

Nutrition-related outcomes of children's involvement in healthy meal preparation: a scoping review protocol

Choon Ming Ng¹ · Satvinder Kaur¹ · Hui Chin Koo² · Firdaus Mukhtar³

¹Faculty of Applied Sciences, UCSI University, Kuala Lumpur, Malaysia, ²Faculty of Applied Sciences, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia, and ³Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

ABSTRACT

Objective: This scoping review aims to describe the existing evidence of children's involvement in healthy meal preparation in terms of nutrition-related outcomes, and to highlight potential research directions.

Introduction: With the worldwide trend of unhealthy dietary habits among children, many researchers have explored the practice of healthy meal preparation as a health promotion habit. Hands-on healthy meal preparation seems to be promising among children, as it focuses on concrete experiences in creating positive attitude towards nutrition. However, a far-reaching understanding of the impact of healthy meal preparation on the wide-ranging nutrition-related outcomes among children is lacking.

Inclusion criteria: This scoping review will consider studies worldwide that focused on hands-on healthy meal preparation among children aged 5–12 years and the associated nutrition-related outcomes: psychosocial variables, actual nutrition-related behavior, and body composition.

Methods: Experimental studies, observational studies, reviews, and text and opinion papers related to the practice of healthy meal preparation among children in English language published from 2010–2019 will be retrieved from five electronic databases. Gray literature sources will also be searched. After screening of titles and abstracts, the full text of potentially relevant articles will be retrieved. Data extracted will be presented in tables alongside the necessary information. Any discrepancies that arise during data synthesis will be discussed among the research team until consensus is reached.

Keywords Children; cooking; healthy meal preparation; nutrition outcomes

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Introduction

The nutritional status of children worldwide is reported to be at risk, as children suffer from overweight/obesity and micronutrient deficiencies.^{1,2} Poor diet, comprising a high intake of energy-dense foods, calories, carbohydrates and sugar-sweetened beverages, coupled with a low intake of fresh fruits and vegetables, is a major contributor to adverse nutrition outcomes and increased disease risks.³ Advocating healthy eating practices among children is expected to ensure the health, cognition, and educational achievement of future generations.⁴ With the increasing prevalence of childhood obesity, and in light of unhealthy eating habits in children around the globe,⁵ researchers have attempted to position

healthy meal preparation in children as a health promotion habit.^{6–9} The rationale behind this is the experiential learning approach that is attainable through hands-on healthy meal preparation, which seems more beneficial than the presentation of nutrition information alone. Hands-on healthy meal preparation focuses more on concrete experiences rather than on abstract concepts,¹⁰ which is important as the general pattern of child behavior consists of learning by doing, seeing and experiencing.¹¹

Because children are great observers and experimenters, and want to learn while having fun,¹² activities such as cooking and meal preparation catch their attention and drive them to learn, subsequently changing their health-related practices.¹³ Children learn from the hands-on healthy meal preparation experience involving cognitions, environmental factors and emotions, which leads to generating new skills and developing new habits.¹⁴

Correspondence: Satvinder Kaur, satvinderkaur@ucsiuniversity.edu.my

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This relates closely to “play” as a method of learning, and is particularly suitable for children because they acquire various skills such as self-reflection, problem-solving, and abstract thinking while simultaneously creating positive emotions towards nutrition and healthy eating.¹⁵

In Western countries, culinary nutrition education programs have led to demonstrated improvement in children’s psychosocial variables such as increased nutrition knowledge, attitude and self-efficacy for healthy foods and cooking, and fruit and vegetable preferences.^{6,16-18} This extended to improvement in actual nutrition-related behavior such as vegetable and fruit consumption, eating behavior, communication to family about healthy eating, willingness to taste novel foods, and the skills and practice of preparing healthy meals.^{6,16,17,19-22} One study showed positive change in children’s dietary intake, although no significant change was observed in body composition.²² Most evidence was on the premise that improving psychosocial variables (knowledge, attitude, and self-efficacy towards nutrition and cooking; vegetable and fruit preferences) and actual behavior (vegetable consumption and communication to family about healthy eating) through hands-on healthy meal preparation would most likely lead to improved diet quality and healthy body mass index (BMI) over time, although these outcomes were not reported.^{6,17,18,23}

Currently, culinary nutrition education has not been the focus of existing nutrition and obesity prevention policies, and compulsory home economics has been widely eliminated from public schools.^{24,25} Nevertheless, the encouraging data related to hands-on healthy meal preparation have led to the call for a formal culinary education, highlighting that healthy meal preparation not only provides nutrition knowledge, but creates long-lasting motivations for children to engage in positive nutrition-behavior.²⁶ Dietary guidelines also emphasize that food preparation education should be a mandatory part of school curricula.²⁷ There is also strong support for cooking to be taught in schools through health education; children should be empowered with the skills to identify, choose and prepare healthy food, which eventually will create and sustain healthy lives while reversing the trends of poor nutritional outcomes and disease risks.^{24,28,29}

In a systematic review that included quasi-experimental and randomized controlled trials of cooking

education programs from 2003 to 2014, it was concluded that hands-on healthy meal preparation was effective for promoting positive changes in food-related preferences, attitudes and healthy nutrition behaviors among children.³⁰ More recently, a narrative review by Muzaffar *et al.*³¹ consisting of intervention studies published from 1998 to 2013 further explored the influence of culinary education programs on children’s diet quality and weight status, and concluded that an up-to-date and larger pool of studies is needed for a conclusion to be drawn. Although hands-on healthy meal preparation is emerging as a way forward in the field of nutrition education,^{20,29,32} no scoping review has been published to explore the wide-ranging outcomes of hands-on healthy meal preparation in children, given the broad nature of related studies. Hence, more inclusive evidence that incorporates not just randomized controlled trials and quasi-experimental studies is needed, especially with the growing body of recent evidence. A comprehensive scoping review examining the influence of healthy meal preparation on children’s psychosocial variables, nutrition-related behavior and body composition is crucial in determining future research direction, which should include other types of primary studies, reviews and gray literature.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and the *JBI Database of Systematic Reviews and Implementation Reports* was conducted and no current or underway scoping reviews on this topic were identified. Beyond intervention studies, the proposed scoping review aims to describe the existing evidence of children’s involvement in healthy meal preparation, in terms of various nutrition-related outcome measures. Findings from the scoping review may contribute to government planning of nutrition policies and action, and inform evidence-based recommendations for nutrition researchers, healthcare educators, teachers and parents. This is an initiative to instill healthy nutrition habits effectively in children and to achieve optimal nutritional status as per the United Nations Decade of Action on Nutrition 2016 to 2025.³³

Review questions

What are the nutrition-related outcomes of healthy meal preparation among children in terms of:

- i) psychosocial variables (e.g. knowledge, attitude, self-efficacy, preferences)
- ii) nutrition-related behavior (e.g. healthy meal preparation practice, dietary intake/pattern/consumption/behavior)
- iii) body composition (weight, BMI z-score, waist circumference, percent body fat)?

Inclusion criteria

Participants

This review will consider studies related to hands-on healthy meal preparation among children between 5 and 12 years of age. It will explore the belief that involving children in healthy meal preparation at a young age may promote the development of important nutrition behavior, lifelong skills, practices and health outcomes that will eventually track into adulthood.

Concept

Healthy meal preparation may be defined using any of the constructs displayed in Table 1. The proposed scoping review will use the developed evidence-based definitions by Raber *et al.*³⁴ for guidance in inclusion of studies. In addition, studies that

incorporate healthy cooking, meal preparation in nutrition education, or the involvement of food-related tasks will also be considered. In the developed definitions, “preparing meals at home” was included; however, children may not prepare meals all by themselves, as adult supervision is needed. Hence, “involvement in food-related tasks” is included in the instance that children are not cooking from basic ingredients up to the final prepared meals themselves, but they are involved in certain food-related tasks by helping their family. This is supported by past research demonstrating the positive outcomes (i.e. self-efficacy for selecting and eating healthy foods; greater fruit and vegetable preference and consumption) when children help their family to prepare meals at home and are involved in food-related tasks.^{7,35}

Context

Studies conducted worldwide and in any setting (e.g. schools, home, summer programs/camps) will be considered for inclusion.

Studies that include healthy meal preparation as only a minor part of the study in a multi-component approach in line with other strategies such as

Table 1: Definition of healthy meal preparation³⁴ for study inclusion

Construct	Example of behaviors
Cooking frequency	<ul style="list-style-type: none"> • Preparing meals at home as opposed to eating out or ordering take-out • Cooking from scratch • Using whole foods instead of processed foods
Techniques and methods	<ul style="list-style-type: none"> • Avoiding cooking red meat with high-temperature cooking methods • Avoiding the deep-frying method • Using low-fat cooking method • Accurately measuring ingredients • Avoiding cooking meats until heavily browned
Minimal usage	<ul style="list-style-type: none"> • Limiting the use of added sugars, sweeteners, animal fats, processed foods and/or red meat
Addition/replacements	<ul style="list-style-type: none"> • Using unprocessed fruit and vegetables (fresh/frozen instead of canned) • Using olive oil • Using whole grains as opposed to refined grains
Flavoring	<ul style="list-style-type: none"> • Using spices, citrus, alliums and herbs • Avoiding the use of cream-based sauce/margarine to flavor vegetables • Reducing salt when cooking • Limiting the use of processed meats as flavoring

physical activity will not be included, as it may be inappropriate to explain the direct associations of hands-on healthy meal preparation with the nutrition-related outcomes.

Types of sources

This review will consider observational and experimental studies that explore the involvement of children in hands-on healthy meal preparation and report various nutrition outcomes such as psychosocial variables, nutrition-related behavior or body composition. The proposed scoping review will include quantitative, qualitative and mixed-methods study designs. Additionally, systematic reviews and text and opinion papers will be considered for inclusion. Articles published in the English language in the Cochrane Database of Systematic Reviews, PubMed, Science Direct, Scopus and Google Scholar from 2010 to present will be retrieved.

Gray literature will be searched for relevant programs related to healthy meal preparation. Gray literature can provide data not found within published literature and thus increase this scoping review's comprehensiveness.³⁶ Inclusion of gray literature will be valuable to fully capture the nutrition-related outcomes associated with hands-on healthy meal preparation among children.

Methods

The proposed scoping review will be conducted in accordance with the JBI methodology.³⁷ Scoping reviews are becoming an increasingly popular approach for synthesizing research evidence.³⁸ Scoping reviews are commonly undertaken to identify the nature of research activity, map out the existing body of literature comprising of wide-ranging study designs and methodologies, and determine research gaps on an area of interest.^{39,40} This approach is ideal for determining the coverage of research findings on a specific topic and providing a clear indication of the volume of literature, simultaneously depicting an overview of its focus.⁴¹

Search strategy

The search strategy will aim to locate published primary studies, reviews, text and opinion papers, and gray literature. An initial limited search of PubMed will be undertaken to identify articles on the topic. The research team will discuss and develop

the most appropriate keywords and synonyms for comprehensive search activities with feedback from an academic librarian. Boolean operators (OR, AND), including adjacencies and truncations, will be used to combine appropriate keywords and related terms for search activities. The text words contained in the titles, abstracts and the index terms used to describe relevant articles will be used to develop a full search strategy. The search strategy (see Appendix I), including all identified text and index terms, will be adapted for each included information source. The search strategy will be modified when searching for gray literature. Articles found through the electronic search will be screened for their titles, abstracts and keywords. Lists of references in all retrieved articles after title and abstract screening will be checked to ensure that relevant studies are included in the scoping review.

Information sources

The databases to be searched include the Cochrane Database of Systematic Reviews, Science Direct, Scopus and Google Scholar.

The gray literature sources to be searched will include relevant websites with available links, resources and information related to cooking education programs involving children. Websites to be initially searched include, but are not limited to, kidscookingforlife.org, foodhero.org, cooking-matters.org and actionforhealthykids.org.

Study selection

Following the search, all identified records will be collated and uploaded into a reference management software, Mendeley version 1.19.4 (Mendeley Ltd., Elsevier, Netherlands) and duplicates removed. Study selection will consist of two-level screening: title and abstract review, and full-text review. Two researchers will independently screen the titles and abstracts of retrieved articles and gray literature, and exclude any that do not meet the inclusion criteria. The full text of eligible articles (deemed by at least one researcher during the title and abstract review) will be retrieved. Researchers will independently assess the full text to determine whether the article meets the inclusion criteria. Disagreements in article eligibility will be discussed between researchers until consensus is reached or by arbitration of a third researcher, if needed. The process of study selection will be reported using the Preferred Reporting Items

for Systematic Reviews and Meta-Analyses (PRISMA) diagram.⁴² Reasons for exclusion of articles after full-text review will be provided. Additionally, gray literature will be screened independently by two researchers to ensure that it meets the inclusion criteria. Similarly, any disagreement that arise will be discussed until consensus is reached.

Data extraction

The research team will use an adapted data collection instrument from JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia)³⁷ to extract study information (see Appendix II). It includes standard article information (author, year of publication, country), study design, settings, aims/objectives, target audience, sample size, methodology/research instruments, outcomes/key findings and information on study limitations, research gaps and future research direction. The data extraction instrument will also be used for secondary studies and gray literature. However, for secondary studies, the number and type of studies will be recorded, rather than sample size. For gray literature, irrelevant information (i.e. study design) will be recorded as “not applicable”.⁴³ All research members will pre-test the instrument to ensure that it is appropriate to capture study information accurately. When necessary, the instrument will be modified accordingly, and modifications will be detailed in the full scoping review. Authors of the articles will be contacted if there are any missing or additional data required for clarifications. One researcher will independently chart the data from 50% of the included studies using the data collection instrument, and this will be cross-checked by a second researcher. The remaining 50% of included studies will be extracted by the second researcher and cross-checked by the first researcher. Finally, all researchers will discuss any discrepancies in extracted data and agree upon a final interpretation.

Data presentation

Data analysis using the data extraction instrument will provide an overview of evidence from research conducted regarding the involvement of children in healthy meal preparation. Results will be presented in visual form with tables, as per the objectives of this scoping review. The characteristics of studies conducted in terms of study design and methodology

will be presented. Outcomes such as psychosocial indicators, nutrition-related behavior and body composition will be assessed. Limitations, research gaps and potential future research directions will also be highlighted. A narrative summary will accompany the tabulated results, describing how the results relate to the reviews objectives. For reviews, we will include number and types of studies assessed.

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Appendix I: Search strategy for PubMed

Search conducted in June 2019.

1. “meal preparation” [tw] OR cooking [Mesh] OR “food preparation” [tw] OR “scratch cooking” [tw] OR “culinary nutrition” [tw]
2. self-efficacy [Mesh] OR “health knowledge, attitudes, practice” [Mesh] OR knowledge [tw] OR attitude [tw] OR practice [tw] OR preference [tw] OR liking [tw] OR perception [tw] OR psychosocial determinants [tw] OR “feeding behavior” [Mesh] OR “nutrition-related behaviour” [tw] OR “nutrition-related behavior” [tw] OR diet [Mesh] OR “dietary intake” [tw] OR “dietary pattern” [tw] OR “dietary quality” [tw] OR “food consumption” [tw] OR “food behavior” [tw] OR “food behaviour” [tw] OR “food habit” [tw] OR “food intake” [tw] OR “food choice” [tw] OR eating habit [tw] OR “body weight” [Mesh] OR anthropometry [Mesh] OR “body composition” [tw] OR “body mass index” [tw] OR “waist circumference” [tw] OR “body fat” [tw]
3. child [Mesh] OR adolescent [Mesh] OR kids [tw] OR children [tw] OR youth [tw] OR teenager [tw]
4. #1 AND #2
5. #3 AND #4
6. #5 AND English

Other limit set: publication date from 2010–2019

Records retrieved: 179

Appendix II: Data extraction instrument

Authors/ study year	Study design/ country/ Settings	Aims/ objectives	Target audience/ Sample size (n)/ number and type of studies included	Methodology/ approach	Research instruments	Outcomes/key findings			Study limitations	Research gaps/ research direction
						Psychosocial variables	Nutrition- related behavior	Body composition		