

## Fruit and vegetable consumption and muscle strength and power during adolescence: the Northern Ireland Young Hearts Project

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Epidemiological studies suggest that increased fruit and vegetable (FV) consumption may improve muscle strength and power. However, the evidence is inconclusive and the majority of studies have been conducted in older adults<sup>(1–4)</sup>. The current study examined the association between FV consumption and muscle strength and power in an adolescent population.

A cross-sectional analysis was carried out on data obtained from 1019 boys and 998 girls, aged 12 and 15 years, who participated in The Young Hearts 2000 Study. FV consumption was assessed by diet history. Grip strength (muscle strength) and vertical jump power (muscle power) was assessed with a dynamometer and Jump-MD meter, respectively. Associations between FV consumption and strength and power were assessed by regression modelling, with adjustment for potential confounders.

Boys and girls with high FV intakes (>237.71 g/d and >267.57 g/d, respectively, based on the highest third) had significantly higher jump power than those with low intakes, after adjustment for confounding factors. Girls with high FV intakes also had higher grip strength than those with low FV intake, although significance was lost after adjusting for physical activity. No significant associations were evident between FV intake and grip strength in boys after adjusting for confounding factors. Similar findings were observed when FV intakes were analysed separately.

FV Categories	Grip strength (kg)		Vertical jump power (cm)	
	Boys	Girls	Boys	Girls
	Difference in mean (95% CI)	Difference in mean (95% CI)	Difference in mean (95% CI)	Difference in mean (95% CI)
<b>Model 1</b>				
High intake <sup>a</sup>	–	–	–	–
Moderate intake	–1.56 (–2.94, –0.18)*	–0.63 (–1.41, 0.14)	–1.21 (–2.51, 0.10)	–1.14 (–2.08, –0.19)*
Low intake	–0.58 (–1.96, 0.80)	–0.99 (–1.77, –0.22)*	–1.80 (–3.10, –0.49)**	–1.66 (–2.61, –0.72)**
<b>Model 2</b>				
High intake <sup>a</sup>	–	–	–	–
Moderate intake	–0.11 (–0.80, 0.59)	–0.23 (–0.77, 0.31)	–0.46 (–1.50, 0.58)	–0.91 (–1.82, 0.006)
Low intake	–0.15 (–0.85, 0.54)	–0.70 (–1.23, –0.16)*	–1.50 (–2.54, –0.46)**	–1.52 (–2.44, –0.61)**
<b>Model 3</b>				
High intake <sup>a</sup>	–	–	–	–
Moderate intake	–0.04 (–0.74, 0.66)	–0.09 (–0.62, 0.45)	–0.34 (–1.38, 0.70)	–0.73 (–1.63, 0.18)
Low intake	–0.04 (–0.74, 0.66)	–0.40 (–0.94, 0.15)	–1.27 (–2.31, –0.22)*	–1.07 (–1.99, –0.15)*

<sup>a</sup>Reference category. \* $p < 0.05$ , \*\* $p < 0.01$  compared to reference category. For boys, low FV intake was defined as <135.09 g/d, moderate FV intake as 135.09–237.71 g/d, high FV intake as >237.71 g/d. For girls, low FV intake was defined as <147.43 g/d, moderate FV intake as 147.43–267.57 g/d, high FV intake as >267.57 g/d. Model 1: unadjusted; Model 2: adjusted for age, height, weight, pubertal status, energy intake; Model 3: adjusted for age, height, weight, pubertal status, energy intake, physical activity

Increased FV consumption in adolescence is associated with increased vertical jump power (muscle power). An association between increased FV consumption and grip strength (muscle strength) in girls was also evident, however, this became non-significant when adjusted for physical activity. Intervention studies are required to determine whether grip strength (muscle strength) and vertical jump power (muscle power) can be improved through increased FV consumption.

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