



Guidelines for research initiatives to increase children's vegetable intake

Design and implement research initiatives that are based on best practice

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Context

Purpose

To provide researchers with guidelines on how to incorporate best practice into the design and reporting of research initiatives to increase children's vegetable intake.

Audience

Those involved in designing and reporting interventions that aim to increase children's vegetable intake.

Usability

The two checklist forms will assist in translating best-available evidence into practice.

Checklists

Part 1: Guidance for study design

Part 2: Ideas for intervention content

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The rationale

What do we know?

- Australian **children's vegetable intake remains low** with 6.3% of children aged 2 to 17 years eating the recommended amounts [1].
- Increasing vegetable intake is a shared priority for public health researchers, growers, the vegetable industry, policymakers and others [2].
- Children need support from a range of stakeholders to help increase their intake.

What have we achieved to date?

- Previous interventions have increased children's vegetable intake, on average, by almost 30%, which, based on current intake patterns, equates to about half a serve per child per day. This is a substantial increase and would be a great result if we could achieve this in all children.
- Systematic reviews were used to inform the development of best practice guidelines to increase children's vegetable intake. The reviews focused on research studies that aimed to increase children's vegetable intake, either in isolation or as part of a healthy diet. Intervention characteristics associated with successfully increasing children's intake of vegetables were identified. For more information refer to the published review.

What can be done?

- To build on past interventions and focus on elements of successful interventions, we have developed a set of best practice guidelines for increasing children's vegetable intake. These will assist those seeking to create new initiatives and implement existing ones using evidence-based techniques to enhance your likelihood of success.
- New interventions based on best practice have the potential to achieve greater increases in children's vegetable intake and close the gap between intake and recommendations.

The guidelines

Figure 1 provides a brief explanation of the seven best practice guidelines for increasing children's vegetable intake.

Ideas about how these guidelines can be implemented by stakeholders are available on the VegKIT [website](#).

Figure 1. Seven best practice guidelines for increasing children's vegetable intake

Foundation

- 1 Make vegetables the hero**
Have simple vegetable specific messages with a clear focus.
- 2 Coordinate sustained effort across multiple players**
Coordinate long-term action among key players involved in providing and promoting vegetables to children.
- 3 Grow knowledge and skills to support change**
Identify and act on gaps in knowledge and skills to support children's vegetable intake.
- 4 Minimise barriers to increase success**
Understand and identify ways to address barriers to children's vegetable intake.

Action

- 5 Plan for and commit to success**
Set clear and measurable vegetable-specific goals and commit to a plan of action.
- 6 Create an environment that supports children to eat vegetables**
Make vegetables the easy choice by providing an environment that promotes vegetable familiarisation and intake.

Review

- 7 Monitor and provide feedback on progress**
Monitor progress and achievement against goals and provide feedback at regular intervals.

Designing research using the guidelines

The following checklists have been developed to help plan and implement interventions that are based on the seven best practice guidelines. They can also be used to capture sufficient detail when reporting initiatives in scientific publications, reports and articles.

The checklists are consistent with characteristics of higher quality studies as classified in the [VegKIT Evaluation Tool](#): *Quality assessment tool for initiatives to increase children's vegetable intake*.



Checklist 1: Guidance for study design

Study design

- Decide on the study design which is feasible and achievable to best answer your research question.
- Consider whether it is possible to blind the participants and outcome assessors to the purpose of the study.

Recruitment of participants

- Plan a recruitment strategy designed to recruit participants who are representative of the target population.

Measurement of outcomes

- Choose a tool that is reliable and valid to assess the amount of vegetables eaten per person in a defined time period (in grams or serves).
- Decide on the time points where vegetable intake will be measured throughout the intervention, e.g. baseline, post-intervention and a follow-up point at least three months after the intervention.
- Consider measuring other outcomes of interest which are downstream to the amount of vegetables eaten:
 - Other vegetable-related measures e.g. frequency or variety of vegetables eaten
 - Purchasing patterns
 - Knowledge
 - Attitudes and beliefs
 - Preferences and liking
 - Confidence to prepare, cook and eat vegetables.
- Consider collecting information about processes and outcomes to add further depth to the evaluation.
 - Fidelity and adherence
 - Satisfaction with the intervention
 - Feedback on project activities
 - User testing and experience.

Checklist 2: Ideas for intervention content

Guideline 1: Make vegetables the hero

- Create intervention messages which are specific to vegetables.

Guideline 2: Coordinate sustained effort across multiple players

- Identify target audiences. Effective studies target multiple audiences in multiple settings, such as schools, community centres, out of school hours care, and families.
- Create messages which are consistent across all target audiences.
- Ensure that the intervention duration is at least six weeks.
- Plan regular contact with the intervention. Best practice indicates that participants should have contact with the intervention at least once per week.

Guideline 3: Grow knowledge and skills to support change

- Identify the gaps in your participants' knowledge and skills.
- Address gaps in participants' knowledge and skills using successful behaviour-change techniques. For example:
 - Instruction on how to perform a behaviour (e.g. designing a recipe)
 - Providing information about the behaviour (e.g. the health or environmental benefits of eating vegetables).

Guideline 4: Minimise barriers to increase success

- Identify potential barriers to success. For example, talk with stakeholders and conduct surveys or desktop reviews to determine the key barriers.
- Consider how the barriers will be addressed. For example, through:
 - Changing the physical environment (e.g. providing child-safe knives)
 - Changing the social environment (e.g. creating a nutrition policy).

Guideline 5: Plan for and commit to success

- Create clear and specific target behaviours. The change in vegetable intake should be clearly defined, for example:
 - An increase in the amount of vegetables eaten at one time
 - An increase in the frequency of vegetables eaten
 - An increase in the variety of vegetables eaten.
- Engage the entire research and implementation team (e.g. staff members or families) and encourage commitment to the target behaviour. They should know:
 - Why the intervention is of value
 - What needs to happen to change the behaviour
 - When and where the change needs to occur
 - How the change will occur
 - Who is responsible.
- Encourage the participants to commit to achieving the target behaviour. They can do this by:
 - Formally committing to change (e.g. by signing a pledge)
 - Creating and reviewing their goals relating to the target behaviour
 - Identifying personal and environmental barriers to changing behaviour (e.g. through a problem-solving session).

Guideline 6: Create an environment than supports children to eat vegetables

- Support changes to the environment. Consider what changes to the environment could reduce barriers and create opportunities for participants to interact with vegetables regularly and in different ways. Ways to change the environment include:
 - Changing the physical environment (e.g. adding posters)
 - Removing distractions (e.g. reducing access to unhealthy foods).

Guideline 7: Monitor and provide feedback on progress

- Include monitoring in your study. For example:
 - Participants monitor or evaluate their own vegetable intake
 - Evaluate the change in knowledge, understanding and attitudes
 - Communicate with children and/or their families about their vegetable intake.

Filling the research gaps

There are opportunities to broaden our understanding of how to effectively increase children's vegetable intake. Success could be achieved by designing new initiatives incorporating elements that have had little or no focus in previous research. The following research gaps were identified during the review of the research which informed the best practice guidelines.

Gaps in the settings to target

More evidence is required to understand the impact of vegetable intake initiatives in different settings. This includes:

- Increasing the reach of initiatives by delivering them on a larger scale, across multiple settings or to multiple target audiences.
- Including one or more settings where there are fewer published research examples:
 - Out-of-school hours care
 - Vacation care
 - Long day care centres
 - Retail outlets
 - Community farms or farmer markets.

Gaps in testing the Behaviour Change Wheel

The Behaviour Change Wheel [3] is one intervention design framework for promoting change. Behavioural change is linked with the capability, opportunity and motivation for change – which can be addressed through a range of policies and interventions. The wheel can be used to design interventions and to analyse their effectiveness.

The Behaviour Change Wheel includes consideration of the individual behaviour change techniques that can be used to create change. Many of the behaviour change techniques [4] – within the categories of social support, natural consequences, associations, regulation, comparison of outcomes, scheduled consequences, self-belief, covert learning, repetition and substitution, and rewards and threats – have not been used in interventions to increase children's vegetable intake. Their effectiveness is therefore largely unknown.

Other gaps in the use of the wheel that were identified during the process of developing the best practice guidelines include:

- Addressing physical capability and skills to prepare and cook vegetables
- Using verbal or visual communication to induce positive feelings towards eating more vegetables (using persuasion to influence behaviour change)
- Designing studies that control the physical or social environments impacting on food supply

- Evaluating the impact of fiscal measures such as taxation or changes in legislation that impact on food purchasing and intake
- Evaluating the implementation of guideline documents that recommend or mandate best practice within different settings
- Incorporating a variety of techniques to provide feedback to participants and monitor behaviour – in previous initiatives participants were primarily asked to simply self-monitor.

Program examples and resources

Other interventions and initiatives

There are many freely accessible programs and resources that can be used to design or implement interventions.

Examples of research studies or other initiatives can be found at the VegKIT registry: www.vegkit.com.au/registry/

The Behaviour Change Wheel

The Behaviour Change Wheel provides the theoretical framework for these best practice guidelines. The wheel can be used to design interventions and to analyse their effectiveness.

Further information on the Behaviour Change Wheel and behaviour change techniques can be found in the book by Michie, Atkins and West, *The Behaviour Change Wheel: A Guide to Designing Interventions*.

For more information: www.behaviourchangewheel.com/

Evaluation

Evaluating your intervention improves both delivery and outcomes. It also supports comprehensive reporting. The Centre for Disease Control has an overview of the four most common types of evaluation used in public health research.

For more information: www.cdc.gov/std/Program/pupestd/Types%20of%20Evaluation.pdf

Reporting interventions

The checklists provided in this document are designed to be used to assist in the comprehensive reporting of your intervention. Additional reporting resources are available such as the Template for intervention description and replication (TIDieR).

For more information: www.bmj.com/content/348/bmj.g1687

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