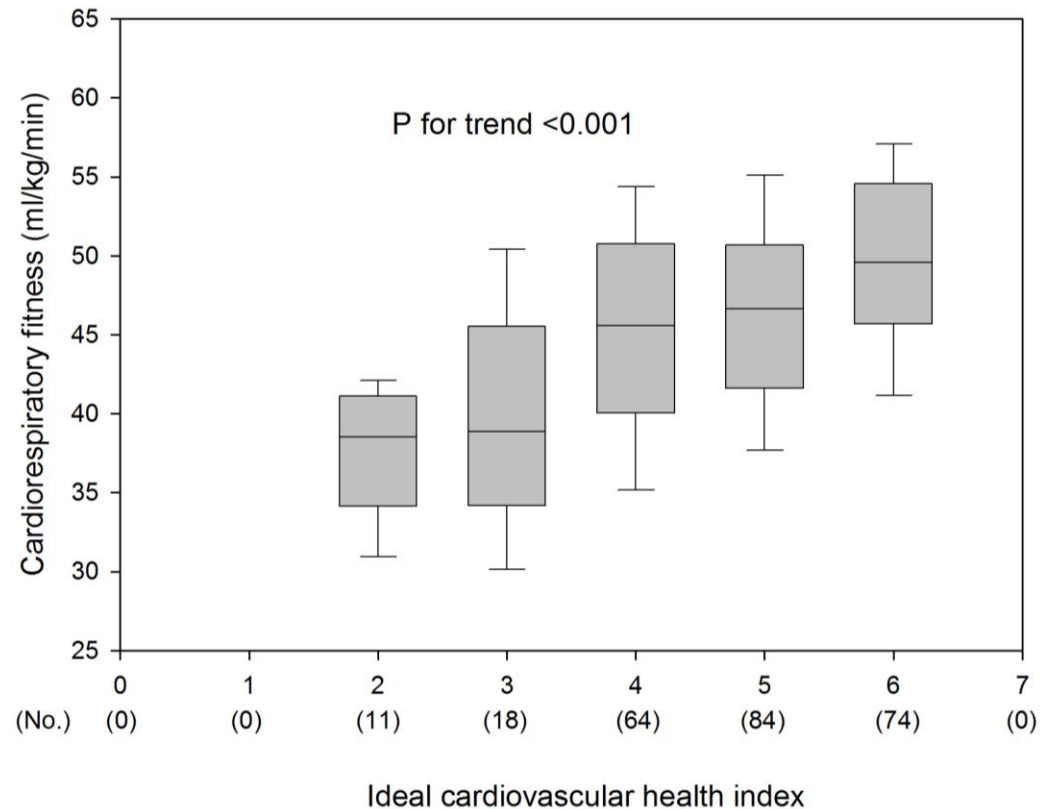
AHA ICH

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)



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.

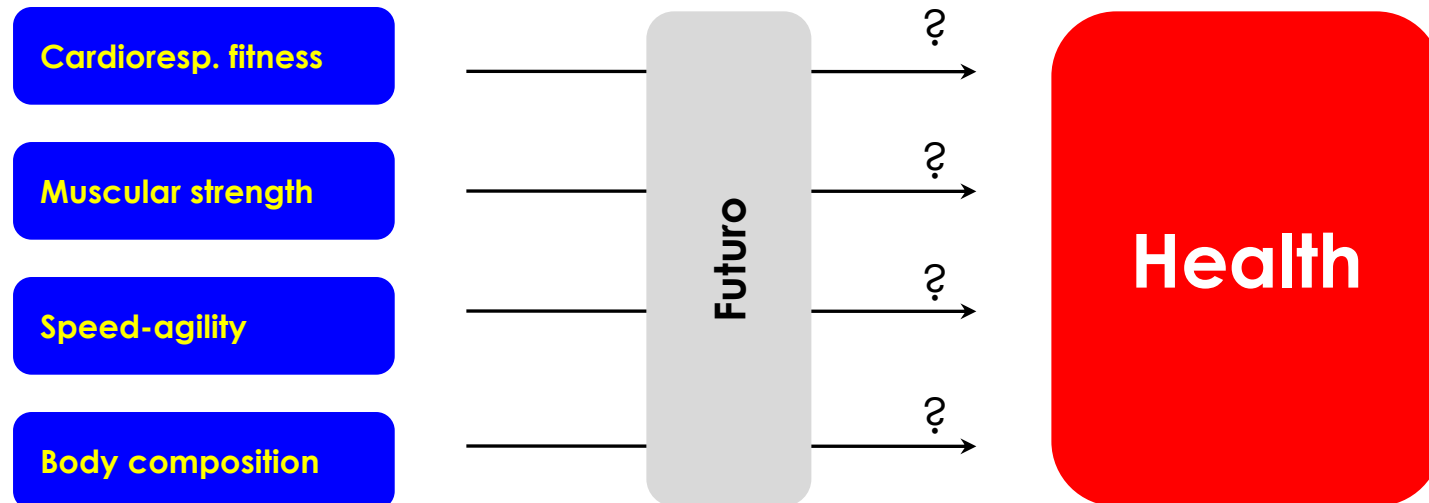
Cardiovascular profile: Systolic blood pressure, triglyceride, TC/HDL, insulin resistance, sum of four skinfolds, and **aerobic fitness**

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 Castillo²

2009

Does fitness in childhood predicts health in adulthood?

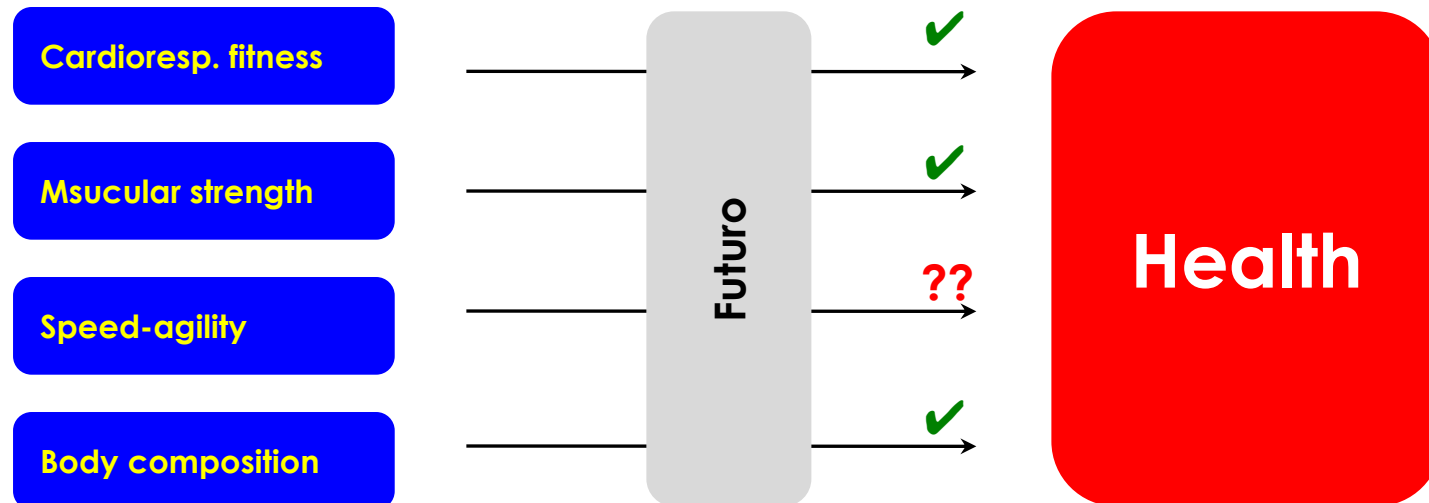


Predictive validity of health-related fitness in youth: a systematic review

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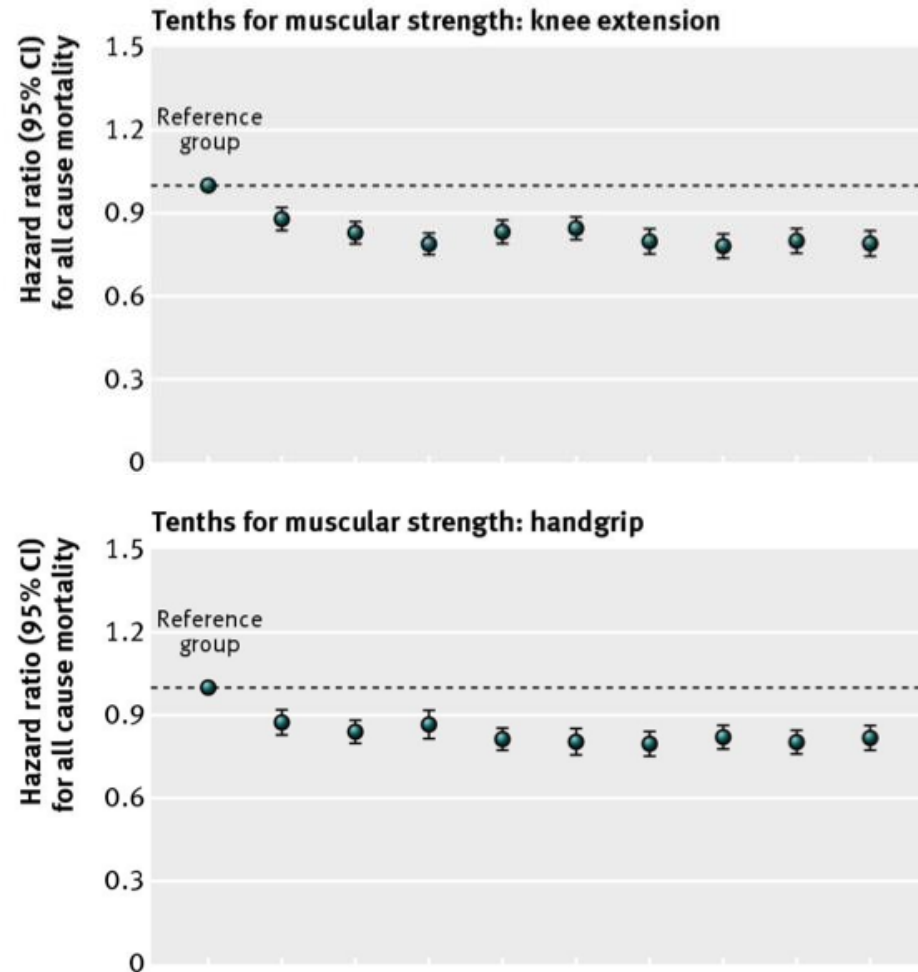
2009

Does fitness in childhood predicts health in adulthood?



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

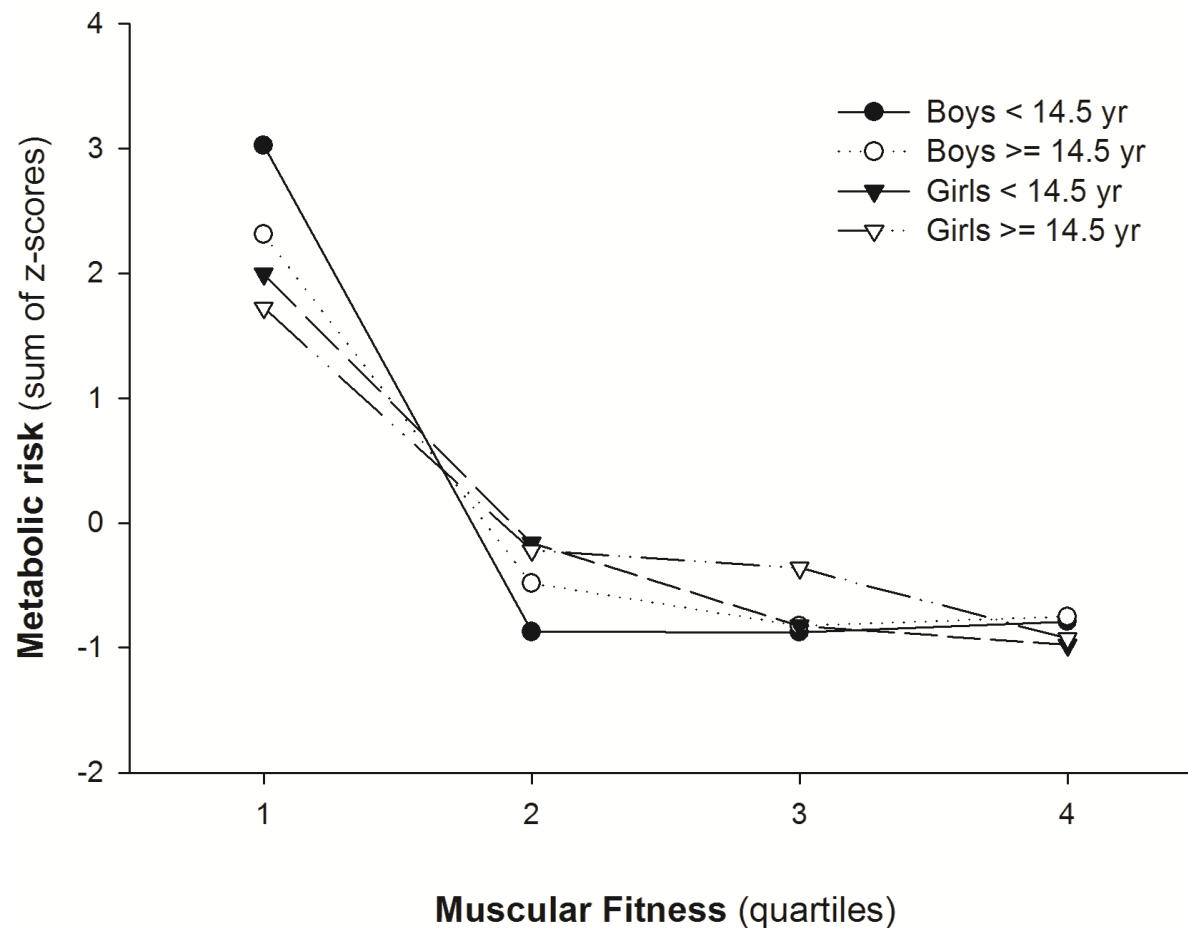
2012



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

Role of Childhood Aerobic Fitness in Successful Street Crossing



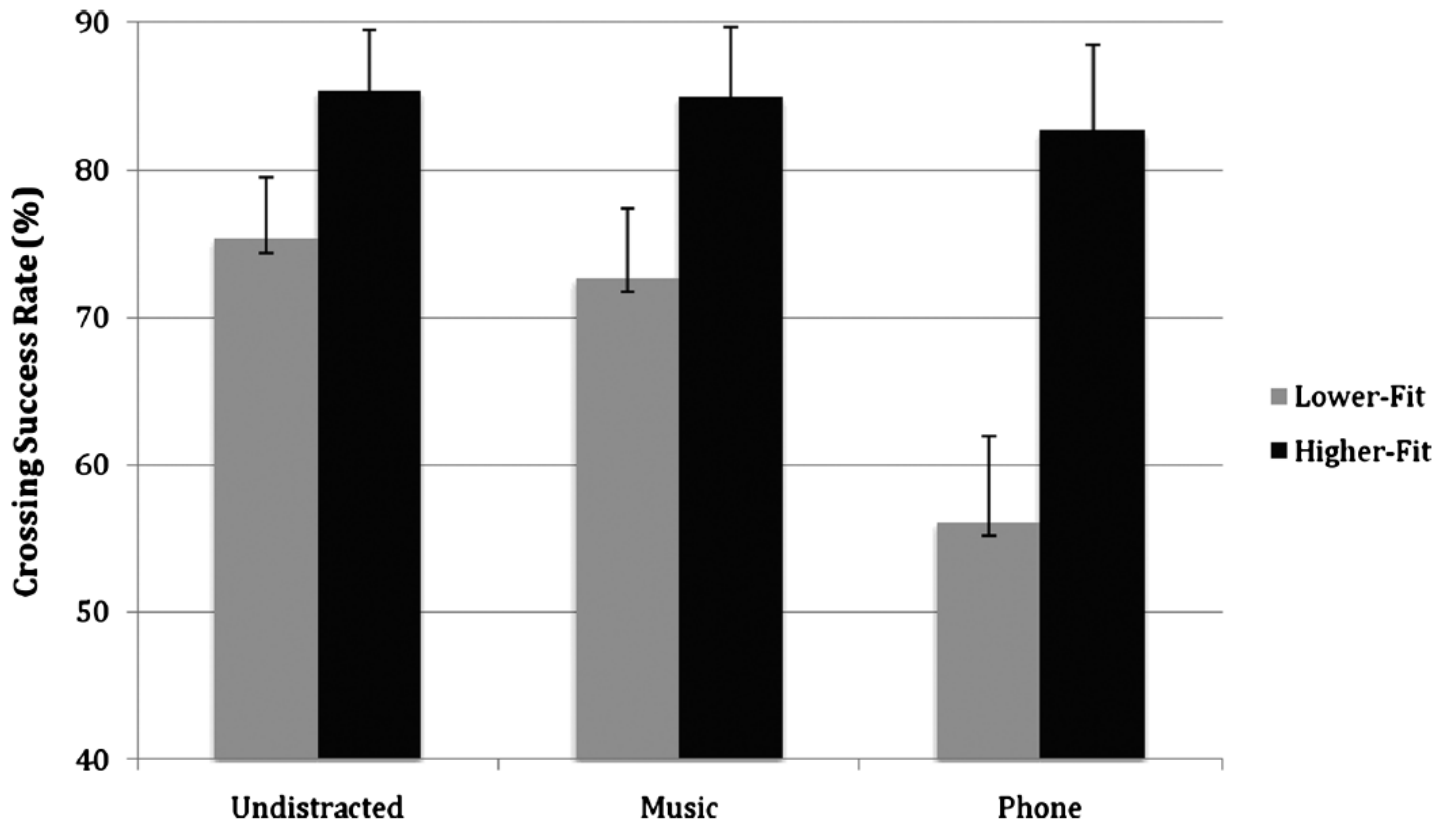
The Survival of the Fittest



NEJM 2012

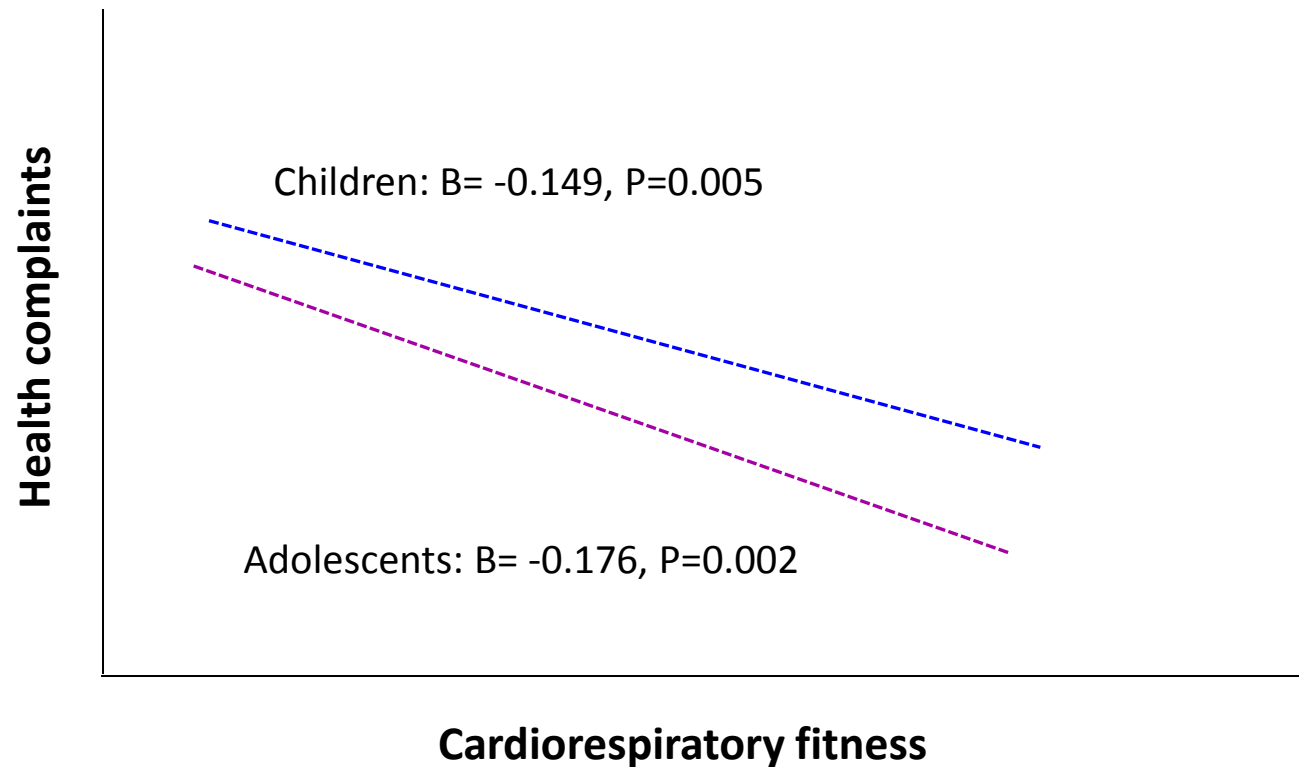
Chaddock et al 2012 MSSE²⁴

Role of Childhood Aerobic Fitness in Successful Street Crossing



Cardiorespiratory fitness and health complaints

Spanish children and adolescents

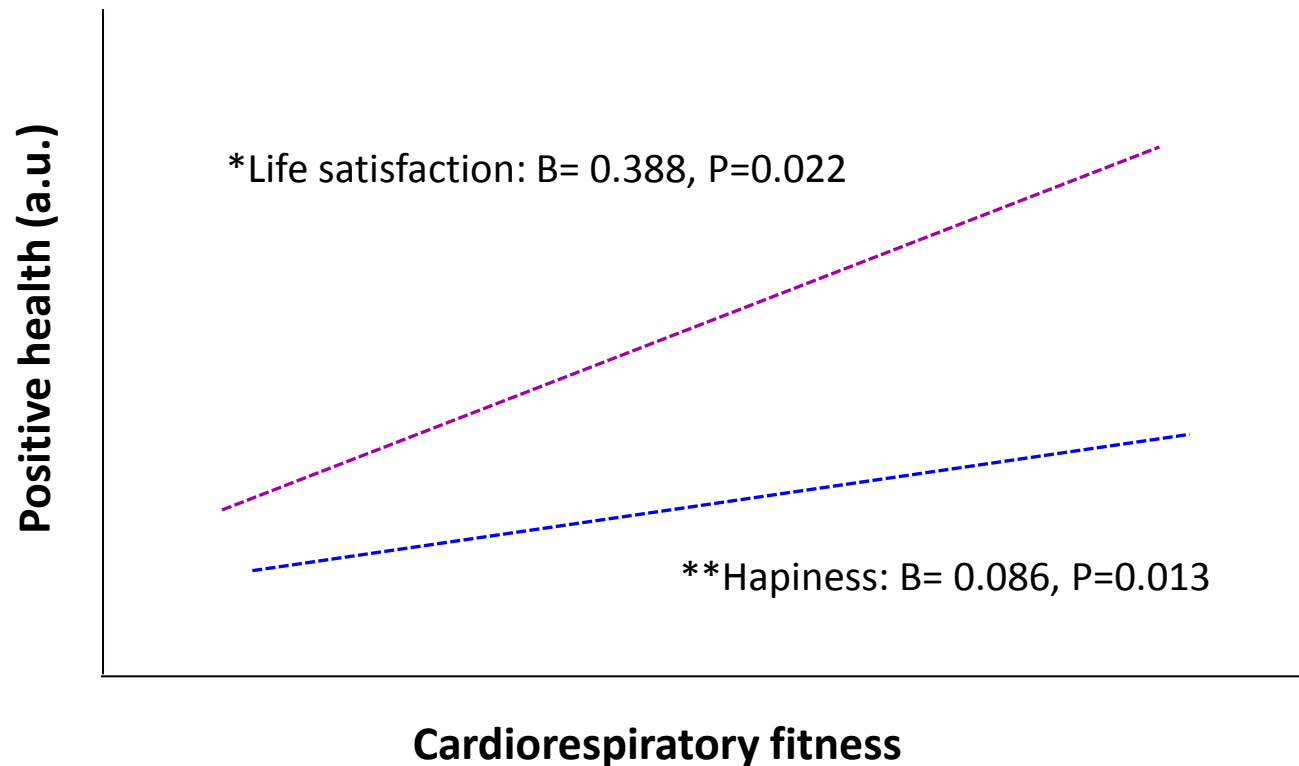


*Headache, stomach-ache, backache, feeling low, irritability or bad temper, feeling nervous, difficulties getting to sleep, feeling dizzy

Castro-Piñero et al 2011

Cardiorespiratory fitness, happiness, and satisfaction with life

Spanish adolescents



*Satisfaction With Life Scale, 1985

**Subjective Happiness Scale, 1999

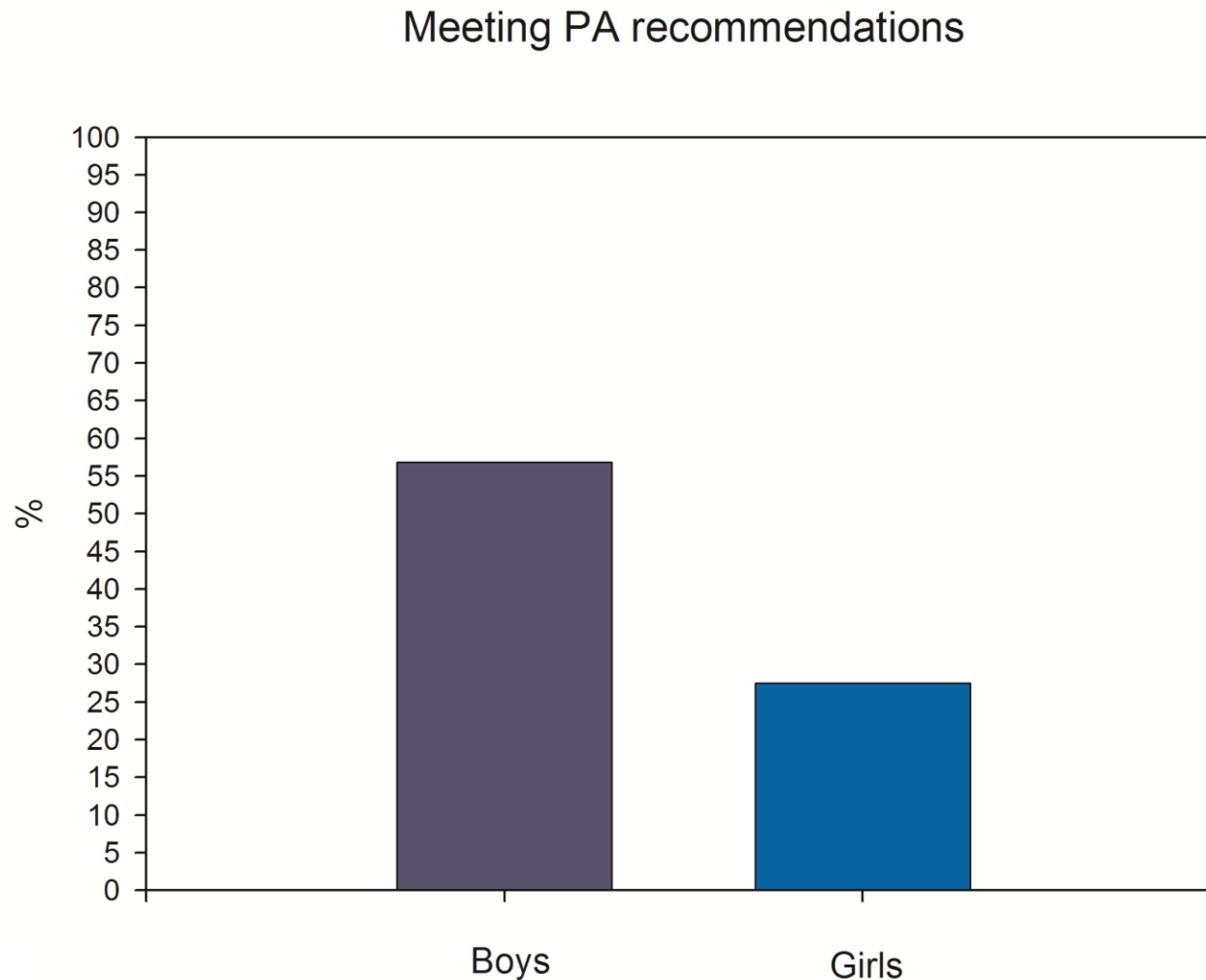
Jimenez et al 2013

How can I
improve my
fitness?

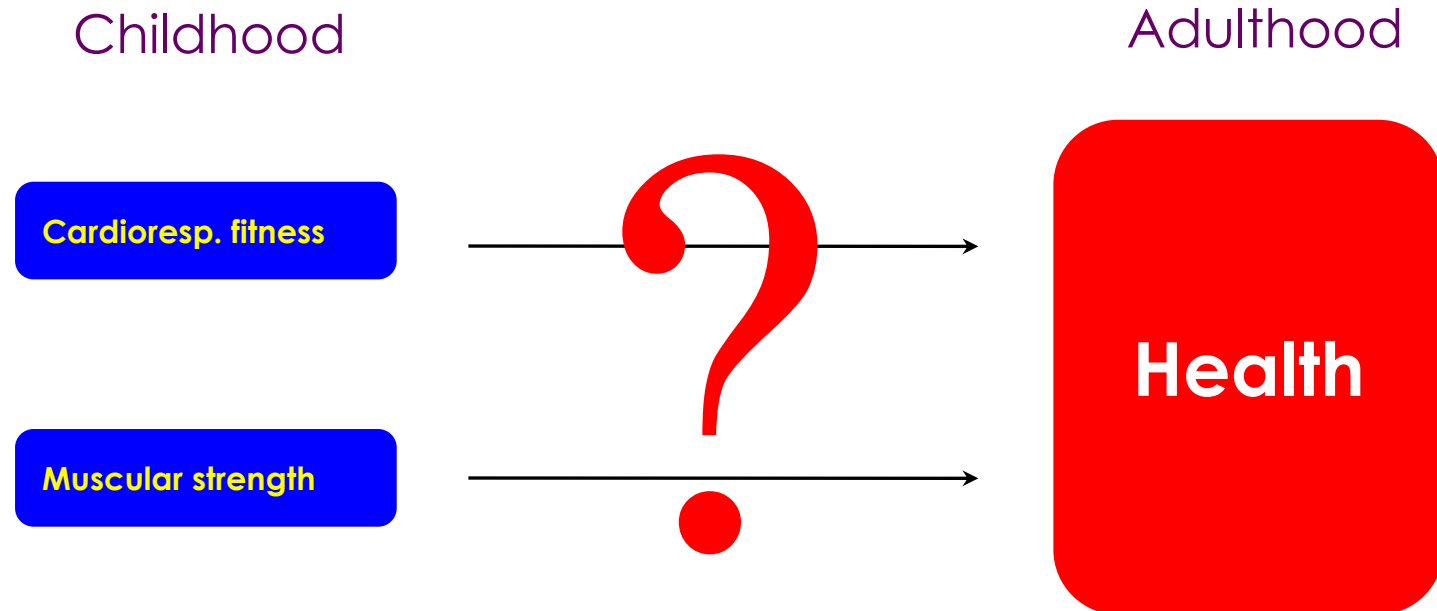


60 min/day of moderate-vigorous PA

Physical activity levels in European adolescents: The HELENA study



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
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Women 17-35	29
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Boys 12-17 yrs	42 ml/kg/min
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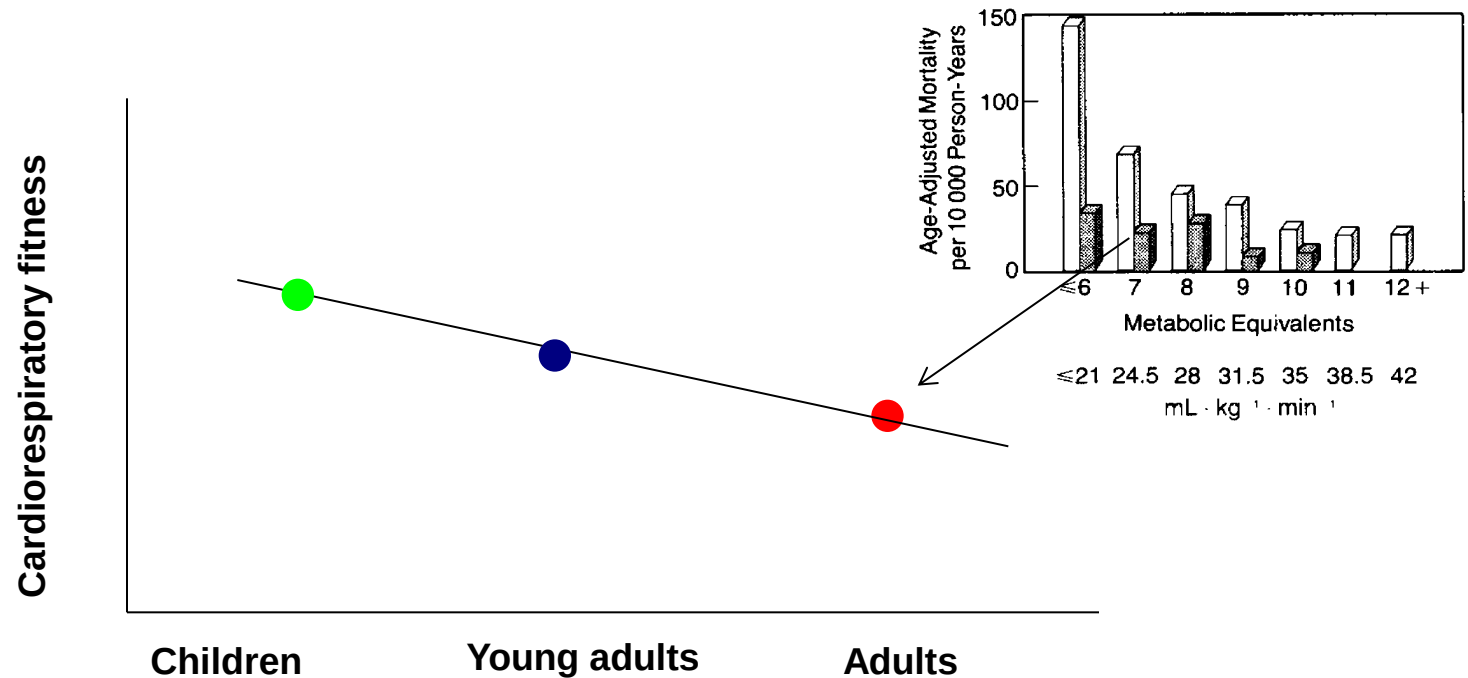
Girls 12-17	35
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FITNESSGRAM Reference Guide

Aerobic Capacity Assessments

Kirk J. Cureton & Sharon A. Plowman

The Cooper Institute

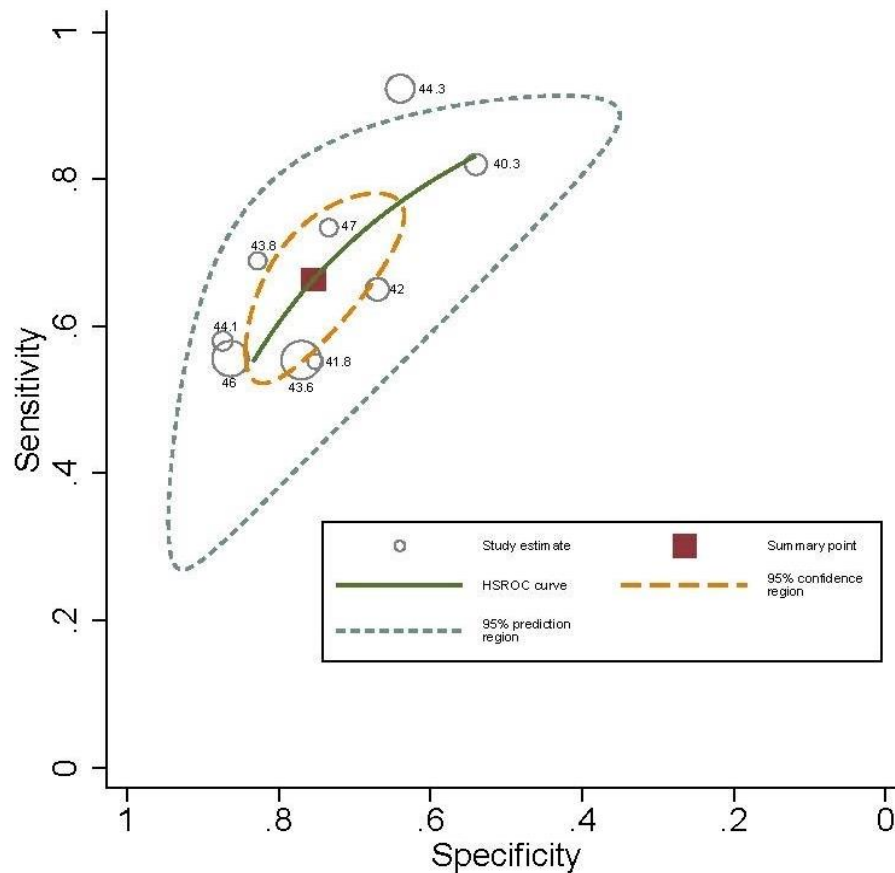


...Too many assumptions?

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

Cardiorespiratory fitness and cardiovascular health in boys



Healthy fitness zone

41.8 – 47 ml/kg/min

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

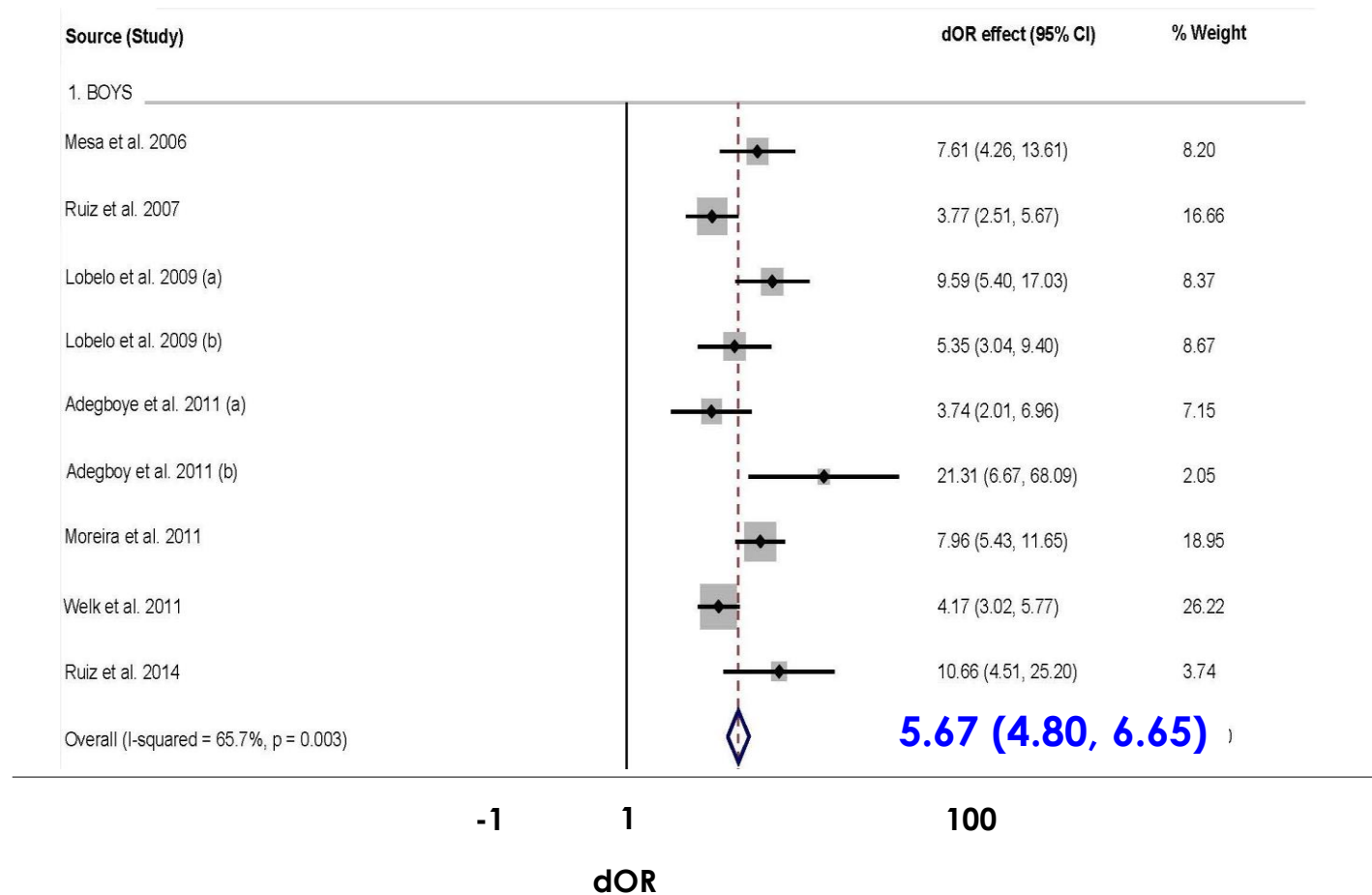
FITNESSGRAM 1999

VO₂max: 42 ml/kg/min

**European Group of
Pediatric Work Physiology 1986**
VO₂max: 40 ml/kg/min

Cardiorespiratory fitness and cardiovascular health in boys

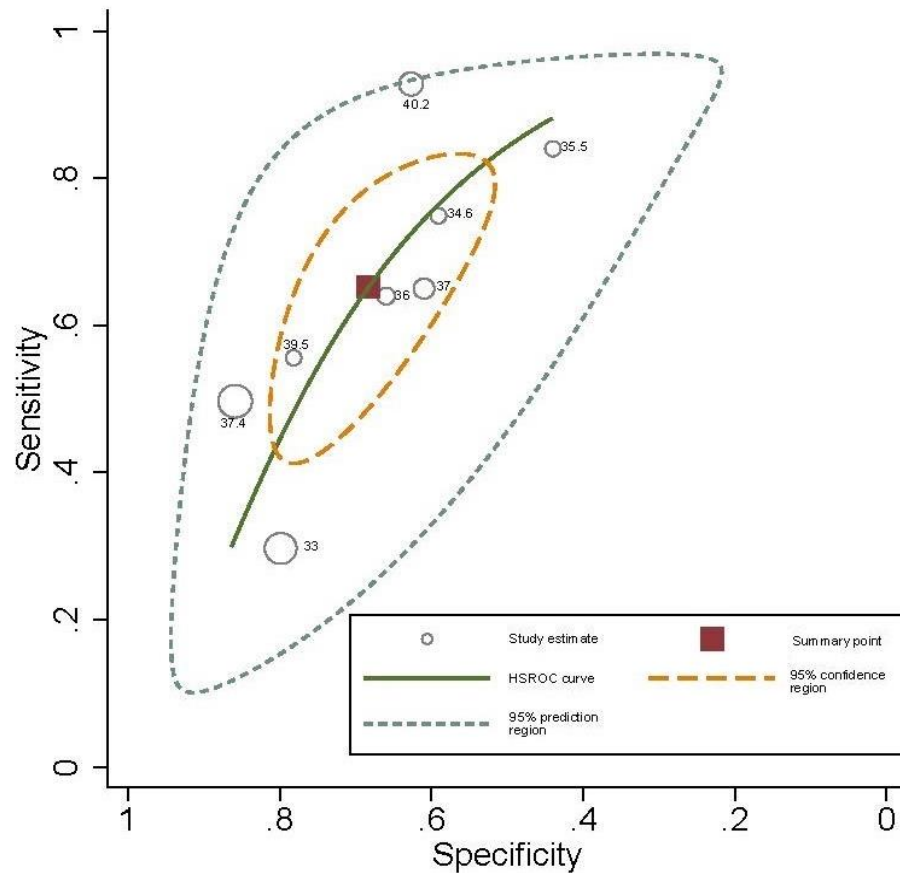
Boys



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

VO₂max: 35 ml/kg/min

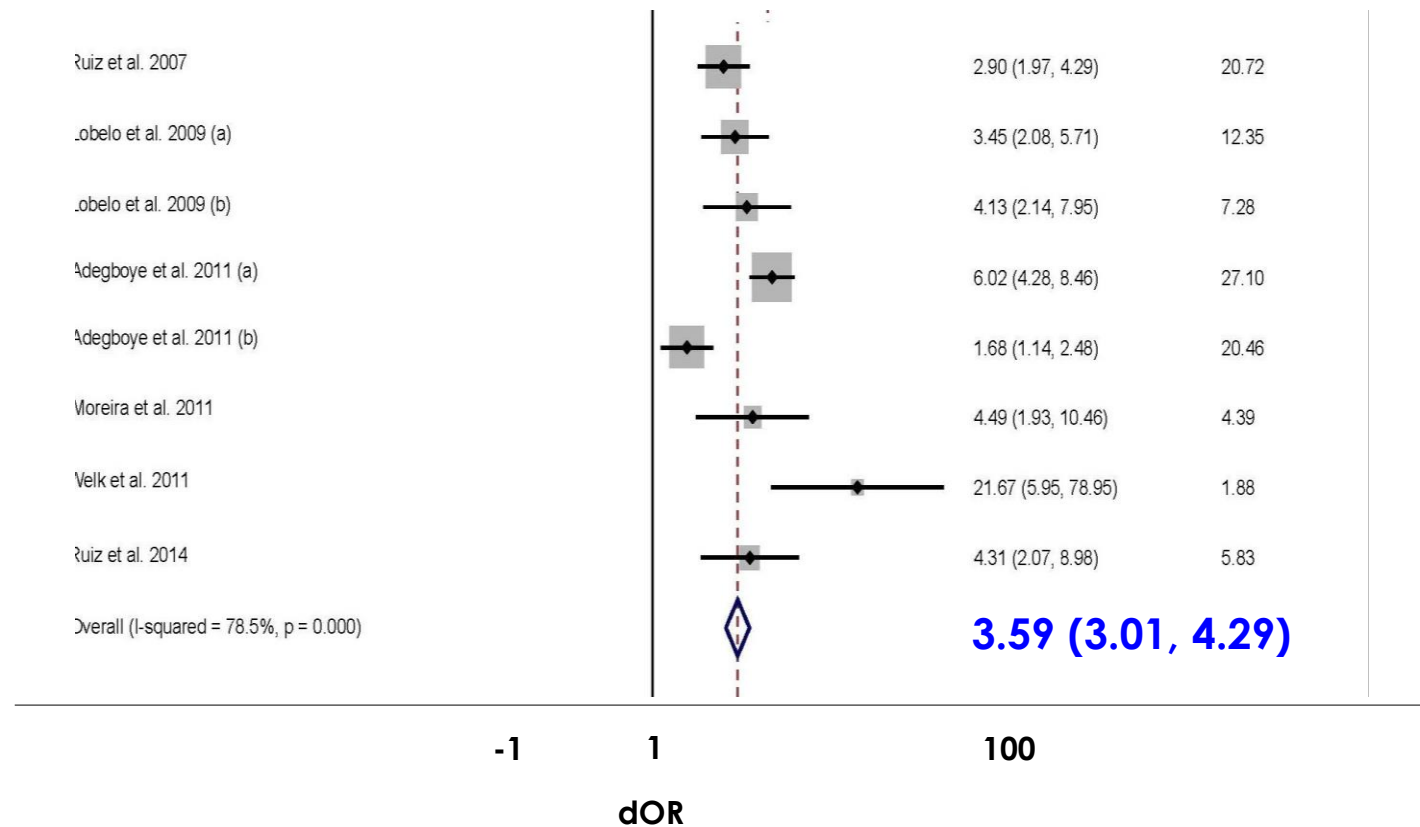
**European Group of
Pediatric Work Physiology 1986
VO₂max: 35 ml/kg/min**

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 Age/Sex	Relative Grip Strength (kg/kg mass)		Standing Broad Jump (cm)	
	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	

2

¿Utilidad práctica?



¿Profesor de E.F.
primer agente de salud?



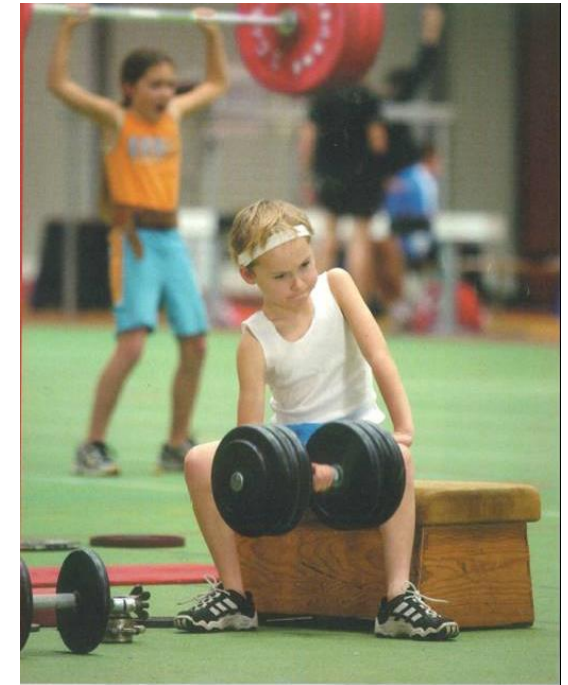


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Condición física, obesidad y salud cardiovascular. Niños en forma, adultos sanos"



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PLANES DE PENSIONES

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
© The Author 2011; all rights reserved.

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 Castillo² and on behalf of the HELENA study group†

www.helenastudy.com/IFIS

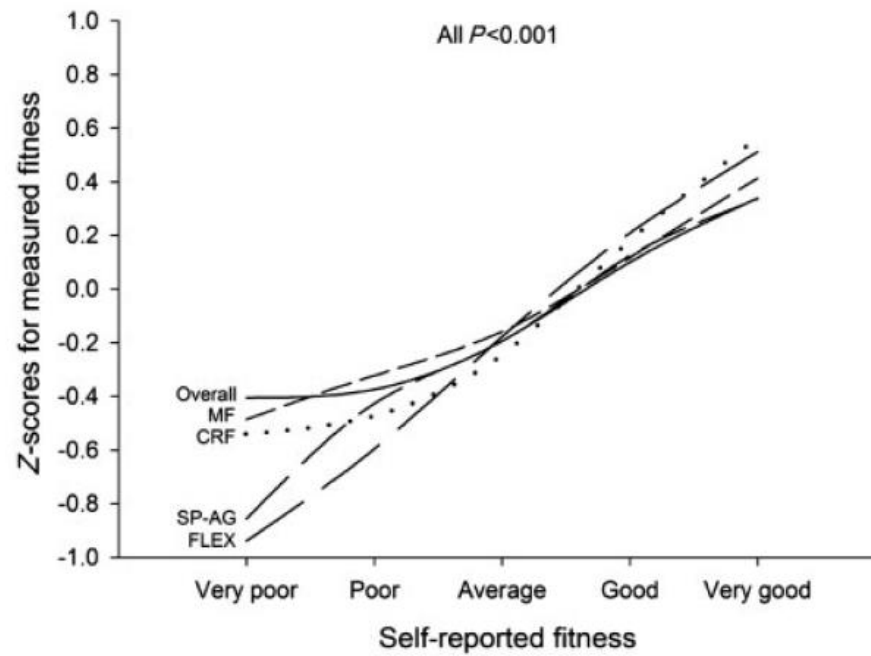
The International Fitness Scale - IFIS -

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

The International Fitness Scale - IFIS -

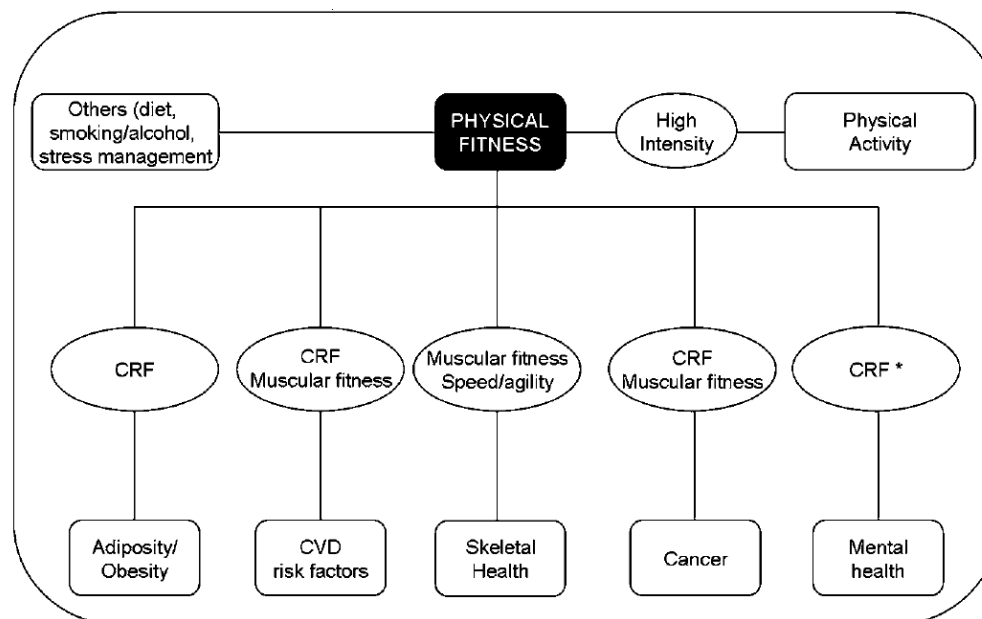


PEDIATRIC REVIEW

2008

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

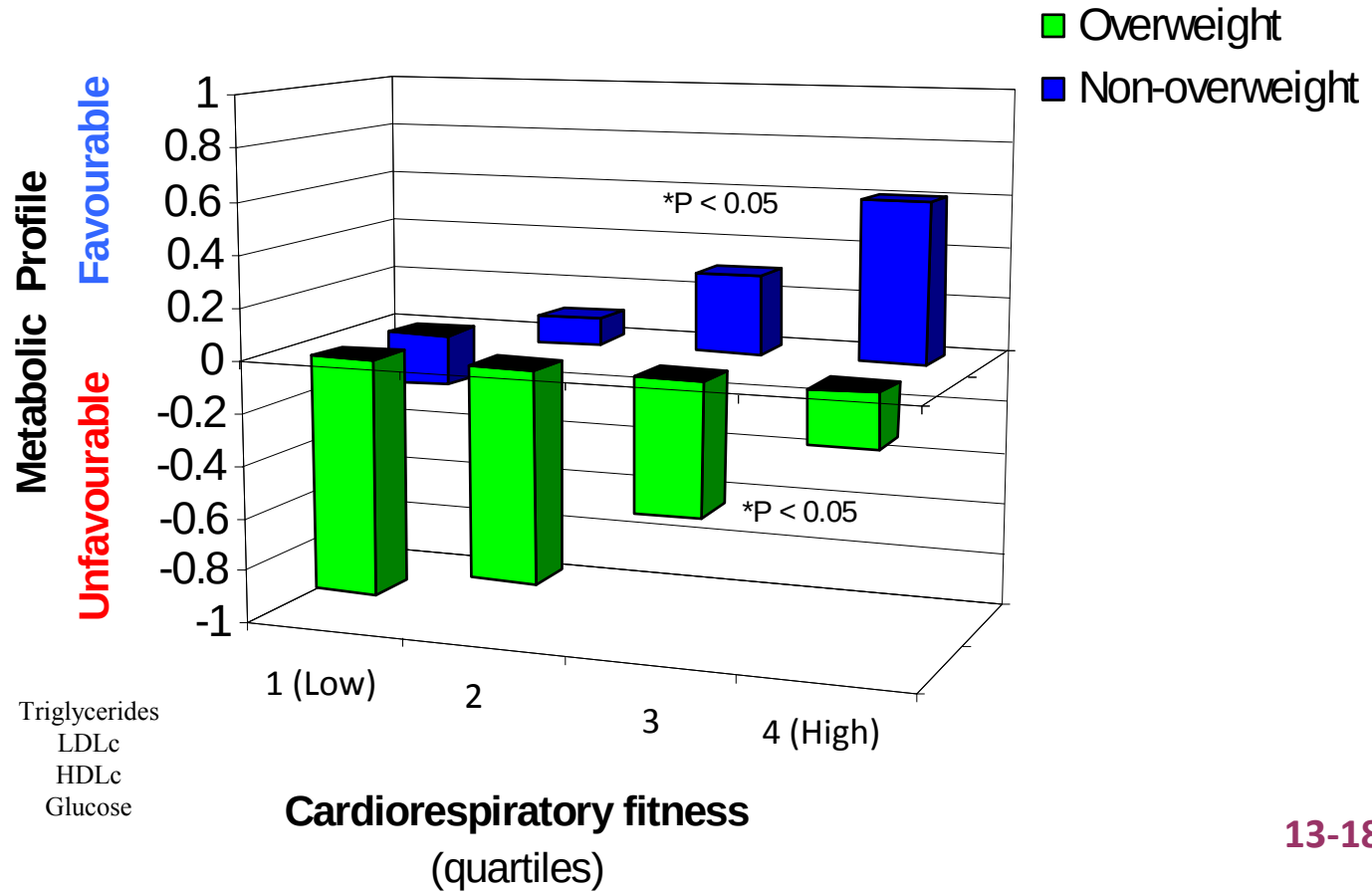
FB Ortega^{1,2}, JR Ruiz^{1,2}, MJ Castillo¹ and M Sjöström²





Fat but Fit?

Fitness – Fatness y perfil cardiovascular



13-18 y old

The AVENA Study

Fitness – Fatness y perfil inflamatorio

