School gardens and student nutrition

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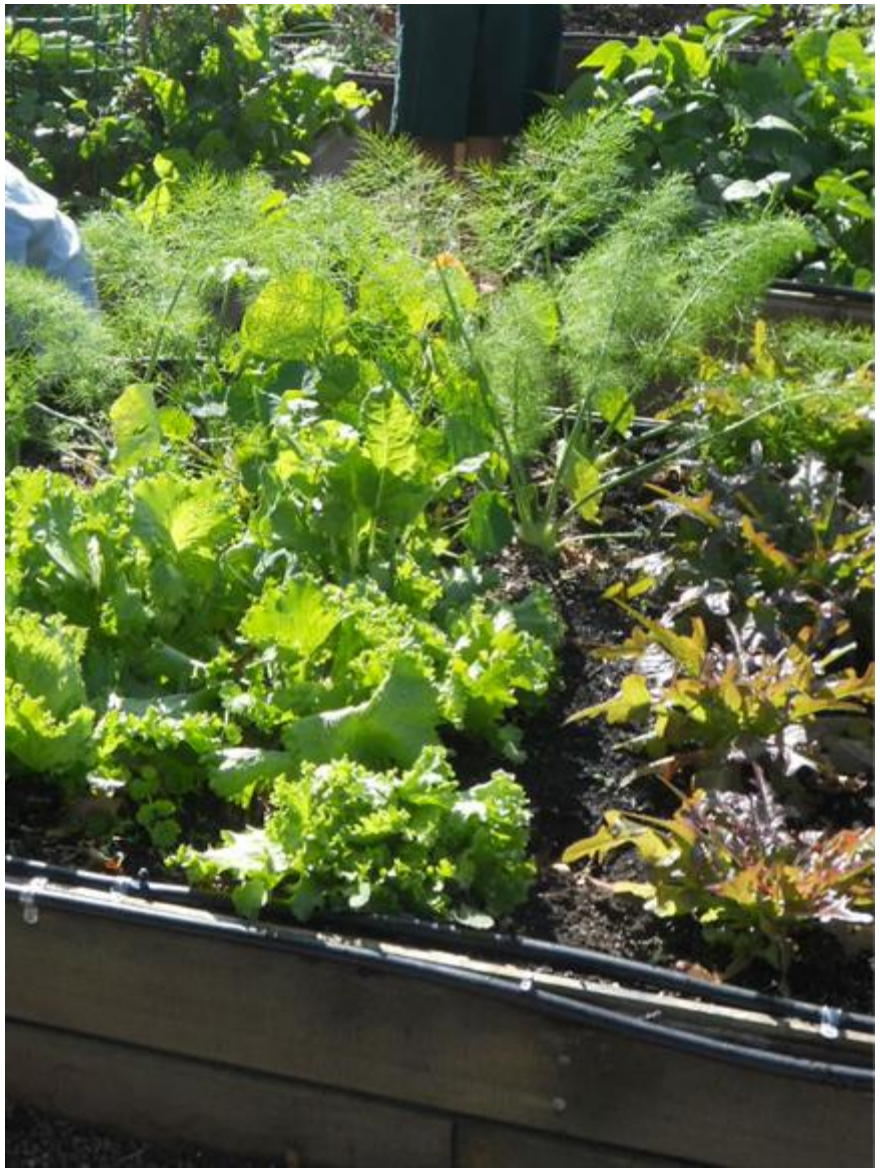


Background

Nā tō rourou,
nā taku rourou
ka ora ai te iwi

With your food basket
and my food basket
the people will thrive

GARDEN TO TABLE

GROW, HARVEST, PREPARE, SHARE

Challenges with evaluation

- Time and resource required to set up
- Design, comparison groups
- Selection bias
- Implementation

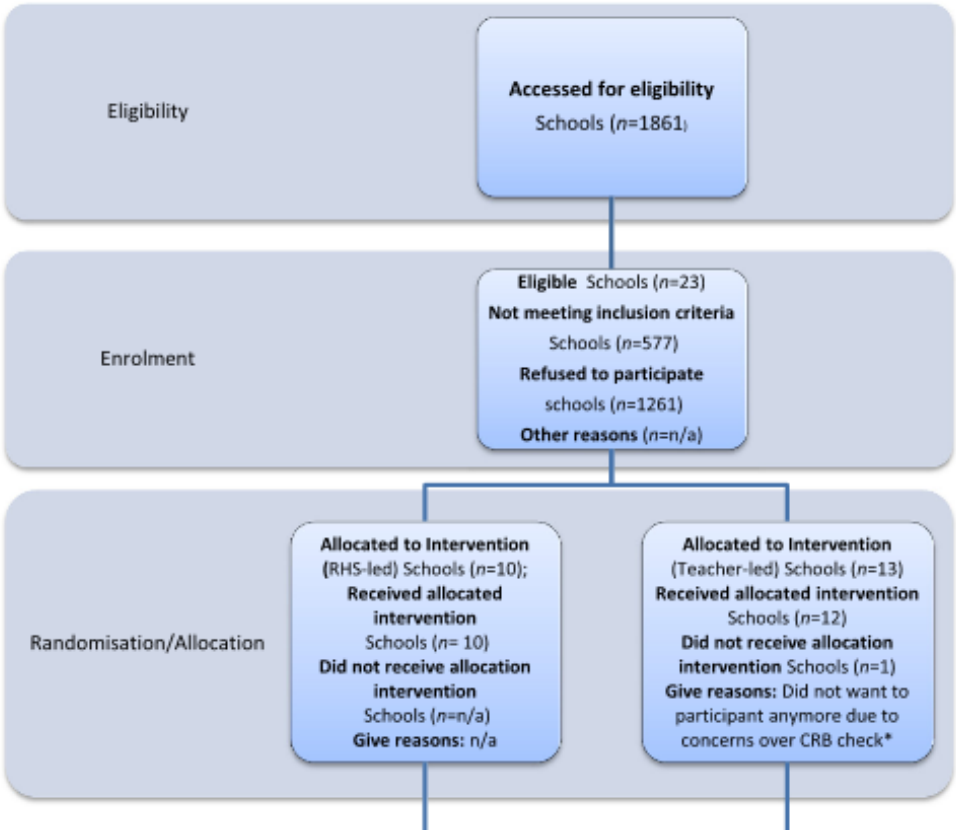
Christian *et al. International Journal of Behavioral Nutrition and Physical Activity* 2014, **11**:99
http://www.ijbnpa.org/content/11/1/99

International Journal of Behavioral Nutrition and Physical Activity

RESEARCH **Open Access**

Evaluation of the impact of a school gardening intervention on children's fruit and vegetable intake: a randomised controlled trial

Meaghan S Christian[1,2*], Charlotte EL Evans[1], Camilla Nykjaer[1], Neil Hancock[1] and Janet E Cade[1]



Methods

Study population

All primary schools (n = 1861) from the following London boroughs: Wandsworth; Tower Hamlets; Greenwich and Sutton were invited to take part in this trial, regardless of their level of previous gardening involvement in their school. Twenty-three schools responded which were then randomised. Ten were randomly allocated to receive the Royal Horticultural Society (RHS)-led and 13 schools were allocated to receive the Teacher-led intervention. The schools were randomised stratified by geographical location (London borough) using Stata [26]. All schools were allocated at the same time. No more than ten schools could receive the RHS-led intervention due to the more intensive nature of the intervention and RHS staff constraints. It was not possible in this case to randomise schools to receive no intervention at all (control/comparison group) as it is the policy of the RHS gardening charity to provide support to all schools who register an interest in their School Gardening Campaign. As a consequence of this, the second set of schools were recruited into a linked trial, Trial 2, to provide a no intervention arm - comparison group [27]. A detailed description of this study can be found in the study protocol published elsewhere [28]. Ethics approval for both trials was granted by the Leeds Institute of Health Sciences and the Leeds Institute of Genetics, Health and Therapeutic (LIHS/LIGHT) Joint Ethics Committee on 10th of December 2009 (ref number HSLT/09/012).

Table 3 Intervention effect on change in fruit and vegetables (g/day) between baseline and follow up

Food	RHS-led (n = 312)			Teacher-led intervention (n = 329)			Intervention effect			
	Mean (g)	SE	95% CI	Mean (g)	SE	95% CI	Mean diff (g)	SE	95% CI	P- value
Adjusted for IMDS[a], Ethnicity, Age & Gender										
Change in fruit (g)	−8	30.8	−69, 52	−20	29.0	−36, 77	−28	16.4	−60, 3	0.08
Change in vegetables (g)	16	19.6	−11, 38	29	18.2	−6, 66	−13	12.8	−39, 11	0.2
Change in combined fruit and vegetables (g)	1	39.4	−75, 78	41	36.7	−27, 116	−40	22.8	−88, 1	0.06
Change in fruit (g) School only	−25	10.1	−46, −5	−12	14.2	−41, 17	−13	13.4	−41, 14	0.3
Change in fruit (g) Home only	−32	15.8	−65, 0	−13	14.1	−42, 16	−19	14.8	−50, 40	0.2
Change in vegetables (g) School only	−8	9.6	−28, 12	−1	5.9	−12, 12	−7	9.6	−26, 12	0.4
Change in vegetables (g) Home only	12	11.2	−11, 36	23	11.0	1, 46	−11	8.7	−29, 7	0.2
Change in combined fruit & vegetable consumption (g) School only	−25	10.8	−48, −3	−4	16.0	−37, 29	−21	15.8	−54, 11	0.2
Change in combined fruit & vegetable consumption (g) Home only	−19	20.8	−62, 24	9	20.4	−33, 52	−28	20.7	−71, 14	0.2

Multi-level robust cluster regression analysis used to test significant difference between the two groups.

[a]IMDS: index of multiple deprivation score.

Aims

- Describe the prevalence and characteristics of secondary schools with school gardens
- Determine the relationship between presence of a school garden and student eating behaviours and BMI

Youth'12

Student data

- Fruit and vegetable consumption
- Fast food/ takeaway consumption
- Physical activity
- Measured height/ weight

Youth'12

School level items

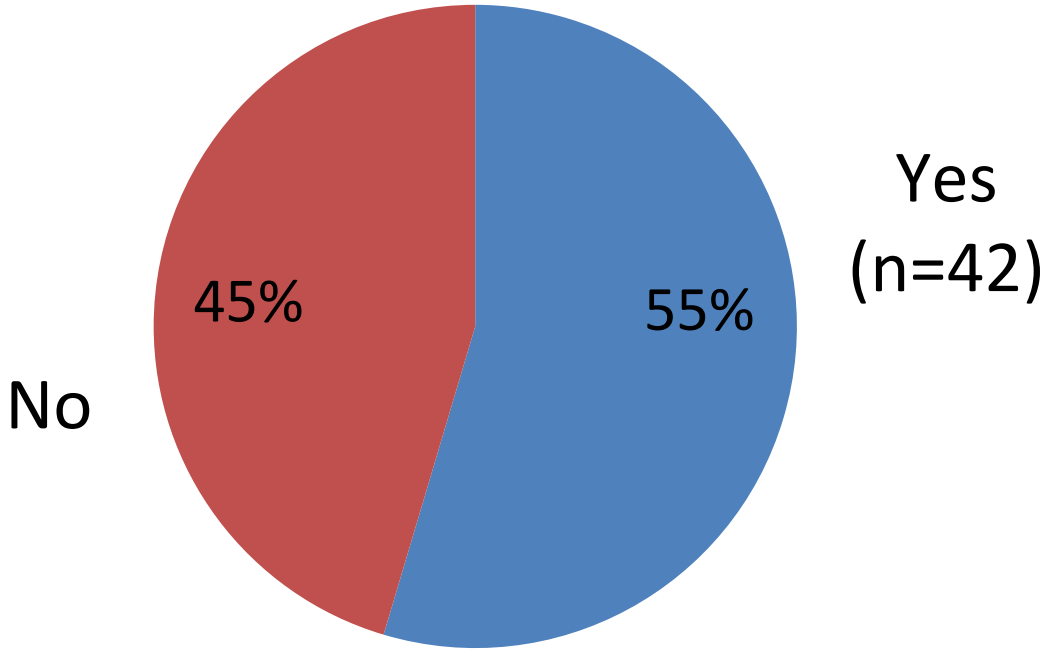
- "Does your school have a garden (vegetable and/ or fruit) that students participate in?"

- School funding
- Co-educational/ single sex
- School size
- School decile

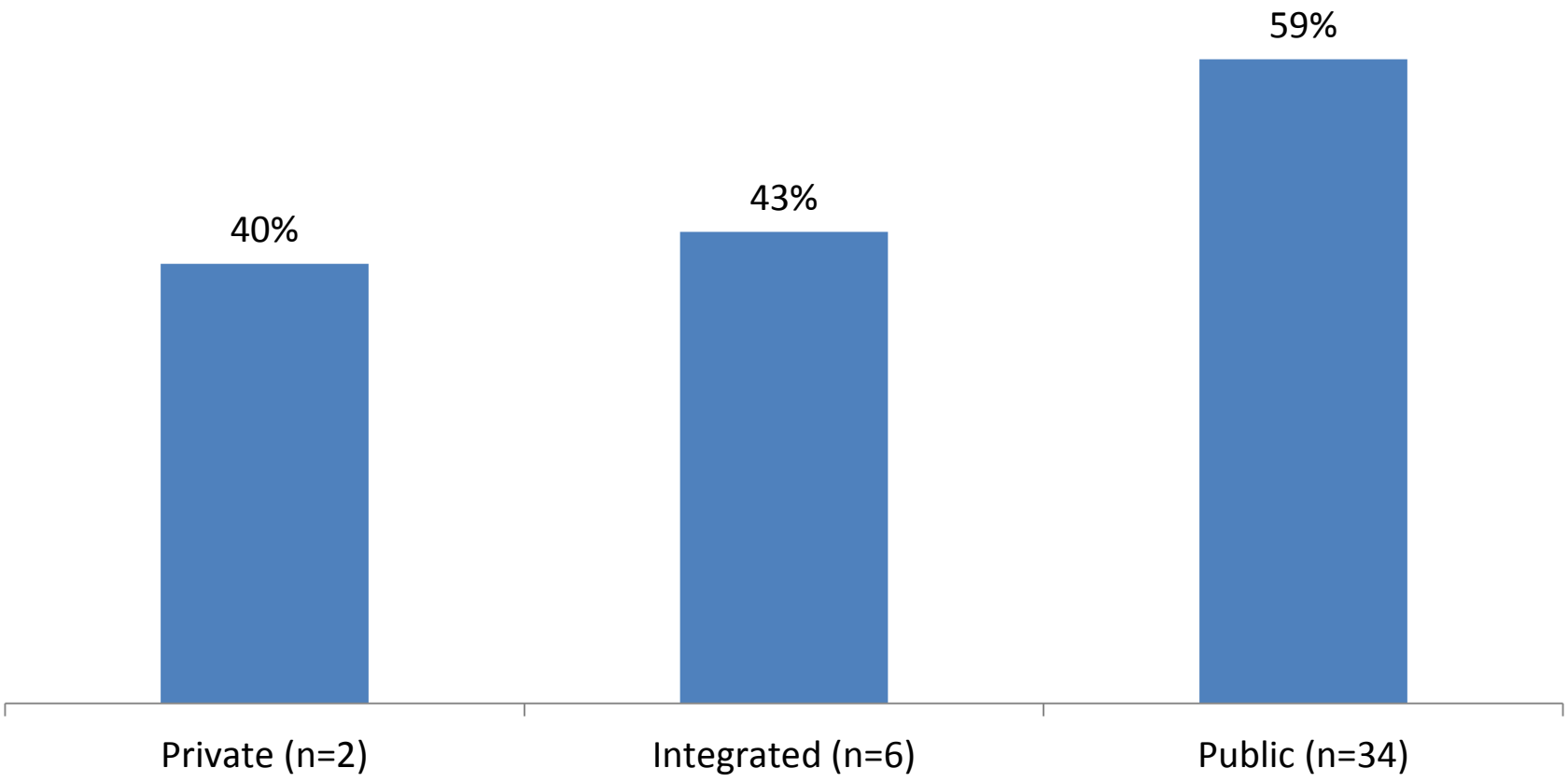
Analysis

- Multilevel regression models used to estimate the association between presence of school garden and student nutrition indicators
- Analyses control for student characteristics (sex, age, ethnicity, socioeconomics) and school characteristics (size, funding, decile)

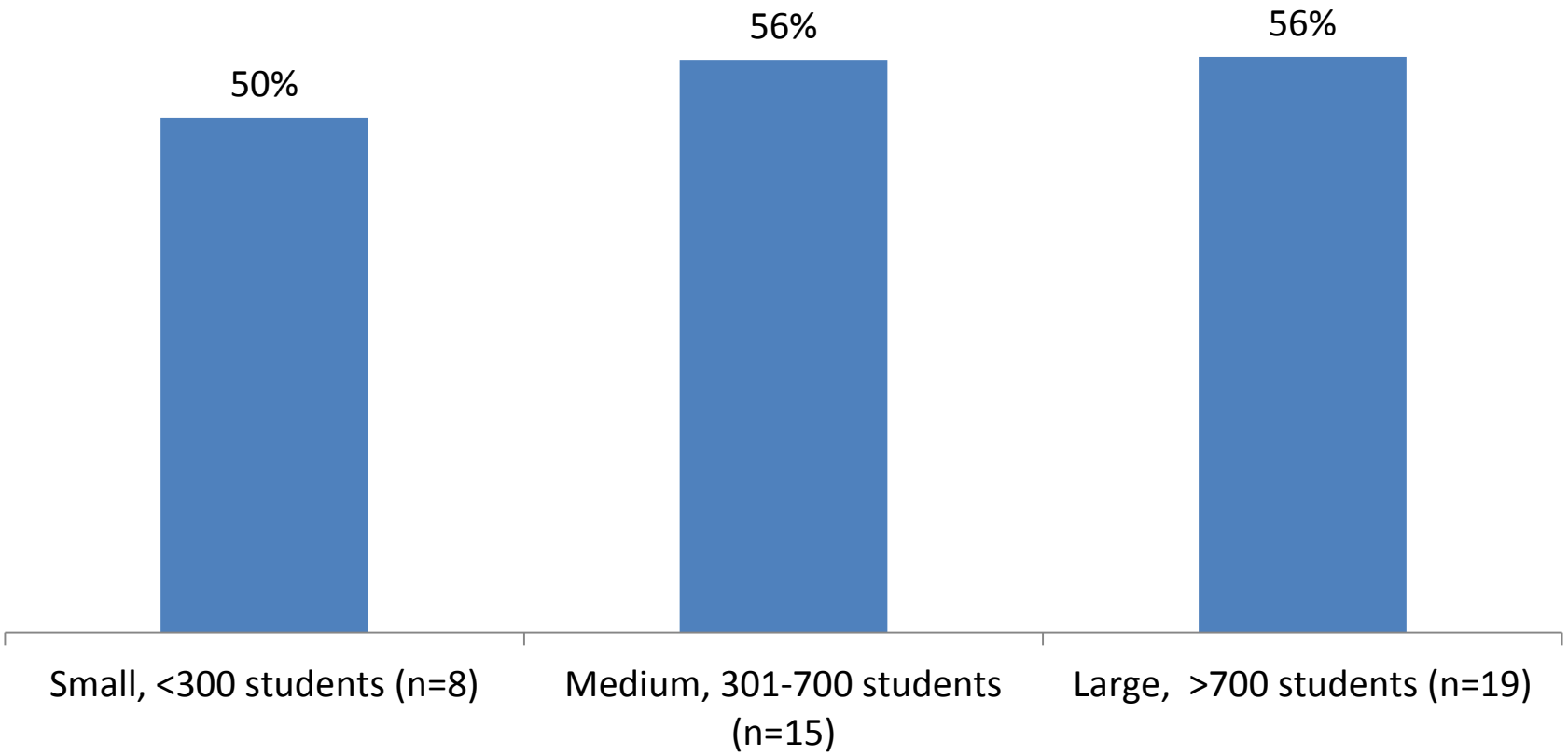
Fruit/ vegetable garden at school



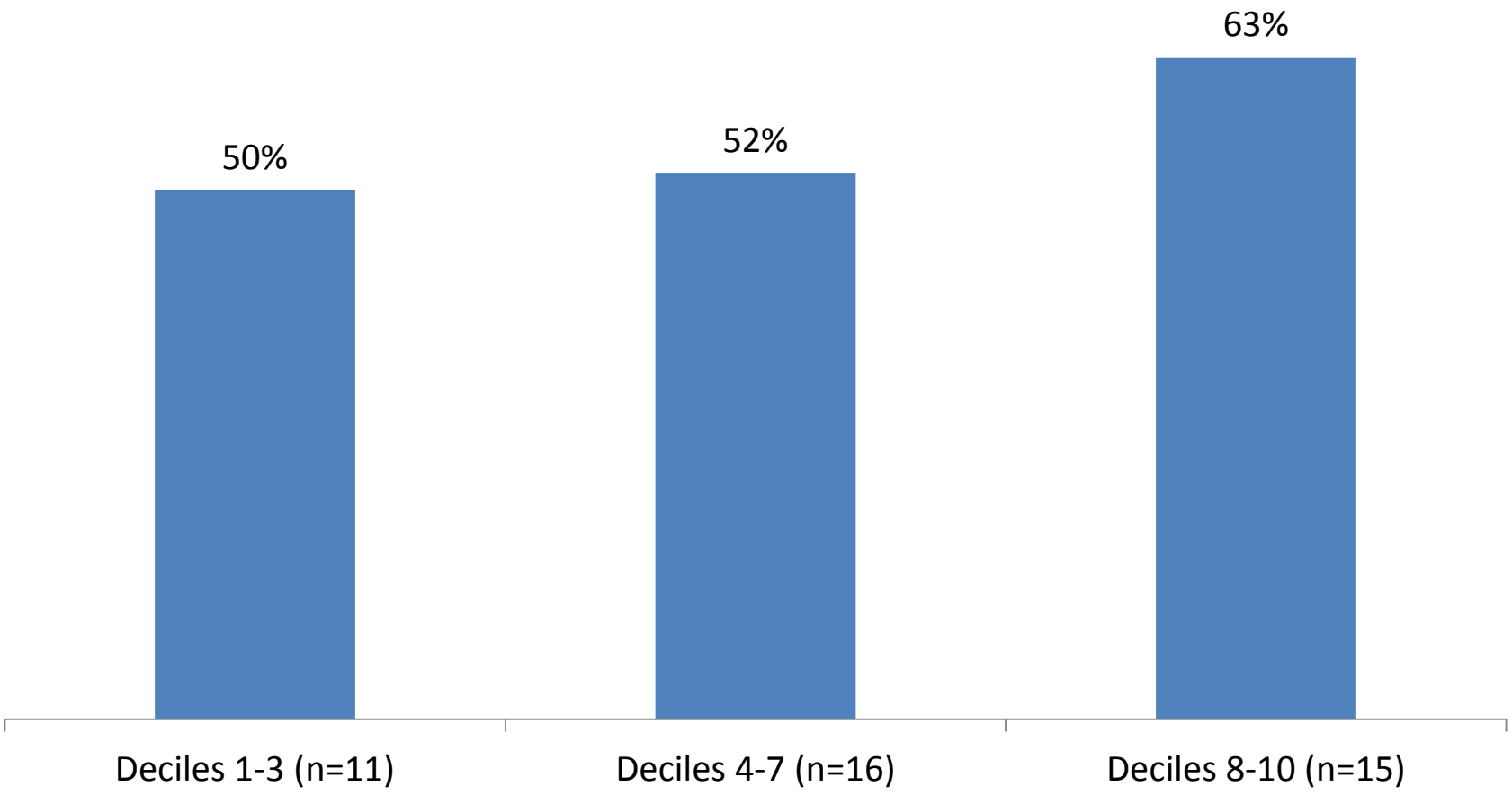
School gardens by school funding



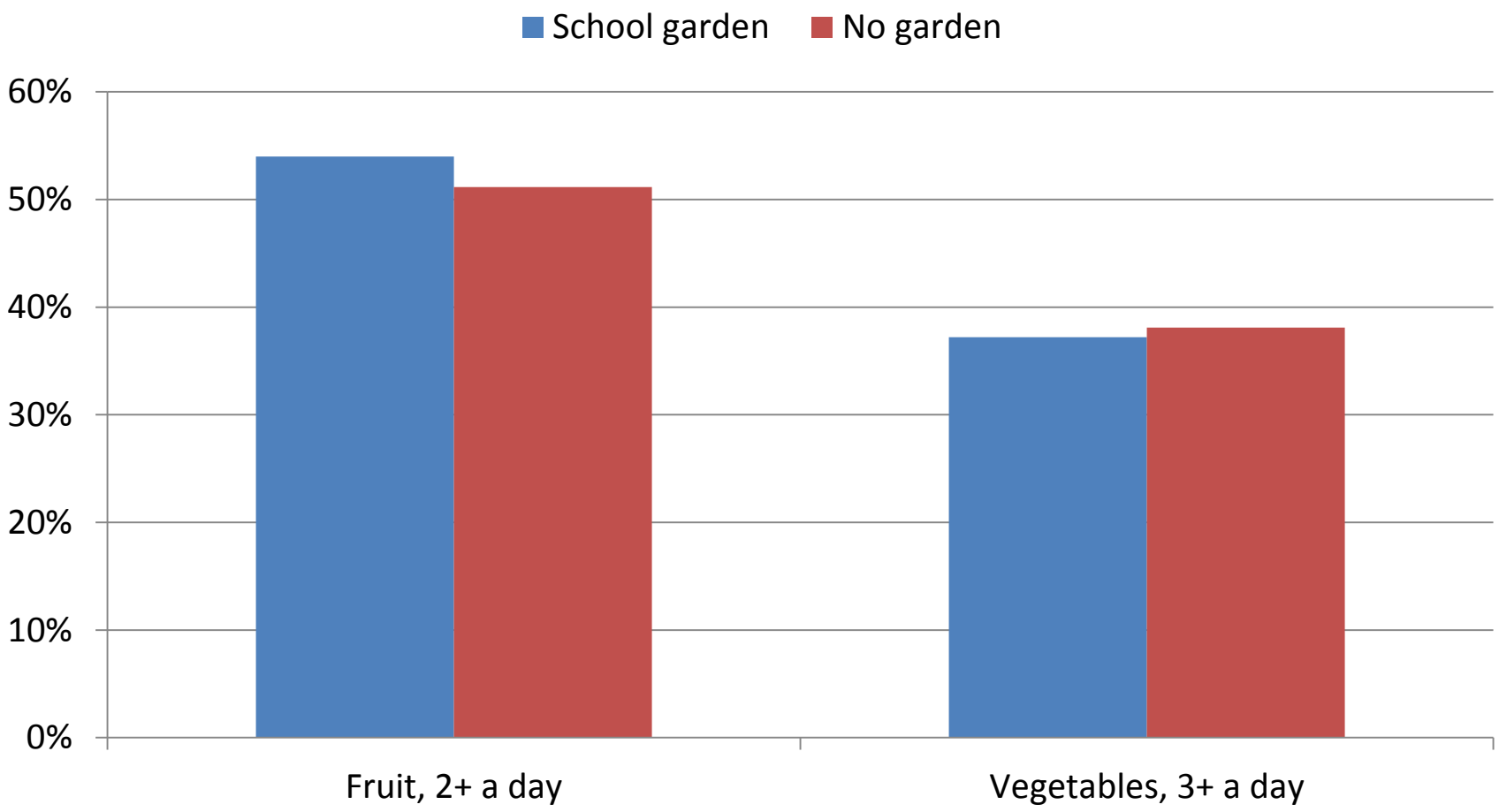
School gardens by school size



School gardens by decile

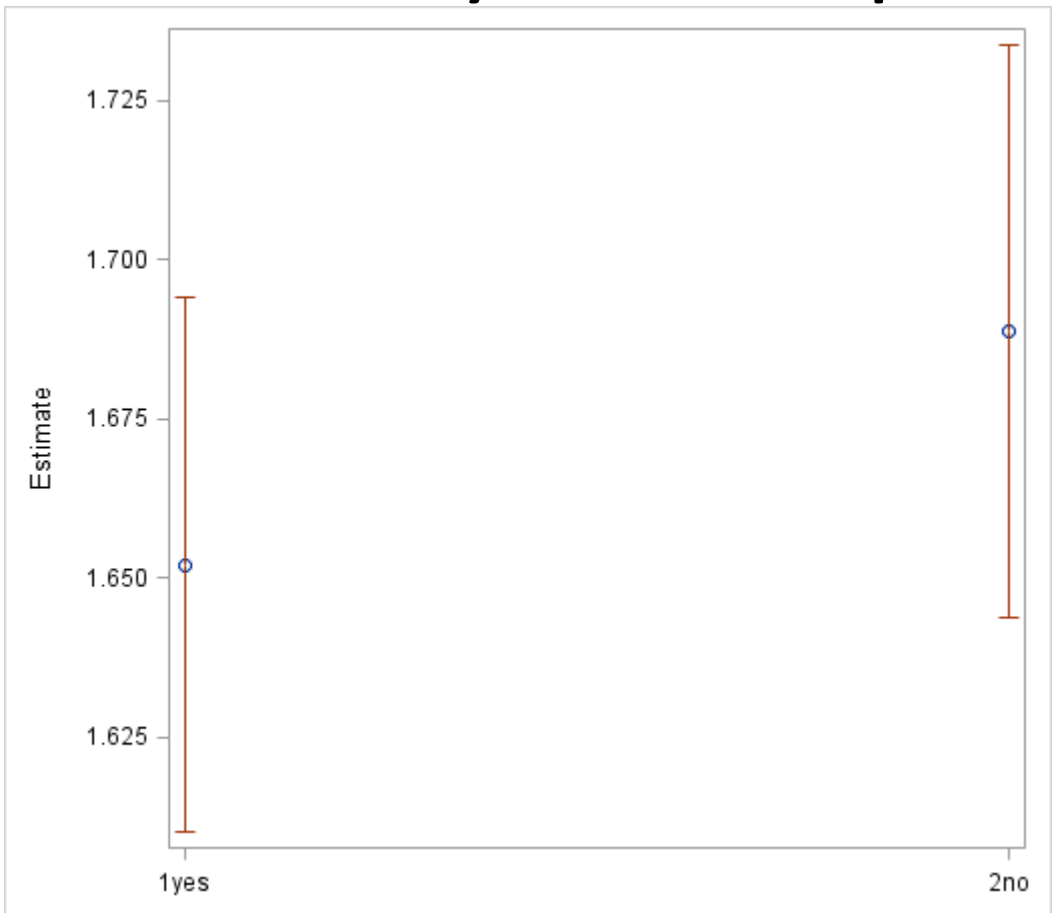


School gardens and F&V consumption



School gardens and fast food/ takeaway consumption

Fast food

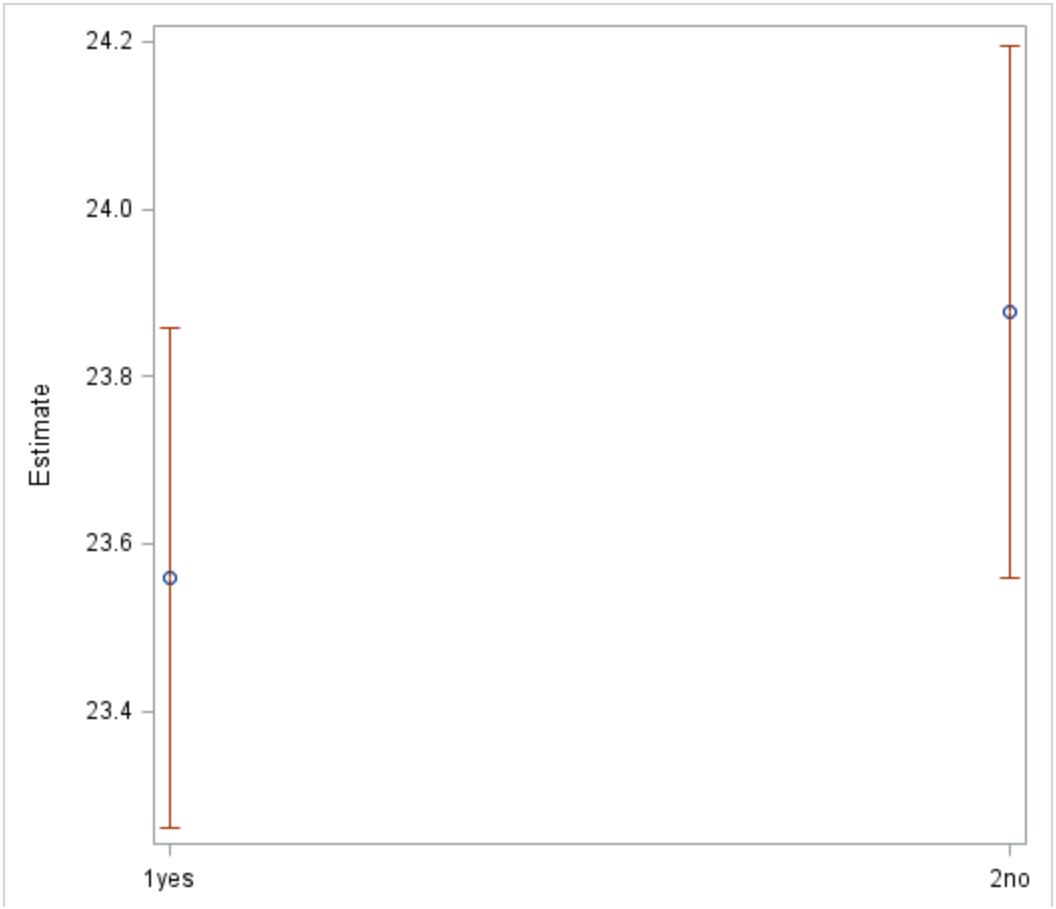


School Garden

P=0.042

School gardens and BMI

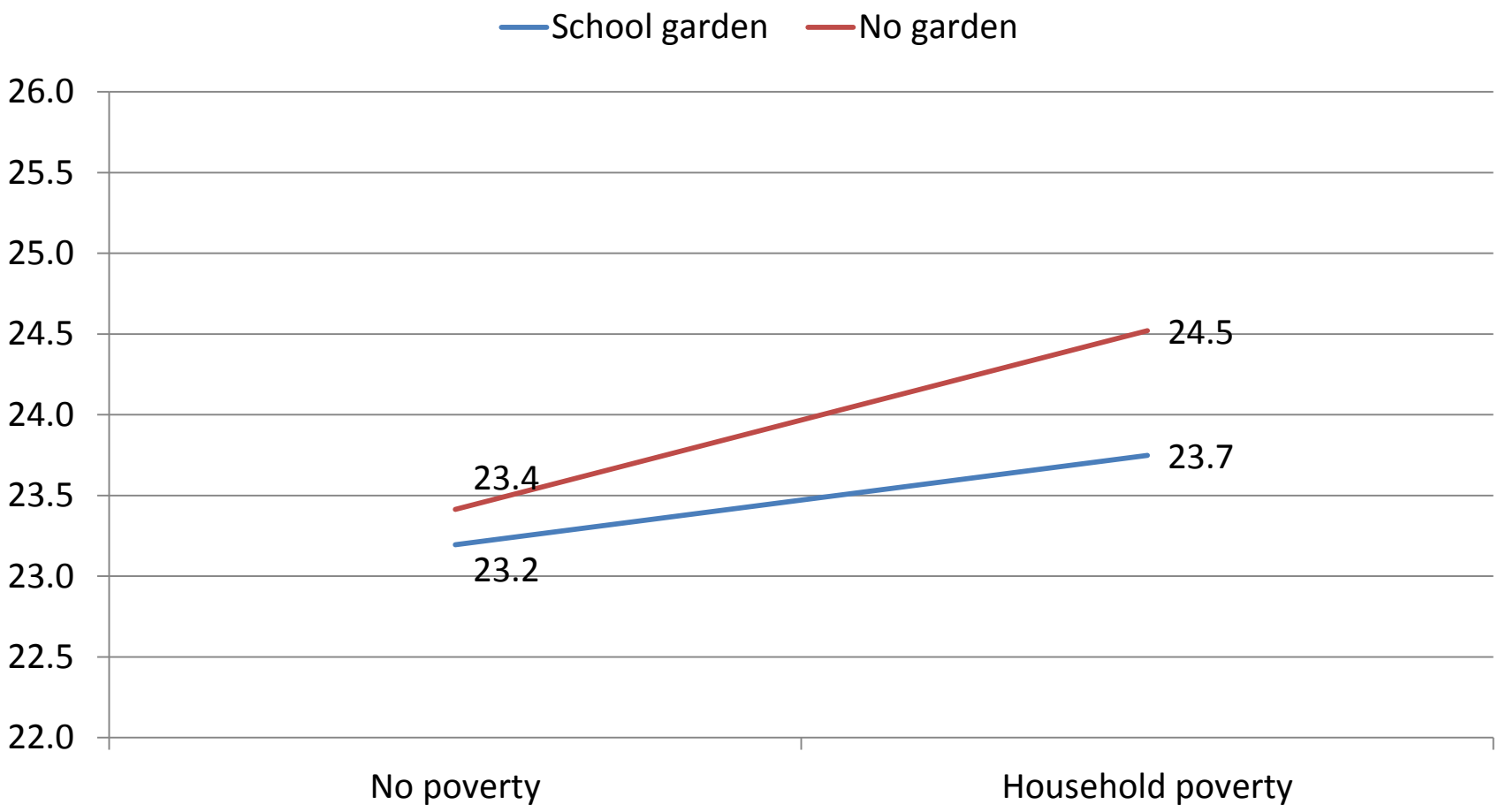
BMI



School Garden

P=0.013

School gardens, BMI and poverty



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Summary

- School gardens common among secondary schools
- Appear to be associated with better nutrition indicators, particularly for young people living with poverty
- Implementation of school gardens and integration within community largely unknown