



EARLYNUTRITION
Long-term effects of early nutrition on later health



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Exclusive breastfeeding duration and cardiorespiratory fitness in children and adolescents

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Benefits of breast feeding

- Otitis meida
- GI infections
- Respiratory infections
- Atopy
- Atopic dermatitis
- Asthma
- Type 1 diatebes
- Type 2 diabetes
- Cardiovascular disease
- High blood pressure
- Cholesterol
- Intelligence
- Motor development
- Etc.

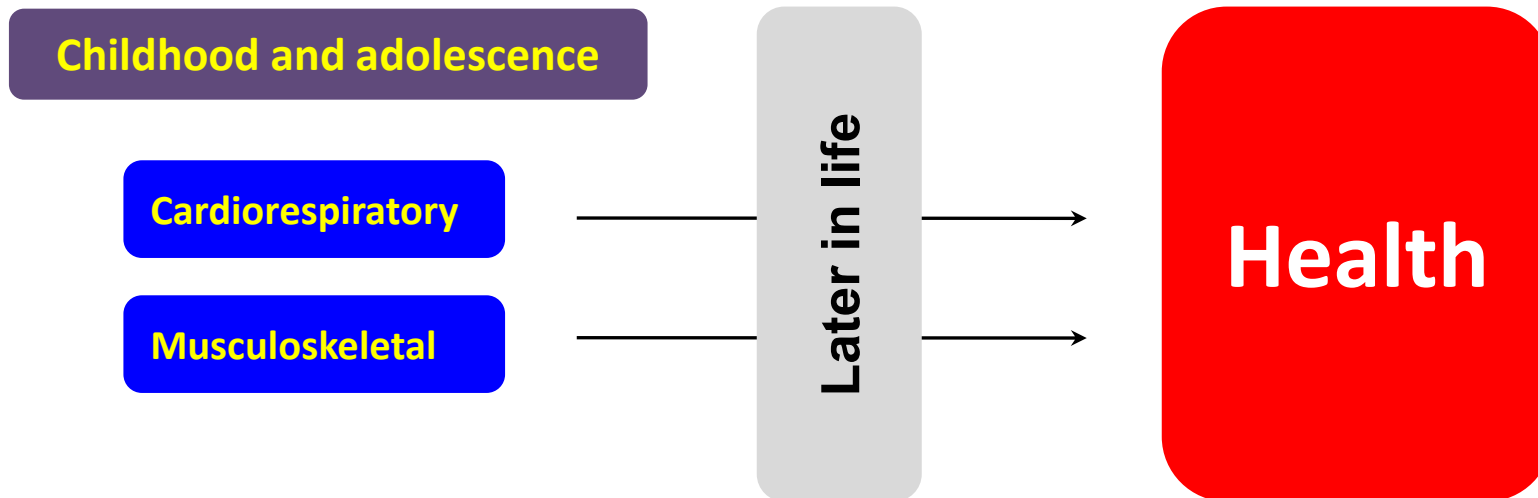
Institutions

- WHO
- ESPGHAN
- FISPGHAN
- ENeA
- Early Nutrition Academy
- US Agency for Healthcare Research and Quality
- Dutch State Institute for Nutrition and Health

PEDIATRIC REVIEW

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

FB Ortega^{1,2}, JR Ruiz^{1,2}, MJ Castillo¹ and M Sjörström²



Exclusive breastfeeding duration and cardiorespiratory fitness in children and adolescents

Aim

To examine the association of exclusive breastfeeding duration with fitness in children and adolescents and to test the role of body composition and sociodemographic factors in this relation

METHODS

Participants

1025 children (9-10 years) and 971 adolescents (15-16 years) from Sweden and Estonia (EYHS)

Exposures

Breast feeding

- Was your child fed completely on breast milk for any length of time—that is, without complementary formula feeds? (Categories provided for response were yes or no)
- For how long was your child breastfed? (Categories provided for response were <1 month, 1–3 months, >3–6 months, and >6 months)

METHODS

Participants

1025 children (9-10 years) and 971 adolescents (15-16 years) from Sweden and Estonia (EYHS)

Exposures

Breast feeding

Main outcome

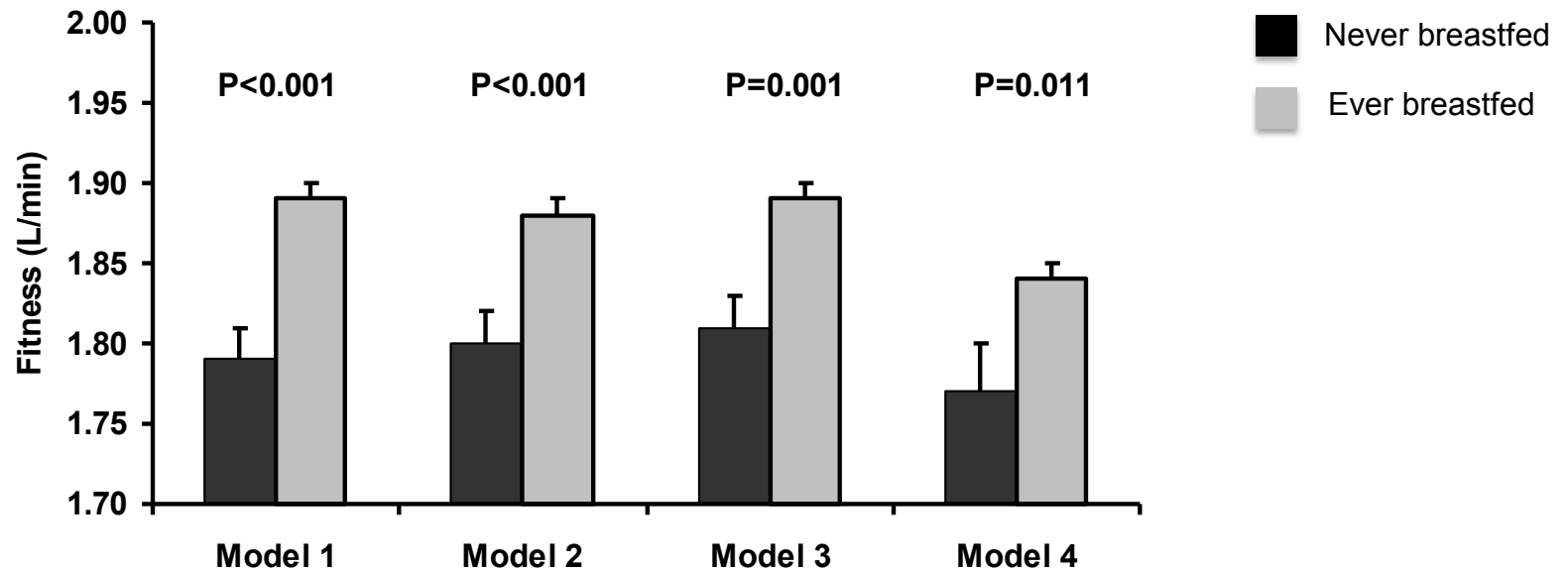
Cardiorespiratory fitness

Confounding factors

Anthropometry, birth weight, smoking, physical activity, maternal education, and mother's BMI

RESULTS

Cardiorespiratory fitness and never vs. ever breastfed



Model 1: adjusted for country, age, sex, and pubertal status

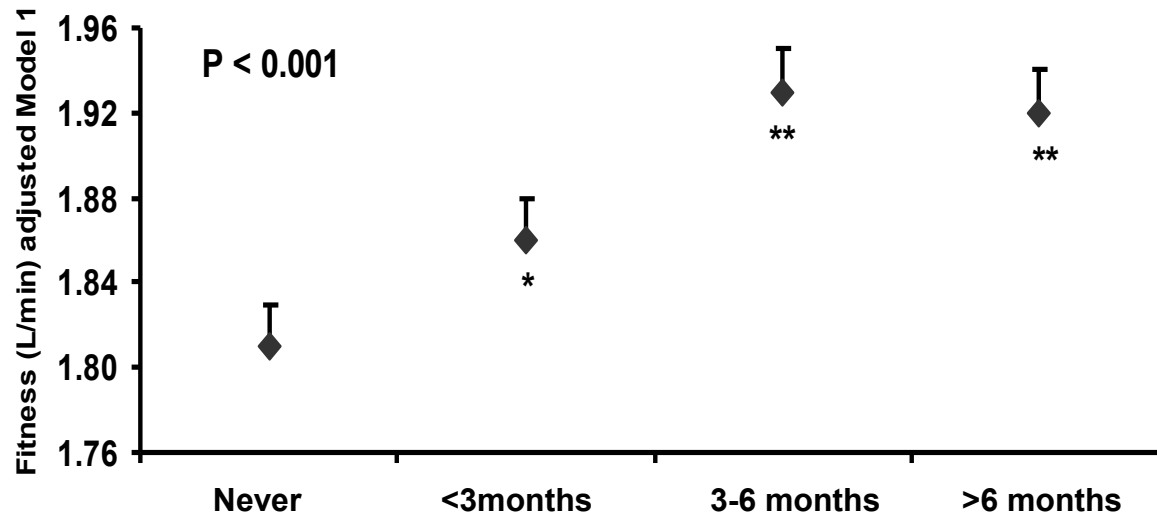
Model 2: model 1 plus BMI

Model 3: model 1 plus fat mass, and fat-free mass

Model 4: model 1 plus birth weight and maternal BMI and educational level

RESULTS

Cardiorespiratory fitness and duration of breast feeding



Model 1: adjusted for country, age, sex, and pubertal status

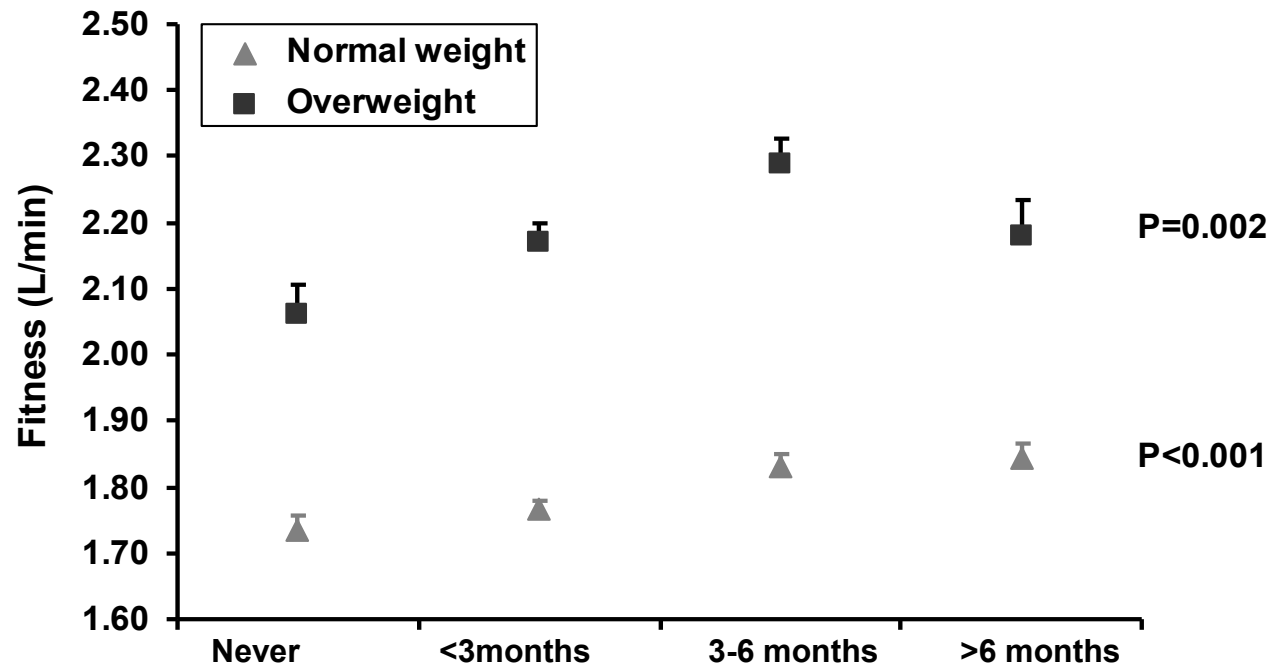
Model 2: model 1 plus BMI

Model 3: model 1 plus fat mass, and fat-free mass

Model 4: model 1 plus birth weight and maternal BMI and educational level

RESULTS

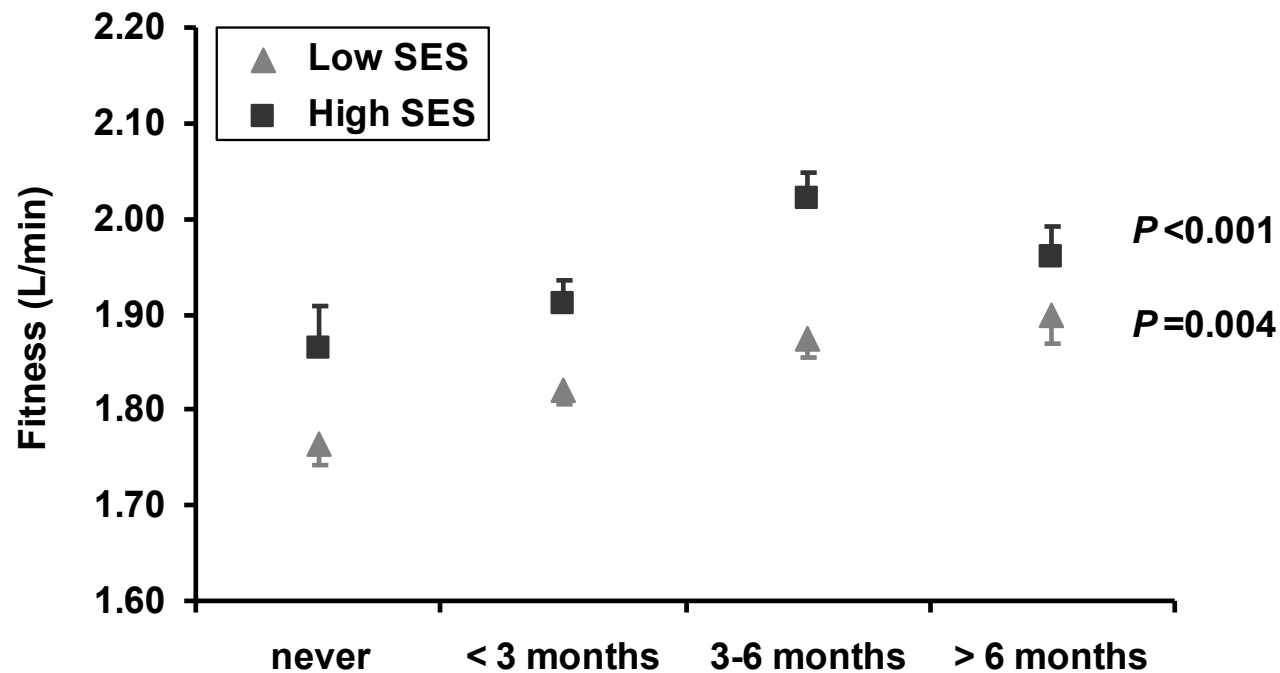
Cardiorespiratory fitness and duration of breast feeding by weight status



Normal weight/overweight+obesity according to the International Obesity Task Force recommendations
Confounders: country, sex, age, pubertal status, and body mass

RESULTS

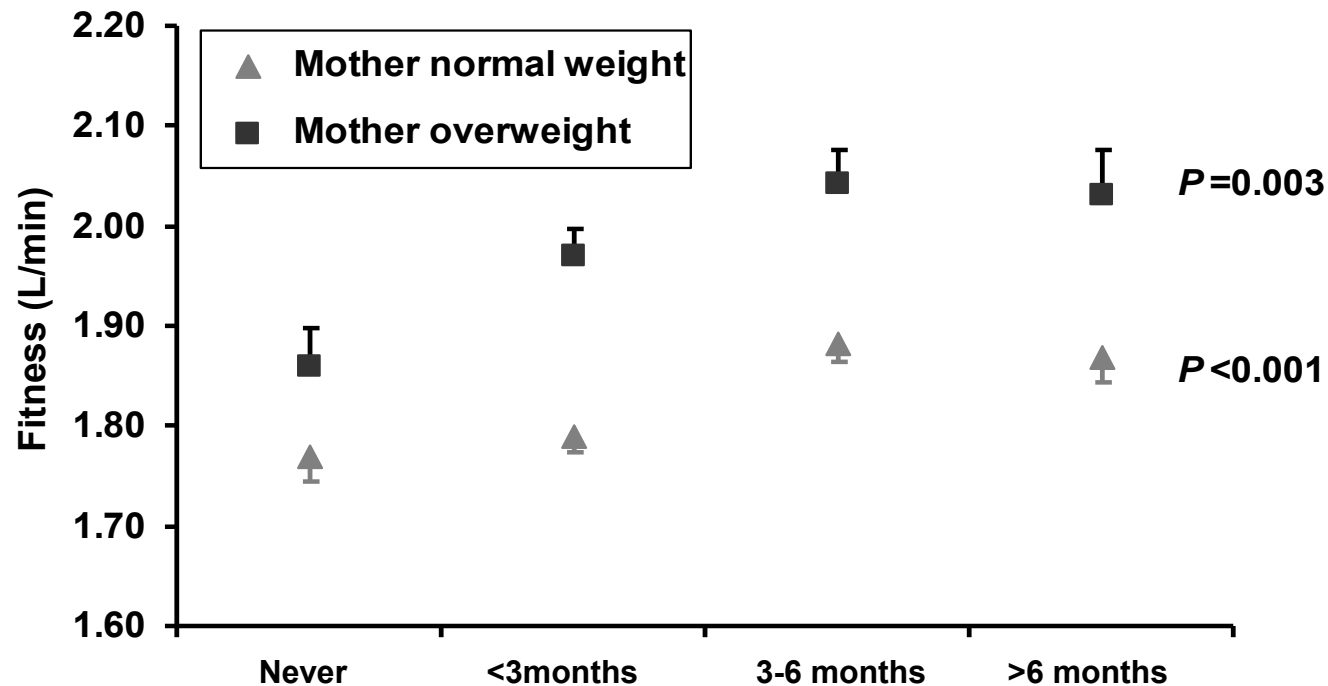
Cardiorespiratory fitness and duration of breast feeding by SES



Low/ high-SES: less than university education and university education, respectively
Confounders: country, sex, age, pubertal status, and body mass

RESULTS

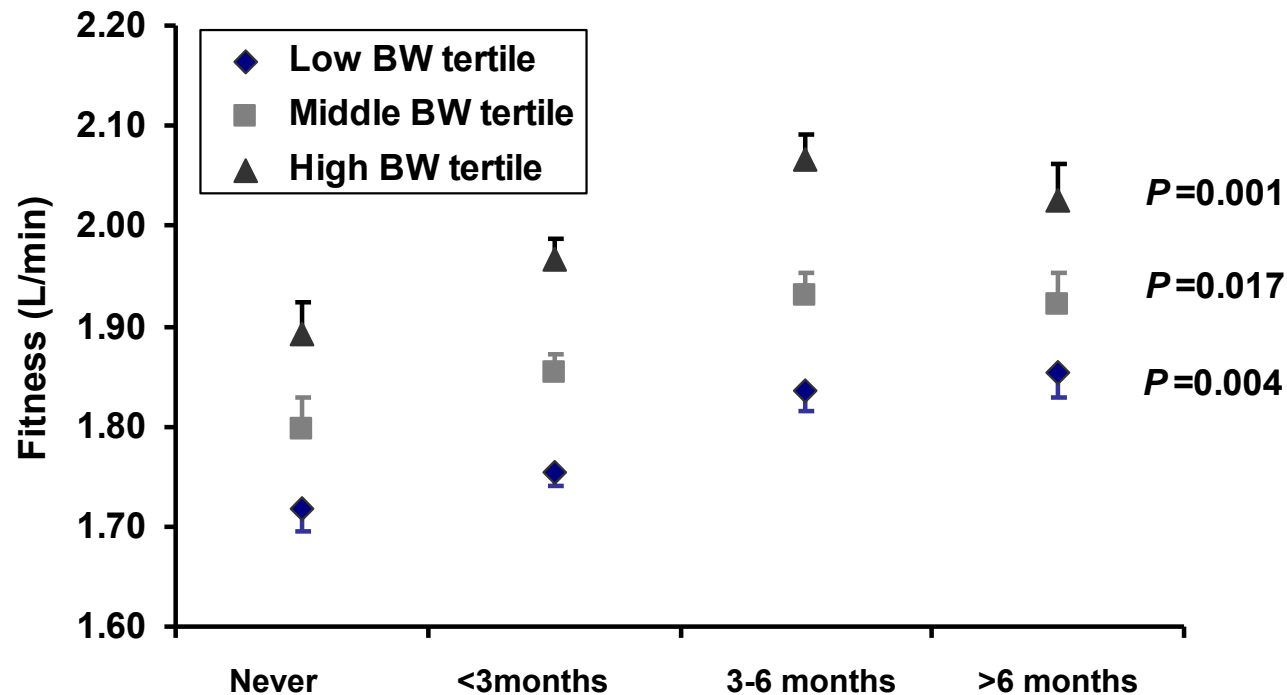
Cardiorespiratory fitness and duration of breast feeding by mother's weight



Confounders: country, sex, age, pubertal status, and body mass

RESULTS

Cardiorespiratory fitness and duration of breast feeding by BW

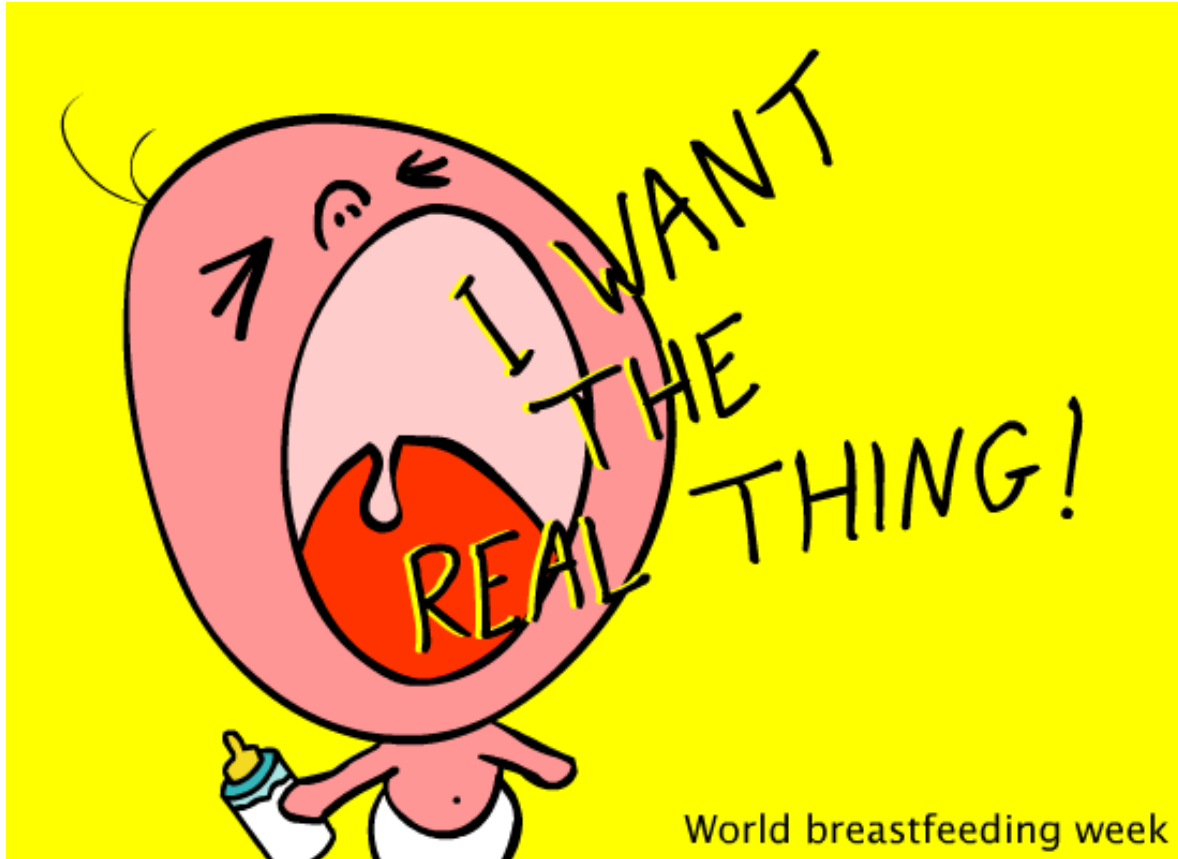


Confounders: country, sex, age, pubertal status, and body mass

Conclusions

Longer exclusive breastfeeding has a beneficial effect on cardiorespiratory fitness in children and adolescents

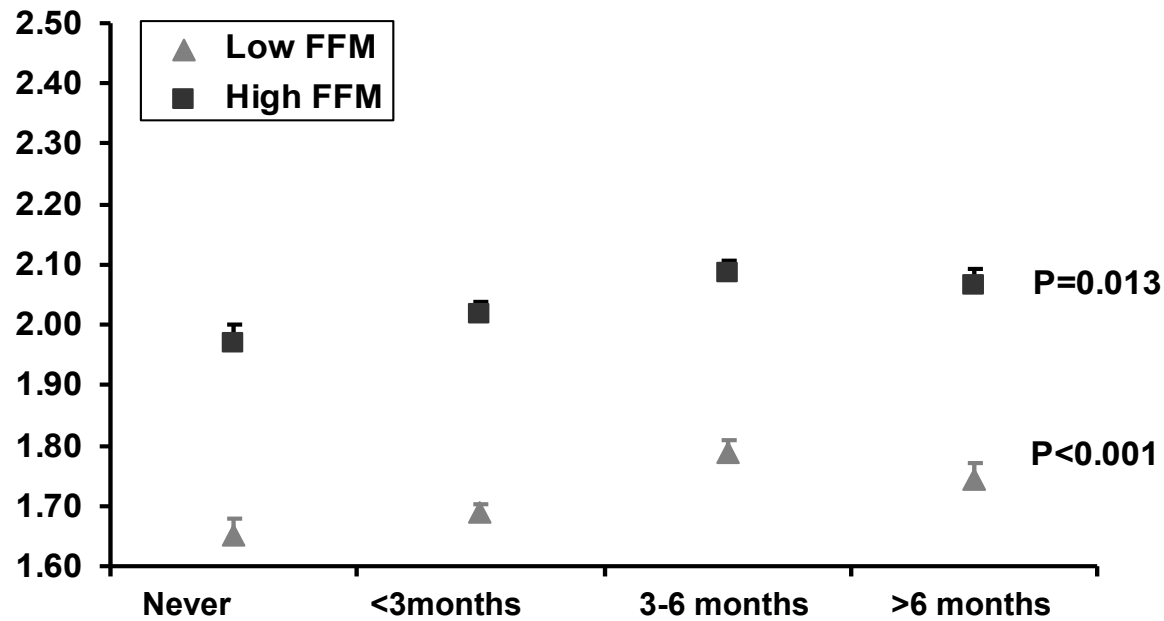
Because early infant-feeding patterns are potentially modifiable, a better understanding of the possible programming effect of exclusive breastfeeding on cardiorespiratory fitness is of public health interest



Thanks for your attention

RESULTS

Cardiorespiratory fitness and duration of breast feeding by FFM



Low/high FFM: below or above the sex- and age group-specific median



Test protocol

Gender	Age (years)	Weight (kg)	Initial work rate (W)	Δ Work rate (W)
Girls & boys	9-10	< 30	20	20
Girls & boys	9-10	> 30	25	25
Girls	15-16	-	40	40
Boys	15-16	-	50	50

Variables

- Watt: $W1 + (W2 \cdot t/180)$
- VO_2 max (L/min): $12 \times W + 5 \times \text{body weight (kg)}$

METHODS

Anthropometry

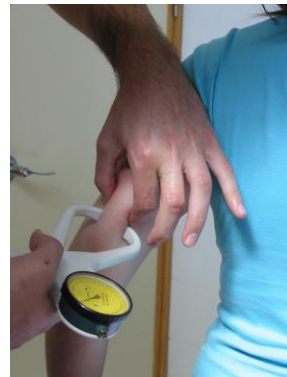
Weight



Skinfold thickness



Height



Variables

- BMI
- % Overweight/Obese
- % Body fat (Slaughter et al.)
- FFM



Test protocol

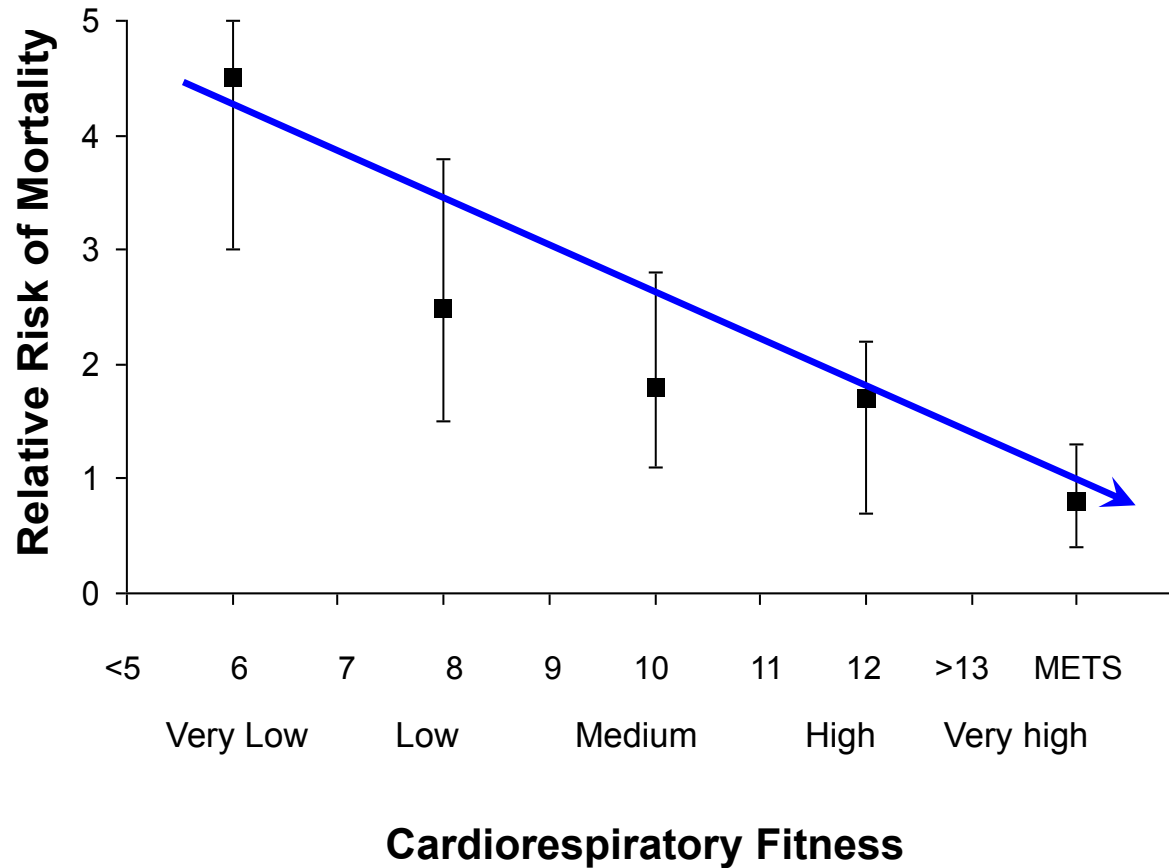
- 4 consecutive days
- 10 hrs/day

Variables

- Total PA (counts/min)
- Moderate + Vigorous PA >3 METs (min/day)



Cardiorespiratory fitness: marker of health



Adults
10,224 men and 3120 women