Gardening for Health and Wellbeing

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• Defining terms
• Why do we need research evidence
• What is the research evidence
• What do we do with it
HORTICULTURE

The science and art of growing:

• Fruits
• Vegetables
• Flowers
• Ornamental plants
GARDENING

An activity in which people grow, cultivate, and take care of plants (flowers and vegetables) for non-commercial use.
What is a garden?
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What is a garden?
Health

- A state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity (WHO, 1948)
Wellbeing

Well-being includes the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), satisfaction with life, fulfillment and positive functioning (CDC)

...‘stable ‘well-being’ is when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge’ (Dodge et al, 2012)
Researchers from different disciplines have examined different aspects of well-being that include:

- Physical well-being.
- Economic well-being.
- Social well-being.
- Development and activity.
- Emotional well-being.
- Psychological well-being.
- Life satisfaction.
- Domain specific satisfaction.
- Engaging activities and work.
**Why Gardening Is Good for Your Health | Health.com**  
In addition to being a source of fresh, healthy produce, gardening can ease stress, keep you limber, and even improve your mood. Here are just a few of the ways gardening can benefit your physical...

**5 Health Benefits of Gardening and Planting**  
In addition to providing nutritious veggies and fruits for your dinner table and beautiful flowers to decorate it, gardening offers a variety of health benefits. 1. Exposure to vitamin D: Vitamin D increases your calcium levels, which benefits your bones and immune system.

**10 Benefits of Gardening, Plus Helpful Tips & Recommendations**  
Gardening builds strength, promotes sleep, and helps you maintain a healthy weight. The Centers for Disease Control and Prevention (CDC) says gardening is exercise. Activities like raking and...

**Gardening for health: a regular dose of gardening**  
Health professionals should therefore encourage their patients to make use of green space and to work in ... There is increasing evidence that exposure to plants and green space, and particularly to gardening, is beneficial to mental and physical health, and so could reduce the pressure on NHS services.
What does gardening do for our health and wellbeing?
Gardening: Benefits for Individuals

• A form of physical activity (Park et al 2008)
• Improved bone density (Turner et al 2002)
• Greater hand strength (Park et al 2009)
• Relief from acute stress (van den Berg and Custers, 2010)
Gardening and our Diets

- Increased food security and food quality (Butler & Maronek 2002)
- Reduce food costs and increase intake of fresh, nutrient-rich vegetables (Blair et al 1991)
- Improved willingness to try, attitudes, preference and consumption of vegetables for children (Pothukucki and Bickes 2001; Lineberger and Zajicek 1999; O’Brien & Shoemaker 2006)
Gardening in Schools

- Improved self-esteem and attitudes toward school (Sheffield 1992)
- Improved social skills and behavior (Demarco 1999)
- Improved interpersonal relationships (Skelly and Zajicek 1998; Waliczek and Zajicek 1999)
Gardening in Communities

- Community gardeners tend to regard their neighbors as friendly (Blair et al 1991)
- Community gardens promote neighborhood “togetherness”, trust, and reduced racial discrimination (Feenstra et al 1999)
Research Reviews

The value of review articles

Wang & MacMillan, 2013

Search criteria do the work for us

Wang & MacMillan, 2013

Arbitrarily selected from the identification and selection of studies.
<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Study aims</th>
<th>Garden type</th>
<th>Age</th>
<th>Outcomes measured</th>
<th>Key findings</th>
<th>Author conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian <em>et al</em>, UK 31</td>
<td>To evaluate the impact of a school gardening programme, the Royal Horticultural Society (RHS) Campaign for School Gardening, on children’s fruit and vegetable intake</td>
<td>School gardening</td>
<td>8–11 years</td>
<td>Change in fruit and vegetable intake. Child-level data—school food diary, home food diary—Child and Diet Evaluation Tool (CADET), knowledge and attitude questionnaire. School level—school gardening level questionnaire, gardening in schools—process measures email, information collected from RHS advisor on school gardening in intervention schools. Outcomes measured across the May–June 2010 and October 2011 to January 2012</td>
<td>Trial 1: Higher mean change of 8 g (95% CI −19 to 36) for combined fruit and vegetable intake for teacher-led group than for RHS-led group −32 g (95% CI −60 to −3), difference not significant (intervention effect −43 g, 95% CI −88 to 1, p=0.06). Trial 2: More fruit and vegetables consumed in teacher-led group (15 g (95% CI −36 to 148), difference not significant. Schools which improved the most in gardening increased their vegetable intake on average, an increase in intake of fruit and vegetables by 81 g (95% CI 0 to 163, p=0.05) compared with children attending schools that had no change in gardening score</td>
<td>There is little evidence that school gardening alone can improve children’s fruit and vegetable intake. When gardening was implemented at the highest intensities the findings suggest it could improve children’s fruit and vegetable intake by a portion per day</td>
</tr>
<tr>
<td>Detwiler <em>et al</em>, USA 35</td>
<td>To assess the effect of horticultural therapy on cortisol levels, depression, symptoms of post-traumatic stress disorder, alcohol cravings, and quality of life</td>
<td>Structured gardening programme</td>
<td>Mean age 46.4 years (SD=11.9)</td>
<td>Quality of life (Quality of Life Enjoyment and Satisfaction Questionnaire - Short Form (Q-LES-Q-SF)), alcohol craving (Alcohol Craving Questionnaire (ACQ-NOW)), PTSD (Posttraumatic Stress Disorder Checklist Civilian Version (PCL-C)), depression</td>
<td>24 participants completed protocol. Although a positive impact of HT was seen in a 12% reduction in salivary cortisol levels from week 1 to week 3, the difference was not statistically significant (analysis of variance (ANOVA) (F2, 20=0.878), p=0.43). Separate</td>
<td>HT may have a role in reducing stress and depression and quality of life more than the programmes in which the OT participated</td>
</tr>
</tbody>
</table>

The value of review articles
Summary of all the studies
The value of review articles

Analyze the studies

Summary of the meta-analysis for eight subgroups.

<table>
<thead>
<tr>
<th>Subgroups</th>
<th>No. of comparison</th>
<th>Effect size</th>
<th>Heterogeneity</th>
<th>Between-subgroup difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>995% CI</td>
</tr>
<tr>
<td><strong>Outcome types</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Health variables</td>
<td>18</td>
<td>0.31</td>
<td>0.05</td>
<td>0.21–0.40</td>
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<tr>
<td>Wellbeing variables</td>
<td>58</td>
<td>0.47</td>
<td>0.04</td>
<td>0.39–0.54</td>
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<tr>
<td><strong>Gardening types</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Therapy</td>
<td>33</td>
<td>0.61</td>
<td>0.05</td>
<td>0.51–0.72</td>
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<tr>
<td>Non-therapy</td>
<td>43</td>
<td>0.31</td>
<td>0.03</td>
<td>0.26–0.37</td>
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<tr>
<td><strong>Comparison types</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before/after gardening</td>
<td>32</td>
<td>0.60</td>
<td>0.06</td>
<td>0.49–0.71</td>
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<td>Gardener/non-gardener</td>
<td>44</td>
<td>0.31</td>
<td>0.03</td>
<td>0.27–0.38</td>
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<tr>
<td><strong>Participant types</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Patients</td>
<td>28</td>
<td>0.61</td>
<td>0.06</td>
<td>0.49–0.74</td>
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<tr>
<td>Non-patients</td>
<td>48</td>
<td>0.32</td>
<td>0.03</td>
<td>0.27–0.38</td>
</tr>
</tbody>
</table>

Soga et al, 2017
The value of review articles

Implications for practice

Figure 3  Logic model: well-being.

Howarth et al 2020
The value of review articles

Implications for practice

Fig. 3 Conceptual model showing the potential health and well-being impacts of school gardening

Ohly et al, 2015
What the reviews found

• Overall, the majority of the studies found some evidence that gardening has a positive and moderate effect on health and wellbeing.
  — Social outcomes: engagement, and social support
  — Psychological health outcomes: overall well-being, affect, life satisfaction, quality of life
  — Physical health outcomes: blood pressure, waist circumference, hand function, BMI
  — Nutrition outcomes: Fruit and vegetable consumption

• The majority of studies appeared to have moderate quality with weaknesses in methodology.
  — Small sample sizes, convenience sampling, and self-selection
  — Lack of representativeness to general population
  — Less rigorous research designs, lacking randomized control trials
  — Lack of sophisticated statistical analyses
  — Lack of reliable and validated assessment tools
Conclusions

• That there are now systematic reviews, some with meta-analysis, of the research literature on the health benefits of gardening demonstrates the growing body of research in the field

• Overall, the research is of a considerably higher quality than that reviewed earlier, (i.e., Sempik et al., 2003), providing more convincing evidence in support of gardening-based interventions

“A regular dose of gardening can improve public health.”
(Soga et al, 2017)
Thank You

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CDC https://www.cdc.gov/hrqol/wellbeing.htm#