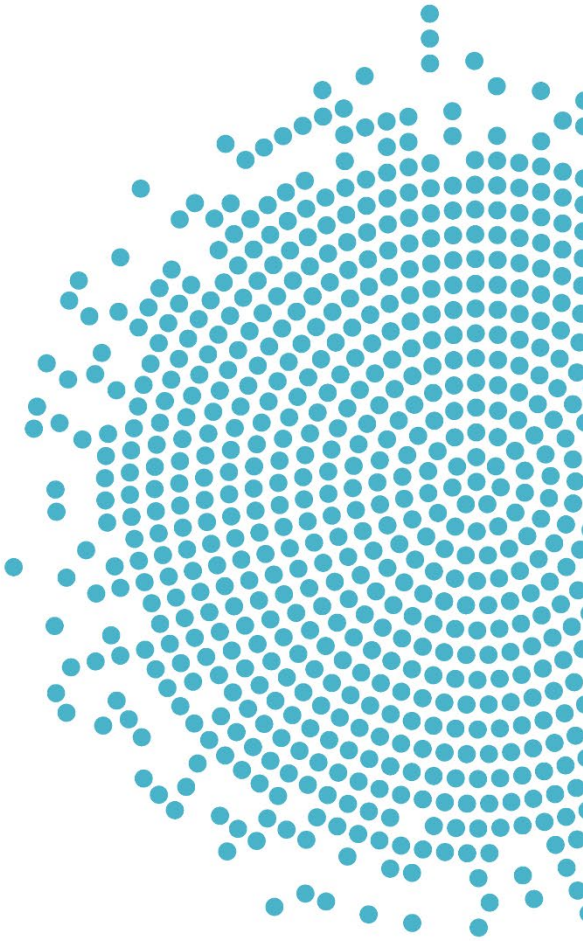
USDA
UNITED STATES DEPARTMENT OF AGRICULTURE

# Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity: A Systematic Review Protocol



Jennifer Orlet Fisher, PhD,[a,b] Steven Abrams, MD,[a,c] Aline Andres, PhD, RD,[a,d] Carol Byrd-Bredbenner, PhD, RD, FAND,[a,e] Andrea Deierlein, PhD, MPH, MS,[a,f] Heather A. Eicher-Miller, PhD,[a,g] Angela Odoms-Young, PhD, MS,[a,h] Cristina Palacios, PhD, MSc,[a,i] Julie Obbagy, PhD,[j] Julia H. Kim, PhD, MPH, RD,[k] Megan Lawless, PhD,[l] Shabnam Momin, PhD,[l] Joanne M. Spahn, MS, RD, FADA,[k] Molly Higgins, MLIS,[m] Gisela Butera, MEd, MLIS,[n] Nancy Terry, MLIS[n]

[a] Diet in Pregnancy and Birth through Adolescence Subcommittee, 2025 Dietary Guidelines Advisory Committee

[b] Temple University, Subcommittee Chair

[c] University of Texas at Austin

[d] University of Arkansas for Medical Sciences

[e] Rutgers, The State University of New Jersey

[f] New York University

[g] Purdue University

[h] Cornell University, Committee Vice Chair

[i] Florida International University

[j] Branch Chief, Nutrition Evidence Systematic Review (NESR) Branch; Nutrition Guidance and Analysis Division (NGAD), Center for Nutrition Policy and Promotion (CNPP), Food and Nutrition Service (FNS), U.S. Department of Agriculture (USDA)

[k] Systematic Review Analyst, NESR Team, NGAD, CNPP, FNS, USDA

[l] Systematic Review Analyst, NESR team; Panum Telecom, under contract with FNS, USDA

[m] Systematic Review Librarian, NESR Branch; NGAD, CNPP, FNS, USDA

[n] Biomedical Librarian/Informationist, National Institutes of Health Library

NESR

**Suggested citation:** Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Kim JH, Momin S, Spahn J, Higgins M, Butera G, Terry N. Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols

**Related citations:** Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Parental and Caregiver Feeding Practices and Growth, Size, and Body Composition Outcomes: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0402.

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# Introduction

To prepare for the development of the *Dietary Guidelines for Americans, 2025-2030*, the U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) identified a proposed list of scientific questions based on relevance, importance, potential federal impact, and avoiding duplication, which were posted for public comment.[*] The Departments appointed the 2025 Dietary Guidelines Advisory Committee (Committee) in January 2023 to review evidence on the scientific questions. The proposed scientific questions were refined and prioritized by the Committee for consideration in their review of the evidence. Their review forms the basis of their independent, science-based advice and recommendations to HHS and USDA, which is considered as the Departments develop the next edition of the *Dietary Guidelines*. As part of that process, the following systematic review question has been identified: What is the relationship between parental and caregiver feeding styles and practices during childhood growth, body composition, and risk of obesity? The Committee will conduct a systematic review to address this question, with support from USDA's Nutrition Evidence Systematic Review (NESR) team. This question will update the systematic review conducted by the Pregnancy and Birth to 24 Months Project Flavor Exposure and Feeding Practices Technical Expert Collaborative (**Table 1**) to include new evidence in children.

**Table 1. Review history**

| Date | Description | Citation |
|---|---|---|
| April 2019 | Original systematic review conducted by the Pregnancy and Birth to 24 Months Project, Flavor Exposure and Feeding Practices Technical Expert Collaborative published | Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Parental and Caregiver Feeding Practices and Growth, Size, and Body Composition Outcomes: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0402. |
| May 2023 | Systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online | Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Kim JH, Momin S, Spahn J, Higgins M, Butera G, Terry N. Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols |
| February 2024 | Revisions to the systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online | Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Kim JH, Momin S, Spahn J, Higgins M, Butera G, Terry N. Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols |

[*] Dietary Guidelines for Americans: Learn About the Process. 2022. Available at: https://www.dietaryguidelines.gov/work-under-way/learn-about-process

| Date | Description | Citation |
|---|---|---|
| June 2024 | Revisions to the systematic review protocol for the 2025 Dietary Guidelines Advisory Committee published online | Fisher JO, Abrams SA, Andres A, Byrd-Bredbenner C, Deierlein A, Eicher-Miller HA, Odoms-Young A, Palacios C, Obbagy J, Kim JH, Momin S, Spahn J, Higgins M, Butera G, Terry N. Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity: A Systematic Review Protocol. May 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols |

# Methods

The NESR methodology manual [*] has a detailed description of the NESR methodology as it will be applied in the systematic reviews for the Dietary Guidelines for Americans, 2025-2030 Project. This section presents an overview of the specific methods that will be used to by the Committee to answer the systematic review question: What is the relationship between parental and caregiver feeding styles and practices during childhood and growth, body composition, and risk of obesity?

This systematic review updates existing an NESR systematic review completed as part of the P/B-24 Project by the Flavor Exposure and Feeding Practices Technical Expert Collaborative on parental and caregiver feeding practices and growth, size, and body composition outcomes[†], which included evidence published from January 1980 to January 2017. Eligible studies conducted in children (2 up to 6 years) will be synthesized separately in a new systematic review.

## Develop a protocol

A systematic review protocol is the plan for how NESR's methodology will be used to conduct a specific systematic review and is established by the Committee, *a priori*, before any evidence is reviewed. The protocol is designed to capture the most appropriate and relevant body of evidence to answer the systematic review question. Development of the protocol involves discussion of the strengths and limitations of various methodological approaches relevant to the question, which then inform subsequent steps of the systematic review process. The protocol describes all of the methods that will be used throughout the systematic review process. Additionally, the protocol includes the following components, which are tailored to each systematic review question: the analytic framework, the inclusion and exclusion criteria, and the synthesis plan. When updating an existing review, the Committee uses the analytic framework and the inclusion and exclusion criteria from the existing review and makes adjustments to the protocol, if necessary. Differences in the inclusion and exclusion criteria between existing and updated reviews are documented in **Appendix 1**.

The protocol for this systematic review was posted online (https://nesr.usda.gov/protocols) in May 2023. Revisions to the systematic review protocol were made during the review process. These revisions are documented in **Table 2**.

[*] USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

[†] Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Parental and Caregiver Feeding Practices and Growth, Size, and Body Composition Outcomes: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0402.

**Table 2. Protocol revisions**

| Date | Protocol revision | Description |
|---|---|---|
| January 2024 | Inclusion and exclusion criteria for publication date were updated to document that the review will include studies published through July 2023. | This revision was made to document the final publication date range covered by the literature search. |
| May 2024 | The analytic framework and inclusion and exclusion criteria for population were updated to document that the review will include only those studies that examine caregiver feeding practices in children 2 up to 6 years. This change also resulted in a change to the wording of the systematic review question (i.e., remove of "adolescence"), to clarify that the focus of the review is on caregiver feeding practices during childhood. | This revision was made to enable focus on one life stage, taking into consideration project timelines and workload. The revision was made before evidence synthesis. |

# Develop an analytic framework

An analytic framework visually represents the overall scope of the systematic review question and depicts the contributing elements that will be examined and evaluated. **Figure 1** is the analytic framework for the systematic review and shows that the intervention or exposure of interest is parental and caregiver feeding styles and practice in children (2 up to 6 years); the comparators are different degree of parental and caregiver feeding styles and practices or different parental and caregiver feeding styles and practices. The outcomes are: Growth (in children, adolescents) including: height, length/stature-for-age, weight, weight-for-age, stunting, failure to thrive, wasting, BMI-for-age, weight-for-length/stature, body circumferences (arm, neck, thigh), head circumference; Body composition (in children, adolescents, adults, older adults) including: skinfold thickness, fat mass, ectopic fat, fat-free mass or lean mass, waist circumference, waist-to-hip-ratio; Risk of obesity (in children, adolescents, adults, older adults) including: BMI, overweight and obesity, underweight, normal/healthy weight, weight gain, weight loss and maintenance (in adults, older adults). The key confounders are socioeconomic position and/or parental or caregiver education, race and/or ethnicity, child's anthropometry at baseline, child sex, and parental or caregiver BMI. The confounders may impact the relationships of interest.

**Figure 1. Analytic framework for the systematic review question: What is the relationship between parental and caregiver feeding styles and practices during childhood and growth, body composition, and risk of obesity?**

| *Population* | *Intervention/ exposure* | *Comparator* | *Outcome* | *Key confounders* |
|---|---|---|---|---|
| Children (2 up to 6 years) | Parental and caregiver feeding styles and practices | • Different degree of parental and caregiver feeding styles and practices<br>• Different parental and caregiver feeding styles and practices | Growth (in children, adolescents)<br>• Height, length/stature-for-age<br>• Weight, weight-for-age<br>• Stunting, failure to thrive, wasting<br>• BMI-for-age, weight-for-length/stature<br>• Body circumferences (arm, neck, thigh)<br>• Head circumference<br><br>Body composition (children, adolescents, adults, older adults)<br>• Skinfold thickness<br>• Fat mass, ectopic fat<br>• Fat-free mass, lean mass<br>• Waist circumference, waist-to-hip ratio<br><br>Risk of obesity (in children, adolescents, adults, older adults)<br>• BMI<br>• Overweight and obesity<br>• Underweight<br>• Healthy/normal weight<br>• Weight gain<br>• Weight loss and maintenance (in adults, older adults) | • Socioeconomic position and/or parental or caregiver education<br>• Race and/or ethnicity<br>• Child's anthropometry at baseline<br>• Child sex<br>• Parental or caregiver BMI |

***Synthesis organization:***

I. ***Intervention/exposure:*** Parental and caregiver feeding styles and practices

   a. ***Outcome:*** Growth; body composition; risk of obesity

***Key definitions:***

Caregiver: A parent or guardian who provides most of the direct care to a child in the home setting (e.g., mother, father, grandparent, and guardian).

**Feeding styles and practices across developmental stages**

Parental feeding styles: reflect the overall attitude and emotional climate which characterize child eating occasions and reflect differences in parental demandingness and responsiveness[*†]:

- Authoritative feeding style characterized by high demand and high response is defined as reasonable nutritional demands in conjunction with sensitivity toward the child.
- Authoritarian feeding style characterized by high demand and low response is defined as high control with little sensitivity during feeding.
- Indulgent feeding style characterized by low demand and high response is defined as high responsivity with little structure around feeding.
- Uninvolved feeding style characterized by low demand and low response is defined as a lack of involvement during feeding.

Food parenting practices/feeding practices: goal-oriented food-specific behaviors or actions carried out by parents (intentional or unintentional) that affect their child's attitudes, behaviors, or beliefs.[‡] Three overarching, high-order food parenting constructs include:

- Coercive control: "parent's pressure, intrusiveness, and dominance in relation to children's feelings and thoughts, as well as their behaviors". Coercive control includes restriction, pressure to eat, threats and bribes (instrumental feeding, food and non-food threats or rewards), and using food to control negative emotions (emotional feeding).
- Autonomy support: "psychological autonomy and encouragement of independence" and may include responsiveness to feeding cues, nutrition education, child involvement, encouragement, praise, reasoning, and negotiation.
- Structure: "parent's organization of children's environment to facilitate children's competence" and may encompass rules, limits or boundaries, limited/guided choices, portion size, monitoring, meal- and snack time routines (atmosphere of meals, distractions [e.g., screens], family presence, and meal and snack schedule), modeling, food availability and accessibility, and food preparation, and unstructured (indulgent feeding practices).

[*] Arlinghaus KR, Vollrath K, Hernandez DC, Momin SR, O'Connor TM, Power TG, Hughes SO. Authoritative parent feeding style is associated with better child dietary quality at dinner among low-income minority families. Am J Clin Nutr. 2018 Oct 1;108(4):730-736. doi: 10.1093/ajcn/nqy142. PMID: 30169719; PMCID: PMC6186208.

[†] Hughes SO, Shewchuk RM, Baskin ML, Nicklas TA, Qu H. Indulgent feeding style and children's weight status in preschool. J Dev Behav Pediatr. 2008 Oct;29(5):403-10. doi: 10.1097/DBP.0b013e318182a976. PMID: 18714209; PMCID: PMC2769986.

[‡] Vaughn AE, Ward DS, Fisher JO, Faith MS, Hughes SO, Kremers SP, Musher-Eizenman DR, O'Connor TM, Patrick H, Power TG. Fundamental constructs in food parenting practices: a content map to guide future research. Nutr Rev. 2016 Feb;74(2):98-117.

# Develop inclusion and exclusion criteria

The inclusion and exclusion criteria provide an objective, consistent, and transparent framework for determining which articles to include in the systematic review (see **Table 3**). These criteria ensure that the most relevant and appropriate body of evidence is identified for the systematic review question, and that the evidence reviewed is:

- Applicable to the U.S. population of interest
- Relevant to Federal public health nutrition policies and programs
- Rigorous from a scientific perspective

**Table 3. Inclusion and exclusion criteria**

| Category | Inclusion Criteria | Exclusion Criteria |
|---|---|---|
| Study design | • Randomized controlled trials<br>• Non-randomized controlled trials[*]<br>• Prospective cohort studies<br>• Retrospective cohort studies<br>• Nested case-control studies | • Uncontrolled trials[†]<br>• Case-control studies<br>• Cross-sectional studies<br>• Ecological studies<br>• Narrative reviews<br>• Systematic reviews<br>• Meta-analyses<br>• Modeling and simulation studies |
| Publication date | • January 2000 – July 2023 | • Before January 2000, after July 2023 |
| Population: Study participants | • Human | • Non-human |
| Population: Life stage | • At intervention or exposure:<br>  ○ Children (2 up to 6 years)<br>• At outcome:<br>  ○ Children and adolescents (2 up to 19 years)<br>  ○ Adults and older adults (19 years and older) | • At intervention or exposure:<br>  ○ Infants and young children (birth up to 24 months)<br>  ○ Children and adolescents (6 up to 19 years)<br>  ○ Adults and older adults (19 years and older)<br>• At outcome:<br>  ○ Infants and young children (birth up to 24 months) |

[*] Including quasi-experimental and controlled before-and-after studies

[†] Including uncontrolled before-and-after studies

| Category | Inclusion Criteria | Exclusion Criteria |
|---|---|---|
| Population: Health status | • Studies that enroll some caregivers with a disease or disorder that affects feeding or eating (e.g., eating disorders, depression, or anxiety disorders)<br>• Studies that exclusively enroll children not diagnosed with a disease or disorder that affects feeding or eating*<br>• Studies that enroll some participants:<br>o diagnosed with a disease;<br>o diagnosed with a disorder that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders);<br>o with severe undernutrition, failure to thrive/underweight, stunting, or wasting;<br>o born preterm,† with low birth weight,‡ and/or small for gestational age<br>o and/or hospitalized for an illness, injury or surgery | • Studies that exclusively enroll caregivers with a disease or disorder that affects feeding or eating (e.g., eating disorders, depression, or anxiety disorders)<br>• Studies that exclusively enroll participants:<br>o diagnosed with a disease;§<br>o diagnosed with a disorder that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders);<br>o with severe undernutrition, failure to thrive/underweight, stunting, or wasting;<br>o born preterm,† with low birth weight,‡ and/or small for gestational age;<br>o and/or hospitalized for an illness, injury, or surgery** |
| Intervention/ exposure | • Measured parental or caregiver feeding styles or practices assessed using objective (observations) or subjective (self-reported questionnaire) or ecological momentary assessment methods<br>• Multi-component interventions which isolated effect or association of parental and caregiver feeding styles or practices on growth, body composition or risk of obesity | • Childcare and school-based interventions/exposures<br>• Multi-component interventions in which the isolated effect of parental and caregiver feeding styles and practices on growth, body composition and risk of obesity is not provided or cannot be determined due to multiple components |
| Comparator | • Different degrees of caregiver and parental feeding styles and practices<br>• Different caregiver and parental feeding styles or practices (feeding practices) | • No comparator |

* Studies that enroll participants who are at risk for chronic disease will be included; disorders that affects feeding or eating include condition such as autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders, depression or anxiety disorders.

† Gestational age <37 weeks and 0/7 days

‡ Birth weight <2500g

§ Studies that exclusively enroll participants with obesity will be included

** Studies that exclusively enroll participants post-cesarean section will be included

| Category | Inclusion Criteria | Exclusion Criteria |
|---|---|---|
| Outcomes | Growth (in children, adolescents)<br>• Height, length/stature-for-age<br>• Weight, weight-for-age<br>• Stunting, failure to thrive, wasting<br>• BMI-for-age, weight-for-length/stature<br>• Body circumferences (arm, neck, thigh)<br>• Head circumference<br><br>Body composition (in children, adolescents, adults, older adults)<br>• Skinfold thickness<br>• Fat mass, ectopic fat<br>• Fat-free mass, lean mass<br>• Waist circumference, waist-to-hip ratio<br><br>Risk of obesity (in children, adolescents, adults, older adults)<br>• BMI<br>• Overweight and obesity<br>• Underweight<br>• Healthy/normal weight<br>• Weight gain<br>• Weight loss and maintenance (in adults, older adults) | • N/A |
| Publication status | • Peer-reviewed articles published in research journals | • Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings |
| Language | • Published in English | • Not published in English |
| Country* | • Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected | • Studies conducted in countries classified as medium or low on the Human Development Index the year(s) the intervention/exposure data were collected |

* The classification of countries on the Human Development Index (HDI) is based on the UN Development Program Human Development Report Office (http://hdr.undp.org/en/data) for the year the study intervention occurred or data were collected. If the study does not report the year(s) in which the intervention/exposure data were collected, the HDI classification for the year of publication is applied. Studies conducted prior to 1990 are classified based on 1990 HDI classifications. If the year is more recent than the available HDI values, then the most recent HDI classifications are used. If a country is not listed in the HDI, then the current country classification from the World Bank is used (The World Bank Country and Lending Groups, available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups)

# Search for and screen studies

NESR librarians, in collaboration with NESR analysts and the Committee, will use the analytic framework and inclusion and exclusion criteria to develop a comprehensive literature search strategy. The literature search strategy will include selecting and searching the appropriate bibliographic databases, translating search using syntax appropriate for the databases being searched, and employing search refinements, such as search filters. For existing reviews, search strategies will be updated, as appropriate, for each database. The full literature search will be available upon request and will be fully documented in the final review.

The results of all electronic database searches, after removal of duplicates, will be screened independently by two NESR analysts using a step-wise process by reviewing titles, abstracts, and full-texts to determine which articles meet the inclusion criteria. Manual searching will be conducted to find peer-reviewed published articles not identified through the electronic database search. These articles will also be screened independently by two NESR analysts at the abstract and full-text levels.

# Extract data and assess the risk of bias

NESR analysts will extract all essential data from each included article to describe key characteristics of the available evidence, such as the author, publication year, cohort/trial name, study design, population life stage at intervention/exposure and outcome, intervention/exposure and outcome assessment methods, and outcomes. One NESR analyst will extract the data and a second NESR analyst will review the extracted data for accuracy. Each article included in the systematic review will undergo a formal risk of bias assessment, with two NESR analysts independently completing the risk of bias assessment using the tool that is appropriate for the study design.[*†‡]

# Synthesize the evidence

The Committee will describe, compare, and combine the evidence from all included studies to answer the systematic review question. Synthesis of the body of evidence will involve identifying overarching themes or key concepts from the findings, identifying and explaining similarities and differences between studies, and determining whether certain factors impact the relationships being examined. The first level of synthesis will be organized by similar parental and caregiver feeding styles or practices based on the available evidence. Depending on the available evidence, the next level of organization will be according to similar outcomes.

# Develop conclusion statements and grade the evidence

After the Committee synthesizes the body of evidence, they will draft a conclusion statement or conclusion statements. A conclusion statement is one or more summary statements carefully constructed to answer the systematic review question. It reflects the evidence reviewed, as outlined in the analytic framework (e.g., PICO elements) and synthesis plan, and does not take evidence from other sources into consideration. The Committee will review, discuss, and revise the conclusion statement until they reach agreement on wording that accurately reflect the body of evidence.

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[*] Sterne JAC, Savovic J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*. Aug 28 2019;366:l4898.doi:10.1136/bmj.l4898

[†] Sterne JA, Hernan MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ*. Oct 12 2016;355:i4919.doi:10.1136/bmj.i4919

[‡] ROBINS-E Development Group., Higgins J, Morgan R, et al. Bias In Non-randomized Studies - of Exposure (ROBINS-E). 2022. https://www.riskofbias.info/welcome/robins-e-tool

The Committee will then assign a grade to each conclusion statement (i.e., strong, moderate, limited, or grade not assignable). The grade communicates the strength of the evidence supporting a specific conclusion statement to decision makers and stakeholders. NESR has predefined criteria, based on five grading elements that the Committee will use to evaluate and grade the strength of the evidence supporting each conclusion statement. The five grading elements are: consistency, precision, risk of bias, directness and generalizability of the evidence. Study design will also be considered during the grading process.

## Recommend future research

The Committee will identify and document research gaps and methodological limitations throughout the systematic review process. These gaps and limitations will be used to develop research recommendations that describe the research, data, and methodological advances that are needed to strengthen the body of evidence on a particular topic. Rationales for the necessity of additional or stronger research may also be provided with the research recommendations.

## Acknowledgments and funding

The Committee members are involved in: establishing all aspects of the protocol, which presents the plan for how they are planning to examine the scientific evidence, including the inclusion and exclusion criteria; reviewing all studies that meet the criteria the Committee sets; deliberating on the body of evidence for each question; and writing and grading the conclusion statements. The NESR team, with assistance from Federal staff from HHS and USDA (Dennis Anderson-Villaluz, MBA, RD, LDN, FAND; Hazel Hiza, PhD; Tessa Lasswell, MPH, RDN; TusaRebecca Pannucci, PhD, MPH, RD;  Elizabeth Rahavi, RD; Kelley Scanlon, PhD, RD; Colleen Sideck, MPH, RDN) and Project Leadership (HHS: Janet de Jesus, MS, RD; USDA: Eve Stoody, PhD), supports the Committee by facilitating, executing, and documenting the work necessary to ensure the reviews are completed in accordance with NESR methodology. Contractor support was also provided by Panum Telecom (Shabnam Momin, PhD; Megan Lawless, PhD).

**Funding**: United States Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Alexandria, VA

# Appendix

**Appendix 1: Inclusion and exclusion criteria comparison between existing[*] and updated systematic reviews for the research question: What is the relationship between parental and caregiver feeding styles and practices during childhood and growth, body composition, and risk of obesity?**

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Study design | Included:<br>• Randomized controlled trials<br>• Non-randomized controlled trials<br>• Prospective cohort studies<br>• Retrospective cohort studies<br>• Pre/post studies with a control<br>• Nested case-control studies<br>Excluded:<br>• Case-control studies<br>• Cross-sectional studies<br>• Uncontrolled studies<br>• Pre/post studies without a control<br>• Narrative reviews<br>• Systematic reviews<br>• Meta-analyses | Included:<br>• Randomized controlled trials<br>• Non-randomized controlled trials[†]<br>• Prospective cohort studies<br>• Retrospective cohort studies<br>• Nested case-control studies<br>Excluded:<br>• Uncontrolled trials[‡]<br>• Case-control studies<br>• Cross-sectional studies<br>• Ecological studies<br>• Narrative reviews<br>• Systematic reviews<br>• Meta-analyses<br>• Modeling and simulation studies | No changes other than formatting |

[*] Spill M, Callahan E, Johns K, Shapiro M, Spahn JM, Wong YP, Terry N, Benjamin-Neelon S, Birch L, Black M, Briefel R, Cook J, Faith M, Mennella J, Casavale KO, Stoody E. Parental and Caregiver Feeding Practices and Growth, Size, and Body Composition Outcomes: A Systematic Review. April 2019. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://doi.org/10.52570/NESR.PB242018.SR0402.

[†] Including quasi-experimental and controlled before-and-after studies

[‡] Including uncontrolled before-and-after studies

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Publication date | Included:<br>• January 1980 – January 2017<br>Excluded:<br>• Before January 1980, after January 2017 | Included:<br>• January 2000 – July 2023<br>Excluded:<br>• Before January 2000, after July 2023 | The existing systematic review conducted by the 2020 Dietary Guidelines Advisory Committee (Committee) examined caregiver feeding practices in infants and young children (birth up to 24 months). The proposed question will expand that work by examining the relationship between caregiver feeding practices and growth, size, body composition, and risk of obesity in children 2 up to 6 years.<br>This expansion was recommended by the 2020 Committee, Federal stakeholders, and the public. |
| Population: Study participants | Included:<br>• Human subjects<br>Excluded:<br>• Hospitalized patients, not including birth and immediate post-partum hospitalization of healthy mothers and babies | Included:<br>• Human<br>Excluded:<br>• Non-human | No change other than formatting |

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Population: Life stage | Included:<br>Mothers/caregivers Include:<br>• Adolescents (13-18 years)<br>• Adults (19 and older)<br>Infants and Young children Include for Exposure/s:<br>• Infants and young children (0-24 months)<br>Children Include for Outcome/s:<br>• Infants and young children (0-24 months)<br>• Children (2 to 18 years)<br>Excluded:<br>• Older adults (65 to 79 years)<br>• Older adults (80+ years) | Included:<br>• At intervention or exposure:<br>  ○ Children (2 up to 6 years)<br>• At outcome:<br>  ○ Children and adolescents (2 up to 19 years)<br>  ○ Adults and older adults (19 years and older)<br>Excluded:<br>• At intervention or exposure:<br>  ○ Infants and young children (birth up to 24 months)<br>  ○ Children and adolescents (6 up to 19 years)<br>  ○ Adults and older adults (19 years and older)<br>• At outcome:<br>  ○ Infants and young children (birth up to 24 months) | Broadened the intervention/exposure population to include children.<br>Broadened the outcome population to include adults and older adults. |

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| Population: Health Status | Included:<br>• Studies done in generally healthy samples<br>• Studies done in samples where infants were born full-term (≥37 and 0/7 weeks gestational age)<br>• Studies done in generally healthy samples<br>• Studies done in samples with elevated chronic disease risk or that enroll some subjects with a disease or with the health outcome of interest (intermediate or endpoint health outcomes)<br>  ○ *Anemia*: hemoglobin (Hg), hematocrit (Hct), or Hb/Hct < 5th percentile for age/gender-specific cutoffs<br>  ○ *Prediabetes*: A1C: 5.7-6.4% Fasting plasma glucose (FPG): 100- 125 mg/dL Oral glucose tolerance test (OGTT): 140-199 mg/dL<br>  ○ *Prehypertension*: Systolic blood pressure (SBP): 120- 139 mmHg Diastolic blood pressure (DBP): 80-89 mmHg<br>  ○ *LDL-Cholesterol*: above optimal (≥100 mg/dL)<br>  ○ *Total cholesterol*: above desirable (≥200 mg/dL)<br>  ○ *Low HDL cholesterol*: <40 mg/dL<br>  ○ *Triglycerides*: above normal (≥150 mg/dL)<br>• Samples with diagnosed disease states and conditions common during pregnancy in the US (e.g., obesity, diabetes, gestational diabetes, anemia, allergies, pre-eclampsia), and taking associated medications<br>Excluded:<br>• Studies that exclusively enroll infant subjects with a disease or with the health outcome of interest (e.g., failure to thrive) (intermediate or endpoint health outcomes)<br>• Studies of exclusively pre-term babies (gestational age < 37 and 0/7 weeks), exclusively babies that have low birth weight (2500g), and/or exclusively babies that are small for gestational age<br>• Studies done in subjects hospitalized for illness or injury (i.e., this does not include birth and immediate postpartum hospitalization of healthy babies) or malnourished subjects | Included:<br>• Studies that enroll some caregivers with a disease or disorder that affects feeding or eating (e.g., eating disorders, depression, or anxiety disorders)<br>• Studies that exclusively enroll children not diagnosed with a disease or disorder that affects feeding or eating*<br>• Studies that enroll some participants:<br>  ○ diagnosed with a disease;<br>  ○ diagnosed with a disorder that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders);<br>  ○ with severe undernutrition, failure to thrive/underweight, stunting, or wasting;<br>  ○ born preterm,† with low birth weight,‡ and/or small for gestational age<br>Excluded:<br>• Studies that exclusively enroll caregivers with a disease or disorder that affects feeding or eating (e.g., eating disorders, depression, or anxiety disorders)<br>• Studies that exclusively enroll participants:<br>  ○ diagnosed with a disease;§<br>  ○ diagnosed with a disorder that affects feeding/eating or growth (e.g., autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders);<br>  ○ with severe undernutrition, failure to thrive/underweight, stunting, or wasting; | No change other than formatting |

| Category | Existing Review | Updated Review | Change and Rationale |
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| | • Exclude studies that exclusively enroll parents/caregivers with diagnosed depression or anxiety disorders or eating disorders.<br>• Studies done in subjects hospitalized for illness or injury (i.e., this does not include birth and immediate postpartum hospitalization of healthy mothers) or malnourished subjects<br>• Studies of subjects with infectious diseases (e.g. HIV/AIDS) | ○ born preterm,† with low birth weight,‡ and/or small for gestational age;<br>○ and/or hospitalized for an illness, injury, or surgery | |
| Intervention/exposure | Included:<br>• Measured parental or caregiver feeding practice/s assessed using objective (e.g., meal observations) or subjective (i.e., self-report questionnaire) methods<br><br>Excluded:<br>• N/A | Included:<br>• Measured parental or caregiver feeding style(s) or feeding practice(s) assessed using objective (observations) or subjective (self-reported questionnaire) or ecological momentary assessment methods<br>• Multi-component interventions which isolated effect or association of parental and caregiver feeding styles or practices on growth, body composition or risk of obesity<br><br>Excluded:<br>• Childcare and school-based interventions/exposures<br>• Multi-component interventions in which the isolated effect of parental and caregiver feeding styles and practices on growth, body composition and risk of obesity is not provided or cannot be determined due to multiple components | |

* Studies that enroll participants who are at risk for chronic disease will be included; disorder that affects feeding or eating include condition such as autism spectrum disorder, attention-deficit/hyperactivity disorder, eating disorders, depression or anxiety disorders.

† Gestational age <37 weeks and 0/7 days

‡ Birth weight <2500g

§ Studies that exclusively enroll participants with obesity will be included

| Category | Existing Review | Updated Review | Change and Rationale |
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| Comparator | Included:<br>• Differing degrees of control, pressure, restriction and responsive/nonresponsive/pressuring/indulgent feeding practice; differing feeding practices<br><br>Excluded:<br>• N/A | Included:<br>• Different degrees of caregiver and parental feeding styles and practices<br>• Different caregiver and parental feeding styles or practices<br><br>Excluded:<br>• N/A | No change |

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Outcomes | Included:<br>Intermediate Outcomes<br>• Weight and height<br>• BMI, BMI z-score<br>• Waist circumference<br>• Weight change<br>• Weight status change<br>• Child indices:<br>  ○ *Size*: Weight-for-age, length/stature-for-age, weight-for-length, head, arm, and thigh circumference for age<br>  ○ *Growth*: Change across more than onetime point of weight-for-age, length-for-age, weight-for-length, head, arm, and thigh circumference for age<br>• Body composition: % fat mass, % fat free mass, bone mineral density<br>• Skin-folds<br>Health Outcomes<br>• Incidence and prevalence of healthy weight, overweight, obesity<br>  ○ *Children*: BMI-for-age percentile or z-score<br>• Incidence and prevalence of underweight or failure to thrive, stunting, and wasting in infants and children<br>Excluded:<br>• N/A | Included:<br>Growth (in children, adolescents)<br>• Height, length/stature-for-age<br>• Weight, weight-for-age<br>• Stunting, failure to thrive, wasting<br>• BMI-for-age, weight-for-length/stature<br>• Body circumferences (arm, neck, thigh)<br>• Head circumference<br>Body composition (in children, adolescents, adults, older adults)<br>• Skinfold thickness<br>• Fat mass, ectopic fat<br>• Fat-free mass, lean mass<br>• Waist circumference, waist-to-hip ratio<br>Risk of obesity (in children, adolescents, adult, older adults)<br>• BMI<br>• Overweight and obesity<br>• Underweight<br>• Healthy/normal weight<br>• Weight gain<br>• Weight loss and maintenance (in adults and older adults)<br>Excluded:<br>• N/A | No change other than formatting |

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Risk of bias | Included:<br>• All studies regardless of NEL BAT risk of bias rating<br>Excluded<br>• N/A | N/A | No change other than formatting |
| Study Duration | Included:<br>• Studies of all durations<br>Excluded:<br>• N/A | N/A | No change |
| Language | Included:<br>• Studies published in English<br>Excluded:<br>• Studies published in languages other than English | Included:<br>• Published in English<br>Excluded:<br>• Not published in English | No change |
| Publication status | Included:<br>• Studies published in peer-reviewed journals<br>Excluded:<br>• Grey literature, including unpublished data, manuscripts, reports, abstracts, conference proceedings | Included:<br>• Peer-reviewed articles published in research journals<br>Excluded:<br>• Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings | No change |

| Category | Existing Review | Updated Review | Change and Rationale |
|---|---|---|---|
| Country* | Included:<br>• Studies conducted in Very High or High Human Development Countries<br>Excluded:<br>• Studies conducted in Medium or Low Human Development Countries | Included:<br>• Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected<br>Excluded:<br>• Studies conducted in countries classified as medium or low on the Human Development Index the year(s) the intervention/exposure data were collected | No change |

* In order to determine the inclusion exclusion criteria for country, the Human Development classification was used. This classification is based on the Human Development Index (HDI) ranking from the year the study intervention occurred or data were collected (UN Development Program. HDI 1990-2017 HDRO calculations based on data from UNDESA (2017a), UNESCO Institute for Statistics (2018), United Nations Statistics Division (2018b), World Bank (2018b), Barro and Lee (2016) and IMF (2018). Available from: http://hdr.undp.org/en/data). If the study did not report the year in which the intervention occurred or data were collected, the HDI classification for the year of publication was applied. HDI values are available from 1980, and then from 1990 to present. If a study was conducted prior to 1990, the HDI classification from 1990 was applied. If a study was conducted in 2018 or 2019, the most current HDI classification was applied. When a country was not included in the HDI ranking, the current country classification from the World Bank was used instead (The World Bank. World Bank country and lending groups. Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups)