School gardens and student nutrition

Dr Jennifer Utter
School of Population Health
University of Auckland
Background

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

With your food basket and my food basket the people will thrive
Challenges with evaluation

• Time and resource required to set up
• Design, comparison groups
• Selection bias
• Implementation
Evaluation of the impact of a school gardening intervention on children’s fruit and vegetable intake: a randomised controlled trial

Meaghan S Christian¹,²*, Charlotte EL Evans¹, Camilla Nykjaer¹, Neil Hancock¹ and Janet E Cade¹
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>
<thead>
<tr>
<th>Food</th>
<th>RHS-led (n = 312)</th>
<th>Teacher-led intervention (n = 329)</th>
<th>Intervention effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (g)</td>
<td>SE</td>
<td>95% CI</td>
</tr>
<tr>
<td>Adjusted for IMDSa, Ethnicity, Age &amp; Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in fruit (g)</td>
<td>−8</td>
<td>30.8</td>
<td>−69.52</td>
</tr>
<tr>
<td>Change in vegetables (g)</td>
<td>16</td>
<td>19.6</td>
<td>−11.38</td>
</tr>
<tr>
<td>Change in combined fruit and vegetables (g)</td>
<td>1</td>
<td>39.4</td>
<td>−75.78</td>
</tr>
<tr>
<td>Change in fruit (g) School only</td>
<td>−25</td>
<td>10.1</td>
<td>−46.5</td>
</tr>
<tr>
<td>Change in fruit (g) Home only</td>
<td>−32</td>
<td>15.8</td>
<td>−65.0</td>
</tr>
<tr>
<td>Change in vegetables (g) School only</td>
<td>−8</td>
<td>9.6</td>
<td>−28.12</td>
</tr>
<tr>
<td>Change in vegetables (g) Home only</td>
<td>12</td>
<td>11.2</td>
<td>−11.36</td>
</tr>
<tr>
<td>Change in combined fruit &amp; vegetable consumption (g) School only</td>
<td>−25</td>
<td>10.8</td>
<td>−48.3</td>
</tr>
<tr>
<td>Change in combined fruit &amp; vegetable consumption (g) Home only</td>
<td>−19</td>
<td>20.8</td>
<td>−62.24</td>
</tr>
</tbody>
</table>

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

aIMDS: 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

www.youthresearch.auckland.ac.nz
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

- Yes (n=42) - 55%
- No - 45%
School gardens by school funding

- Private (n=2) 40%
- Integrated (n=6) 43%
- Public (n=34) 59%

www.youthresearch.auckland.ac.nz
School gardens by school size

Small, <300 students (n=8) 50%
Medium, 301-700 students (n=15) 56%
Large, >700 students (n=19) 56%

www.youthresearch.auckland.ac.nz
School gardens by decile

Deciles 1-3 (n=11) - 50%
Deciles 4-7 (n=16) - 52%
Deciles 8-10 (n=15) - 63%
School gardens and F&V consumption

- Fruit, 2+ a day
  - School garden: 50%
  - No garden: 50%

- Vegetables, 3+ a day
  - School garden: 35%
  - No garden: 35%
School gardens and fast food/takeaway consumption

P=0.042

Fast food

School Garden

www.youthresearch.auckland.ac.nz
School gardens and BMI

\[ P = 0.013 \]

www.youthresearch.auckland.ac.nz
School gardens, BMI and poverty

P=0.04

www.youthresearch.auckland.ac.nz
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