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Safety and effectiveness of responsive feeding for infants and young children: Systematic Review and Meta-Analysis

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November 2021

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November 2021

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Safety and effectiveness of responsive feeding for infants and young children: A Systematic Review and Meta-Analysis

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EXECUTIVE SUMMARY

Objectives: We aimed to assess the safety and effectiveness of dietary and health outcomes of interventions that include elements of responsive feeding (RF), compared with no intervention or other interventions that do not include those elements of RF, for children from introduction of complementary foods to 23 months of age.

Methods: We conducted a systematic review of randomized controlled trials (RCTs) that assessed interventions targeted directly or indirectly to children from the introduction of complementary foods. We included healthy children from the general population and excluded hospitalized or diseased children and pre-term babies.

The interventions considered were behavioral interventions with one or more of the following components of RF: C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Critical outcomes included 1. Food acceptance: 2. Food preference 3. Intake of healthy food/beverages 4. Intake of unhealthy food/beverages 5. Nutrient and energy intake 6. Growth and body composition 7. Early Child Development. Secondary outcomes included: 8. Safety outcomes, 9. Flavor preference 10. Food intake self-regulation 11. Nutrient status 12. Sleep 13. Physical activity and play 14. Dental health and 15. Caregiver-infant bonding

We searched the Cochrane Library databases, PUBMED, EMBASE, Latin American and Caribbean Health Sciences Literature (LILACS), CINAHL (Plus) and PsycINFO, from 1990 to current date. We also explored the databases of ongoing trials (CTG, WHO and EUCTR). We also searched reference lists of relevant primary studies and systematic reviews retrieved. No language restrictions were applied. Pairs of authors independently screened each identified record by title and abstract and retrieved all the full texts of the potentially eligible studies. Pairs of review authors independently examined the full-text articles for compliance with the inclusion criteria and selected eligible studies. We resolved any disagreements by discussion. We documented the selection process with a 'PRISMA' flow chart. This process was conducted through COVIDENCE, a software for the conduction of systematic reviews.

Pairs of researchers independently extracted data from eligible studies in a data extraction form previously pilot-tested about: a) general information about the study publication, b) study design and methods, including duration of the study, type of randomization employed, inclusion and exclusion criteria, follow-up period) study setting, sample size, characteristics of the included participants, d) details of the intervention and the control/comparison groups, e) how information was collected, and outcome measures assessed, and f) outcome data.

The same pairs independently assessed the risk of bias of the included studies using the Cochrane risk of bias assessment RoB-2 tool.
We use the numbers of events in each study's control and intervention groups to calculate Risk Ratios (RRs) or Mantel-Haenszel Odds Ratios (ORs) for dichotomous data. We calculated mean difference (MD) or standardized mean difference (SMD) between treatment groups depending on the same or different scales for continuous data.
We considered the level at which randomization occurred and its effect through the approximate analyses of cluster-randomized trials and considering multiple observations for the same outcome.
We undertook fixed and random-effects meta-analyses, measuring statistical heterogeneity using the I^2 statistic. We carried out the statistical analysis using Review Manager software 5.4.1 (RevMan). We conducted subgroup analyses such as country income (High-income countries, HIC/ High-income countries, low-resource settings / Low-and-middle-income countries, LMIC). We also presented Evidence Profile tables using GRADEpro and following the Cochrane methods.

Results:

We identified 4,412 references from databases and 94 via other methods including the reference lists of systematic reviews retrieved. After assessing 323 full-text reports for eligibility, we included 26 RCTs (from 53 relevant reports) involving 10,009 participants. Diverse components of responsive feeding were identified in different trials. The component “recognition of hunger and satiety” was identified in all the included trials with the exception of one. Most of the trials also included the following components of RF in the intervention “not pressuring child to eat; praising; encourage self-feeding” and “pleasant and stimulating family eating environment”. Trials were classified according to their interventions in the following groups:

A) Interventions focused on one component of responsive feeding (A1. Advice on step-by-step repeated exposure to vegetables during the introduction of solids; A2. Advice and counselling for promoting the introduction of textured foods); 3 trials.

B) Interventions aimed to prevent under-nutrition, including two or more components of RF (Responsive feeding and development stimulation programs, delivered by trained women/mothers of the village or family welfare assistants, including between 6 and 7 components of RF); 5 trials.

C) Interventions aimed to prevent obesity, including two or more components of RF (C.1 E-health interventions, Facebook peer groups, including between 4 and 5 components of RF; C.2 Interventions aimed to prevent obesity delivered by health professionals/health students (e.g. group sessions, home visits, specific advice during well-child visits), including between 5 and 8 components of RF); 18 trials.

Trials with interventions in groups A and C were conducted in HICs, with the exception of one trial from Brazil included in C.2. Trials in group B were carried out in LMICs.

Outcomes of critical importance

O1. Food acceptance

A. Interventions focused on one component of responsive feeding

O1.A.1 Advice on step-by-step **repeated exposure to vegetables during the introduction of solids** (C5) vs other foods/country specific weaning advice

- One trial of 35 participants indicated that at ~6 to 7 months old the intervention may increase the intake of target vegetables in a meal by a mean of 37.6 g (95% CI: 14.0 g to 61.2 g) after 24 to 35 days of repeated exposure to vegetables (low certainty).
- Two trials of 119 participants indicated that the intervention probably increased the food acceptance of novel vegetables at ~6 to 7 months old by a mean increase of 15.6 g (95% CI: 7.2 g to 23.9 g) of these foods consumed in a meal after a month of repeated exposure to vegetables (moderate certainty). Sensitivity analysis: After excluding one study with overall high risk of bias, the analysis lost statistically significance: MD 17.00 (95% CI -11.46 to 45.46).
- Based on one trial of 84 participants, it is uncertain whether the repeated exposure to vegetables during a month improves the food acceptance of novel fruits consumed in a meal at ~6 to 7 months old (MD 0.5 g, 95% CI -34.2 g to 35.2 g; very low certainty). Sensitivity analysis: After excluding one study with overall high risk of bias, this estimation is eliminated.

O1. A.2. Advice and counselling for **promoting the introduction of textured foods** in addition to the standard French recommendations on complementary feeding from 8 to 15 months of age (C3) vs standard French recommendations on complementary feeding

- Based on one trial of 60 participants, it is uncertain whether the intervention improves the food texture acceptance at 15 months of age (global texture acceptance score[1]: MD 0.30, 95% CI -0.80 to 1.40; very low certainty).

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O1.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 7 components of RF (C1, C3, C4, C5, C7, C9, and C10) vs. routine care/regular programs

- At 20-23 months of age, in comparison to the control group the intervention increase the % self-fed mouthfuls (MD 14.42%, 95% CI 6.45% to 22.39%; participants = 458; studies = 3; I^2 = 0%; high certainty) and probably reduces the number of child refusals (MD -0.69, 95% CI -1.28 to -0.09; participants = 458; studies = 3; I^2 = 0%; moderate certainty). The intervention may make little or no difference to the number of mouthfuls eaten (MD 1.98, 95% CI -0.84 to 4.80; participants = 458; studies = 3; I^2 = 40%; low certainty).

C. Interventions aimed to prevent obesity, including two or more components of RF

O1. C.1 E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8) vs. routine care

- The intervention probably slightly increases the mean “Enjoyment of Food” scale score, measured by the Child Eating Behavior Questionnaire (CEBQ) [2] at the age of 12 months (MD 0.10, 95% CI -0.01 to 0.21; participants = 533; studies = 1; moderate certainty) and makes little or no difference at 24 months old (MD -0.04, 95% CI -0.16 to 0.08; participants = 295; studies = 1; moderate certainty).
- The intervention probably makes little or no difference to the mean “Food Fussiness” scale score measured by the same questionnaire[3], both at 12 months old (MD 0.00, 95% CI -0.12 to 0.12; participants = 533; studies =

[1] Scale that ranges from 0 (the child did not swallow any trial of any food item) to 8 (the child swallowed all trials of all the offered food items)
[2] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child enjoyment of food.
[3] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child food fussiness.

1; moderate certainty) and at the age of 24 months (MD 0.04, 95% CI -0.21 to 0.12; participants = 295; studies = 1; moderate certainty).

O1.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7 and others) vs. routine/standard care or routine/standard care + intervention focused on child safety messages.

- In comparison with the control group, the intervention probably increases the mean "Enjoyment of Food" scale score (CEBQ) at 12 months of age (MD 0.22, 95% CI 0.04 to 0.40; participants = 173; studies = 1; moderate certainty) and may very slightly increase the score between 12 and 30 months of age (MD 0.11, 95% CI 0.02 to 0.20; participants = 857; studies = 3; I^2 = 10%; low certainty).
- At 12 months of age, in comparison with routine care the intervention that promotes the baby-led complementary feeding was associated with a lower mean "Food Fussiness" scale score *(*CEBQ) (MD -0.31, 95% CI -0.50 to -0.12; participants = 706; studies = 1; high certainty). From 24 to 30 months of age the interventions aimed to prevent the obesity including several components of RF and delivered by health professionals may slightly reduce the mean scale score (MD -0.16, 95% CI -0.26 to -0.07; participants =857; studies = 3; I^2 = 0%; low certainty). At older ages, the intervention may make little or no difference to food fussiness (3.7 years: MD -0.10, 95% CI -0.24 to 0.04; participants = 504; studies = 1; low certainty; and 5 years of age :MD -0.10, 95% CI -0.24 to 0.04; participants = 424; studies = 1; low certainty)

O2. Food preferences

A. Interventions focused on one component of responsive feeding

The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

The outcome was not reported in the included studies.

C. Interventions aimed to prevent obesity, including two or more components of RF

O2.C.1 E-health interventions

The outcome was not reported in the included studies.

O2.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, face to face or telephone contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9 and others) vs. routine/standard care or routine/standard care.

- Perceived preferences for vegetables. After combining data from two trials on a SMD at 24 months of age, the interventions probably very slightly improve preferences for vegetables (vegetables: SMD 0.15, 95% CI -0.01 to 0.30; participants = 628; studies = 2; I^2 = 0%; moderate certainty). At older ages, the intervention may make little or no difference to the proportion (%) of listed vegetables liked (3.7 years old: 54.4% vs. 52.2%; MD 2.20, 95% CI -1.96 to 6.36; participants = 504; studies = 1; low certainty), (5 years old: 53.9% vs. 52.6%; MD 1.30, 95% CI -3.13 to 5.73; participants = 424; studies = 1; low certainty).
- Perceived preferences for fruits. After combining data from two trials on a SMD at 24 months of age, the intervention may slightly increase the perception of liking for fruits (SMD 0.15, 95% CI -0.07 to 0.38; participants

= 628; studies = 2; I^2 = 42%; low certainty). At older ages, the intervention probably increases the proportion of listed vegetables liked (3.7 years old: 75.9% vs. 68.9%; MD 7.00, 95% CI 3.40 to 10.60; participants = 504; studies = 1; moderate certainty/ 5 years old: 73.3% vs. 68.1%; MD 5.20, 95% CI 1.60 to 8.80; participants = 424; studies = 1; moderate certainty).

- Perceived preferences for meat and fish at 24 months. The mean score for several items in this food category using a scale from 1 (dislikes a lot) to 5 (likes a lot) was calculated in one study. The intervention probably makes little or no difference to preferences for meat and fish in a score (MD 0.10, 95% CI -0.07 to 0.27; participants = 161; studies=1; moderate certainty).
- Perceived preferences for energy-dense sweet and savory foods. The intervention may make little or no difference to the proportion (%) of listed sweet and savory foods liked at 24 months (66.5% vs 69%; MD -2.50, 95% CI -5.27 to 0.27; participants = 467; studies=1; low certainty), 3.7 years (76.8% vs 78.2%; MD -1.40, 95% CI -4.45 to 1.65; participants = 504; studies=1; low certainty) and 5 years old (79.2% vs 79.4%; MD -0.20, 95% CI -3.25 to 2.85; participants = 424; studies=1; low certainty).

O3. Healthy Food intake

A. Interventions focused on one component of responsive feeding

The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O3.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 7 components of RF (C1, C3, C4, C5, C7, C9, and C10) vs. routine care/regular programs

- Dietary diversity. The number of critical food groups out of seven consumed the day before was reported in three trials conducted in Bangladesh. In comparison with regular programs, programs focused on responsive complementary feeding and development stimulation probably result in a slight increase in the number of critical food groups consumed the previous day (MD 0.25, 95% CI 0.04 to 0.45; participants = 625; studies/sub-studies = 4; I^2 = 20%; moderate certainty) at ages between 17 and 21 months.
- Vegetable consumption. One trial indicated that an intervention implemented since the child's age of three months probably increases the consumption of vegetables (spinach) at 9 months old (14.8% vs. 5.2%, RR 2.85, 95% CI 1.23 to 6.58; participants = 257; studies = 1; moderate certainty) and at 15 months old (45.5% vs. 26.4%, RR 1.73, 95% CI 1.21 to 2.46; participants = 241; studies = 1; moderate certainty). It is uncertain whether the interventions initiated during the second year increase the frequency of intake of vegetables between 20 and 23 months of age (MD 0.09 times/day, 95% CI -0.88 to 1.66; participants = 314; studies = 2; I^2 = 91%; very low certainty).
- Fruit consumption after the intervention implemented since the child's age of three months: in comparison with the regular program, the intervention probably increases the consumption of fruit (banana) during the previous week at nine months old (59.0% vs 38.5%, RR 1.53, 95% CI 1.18 to 1.99; participants = 257; studies = 1; moderate certainty) and at the age of 15 months (78.6% vs 62.0%, RR 1.27, 95% CI 1.07 to 1.50; participants = 241; studies = 1; moderate certainty). Two trials indicated that the intervention initiated during the second year of life probably increase the frequency of consumption of fruit at 20-23 months old (MD 0.23 times/day, 95% CI 0.12 to 0.35; participants = 314; studies = 2; I^2 = 0%; moderate certainty).
- Eggs, meat and fish. The program initiated at 3 months of age, probably increases the proportion of the group that consumes eggs (at least once during the previous week) at the age of 9 months (51.6% vs 17.8%, RR 2.90, 95% CI 1.94 to 4.34; participants = 257; studies = 1; moderate certainty) and 15 months (77.7% vs 54.3%, RR 1.43, 95% CI 1.19 to 1.73; participants = 241; studies = 1; moderate certainty).**Error! Reference source not found.** The same intervention may slightly increase the proportion of the group that consumes

meat (goat) at least once during the previous week at the age of 9 months (11.5% vs 4.44%, RR 2.58, 95% CI 1.02 to 6.51; participants = 257; studies = 1; low certainty) and 15 months (43.8% vs 32.6%, RR 1.34, 95% CI 0.97 to 1.86; participants = 241; studies = 1; low certainty). According to two trials the program initiated during the second year of life may slightly increase the frequency of consumption of eggs, at 20-23 months (MD 0.13 times/day, 95% CI -0.00 to 0.25; participants = 314; studies = 2; I2 = 43%; low certainty). Based on the same trials, the intervention may make little or no difference to the frequency of consumption of fish (MD -0.06 times/day, 95% CI -0.30 to 0.17; participants = 314; studies = 2; I^2 = 0%; low certainty).**Error! Reference source not found.**

C. Interventions aimed to prevent obesity, including two or more components of RF

O3.C.1 E-health interventions E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8) vs. routine/standard care

- Compared with routine care, the intervention probably increase the frequency of consumption of fruits and vegetables at 12 months old (MD 0.51 times/ day, 95% CI 0.07 to 0.95; participants = 533; studies = 1, moderate certainty). The intervention probably leads to minimal to no important difference at 24 months. However, the 95% interval is also compatible with a slightly increase in fruit and vegetable consumption (MD 0.21 times/day, 95% CI -0.32 to 0.74; participants = 295; studies = 1, moderate certainty).

O3.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, face to face or telephone contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9, and others) vs. routine/standard care

- Vegetable intake. In comparison with routine care, these interventions may make little or no difference to the vegetable consumption at ages between 9 and 12 months (SMD 0.04, 95% CI -0.15 to 0.23; participants = 542; studies = 3; I^2 = 17%; low certainty), between 20 and 24 months (SMD -0.01, 95% CI -0.15 to 0.13; participants = 1002; studies = 3; I^2 = 15%; low certainty) and at 3.5 - 3.7 years (SMD 0.07 , 95% CI -0.17 to 0.31; participants = 721; studies = 2; I2 = 54%, low certainty). The intervention probably make little or no difference at 5 years old (SMD 0.08, 95% CI -0.06 to 0.23; participants = 723; studies = 2; I2 = 0%, moderate certainty).
- Fruit intake. In comparison with routine care, the interventions may slightly increase fruit consumption between 9 and 12 months old (SMD 0.15, 95% CI -0.06 to 0.35; participants = 542; studies = 3; I^2 = 22%; low certainty) and between 20 and 24 months (SMD 0.09, 95% CI -0.05 to 0.22; participants = 1002; studies =3; I2 = 0%; low certainty). The interventions probably slightly increase fruit intake at 3.5 - 3.7 years (SMD 0.17, 95% CI 0.02 to 0.32; participants = 721; studies = 2; I^2 = 0%, moderate certainty) and probably make little or no difference at 5 years old (SMD 0.05, 95% CI -0.09 to 0.20; participants = 723; studies = 2; I2 = 0%, moderate certainty).
- In comparison with usual care, the intervention may make little or no difference to consumption of meat, poultry and/or fish at 7 months old (MD 1.50 g/day, 95% CI -0.68 to 3.68; participants = 162; studies = 1). Similarly, at 12 month of age the intervention probably make little or no difference to consumption of meat, poultry and/or fish (SMD 0.00, 95% CI -0.25 to 0.25; participants = 242; studies = 2; I2 = 0%; moderate certainty).
- One trial indicated that In comparison with usual care, the intervention probably makes little or no difference to water consumption at 9 months (MD -4.0 ml/day, 95% CI -23.36 to 15.36; participants = 320; studies = 1; moderate certainty) and at 20 months old (MD 24.2 ml/day, 95% CI -26.43 to 74.83; participants = 278; studies = 1; moderate certainty). The intervention probably increase water intake at 3.6 years old (MD 111.3 ml/day, 95% CI 16.98 to 205.6; participants = 180; studies = 1; moderate certainty) and probably slightly increase water intake at 5 years old (MD 52.6 ml/day, 95% CI -42.8 to 148.0; participants = 182; studies = 1; moderate certainty).

O4. Unhealthy Food intake

A. Interventions focused on one component of responsive feeding

The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O4.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, and C10) vs. routine care/regular programs

- It is uncertain whether the intervention reduces the frequency of consumption of sweet snacks and sugar-dense foods at 20-23 months old because the certainty of this evidence is very low (MD -0.11 times/day, 95% CI -0.50 to 0.28, participants = 314; studies = 2; I2 = 60%).

O4.C. Interventions aimed to prevent obesity, including two or more components of RF

O4.C.1 E-health interventions E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8) vs. routine/standard care

- The intervention does not have an important effect on the frequency of consumption of “non-core foods and drinks” (sweet and salty snacks, sweetened beverages) measured as times/day at 12 months (MD -0.02, 95% CI -0.06 to 0.02 participants = 533; studies = 1, high certainty). At 24 months the intervention probably makes little or no difference to the consumption of sweet and salty snacks more frequently than 3.5 times per week (61.2% vs. 68.6%, RR 0.89, 95% CI 0.76 to 1.95 participants = 318; studies = 1; moderate certainty) and the consumption of sweetened beverages more than twice a week (53.0% vs. 45.2%, RR 1.17, 95% CI 0.94 to 1.47 participants = 321; studies = 1; moderate certainty)

O4.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, face to face or telephone contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9, and others) vs. routine/ standard care

- Sugar-sweetened beverages (SSB). One trial indicated that an intervention delivered between 3 and 6 months old by Native Americans paraprofessionals probably reduces the intake of SSBs at 6 months of age in this community (MD -5.07 ml/day, 95% CI -10.53 to 0.39; participants = 97; studies = 1, moderate certainty). At 9 months old, two trials indicated that the intervention may reduce the SSB intake (MD -7.45 ml/day, 95% CI -14.21 to -0.68; participants = 425; studies = 2; I2 = 61%, low certainty). Four studies indicated that the intervention may slightly reduce the intake of SSBs between 12 and 24 month old (SMD -0.34, 95% CI -0.78 to 0.09; participants = 1038; studies = 4; I2 = 91%, low certainty). Two trials indicated that in comparison with routine care the intervention probably makes little or no difference to the consumption of SSBs at 3.6 years (SMD -0.00, 95% CI -0.15 to 0.15; participants = 695; studies = 2; I2 = 0%, moderate certainty) and 5 years old (SMD -0.08, 95% CI -0.26 to 0.11; participants = 697; studies = 2; I2 = 27%, moderate certainty).
- Sweet snacks/sugar-dense foods. Two trials indicated that the intervention probably slightly reduces the consumption of sweet snacks/sugar-dense foods between 9 and 16 months old (SMD -0.14, 95% CI -0.29 to 0.02 participants = 680; studies = 3; I2 = 0%; moderate certainty) and at 20 months old (SMD -0.25, 95% CI -0.48 to -0.01 participants = 278; studies = 1; moderate certainty). The intervention may slightly reduce the consumption of sweet snacks/sugar-dense food between 3 and 4 years old (SMD -0.22, 95% CI -0.45 to 0.01 participants = 524; studies = 3; I2 = 44%; low certainty) and probably slightly reduces their consumption between 5 and 8 months old (SMD -0.22, 95% CI -0.40 to -0.04 participants = 486; studies = 3; I2 = 0%; moderate certainty).

O5. Energy and nutrient intakes

A. Interventions focused on one component of responsive feeding

- The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O5.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 6 components of RF (C1, C3, C4, C5, C7, C9) vs. regular programs

- One trial conducted in India reported energy and nutrient intakes. According to that trial, the intervention: a) probably increases energy, protein and zinc intakes at 9 and 15 months old (moderate certainty); b) may increase iron intake at 9 months old (low certainty) and probably increases iron intake at 15 months old (moderate certainty); c) probably slightly increases calcium intake at 9 months old (moderate certainty) and may slightly increase calcium intake at 15 months old (low certainty).
  Effect size and participants:
  - Energy (kcal/day)
    <12 months (MD 122.00, 95% CI 76.68 to 167.32; participants = 257; studies = 1)
    15 months (MD 100.00, 95% CI 86.72 to 113.28; participants = 241; studies = 1)
  - Protein intake (g/day)
    9 months (MD 3.30, 95% CI 2.19 to 4.41; participants = 257; studies = 1)
    15 months (MD 4.60, 95% CI 4.12 to 5.08; participants = 241; studies = 1)
  - Iron intake (mg/day)
    9 months (MD 0.20, 95% CI 0.04 to 0.36; participants = 257; studies = 1)
    15 months (MD 0.30, 95% CI 0.25 to 0.35; participants = 241; studies = 1)
  - Zinc intake (mg/day)
    9 months (MD 0.40, 95% CI 0.29 to 0.51; participants = 251; studies = 1)
    15 months (MD 0.29, 95% CI 0.27 to 0.31; participants = 241; studies = 1)
  - Calcium intake (mg/day)
    9 months (MD 50.00, 95% CI 17.67 to 82.33; participants = 257; studies = 1)
    15 months (MD 21.00, 95% CI 1.20 to 40.80; participants = 241; studies = 1)

C. Interventions aimed to prevent obesity, including two or more components of RF

O5.C.1 E-health interventions E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8) vs. routine/standard care

- The outcome was not reported in the included studies.

O5.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, face to face or telephone contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9, and others) vs. routine/ standard care

- The intervention may slightly reduce energy intake at 24 months old (SMD -0.13, 95% CI -0.46 to 0.2; participants = 153; studies = 2; I2 = 4%; low certainty). One trial indicated that the intervention probably makes little or no difference to energy intake at <12 months and at 12 months, protein, vitamin C, and calcium intakes at <12 months, 12 months, and 24 months old, total fat (% energy), iron and zinc intakes at <12 months and at 12 months old (moderate certainty). Two trials indicated that the intervention may make little or no difference to the total fat intake (% energy) at 24 months old (low certainty).

O6. Growth and body composition

A. Interventions focused on one component of responsive feeding

- The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O6.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 6 to 7 components of RF (C1, C3, C4, C5, C7, C9) vs. regular programs

- The intervention probably makes little or no difference to the weight-related outcomes at 12 months (SMD 0.00, 95% CI -0.24 to 0.24; participants = 273; studies = 1; moderate certainty) and may make little or no difference at 24 months old (SMD 0.05, 95% CI -0.24 to 0.35; participants = 458; studies = 3; I^2 = 61%; low certainty).
- The intervention probably makes little or no difference to the length-related outcomes between 15 and 24 months old. (SMD 0.01, 95% CI -0.14 to 0.15; participants = 709; studies = 3; I2 = 0%; moderate certainty)

C. Interventions aimed to prevent obesity, including two or more components of RF

O6.C.1 E-health interventions Facebook peer group, including between 4 and 5 components of RF (C1, C4, C7, C8, and C6 in one study) vs usual care

- Two trials reported weight-for-length z-scores and BMI z-scores. The interventions probably make little or no effect at ages of 12 (MD -0.01, 95% CI -0.17 to 0.15; participants=526; studies=2; I2=0%; moderate certainty) and 24 months old (MD 0.10, 95% CI -0.28 to 0.48; participants=119; studies=1; moderate certainty).

O6.C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, face to face or telephone contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9, and others) vs. routine/ standard care

- Weight-related outcomes (BMI z-score and WAZ). The interventions may slightly reduce these weight-related outcomes at 12 months of age expressed as z-score (MD -0.07, 95% CI -0.19 to 0.05; participants = 3069; studies = 7; I^2 = 58%; low certainty), and probably at 24 months (MD -0.08, 95% CI -0.17 to 0.02; participants = 2138; studies = 7; I^2 = 11%, moderate certainty). The interventions may make little or no effect to these outcomes at 32 to 36 years old (MD -0.04, 95% CI -0.15 to 0.08; participants = 2515; studies = 6; I^2 = 50%; low certainty), and probably do not have an important effect at 5 years (MD -0.01, 95% CI -0.17 to 0.15; participants = 661; studies = 2; I^2 = 22%; moderate certainty).
- Overweight and obesity. Five trials indicated that the interventions may make little or no effect to the prevalence of overweight at 12 months old (RR 1.00, 95% CI 0.69 to 1.46; participants =1259; studies = 5; I^2 =45%; low certainty). Eight trials indicated that the interventions may slightly reduce the prevalence of obesity/overweight at 24 months old (RR 0.81, 95% CI 0.63 to 1.04; participants =2171; studies = 8; I^2 =50%; low certainty). Two trials indicated that the interventions probable make little or no effect to the prevalence of obesity/overweight between 5 and 8 years old (RR 1.07, 95% CI 0.78 to 1.46; participants =730; studies = 2; I^2 =11%; moderate certainty). It is uncertain whether the intervention reduces the prevalence of obesity7overweight at 32 to 36 months (RR 0.92, 95% CI 0.68 to 1.24; participants =2169; studies = 5; I^2 =61%; very low certainty).
- Three trials indicated that the interventions may make little or no difference to length at 24 months old (SMD -0.02, 95% CI -0.12 to 0.08; participants = 1492; studies = 3; I^2 = 0%, low certainty)

O7. Early and child development

A. Interventions focused on one component of responsive feeding

- The outcome was not reported in the included studies.

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

O6.B.1 Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 6 to 7 components of RF (C1, C3, C4, C5, C7, C9) vs. regular programs

- Three trials indicated that in comparison with regular programs, the programs focused on responsive feeding and development stimulation increase mental/language domains of infant development scales between 15 and 22 months of age (SMD 0.60, 95% CI 0.35 to 0.86; participants =709; studies = 3; I^2 =63%; high certainty).
- On the other hand, one trial indicated that the interventions may make little or no effect to the Motor Development Score (Bayley Scales of Infant Development-II) at 15 months old (MD 2.40, 95% CI -1.09 to 5.89; participants =258; studies = 1; low certainty).

C. Interventions aimed to prevent obesity, including two or more components of RF

- The outcome was not reported in the included studies.

Other outcomes

0.8 Safety outcomes

- One study has reported that an intervention with elements of RF conducted in Brazil, during the first year of life resulted in a reduction of the risk of diarrhea during the previous months, assessed at 12 to 16 months old (RR 0.68, CI95% 0.51 to 0.90), but no differences were found for hospitalizations.
- BLISS Study has reported little to no difference in the risk of choking by treatment group.

O.9 Flavor preferences

- Only one study assessed the perceived food preferences in some taste categories groups. A slight difference in perceived preference was detected for 'savory-non-meat high-protein foods, with higher scores for the intervention with elements of RF.

O.10 Energy self-regulation

- Regarding energy self-regulation, there were not differences between treatment groups in the dimensions of energy-self regulation (by questionnaire), satiety, and food responsiveness (by CEBQ score).

O.11 Nutrient Status

- Interventions with elements of RF resulted in higher levels of hemoglobin (MD 0.39, 95% CI 0.17 to 0.61; participants = 377; studies = 2; I^2 = 28%) at 12 and 15 months old. However, authors reported little or no effect on reducing the risk of Hemoglobin levels <11 g/dL, levels of plasma ferritin, plasma zinc concentration at 12 months old, nor on plasma zinc level <65 ug/dL at 12 to 16 months old.

O.12 Sleep

- We found little to no evidence of a beneficial effect of RF on sleep duration by accelerometer and questionnaires, in ages six months to 5 years.

O.13 Physical activity and play

- Interventions with elements of RF and messages targeting TV viewing and/or screen time were associated with a benefit in reducing the minutes/day of television watching at ages 12, 18 to 20 and 24 months, and on screen time at 10 to 12 months old. These effects were not sustained at older ages. At 10 and 12 months, and three years, the interventions that included

elements of RF resulted in more significant proportions of children with screen time according to guidelines. We found little to no effect at 1.5, 2, and 2.5 years old.
- An intervention with elements of RF and messages targeting physical activity (Fangupo 2015) reported more significant time in active play outside at 12 and 18 months of age, without effect at 24 months.
- We found little to no evidence of an effect of the interventions with elements of RF on time of physical activity measured by accelerometry.

O.14 Dental Health

- Only one study assessed the risk of dental caries between 12 and 16 months of age, showing a reduction of the risk (RR 0.56 CI 0.32 to 0.96).

O.15 *Bonding*

- No studies were found for caregiver infant bonding and RF.

CONCLUSION

The present work constitutes a comprehensive systematic review on RF for infants and young children. In conclusion, with varying certainty of evidence:

- Interventions focused on repeated exposure of vegetables may improve food acceptance of vegetables during the first month from the beginning of the introduction of solid foods.
- Interventions aimed to prevent under-nutrition, including six or more components of responsive feeding and development stimulation probably increase self-feeding and reduce child refusals, probable slightly increase the dietary diversity and the frequency of intake of some healthy foods, may increase or slightly increase energy and nutrient intakes and increase scores of infant development scales in mental or language domains. However, these interventions probably makes little or no difference to anthropometric outcomes.
- Interventions aimed to prevent obesity, including four of five components of responsive feeding and delivered as eHealth interventions or Facebook peer groups during the first year of life probably slightly increase the perception of enjoyment of food at 12 months, probably slightly increase the frequency of consumption of some healthy foods at 12 months, but may makes little or no difference to anthropometric outcomes.
- Interventions aimed to prevent obesity, including six or more components of responsive feeding and delivered by health professionals or health students, may result in benefits with regard to food acceptance, food preferences for some healthy foods, intakes of some healthy foods and intakes of some unhealthy foods and beverages, some anthropometric outcomes particularly at 24 months.

RESEARCH QUESTION

For children from introduction of complementary foods to 23 months of age (P), do interventions that include elements of responsive feeding (I) compared to interventions that do not include those elements of responsive feeding (C) result in beneficial or harmful dietary and health outcomes (O)?

- **P**: Children from introduction of complementary foods to 23 months of age
- **I** : Interventions that include elements of responsive feeding
- **C**: No intervention or same intervention but without the responsive feeding elements
- **O**: Dietary and health outcomes

BACKGROUND

Safety and effectiveness of responsive feeding for infants and young children: A Systematic Review and Meta-Analysis

Between ages 6 and 23 months, breastfeeding, and access to a diverse range of nutritious foods provide children with the essential nutrients, vitamins, and minerals they need to develop to their full physical and cognitive potential. This period is also a critical opportunity to prevent all forms of childhood malnutrition, including stunting, wasting, micronutrient deficiencies, overweight, obesity and diet-related non-communicable diseases. In addition, lifelong food preferences, tastes and habits are often established in childhood.

Optimal complementary feeding depends not only on what is fed, but also on how, when, where, and by whom the child is fed.[1] Feeding requires a reciprocal relationship between children and their caregivers.[2] Responsive feeding is an approach where caregivers encourage the child to eat autonomously and in response to their physiological and developmental needs, which may promote eating self-regulation and support cognitive, emotional, and social development.[2-4] RF is grounded upon the following three steps: (a) the child signals hunger and satiety through motor actions, facial expressions, or vocalizations; (b) the caregiver recognizes the cues and responds promptly in a manner that is emotionally supportive, contingent on the signal, and developmentally appropriate; and (c) the child experiences a predictable response to signals.[2,3,5,6] The key outcome sought through RF is for the young child to learn to self-regulate their food intake in response to hunger. Other aspects in the frame of RF are the maternal diet during pregnancy and lactation, which is important for the future development of food acceptance and preferences in the child[3,7] and the repeated exposure to a variety of foods as well as a variety of textures that are appropriate for their developmental stage.[3,8] Also, focusing on establishing pleasant and stimulating eating time experiences, including not pressuring the child to eat and positive role modelling of healthy dietary behaviors by caregivers, and avoiding screen distraction helps the child learn to eat healthy foods in a nurturing way.[3,9,10]

RF falls within the framework of responsive parenting (RP)[2,6], which acknowledges soothing, sleep, and play routines intimately intertwined with feeding routines. Both RF and RP are under the umbrella of the “Nurturing Care”, a dynamic system model including five components that are central to children’s well-being: nutrition, health, learning, responsive caregiving, and security and safety.[3,11]

Guiding principles for complementary feeding of the breastfed[12] and non-breastfed children 6-23 month of age[13] were published by the Pan American Health Organization/Word Health Organization (PAHO/WHO) and WHO in 2003 and 2005, respectively. Both recommend RF, highlighting the importance of caregivers reading children’s signals of hunger and satiety, promoting self-feeding, not forcing or pressuring children, and making meals occasions for pleasant social interactions. UNICEF also recommends RF practices. Existing guidance about complementary feeding, including components of RF, have been recently reviewed.[14,15] Since the first recommendations, mostly based on the expert consensus, several studies have been conducted suggesting that RF interventions can promote self-feeding, improve nutrient intake, and reduce the risk of undernutrition and overweight.[10,16-19] Also, besides the potential benefits on maternal mental health, supporting caregivers to use mealtime as an opportunity for social interaction can improve child growth and development.[5,20]

Given the importance of the complementary feeding period to prevent all forms of malnutrition and to set lifelong food preferences and diet habits, it is imperative to identify evidence-based

interventions improving child nutrition and early child development. The current body of evidence about RF requires a synthesis and a critical appraisal to inform key stakeholders' decision-making.

OBJECTIVES

To assess the safety and effectiveness on dietary and health outcomes of interventions that include elements of responsive feeding (RF), compared with no intervention or other interventions that do not include those elements of RF, for infants and young children 6-23 months of age.

METHODS

For this systematic review protocol, we followed the Cochrane methods and the PRISMA 2020 for reporting results.[21] The protocol of this work is registered in the Centre for Reviews and Dissemination of the University of York, PROSPERO database under the number CRD42021243921.

Criteria for considering studies for this review

Types of studies

We included randomized controlled trials (RCTs). We excluded systematic reviews, but we used them as a source of primary studies.

Types of participants

We included studies assessing interventions targeted directly or indirectly to children from the introduction of complementary foods to 23 months of age.

We included apparently healthy children (described by the trial authors as being healthy) from the general population, although some may be at risk of having highly prevalent diseases such as malaria, diarrhea or even malnutrition.

We excluded:

- Studies that exclusively enroll infant subjects with a disease or with the health outcome of interest (intermediate or endpoint health outcomes)
- 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
- Studies done in subjects hospitalized for illness or injury (i.e., this does not include birth and immediate post-partum hospitalization of healthy babies)

Types of interventions

The behavioral interventions considered were those with one or more of the following components of RF[6,11]:

- Recognition of hunger and satiety
- Infant readiness for introduction of complementary foods, considering the child's developmental readiness
- Texture/consistency responsive to child developmental needs. This includes interventions promoting caregivers to offer foods with appropriately evolving consistency as the child develops. Interventions solely focused on changing consistency of foods (e.g., addition of amylase to cereal porridges) not based on the responsive feeding framework were not included.
- Not pressuring child to eat, praising
- Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar sweetened beverages. Studies assessing interventions only directed to maternal diet during gestation/lactation without other components of RF targeting complementary feeding were not included.
- Role modelling of healthy eating
- Pleasant and stimulating family eating environment
- Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention)
- Positive caregiver verbalization during feeding
- Feeding during and after illness

We included studies that met at least one of the following conditions:

- The behavioral intervention is mainly focused in RF in complementary feeding in an explicit manner.
- The Intervention includes topics/messages and most of them are about one or more of the RF components in complementary feeding listed above (i.e. from a list of topics or a list of messages).
- The intervention includes educational content or topics about components of RF in complementary feeding given in most of the sessions (i.e. from a list of sessions).

We excluded studies in which RF is only an explicit component of a behavioral intervention, but the intervention also includes other components beyond education/counseling on complementary feeding (e.g., micronutrient supplementation). When there were intervention arms with and without these co-interventions, we analyzed the arms that included only RF.

Types of outcome measures

Primary Outcomes

1. Food acceptance: including behavior during feeding (e.g. infant-led feeding paradigm, facial response-- expressions made during feeding of target/novel food), infants' overall feeding response (e.g. pickiness as measured by questionnaire), amount of target food consumed, measured by research staff or reported by caregiver, amount of novel food (non-exposed food) consumed, measured by research staff or reported by caregiver and caregiver perception of infants' enjoyment of the feeding of target/novel food.
2. Food preference
3. Intake of healthy food/beverages
4. Intake of unhealthy food/beverages
5. Nutrient and energy intake
6. Growth and body composition: including weight and height, BMI, BMI z-score, waist circumference, weight change, weight status change, child indices of size (weight-for-age, length/stature-for-age, weight-for-length, head, arm, and thigh circumference for age) and growth (change across more than one time point of weight-for age, length-for-age, weight-for-length, head, arm, and thigh circumference for age), as well as % fat mass, % fat free mass, bone mineral density and skin-folds. Incidence and prevalence of healthy weight, overweight, obesity, underweight, failure to thrive, stunting, and wasting.
7. Early Child Development (ECD) including motor development, cognitive (e.g. language), social-emotional
8. Safety: any adverse event

Secondary outcomes

9. Flavor preference
10. Food intake self-regulation
11. Nutrient status
12. Sleep
13. Physical activity and play
14. Dental health
15. Caregiver-infant bonding

We assessed the outcomes at any point during and after the intervention to the target population, including follow-up longer than 24 months.

Search methods for identification of studies

Electronic searches

An experienced librarian searched the Cochrane Library databases, PUBMED, EMBASE, Latin American and Caribbean Health Sciences Literature (LILACS), CINAHL (Plus) and PsycINFO, from 1990 to current.

We also searched databases of ongoing trials:

- ClinicalTrials.gov www.clinicaltrials.gov
- World Health Organization International Clinical Trials Registry Platform (WHO ICTRP) www.who.int/ictrp
- The EU Clinical Trials Register (EUCTR) https://www.clinicaltrialsregister.eu/ctr-search/search

No language restrictions were applied.

For detailed search strategy see **Appendix 1**

Searching other resources

We searched reference lists of relevant primary studies and systematic reviews retrieved by the search strategy, as well as contact experts in the field to obtain additional data. We contacted original authors for clarification and further data if reports were unclear.

Data collection and analysis

Selection of studies

Pairs of authors independently screened each identified record by title and abstract and retrieved all the full texts of the potentially eligible studies. Pairs of review authors independently examined the full-text articles for compliance with the inclusion criteria and select eligible studies. We contacted the study investigators as required to clarify study eligibility. We resolved any disagreements by discussion. If any reports require translation, we described the process used for data extraction. We documented the selection process with a 'PRISMA' flow chart.[21] This process was conducted through COVIDENCE[22], a software for systematic reviews.

Data extraction and management

Pairs of researchers independently extracted data from eligible studies using a data extraction form designed and pilot-tested by the authors. We resolved any disagreements by discussion. Extracted data included: a) general information about the study publication, b) study design and methods, including duration of the study, type of randomization employed, inclusion and exclusion criteria, follow-up period) study setting, sample size, characteristics of the included participants, d) details of the intervention and the control/comparison groups, e) how information was collected, and outcome measures assessed, and f) outcome data. Intermediate behavioral outcomes, e.g., soothing-not using food as reward were also recorded during data extraction. Where studies have multiple publications, we collated multiple reports of the same study under a single study ID with multiple references. We contacted the study investigators for further data on methods or results, as required.

Assessment of risk of bias in included studies

We independently assessed the included studies for risk of bias using the Cochrane risk of bias assessment RoB-2 tool[23]. For each included study, we rated the risk of bias in each domain as low, high, or unclear.

We include the Excel tool to implement RoB 2 and the version of RoB 2 for cluster-randomized trials (available in https://www.riskofbias.info/welcome/rob-2-0-tool/current-version-of-rob-2).

Measures of treatment effect

For dichotomous data, we use the numbers of events in the control and intervention groups of each study to calculate Risk Ratios (RRs) or Mantel-Haenszel Odds Ratios (ORs). For continuous data, we calculated mean difference (MD) or standardized mean difference (SMD) between treatment groups depending on the use of the same or different scales respectively. We treated large ordinal data as continuous data. We presented 95% confidence intervals (CIs) for all outcomes. Where data to calculate RRs/ORs or MDs/SMDs are not available, we utilized the most detailed numerical data available that may facilitate similar analyses of included studies (e.g., test statistics, P values). We assessed whether the estimates calculated in the review for individual studies are compatible in each case with the estimates reported in the study publications.

Unit of analysis issues

We considered the level at which randomization occurred, such as cluster-randomized trials and multiple observations for the same outcome.
The cluster (e.g., health center, village, physician, etc.) was the unit of analysis in cluster randomized trials. We analyzed these trials using 'approximate analyses' to obtain 'effective sample sizes' as described in the Cochrane Handbook for Systematic Reviews of Interventions.[24] We used the studies' reported intra-cluster correlation coefficient (ICC). If this data was not available we used an ICC of 0.05[25] to reduce the unit of analysis error as much as possible by reducing the 'effective sample size'.

Dealing with missing data

We analyzed the data on an intention-to-treat basis as far as possible (i.e., including all randomized participants in analysis, in the groups to which they were randomized). We attempted to obtain any missing data from the original trialists. Where these are unobtainable, we undertook imputation of individual values for all dichotomous outcomes: we assumed that the outcome did not occur in participants without a reported outcome.

If studies report sufficient detail to calculate mean differences but no information on associated standard deviation (SD), we assumed the outcome to have an SD equal to the highest SD from other studies within the same analysis.

Assessment of heterogeneity

We considered whether the clinical and methodological characteristics of the included studies are sufficiently similar for meta-analysis to provide a clinically meaningful summary. We measure statistical heterogeneity using the I^2 statistic. Following *The Cochrane Handbook*[26], we interpreted an I^2 statistic over 60% as indicating substantial heterogeneity.

Assessment of reporting biases

In view of the difficulty of detecting and correcting for publication bias and other reporting biases, we aimed to minimize their potential impact by ensuring a comprehensive search for eligible studies and by being alert for duplication of data. If there are 10 or more studies in an analysis, we used a funnel-plot to explore the possibility of small study effects (a tendency for estimates of the intervention effect to be more beneficial in smaller studies).

Data synthesis

If the studies were sufficiently similar, we combined the data using a random-effects model (given the expected variations in intervention/exposures) for the comparisons of interest.

We carried out the statistical analysis using Review Manager software 5.4.1 (RevMan)[27].

If we detected substantial heterogeneity, we explored possible explanations in subgroup analyses (e.g., differing populations) or sensitivity analyses (e.g. differing risk of bias). We took any statistical heterogeneity into account when interpreting the results, especially if there was any variation in the direction of effect.

Subgroup analysis and investigation of heterogeneity

Where data are available, we conducted subgroup analyses at study or population level, to determine the separate evidence within the following subgroups:

- Country income (High-income countries, high resource setting, HIC /High-income countries, low resource setting/ Low-and-middle-income countries, LMICs).
- Age group
- Maternal nutritional status (Normal nutritional status/ Undernutrition/ Overweight or Obesity)
- Socioeconomic status (parents or caregivers' education level, working status, income)
- Food security status
- Intervention components and/or packages of intervention components (Interventions based on one element of RF/ Interventions with more than one element of RF aimed to prevent under-nutrition/ Interventions with more than one element of RF aimed to prevent obesity)

Sensitivity analysis

We conducted sensitivity analyses for the primary outcomes to determine whether the conclusions are robust to decisions made regarding eligibility. These analyses included consideration of whether the review conclusions would have differed if we had restricted the analysis exclusively to studies with low risk of bias.

Summary of findings and assessment of the certainty of the evidence

We prepared 'Evidence Profile' tables using GRADEpro and Cochrane methods[26,28]. This table evaluated the overall certainty of the body of evidence for the main review outcomes. We assessed

the certainty of the evidence using GRADE criteria. Pairs of authors working independently made judgements about evidence certainty (high, moderate, low, or very low), with disagreements resolved by discussion. We justified the judgements, document them, and incorporated them into reporting of results for each outcome.

Considering that standardized mean difference are hard to interpret clinically when minimal important differences were not available we used the rule of thumb for interpretation (0.2 represents a small effect, 0.5 a moderate effect, and 0.8 a large effect).[29] In addition, to gain interpretability we re-expressed the SMD results in natural units by calculating the absolute difference in means, and by multiplying the SMD by an estimate of the SD associated with the most familiar instrument. To make this calculation we used the median of the control and intervention SDs.[30,31]

RESULTS

Description of studies

We identified 4412 references from databases and 94 references via other methods including reference list of systematic reviews retrieved and we assessed 323 full-text reports for eligibility (**Figure 1**). We included 26 RCTs[20,32-56] (from a total 53 relevant reports[32-41,43-49,51-54,56-87]) involving 10,009 participants. The characteristics of included trials are reported in **Table 1.** The intervention components regarding responsive feeding in each trial are presented in **Table 2** and the reported outcomes in **Table 3**. We defined the primary references used for this report and other reference from the same trial as secondary references for each study. **Table 4** shows the average cluster size and design effects of cluster-randomized clinical trials.

The dates on which the interventions were administered were between October 2001 and March 2017. The duration of the studies was between 9 and 72 months, with a median of 36 months. Ten studies were cluster randomized trials and 16 were individual RCTs. Nine studies came from the United States, four from Bangladesh, two from Australia, two from New Zealand, and the rest from UK and Greece, USA and Canada, Norway, The Netherlands, Italy, UK, Brazil, France, and India. Consequently, six studies were conducted in LMICs[20,33,37,38,46,52] and 20[32,34-36,39-45,47-51,53-56] in HICs.

Three trials were focused on one component of responsive feeding. In two of them the interventions consisted of guidance on step-by-step repeated exposure to vegetables since the introduction of solid foods. The third one implemented advised and regular counselling for promoting the introduction of texture foods from 8 to 15 months of age. Three trials included measures in a laboratory setting. They were conducted in HICs and control groups were routine care and standard national recommendations on complementary feeding.

Five trials implemented interventions aimed to prevent under-nutrition including several components of RF. These programs were conducted in rural areas in LICs and included development stimulation and responsive feeding components. Interventions consisted of group sessions and home visits conducted by trained village women or family welfare assistants. One of these trial was implemented from 3 to 15 months of age, the rest was implemented after the introduction of solid food period, mostly during the second year of life. Comparators were regular programs including general or specific advice on complementary feeding but without focus on RF.

Eighteen trial implemented interventions aimed to prevent obesity including several components of RF. Interventions in two of them consisted of e-Health interventions and Facebook peer groups, conducted during the first year of life. The rest of the trials consisted of interventions delivered mostly by health professionals and health students including group sessions, home visits, individual counselling, and/ or specific advice during well-child visits. Most of the interventions were initiated before or at the introduction of solids foods, with the exception of two that were implemented during the second year of life. All the trials in this groups were conducted in HICs, with the exception of one carried out in Brazil. Seven were conducted in low-resource settings. Two studies were conducted in Native American communities. Comparators were routine or usual care. In addition, some studies included interventions focused on other topics (e.g. children safety) in the control groups.

We excluded 270 studies. The main reasons of exclusions were wrong intervention (n=90), wrong study design (n=78) and wrong population (n=45) (**Figure 1**). The exclusion reasons of the initially included studies are presented in Appendix 2.

Risk of bias in included trials

Figure 2 shows the risk of bias of the 26 included trials according to Cochrane's ROB2 tool. Of note, most studies were of an overall low risk of bias (11/26 = 42%) or presenting some concerns (11/26 = 42%), and only four were deemed of high risk of bias (4/26 = 16%). The domains that most frequently presented concerns were the description or fulfillment of the randomization process, and the bias related to missing outcomes, mainly due to the loss to follow-up. (***Figure 3***)

Since some articles presented more than one outcome, certain domains were evaluated for each outcome of each trial. In some cases, the risk of bias was different for each outcome of each trial. For Morandi[88], Wasser[89] trials we also detail differential RoB judgment by outcome.

Effects of interventions

Outcome 1. Food Acceptance

There were heterogeneity between trials in the type of outcomes reported with regard to food acceptance. The results are presented by subgroup of interventions.

O1.A Interventions focused on one component of responsive feeding

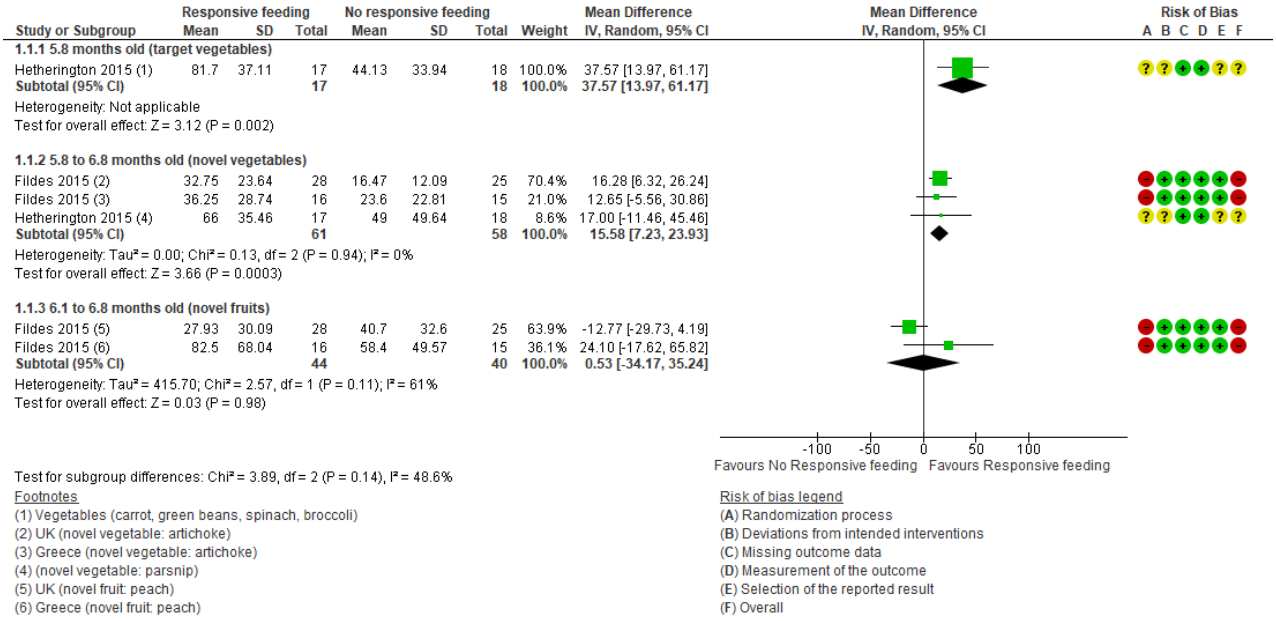
Three studies (Hetherington 2015[55], Fildes 2015[42] and Tournier 2021[43]) reported results regarding food acceptance measurements conducted in a laboratory setting after guidance about repeated exposure of certain foods or textures during the introduction of solids.

A.1 Guidance on repeated exposure to healthy foods (C5)

Interventions in Hetherington et al and Fildes et al trials consisted of guidance on repeated exposure to vegetables since the introduction of solid foods. At 5.8 and 6.8 months old, repeated exposure to a variety of vegetables may increase the amount of target vegetables consumed (MD 37.57 g, 95% CI 13.97 to 61.17 g; participants = 35; studies = 1; low certainty) and probably increases the novel vegetables consumed by a mean increase of 15.58 g (95% CI 7.23 to 23.93 g; participants = 119; studies = 3; I^2 = 0%; moderate

certainty). It is uncertain whether the exposure to vegetables since the introduction of solids has an effect for other food group consumed (e.g. novel fruits, MD 0.53 g, 95% CI -34.17 to 35.24 g; participants = 84; studies = 2; I^2 = 61%; very low certainty). Plot 1.

Plot 1. Food acceptance at ~6 to 7 months old. Amount of target/novel foods consumed (g), after 24 to 35 days of repeated exposure to vegetables.



Results were in accordance with the perception of infant's liking for the same foods assessed in the same studies. Please see Supplementary Plot 1.

A.2 Advice and regular counselling for promoting the introduction of textured foods, delivered by a research dietitian (C3)

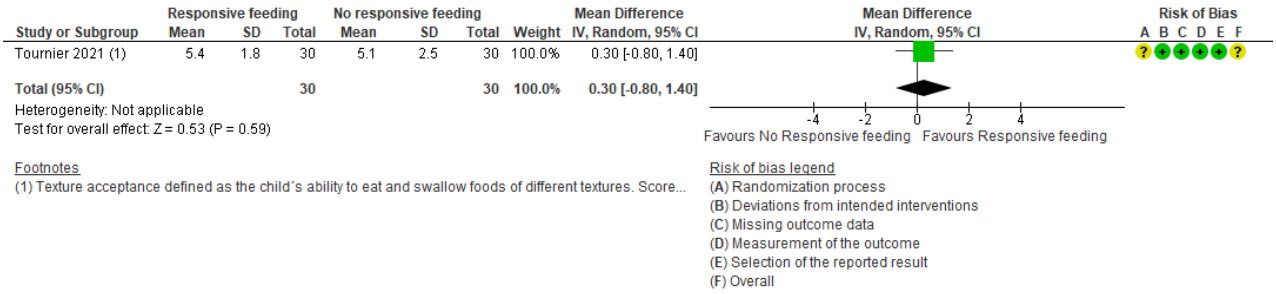
One trial (Tournier 2021) assessed the effect of the advice and counselling for promoting the introduction of textured foods in addition to the standard French recommendations on complementary feeding during 7 months (from 8 to 15 months of age) on food textured acceptance. The control group received the standard French recommendations on complementary feeding. It is uncertain whether the intervention improves food acceptance at 15 months (measured by a global texture acceptance score[4]) because the certainty of this evidence is very low (MD 0.30, 95% CI -0.80 to 1.40; participants = 60; studies = 1, Tournier 2021).
Plot 2

In addition, the trial reported some general eating behaviors related to food acceptance assessed by the Child Eating Behavior Questionnaire-T (CEBQ-T). The intervention may make little or no difference to the mean score of the "Enjoyment of Food" scale[5] (MD -0.12, 95% CI -0.44 to 0.20; participants = 60; studies =

[4] Scale that ranges from 0 (the child did not swallow any trial of any food item) to 8 (the child swallowed all trials of all the offered food items)
[5] CEBQ-T. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child enjoyment of food.

1, low certainty) and the "Food Fussiness" scale[6], (MD 0.09, 95% CI -0.27 to 0.45; participants = 60; studies = 1, low certainty).

Plot 2. Food texture acceptance, global texture acceptance score (15 months old)



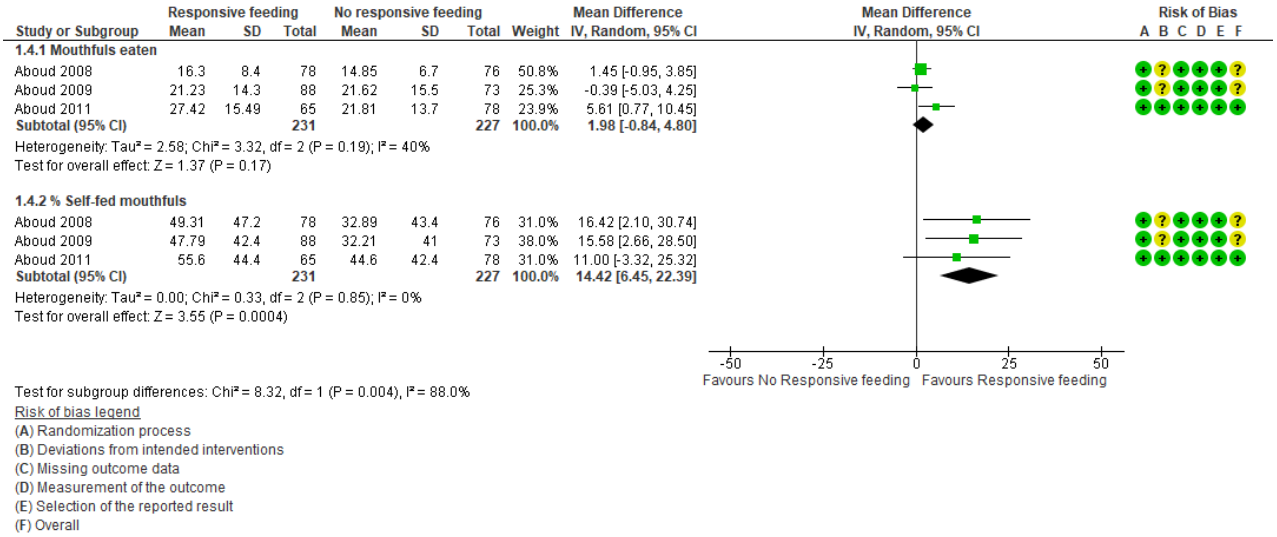
O1.B Interventions aimed to prevent under-nutrition, including two or more components of RF

B.1 Responsive feeding and development stimulation programs, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)

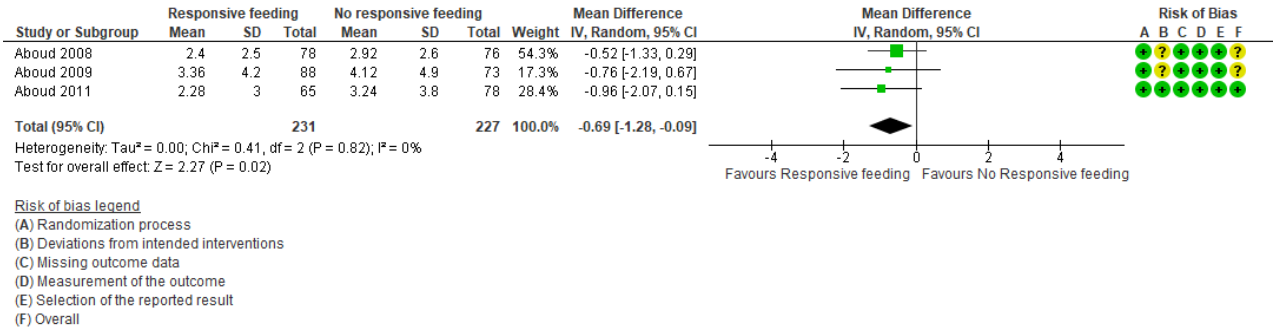
Three trials (Aboud 2008[37], Aboud 2009[52] and Aboud 2011[20]) conducted in Bangladesh reported data obtained by the observation of a midday meal including the number of mouthfuls eaten, the % of self-fed mouthfuls and the number of child refusals[7] at 20-23 months of age. The intervention consisted of a six-session educational responsive stimulation and feeding program, which included discussion, demonstration and practice of self-feeding and RF, and was delivered by women/mothers of the village who were trained as peer educators. It included the following elements of RF: C1, C3, C4 C5, C7, C9 and C10[8], and aimed to prevent under-nutrition. In comparison to the control group, the intervention increase the % self-fed mouthfuls (MD 14.42%, 95% CI 6.45% to 22.39%; participants = 458; studies = 3; I^2 = 0%; high certainty) and probably reduces the number of child refusals (MD -0.69, 95% CI -1.28 to -0.09; participants = 458; studies = 3; I^2 = 0%; moderate certainty). The intervention may make little or no difference to the number of mouthfuls eaten (MD 1.98, 95% CI -0.84 to 4.80; participants = 458; studies = 3; I^2 = 40%; low certainty). Plot 3 and Plot 4

[6] CEBQ-T. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child food fussiness.
[7] defined as the number of offered mouthfuls of food that were rejected by the child.
[8] C1. Recognition of hunger and satiety; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C7. Pleasant and stimulating family eating environment; C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

Plot 3. Food acceptance. Foods consumed in a midday meal, number of mouthfuls eaten and % self-fed mouthfuls at 20 to 23 months old



Plot 4. Child refusals, number of offered mouthfuls of food that were rejected by child (by observation of a midday meal) at 20 to 23 months old



O1.C Interventions aimed to prevent obesity, including two or more components of RF

Trials in this category reported some general eating behaviors related with food acceptance assessed by questionnaire.

C.1 E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8)

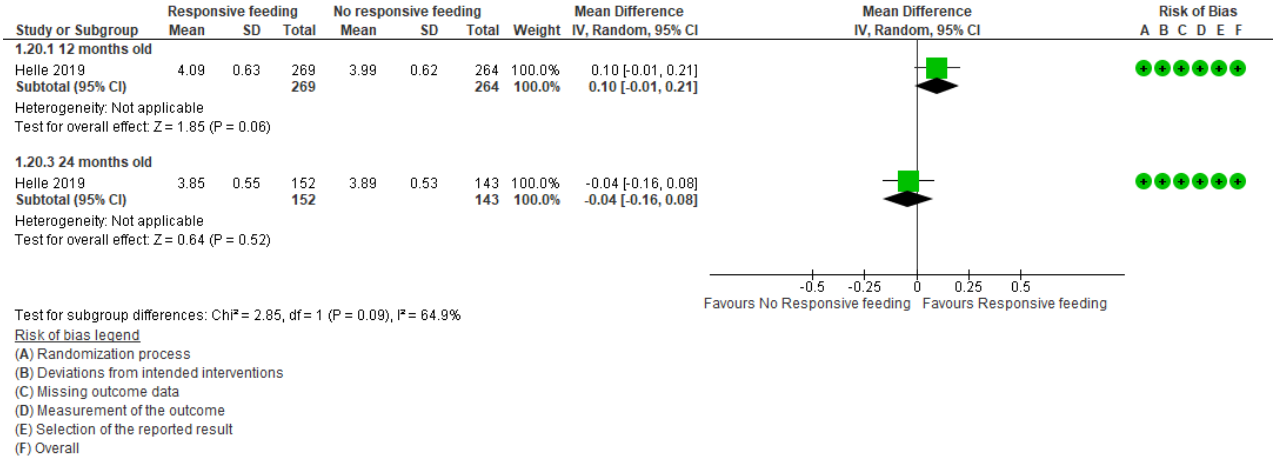
One individual RCT conducted in Norway (Helle 2019[39]) implemented an eHealth intervention (e-mails, a webpage with a monthly age-appropriate video addressing infant feeding topics together with corresponding cooking films/recipes), during 7 months (from 6 to 12 months old). Compared with routine care, the intervention probably slightly increases the "Enjoyment of Food" scale mean score, measured by the Child Eating Behavior Questionnaire (CEBQ) [9] at the age of 12 months (MD 0.10, 95% CI -0.01 to 0.21; participants = 533; studies = 1; moderate certainty) and makes little or no difference at 24 months old (MD -0.04, 95% CI

[9] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child enjoyment of food.

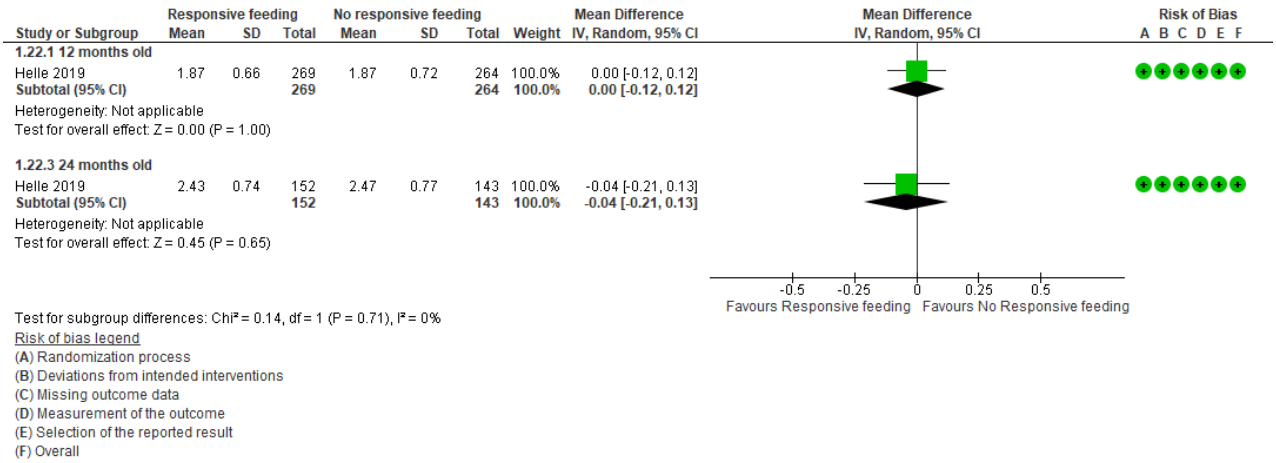
-0.16 to 0.08; participants = 295; studies = 1; moderate certainty). The intervention probably makes little or no difference to the mean score of the "Food Fussiness" scale measured by the same questionnaire[10], both at 12 months old (MD 0.00, 95% CI -0.12 to 0.12; participants = 533; studies = 1; moderate certainty) and at the age of 24 months (MD 0.04, 95% CI -0.21 to 0.12; participants = 295; studies = 1; moderate certainty). Please see Plot 5 and Plot 6.

In addition, parent's perception of child food neophobia[11] was measured by the CFNS scale at 12 and 24 months in Helle et al trial. Comparing with routine care the intervention probably makes little or no difference to the mean score at 12 (MD -0.43, 95% CI -1.05 to 0.19; participants = 533; studies = 1; moderate certainty) or 24 months old (MD -0.42, 95% CI -1.46 to 0.62; participants = 295; studies = 1; moderate certainty). Plot 7

Plot 5. Enjoyment of Food scale scores (Child Eating Behavior Questionnaire, CEBQ) at 12 and 24 months of age. EHealth intervention

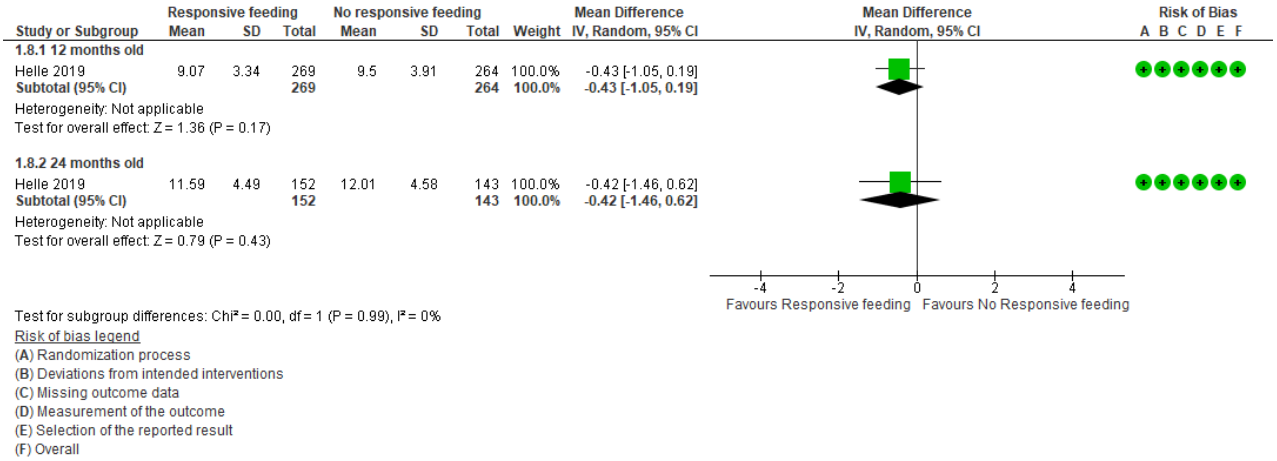


Plot 6. Food Fussiness scale scores (Child Eating Behavior Questionnaire, CEBQ) at 12 and 24 months of age. EHealth intervention



[10] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child food fussiness.
[11] The range of possible scores varies between 6 and 24, with a high score indicating high levels of child food neophobia.

Plot 7. Child Food Neophobia Scale (CFNS) at 12 to 24 months old, eHealth intervention



C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7 and others)

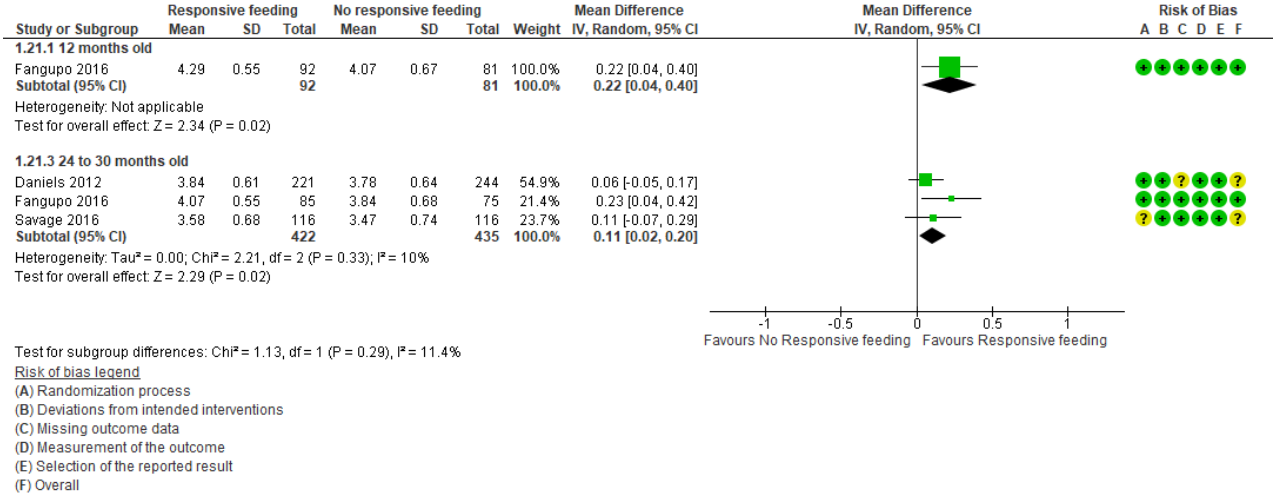
Tournier 2021[43]

Three RCTs reported general eating behaviors related with food acceptance measured by questionnaires: Daniels 2012[40], Fangupo 2016[32], Savage 2016[36]. Daniels 2012 trial was conducted in USA, and the intervention consisted of 2 modules of 6 group sessions at child health clinics delivered by a dietitian and a psychologist. Savage et al trial, also conducted in USA, included four nurses-conducted home visits, 2 research center visits and mail-delivered materials. Fangupo 2016 trial, was carried out in New Zealand, and the intervention consisted of 5 individual parent contacts and 3 home visits with regard to lactation and baby-led complementary feeding (BLISS Study), delivered by lactation consultants and trained research assistants. All the interventions began before the introduction of solids foods and included the following four contents related with RF: recognition of hunger and satiety (C1), infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2), not pressuring child to eat; praising, encourage self-feeding (C4) and pleasant and stimulating family eating environment (C7). Fangupo 2016 also included C9; Daniels: C3, C5, C6 and C9; and Savage C5, C6 and C8. Comparator arm was routine/standard care in all trials, and Savage trial also included child safety messages at the same time points. Interventions finished during the first (Fangupo 2016, 9 months old), the second (Daniels 2012) or the third years of life (Savage 2016). Comparator arm was routine/standard care in all trials, and Savage trial also included child safety messages at the same time points.

In comparison with the control group, the intervention probably increases the mean "Enjoyment of Food" scale score (CEBQ)[12] at 12 months of age (MD 0.22, 95% CI 0.04 to 0.40; participants = 173; studies = 1, RCT: Fangupo 2016; moderate certainty) and may very slightly increase the score between 12 and 30 months of age (MD 0.11, 95% CI 0.02 to 0.20; participants = 857; studies = 3; I^2 = 10%, RCTs: Daniels 2012, Fangupo 2016 and Savage 2016; low certainty). Please see Plot 8

[12] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child enjoyment of food.

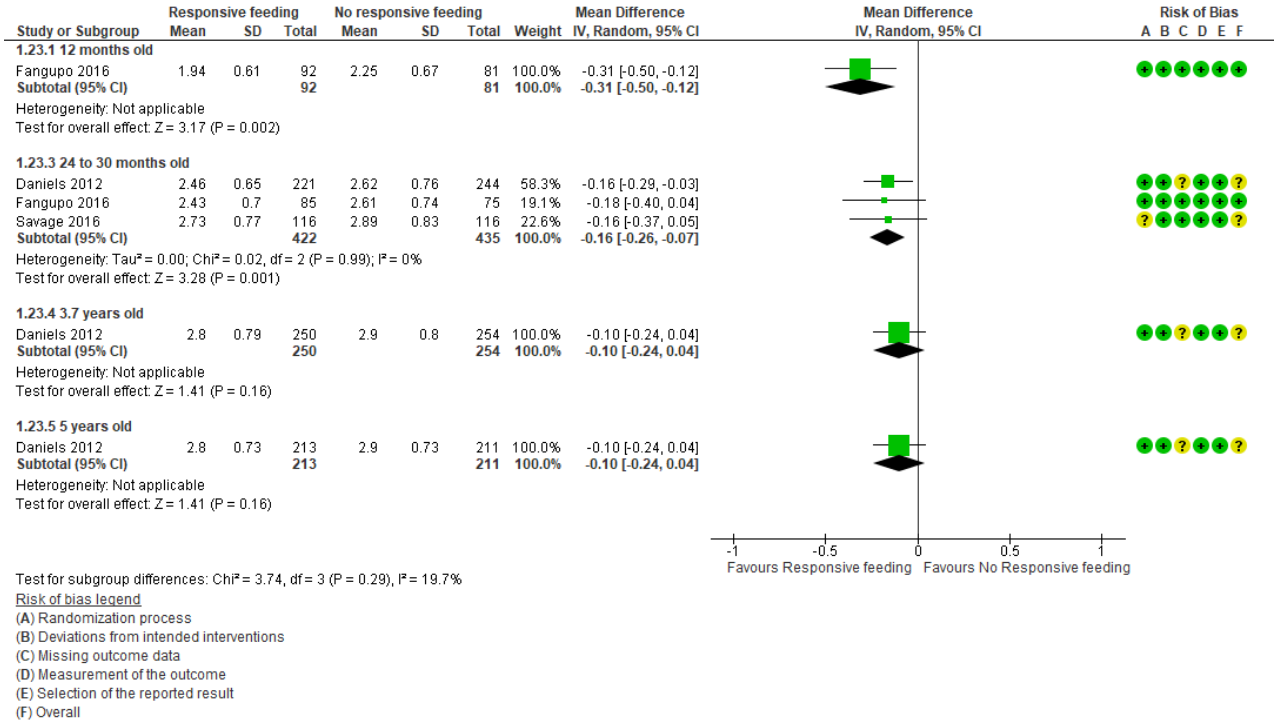
Plot 8. Enjoyment of Food scale scores (Child Eating Behavior Questionnaire, CEBQ) at 12 and 24 months old. Interventions delivered by health professionals.



At 12 months of age, in comparison with routine care the intervention that promote the baby-led complementary feeding was associated with a lower mean "Food Fussiness" scale score *(*CEBQ)[13] (MD -0.31, 95% CI -0.50 to -0.12; participants = 706; studies = 1, Fangupo 2016; high certainty). From 24 to 30 months of age the interventions aimed to prevent the obesity including several components of RF and delivered by health professionals may slightly reduce the mean scale score (MD -0.16, 95% CI -0.26 to -0.07; participants = 857; studies = 3; I^2 = 0%; low certainty). At older ages, the intervention may make little or no difference to food fussiness (3.7 years: MD -0.10, 95% CI -0.24 to 0.04; participants = 504; studies = 1, Daniels 2012; low certainty; and 5 years of age: MD -0.10, 95% CI -0.24 to 0.04; participants = 424; studies = 1, Daniels 2012; low certainty). Plot 9

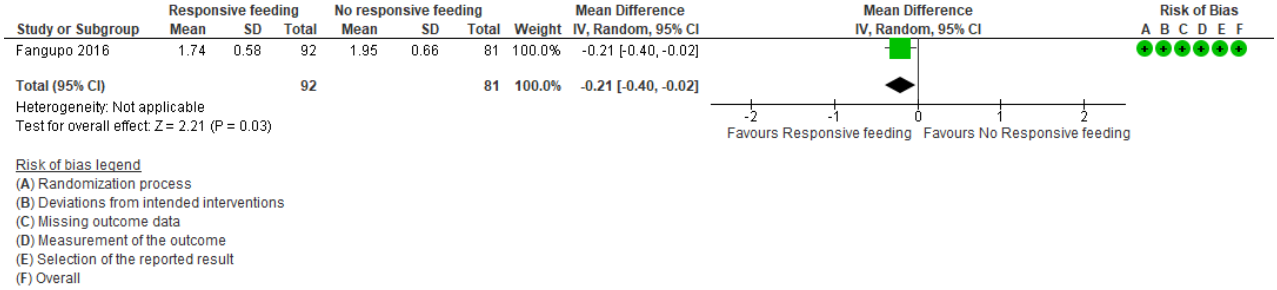
[13] CEBQ. The range of possible scores varies between 1 and 5, with a high score indicating high levels of child food fussiness

Plot 9. Food fussiness scale scores (Child Eating Behavior Questionnaire, CEBQ) between 12 months and 5 years old. Interventions delivered by health professionals



Fangupo 2016[32] also reported results about the perception of *picky eating*[14], measured by the Toddler-Parent Mealtime Behavior Questionnaire (TMBQ) at 12 months. The intervention including components of RF probably reduces slightly the score (MD -0.21, 95% CI -0.40 to -0.02; participants = 173; studies = 1, moderate certainty). Plot 10

Plot 10. Child is picky eater (Toddler-Parent Mealtime Behavior Questionnaire, TMBQ) (12 months old)



Outcome 1. Subgroup analyses

Not applicable.

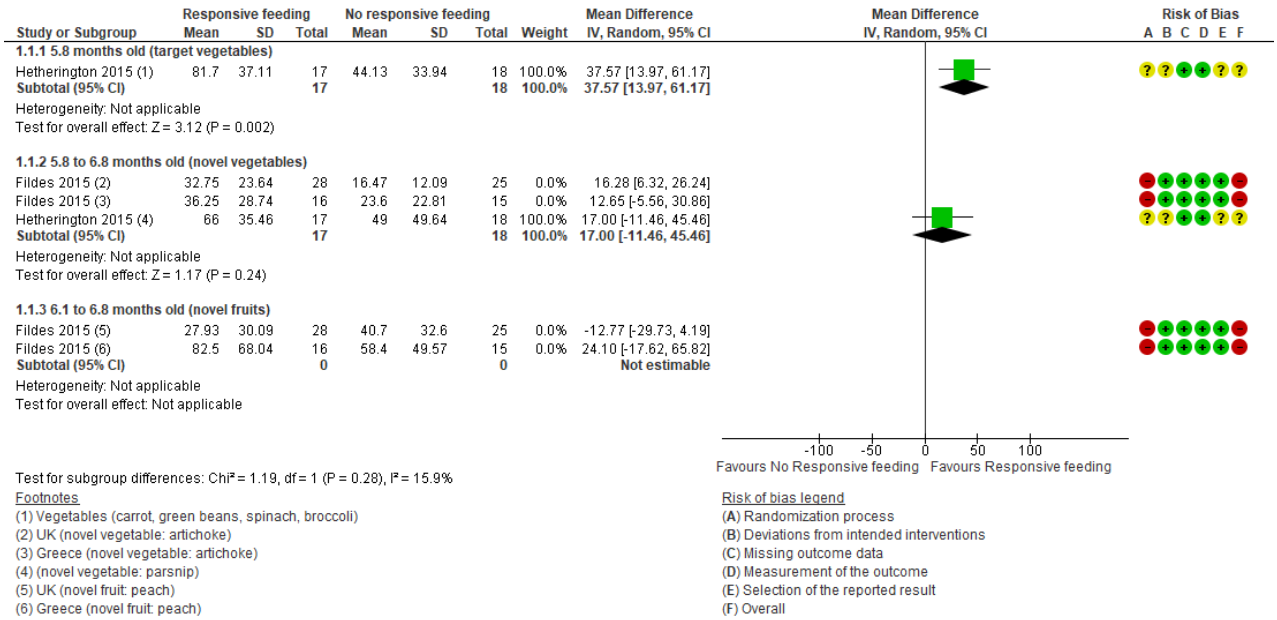
Outcome 1. Sensitivity analyses (SA)

After excluding the studies with overall high risk of bias, we found little to no differences besides the elimination of some subgroup estimations regarding repeated exposure.

[14]TMBQ. Scale ranges from 1 to 5; with greater scores for perception of picky eating indicating less favorable eating behavior.

Intervention A1. The amount of novel vegetables consumed, subgroup 5.8 to 6.8 months (novel vegetables) lost statistically significance: MD 17.00 [95% CI -11.46, 45.46]. SA 1

SA 1. Food acceptance at ~6 month old, amount of target/novel foods consumed (g)



Outcome 2. Food Preference

O2.A Interventions focused on one component of responsive feeding

The outcome was not reported in the included studies.

O2.B Interventions aimed to prevent under-nutrition, including two or more components of RF

The outcome was not reported in the included studies.

O2.C Interventions aimed to prevent obesity, including two or more components of RF

C.1 Interventions aimed to prevent obesity (e-health interventions)

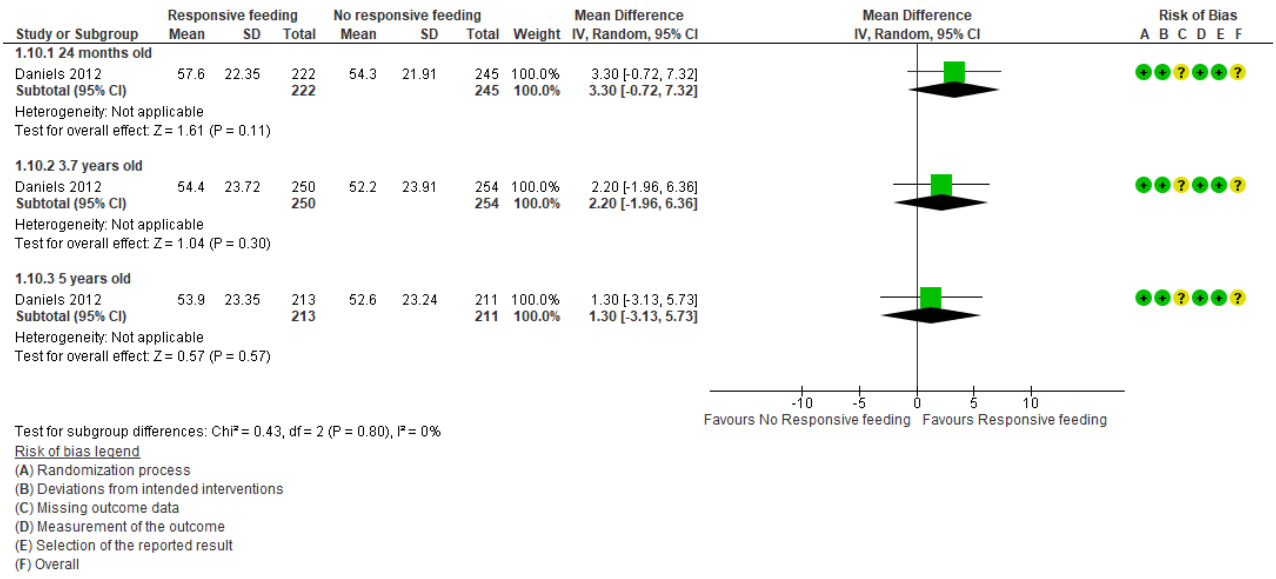
The outcome was not reported in the included studies.

C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9 and others)

Perceived food preferences were assessed in two trials. In the NOURISH RCT (Daniels 2012; USA; intervention consisted of group sessions from before the introduction of solids to ~ 18 months) the proportion of a list of selected food groups "liked" was reported at 24 months, 3.7 and 5 years old. The BLISS RCT (Fangupo 2016[32], New Zealand, intervention consisted of face-to-face or telephone contacts and home visits until the infants were 9-month-old), reported a mean score of "liking" for selected food groups measured at 24 months old (i.e. 15 months after the intervention). Comparator in both trials were routine care. When possible, 24-months-old data were combined on an SMD.

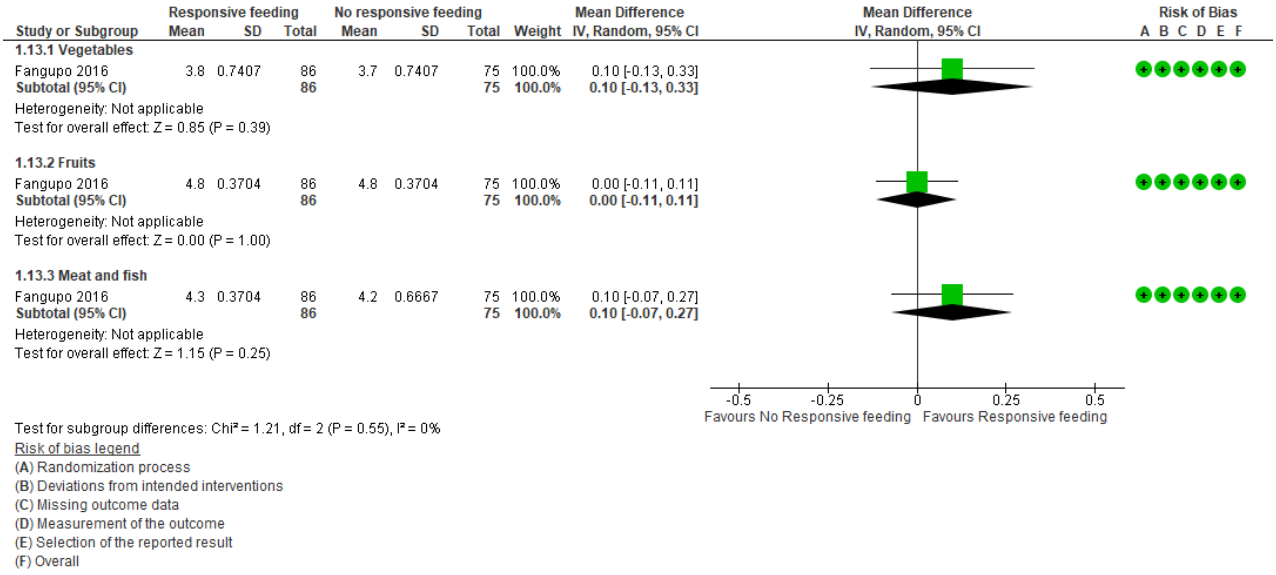
Preferences for vegetables at 24 months old were assessed in both trials. Daniels et al reported that the proportion of listed vegetables liked was 57.4% and 54.3% in the intervention and the control group, respectively (MD 3.30%, 95% CI -0.72 to 7.32%; participants = 467; Plot 11). Fangupo reported that the mean score[15] for vegetables was 3.7 and 3.8 in the intervention and control group, respectively (MD 0.10, 95% CI -0.13 to 0.33; participants = 161; Plot 12). After combining data from both trials on a SMD at 24 months of age (Plot 13), the interventions probably very slightly improve preferences for vegetables (vegetables: SMD 0.15, 95% CI -0.01 to 0.30; participants = 628; studies = 2; I2 = 0%; moderate certainty). At older ages, the intervention may make little or no difference to the proportion (%) of listed vegetables liked (3.7 years old: 54.4% vs. 52.2%; MD 2.20, 95% CI -1.96 to 6.36; participants = 504; studies = 1, Daniels 2012; low certainty), (5 years old: 53.9% vs. 52.6%; MD 1.30, 95% CI -3.13 to 5.73; participants = 424; studies = 1, Daniels 2012; low certainty) Please see Plot 11.

Plot 11. Perceived food preferences, % of listed vegetables "liked" between 24 months and 5 years old

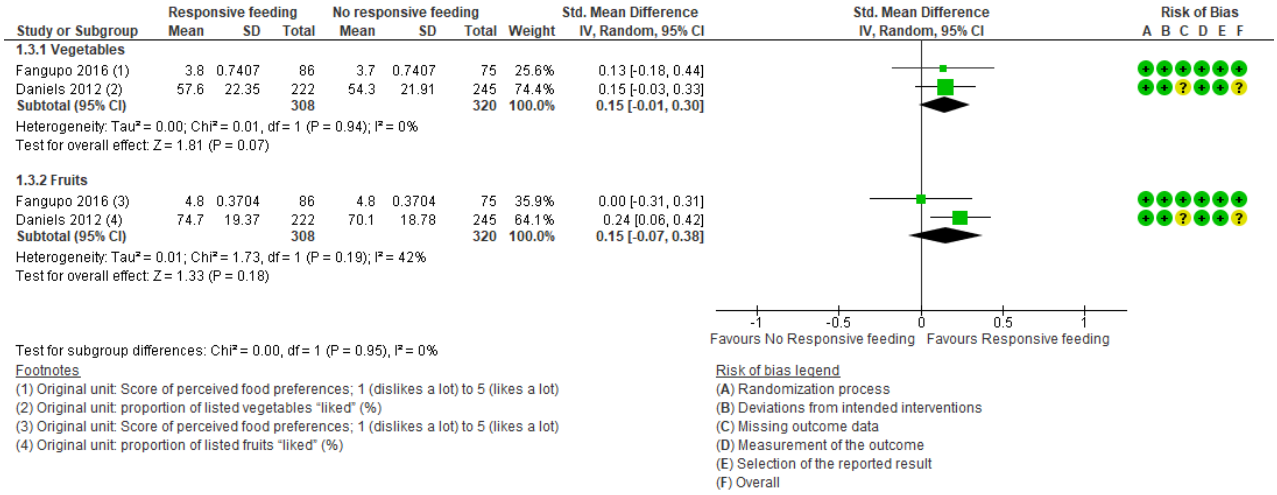


[15] mean score on a response scale of 1 (dislikes a lot) to 5(likes a lot)

Plot 12. Perceived food preference scores, mean score on a response scale of 1 (dislikes a lot) to 5 (likes a lot), for healthy food groups (24 months old)



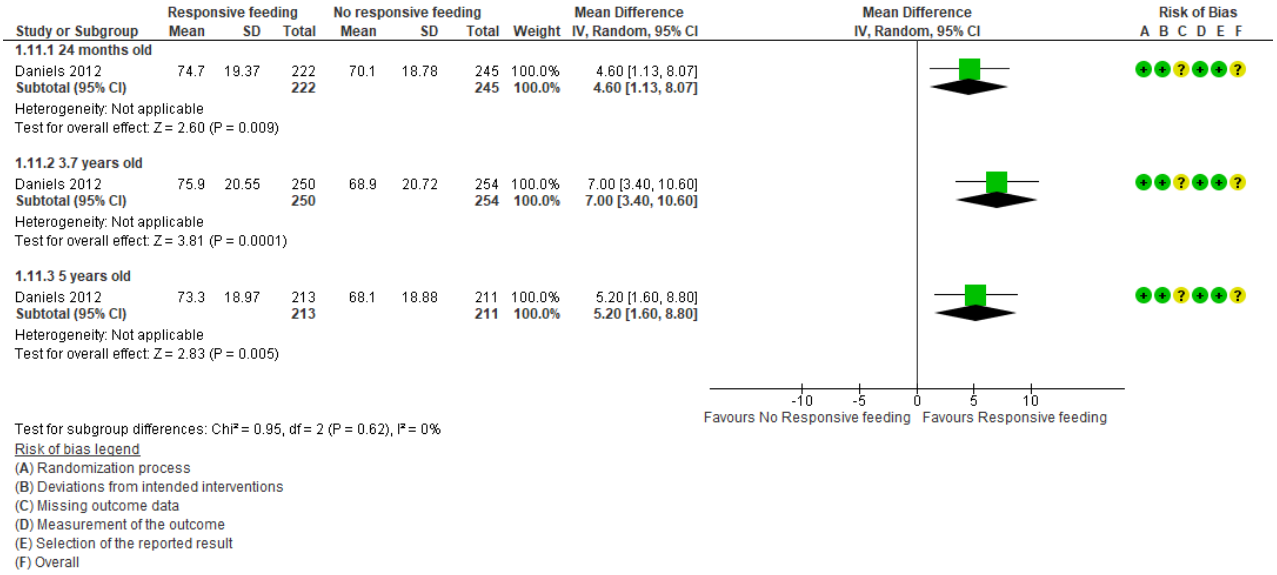
Plot 13. Perceived food preferences, vegetables and fruits at 24 months (SMD)



Preferences for fruits at 24 months old were assessed in both trials. Daniels et al reported that the proportion of listed fruit liked in the intervention and the control group was 74.7% and 70.1%, respectively (MD 4.60, 95% CI 1.13 to 8.07; participants = 467; Plot 14). Fangupo et al reported that the mean score[16] for fruits in the intervention and control group was 4.8 and 4.8, respectively (MD 0.00, 95% CI -0.11 to 0.11; participants = 161; Plot 12). After combining data from both trials on a SMD at 24 months of age (Plot 13), the intervention may slightly increase the perception of liking for fruits (SMD 0.15, 95% CI -0.07 to 0.38; participants = 628; studies = 2; I^2 = 42%; low certainty). At older ages, the intervention probably increases the proportion (%) of listed vegetables liked (3.7 years old: 75.9% vs. 68.9%; MD 7.00, 95% CI 3.40 to 10.60; participants = 504; studies = 1, Daniels 2012; moderate certainty/ 5 years old: 73.3% vs. 68.1%; MD 5.20, 95% CI 1.60 to 8.80; participants = 424; studies = 1, Daniels 2012; moderate certainty) Please see Plot 14

[16] mean score on a response scale of 1 (dislikes a lot) to 5(likes a lot)

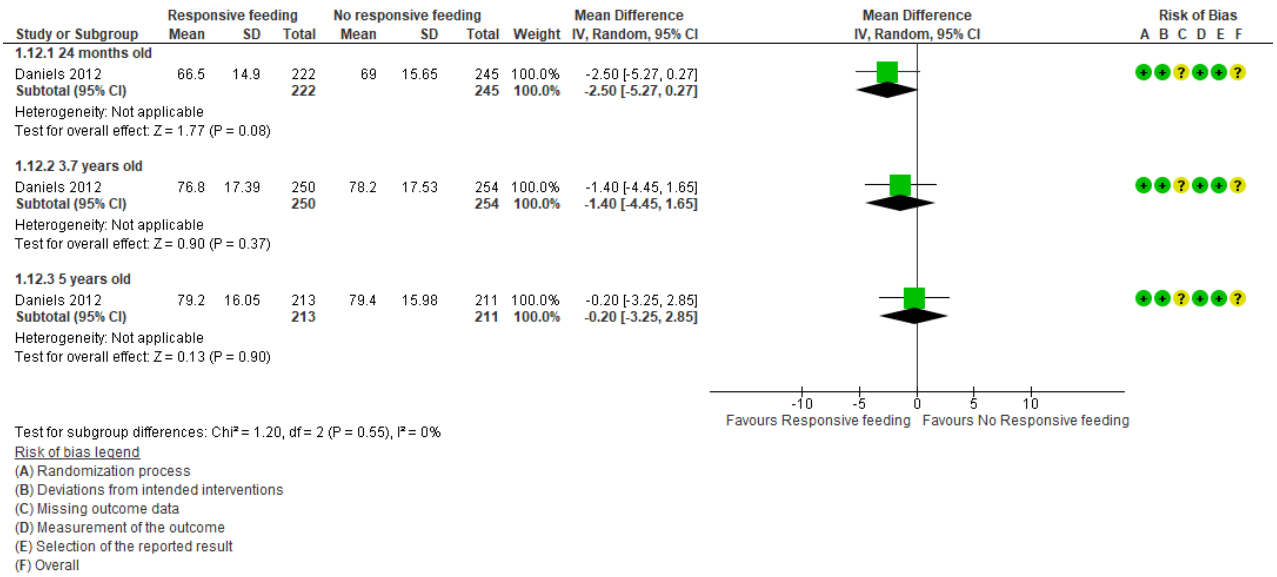
Plot 14.Perceived food preferences, % of listed fruits "liked" between 24 months and 5 years old



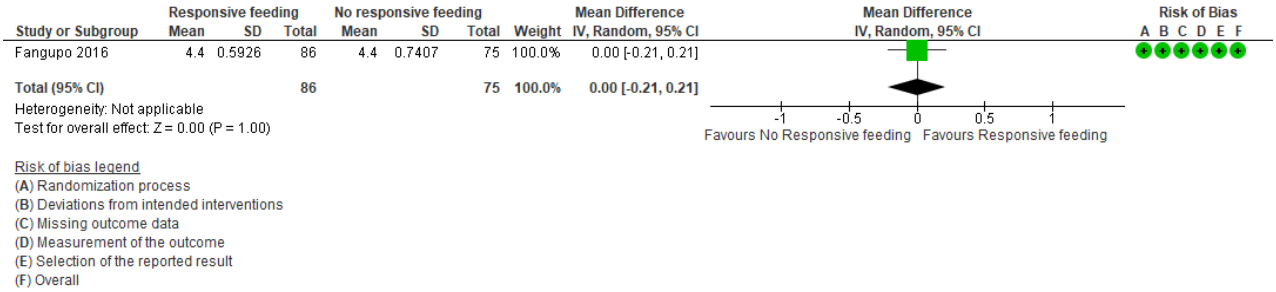
Preferences for meat and fish at 24 months old were assessed in Fangupo 2016 trial. Fangupo et al reported that the mean score for meat and fish in the intervention and control group was 4.3 and 4.2, respectively. The intervention probably makes little or no difference to preferences for meat and fish (MD 0.10, 95% CI -0.07 to 0.27; participants = 161; studies=1; Plot 12; moderate certainty).

Preferences for energy-dense sweet and savory foods (reported by the authors as discretionary foods) were assessed in NOURISH RCT. The intervention may make little or no difference to the proportion (%) of listed sweet and savory foods liked at 24 months (66.5% vs 69%; MD -2.50, 95% CI -5.27 to 0.27; participants = 467; studies=1; low certainty), 3.7 years (76.8% vs 78.2%; MD -1.40, 95% CI -4.45 to 1.65; participants = 504; studies=1; low certainty) and 5 years old (79.2% vs 79.4%; MD -0.20, 95% CI -3.25 to 2.85; participants = 424; studies=1; low certainty). Plot 15. In addition, Fangupo et al reported the mean score of liking for desserts at 24 months old without differences between groups (Plot 16).

Plot 15. Perceived food preferences, % of listed sweet and savory foods "liked" between 24 months and 5 years old



Plot 16. Perceived food preference scores, mean score on a response scale of 1 (dislikes a lot) to 5 (likes a lot), for desserts (24 months old))



Outcome 2. Subgroup analyses

Not applicable.

Outcome 2. Sensitivity analyses (SA)

Not applicable.

Outcome 3. Intake of healthy food/beverages

Fourteen trials (Aboud 2008[16], Aboud 2009[52], Aboud 2011[20], Aboud 2013[38], Black 2021[56], Campbell 2013[48], Daniels 2012[40], Fangupo 2015[45], French 2012[41], Helle 2019[39], Louzada 2012[46], Messito 2020[54], Savage 2016[36], Vazir 2013[33]) reported at least one result regarding the consumption of healthy foods and beverages. Interventions in all trials in this section have included messages targeting the consumption of healthy foods. A variety of outcomes were identified, including a dietary diversity score, the intake of fruits, vegetables, eggs, meat, poultry, fish and water; as well as a diet quality score and a healthy dietary pattern derived by principal component analysis.

O3.A Interventions with focus in one component of RF

The outcome was not reported in the included studies.

O3.B Interventions with two or more elements of RF, aimed to prevent under-nutrition

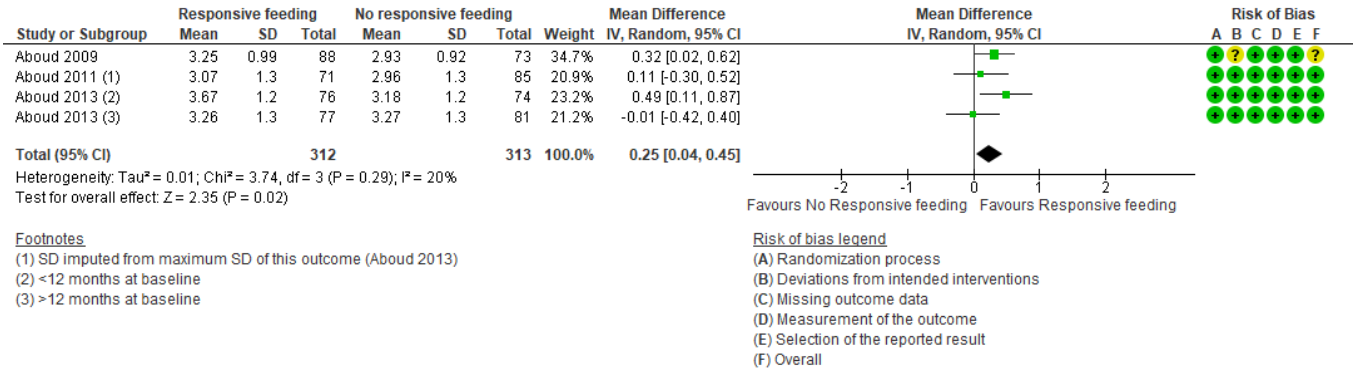
B.1 Responsive feeding and development stimulation programs, delivered by trained women/mothers of the village or family welfare assistants, including 6-7 components of RF (C1, C3, C4, C5, C7, C9 and in some studies C10)

Five cluster RCTs conducted in rural villages in LICs reported at least one result related to the consumption of healthy foods. Four were carried out in Bangladesh (Aboud 2008, 2009, 2011[17] and 2013[18]) and one of them in India (Vazir 2013[19]). Interventions in trials conducted in Bangladesh began after the weaning period and consisted of group sessions or home visits including discussion, demonstration and practice of self-feeding and responsive feeding. Intervention in Vazir et al trial began at the child's age of 3 months and lasted until the age of 15 months and was delivered in bi-weekly visits. Interventions in all trials included contents about the same elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9); and trials conducted in Bangladesh also included some messages about feeding during and after illness (C10).

Dietary Diversity

The number of critical food groups (out of 7) consumed the day before was reported in three trials conducted in Bangladesh: Aboud 2009, 2011 and 2013. In comparison with regular programs, those programs focused on responsive complementary feeding and development stimulation, delivered by trained women of the village or family welfare assistants probably result in a slight increase in the number of critical food groups consumed the previous day (MD 0.25, 95% CI 0.04 to 0.45; participants = 625; studies/sub-studies = 4; I^2 = 20%; moderate certainty) between 17 and 21 months old. Plot 17

Plot 17. Dietary diversity (# of food groups consumed out of 7 critical food groups during the previous day) between 17 and 21 months old



Consumption of fruits, vegetables, eggs, meats and fish

Three trials with interventions focused on responsive complementary feeding and development stimulation reported information related to the consumption of fruits, vegetables, eggs, meats and fish: Aboud 2008, 2009 and Vazir 2013.

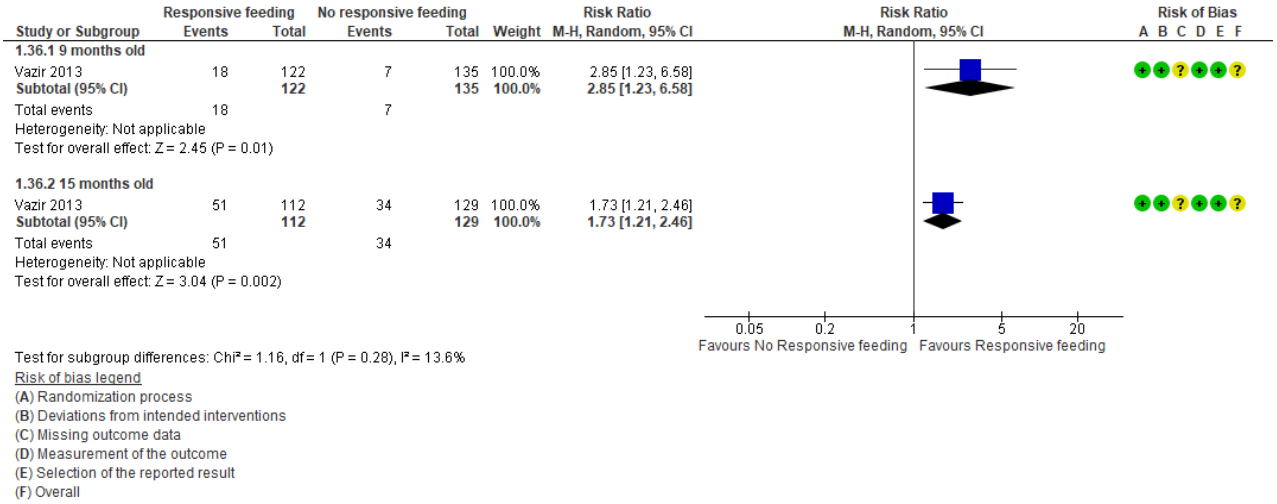
[17] Aboud 2011: Only one of two intervention groups was included (Responsive complementary feeding and stimulation program). An intervention group which included nutrient supplementation was not included in this systematic review.
[18] Aboud 2013: there were two sub-studies according to the age at the beginning of the study and both were included.
[19] Vazir 2013: Only one out of two intervention groups was included (Responsive complementary feeding and play program). An intervention group focused on complementary feeding (not RF) was not included in this systematic review.

Fruit and vegetable Intake

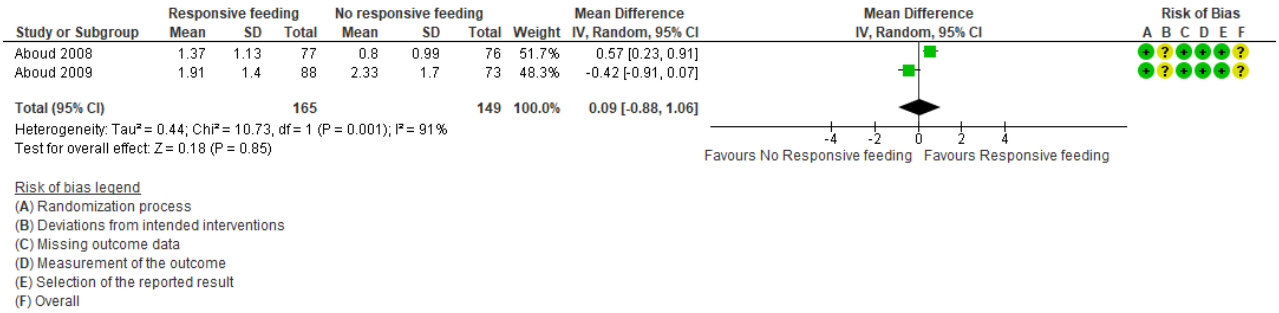
Vegetable consumption after the intervention implemented since the child's age of three months (Vazir 2013): in comparison with the regular program, the intervention probably increases the proportion of the group that consumes vegetables (spinach) during the previous week at 9 months old (14.8% vs. 5.2%, RR 2.85, 95% CI 1.23 to 6.58; participants = 257; studies = 1; moderate certainty) and at 15 months old (45.5% vs. 26.4%, RR 1.73, 95% CI 1.21 to 2.46; participants = 241; studies = 1; moderate certainty). Plot 20

It is uncertain whether the interventions initiated during the second year (Aboud 2008 and 2009) increase the frequency of intake of vegetables between 20 and 23 months of age (MD 0.09 times/day, 95% CI -0.88 to 1.66; participants = 314; studies = 2; I^2 = 91%; very low certainty). Plot 19

Plot 18. Vegetable intake (spinach), previous week consumption (9 to 15 months old)



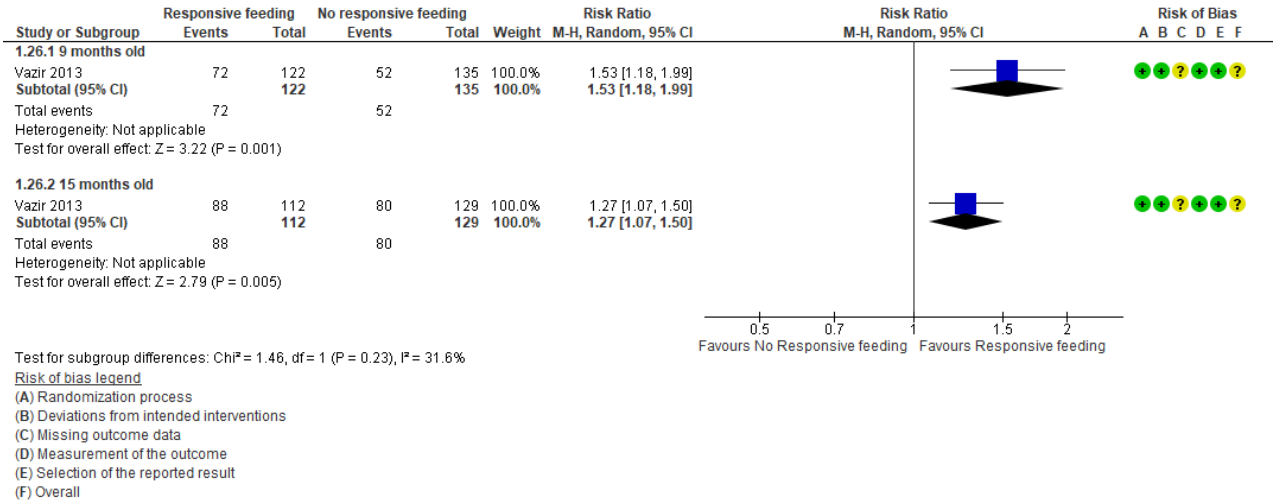
Plot 19. Vegetable intake, times/day (20 to 23 months old)



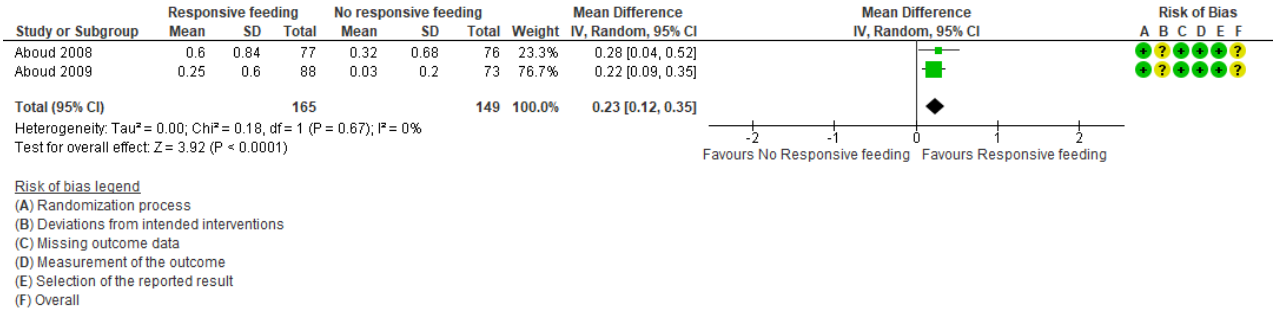
Fruit consumption after the intervention implemented since the child's age of three months (Vazir 2013): in comparison with the regular program, the intervention probably increases the proportion of the group that has consumed fruit (banana) during the previous week at nine months old (59.0% vs 38.5%, RR 1.53, 95% CI 1.18 to 1.99; participants = 257; studies = 1; moderate certainty). Similar results were found at the age of 15 months (78.6% vs 62.0%, RR 1.27, 95% CI 1.07 to 1.50; participants = 241; studies = 1; moderate certainty). Plot 20

According to the two trials conducted in Bangladesh (Aboud 2008 and 2009), the intervention initiated during the second year of life probably increase the frequency of consumption of fruit at 20-23 months old (MD 0.23 times/day, 95% CI 0.12 to 0.35; participants = 314; studies = 2; I^2 = 0%; moderate certainty). *Plot 21*

Plot 20. Fruit intake (banana), previous week consumption (9 to 15 months old)



Plot 21. Fruit intake, times/day (20 to 23 months old)

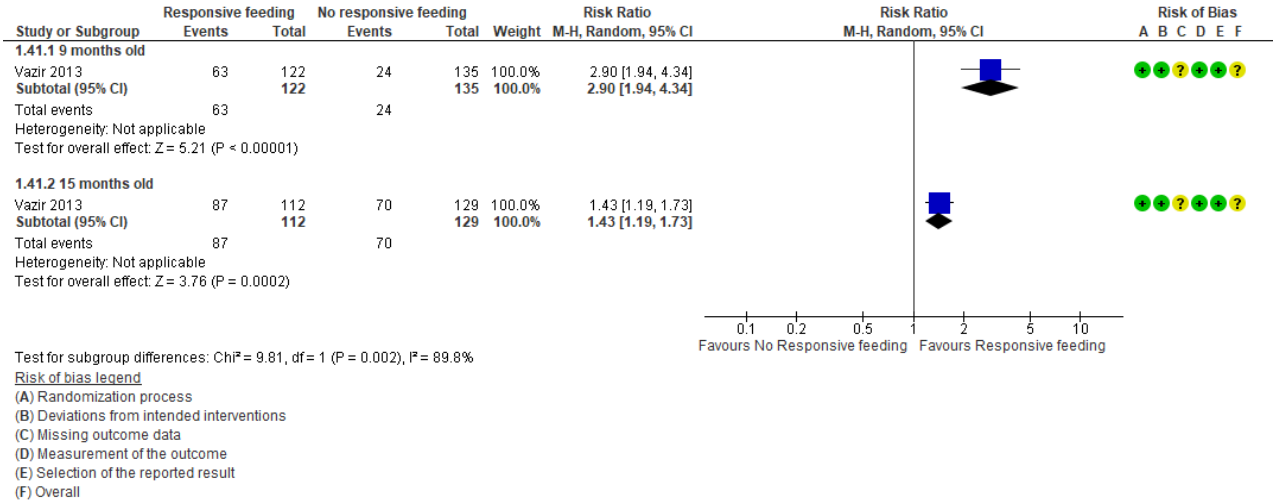


Eggs, meat and fish

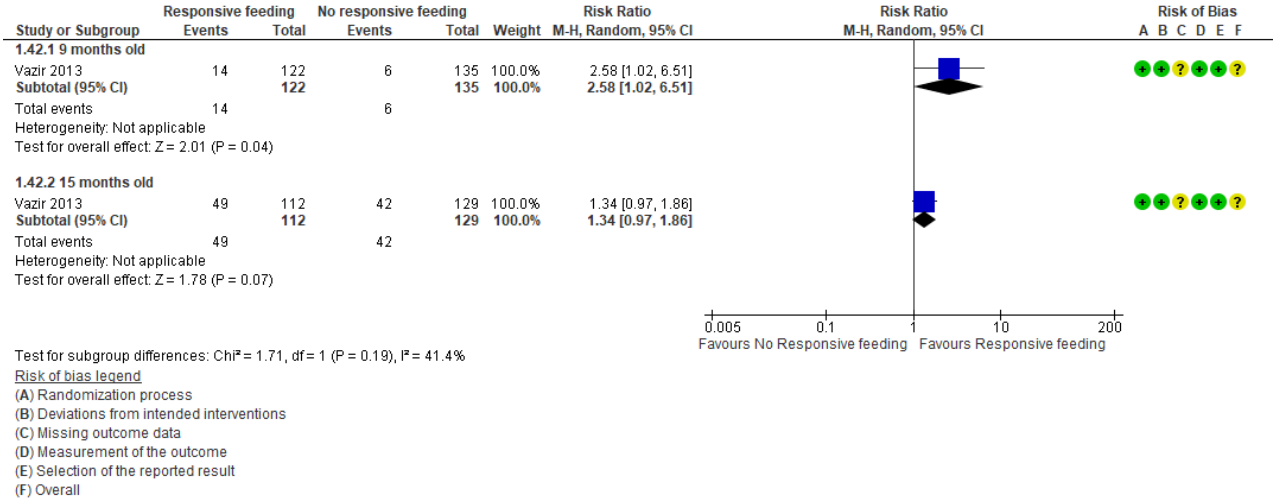
The responsive feeding and development stimulation program initiated at 3 months of age (Vazir 2013), probably increases the proportion of the group that consumes eggs (at least once during the previous week) at the age of 9 months (51.6% vs 17.8%, RR 2.90, 95% CI 1.94 to 4.34; participants = 257; studies = 1; moderate certainty; Plot 22) and 15 months (77.7% vs 54.3%, RR 1.43, 95% CI 1.19 to 1.73; participants = 241; studies = 1; moderate certainty; Plot 22).**Error! Reference source not found.** The same intervention may slightly increase the proportion of the group that consumes meat (goat) (at least once during the previous week) at the age of 9 months (11.5% vs 4.44%, RR 2.58, 95% CI 1.02 to 6.51; participants = 257; studies = 1; low certainty; Plot 23) and 15 months (43.8% vs 32.6%, RR 1.34, 95% CI 0.97 to 1.86; participants = 241; studies = 1; low certainty; Plot 23).

According to the two trials conducted in Bangladesh (Aboud 2008 and Aboud 2009), a responsive feeding and development stimulation program initiated during the second year of life, may slightly increase the frequency of consumption of eggs, measured in times/day at 20-23 months (MD 0.13, 95% CI -0.00 to 0.25; participants = 314; studies = 2; I2 = 43%; low certainty). Based on the same trials, the intervention may make little or no difference to the frequency of consumption of fish (MD -0.06 times/day, 95% CI -0.30 to 0.17; participants = 314; studies = 2; I^2 = 0%; low certainty). Plot 24

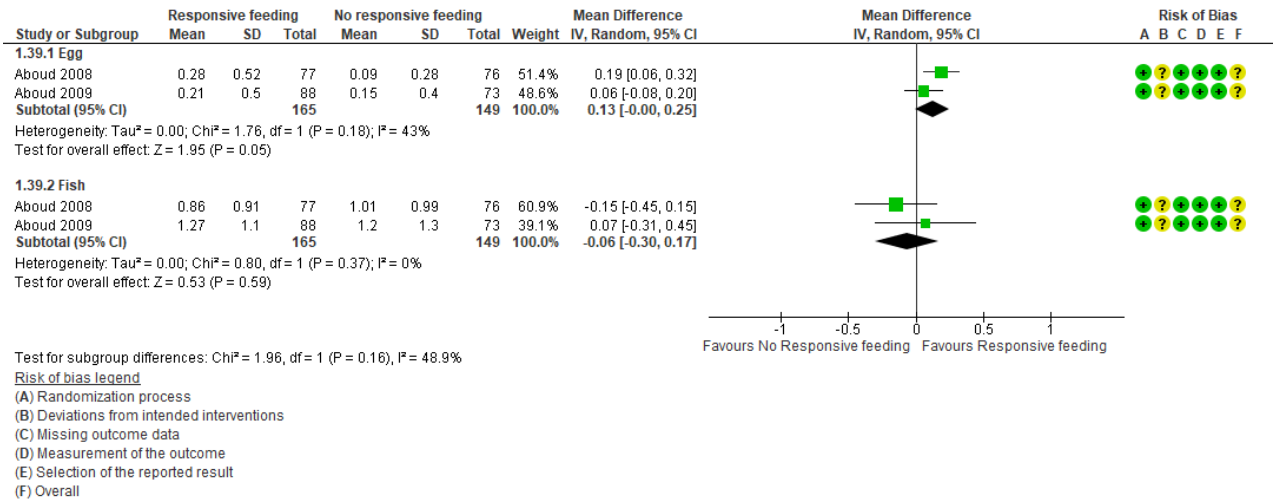
Plot 22. Egg intake, previous week consumption (9 to 15 months old)



Plot 23. Meat (goat) intake, previous week consumption (9 to 15 months old)



Plot 24. Egg and fish consumption, times/day (20 to 23 months old)



O3.C Interventions with two or more elements of RF, aimed to prevent obesity

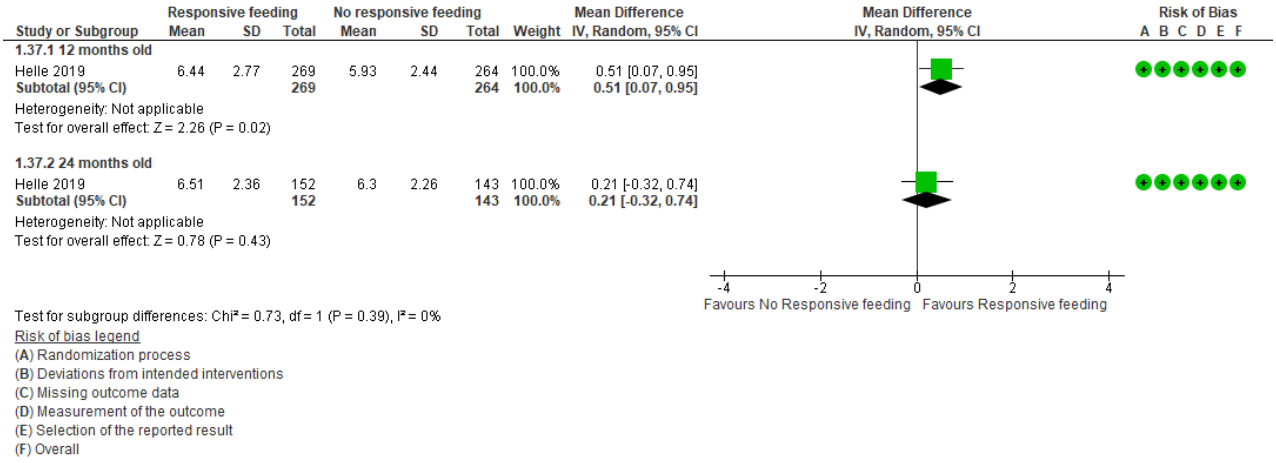
C.1 E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8)

The individual RCT conducted in Norway (Helle 2019[39]) that implemented an eHealth intervention during 7 months (from 6 to 12 months old) reported data regarding fruit and vegetable consumption.

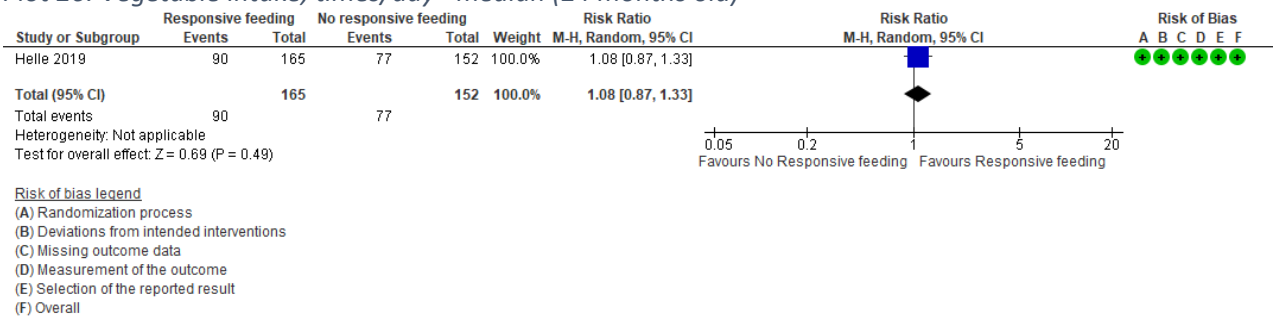
Compared with routine care, the intervention probably increase the frequency of consumption of fruits and vegetables at 12 months old (MD 0.51 times/ day, 95% CI 0.07 to 0.95; participants = 533; studies = 1, moderate certainty; Plot 25).

The intervention probably leads to minimal to no important difference at 24 months. However, the 95% interval is also compatible with a slightly increase in fruit and vegetable consumption at 24 months old (MD 0.21 times/day, 95% CI -0.32 to 0.74; participants = 295; studies = 1, moderate certainty; Plot 25). In addition, the same study reported dichotomous outcomes (times per day above the median) at 24 months of age showing similar results for the consumption of vegetables (RR 1.08, 95% CI 0.87 to 1.33; participants = 317; studies = 1; low risk of bias; Plot 26) and fruits (RR 1.12, 95% CI 0.90 to 1.39; participants = 325, low risk of bias; Plot 27).

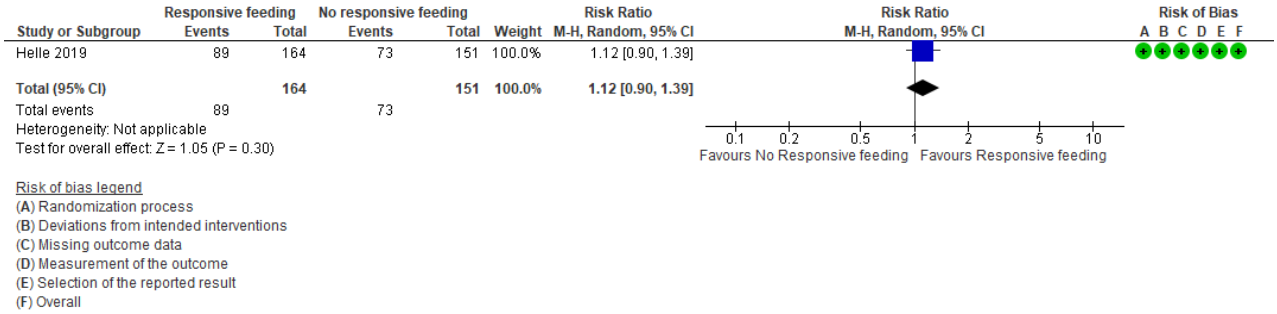
Plot 25. Fruit and vegetable intake, times per day score (12 to 24 months old)



Plot 26. Vegetable intake, times/day >median (24 months old)



Plot 27. Fruit intake, times/day >median (24 months old)



C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)

Nine trials in this category of interventions (Black 2021[56], Campbell 2013[48], Daniels 2012[40], Fangupo 2015, Fangupo 2016, French 2012[41], Louzada 2012[46], Messito 2020[54], Savage 2016[36]) reported at least one result regarding the consumption of healthy foods and beverages.
Interventions consisted of group or individual sessions during home visits or at health centers, and specific brief advice included in well-child visits. All the interventions had begun before the introduction of solid foods, with the exception of one of them one implemented during the second year of life (Black 2021). All the interventions were delivered by health professionals and/or research assistants.

Contents with regard to RF:

- All the interventions included the following contents: recognition of hunger and satiety (C1), not pressuring child to eat, praising, encourage self-feeding (C4), and pleasant and stimulating family eating environment (C7).
- With the exception of two trials (Fangupo 2015 and Louzada 2012), all the RCTs with interventions implemented before the introduction of solids had included contents about infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2).
- All the trials included contents with regard to the role modelling of healthy eating (C6), with the exception of Fangupo 2016 study.
- Eight trials included contents about flavor preferences and repeated exposure to certain foods (interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C5)
- Six trials included appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention) (C8).
- Four trials included messages about the texture/ consistency responsive to child developmental needs (C3) and the positive caregiver verbalization during feeding (C9).

Interventions in all trials in this section have included messages targeting the consumption of healthy foods.

All the trials were conducted in HICs, with the exception of Louzada 2012 trial that was conducted in Brazil (LMIC). Three of the studies were conducted in low-resource settings (Black 2021, French 2012, and Messito 2020). When it was possible we conducted subgroup analyses.

A variety of outcomes were identified, including the intake of fruits, vegetables, meat, poultry, fish and water; as well as a diet quality score and a healthy dietary pattern derived by principal component analysis.

Fruit and vegetable intake

Fruit and vegetable intake was assessed by diverse methodologies and results were expressed in different units, thus we combined data by calculating the SMD. Data in original units are presented in the section Supplementary data and plots.

Vegetables

Four trials reported the consumption of vegetables at ages between 9 and 12 months (Campbell 2013, French 2012, Savage 2016 and Messito 2020). Interventions consisted of parent group sessions delivered by dietitians (Campbell 2013, Messito 2020), specific brief advice at each well-child visit given by clinic physicians, nurses and medical assistants (French 2012) and home visits by trained research nurses (Savage 2016). They included seven or eight components of RF, and were implemented before the introduction of solids. Control groups included routine care in all the trials. In addition, the control group of Savage RCT included child safety messages, at the same time points and matched for content intensity with those given in the intervention group.

Data from three of the trials (Campbell 2013, French 2012, and Savage 2016) were combined on an SMD. In comparison with routine care, those interventions may make little or no difference to vegetable consumption (SMD 0.04[20], 95% CI -0.15 to 0.23; participants = 542; studies = 3; I^2 = 17%; low certainty; Plot 28). In addition, Messito 2020 reported little or no difference in daily vegetable consumption (dichotomous outcome) between the intervention and the control group at 10 months of age (66.3% vs. 67.1%, RR 0.99, 95% CI 0.86 to 1.13; participants = 412; low risk of bias; Plot 29). Please see subgroup analysis and sensitivity analysis below.

Three trials reported the consumption of vegetables at ages between 20 and 24 months (Black 2021, Campbell 2013, and Daniels 2012). Interventions consisted of parent group sessions delivered by dietitians (Campbell 2013, contents included 7 components of RF), dietitians and psychologists (Daniels 2012, 8 components of RF) or Masters-level health educators (Black 2021, 6 components of RF). Interventions in two trials began before the introduction of solids and lasted to ~18 months (Campbell 2013 and Daniels 2012) and Black's trial during the second year of life. Control groups included routine care in all the trials. In addition, the control group of Black RCT included sessions focused on children safety. Data were combined on an SMD. In comparison with routine care, the interventions may make little or no difference to the consumption of vegetables at 20 to 24 months (SMD -0.01[21], 95% CI -0.15 to 0.13; participants = 1002; studies = 3; I^2 = 15%; low certainty; Plot 28). Please see subgroup analysis below.

Two trials reported results at 3.5 and 5 years old (Campbell 2013 and Daniels 2012). Both consisted of parent group sessions delivered by dietitians or dietitians and psychologists, with contents including seven or eight components of RF, from ~ 4 to 18 months of age. Compared to usual care, these interventions may make little to no difference to vegetable intake at 3.5 - 3.7 years (SMD 0.07[22], 95% CI -0.17 to 0.31; participants =

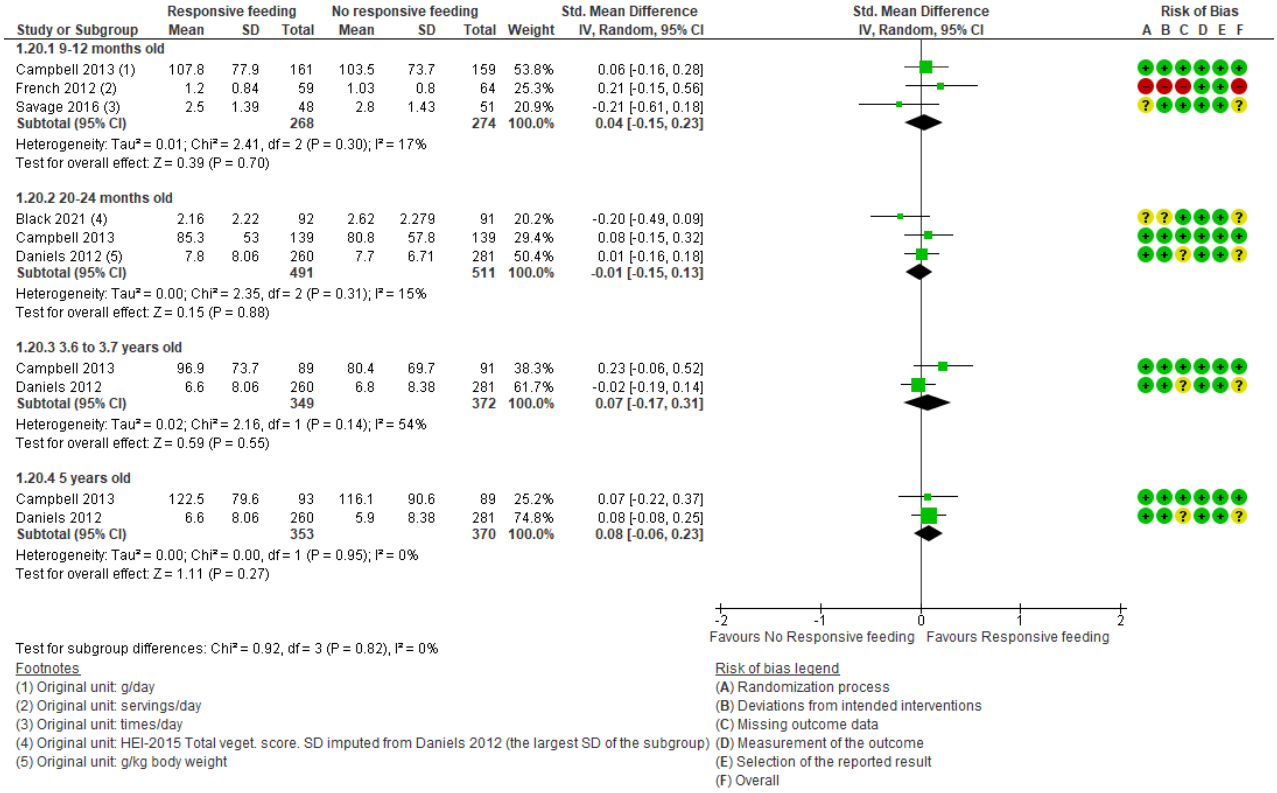
[20] This SMD is equivalent to the following MD in the original units: a) 3.0 g/day (95%CI –11.37 to 17.43), b) 0.03 servings/day (95%CI -0.12 to 0.19), and c) 0.06 times/day (95%CI -0.21 to 0.32).

[21] This SMD is equivalent to the following MD in the original units: a) -0.55 g/day (95%CI -8.31 to 7.02), b) -0.07 g/kg of body weight, (95%CI -1.15 to 0.96), and c) -0.02 points of the HEI-2015 total vegetable score (95%CI -0.34 to 0.29).

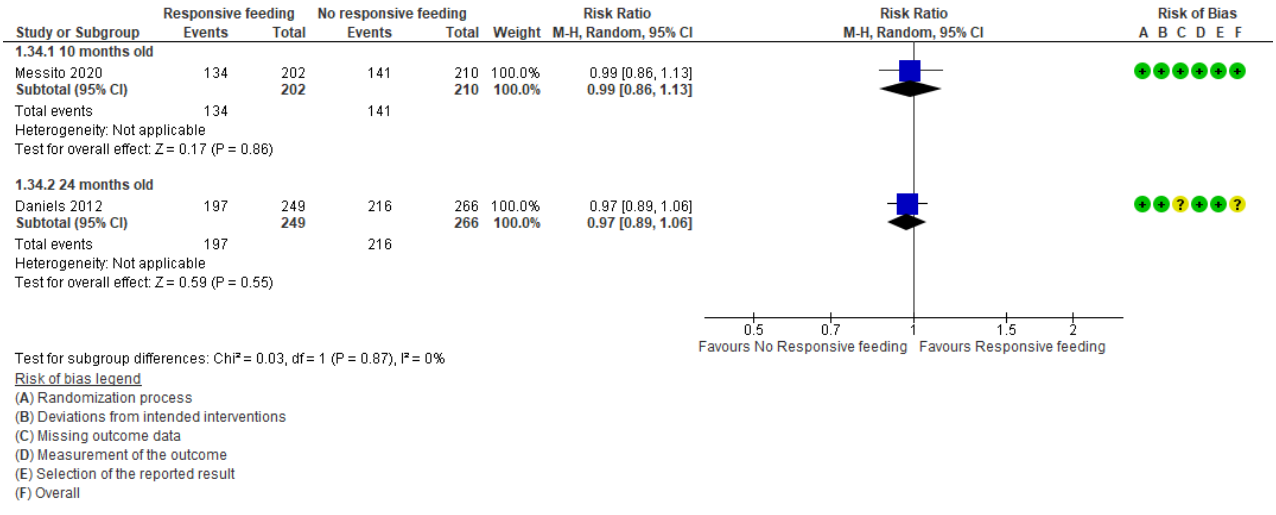
[22] This SMD is equivalent to the following MD in the original units: a) 5.02 g/day (95%CI -12.19 to 22.23), and b) 0.58 g/kg of body weight (95%CI -1.40 to 2.55).

721; studies = 2; I^2 = 54%, low certainty; Plot 28) and probably make little or no difference at 5 years old (SMD 0.08[23], 95% CI -0.06 to 0.23; participants = 723; studies = 2; I^2 = 0%, moderate certainty; Plot 28).

Plot 28. Vegetable intake, SMD (9 months to 5 years old)



Plot 29. Vegetables, daily consumption/previous day consumption (10 to 24 months old)



Fruit Intake

[23] This SMD is equivalent to the following MD in the original units: a) 6.81 g/day (95%CI -5.11 to 19.57), and b) 0.66 g/kg of body weight (95%CI -0.49 to 1.89).

Trials reporting vegetable intakes were the same as those reporting fruit consumption. Please see the description of the studies above (vegetable intake section).

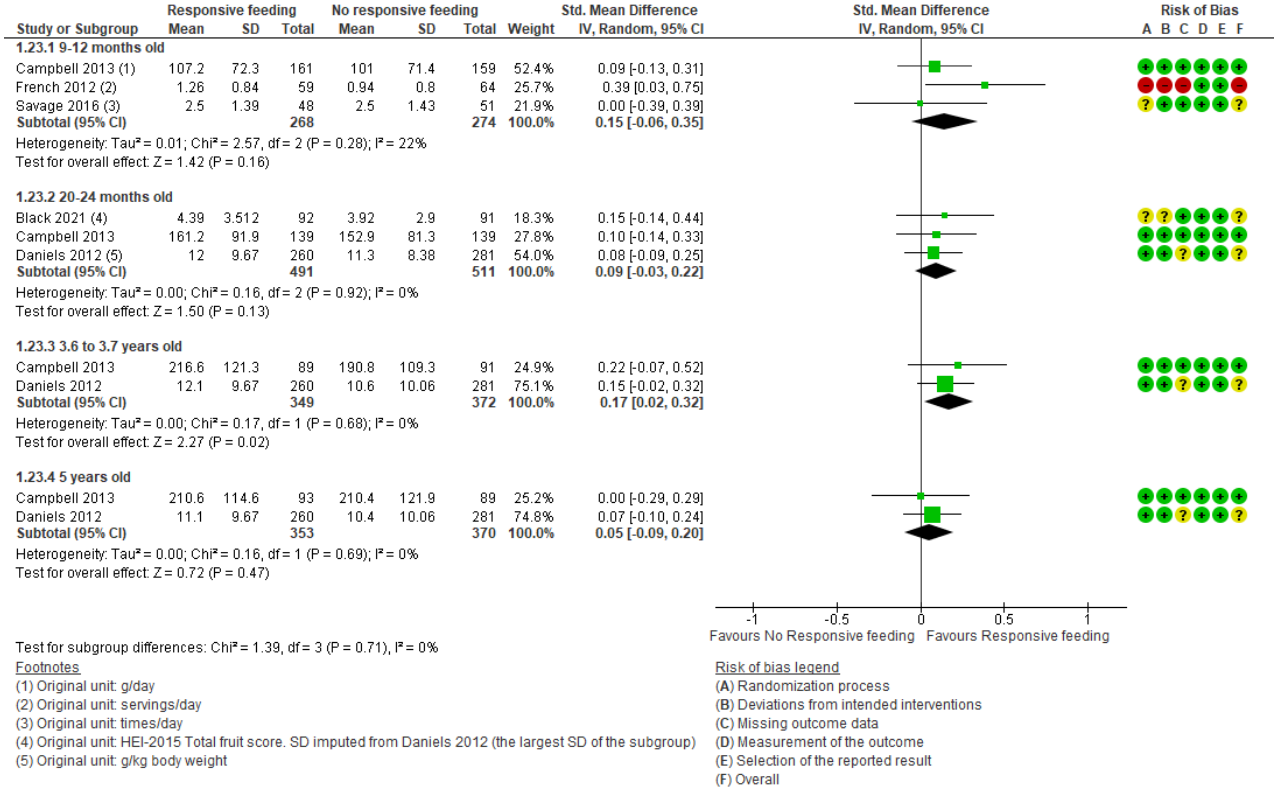
Fruit intake between 9 and 12 months of age. Data from three trials (Campbell 2013, French 2012, and Savage 2016) were combined on an SMD. In comparison with routine care, those interventions may slightly increase fruit consumption (SMD 0.15[24], 95% CI -0.06 to 0.35; participants = 542; studies = 3; I^2 = 22%; low certainty). On the other hand, other trial (Messito 2020) reported little or no difference in daily fruit consumption between the intervention and the control group at 10 months of age (RR 0.99, 95% CI 0.90 to 1.08; participants = 412, low risk of bias; Plot 31). Please see subgroup analysis and sensitivity analysis below.

Fruit intake between 20 and 24 months of age. Data from three trials (Black 2021, Campbell 2013, and Daniels 2012) were combined on an SMD. In comparison with routine care, the interventions may slightly increase the consumption of fruits at 20 to 24 months (SMD 0.09[25], 95% CI -0.05 to 0.22; participants = 1002; studies =3; I^2 = 0%; low certainty; Plot 30). Please see subgroup analysis.

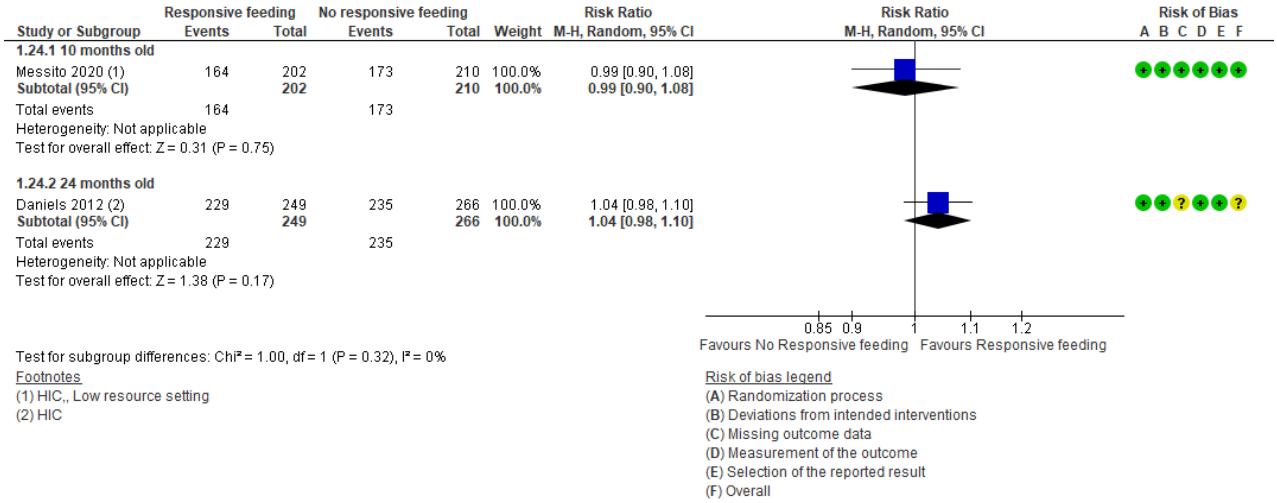
Two trials reported results at 3.5 and 5 years old (Campbell 2013 and Daniels 2012). Compared to usual care, these interventions probably slightly increase fruit intake at 3.5 - 3.7 years (SMD 0.17[26], 95% CI 0.02 to 0.32; participants = 721; studies = 2; I2 = 0%, moderate certainty) and probably make little or no difference at 5 years old (SMD 0.05[27], 95% CI -0.09 to 0.20; participants = 723; studies = 2; I^2 = 0%, moderate certainty). Plot 30

[24] The SMD is equivalent to the following MDs expressed in the original units: a) 10.78 g/day (95%CI -4.31 to 25.14), b) 0.12 servings/day (95%CI -0.05 to 0.29), and c) 0.21 times/day (95%CI -0.08 to 0.49).
[25] This SMD is equivalent to the following MD in the original units: a) 7.79 g/day (95%CI -2.60 to 19.05), b) 0.81 g/kg of body weight (95%CI -0.27 to 1.99), and c) 0.29 points of the HEI-2015 total fruit score (95%CI -0.10 to 0.71).
[26] The SMD is equivalent to the following MDs expressed in the original units: a) 19.60 g/day (95%CI 2.31 to 36.9), and b) 1.68 g/kg of body weight (95%CI 0.20 to 3.16).
[27] The SMD is equivalent to the following MDs expressed in the original units: a) 5.91 g/day (95%CI -10.64 to 23.65), and b) 0.49 g/kg of body weight (95%CI -0.89 to 1.97).

Plot 30. Fruit intake SMD (9 months to 5 years old)



Plot 31. Fruit intake, daily consumption/previous day consumption (10 to 24 months old)



Fruit and Vegetable intake

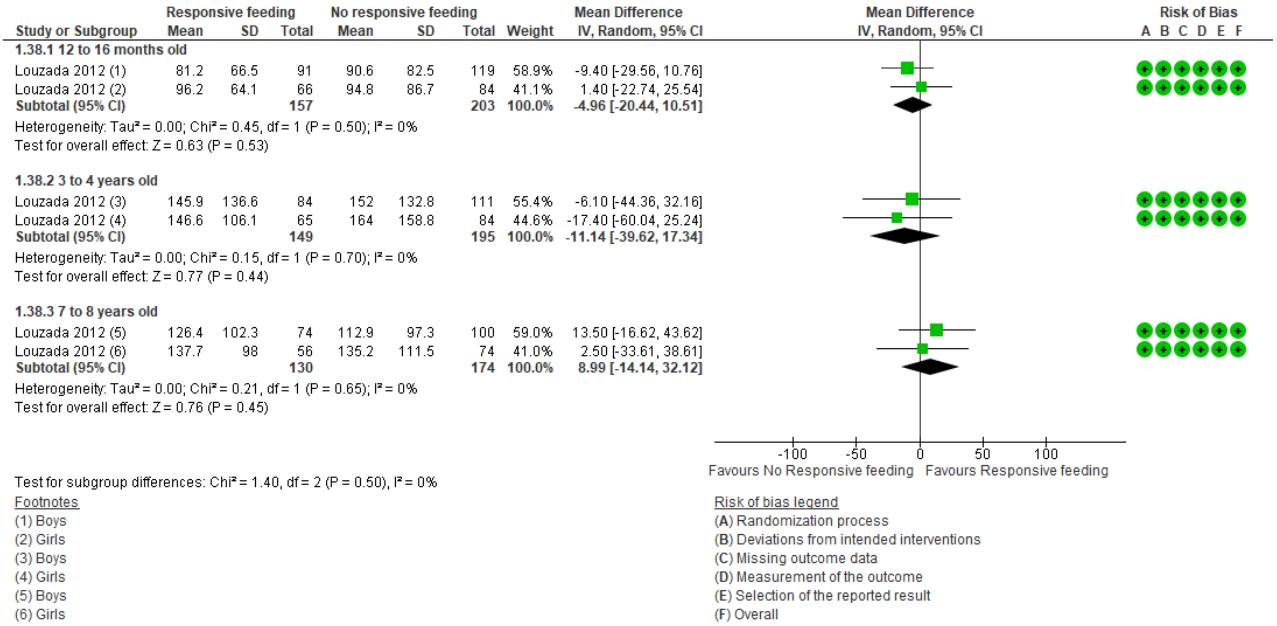
One trial conducted in Brazil, reported fruit and vegetable intake as a combined outcome. The intervention in Louzada 2012 trial consisted of 10 home visits delivered by undergraduate students during the first year of life. The intervention contents included 8 components of RF, and data were reported by sex. Results for fruit

and vegetable intakes (g/day) are show below and in Plot 32. The intervention probably makes little to no difference to fruit and vegetable consumption at 12 to 16 months, 3 to 4 years and 7 to 8 years old (moderate certainty).

Fruit and vegetable intake (g/day) Plot 32

12 to 16 months (MD -4.96, 95% CI -20.44 to 10.51; participants = 360; sub-studies = 2; I^2 = 0%)
3 to 4 years (MD -11.14, 95% CI -39.62 to 17.34; participants = 344; sub-studies = 2; I^2 = 0%)
7 to 8 years (MD 8.99, 95% CI -14.14 to 32.12; participants = 304; sub-studies = 2; I^2 = 0%)

Plot 32.Fruit and vegetable intake, g/day (12 months to 8 years old)

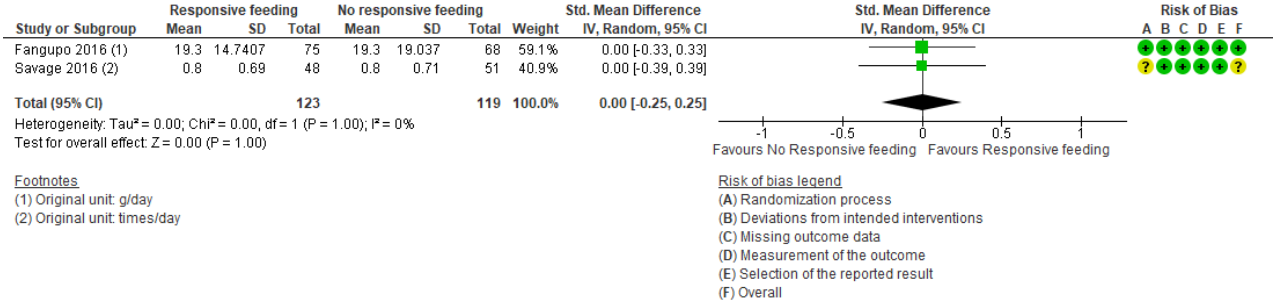


Meat, poultry, and fish

Two studies (Fangupo 2016, Savage 2016) reported meat, poultry and/or fish intake. One trial consisted of 8 contacts including 3 home visits delivered by lactation consultants and research assistants trained in the BLISS approach, from pregnancy to the child's age of 9 months (Fangupo 2016). The second trial (Savage 2016) consisted of home visits by trained research nurses from 3-4 months and two visits to the research center (Savage 2016). Control groups in both trials included routine care; in addition Savage trial included an intervention focused on child safety messages.

In comparison with usual care, at 7 months old, the intervention (Fangupo 2016) may make little or no difference to consumption of meat, poultry and/or fish (MD 1.50 g/day, 95% CI -0.68 to 3.68; participants = 162; studies = 1). Similarly, in comparison with the control group, at 12 month of age the intervention probably make little or no difference to consumption of meat, poultry and/or fish (SMD 0.00, 95% CI -0.25 to 0.25; participants = 242; studies = 2; I^2 = 0%; moderate certainty;
Plot 33)

Plot 33. *Meat,* poultry *and fish intake, SMD* (12 months old)



Water

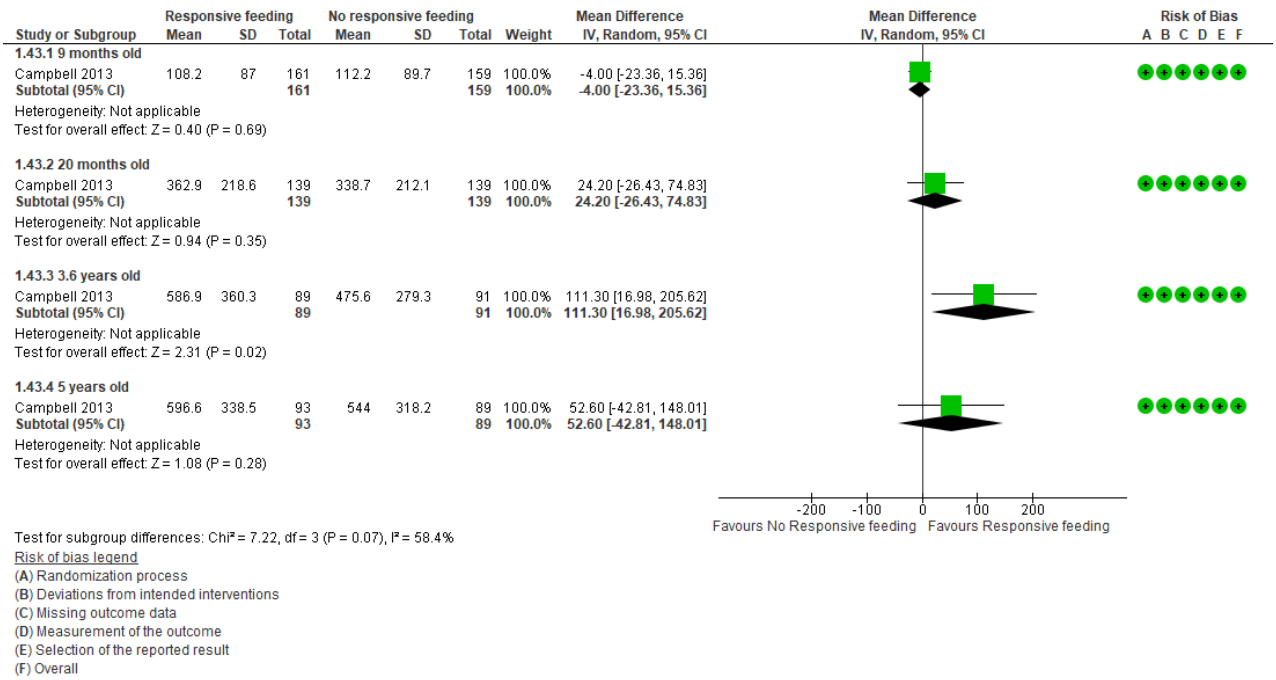
Only one study reported water intake (Campbell 2013). The intervention included sessions in first-parent regular group meetings from 3-4 months of age to ~ 18 months including contents about 7 components of RF and were, carried out by dietitians. Plot 34.

In comparison with usual care, the intervention:

- probably makes little or no difference to water consumption at 9 months old (MD -4.0 ml/day, 95% CI -23.36 to 15.36; participants = 320; studies = 1; moderate certainty),
- probably makes little or no difference water intake at 20 months old (MD 24.2 ml/day, 95% CI -26.43 to 74.83; participants = 278; studies = 1; moderate certainty)
- probably increase water intake at 3.6 years old (MD 111.3 ml/day, 95% CI 16.98 to 205.6; participants = 180; studies = 1; moderate certainty)
- probably slightly increase water intake at 5 years old (MD 52.6 ml/day, 95% CI -42.8 to 148.0; participants = 182; studies = 1; moderate certainty)

Similar results were found by using adjusted data as reported by the authors. See Supplementary plot 14

Plot 34.Water intake, ml/day (9 months to 5 years old)

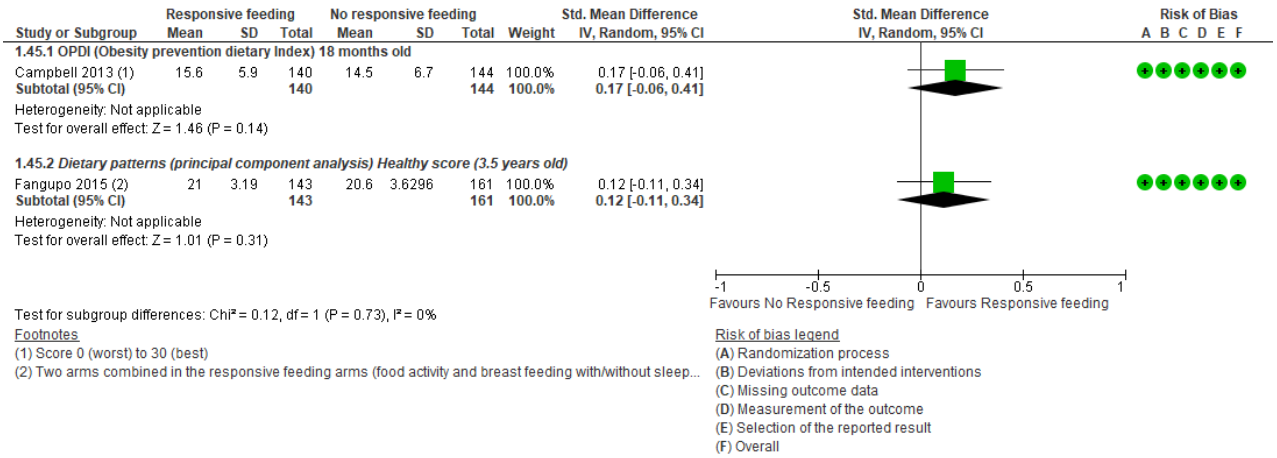


Diet quality and dietary patterns assessment

One study (Campbell 2013) reported the Obesity Prevention Dietary Index at 18 months and other study (Fangupo 2015), results for a healthy pattern detected a posteriori by principal component analysis at 3.5 years of age.

The interventions probably make little or no differences to the Obesity Prevention Dietary Index at 18 months (SMD 0.17, 95% CI -0.06 to 0.41; participants = 284; studies = 1) and to a healthy diet pattern at 3.5 years (SMD 0.12, 95% CI -0.11 to 0.34; participants = 304; studies = 1). Plot 35

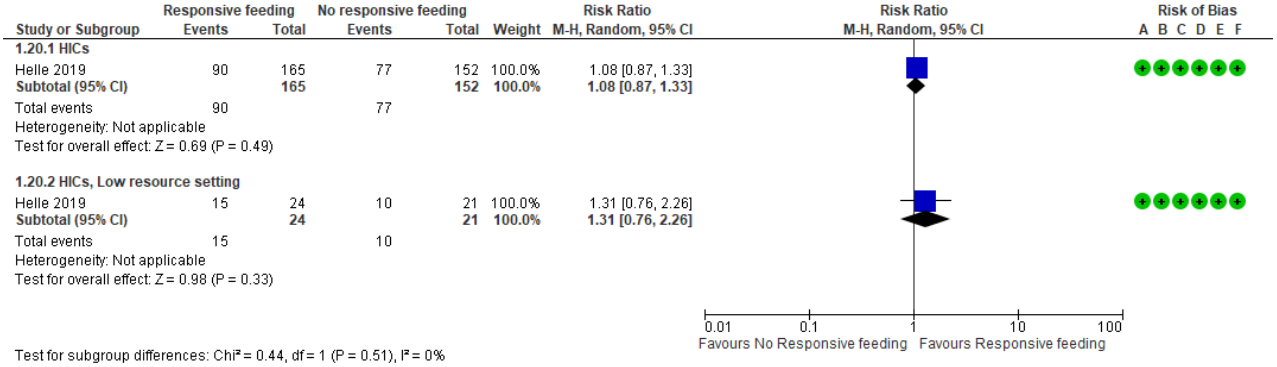
Plot 35. Obesity Prevention Dietary Index and Healthy dietary pattern



Outcome 3. Subgroup analyses

- Intervention C1. (Primary analyses Plot 26 and Plot 27) Analyses of the effects of an e-heath intervention including 5 components of responsive feeding on vegetable and fruit consumption at 24 months (times/day above the median) showed similar results in a low-resource setting subgroup. Subgroup Analysis 1 and Subgroup Analysis 2

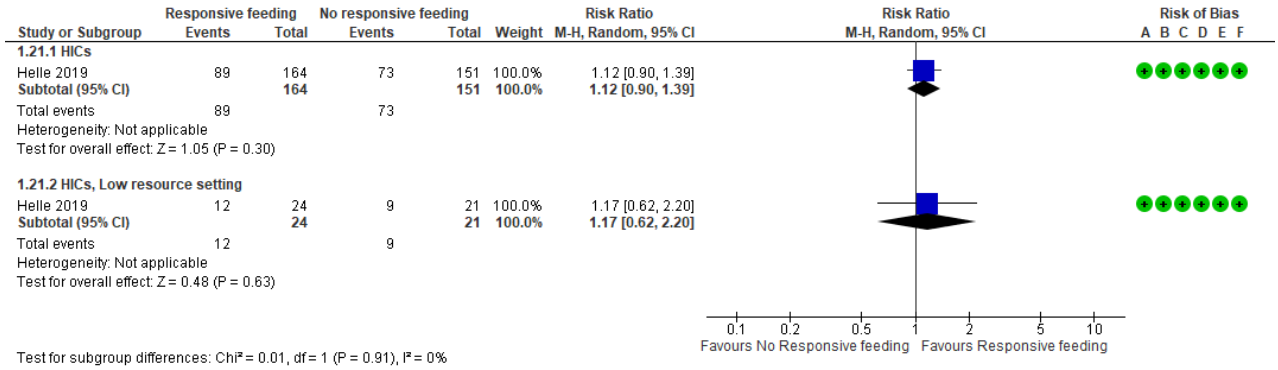
Subgroup Analysis 1. Vegetable intake, times/day >median (24 months old)



Test for subgroup differences: Chi² = 0.44, df = 1 (P = 0.51), I² = 0%

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Subgroup Analysis 2. Fruit intake, times/day >median (24 months old)



Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.91), I² = 0%

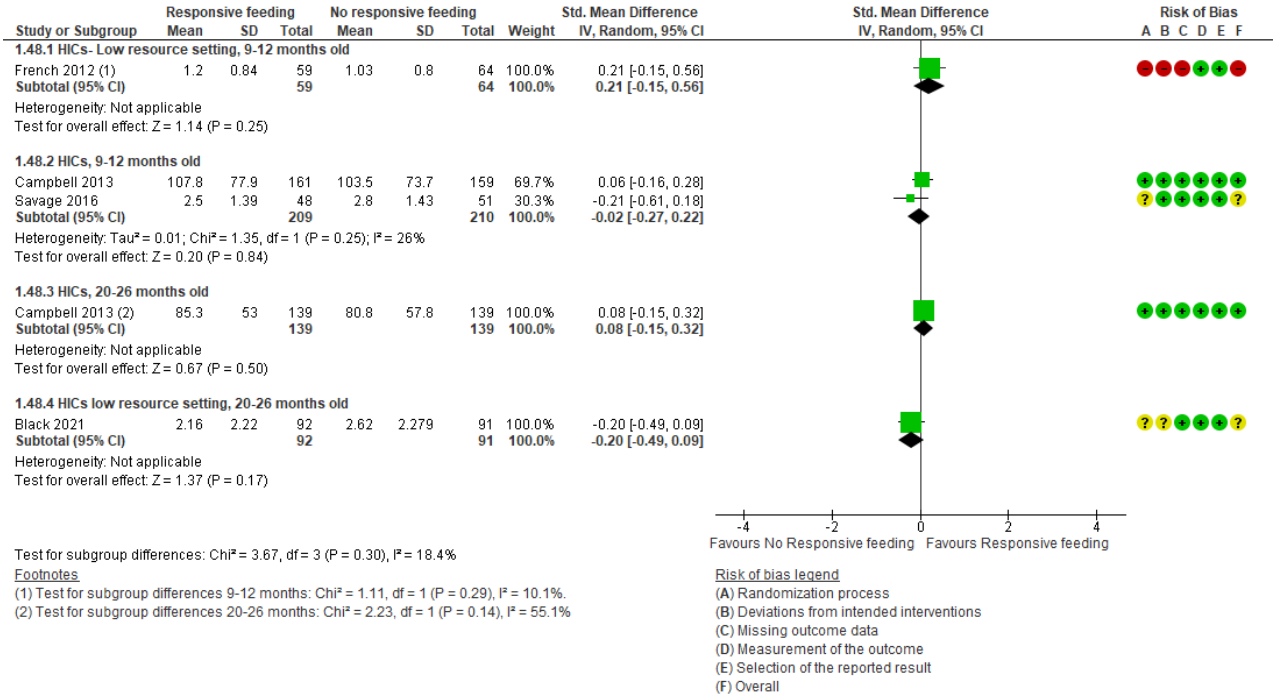
Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

- Intervention C2. Vegetable intake. (Primary analysis Plot 28)

  Vegetable intake at 9 to 12 months old did not differ by subgroups (HICs vs. HICs low-resource setting; test for subgroup difference: I^2 10.1%). At 20 to 24 months old, the consumption of vegetables differed by subgroups (HICs vs. HICs low-resource setting; test for subgroup difference: I^2 55.1%).

  .

Subgroup Analysis 3. Vegetable intake, SMD (9 months to 26 months old)

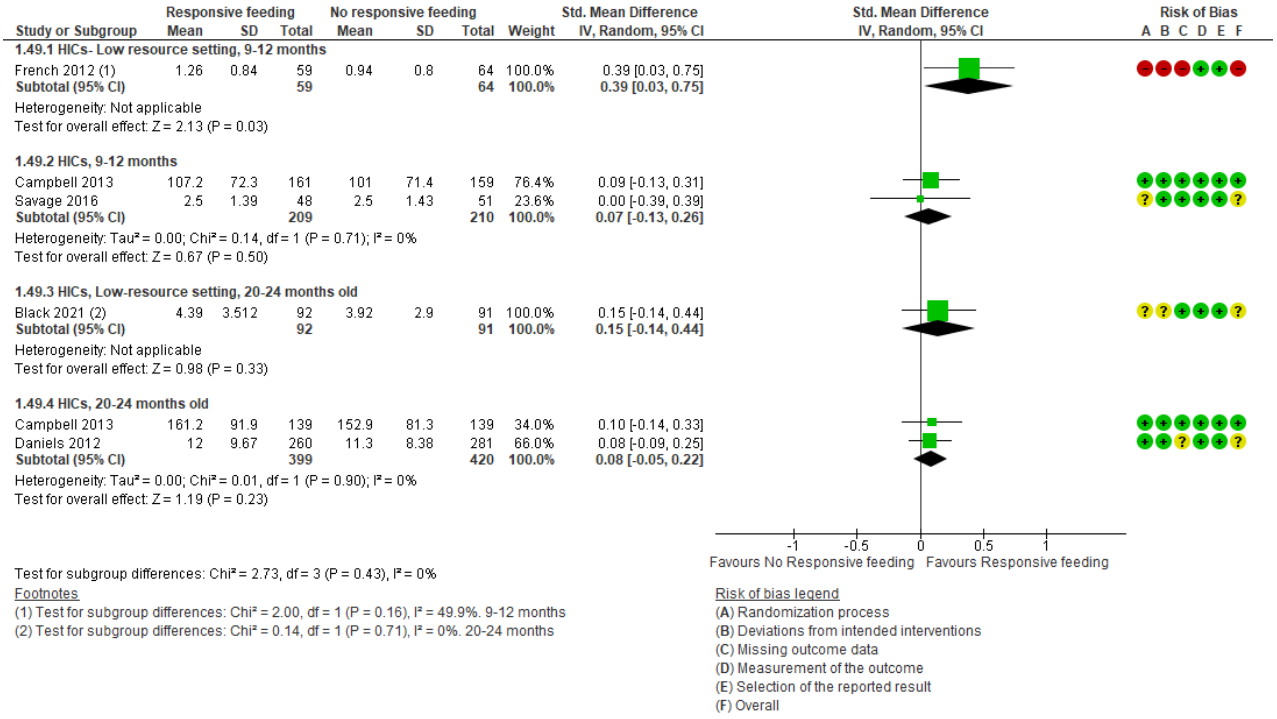


- Intervention C2. Fruit intake. (Primary analysis Plot 30)

  The SMD analysis for fruit intake at 9 to 12 months differed by subgroups. In subgroup of HICs, there was no change in direction of the primary analysis, the SMD was lower and lost statistical significance: SMD 0.07 [95% CI -0.13, 0.26]. In subgroup of HICs- low resource settings (French 2012), the effect seems to be greater and with statistical significance, SMD 0.39 [95% CI 0.03, 0.75] (Test for subgroup difference: I^2 49.9%). Subgroup Analysis 4

  At 20 to 24 months old, fruit intake did not differ by subgroups: HICs (SMD 0.08, 95% CI -0.05 to 0.22; participants = 819; studies = 2; I^2 = 0%) and HICs, low-resource setting (SMD 0.15, 95% CI -0.14 to 0.44; participants = 183; studies = 1). (Test for subgroup difference: I^2 0%). Subgroup Analysis 4

Subgroup Analysis 4. Fruit intake, SMD. 9-12 months and 20 to 26 months

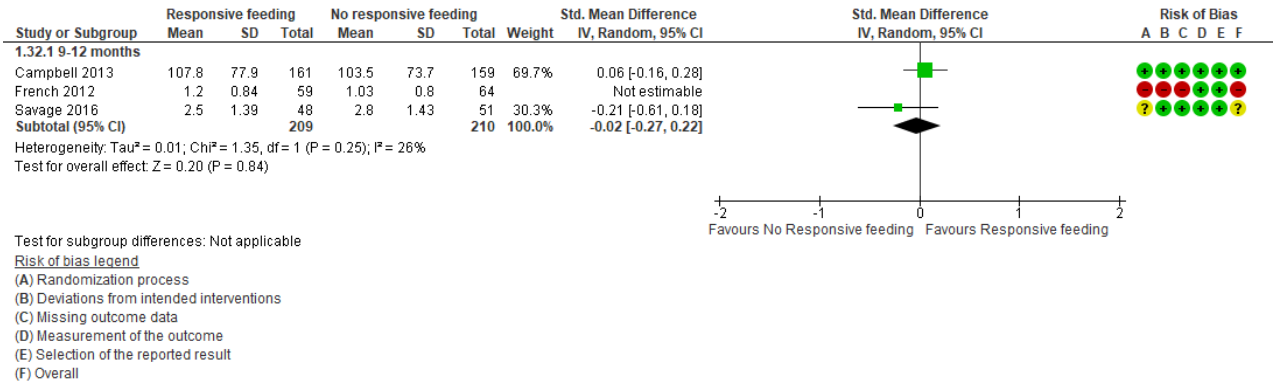


Outcome 3. Sensitivity analyses (SA)

After excluding the trial with overall high risk of bias (French 2012) from two meta-analyses we found the following results:

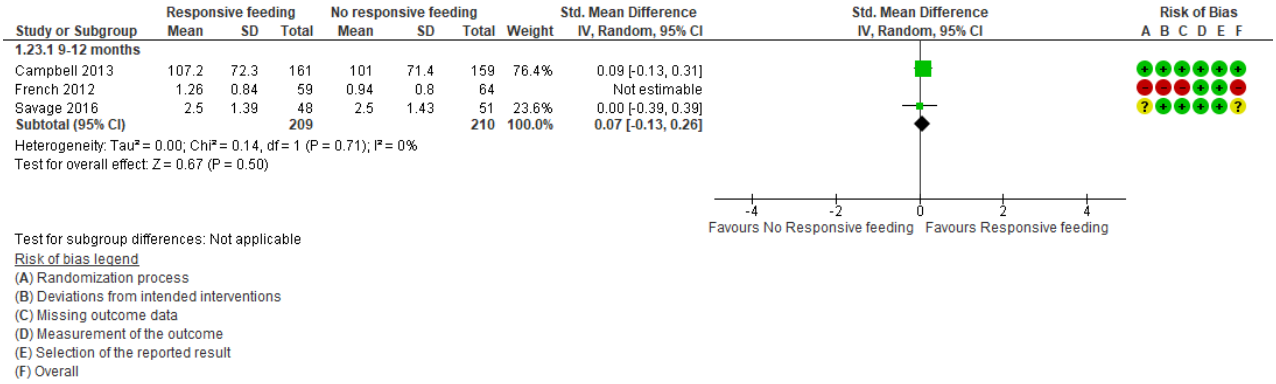
- Vegetable intake, SMD at 9 to 12 months old: SMD -0.02 [95% CI -0.27, 0.22; Plot SA 2].

SA 2. Vegetable intake, SMD (9 to 12 months old)



- Fruit intake, SMD at 9 to 12 months old: there was no change in direction of the primary analysis, the SMD was lower and without statistical significance: SMD 0.07 [95% CI -0.13, 0.26; Plot SA 3]

SA 3. Fruit intake SMD (9 to 12 months old)



Outcome 4. Intake of unhealthy food/beverages

O4.A Interventions with focus in one component of RF

The outcome was not reported in the included studies.

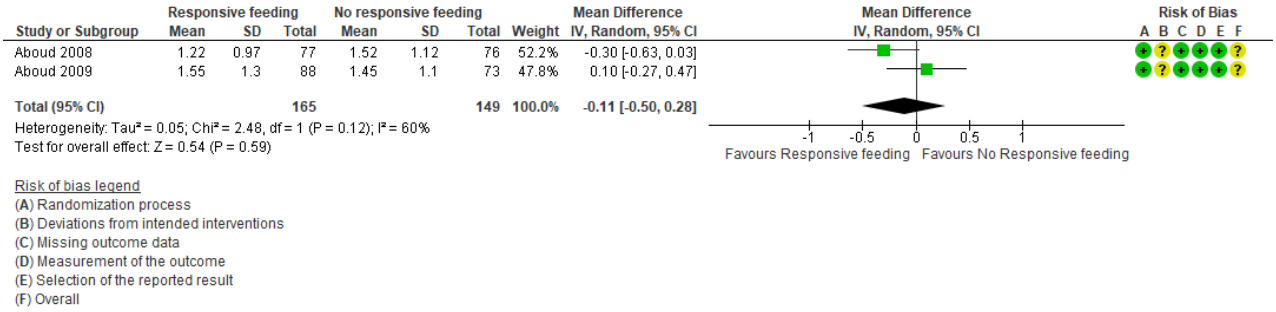
O4.B Interventions with two or more elements of RF, aimed to prevent under-nutrition

B.1 Responsive feeding and development stimulation programs, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)

Two of the trials aimed to prevent under-nutrition conducted in rural Bangladesh (Aboud 2008, Aboud 2009) reported data about biscuit and sugar consumption during the previous day. According to the authors the category included store-bought foods and sugar.

It is uncertain whether the intervention reduces the frequency of consumption of sweet snacks and sugar-dense foods at 20-23 months old because the certainty of this evidence is very low (MD -0.11 times/day, 95% CI -0.50 to 0.28, participants = 314; studies = 2; I^2 = 60%). Plot 36

Plot 36. Sweet snacks/sugar-dense food, times/day (20 to 23 month old)



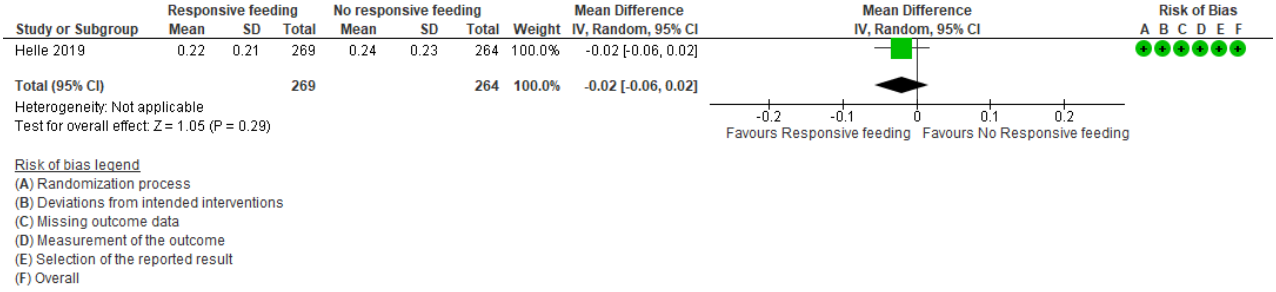
O4.C Interventions with two or more elements of RF, aimed to prevent obesity

C.1 E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8)

The individual RCT conducted in Norway (Helle 2019[39]) that implemented an eHealth intervention during 7 months (from 6 to 12 months old) reported some data regarding the consumption of unhealthy foods. The trial reported the frequency of consumption (times/day) of "non-core food/drink categories" at 12 months old. According to the authors these categories included five sweet and salty snacks (cakes/cookies or similar, dessert/ice cream, chocolate, sweets, potato chips) and two sweetened beverages (lemonade, soda). At 24 months old, the consumption of sweet and salty snacks as well as sweetened beverages consumption were reported.

The intervention does not have an important effect on the frequency of consumption of "non-core foods and drinks" measured as times/day at 12 months (MD -0.02, 95% CI -0.06 to 0.02 participants = 533; studies = 1, high certainty; Plot 37).
At 24 months the intervention probably makes little or no difference to the consumption of sweet and salty snacks more frequently than 3.5 times per week (61.2% vs. 68.6%, RR 0.89, 95% CI 0.76 to 1.95 participants = 318; studies = 1; moderate certainty, Plot 38). The intervention probably does not have an important effect on the consumption of sweetened beverages more than twice a week (53.0% vs. 45.2%, RR 1.17, 95% CI 0.94 to 1.47 participants = 321; studies = 1; moderate certainty, Plot 39)

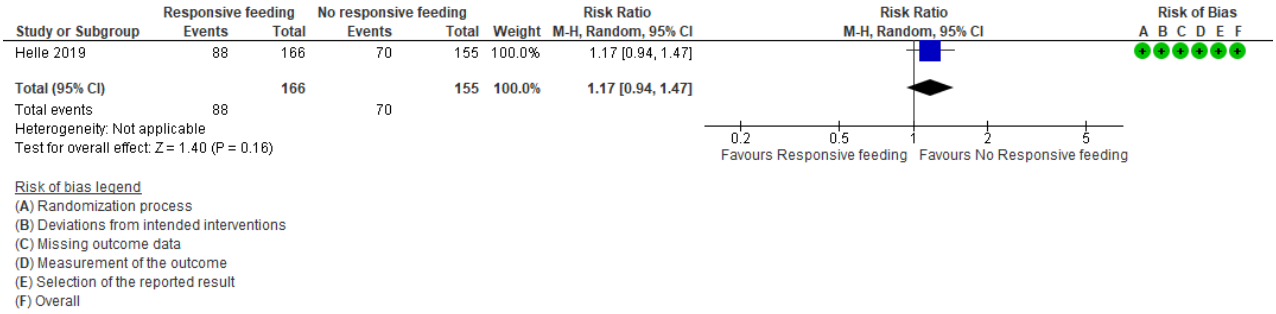
Plot 37. Non-core food/drinks times per day (12 months old)



Non-core food/drink categories defined by authors are five snacks (cakes/cookies or similar, dessert/ice cream, chocolate, sweets, potato chips) and two sweetened beverages (lemonade, soda).

Plot 38. Sweet and salty snacks ≥ 3.5 times per week (24 months old)

Plot 39. Sweetened beverages, consumption ⩾2 times per week (24 months old)



C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)

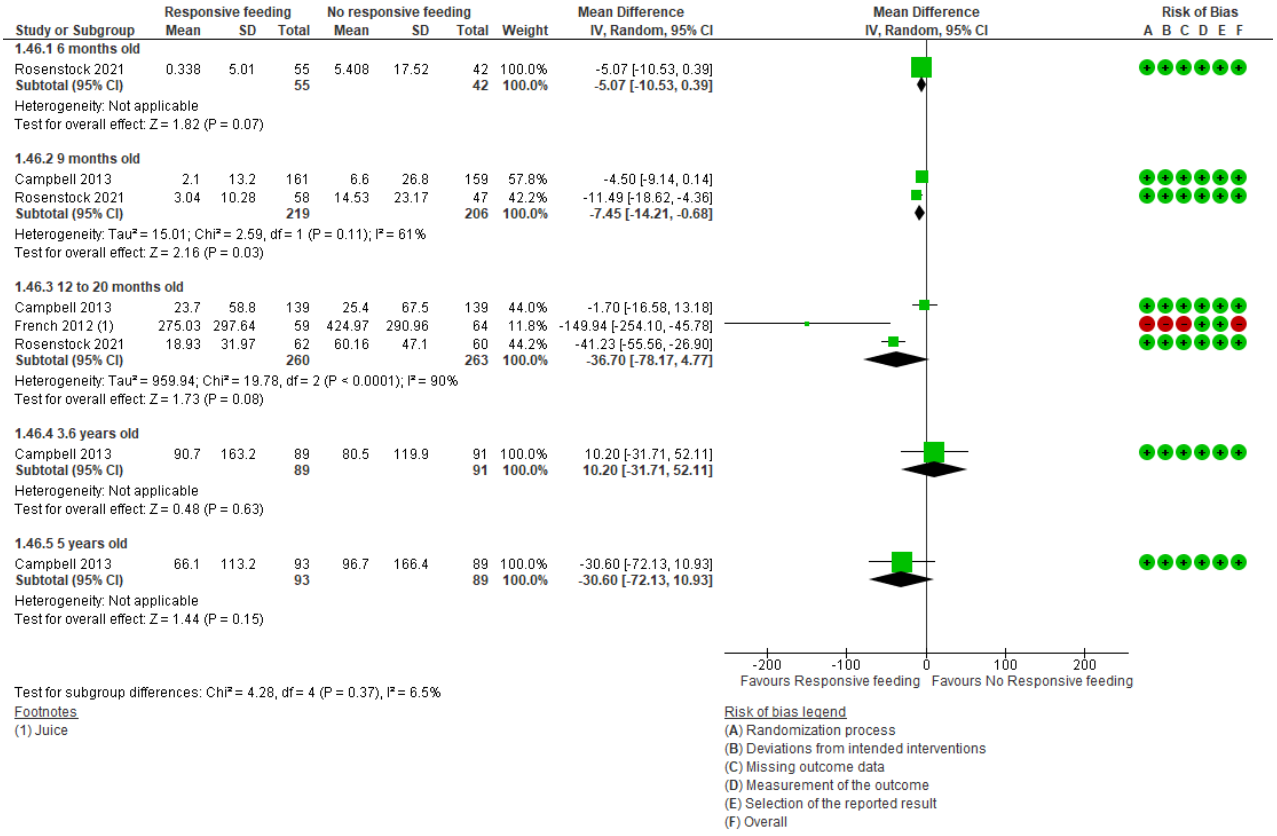
Sugar-sweetened beverages (SSB)

Five trials in this category of intervention reported outcomes related with SSB consumption. All were conducted in HICs (Campbell 2013, Daniels 2012, French 2012, Rosenstock 2021, Vlasblom 2020), but French 2012 and Rosenstock 2021 were carried out in low-resource settings. Rosenstock trial was conducted in a Native American community and delivered by Navajo paraprofessionals. Three trials reported the intake of SSB in ml/day (Campbell 2013, French 2012, and Rosenstock 2021) while Daniels 2012 trial reported data as % of energy intake. Vlasblom et al reported dichotomous data.

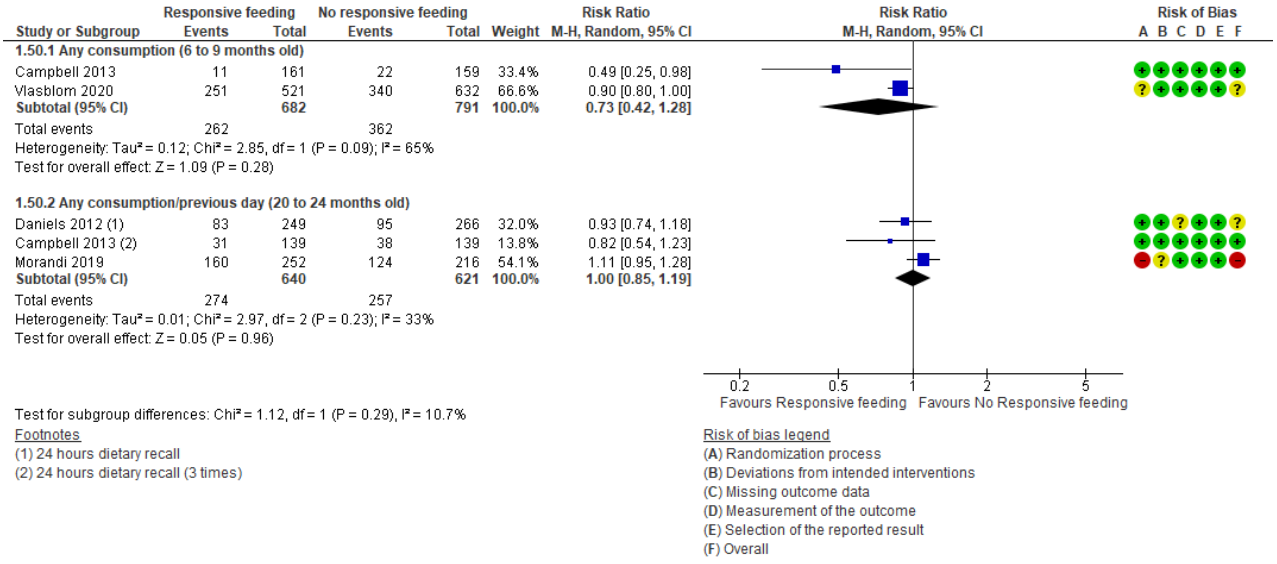
When data are combined on a SMD, results in the original units will be presented in the Supplementary Data and Plots section.

Consumption of SSBs between 6 and 9 months. One trial indicated that the intervention delivered between 3 and 6 months old by Navajo paraprofessionals probably reduces the intake of SSBs at 6 months of age (MD -5.07 ml/day, 95% CI -10.53 to 0.39; participants = 97; studies = 1, moderate certainty; Plot 40). At 9 months old, two trials (Campbell 2013 and Rosenstock 2021) indicated that the intervention may reduce the SSB intake (MD -7.45 ml/day, 95% CI -14.21 to -0.68; participants = 425; studies = 2; I^2 = 61%, low certainty; Plot 40). Between 6 and 9 months old, Vlasblom et al reported results about any consumption of SSBs in the same direction (RR 0.9, CI 95% 0.80 to 1.00, Plot 43).

Plot 40. Sugar-sweetened beverages (SSB) intake in ml/day (6 months to 5 years old)



Plot 41.Sugar-sweetened beverages consumption (6 to 24 months old)

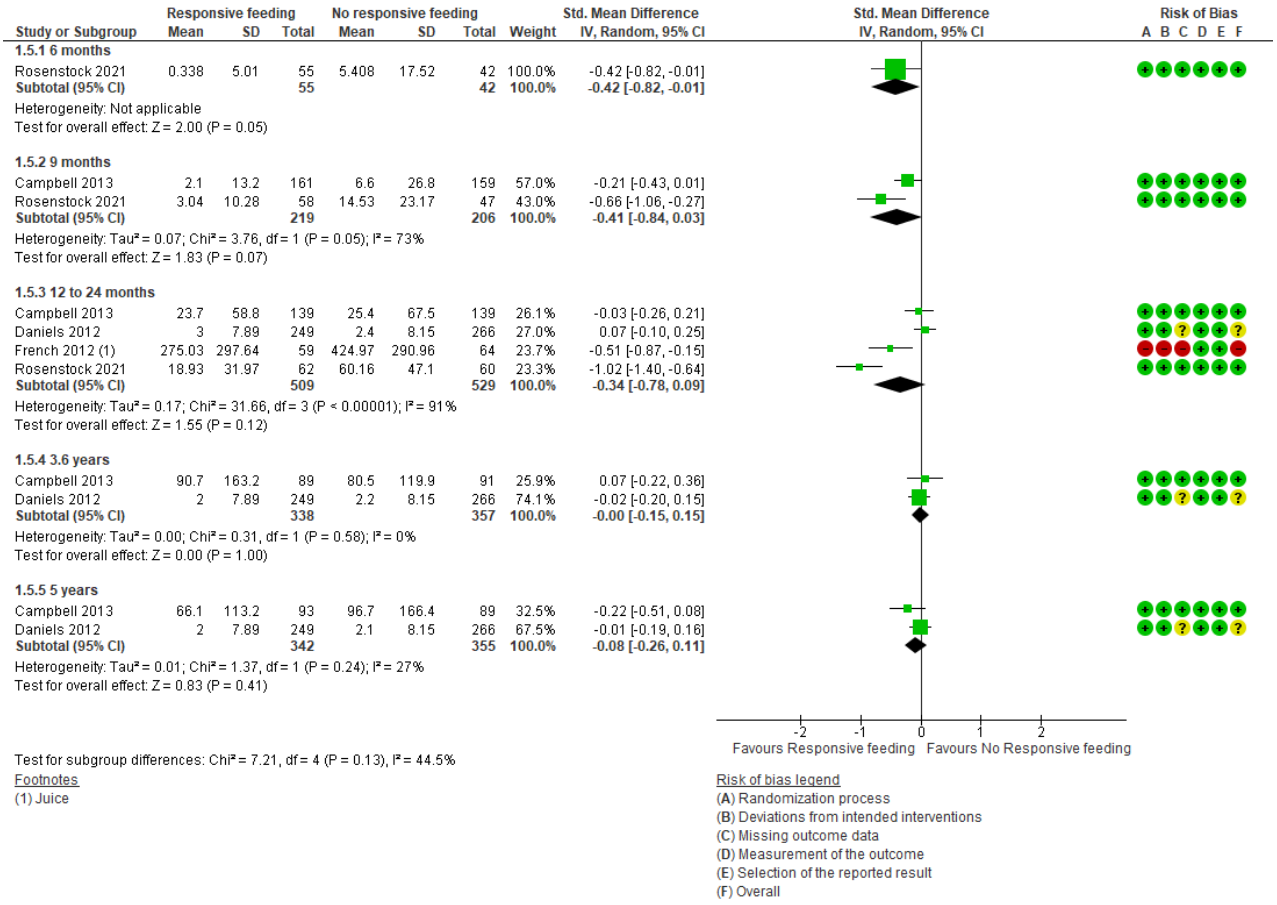


Consumption of SSBs between 12 and 24 months. Four studies indicated that the intervention may slightly reduce the intake of SSBs (SMD -0.34, 95% CI -0.78 to 0.09; participants = 1038; studies = 4; I^2 = 91%, low certainty; Plot 42). Heterogeneity could be partially explained after subgroup analyses, see the section below. In addition, Vlasblom reported at the age of 14 months, the consumption of SSBs ≥ 3 times per weekday (RR 0.95, 95% CI 0.82 to 1.09; participants = 1138; studies =1, risk of bias: some concerns due to possible bias in randomization process) and ≥ 3 times per weekend day (RR 0.99, 95% CI 0.87 to 1.14; participants =

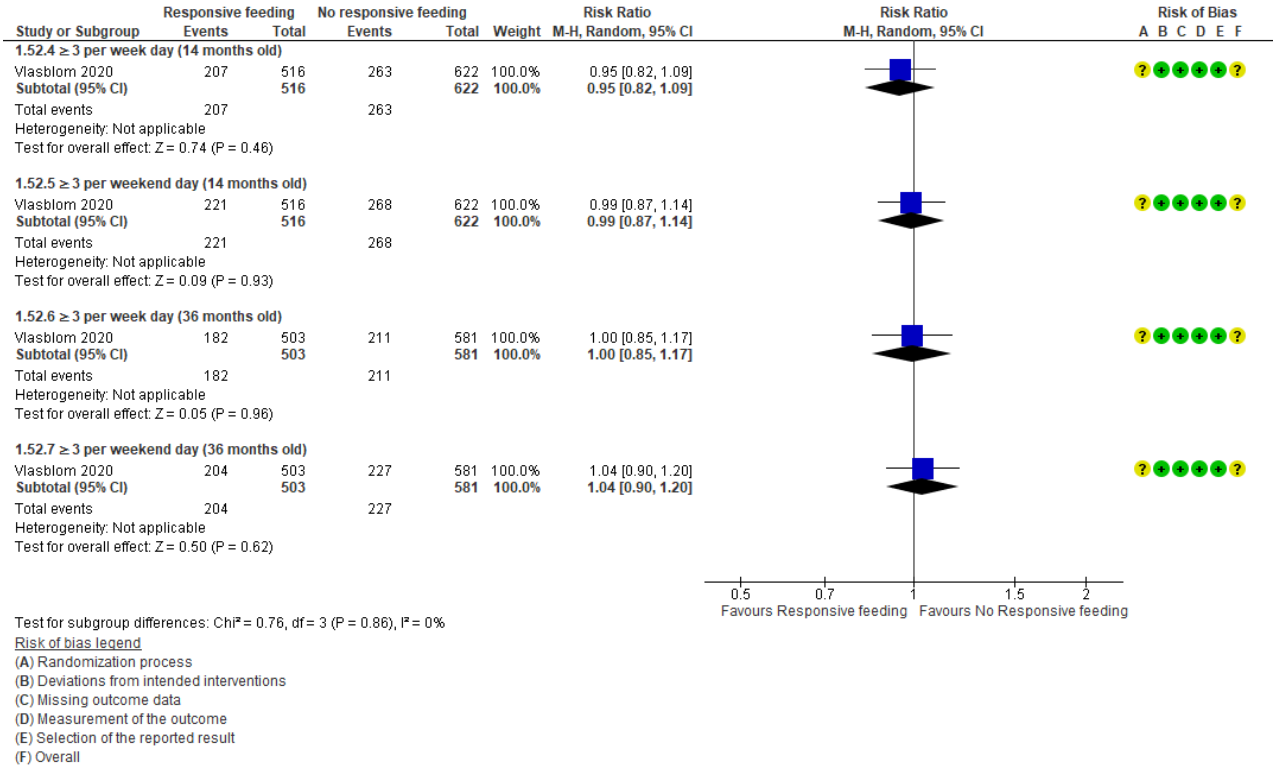
1138; studies =1) Plot 43. Other trial (Morandi 2019) reported the consumption of SSBs at 24 months as a dichotomous outcome (RR 1.11, 95% CI 0.95 to 1.28; high risk of bias due to bias in randomization process, measurement of the outcome and some concerns in deviations from intended interventions; Plot 41).

Consumption of SSBs between 3.6 and 5 years old. Two trials indicated that in comparison with routine care the intervention probably makes little or no difference to the consumption of SSBs at 3.6 years (SMD -0.00, 95% CI -0.15 to 0.15; participants = 695; studies = 2; I^2 = 0%, moderate certainty; Plot 42) and 5 years old (SMD -0.08, 95% CI -0.26 to 0.11; participants = 697; studies = 2; I^2 = 27%, moderate certainty; Plot 42). Moreover, Vlasblom et al reported similar results at the age of 36 months (consumption of SSBs ≥ 3 times per weekday: RR 1.00, 95% CI 0.85 to 1.17; participants = 1084; studies =1/ consumption of SSBs ≥ 3 times per weekend day: RR 1.04, 95% CI 0.90 to 1.20; participants = 1084; studies =1) Plot 43.

Plot 42. Sugar-sweetened beverages (SSB) intake, SMD (at 6 months to 5 years old)



Plot 43. Sugar-sweetened beverages, consumption ⩾3 times per week- and weekend days (14 to 36 months old)



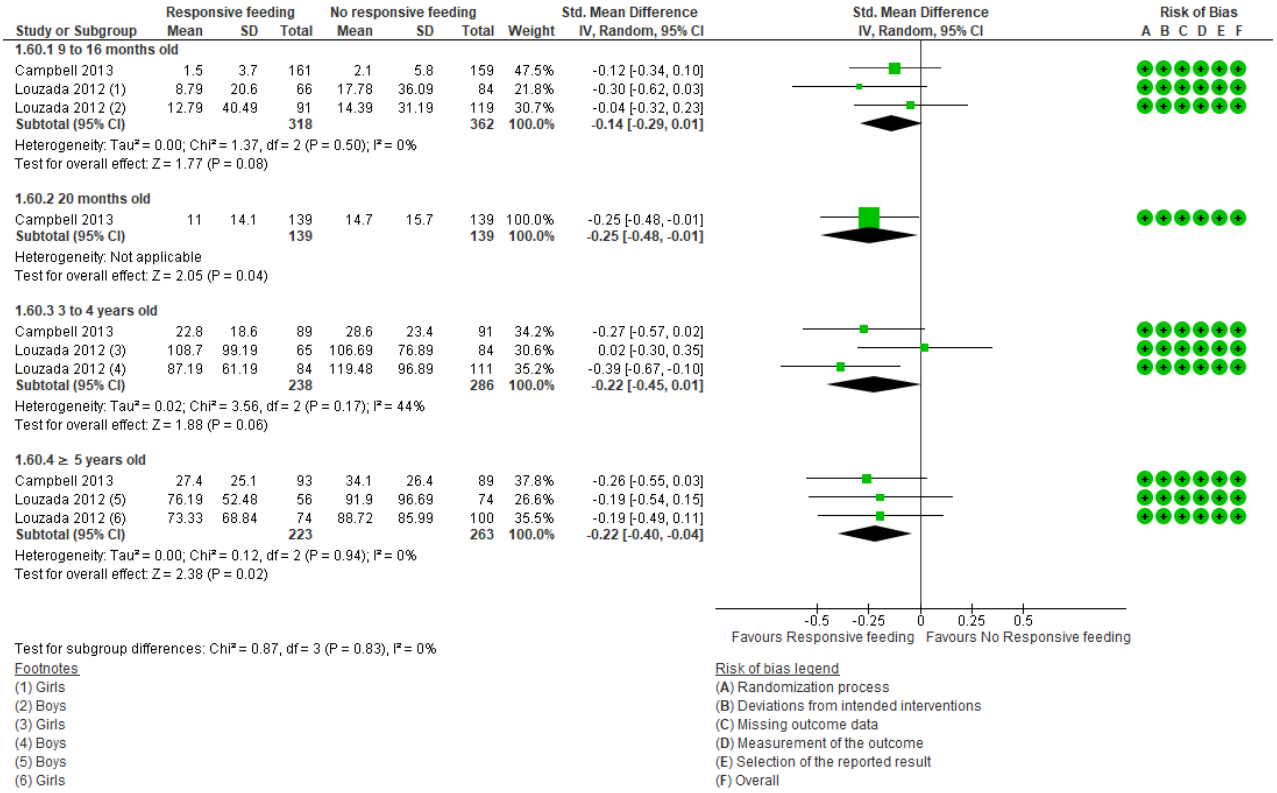
Unhealthy foods

Four studies (Campbell 2013, Daniels 2012, Fangupo 2015, and Louzada 2012) reported outcomes related with unhealthy foods. Heterogeneity was found regarding definitions and classifications of unhealthy food groups and their units of measurement, making difficult the combination of data from some of the studies.

Campbell et al reported the consumption of sweet snacks/sugar-dense foods (g/day) between 9 months and 5 years old. Louzada 2012 reported the consumption of sugar-dense foods (kcal/day) between 12 months and 8 years old. Results in their original units are presented in the Supplementary Data and Plots section. These two trials indicated that in comparison with routine care the interventions aimed to prevent obesity with several elements of RF (Plot 44):

- probably slightly reduces the consumption of sweet snacks/sugar-dense food between 9 and 16 months old (SMD -0.14, 95% CI -0.29 to 0.02 participants = 680; studies = 3; I^2 = 0%, moderate certainty);
- probably slightly reduces the consumption of sweet snacks/sugar-dense food at 20 months old (SMD -0.25, 95% CI -0.48 to -0.01 participants = 278; studies = 1; moderate certainty);
- may slightly reduce the consumption of sweet snacks/sugar-dense food between 3 and 4 years old (SMD -0.22, 95% CI -0.45 to 0.01 participants = 524; studies = 3; I^2 = 44%; low certainty);
- probably slightly reduces the consumption of sweet snacks/sugar-dense food between 5 and 8 months old (SMD -0.22, 95% CI -0.40 to -0.04 participants = 486; studies = 3; I^2 = 0%; moderate certainty).

Plot 44. Sweet snacks/sugar-dense food, consumption/day SMD (9 months to 8 years)

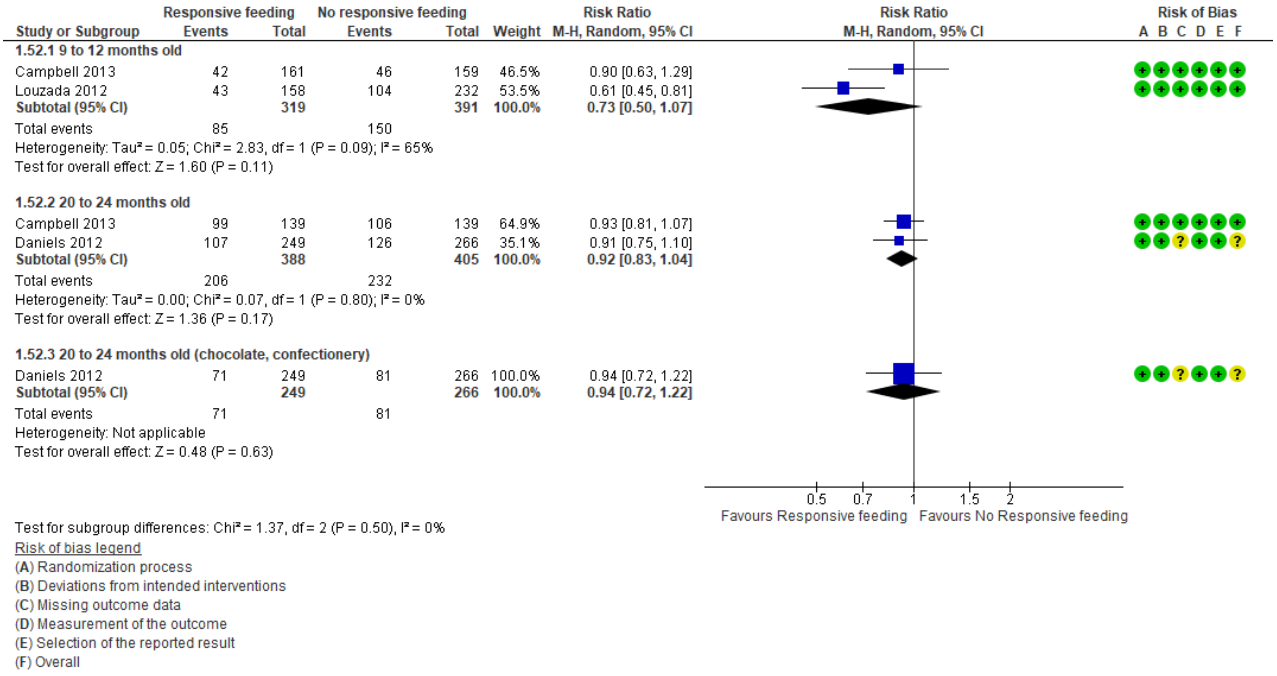


Campbell 2013, Louzada and Daniels 2012 also reported the following dichotomous outcomes (*Plot 45*).

Sweet snacks/sugar-dense food, daily consumption/previous day consumption (9 to 24 months)

9 to 12 months old (RR 0.73, 95% CI 0.50 to 1.07; participants = 710; studies = 2; I2 = 65%)
20 to 24 months old (RR 0.92, 95% CI 0.83 to 1.04; participants = 793; studies = 2; I2 = 0%)
20 to 24 months old. Chocolate, confectionery (RR 0.94, 95% CI 0.72 to 1.22; participants = 515; studies = 1)

Plot 45. Sweet snacks/sugar-dense food, daily consumption/previous day consumption (9 to 24 months)



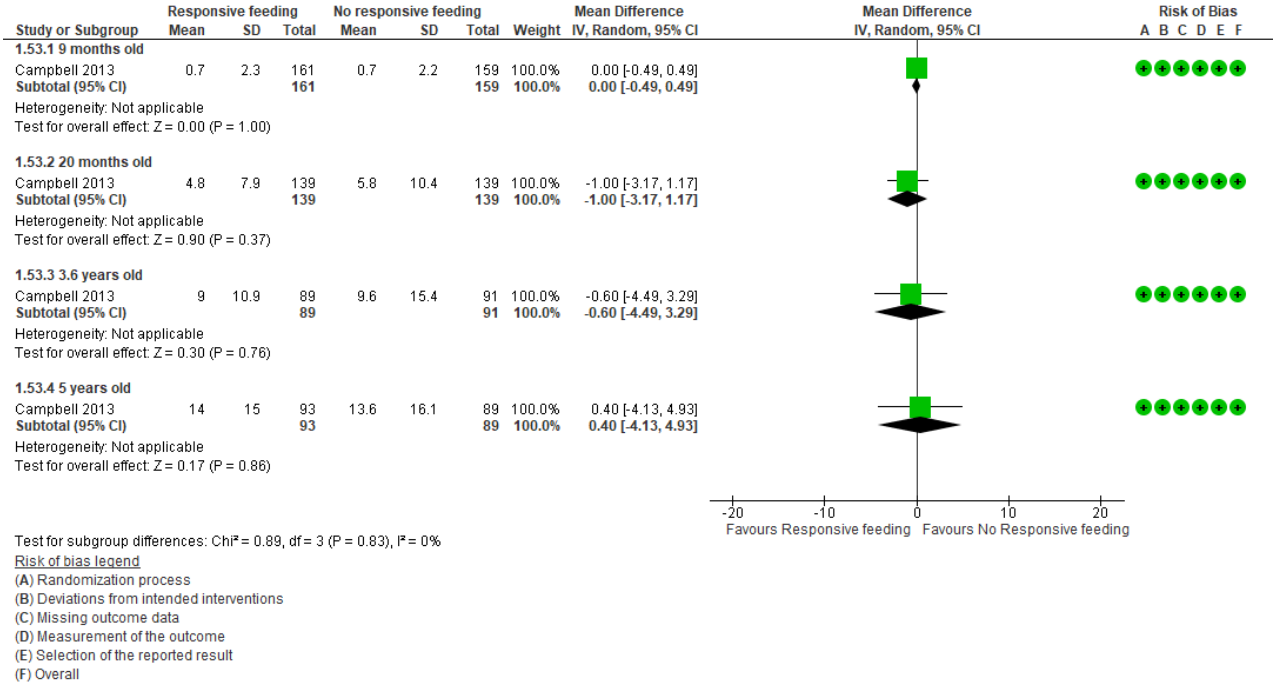
For the following outcomes, combinations were difficult or not possible.

- Campbell 2013 reported the consumption of salty/savory snacks (g/day) from 9 month to 5 years old. The trial reported little or no effect on this outcome. (Plot 46)

Salty/savory snacks, g/day (9 months to 5 years old)

9 months old (MD 0.00, 95% CI -0.49 to 0.49 participants = 320; studies = 1)
20 months old (MD -1.00, 95% CI -3.17 to 1.17 participants = 278; studies = 1)
3.6 years old (MD -0.60, 95% CI -4.13 to 4.93 participants = 180; studies = 1)
5 years old (MD -4.13, 95% CI -4.13 to 4.93 participants = 182; studies = 1)

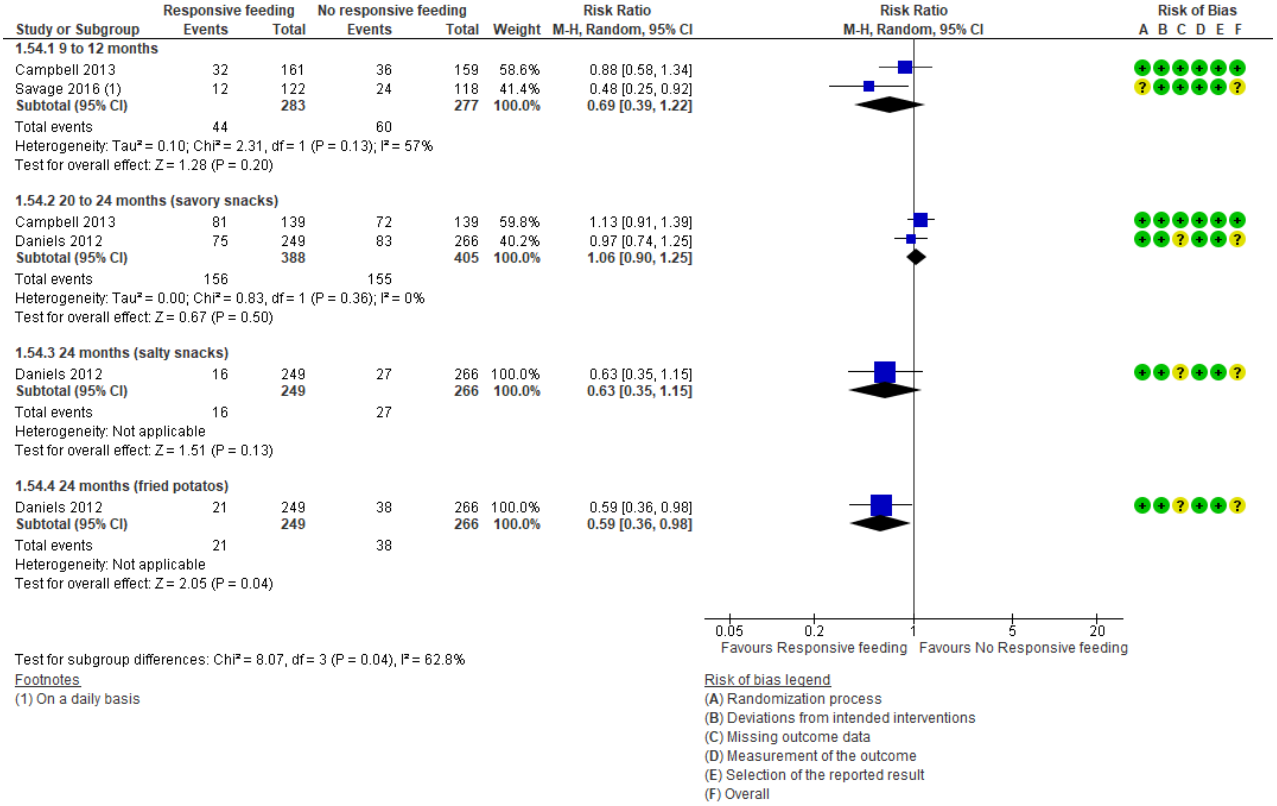
Plot 46. Salty/savory snacks, g/day (9 months to 5 years old)



Daniels 2012 and Campbell reported the consumption of some salty/savory snacks (dichotomous outcome) between 9 and 24 months old. Please see effect sizes below. Some results were imprecise, with the exception of a lower consumption of fried potatoes at 24 months old. Plot 47

Salty/savory snacks, consumption (9 to 24 months old)
9 to 12 months old (RR 0.69, 95% CI 0.39 to 1.22; participants = 560; studies = 2; I2 = 57%)
20 to 24 months old (RR 1.06, 95% CI 0.90 to 1.25; participants = 793; studies = 2; I2 = 0%)
24 months old. Salty snacks (RR 0.63, 95% CI 0.35 to 1.15; participants = 515; studies = 1)
24 months old. Fried potatoes (RR 0.59, 95% CI 0.36 to 0.98; participants = 515; studies = 1)

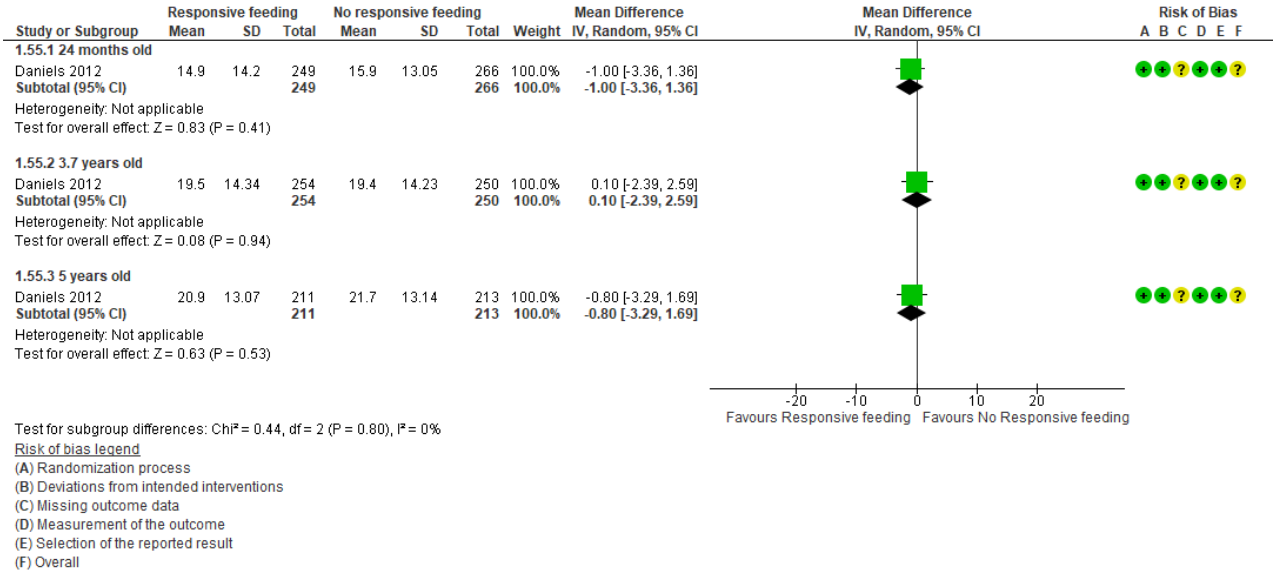
Plot 47. Salty/savory snacks, consumption (9 to 24 months old)



Daniels 2012 reported the consumption of “discretionary foods” as % of total energy, following the definition of the Australian Guide to Healthy Eating, in which core foods are those considered essential for health, and discretionary foods (usually energy-dense, nutrient-poor) are not. For this outcome from 24 months to 5 years old (Plot 48), Daniels et al reported little to no differences between the intervention and the control group.

Discretionary foods, % of total energy intake (24 months to 5 years old)
24 months old (MD -1.00, 95% CI -3.36 to -1.36 participants = 515; studies = 1)
3.7 years old (MD 0.10, 95% CI -2.39 to 2.59 participants = 504; studies = 1)
5 years old (MD -0.80, 95% CI -3.29 to 1.69 participants = 424; studies = 1)

Plot 48. Discretionary foods, % of total energy intake (24 months to 5 years old)

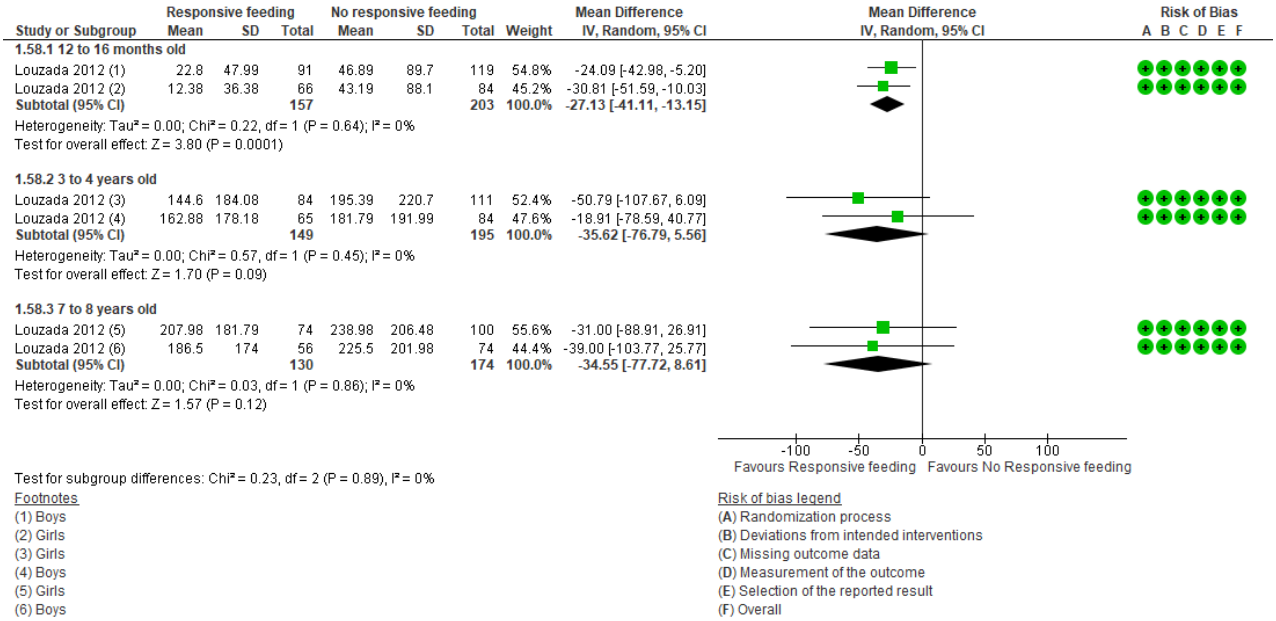


Louzada 2012 trial reported the consumption “lipid-dense foods” including highly processed meat (ham, mortadella, salami, and sausage), fried snacks (such as French fries), chips, filled cookies, and chocolate between 12 months and 8 years old. The trial indicated that the intervention probably slightly reduces the consumption of these foods, measured in kcal/day particularly at 12 to 16 months. Plot 49

(Unhealthy) Lipid-dense foods (kcal/day) (12 months to 8 years)

12 to 16 months old (MD -27.13, 95% CI -41.11 to -13.15 participants = 360; studies = 2; I2 = 0%)
3 to 4 years old (MD -35.62, 95% CI -76.79 to 5.56 participants = 344; studies = 2; I2 = 0%)
7 to 8 years old (MD -34.55, 95% CI -77.72 to 8.61 participants = 304; studies = 2; I2 = 0%)

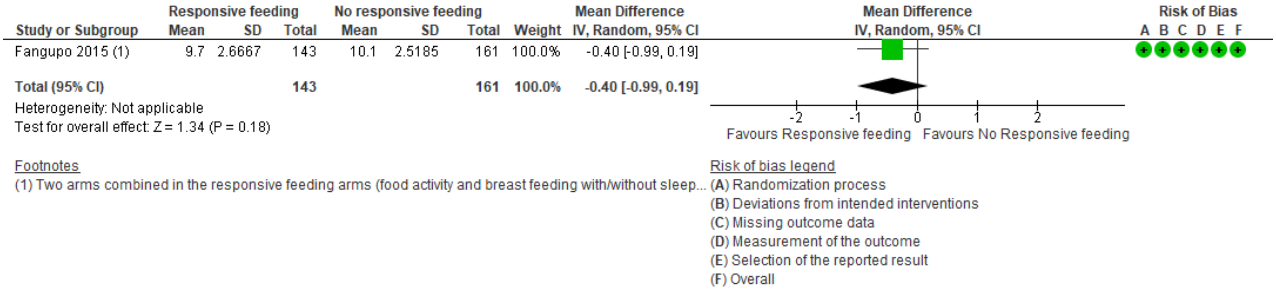
Plot 49. (Unhealthy) Lipid-dense foods (kcal/day) (12 months to 8 years)



Lipid-dense foods include highly processed meat (ham, mortadella, salami, sausage), fried snacks (such as French fries), chips, filled cookies, and chocolate were defined as lipid-dense foods.

Fangupo 2015 reported a dietary pattern detected a posteriori ("Less Healthy score") measured at 3.5 years of age. The study reported little or no difference on the outcome (MD -0.40, 95% CI -0.99 to 0.19; participants = 304; studies = 1). Plot 50

Plot 50.Dietary pattern score (by principal component analysis) "Less Healthy score" (3.5 y old)



Outcome 4. Subgroup analyses

- For intake of sugar-sweetened beverages as SMD, results differed by subgroup at 9 months old (Test for subgroup differences I^2=73.4%) and at 12 to 24 months old (Test for subgroup differences I^2= 88.9%). Subgroup Analysis 5

Subgroup Analysis. SSBs intake, SMD (9 to 24 months old)

9 months old

HIC (MD -0.21, 95% CI -0.43 to 0.01 participants = 320; studies = 1)

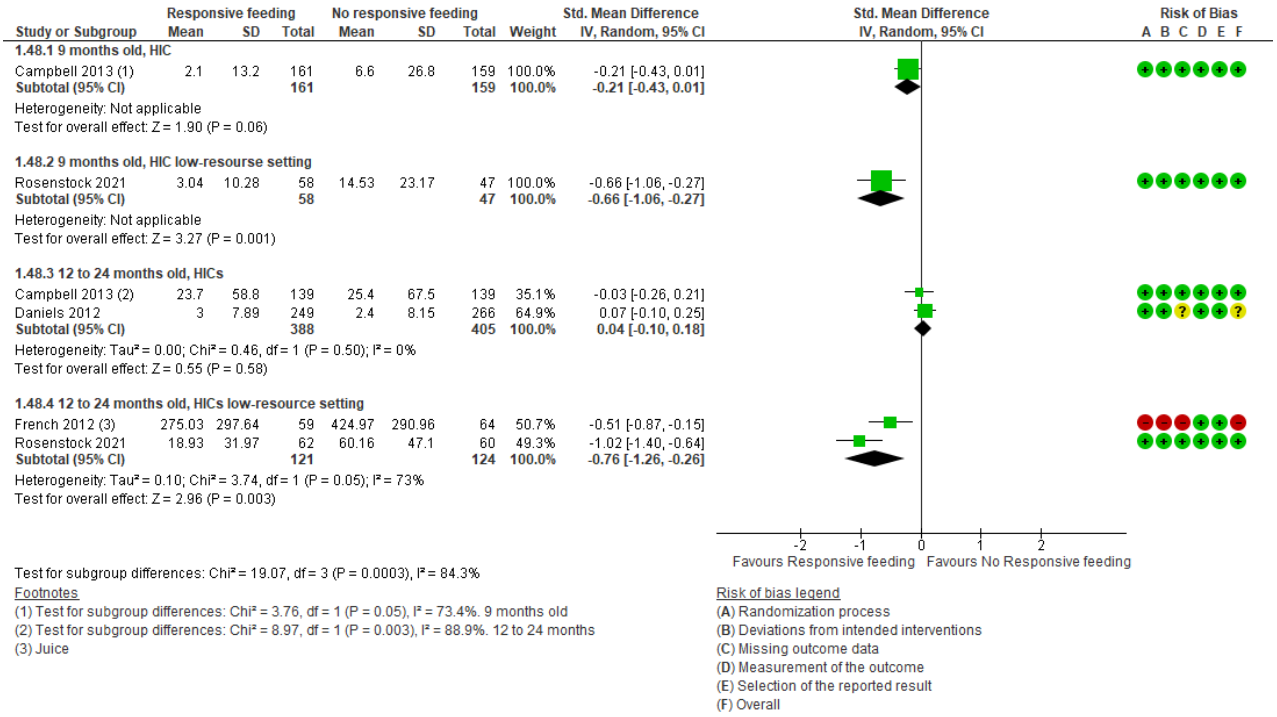
HIC low-resource setting (MD -0.66, 95% CI -1.06 to -0.27 participants = 105; studies = 1)

12 to 24 months old

HICs (MD 0.04, 95% CI -0.10 to 0.18 participants = 793; studies = 2; I2 = 0%)

HICs low-resource setting (MD -0.76, 95% CI -1.26 to -0.26 participants = 245; studies = 2; I2 = 73%)

Subgroup Analysis 5. SSBs intake, SMD (9 to 24 months old)

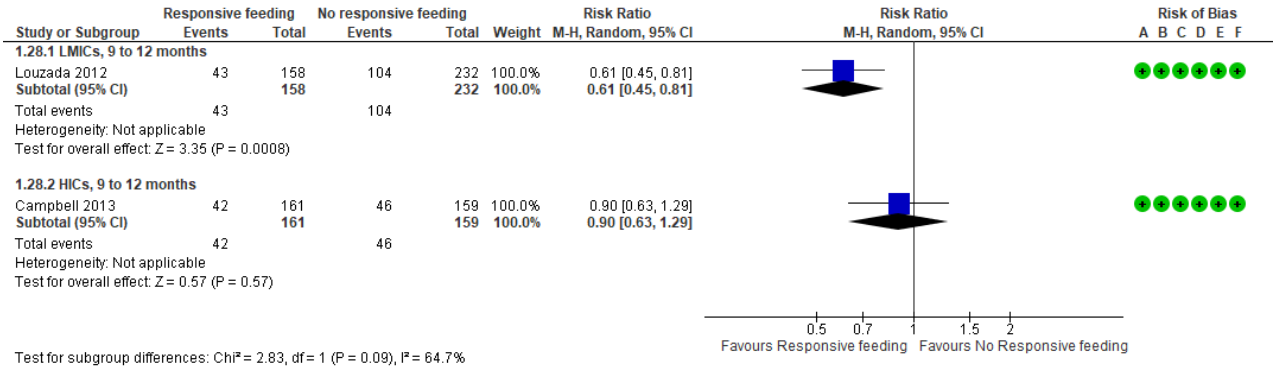


- For Sweet snacks/sugar-dense food, daily consumption/previous day consumption (9 to 12 months) results differed by subgroup *(Test for subgroup differences I^2=64.7%). The RR for consumption of these foods the previous day* associated to a RF intervention was 0.61 (0.45 to 0.81) for one study conducted in a LMIC, and 0.90 (0.63 to 1.29) for the study conducted in the HIC.

Sweet snacks/sugar-dense food, consumption/day SMD (9 months to 5 years)

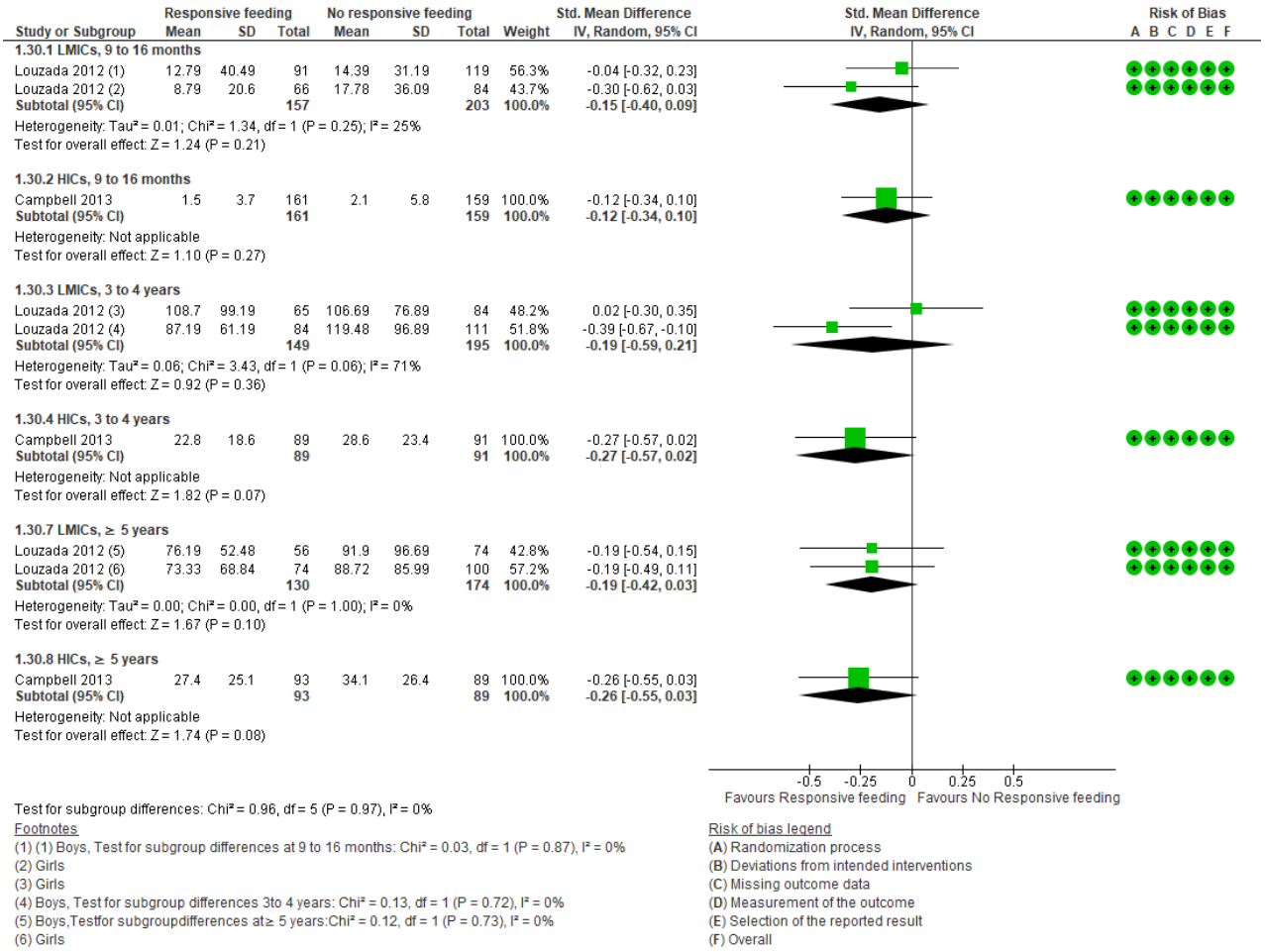
9 to 16 months old (MD -0.15, 95% CI -0.40 to 0.09 participants = 360; studies = 2; I2 = 25%)
HICs 9 to 16 months old (MD -0.12, 95% CI -0.34 to 0.10 participants = 320; studies = 1)
LMICs 3 to 4 years old (MD -0.19, 95% CI -0.57 to 0.02 participants = 180; studies = 1)
LMICs ≥ 5 years old (MD -0.19, 95% CI -0.42 to 0.03 participants = 304; studies = 2; I2 = 0%)
HICs ≥ 5 years old (MD -0.26, 95% CI -0.55 to 0.03 participants = 182; studies = 1)

Subgroup Analysis 6. Sweet snacks/sugar-dense food, daily consumption/previous day consumption (9 to 12 months old)



- For sweet snacks/sugar-dense foods, consumption/day SMD (9 months to 5 years), results did not differ by subgroup (Test for subgroup differences I^2=0%). *Subgroup Analysis 7*.

Subgroup Analysis 7. Sweet snacks/sugar-dense food, consumption/day SMD (9 months to 5 years)



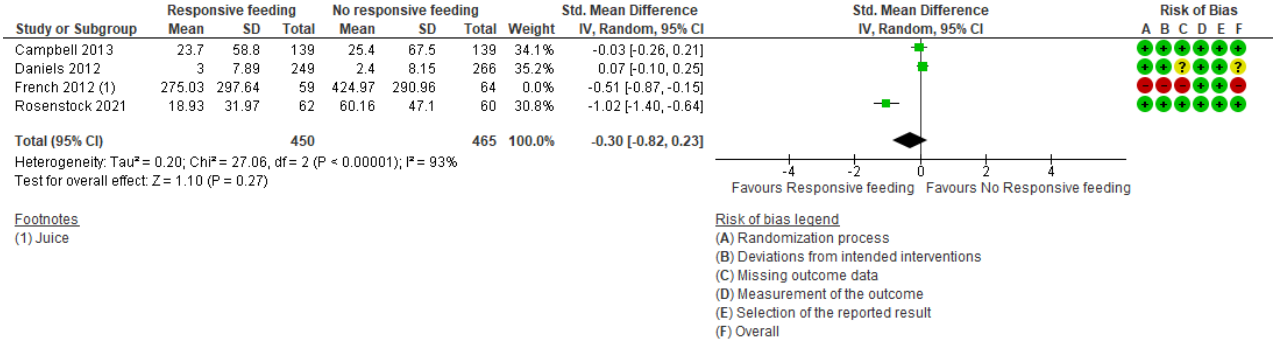
Outcome 4. Sensitivity analyses (SA)

- After excluding two studies (French 2012 and Morandi 2019) with overall high risk of bias, we found little to no differences besides the elimination of some subgroup estimations.

The analysis in Plot 42 (

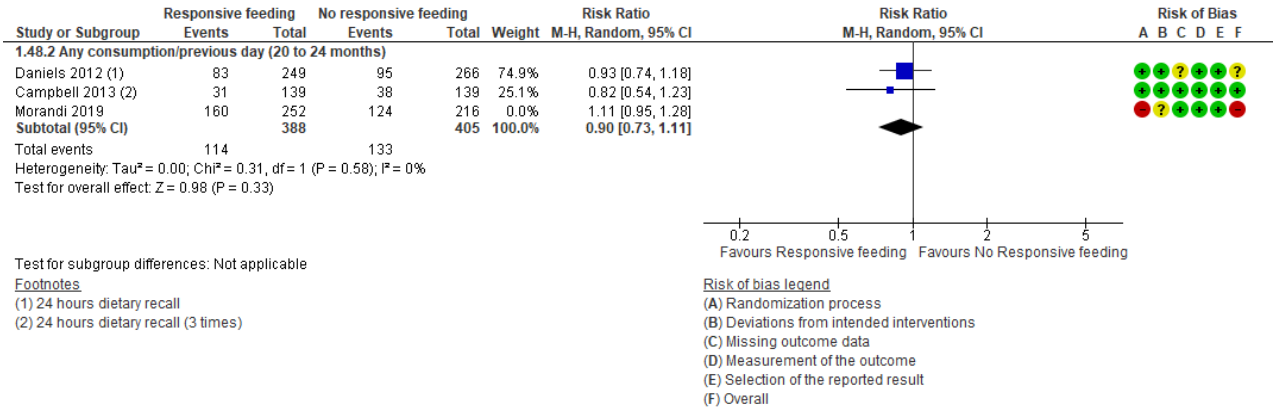
SA 4), for the outcome Sugar-sweetened beverages (SSB) intake in SMD (12 to 20 months old) result in a similar estimation: MD -30 [-0.82, 0.23]

SA 4. Sugar-sweetened beverages (SSB) intake, SMD (12 to 20 months old)



- The analysis in Plot 43 (SA 5). Non-milk sweet beverages consumption (9 to 24 months) resulted in similar estimations: MD 0.90 [0.73, 1.11].

SA 5 Non-milk sweet beverages consumption (9 to 24 months old)



Outcome 5. Nutrient and energy intake

O5.A Interventions with focus in one component of RF

The outcome was not reported in the included studies.

O5.B Interventions with two or more elements of RF, aimed to prevent under-nutrition

B.1 Responsive feeding and development stimulation programs, delivered by trained women/mothers of the village, including 6 components of RF (C1, C3, C4, C5, C7, C9)

One trial conducted in India reported energy and nutrient intakes. According to Vazir 2013 trial, the intervention:

- probably increases energy, protein and zinc intakes at 9 and 15 months old (moderate certainty);

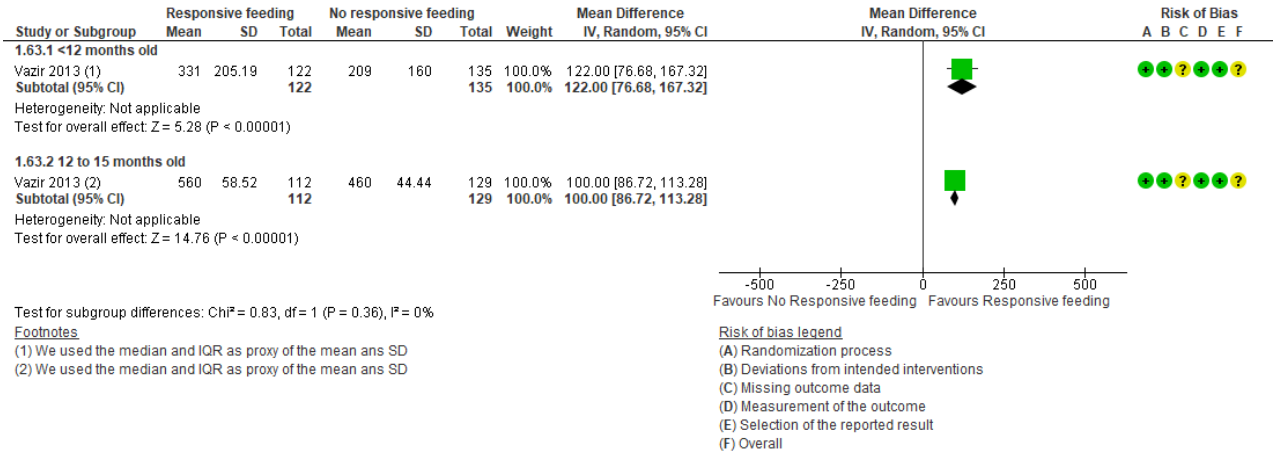
- may increase iron intake at 9 months old (low certainty) and probably increases iron intake at 15 months old (moderate certainty);
- Probably slightly increases calcium intake at 9 months old (moderate certainty) and may slightly increase calcium intake at 15 months old (low certainty).

See below the effect size and participants for energy intake.

Energy (kcal/day) Plot 51

<12 months (MD 122.00, 95% CI 76.68 to 167.32; participants = 257; studies = 1)
15 months (MD 100.00, 95% CI 86.72 to 113.28; participants = 241; studies = 1)

Plot 51. Energy intake (kcal/day) intervention for under-nutrition prevention (<12 months)



We describe below the effect size, participants and studies for nutrient intakes.

Protein intake (g/day) Plot 54

9 months (MD 3.30, 95% CI 2.19 to 4.41; participants = 257; studies = 1)
15 months (MD 4.60, 95% CI 4.12 to 5.08; participants = 241; studies = 1)

Iron intake (mg/day) Plot 57

9 months (MD 0.20, 95% CI 0.04 to 0.36; participants = 257; studies = 1)
15 months (MD 0.30, 95% CI 0.25 to 0.35; participants = 241; studies = 1)

Zinc intake (mg/day) Plot 58

9 months (MD 0.40, 95% CI 0.29 to 0.51; participants = 251; studies = 1)
15 months (MD 0.29, 95% CI 0.27 to 0.31; participants = 241; studies = 1)

Calcium intake (mg/day) Plot 59

9 months (MD 50.00, 95% CI 17.67 to 82.33; participants = 257; studies = 1)
15 months (MD 21.00, 95% CI 1.20 to 40.80; participants = 241; studies = 1)

O5.C Interventions with two or more elements of RF, aimed to prevent obesity

C.1 E-health intervention, delivered between 6 and 12 months of age, including 5 components of RF (C1, C4, C6, C7, C8)

The outcome was not reported in the included studies.

C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)

Two studies reported nutrient and energy intakes (Fangupo 2016 and Harvey-Berino 2003).
The intervention may slightly reduce energy intake at 24 months old (SMD -0.13, 95% CI -0.46 to 0.2; participants = 153; studies = 2; I^2 = 4%; low certainty). The intervention probably makes little or no difference to energy intake at <12 months and at 12 months, protein, vitamin C and calcium intakes at <12 months, 12 months and 24 months old, total fat (% energy), iron and zinc intakes at <12 months and at 12 months old (moderate certainty). The intervention may make little or no difference to the total fat intake (% energy) at 24 months old (low certainty).

We describe below the effect size, participants, studies and I^2 by each outcome.

Energy intake (kcal/day). Plot 52 **and** Plot 53
- *<12 months* (MD 28.68, 95% CI -6.73 to 64.09; participants = 162; studies = 1, Fangupo 2016)
- *12 months* (MD 26.53, 95% CI -33.10 to 86.16; participants = 144; studies = 1, Fangupo 2016)
- *24 months* (MD -5.2, 95% CI -68.45 to 58.41; participants = 113; studies = 1, Fangupo 2016)

Energy intake (kcal/kg of body weight)
- *24 months (*MD -19.90, 95% CI -49.58 to 9.78; participants = 40; studies = 1, Harvey-Berino 2003)

Protein intake (g/day) Plot 54
- *<12 months* (MD 1.40, 95% CI -0.16 to 2.96; participants = 162; studies = 1, Fangupo 2016)
- *12 months* (MD 0.90, 95% CI -2.08 to 3.88; participants = 144; studies = 1, Fangupo 2016)
- *24 months* (MD 0.30, 95% CI -1.86 to 2.46; participants = 113; studies = 1, Fangupo 2016)

Total fat (% energy) Plot 55
- *<12 months* (MD 0.50, 95% CI -1.16 to 2.16; participants = 162; studies = 1, Fangupo 2016)
- *12 months* (MD -0.20, 95% CI -1.86 to 1.46; participants = 144; studies = 1, Fangupo 2016)
- *24 months* (MD -0.21, 95% CI -1.51 to 1.09; participants = 153; studies = 2; I^2 = 0%, Fangupo 2016 and Harvey-Berino 2003)

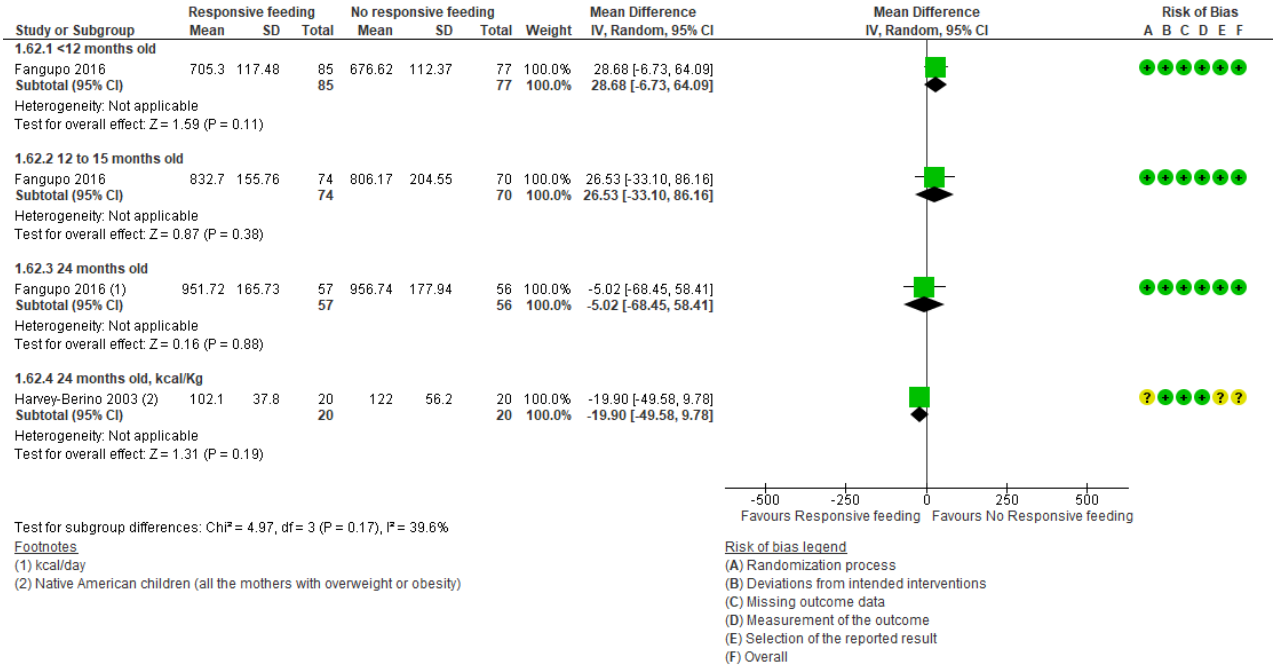
Vitamin C intake (mg/day) Plot 56
- <12 months (MD -5.00, 95% CI -12.00 to 2.00; participants = 162; studies = 1, Fangupo 2016)
- 12 months (MD 0.20, 95% CI -7.08 to 7.48; participants = 144; studies = 1, Fangupo 2016)
- 24 months (MD 3.80, 95% CI -1.97 to 9.57; participants = 113; studies = 1, Fangupo 2016)

Iron intake (mg/day) Plot 57
- <12 months (MD 0.20, 95% CI -0.87 to 1.27; participants = 162; studies = 1, Fangupo 2016)
- 12 months (MD 0.00, 95% CI -1.40 to 1.40; participants = 143; studies = 1, Fangupo 2016)

Zinc intake (mg/day) Plot 58
- <12 months (MD 0.13, 95% CI -0.07 to 0.33; participants = 162; studies = 1, Fangupo 2016)
- 12 months (MD 0.30, 95% CI -0.10 to 0.70; participants = 143; studies = 1, Fangupo 2016)

Calcium intake (mg/day) Plot 59
- <12 months (MD 19.00, 95% CI -28.42 to 66.42; participants = 162; studies = 1, Fangupo 2016)
- 12 months (MD 6.00, 95% CI -70.48 to 82.48; participants = 144; studies = 1, Fangupo 2016)
- 24 months (MD -9.00, 95% CI -91.39 to 73.39; participants = 113; studies = 1, Fangupo 2016)

Plot 52. Energy intake (kcal/day and kcal/kg), interventions for obesity prevention (<12 to 24 months old)

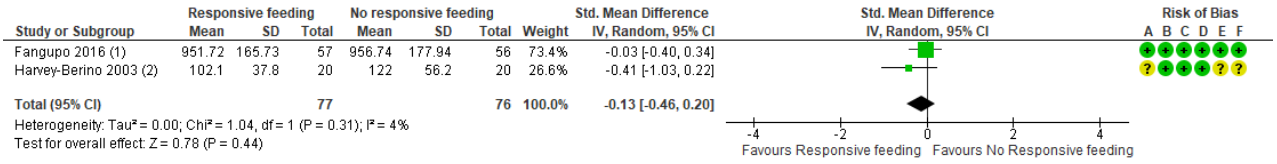


Test for subgroup differences: Chi² = 4.97, df = 3 (P = 0.17), I² = 39.6%

Footnotes
(1) kcal/day
(2) Native American children (all the mothers with overweight or obesity)

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

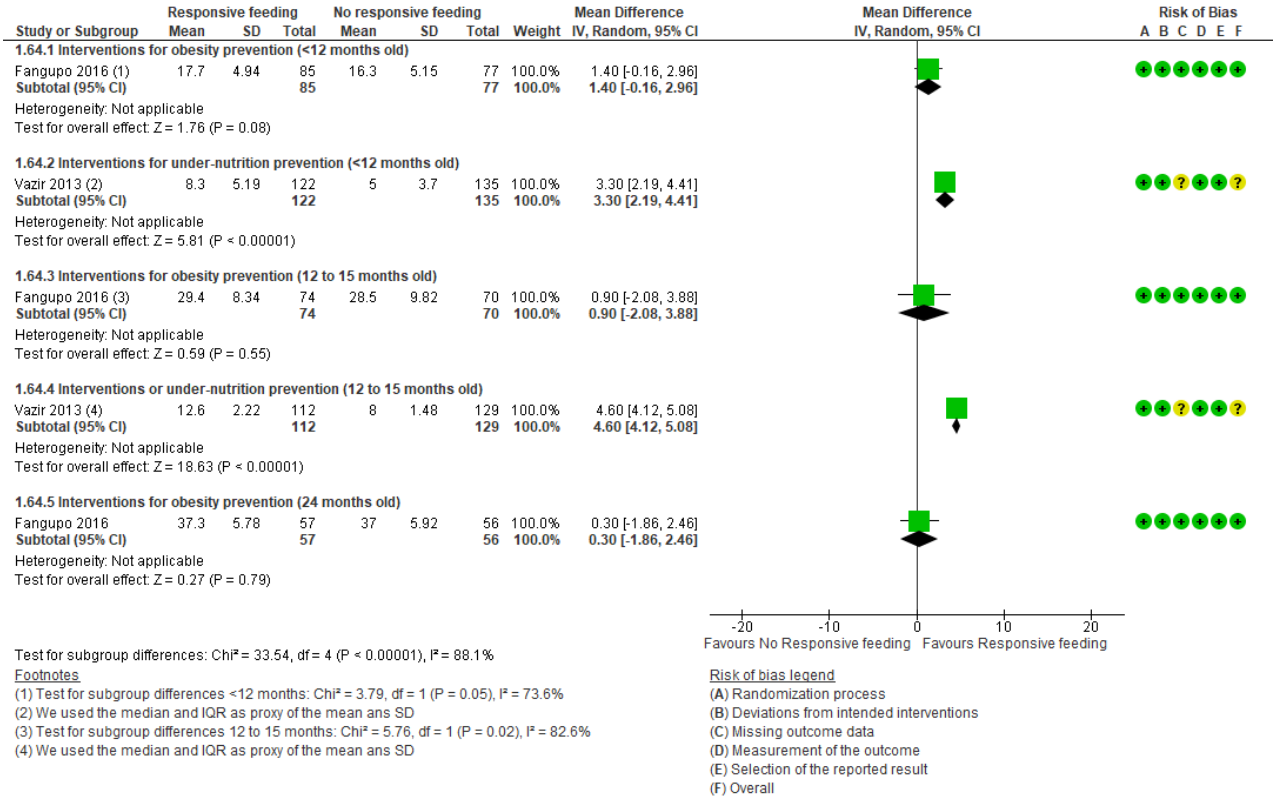
Plot 53. Energy intake (SMD), interventions for obesity prevention (24 months old)



Footnotes
(1) kcal/day
(2) Native American children (all the mothers with overweight or obesity). Kcal/kg

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 54.Protein intake (g/day) (<12 months to 24 months old)

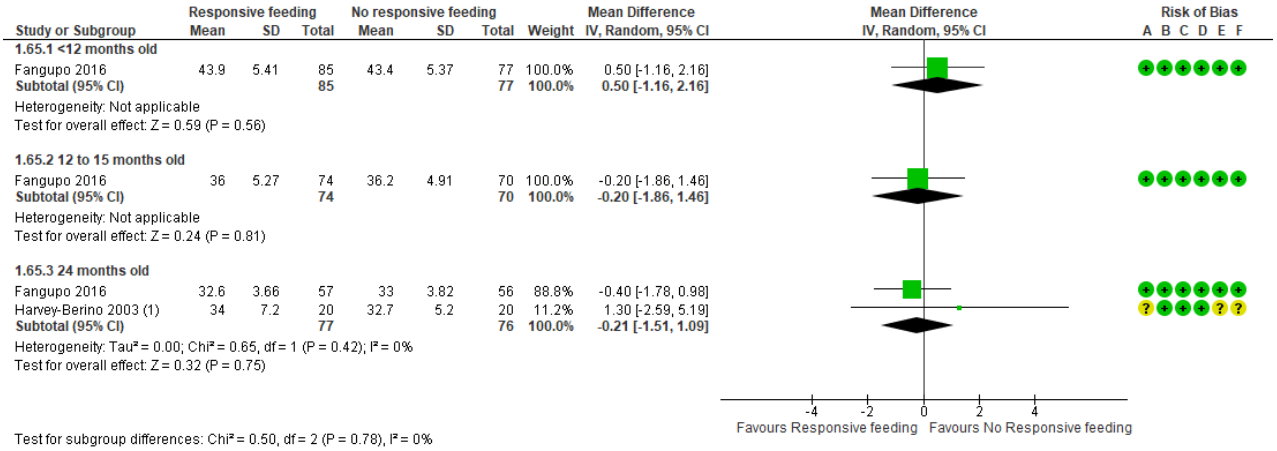


Test for subgroup differences: Chi² = 33.54, df = 4 (P < 0.00001), I² = 88.1%

Footnotes
(1) Test for subgroup differences <12 months: Chi² = 3.79, df = 1 (P = 0.05), I² = 73.6%
(2) We used the median and IQR as proxy of the mean ans SD
(3) Test for subgroup differences 12 to 15 months: Chi² = 5.76, df = 1 (P = 0.02), I² = 82.6%
(4) We used the median and IQR as proxy of the mean ans SD

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 55.Total fat (% energy) for obesity prevention (<12 to 15 months old)

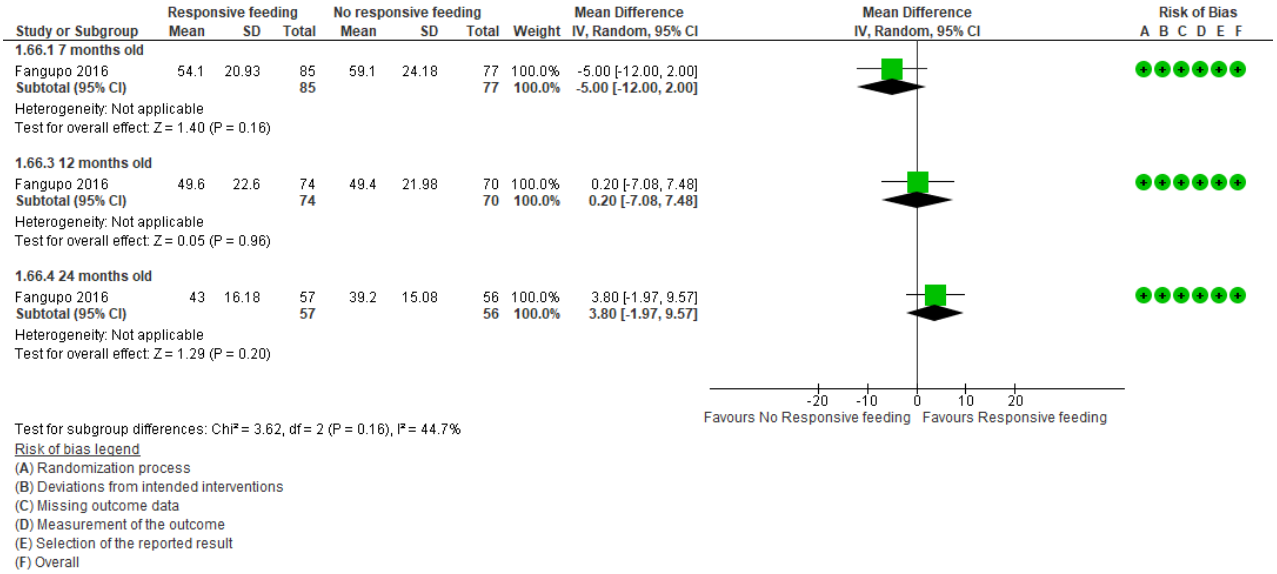


Test for subgroup differences: Chi² = 0.50, df = 2 (P = 0.78), I² = 0%

Footnotes
(1) Native American children (all the mothers with overweight or obesity)

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

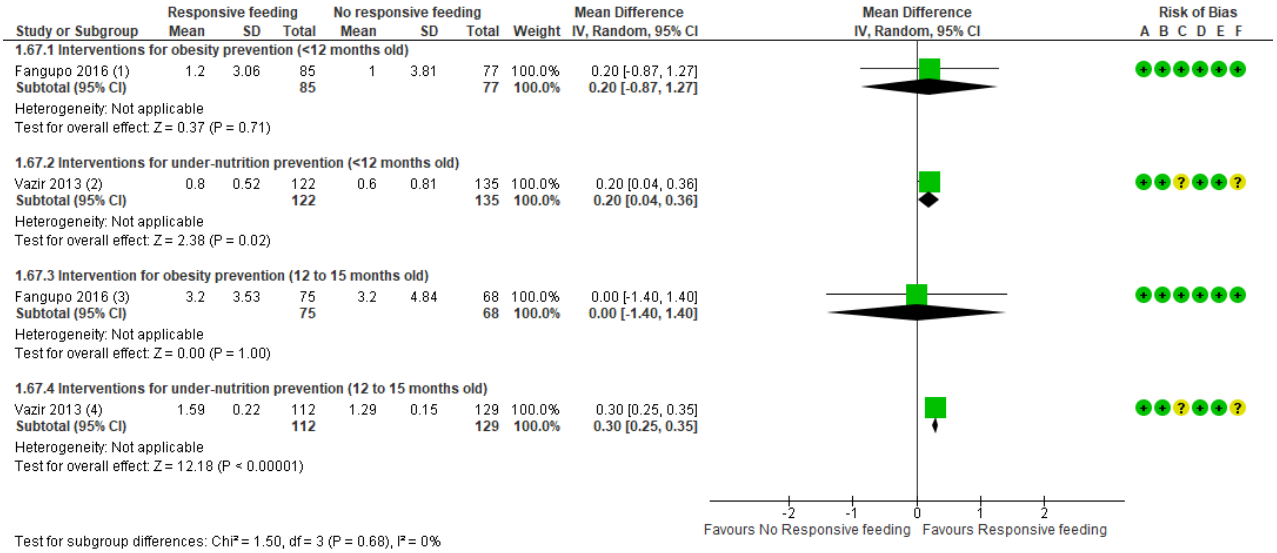
Plot 56. Vitamin C intake (mg/day) for obesity prevention (7 to 24 months old)



Test for subgroup differences: Chi² = 3.62, df = 2 (P = 0.16), I² = 44.7%

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 57. Iron intake (mg/day) (<12 to 15 months old)

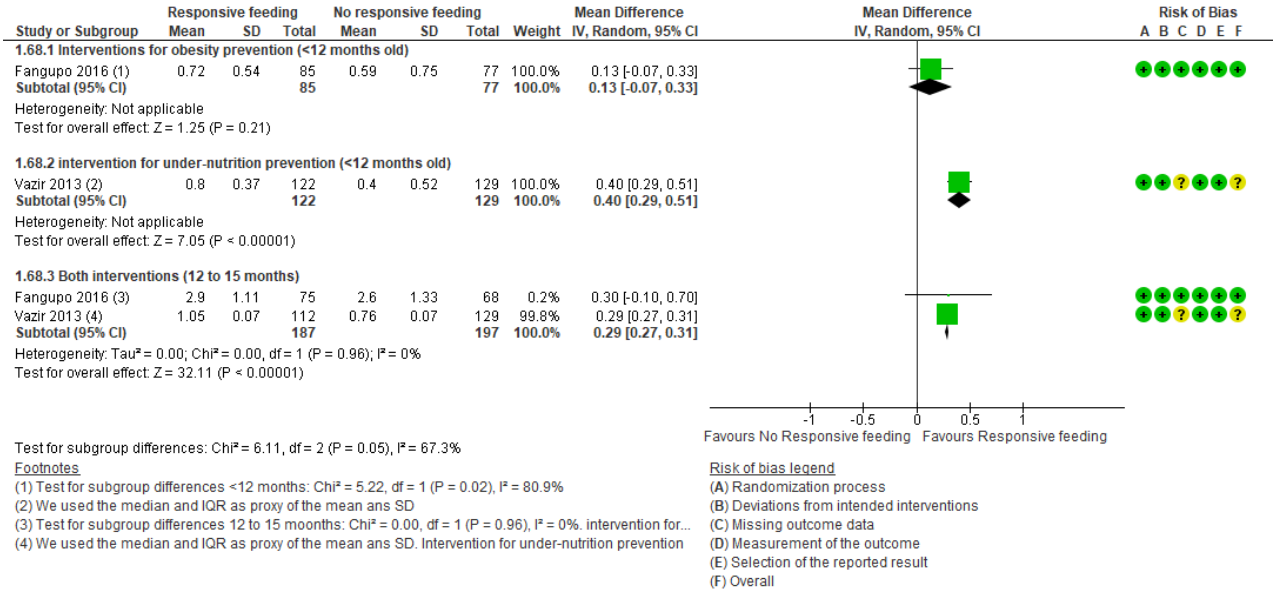


Test for subgroup differences: Chi² = 1.50, df = 3 (P = 0.68), I² = 0%

Footnotes
(1) Test for subgroup differences <12 : Chi² = 0.00, df = 1 (P = 1.00), I² = 0%
(2) We used the median and IQR as proxy of the mean ans SD
(3) Test for subgroup differences 12 to 15 months: Chi² = 0.18, df = 1 (P = 0.67), I² = 0%
(4) We used the median and IQR as proxy of the mean ans SD

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 58. Zinc intake (mg/day) (<12 to 15 months old)



Test for subgroup differences: Chi² = 6.11, df = 2 (P = 0.05), I² = 67.3%

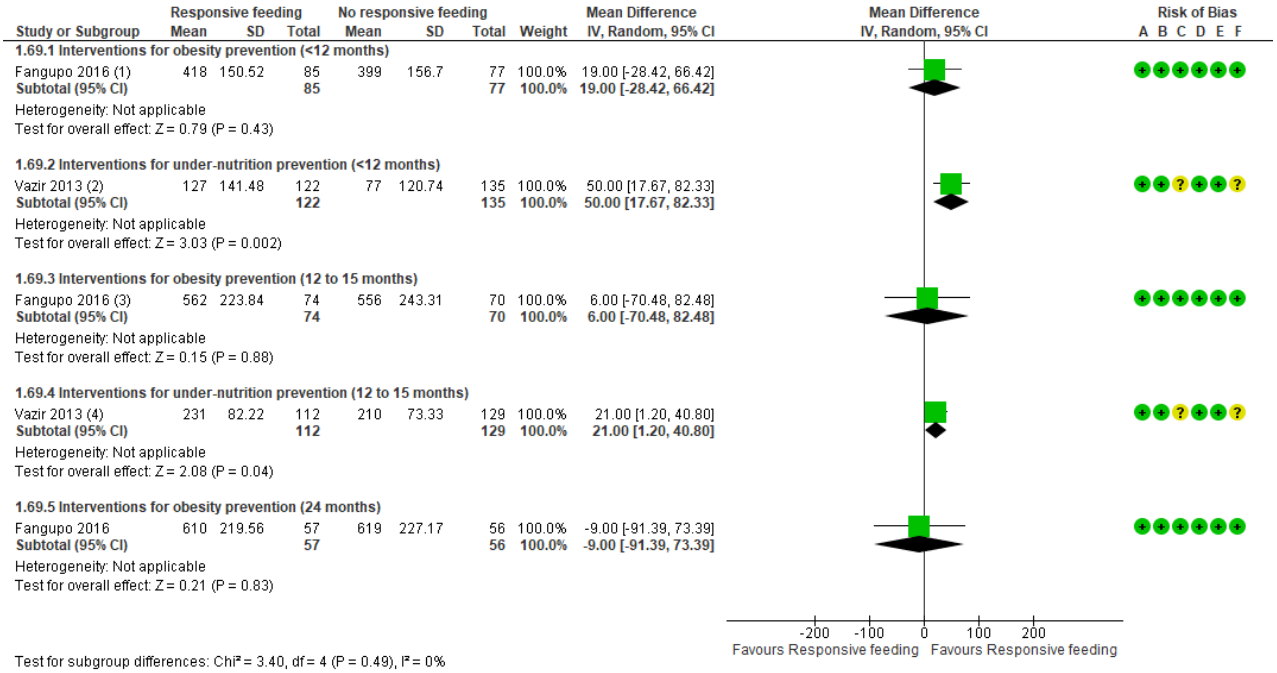
Footnotes

(1) Test for subgroup differences <12 months: Chi² = 5.22, df = 1 (P = 0.02), I² = 80.9%
(2) We used the median and IQR as proxy of the mean ans SD
(3) Test for subgroup differences 12 to 15 moonths: Chi² = 0.00, df = 1 (P = 0.96), I² = 0%. intervention for...
(4) We used the median and IQR as proxy of the mean ans SD. Intervention for under-nutrition prevention

Risk of bias legend

(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 59. Calcium intake (mg/day) (<12 to 24 months)



Test for subgroup differences: Chi² = 3.40, df = 4 (P = 0.49), I² = 0%

Footnotes

(1) Test for subgroup differences <12 months: Chi² = 1.12, df = 1 (P = 0.29), I² = 10.8%
(2) We used the median and IQR as proxy of the mean ans SD
(3) Test for subgroup differences 12 to 15 months: Chi² = 0.14, df = 1 (P = 0.71), I² = 0%
(4) We used the median and IQR as proxy of the mean ans SD

Risk of bias legend

(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Outcome 5. Subgroup analyses

Not applicable

Outcome 5. Sensitivity analyses (SA)

Not applicable

Outcome 6. Grow and body composition outcomes

O6.A Interventions with focus in one component of RF

The outcome was not reported in the included studies.

O6.B Interventions with two or more elements of RF, aimed to prevent under-nutrition

B.1 Responsive feeding and development stimulation programs, delivered by trained women/mothers of the village, including 6 to 7 components of RF (C1, C3, C4, C5, C7, C9 and C10 in some studies)

Weight related outcomes

Four studies (Aboud 2008, Aboud 2009, Aboud 2011 and Vazir 2013) reported weight and/or weight-for-age z-scores. Interventions with elements of RF for under-nutrition prevention probably results in little to no difference between groups for weight-for-age at 12 months and 24 months of age.

We describe below the effect size, participants, studies and I^2 by each outcome.

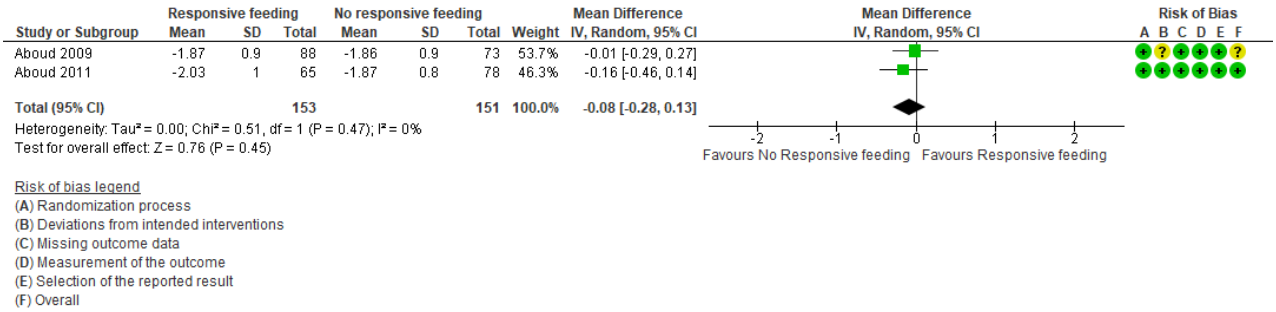
Weight-for-age z-score Plot 60

*24 months (*MD -0.08, 95% CI -0.28 to 0.13; participants = 304; studies = 2; I^2 = 0%)

Weight (kg) Plot 61

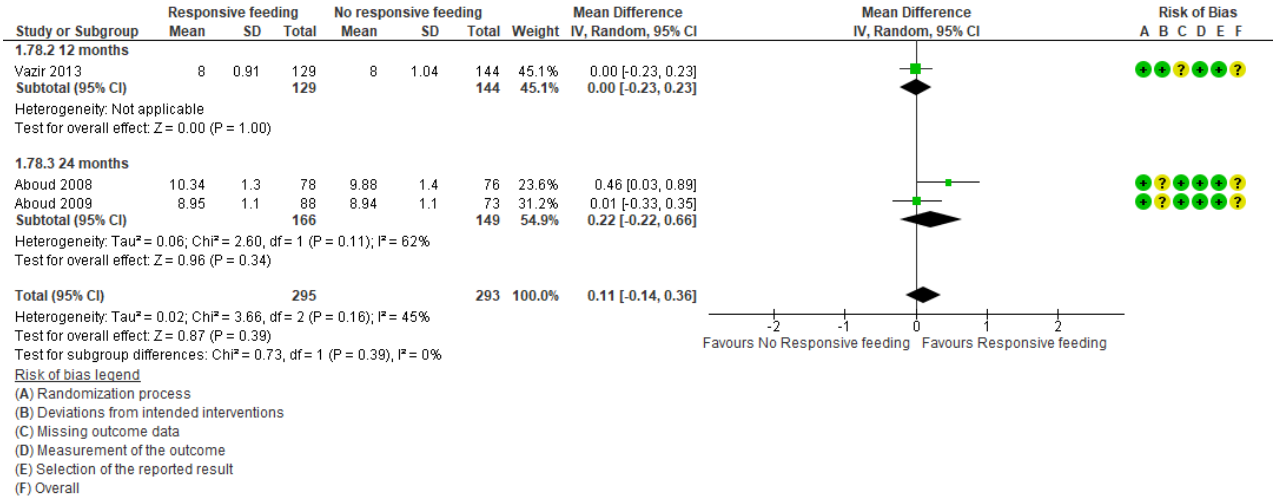
12 to 24 months (MD 0.11, 95% CI -0.14 to 0.36; participants = 588; studies = 3; I^2 = 45%)
12 months (MD 0.00, 95% CI -0.23 to 0.23; participants = 273; studies = 1)
24 months (MD 0.22, 95% CI -0.22 to 0.66; participants = 315; studies = 2; I^2 = 62%)

Plot 60. Weight-for-age z-score for under-nutrition (24 months)



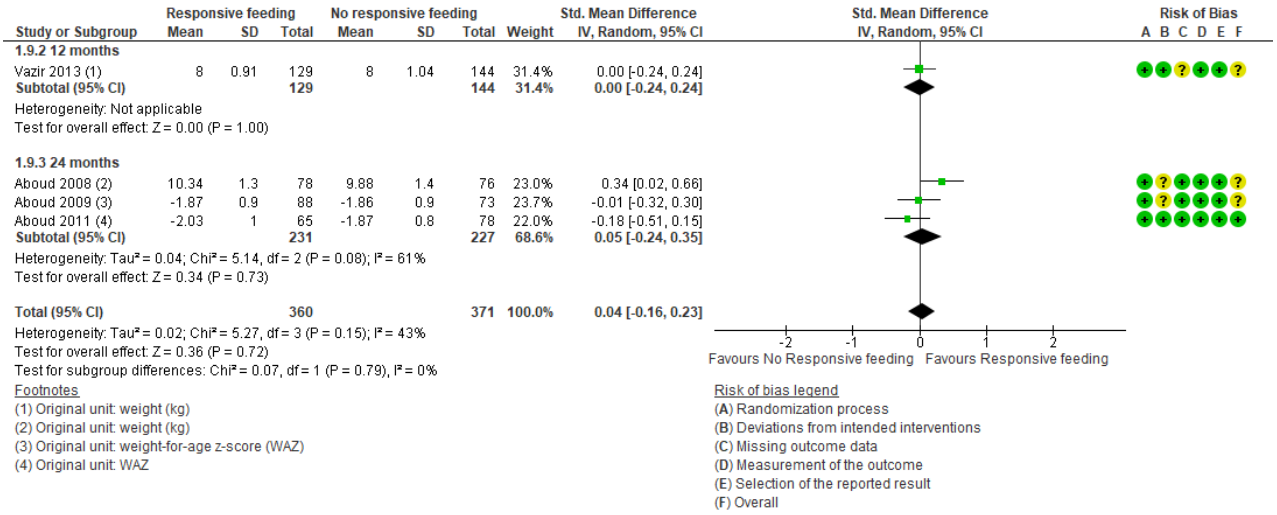
Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 61.Weight (kg), intervention for under-nutrition prevention (12 to 24 months)



The intervention probably makes little or no difference to the weight-related outcomes at 12 months (SMD 0.00, 95% CI -0.24 to 0.24; participants = 273; studies = 1; moderate certainty) and may make little or no difference at 24 months old (SMD 0.05, 95% CI -0.24 to 0.35; participants = 458; studies = 3; I^2 = 61%; low certainty). Plot 62

Plot 62. Weight-related outcomes (SMD), interventions for under-nutrition prevention (12 to 24 months old)



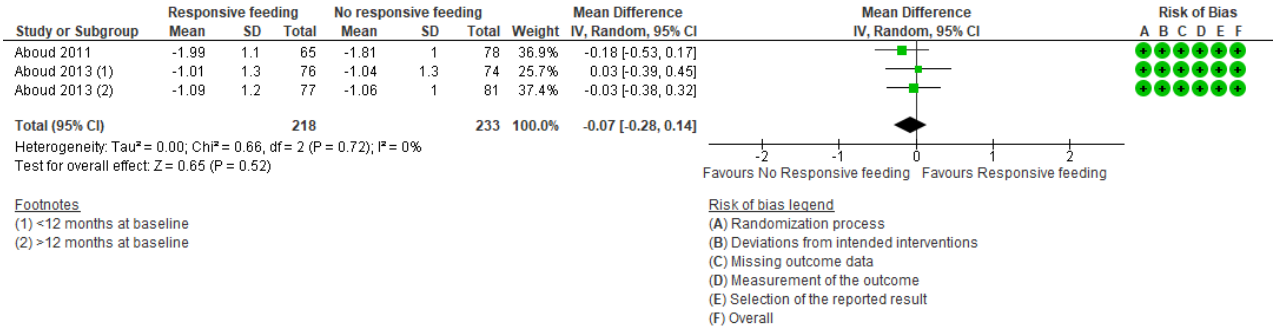
Length-related outcomes

Three trials (Aboud 2011, Aboud 2013, and Vazir 2013) reported at least one outcome in this category. We describe below the effect size, participants, studies and I^2 by each outcome.

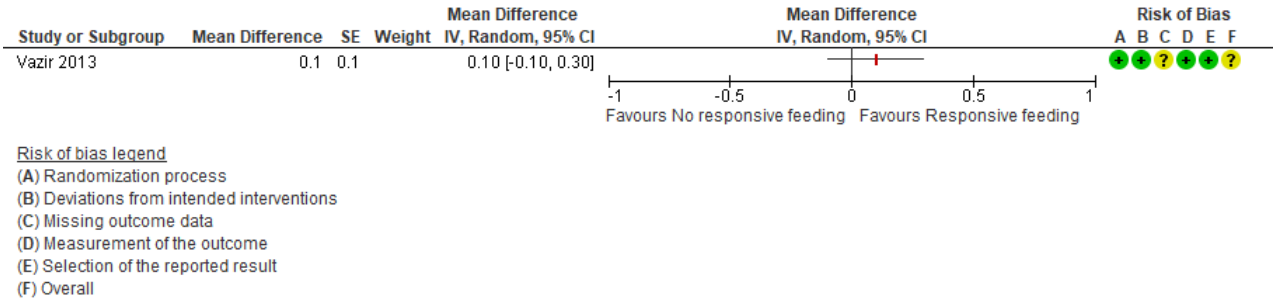
- Length for age z-score at 24 months (MD -0.07, 95% CI -0.28 to 0.14; participants=566; studies=2; I^2=0%) Plot 63
- Change in length-for-age z-score, 12 months from baseline (15 months) (MD 0.10, 95% CI -0.10 to 0.30; studies=1) Plot 64

- Length (cm), 12 months (MD 0.10, 95% CI -0.49 to 0.69; participants = 273; studies = 1); 15 months (MD 0.30, 95% CI -0.34 to 0.94; participants = 258; studies = 1) Plot 65

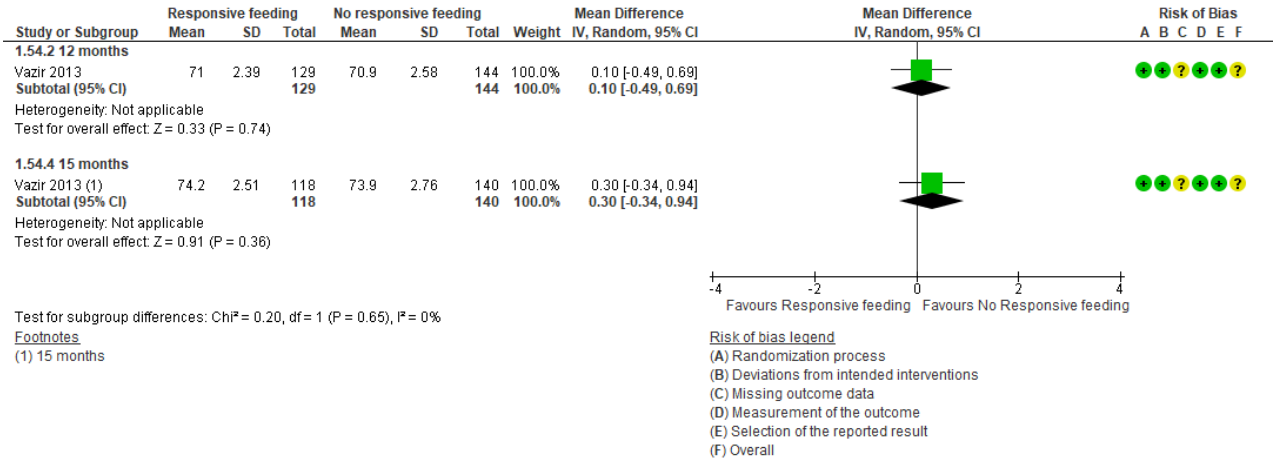
Plot 63. Length for age z-score (24 months old)



Plot 64. Change in length-for-age z-score between 3 and 15 months of age

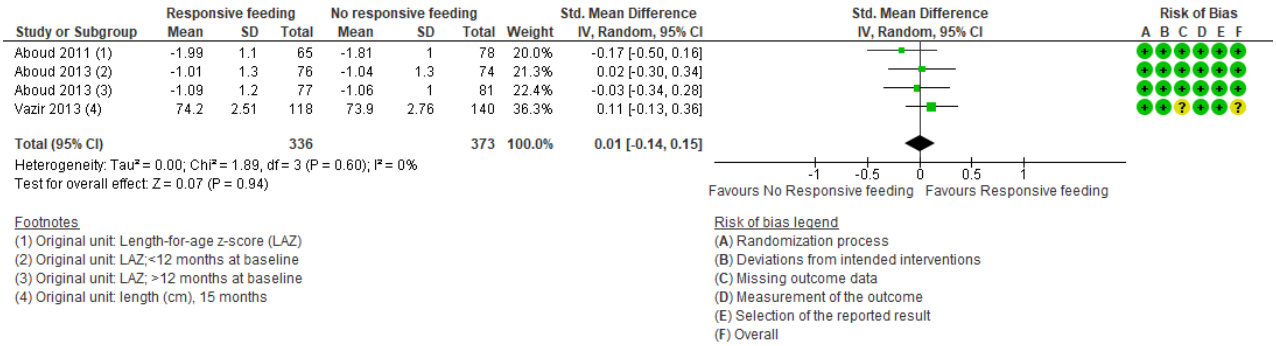


Plot 65. Length (cm) at 12 and 15 months old



Data were combined on a SMD. The intervention probably makes little or no difference to the length-related outcomes between 15 and 24 months old. (SMD 0.01, 95% CI -0.14 to 0.15; participants = 709; studies = 3; I2 = 0%; moderate certainty; Plot 66)

Plot 66. Length (SMD) between 15 and 24 months old



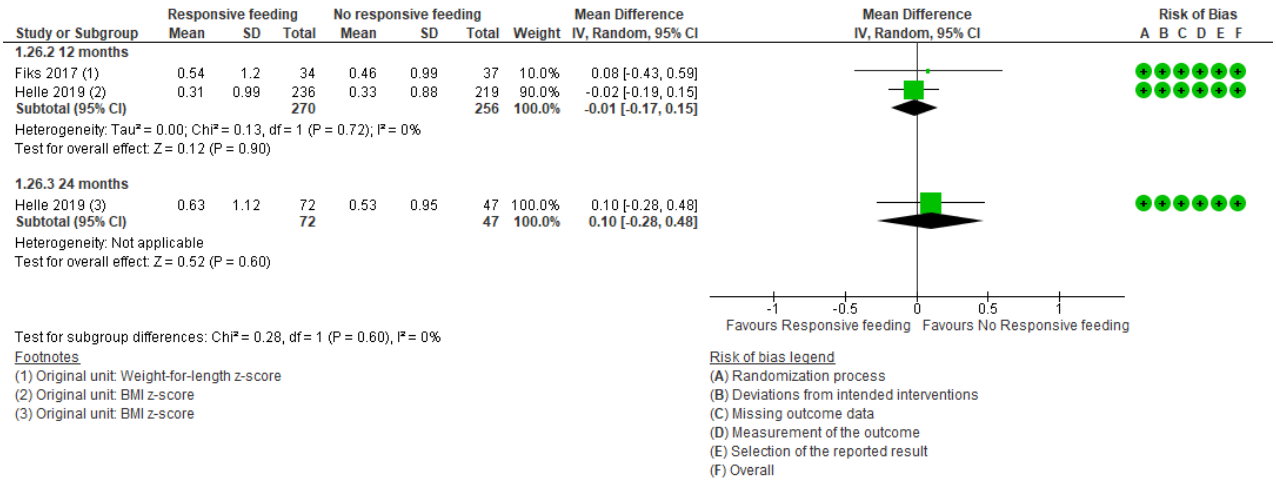
O6.C Interventions with two or more elements of RF, aimed to prevent obesity

C.1 E-health interventions, Facebook peer group, including between 4 and 5 components of RF (C1, C4, C7, C8, and C6 in one study)

Two trials in this category reported weight-related data. Interventions consisted of mails, monthly video clips, cooking films and recipes (Helle 2019, Norway) and a Facebook peer group with two in-person meetings facilitated by a psychologist (Fiks 2017, USA, low resource-setting). Both interventions finished during the first year of life. They included between 4 and 5 components of RF.

Trials reported weight-for-length z-scores and BMI z-scores. The interventions probably make little or no effect at ages of 12 (MD -0.01, 95% CI -0.17 to 0.15; participants=526; studies=2; I2=0%; moderate certainty) and 24 months old (MD 0.10, 95% CI -0.28 to 0.48; participants=119; studies=1; moderate certainty).

Plot 67. Weight-for-length z-score and BMI z-score at 12 and 24 months old



C.2 Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)

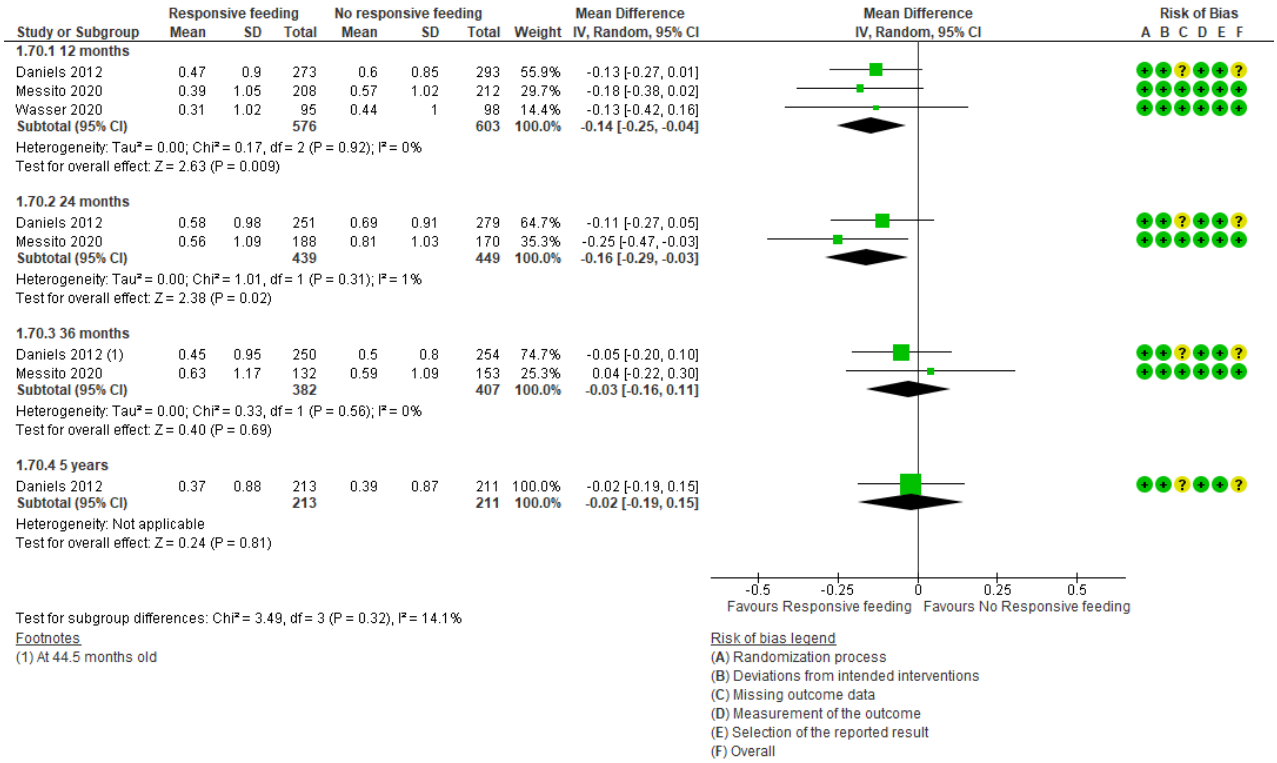
Weight related outcomes.

Thirteen studies (Black 2021, Campbell 2013, Daniels 2012, Fangupo 2015, Fangupo 2016, Louzada 2012, Messito 2020, Paul 2011, Rosenstock 2021, Savage 2016, Schroeder 2015, Vlasblom 2020 and Wasser 2020) reported weight-related outcomes including weight-for-age z-score (WAZ), weight-for-length z-score, BMI z-score, weight (kg) and/or frequency of overweight/obesity.

Three studies (Daniels 2012, Messito 2020 and Wasser 2020) reported results on WAZ. Effect size and participants for each subgroup of age are presented below.

- 12 months old (MD -0.14, 95% CI -0.25 to -0.04; participants=1179; studies=3; I2=0%);
- 24 months old (MD -0.16, 95% CI -0.29 to -0.03; participants=888; studies=3; I2=0%);
- 3 years old (MD -0.03, 95% CI -0.16 to 0.11; participants=789; studies=2; I2=0%);
- 5 years old (MD -0.02, 95% CI -0.19 to 0.15; participants=424; studies=1). Plot 68

Plot 68. Weight-for-age z-score, intervention for obesity prevention (12 months to 5 years old)



At 9 months of age one study (Rosenstock 2021) showed lower BMI z-score in the intervention- than in the control group (MD -0.54, 95% CI -0.93 to -0.15; participants=120; studies=1). Plot 69 and Plot 71.

At 12 months of age, Wasser 2020 trial reported a mean difference for weight-for-length z-score of 0.12 (95% CI -0.23 to 0.47). On the other hand Paul 2011 reported a reduction in the weight-for-length percentiles in the intervention group in comparison with the control group (-15.84; 95% CI -23.04 to -8.64).

Other reported weight-related anthropometric measures were: BMI Z-scores at 12, 24, 32 to 36 months and 5 years old (Plot 69) and weight (kg) at 12 and 24 months (Plot 70). Please see below the effect size, participants, studies and I^2 for these outcomes.

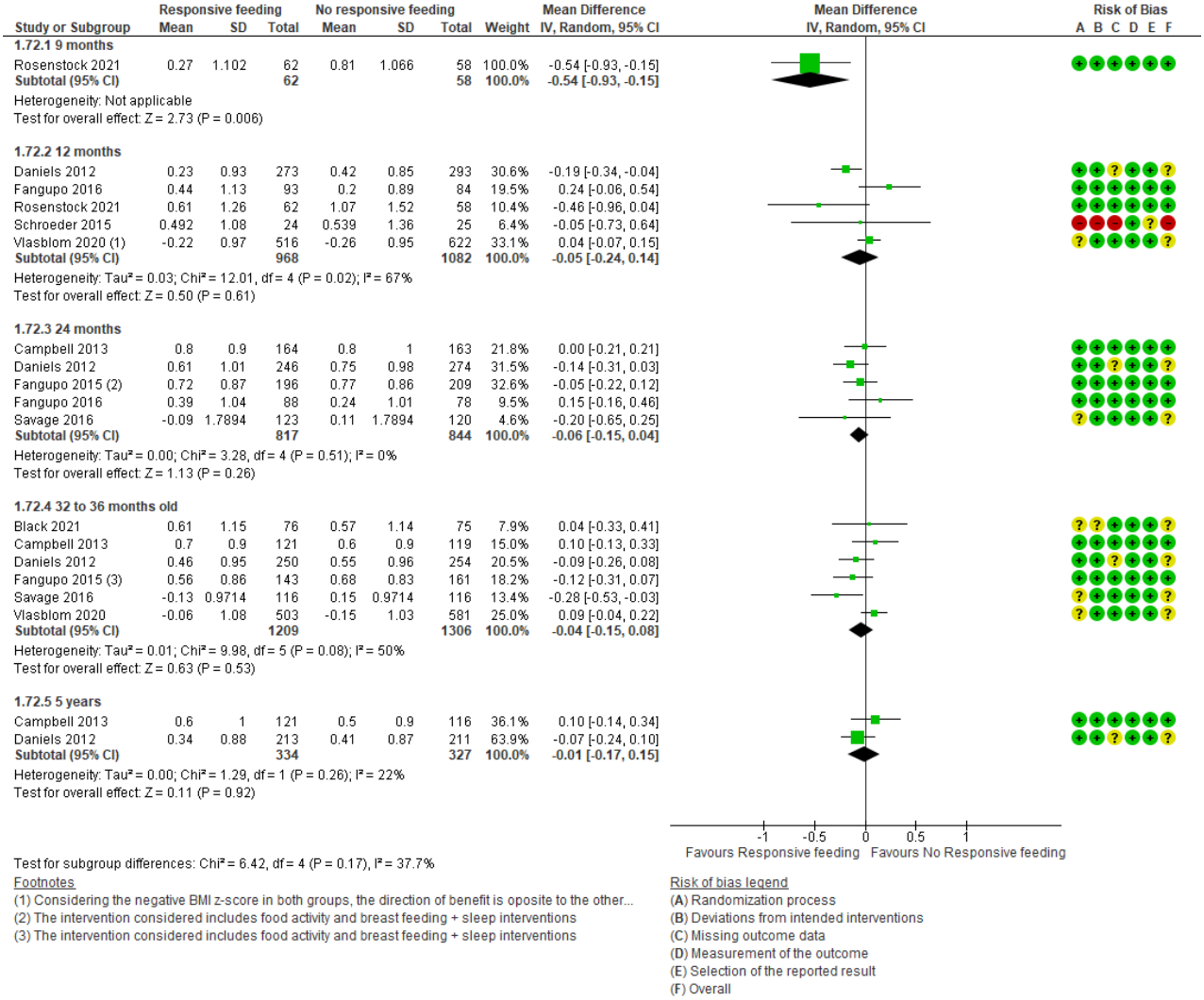
BMI z-score Plot 69

12 months (MD -0.05, 95% CI -0.24 to 0.14; participants = 2050; studies = 5; I^2 = 67%)

24 months (MD -0.06, 95% CI -0.15 to 0.04; participants = 1661; studies = 5; I^2 = 0%)
32 to 36 months (MD -0.04, 95% CI -0.15 to 0.08; participants = 2515; studies = 6; I^2 = 50%)
5 years (MD -0.01, 95% CI -0.17 to 0.15; participants = 661; studies = 2; I^2 = 22%)

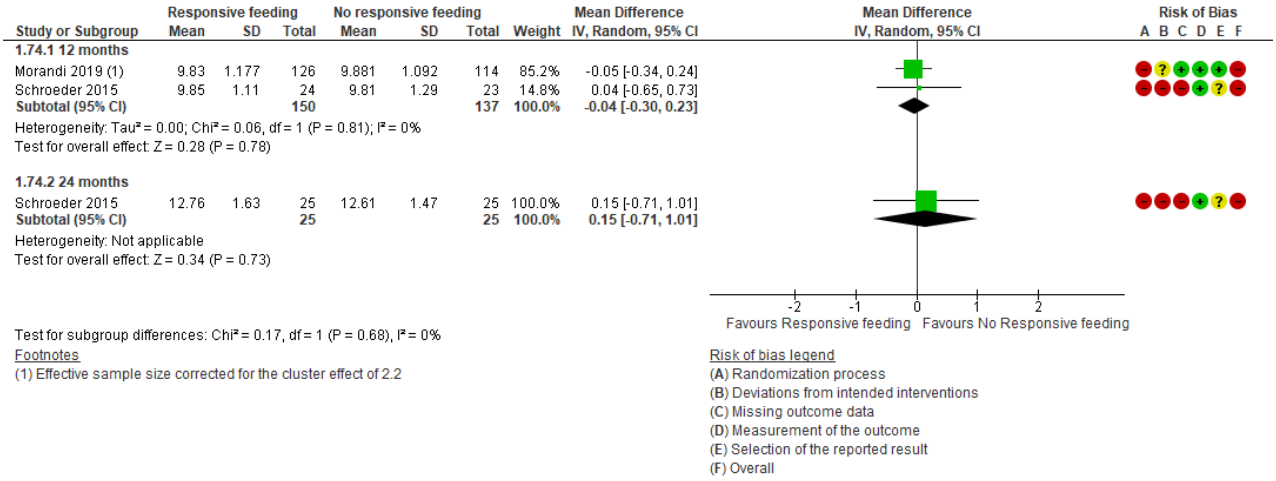
Weight (kg) Plot 70
12 months (MD -0.04, 95% CI -0.30 to 0.23; participants=287; studies=2; I^2=0%)
24 months (MD 0.15, 95% CI -0.71 to 1.01; participants=50; studies=1)

Plot 69. BMI z-score (12 months to 5 years old)



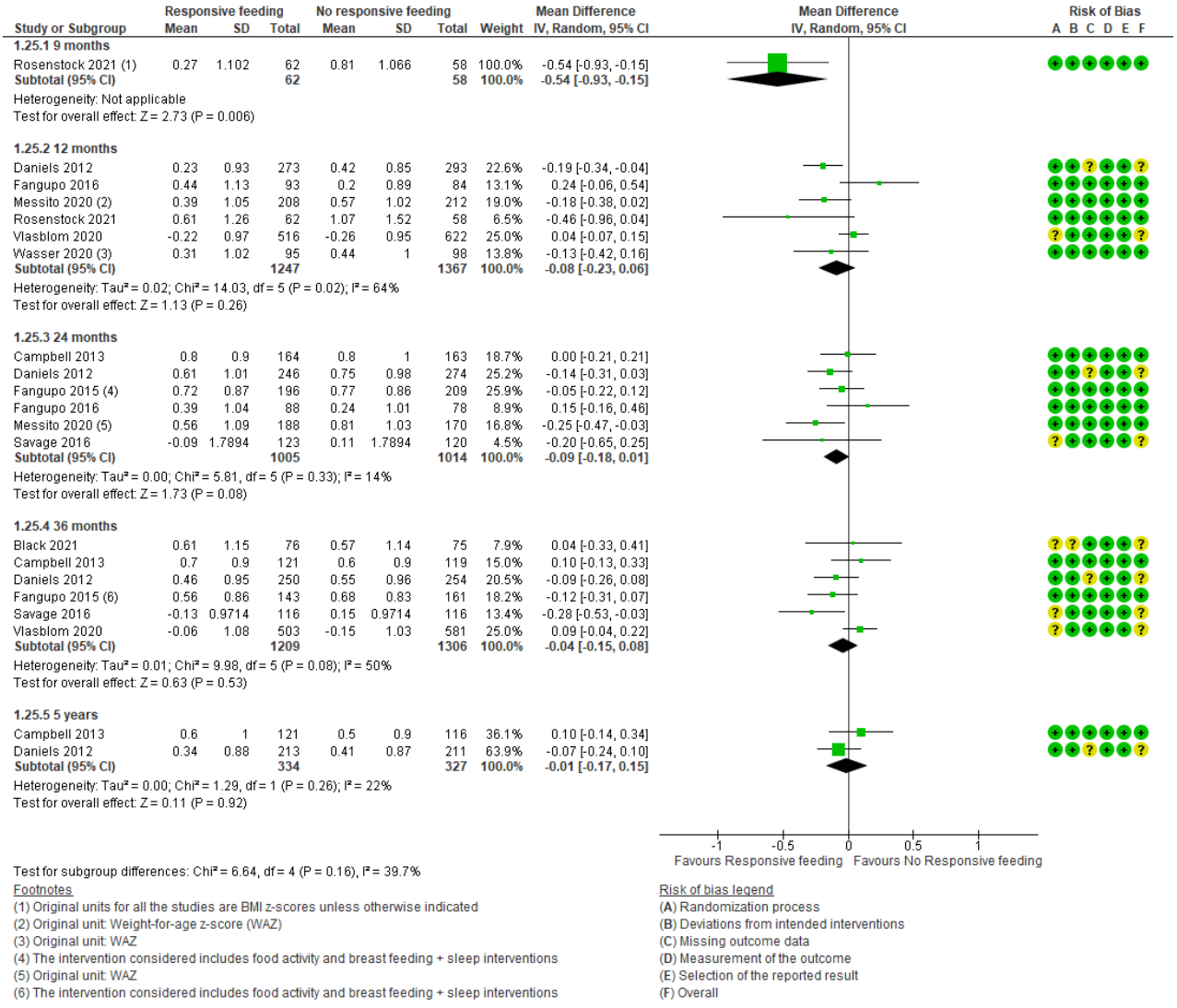
(1) Considering the negative BMI z-score in both groups, the direction of benefit is opposite to the other studies. The prevalence of overweight and obesity at 36 months was lower than expected in both the intervention (6%) and control group (4%).

Plot 70. Weight (kg), interventions for obesity prevention (12 to 24 months old)



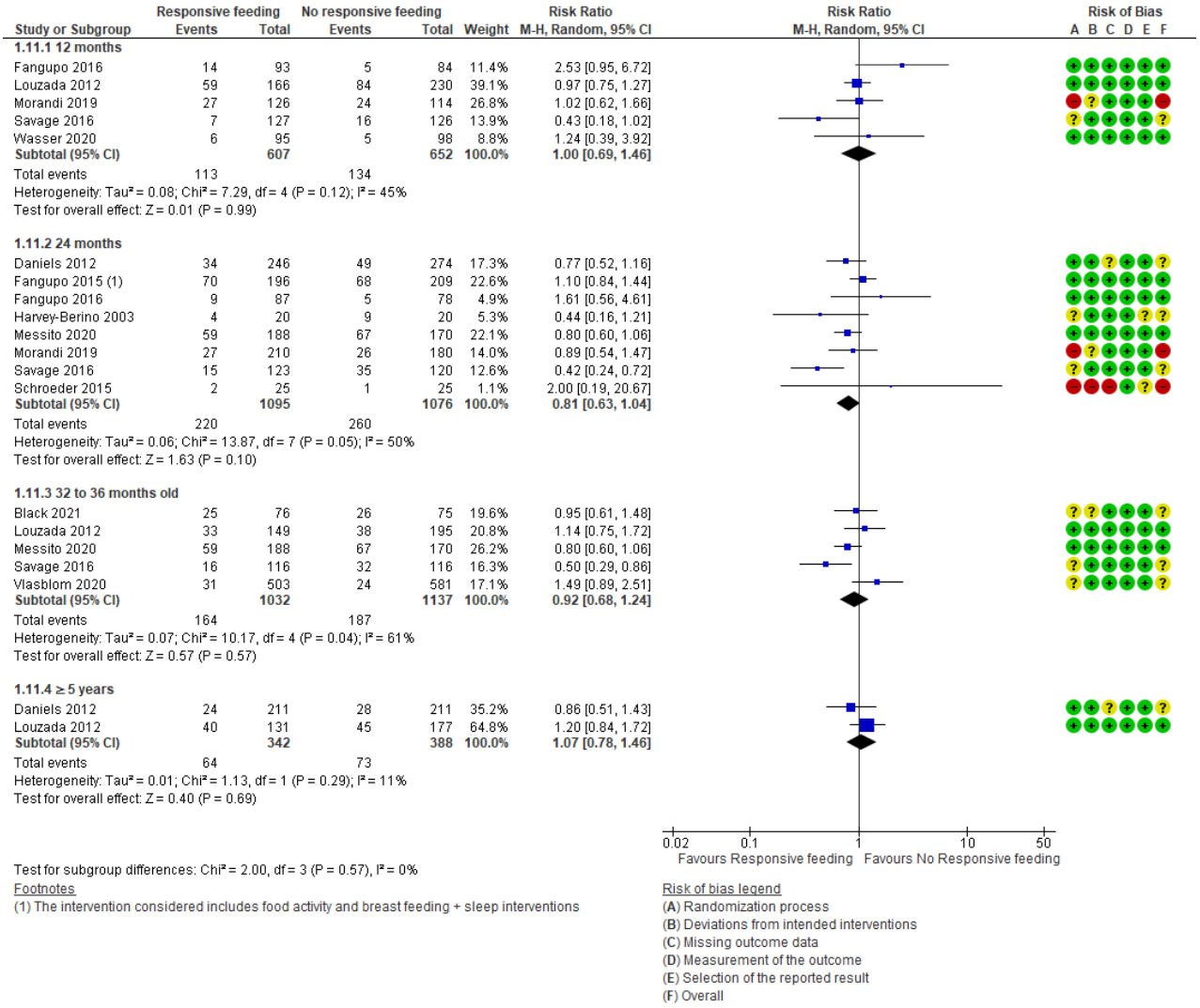
A combination of two weight-related outcomes (BMI z-score and WAZ) at 12, 24, 32 to 36 months and 5 years of age is presented in Plot 71. At 12 months of age the interventions may slightly reduce these weight-related outcomes expressed as z-score (MD -0.07, 95% CI -0.19 to 0.05; participants = 3069; studies = 7; I^2 = 58%; low certainty), and probably at 24 months (MD -0.08, 95% CI -0.17 to 0.02; participants = 2138; studies = 7; I^2 = 11%, moderate certainty). The interventions may make little or no effect to these outcomes at 32 to 36 years old (MD -0.04, 95% CI -0.15 to 0.08; participants = 2515; studies = 6; I^2 = 50%; low certainty), and probably do not have an important effect at 5 years (MD -0.01, 95% CI -0.17 to 0.15; participants = 661; studies = 2; I^2 = 22%; moderate certainty).

Plot 71. Weight-related outcomes (BMI z-score and WAZ) between 12 months to 5 years old)



Effects on overweight and obesity are shown in Plot 72. Five trials indicated that the interventions may make little or no effect to the prevalence of overweight at 12 months old (RR 1.00, 95% CI 0.69 to 1.46; participants =1259; studies = 5; I^2 =45%; low certainty). Eight trials indicated that the interventions may slightly reduce the prevalence of obesity/overweight at 24 months old (RR 0.81, 95% CI 0.63 to 1.04; participants =2171; studies = 8; I^2 =50%; low certainty). Two trials indicated that the interventions probable make little or no effect to the prevalence of obesity/overweight between 5 and 8 years old (RR 1.07, 95% CI 0.78 to 1.46; participants =730; studies = 2; I^2 =11%; moderate certainty). It is uncertain whether the intervention reduces the prevalence of obesity7overweight at 32 to 36 months (RR 0.92, 95% CI 0.68 to 1.24; participants =2169; studies = 5; I^2 =61%; very low certainty).

Plot 72. Overweight/obesity (12 months to 8 years)



Length-related outcomes

Four trials (Daniels 2012, Louzada 2012, Morandi 2019, and Schroeder 2015) reported at least one outcome related to the length.

We describe below the effect size, participants, studies and I^2 by outcome.

Length/height-for-age z-score (Daniels 2012)

12 months (MD -0.02, 95% CI -0.19 to 0.15; participants=566; studies=1)
24 months, (MD -0.03, 95% CI -0.20 to 0.14; participants = 520; studies = 1)
3.5 years (MD 0.07, 95% CI -0.10 to 0.24; participants = 504; studies = 1)
5 years (MD 0.05, 95% CI -0.12 to 0.22; participants = 424; studies = 1)

Length (cm)

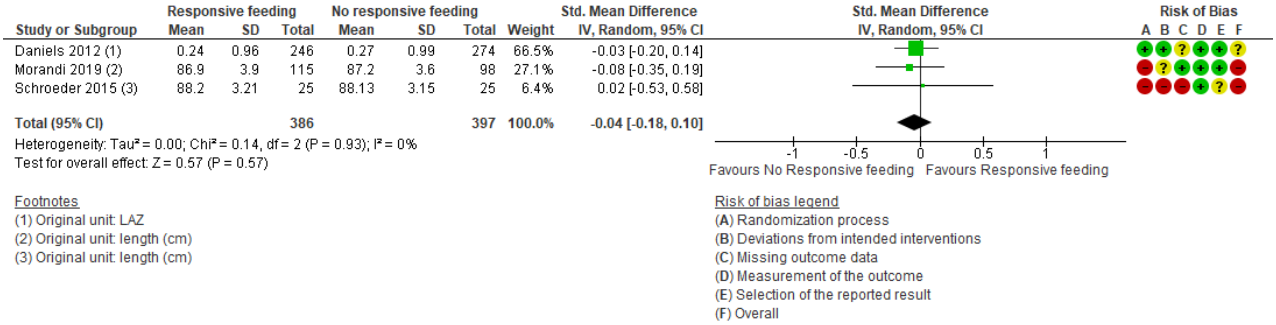
12 months (MD 0.22, 95% CI -1.34 to 1.78; participants = 49; studies = 1; Schroeder 2015)
24 months (MD -0.17, 95% CI -0.63 to 0.30; participants = 783; studies = 3; I^2 = 0%; Schroeder 2015, Daniels 2012, and Morandi 2019)

Stunting

12 months (RR 0.99, 95% CI 0.44 to 2.72; participants=397; studies=1; Louzada 2012)

Three trials indicated that the interventions may make little or no difference to length at 24 months old (SMD -0.02, 95% CI -0.12 to 0.08; participants = 1492; studies = 3; I^2 = 0%, low certainty; Plot 73)

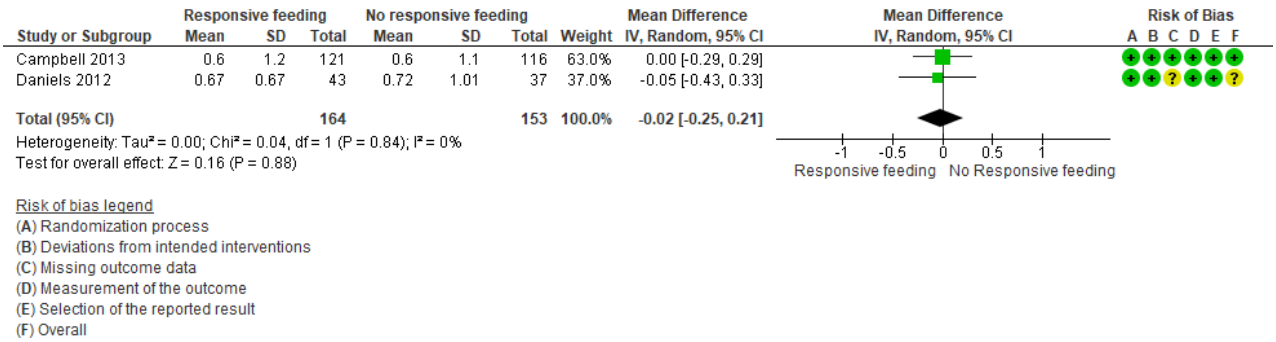
Plot 73. Length, SMD (24 months)



Other anthropometric outcomes

Two studies (Campbell 2013, Daniels 2012) reported waist circumference z-scores at 5 years of age, indicating that the intervention probably makes little or no differences between groups (MD -0.02, 95% CI -0.25 to 0.21; participants = 317; studies = 2; I^2 = 0%; moderate certainty).
Plot 74

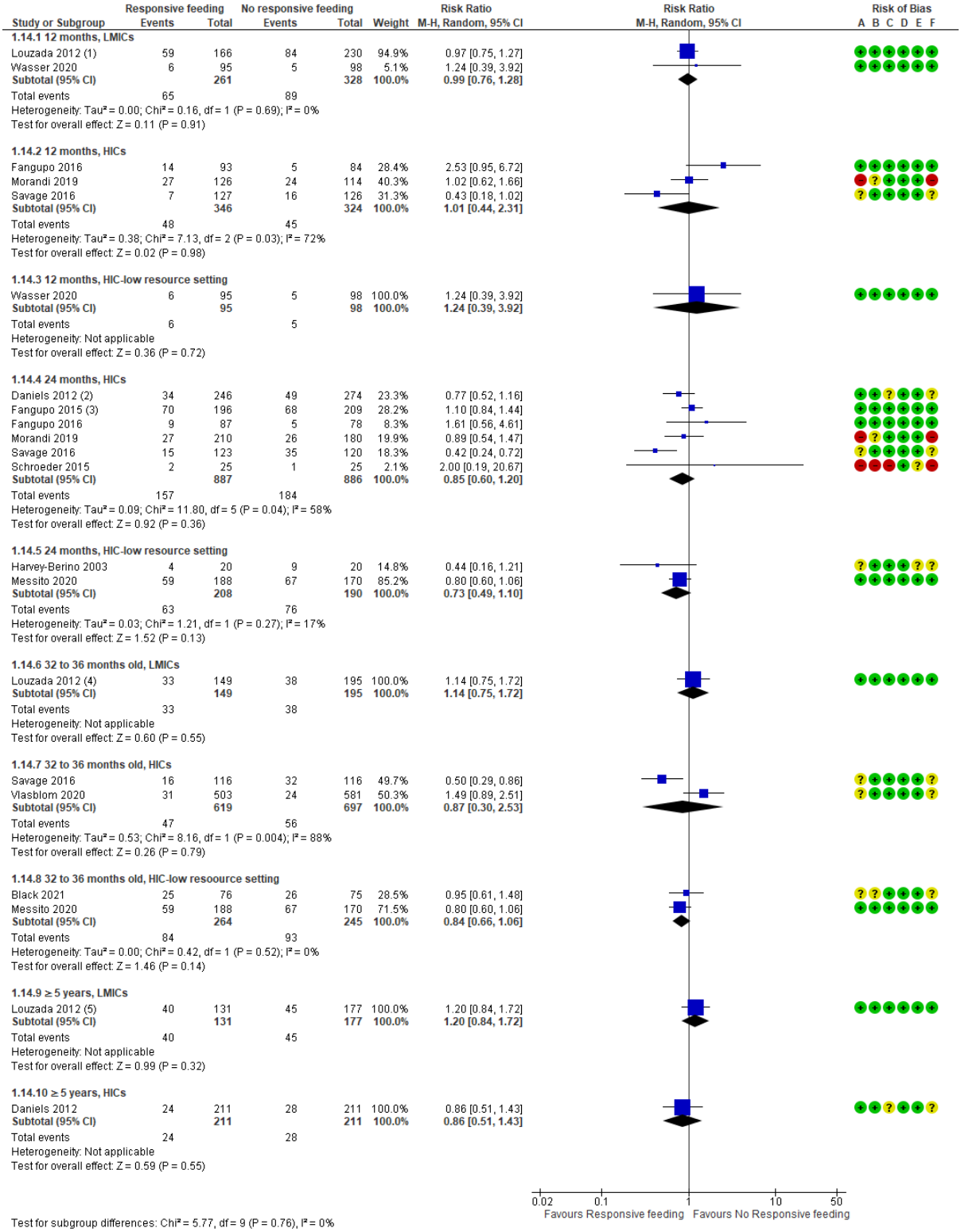
Plot 74. Waist circumference z-score, intervention for obesity prevention (5 years)



Outcome 6. **Subgroup analyses**

- There is evidence of a small subgroup effect in weight-related outcomes after interventions for obesity prevention delivered by health professionals at 12 months (Test for subgroup differences: Chi² = 2.15, df = 1 (P = 0.14), I² = 53.6%) and 24 months of age (Test for subgroup differences: Chi² = 2.53, df = 1 (P = 0.11), I² = 60.5%). At 12 months results differed for HICs (MD 0.00, 95% CI -0.21 to 0.21; participants = 1881; studies = 3; I2 = 78%) and HIC low-resource settings (MD -0.19, 95% CI -0.35 to -0.04; participants = 733; studies = 3; I2 = 0%). A similar result was found at 24 months for the same subgroups: HICs (MD -0.06, 95% CI -0.15 to 0.04; participants = 1661; studies = 5; I^2 = 0%) and HIC low-resource settings (MD -0.25, 95% CI -0.47 to -0.03; participants = 358; studies = 1; I^2 = 0%).
- There were no other subgroup effects for the rest of the outcomes.

Subgroup Analysis 8. Overweight/obesity, from 12 to 8 years of age



Test for subgroup differences: Chi² = 5.77, df = 9 (P = 0.76), I² = 0%

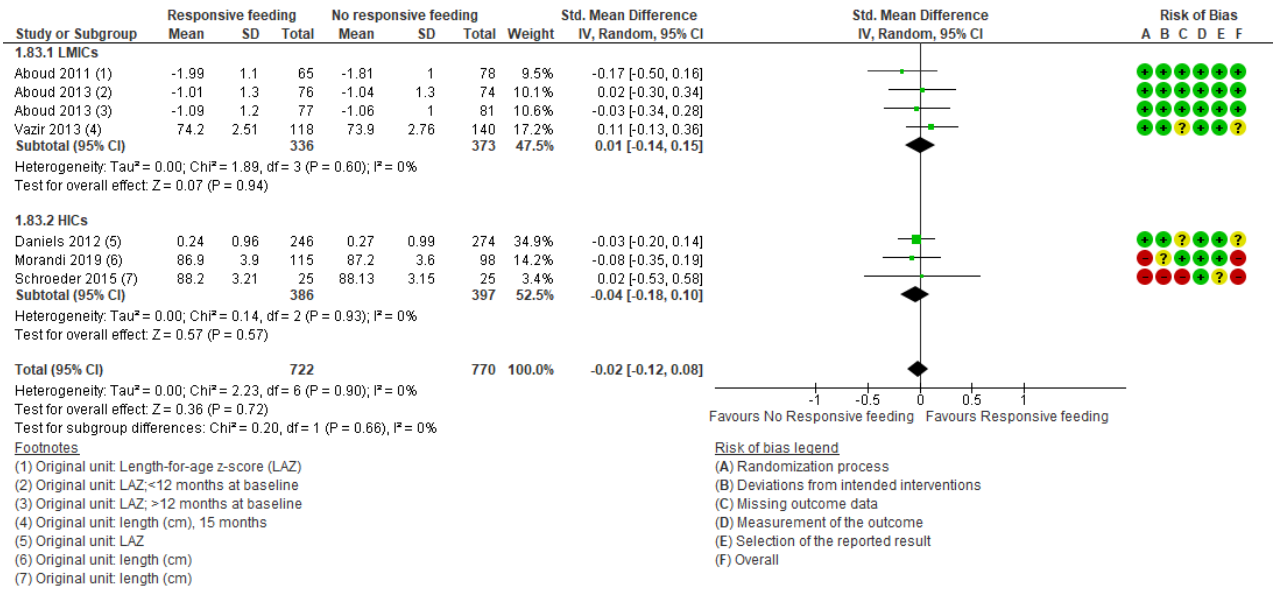
Footnotes

(1) Test for subgroup differences: Chi² = 0.14, df = 2 (P = 0.93), I² = 0%. 12 months
(2) Test for subgroup differences: Chi² = 0.31, df = 1 (P = 0.58), I² = 0%. 24 months
(3) The intervention considered includes food activity and breast feeding + sleep interventions
(4) Test for subgroup differences: Chi² = 1.58, df = 2 (P = 0.45), I² = 0%. 32 to 36 months
(5) Test for subgroup differences: Chi² = 1.12, df = 1 (P = 0.29), I² = 10.5%. 5 years and more

Risk of bias legend

(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Subgroup Analysis 9. Length SMD (24 months)



Outcome 6. Sensitivity analyses (SA)

- After excluding two studies (French 2012 and Morandi 2019) with overall high risk of bias, we found little to no differences besides the elimination of some subgroup estimations.
- The analysis of BMI z-score for obesity prevention (12 months) resulted in similar estimations: MD -0.04 [-0.19, 0.11].
- The analysis of overweight/obesity at 12 and 24 months old resulted in similar estimations: RR of 1.02 [0.57, 1.83] and 0.78 [0.57, 1.06].
- The analysis of Length (cm) at 12 months in interventions for obesity prevention is eliminated; at 15 to 24 months, it results in a similar estimation: MD: -0.15 [-0.70, 0.40].
- The analysis of Length SMD (24 months) resulted in similar estimation: SMD -0.01 [-0.12, 0.10].

Outcome 7. Early and child development

Three cluster RCTs (Aboud 2011, Aboud 2013-including 2 sub-studies- and Vazir 2013) reported outcomes related with this outcome. All of them included developmental stimulation messages as part of the intervention.

The three studies reported outcomes regarding mental development. Outcomes were measured using different scales. All mental development outcomes, between 15 and 22 months of age, showed higher scores for the intervention group, which included responsive feeding and stimulation. We describe below the effect size, participants, studies and I^2 by each outcome. Plot 75

Mental development (15 to 22 months)

Language

22 months old (MD 7.78, 95% CI 1.21 to 14.35; participants = 143; studies = 1)

Cognitive, Bayley III

17 to 21 months old (MD 9.71, 95% CI 8.35 to 11.07; participants = 308; sub-studies = 2; I^2 = 0%)

Receptive language, Bayley III

17 to 21 months (MD 4.35, 95% CI 3.20 to 5.50; participants = 308; sub-studies = 2; I^2 = 0%)

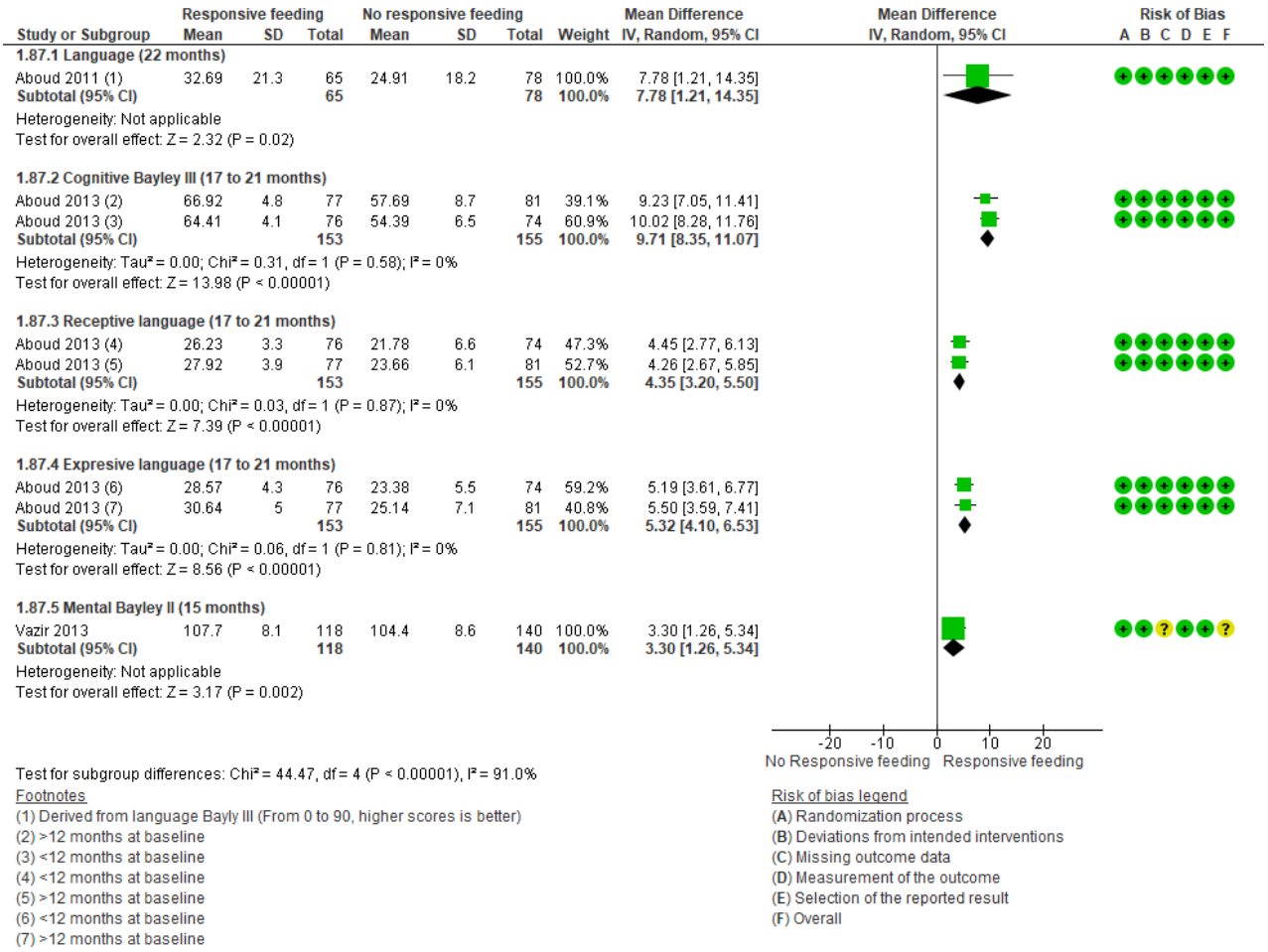
Expressive language, Bayley III

17 to 21 months (MD 5.32, 95% CI 4.10 to 6.53; participants = 308; sub-studies = 2; I^2 = 0%)

Mental Bayley II

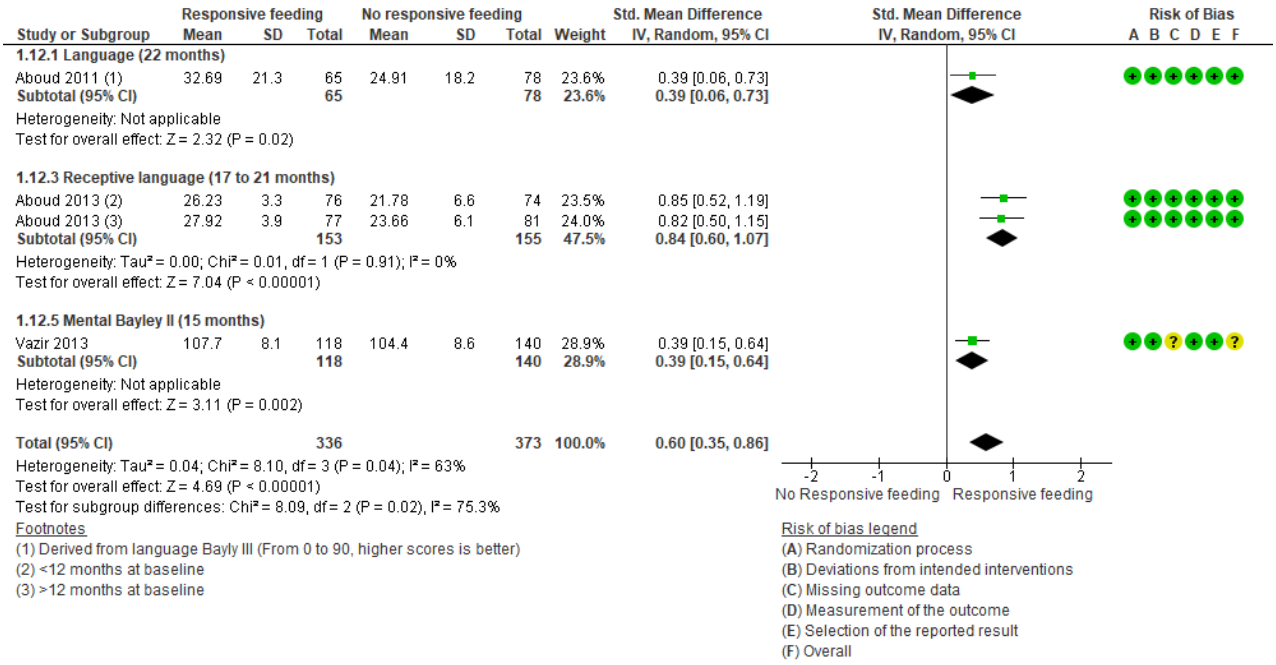
15 months (MD 3.30, 95% CI 1.26 to 5.34; participants = 258; studies = 1)

Plot 75. Mental development/Language scores (15 to 22 months old)



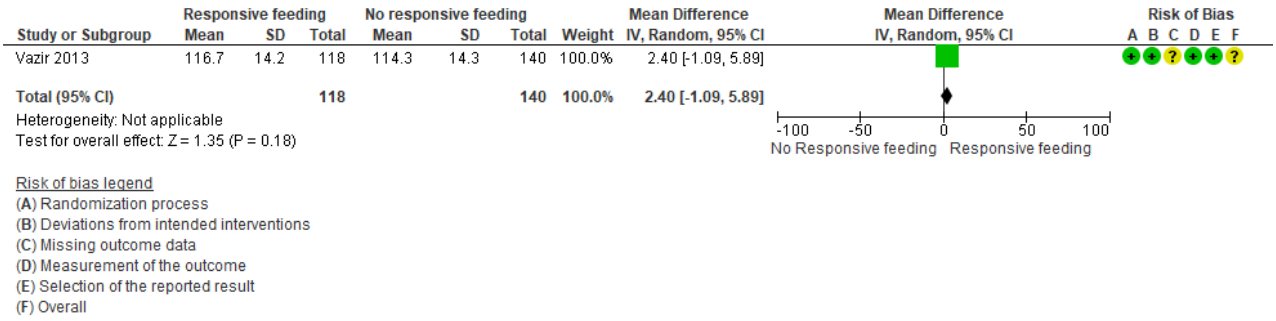
The three trials indicated that in comparison with regular programs, the programs focused on responsive feeding and development stimulation increase mental/language domains of infant development scales between 15 and 22 months of age (SMD 0.60, 95% CI 0.35 to 0.86; participants =709; studies = 3; I^2 =63%; high certainty). Plot 76

Plot 76. Mental development, SMD (15 to 22 months old)



On the other hand, one trial (Vazir 2013) indicated that the intervention may make little or no effect to the Motor Development Score (Bayley Scales of Infant Development-II) at 15 months old (MD 2.40, 95% CI -1.09 to 5.89; participants =258; studies = 1; low certainty). Plot 77

Plot 77. Motor development at 15 months old



Outcome 7. Subgroup analyses

Not applicable, all the studies were conducted in LMICs.

Outcome 7. Sensitivity analysis

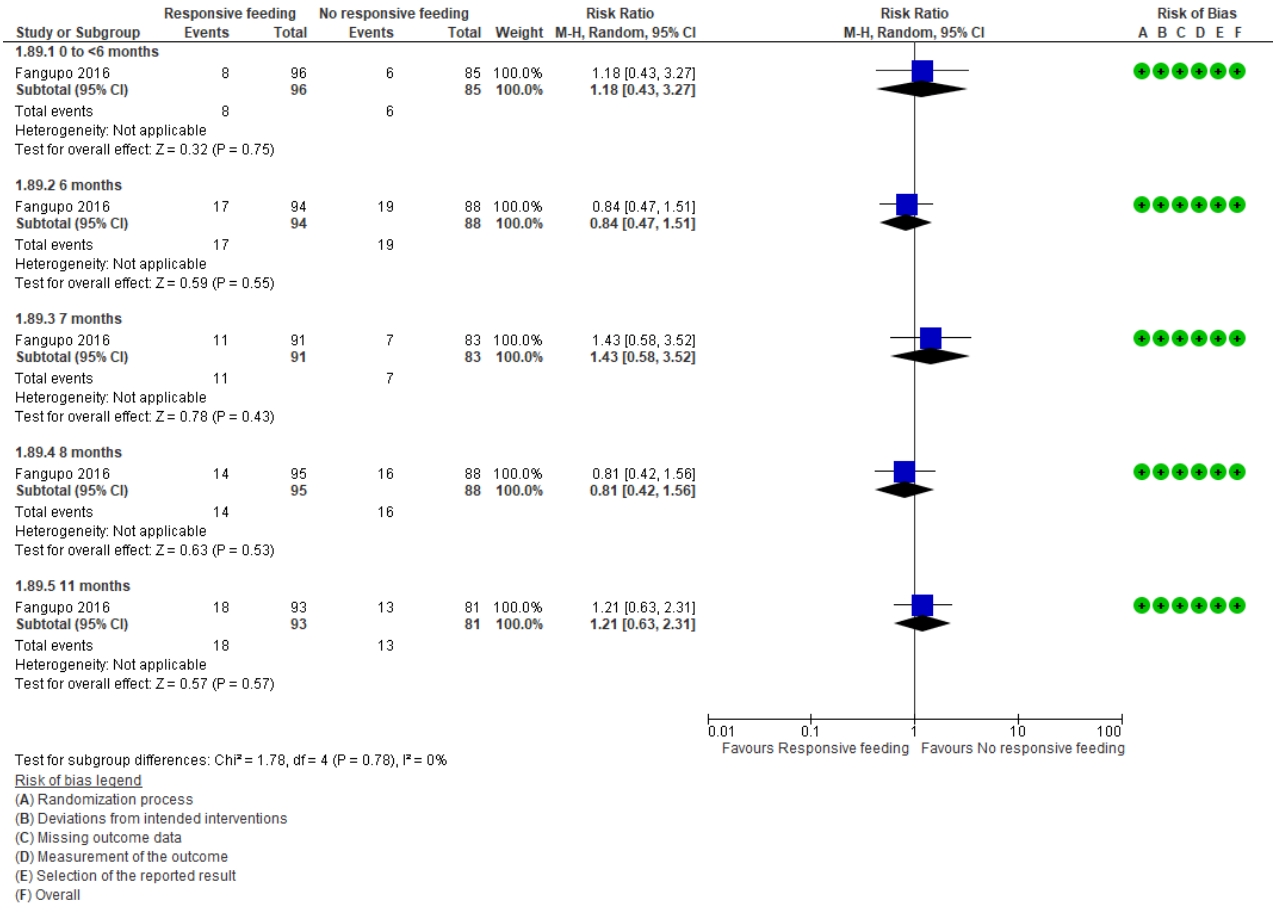
Not applicable.

Outcome 8. Safety

Two trials (Louzada 2012 and Fangupo 2016) reported safety outcomes.

- The BLISS trial found no differences in the risk of choking between the intervention group (a modified baby-led introduction to solids) and the control group (traditional introduction to solid foods). Plot 78

Plot 78. Number of infants choked at least once (by questionnaire)

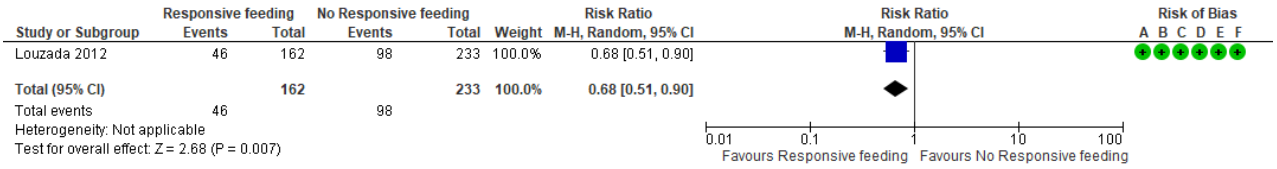


Test for subgroup differences: Chi² = 1.78, df = 4 (P = 0.78), I² = 0%

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

- Louzada et al reported that in the intervention group there was a reduction in the probability of occurrence of diarrhea during the previous month (by questionnaire) at 12 to 16 months of age. Plot 79

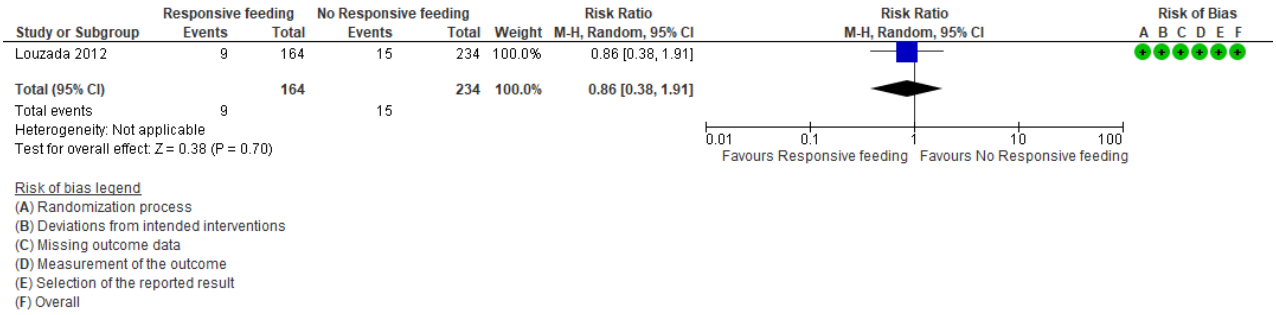
Plot 79. Diarrhea during the previous month (12 to 16 months old)



Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

- Louzada 2012 found little or no effect of the intervention with elements of RF on hospitalizations during the previous months at 12-16 months old. Plot 80

Plot 80. Hospitalizations (12 to 16 months old)



We describe below the effect size, participants, studies and I^2 by each outcome.

Number of infants choked at least once (by questionnaire)

<6 months (RR 1.18, 95% CI 0.43 to 3.27; participants = 181; studies = 1)
6 months (RR 0.84, 95% CI 0.47 to 1.51; participants = 182; studies = 1)
7 months (RR 1.43, 95% CI 0.58 to 3.52; participants = 174; studies = 1)
8 months (RR 0.81, 95% CI 0.42 to 1.56; participants = 183; studies = 1)
11 months (RR 1.21, 95% CI 0.63 to 2.31; participants = 174; studies = 1)

Diarrhea during the last month

16 months (RR 0.13, 95% CI 0.07 to 0.25; participants = 395; studies = 1)

Hospitalizations

12 to 16 months (RR 0.86, 95% CI 0.38 to 1.91; participants = 398; studies = 1)

Outcome 8. Subgroup analyses

Not applicable.

Outcome 8. Sensitivity analysis

Not applicable.

Outcome 9 Flavor preferences

Only one trial (Fangupo 2016) assessed differences in perceived food preferences (i.e. foods actually consumed) of 20 foods assigned to six taste categories ('sweet', 'salty', 'savory-meat', 'savory-non-meat high-protein', 'savory-vegetable', and 'savory-French fries') at 12 months of age. A small difference in perceived preferences was detected for 'savory-non-meat high-protein' foods, favoring RF. Plot 81

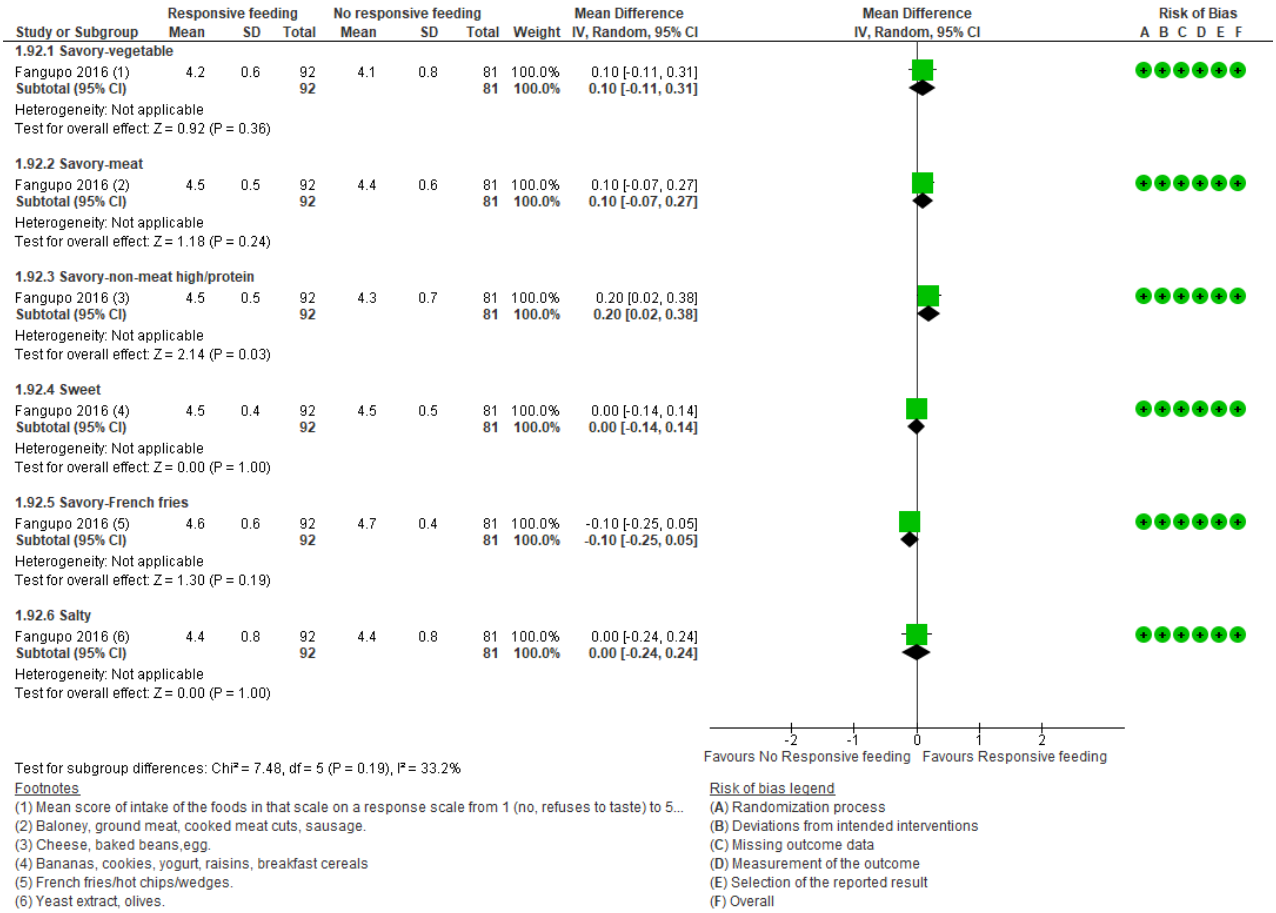
We describe below the effect size, participants, studies and I^2 by each outcome.

Flavor preference, score[28] (at 12 months)

[28] Mean score of intake of the foods in that scale, on a response scale from 1 (no, refuses to taste) to 5 (always eats when offered).

Savory-vegetable[29]
(MD 0.10, 95% CI -0.11 to 0.31; participants = 173; studies = 1)
Savory-meat[30]
(MD 0.10, 95% CI -0.07 to 0.27; participants = 173; studies = 1)
Savory-non-meat high/protein[31]
(MD 0.20, 95% CI 0.02 to 0.38; participants = 173; studies = 1)
Sweet[32]
(MD 0.00, 95% CI -0.14 to 0.14; participants = 173; studies = 1)
Savory-French fries[33]
(MD -0.10, 95% CI -0.25 to 0.05; participants = 173; studies = 1)
Salty[34]
(MD 0.00, 95% CI -0.24 to 0.24; participants = 173; studies = 1)

Plot 81. Flavor preference, score (12 months old)



Outcome 9. Subgroup analyses

Not applicable.

[29] Broccoli, cabbage, spinach, cauliflower, tomato.
[30] Baloney, ground meat, cooked meat cuts, sausage.
[31] Cheese, baked beans, egg.
[32] Bananas, cookies, yogurt, raisins, breakfast cereals
[33] French fries/hot chips/wedges.
[34] Yeast extract, olives.

Outcome 9. Sensitivity analysis

Not applicable.

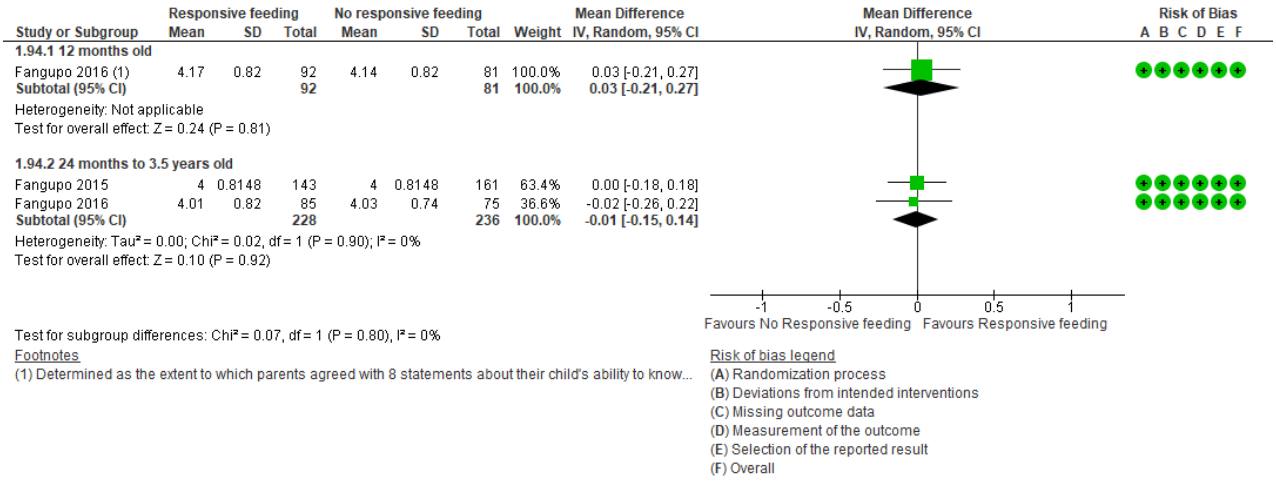
Outcome 10. Food intake self-regulation

Energy self-regulation or its related dimensions were assessed by questionnaire in six trials (Daniels 2012, Fangupo 2015, Fangupo 2016, Helle 2019, Savage 2016, and Tournier 2021).

- Two trials (Fangupo 2015 and Fangupo 2016) assessed the perception of parents about child's ability to know when they were full (self-regulation), without differences observed between treatment groups. Plot 82

Energy self-regulation (questionnaire), score
12 months (MD 0.03, 95% CI -0.21 to 0.27, studies=1)
24 months to 3.5 years (MD -0.00, 95% CI -0.12 to 0.11, studies=2, I^2=0)

Plot 82. Energy self-regulation (questionnaire), score (12 months to 24 months old)



- Five trials (Fangupo 2016, Helle 2019, Tournier 2021, Savage 2016 and Daniels 2012) assessed satiety responsiveness and food responsiveness by the CEBQ. Little or no effect was reported for the interventions with elements of RF in both dimensions. Plot 83 and Plot 84

We describe below the effect size, participants, studies and I^2 by each outcome.

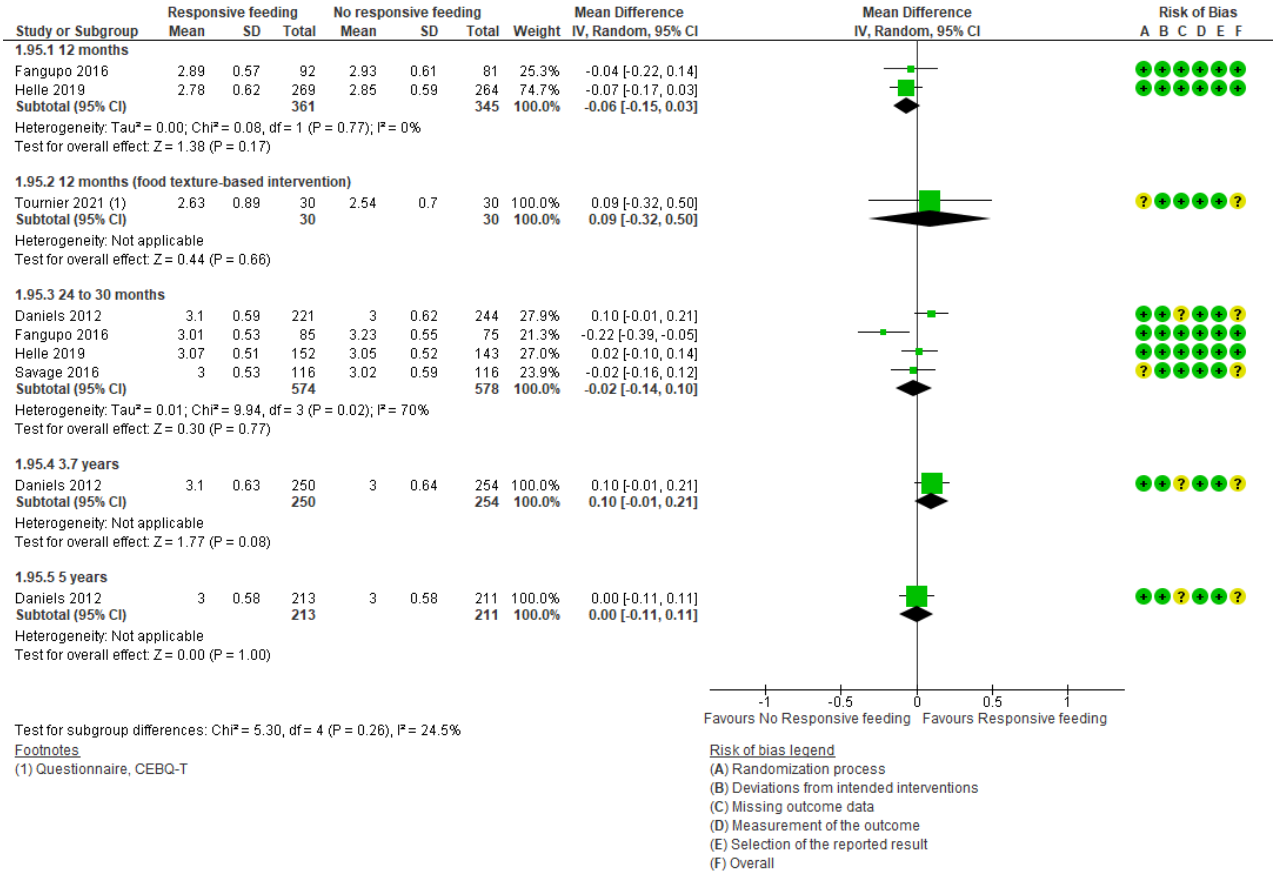
Satiety responsiveness (Child Eating Behavior Questionnaire, CEBQ) Plot 83
12 months (MD -0.06, 95% CI -0.15 to 0.03; participants = 706; studies = 2; I^2 = 0%)
12 months[35] (MD 0.09, 95% CI -0.32 to 0.50; participants = 60; studies = 1)
24 to 30 months (MD -0.02, 95% CI -0.14 to 0.10; participants = 1152; studies = 4; I^2 = 70%)
3.7 years (MD 0.10, 95% CI -0.01 to 0.21; participants = 504; studies = 1)
5 years (MD 0.00, 95% CI -0.11 to 0.11; participants = 424; studies = 1)

Food responsiveness (Child Eating Behavior Questionnaire, CEBQ) Plot 84

[35] *food texture-based intervention*

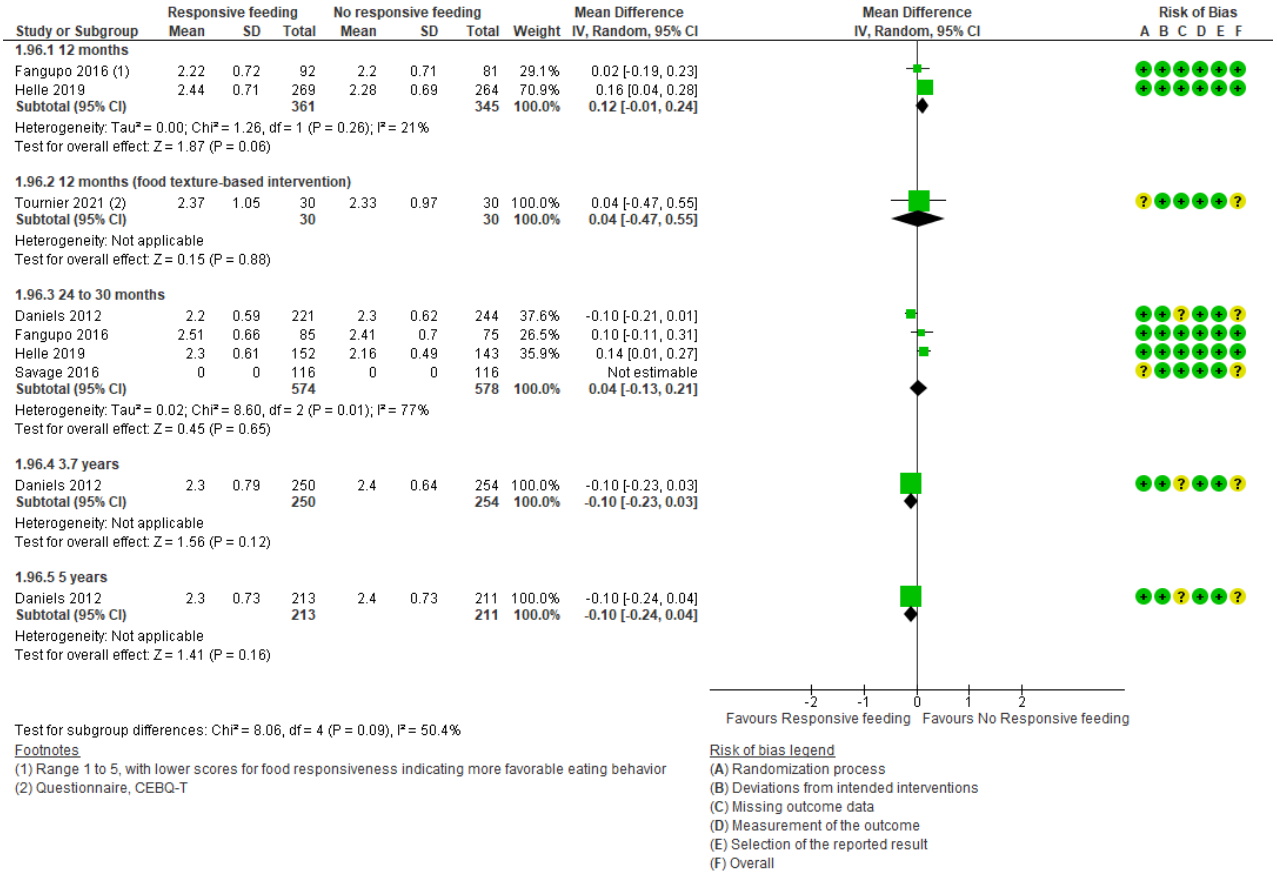
12 months (MD 0.12, 95% CI -0.01 to 0.24; participants = 706; studies = 2; I^2 = 21%)
12 months[36] (MD 0.04, 95% CI -0.47 to 0.55; participants = 60; studies = 1)
24 to 30 months (MD 0.04, 95% CI -0.13 to 0.21; participants = 1152; studies = 4; I^2 = 77%)
3.7 years (MD -0.10, 95% CI -0.23 to 0.03; participants = 504; studies = 1)
5 years (MD -0.10, 95% CI -0.24 to 0.04; participants = 424; studies = 1)

Plot 83. Satiety responsiveness (Child Eating Behavior Questionnaire, CEBQ) (12 months to 5 years old)



[36] *food texture-based intervention*

Plot 84. Food responsiveness (Child Eating Behavior Questionnaire, CEBQ) (12 months to 5 years old)



Outcome 10. Subgroup analyses

Not applicable.

Outcome 10. Sensitivity analysis

Not applicable.

Outcome 11 Nutrient status

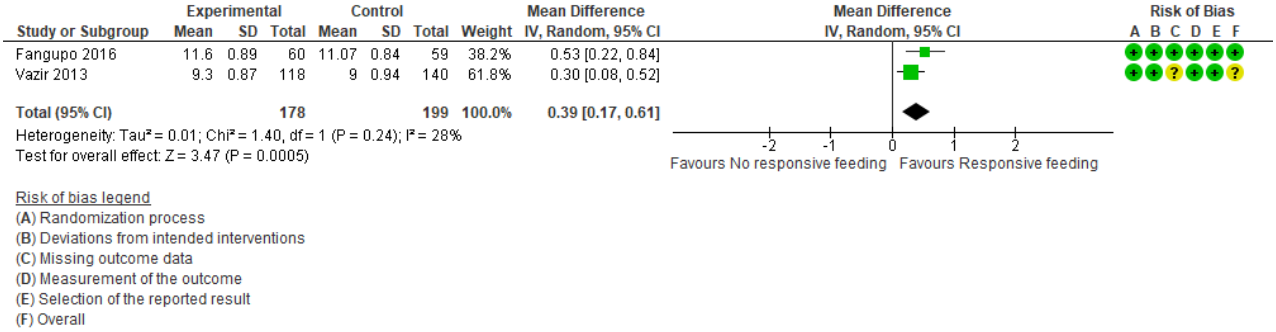
Three trials reported data about nutrient status after interventions with elements of RF (Fangupo 2016, Louzada 2012 and Vazir 2013)

Iron-related status

- Two trials that implemented interventions with elements of RF probably result in higher levels of hemoglobin (MD 0.39, 95% CI 0.17 to 0.61; participants = 377; studies = 2; I^2 = 28%; moderate certainty) at 12 and 15 months old (Plot 85). On the other hand, the intervention probably has little to no effect in the reduction of the proportion of the group with Hemoglobin levels <11 g/dL (RR 1.07,

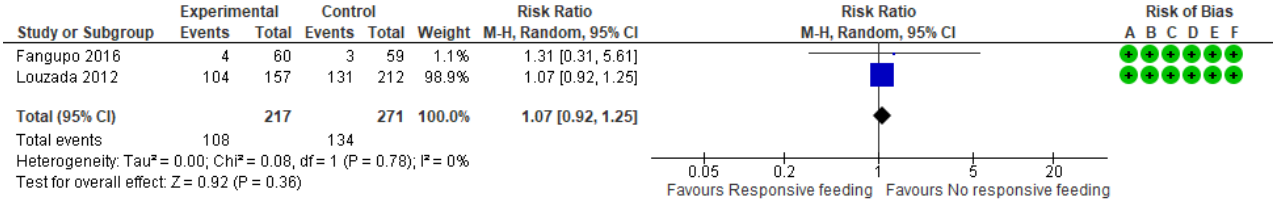
95% CI 0.92 to 1.25; participants = 488; studies = 2; I^2 = 0%, Plot 86) neither in plasma ferritin levels (MD -1.90, 95% CI -8.81 to 5.01; participants = 119; studies = 1, Plot 87)

Plot 85. Hemoglobin (g/dL) at 12 to 15 months old



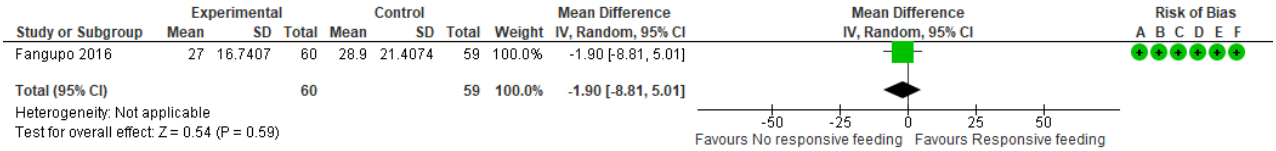
Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 86. Hemoglobin <11 g/dL (12 to 16 months)



Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 87. Plasma ferritin (µg/L) at 12 months old

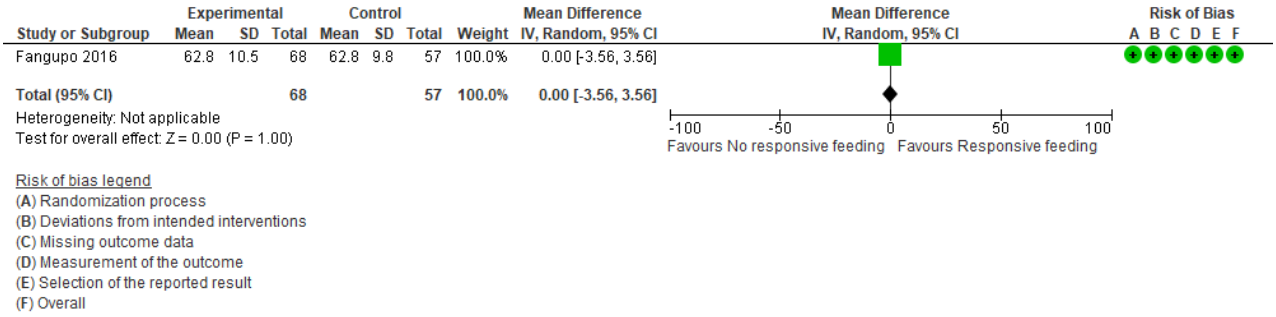


Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

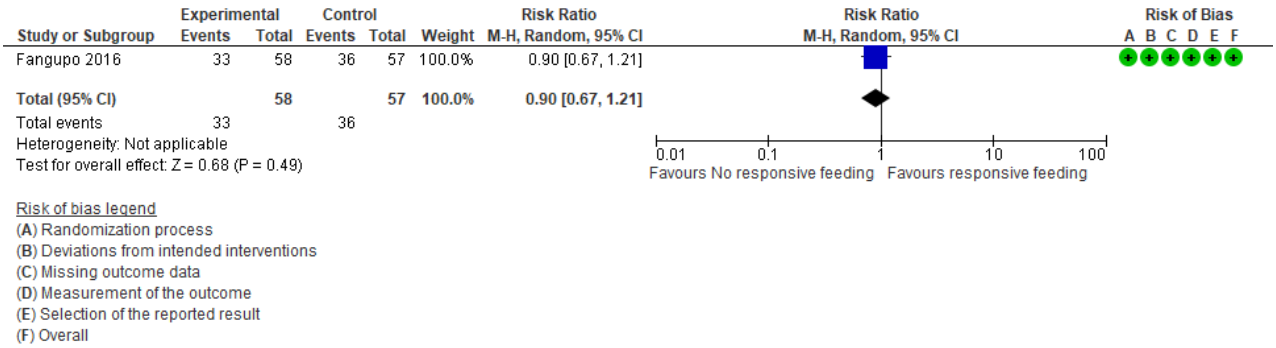
Zinc status

We found little or no effect of an intervention with elements of RF on plasma zinc concentration at 12 months old (MD 0.00 ug/L, 95% CI -3.56 to 3.56; participants = 125; studies = 1), and on levels of plasma zinc <65 ug/dL at 12 to 16 months old (RR 0.90, 95% CI 0.67 to 1.21; participants = 115; studies = 1). Plot 88 and Plot 89

Plot 88. Plasma zinc concentration, ug/L (12 months old)



Plot 89. Plasma zinc <65 ug/dL (12 to 16 months old)



Outcome 11. Subgroup analyses

Analyses about hemoglobin levels include studies from a LMIC and a HIC, but heterogeneity between subgroups was low. Plot 85, Plot 86

Outcome 11. Sensitivity analysis

Not applicable.

Outcome 12 Sleep

One trial (Fangupo 2015, New Zealand) implemented between 8 to 10 contacts for education and support around breastfeeding, food, and activity, and sleep. Fiks 2017 trial was conducted in USA in a low-income community and consisted of a Facebook peer group for mothers. Authors reported little or no differences in sleep duration measured by accelerometer and questionnaires, in ages 6 months to 5 years (Plot 90, Plot 91). We describe below the effect size, participants, studies and I^2 by each outcome.

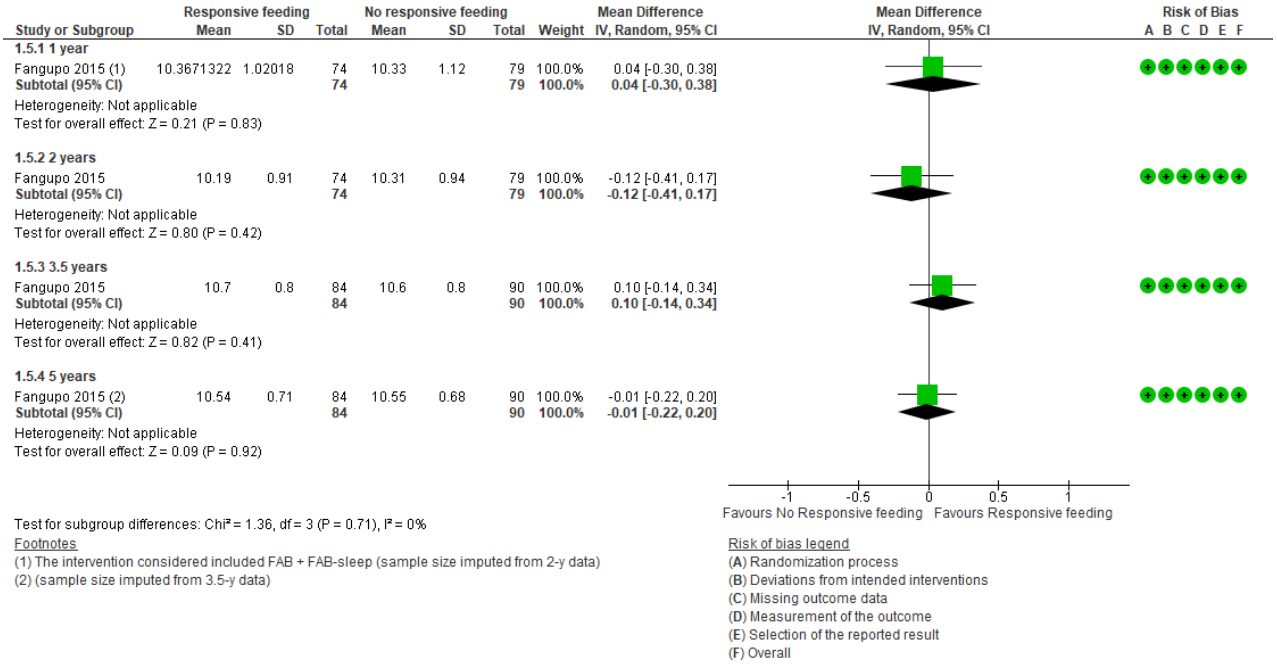
Night sleep duration by accelerometer, hours

1 year (MD 0.04, 95% CI -0.30 to 0.38; participants = 153; studies = 1)
2 years (MD -0.12, 95% CI -0.41 to 0.17; participants = 153; studies = 1)
3.5 years (MD 0.10, 95% CI -0.14 to 0.34; participants = 174; studies = 1)
5 years (MD -0.01, 95% CI -0.22 to 0.20; participants = 174; studies = 1)

Sleep duration by questionnaire, hours

6 months (MD 0.11, 95% CI -0.08 to 0.29; participants = 1591; studies = 3; I^2 = 19%)
9 months (MD 0.33, 95% CI 0.05 to 0.62; participants = 322; studies = 2; I^2= 0%)
12 to 14 months (MD 0.03, 95% CI -0.17 to 0.23; participants = 1717; studies = 3; I^2= 68%)
24 to 36 months (MD -0.04, 95% CI -0.16 to 0.09; participants = 1342; studies = 2; I^2 = 0%)

Plot 90. Night sleep duration by accelerometer, hours (12 months to 5 years)

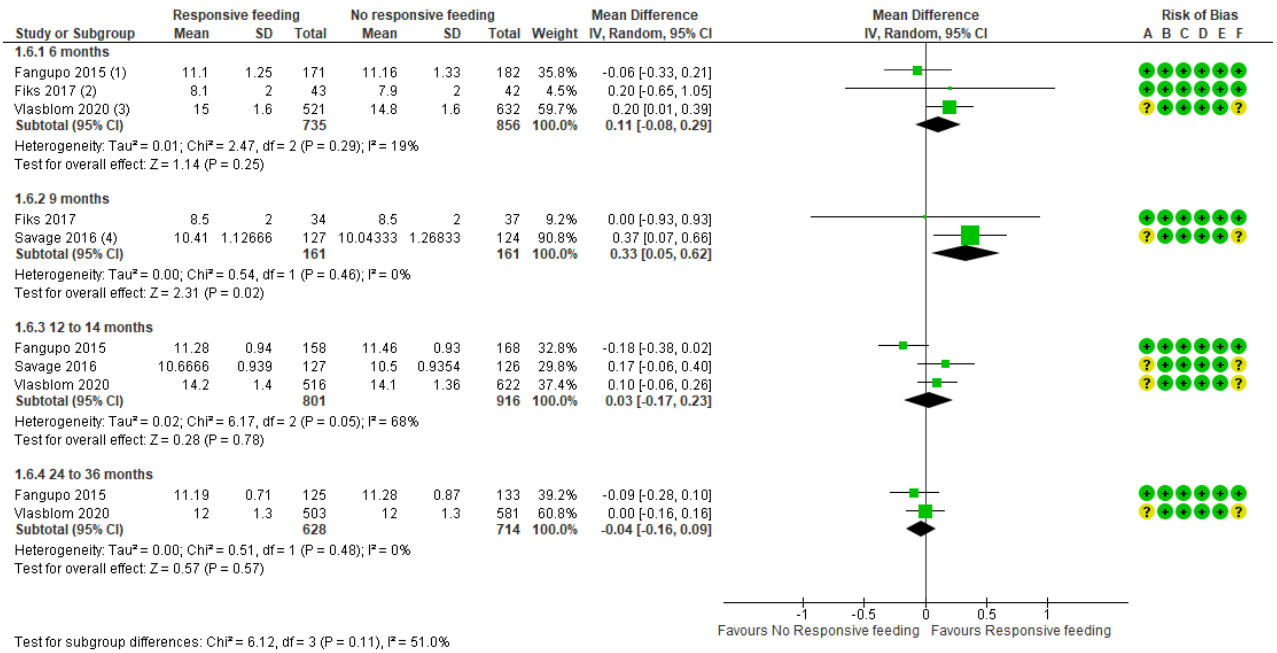


Test for subgroup differences: Chi² = 1.36, df = 3 (P = 0.71), I² = 0%

Footnotes
(1) The intervention considered included FAB + FAB-sleep (sample size imputed from 2-y data)
(2) (sample size imputed from 3.5-y data)

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Plot 91. Sleep duration by questionnaire, hours (6 months to 3 years old)



Test for subgroup differences: Chi² = 6.12, df = 3 (P = 0.11), I² = 51.0%

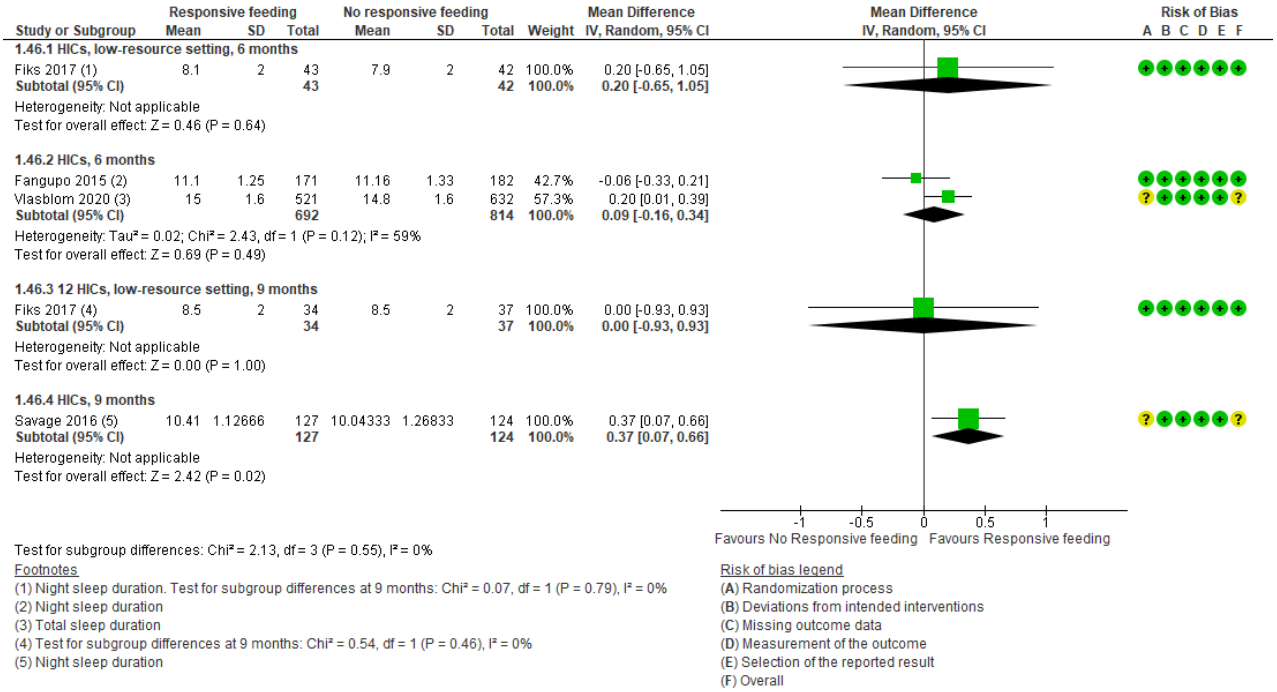
Footnotes
(1) Night sleep duration
(2) Night sleep duration
(3) Total sleep duration
(4) Night sleep duration

Risk of bias legend
(A) Randomization process
(B) Deviations from intended interventions
(C) Missing outcome data
(D) Measurement of the outcome
(E) Selection of the reported result
(F) Overall

Outcome 12. Subgroup analyses

- Effects of RF on Sleep duration by questionnaire at 6- and 9-month-old did not differ between in subgroups of HICs and HICs, low-resource setting. (Test for subgroups differences I^2 = 0%). Subgroup Analysis 10

Subgroup Analysis 10. Sleep duration by questionnaire, hours (6 to 9 months old)



Outcome 12. Sensitivity analysis

Not applicable.

Outcome 13. Physical activity and play

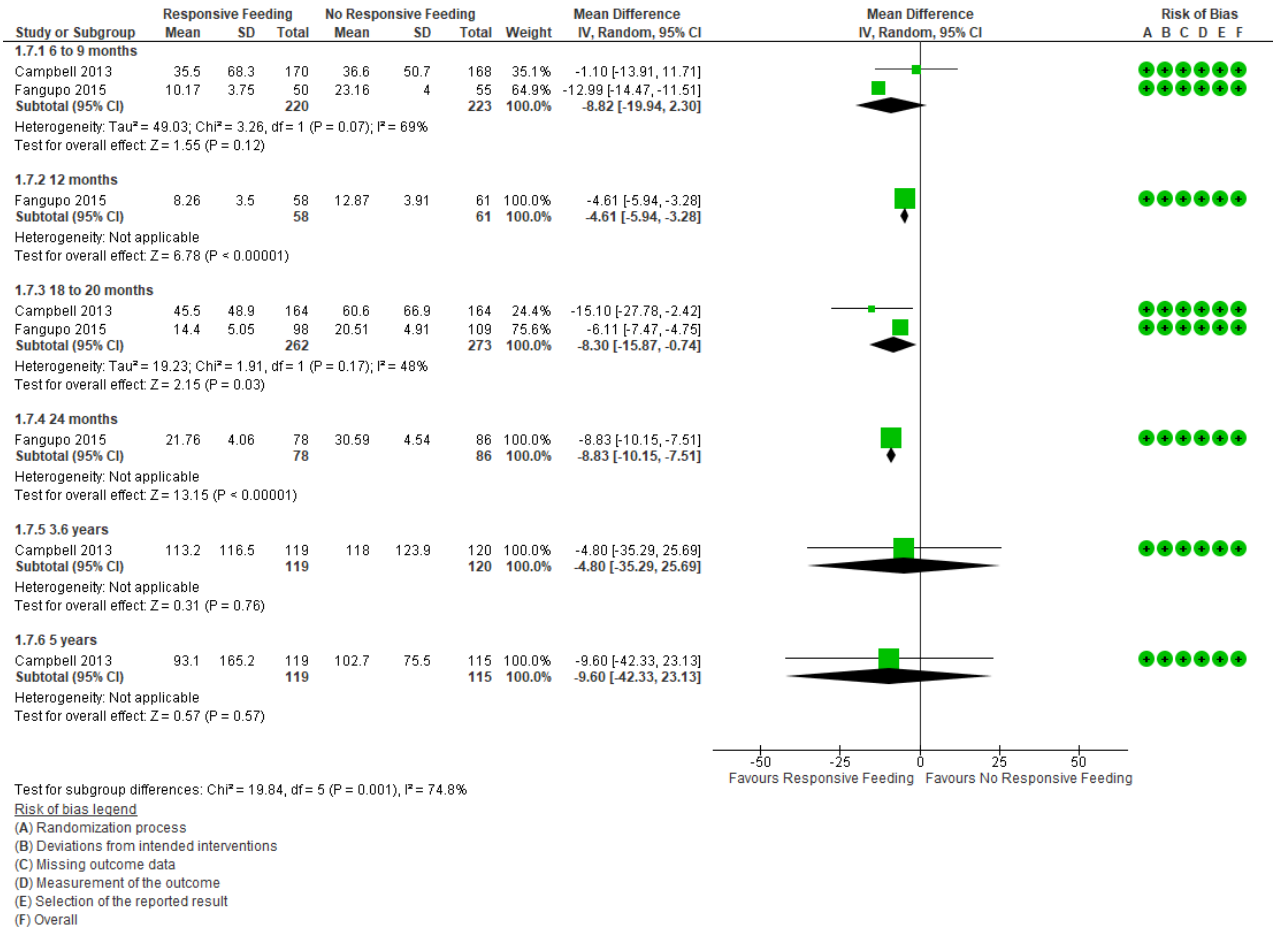
- Six studies assessed television viewing and/or screen time (Campbell 2013, Fangupo 2015, Fiks 2017, Morandi 2019, Savage 2016 and Vlasblom 2020). All of them had included specific messages targeting these behaviors in the RF intervention, except for Morandi 2019 (not explicit). Interventions with elements of RF and specific messages about TV viewing/screen time, were associated with a benefit in the reduction of minutes/day of television watching at ages 12, 18 to 20 and 24 months, from the Campbell 2013 and Fangupo 2015 studies. Campbell et al reported little or no effect at 3.6 and 5 years of age. Plot 92.

Television viewing, min/day (12 months to 5 years old)

6 to 9 months (MD -8.82, 95% CI -19.94 to 2.30; participants= 443; studies=2; I2 = 69%)
12 months (MD -4.61, 95% CI -5.94 to -3.28; participants=119; studies=1)
18 to 20 months (MD -8.30, 95% CI -15.87 to -0.74; participants=535; studies= 2; I2 =48%)
24 months (MD -8.83, 95% CI -10.15 to -7.51; participants=164; studies= 1)
3.6 years (MD -4.80, 95% CI -35.39 to 25.69; participants= 239; studies= 1)

5 years (MD -9.60, 95% CI -42.33 to -23.13; participants= 234; studies= 1)

Plot 92. Television viewing, min/day (12 months to 5 years old)

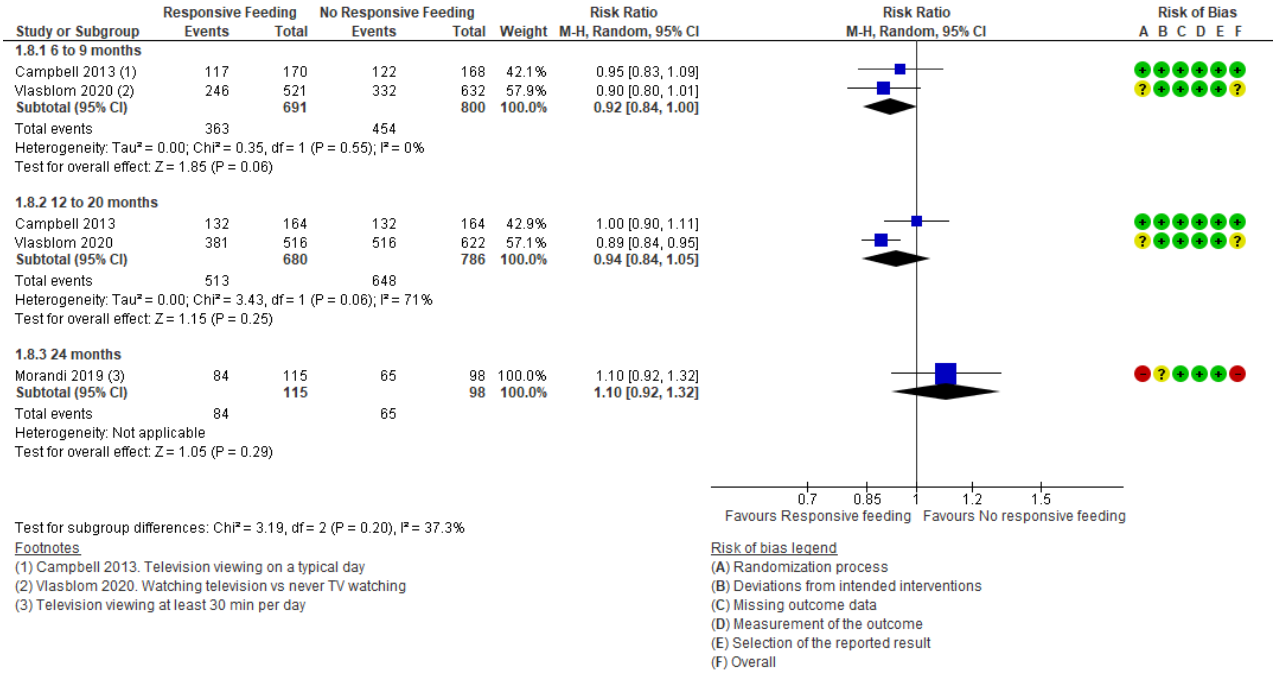


- According to two trials, the intervention was associated with a RR of television viewing between 6 to 9 months of 0.92 (*95% CI 0.84 to 1.0).* However, the interventions had little to no effect in the proportion of children that reported television viewing between 12 and 24 months. Plot 93

Television viewing

6 to 9 months (RR 0.92, 95% CI 0.84 to 1.00; participants= 1491; studies= 2; I2 =0%)
12 to 20 months; (RR 0.94, 95% CI 0.84 to 1.05; participants= 1466; studies= 2; I2 =71%)
24 months (RR 1.10, 95% CI 0.92 to 1.32; participants= 213; studies= 1)

Plot 93. Television viewing (6 to 20 months old)

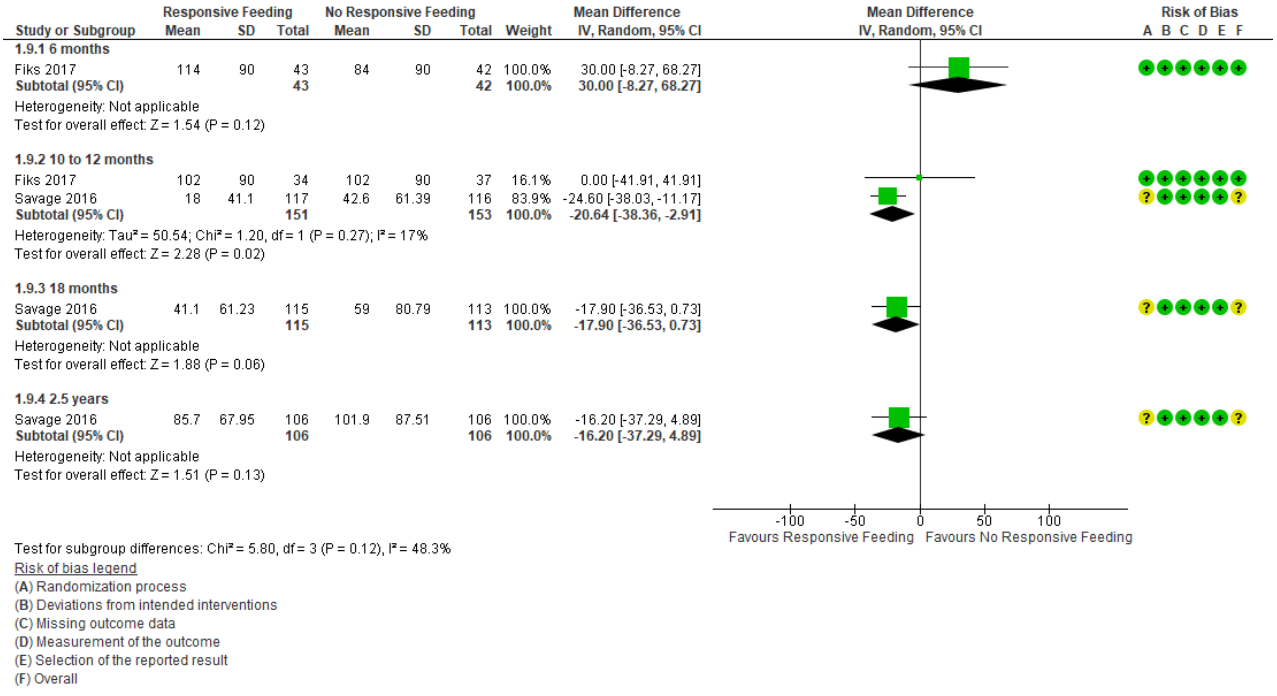


- The interventions seem to results in the reduction of screen time per day from 10 to 30 months, but the only precise estimation was at 10 to 12 months. Plot 94

Screen time, min/day

6 months (MD 30.00, 95% CI -8.27 to 68.27; participants= 85; studies= 1)
10 to 12 months (MD -20.64, 95% CI -38.36 to -2.91; participants= 304; studies= 2; I^2 =17%)
18 months (MD -17.90, 95% CI -36.53 to 0.73; participants= 228; studies= 1)
2.5 years (MD -16.20, 95% CI -37.29 to 4.89; participants= 212; studies= 1)

Plot 94. Screen time, min/day (6 months to 2.5 years old)

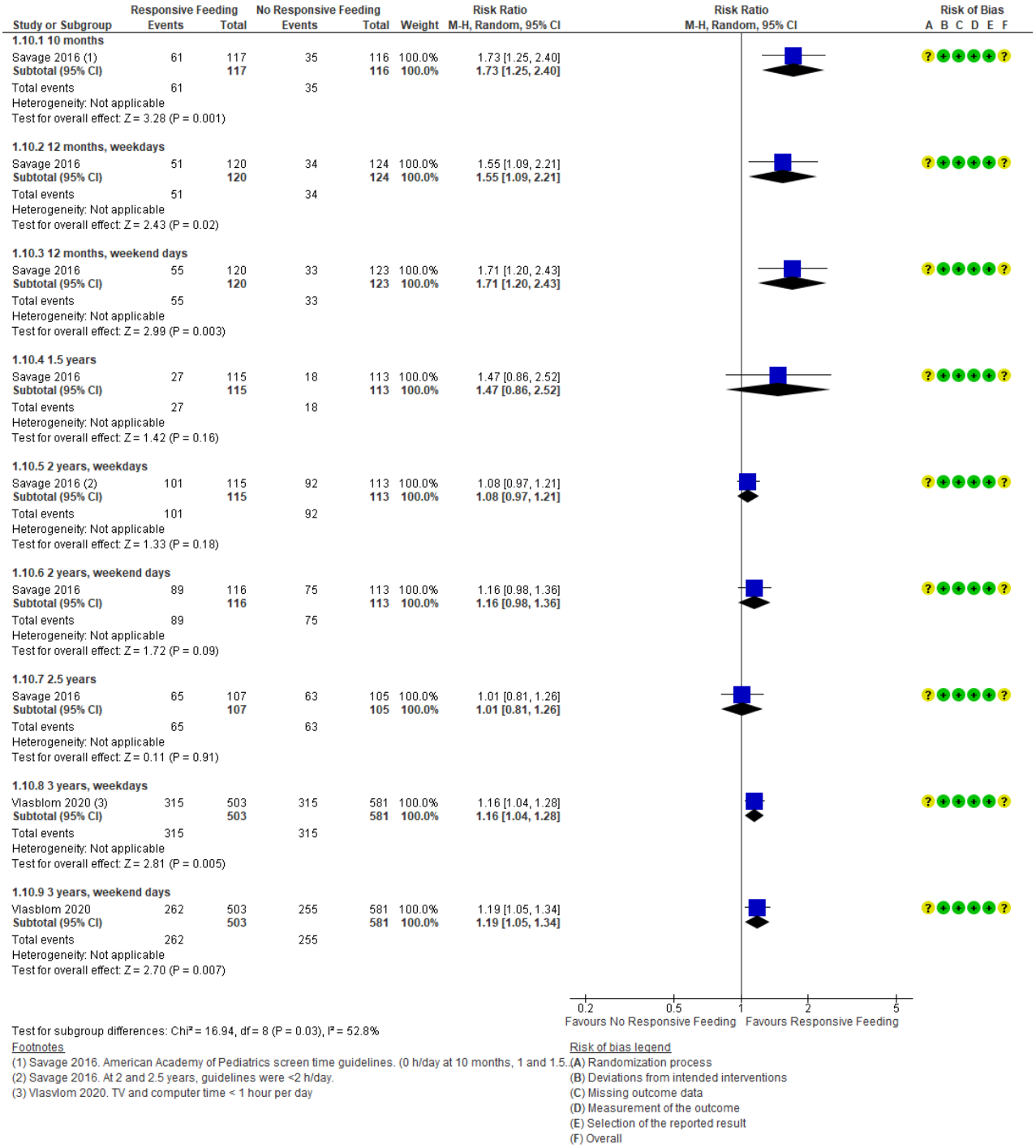


- Regarding the outcome Screen time according to guidelines at 10 to 36 months of age, Savage et al report positive effects of the intervention with elements of RF and messages targeting screen time at 10 and 12 months, both in weekdays as in weekend days; Vlasblom 2020 showed similar results at 36 months old. Plot 95

Screen time according to guidelines (10 to 36 months old)

10 months (RR 1.73, 95% CI 1.25 to 2.40; participants= 233; studies= 1)
12 months, weekdays (RR 1.55, 95% CI 1.09 to 2.21; participants= 244; studies= 1)
12 months, weekend days (RR 1.71, 95% CI 1.20 to 2.43; participants= 243; studies= 1)
1.5 years (RR 1.47, 95% CI 0.86 to 2.52; participants= 228; studies= 1)
2 years, weekdays (RR 1.08, 95% CI 0.97 to 1.21; participants= 228; studies= 1)
2 years, weekend days (RR 1.16, 95% CI 0.98 to 1.36; participants= 229; studies= 1)
2.5 years (RR 1.01, 95% CI 0.81 to 1.26; participants= 212; studies= 1)
3 years weekdays (RR 1.16, 95% CI 1.04 to 1.28; participants= 1084; studies= 1)
3 years weekend days (RR 1.19, 95% CI 1.05 to 1.34; participants= 1084; studies= 1)

Plot 95. Screen time according to guidelines (10 to 36 months old)



- An intervention with elements of RF and messages targeting physical activity, from Fangupo 2015 trial, reported greater time in active play outside at 12 and 18 months of age, without effect at 24 months**.** Plot 96
- We found little to no evidence of an effect of interventions for the outcome “using an outdoor play area daily/ going outside daily” between 6 to 36 months old. Plot 97

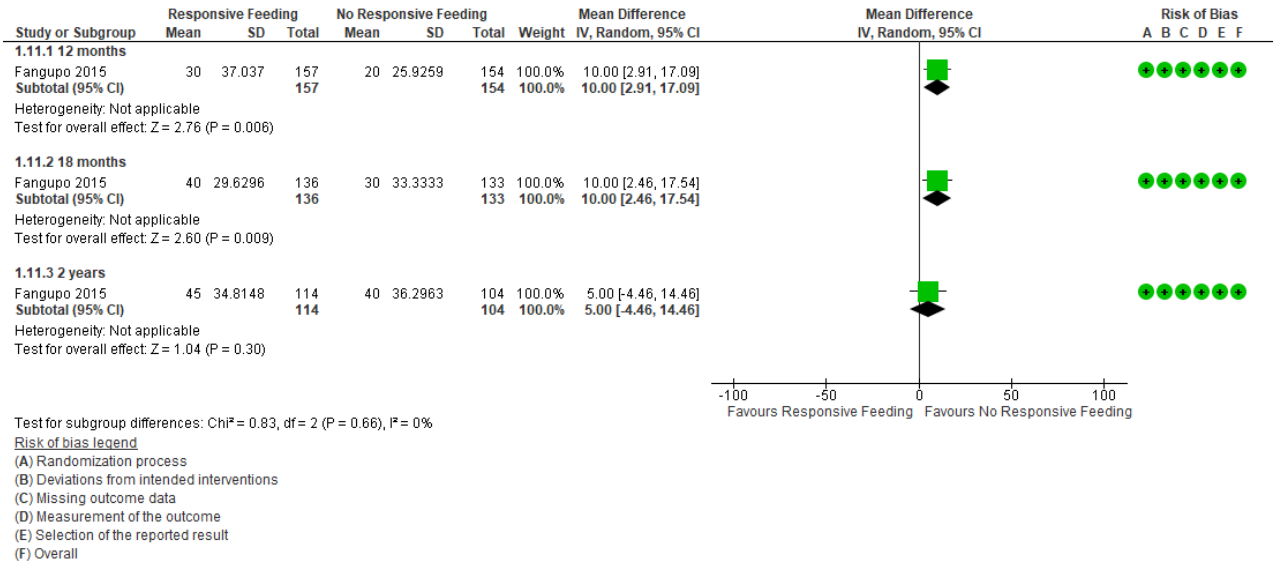
Time in active play outside, min/day (12 to 24 months old)

12 months (MD 10.00, 95% CI 2.91 to 17.09; participants= 311; studies= 1)
18 months (MD 10.00, 95% CI 2.46 to 17.54; participants= 269; studies= 1)
2 years (MD 5.00, 95% CI -4.46 to 14.46; participants= 218; studies= 1)

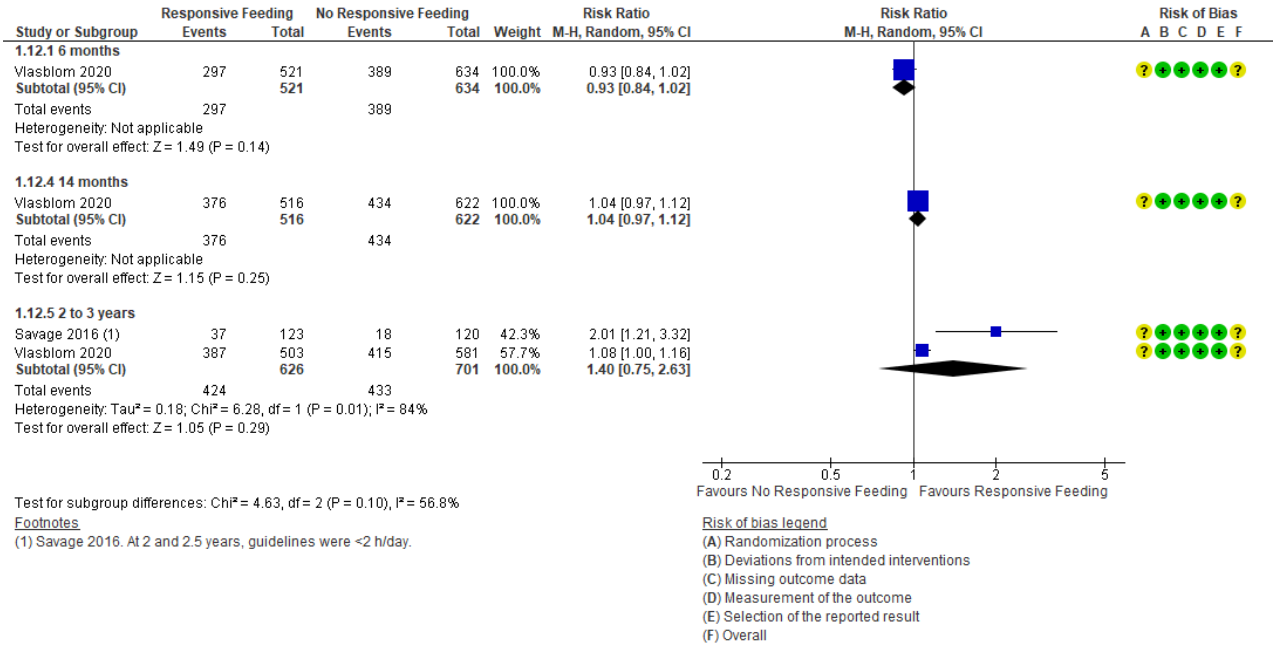
Plot 110. Using an outdoor play area daily/ going outside daily

6 months (RR 0.93, 95% CI 0.84 to 1.02; participants= 1155; studies= 1)
14 months (RR 1.04, 95% CI 0.97 to 1.12; participants= 1138; studies= 1)
2 to 3 years (RR 1.40, 95% CI 0.75 to 2.63; participants= 1327; studies= 2; I2 =84%)

Plot 96. Time in active play outside, min/day (12 to 24 months old)



Plot 97. Using an outdoor play area daily/ going outside daily (6 to 36 months old)



- We found little to no evidence of an effect of the interventions with elements of RF on time of physical activity measured by accelerometry. Plot 98 to Plot 101.

Physical activity, min/day by accelerometry

20 months (MD -8.50, 95% CI -19.64 to 2.64; participants= 204; studies= 1)
3.5 to 3.6 years (MD 12.5, 95% CI -10.95 to 35.95; participants= 405; studies= 2; I2 =63%)

Sitting time, min/day by accelerometry

3.6 years (MD -7.40, 95% CI -46.13 to 31.33; participants= 69; studies= 1)
5 years (MD 8.50, 95% CI -76.16 to 93.16; participants= 103; studies= 1)

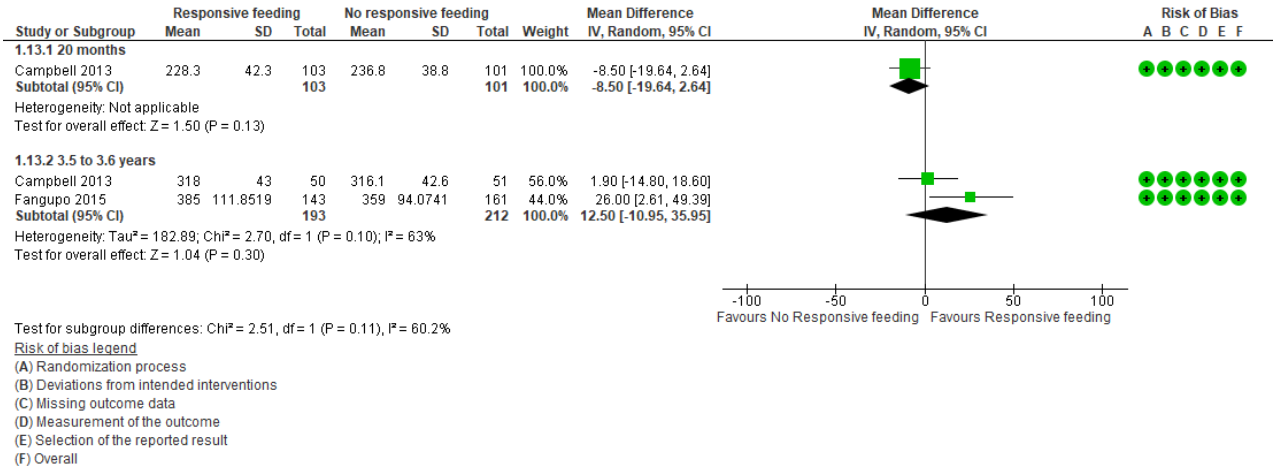
Light intensity physical activity, min/day by accelerometry

3.6 years (MD 6.10, 95% CI -5.67 to 17.87, participants= 101; studies= 1)
5 years (MD 6.50, 95% CI -12.57 to 25.57; participants= 100; studies= 1)

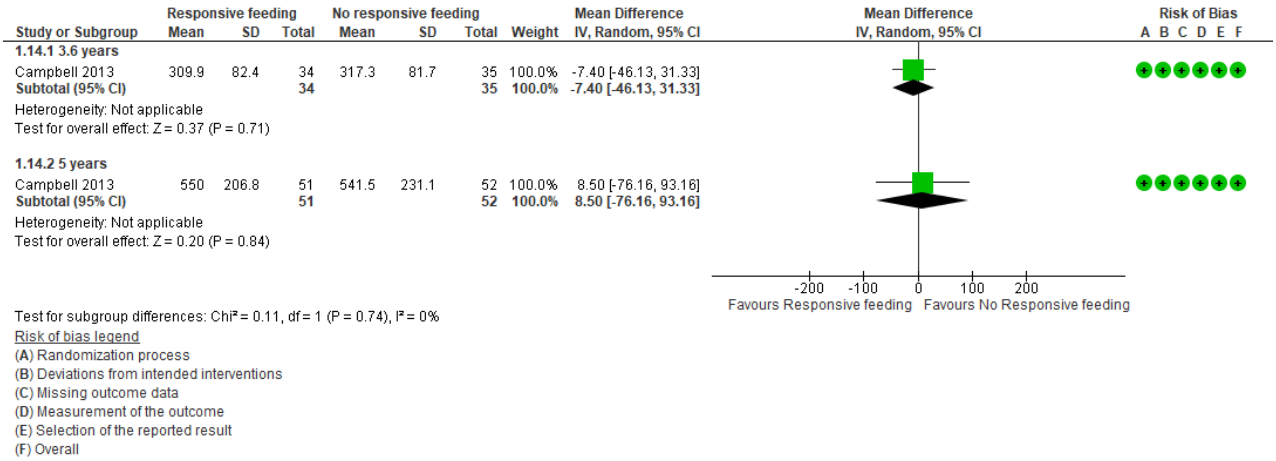
Moderate/vigorous physical activity, min/day by accelerometry

32 months to 3.6 years old (MD -3.13, 95% CI -11.34 to 5.08, participants= 284; studies= 2; I2 =0%)
5 years old (MD -0.80, 95% CI -10.45 to 8.85, participants= 100; studies= 1)

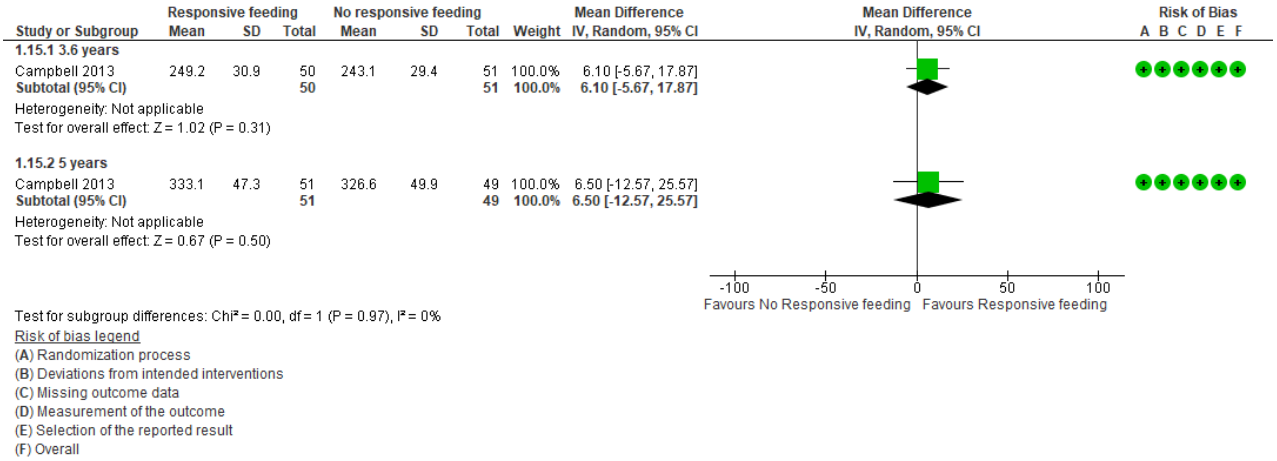
Plot 98. Physical activity, min/day by accelerometry (20 months to 5 years old)



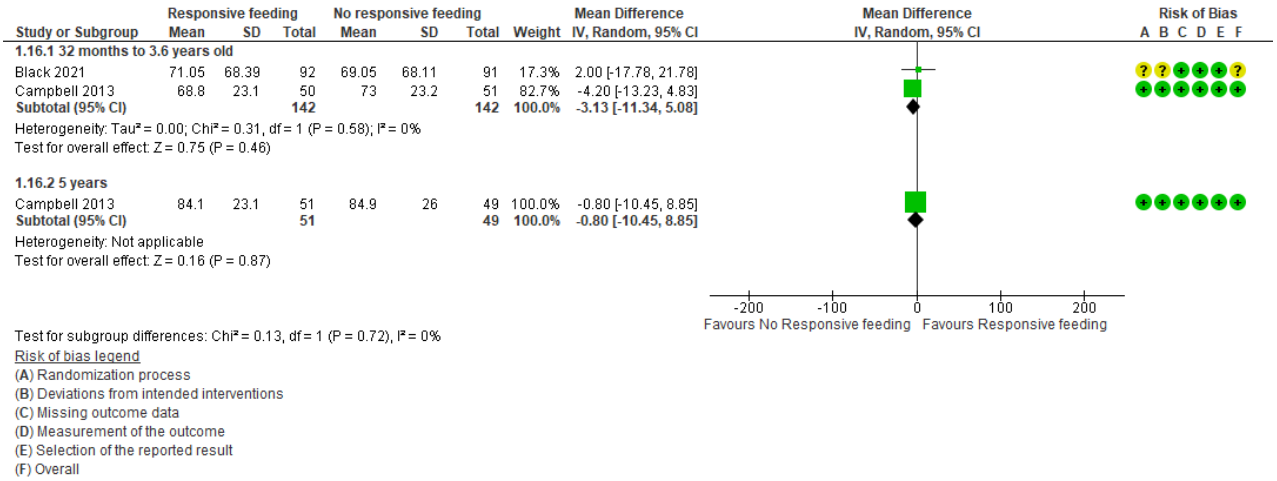
Plot 99. Sitting time, min/day by accelerometry (3.6 to 5 years old)



Plot 100. Light intensity physical activity, min/day by accelerometry (3.6 to 5 years old)



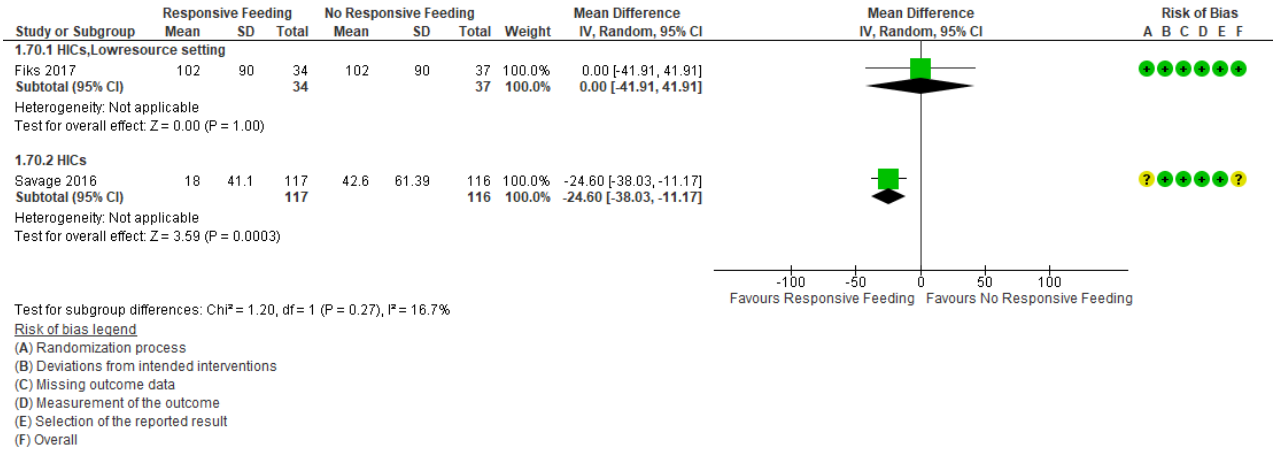
Plot 101. Moderate/vigorous physical activity, min/day by accelerometry (32 months to 5 years old)



Outcome 13. Subgroup analyses

RF interventions resulted in differences on screen time at 10 to 12 months of -24.6 [-38.03 to -11.17] min/day for a study conducted in a HIC (Savage 2016), and of 0.00 [-41.91 to 41.91] min/day for a study conducted in a low-resource setting. Subgroup Analysis 11

Subgroup Analysis 11. Screen time, min/day (10 to 12 months old)



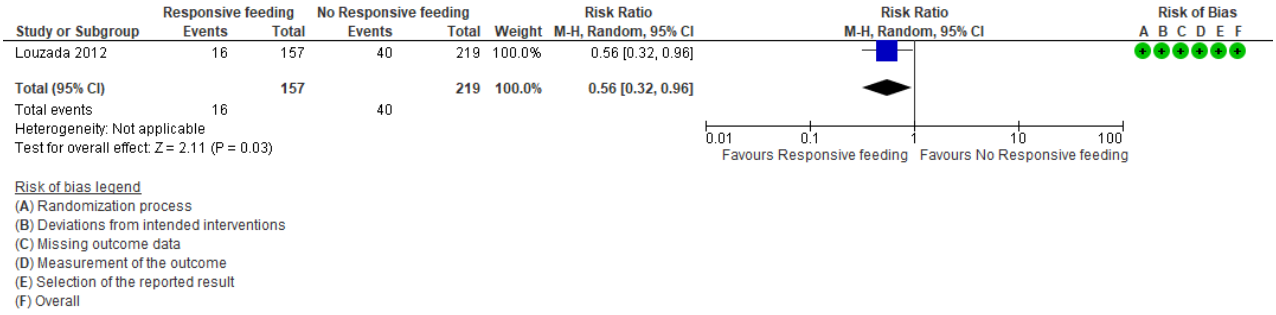
Outcome 13. Sensitivity analysis

- After excluding one study (Morandi 2019) with overall high risk of bias, we found little to no differences besides the elimination of some subgroup estimations.

Outcome 14. Dental Health

Only one study (Louzada 2012) assessed the risk of dental caries between 12 and 16 months of age, showing a reduction of the risk (RR 0.56 CI 0.32 to 0.96; participants = 376; studies = 1). Plot 102

Plot 102. Dental caries (12 to 16 months old)



Outcome 14. Subgroup analyses

Not applicable

Outcome 14. Sensitivity analysis

Not applicable.

Outcome 15. Caregiver infant bonding

No studies were found

GRADE. Evidence Profile Tables

Table 5. GRADE. Evidence Profile

Author(s): Natalia Elorriaga, Ariel Bardach, María Victoria Lopez, Milagros García-Diaz, Federico Rodríguez-Cairoli, Marión Figarella-de-Aguirre, Gabriela Olivera-y-Luna, Daniel Comandé, Vilma Irazola, Agustín Ciapponi
Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **food acceptance** (O1)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		
A. Interventions focused on one component of responsive feeding												
Intervention A1: **Guidance on step-by-step repeated exposure to vegetables during the introduction of solids, delivered by research staff or health professionals, component C5**												
Food acceptance of target vegetables (at ~6 months old). Amount of target vegetables consumed (g), after 24 to 35 days of repeated exposure to vegetables, measured in a laboratory setting												
1	randomized trial	serious	not serious	not serious	serious	none	17	18	-	MD **37.6 higher** (14.0 higher to 61.2 higher)	⊕⊕◯◯ LOW	CRITICAL
Food acceptance of novel vegetables (at ~6 to 7 months old). Amount of novel vegetables consumed (g), after ~ 1 month of repeated exposure to vegetables, measured in a laboratory setting												
2	randomized trials	serious	not serious	not serious	not serious	none	61	58	-	MD **15.6 higher** (7.2 higher to 23.9 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
Food acceptance of novel fruit (at ~6 to 7 months old). Amount of novel fruits consumed (g), after ~ 1 month of repeated exposure to vegetables, measured in a laboratory setting												
1	randomized trial	very serious	serious	not serious	serious	none	44	40	-	MD **0.5 higher** (34.2 lower to 35.2 higher)	⊕◯◯◯ VERY LOW	CRITICAL
Intervention A2: **Advice and regular counseling for promoting the introduction of textured foods, delivered by a research dietitian from 8 to 15 months of age, component C3**												
Food texture acceptance of food textures (at ~15 months old). Global texture acceptance score-from 0 to 8 (highest food texture acceptance), measured in a laboratory setting.												
1	randomized trial	serious	not serious	not serious	very serious [k]	none	30	30	-	MD **0.30 higher** (0.80 lower to 1.40 higher)	⊕◯◯◯ VERY LOW	CRITICAL
B. Interventions aimed to prevent under-nutrition, including two or more components of RF												
Intervention B1**: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**												
Food acceptance at ~20 to 23 months old. Number of mouthfuls eaten, observation of a midday meal by a research assistant												

3	randomized trials	not serious	serious	not serious	serious [k]	none	231	227	-	MD **1.98 higher** (0.84 lower to 4.8 higher)	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at ~20 to 23 months old. Self-fed mouthfuls (%), observation of a midday meal by a research assistant

3 [q]	randomized trials [r]	not serious	not serious	not serious	not serious	none	231	227	-	MD **14.42 higher** (6.45 higher to 22.39 higher)	⊕⊕⊕⊕ HIGH	CRITICAL

Food acceptance at ~20 to 23 months old. Child refusals (%), observation of a midday meal by a research assistant

3 [q]	randomized trials [r]	not serious	not serious	not serious	serious [k]	none	231	227	-	MD **0.69 lower** (1.28 lower to 0.09 lower)	⊕⊕⊕◯ MODERATE	CRITICAL

C. **Interventions for obesity prevention, with two or more components of RF** (HICs: Norway, New Zealand, USA)

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Food acceptance at 12 months old. Enjoyment of Food scale, measured by the Child Eating Behavior Questionnaire (CEBQ), score from 1 to 5 (highest enjoyment of food)

1	randomized trial	not serious	not serious	not serious	serious [k]	none	269	264	-	MD **0.10 higher** (0.01 lower to 0.21 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 24 months old. Enjoyment of Food scale (CEBQ) , score from 1 to 5 (highest enjoyment of food)

1	randomized trial	not serious	not serious	not serious	serious [k]	none	152	143	-	MD **0.04 lower** (0.16 lower to 0.08 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 12 months old. Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [w]	randomized trial	not serious	not serious	not serious	serious [k]	none	269	264	-	MD **0.00 higher** (0.12 lower to 0.12 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 24 months old. Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [y]	randomized trial	not serious	not serious	not serious	serious [k]	none	152	143	-	MD **0.04 lower** (0.21 lower to 0.13 lower)	⊕⊕⊕◯ MODERATE	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7 and others)**

Food acceptance at 12 months old, Enjoyment of Food scale, measured by the Child Eating Behavior Questionnaire (CEBQ), score from 1 to 5 (highest enjoyment of food)

1	randomized trial	not serious	not serious	not serious	serious [k]	none	92	81	-	MD **0.22 higher** (0.04 higher to 0.40 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance from 24 to 30 months old, Enjoyment of Food scale (CEBQ) , score from 1 to 5 (highest enjoyment of food)

3	randomized trials	serious	not serious	not serious	serious [k]	none	422	435	-	MD **0.11 higher** (0.02 higher to 0.20 higher)	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 12 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [cc]	randomized trial	not serious	not serious	not serious	not serious	none	92	81	-	MD **0.31 lower** (0.50 lower to 0.12 lower)	⊕⊕⊕⊕ HIGH	CRITICAL

Food acceptance from 24 to 30 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

3 [ee]	randomized trials	serious [ff]	not serious	not serious	serious [k]	none	422	435	-	MD **0.16 lower** (0.26 lower to 0.07 lower)	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 3.7 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1	randomized trial	serious	not serious	not serious	serious [k]	none	250	254	-	MD **0.10 lower** (0.24 lower to 0.04 higher)	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 3.7 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [kk]	randomized trial	serious [ll]	not serious	not serious	serious [k]	none	213	211	-	MD **0.10 lower** (0.24 lower to 0.04 higher) [mm]	⊕⊕◯◯ LOW	CRITICAL

CI: confidence interval; **CEBQ:** Child Eating Behavior Questionnaire; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **RF COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

Explanations

Author(s): Natalia Elorriaga, Ariel Bardach, María Victoria Lopez, Milagros García-Diaz, Federico Rodríguez-Cairoli, Marión Figarella-de-Aguirre, Gabriela Olivera-y-Luna, Daniel Comandé, Vilma Irazola, Agustín Ciapponi
Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding result in **healthier food preferences** (O2)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		
A. Interventions focused on one component of responsive feeding												
Food preferences - not reported												
-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL
B. Interventions aimed to prevent under-nutrition, including two or more components of RF												
Food preferences - not reported												
-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL
C. Interventions for obesity prevention, which includes two or more components of RF												
***Intervention C1*: Interventions aimed to prevent obesity (e-health interventions)**												
Food preferences - not reported												
-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL
***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group sessions, individual contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9 + C3, C6 in one trial)**												
Food preferences (at 24 months old). Perception of liking for vegetables, SMD												
2	Randomized trials	not serious	not serious	not serious	serious	none	308	320		SMD **0.15 higher** (0.01 lower to 0.3 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
Food preferences (at 3.7 years old). Perception of number of vegetables "liked" (% of listed vegetables "liked", out of 22 items)												
1	Randomized trial	serious	not serious	not serious	serious [c]	none	250	254		MD **2.2 higher** (1.96 lower to 6.36 higher)	⊕⊕◯◯ LOW	CRITICAL
Food preferences (at 5 years old). Perception of number of vegetables "liked" (% of listed vegetables "liked" , out of 22 items)												
1	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	213	211		MD **1.3 higher** (3.13 lower to 5.73 higher)	⊕⊕◯◯ LOW	CRITICAL
Food preferences (at 24 months old). Perception of liking for fruits, SMD												
2 [a]	Randomized trials [b]	not serious	serious	not serious	serious [c]	none	308	320		SMD **0.15 higher** (0.07 lower to 0.38 higher)	⊕⊕◯◯ Low	CRITICAL
Food preferences (at 3.7 years old). Perception of fruits "liked" (% of listed fruits "liked" out of 16 items)												
1 [f]	Randomized trials	serious [g]	not serious	not serious	not serious	none	250	254		MD **7.0 higher** (3.4 higher to 10.6 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
Food preferences (at 5 years old). Perception of fruits "liked" (% of listed fruits "liked" out of 16 items)												
1 [i]	Randomized trials	serious [g]	not serious	not serious	not serious	none	213	211		MD **5.2 higher** (1.6 higher to 8.8 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
Food preferences at 24 months old. Perception of liking for meat and fish, mean score on a response scale of 1 (dislikes a lot) to 5 (likes a lot)												
1	Randomized trials	not serious	not serious	not serious	serious [c]	none	86	75		MD **0.10 higher** (0.07 lower to 0.27 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
Food preferences at 24 months old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 18 items)												

1	Randomized trials	serious [g]	not serious	not serious	serious [c]	none	222	245		MD **2.5 lower** (5.27 lower to 0.27 higher)	⊕⊕◯◯ LOW	CRITICAL
Food preferences at 3.7 years old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 17 items)												
1 [f]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	250	254		MD **1.40 lower** (4.45 lower to 1.65 higher)	⊕⊕◯◯ LOW	CRITICAL
Food preferences at 5 years old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 17 items)												
1 [i]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	213	211		MD **0.20 lower** (3.25 lower to 2.85 higher)	⊕⊕◯◯ LOW	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. COMPONENTS: C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Explanations

Author(s): Natalia Elorriaga, Ariel Bardach, María Victoria Lopez, Milagros García-Diaz, Federico Rodríguez-Cairoli, Marión Figarella-de-Aguirre, Gabriela Olivera-y-Luna, Daniel Comandé, Vilma Irazola, Agustín Ciapponi

Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **healthy food intake** (O3)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

A. Interventions focused on one component of responsive feeding

Healthy food Intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 6-7 components of RF (C1, C3, C4, C5, C7, C9 and in some studies C10)**

Dietary diversity score, between 17 and 21 months old (# of food groups consumed out of 7 critical food groups during the previous day)

3	Randomized trials	not serious	not serious	not serious	serious	none	312	313		MD **0.25 higher** (0.04 higher to 0.45 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Vegetable intake, at 9 months old, consumption during the previous week (dichotomous outcome, spinach)

1	Randomized trials	serious	not serious	not serious	not serious	none	18/122 (14.8%)	7/135 (5.2%)	(

Vegetable intake, at 15 months old, consumption during the previous week (dichotomous outcome, spinach)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	51/112 (45.5%)	34/129 (26.4%)	(

Vegetable intake, between 20 and 23 months old, times/day

2	Randomized trials	serious	serious	not serious	serious [b]	none	165	149		MD **0.09 higher** (0.88 lower to 1.06 higher)	⊕◯◯◯ VERY LOW	CRITICAL

Fruit intake, at 9 months old, consumption during the previous week (dichotomous outcome, banana)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	72/122 (59.0%)	52/135 (38.5%)	**RR 1.53** (1.18 to 1.99)	**204 more per 1,000** (from 69 more to 381 more)	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit intake, at 15 months old, consumption during the previous week (dichotomous outcome, banana)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	88/112 (78.6%)	80/129 (62.0%)	**RR 1.27** (1.07 to 1.50)

Fruit intake, between 20 and 23 months old, times/day

2 [e]	Randomized trials	serious [g]	not serious	not serious	not serious	none	165	149		MD **0.23 higher** (0.12 higher to 0.35 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Egg intake, at 9 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	63/122 (51.6%)	24/135 (17.8%)	

Egg intake, at 15 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	87/112 (77.7%)	70/129 (54.3%)	(

Meat (goat) intake, at 9 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	serious [b]	none	14/122 (11.5%)	6/135 (4.44%)	

Meat (goat) intake, at 15 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	serious [b]	none	49/112 (43.8%)	42/129 (32.6%)	(

Egg intake, at 20 to 23 months old, times/day

2 [f]	Randomized trials	serious [g]	not serious	not serious	serious [b]	none	165	149		MD **0.13 higher** (0.00 lower to 0.25 higher)	⊕⊕◯◯ LOW	CRITICAL

Fish intake, at 20 to 23 months old, times/day

2 [f]	Randomized trials	serious [g]	not serious	not serious	serious [b]	none	165	149		MD **0.06 lower** (0.30 lower to 0.17 higher)	⊕⊕◯◯ LOW	CRITICAL

C. Interventions for obesity prevention, including two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Fruit and vegetable consumption at 12 months old, times/day

1	randomized trial	not serious	not serious	not serious	serious [b]	none	269	264	-	MD **0.51 higher** (0.07 higher to 0.95 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit and vegetable consumption at 24 months old, times/day

1	randomized trial	not serious	not serious	not serious	serious [b]	none	152	143	-	MD **0.21 higher** (0.32 lower to 0.74 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 5 and 8 components of RF (C1, C4, C7, and others)**

Vegetable Intake, at 9 to 12 months old, SMD

3	Randomized trials	Serious	not serious	not serious	serious [b]	none	268	274	

Vegetable Intake, at 20 to 24 months old, SMD

3	Randomized trials	serious	not serious	not serious	serious [b]	none	491	511	

Vegetable Intake, at 3.5 to 3.7 years old, SMD

2	Randomized trials	not serious	serious	not serious	serious [b]	none	349	372		SMD **0.07 higher** (0.17 lower to 0.31 higher)	⊕⊕◯◯ LOW	CRITICAL

Vegetable Intake, at 5 years old, SMD

2	Randomized trials	not serious	not serious	not serious	serious [b]	none	353	370		SMD **0.08 higher** (0.06 lower to 0.23 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit Intake, at 9 to 12 months old, SMD

3 [r]	Randomized trials	serious [s]	not serious	not serious	serious [b]	none	268	274		SMD **0.15 higher** (0.06 lower to 0.35 higher)	⊕⊕◯◯ LOW	CRITICAL

Fruit Intake, at 20 to 24 months old, SMD

3 [w]	Randomized trials	serious [x]	not serious	not serious	serious [b]	none	491	511		SMD **0.09 higher** (0.03 lower to 0.22 higher)	⊕⊕◯◯ LOW	CRITICAL

Fruit Intake, at 3.5 to 3.7 years old, SMD

2[aa]	Randomized trials	not serious	not serious	not serious	serious [b]	none	349	372		SMD **0.17 higher** (0.02 higher to 0.32 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit Intake, at 5 years old, SMD

2[ee]	Randomized trials	not serious	not serious	not serious	serious [b]	none	353	370		SMD **0.05 higher** (0.09 lower to 0.20 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Meat, poultry, fish intake, at 12 months old, g/day

2	randomized trials	not serious	not serious	not serious	serious [b]	none	422	435	-	SMD **0.00 higher** (0.25 lower to 0.25 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Water Intake, at 9 to 12 months old, ml/day

3	Randomized trial	not serious	not serious	not serious	serious [b]	none	268	274	

Water Intake, at 20 to 24 months old, ml/day

3	Randomized trial	not serious	not serious	not serious	serious [b]	none	491	511	

Water Intake, at 3.6 years old, ml/day

2	Randomized trial	not serious	not serious	not serious	serious [b]	none	349	372		MD **111.3 higher** (17.0 higher to 205.6 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Water Intake, at 5 years old, ml/day

2	Randomized trial	not serious	not serious	not serious	serious [b]	none	353	370		MD **52.6 higher** (42.8 lower to 148.0 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Explanations

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding reduce **unhealthy food consumption** (O4)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		
A. Interventions focused on one component of responsive feeding												
Unhealthy food Intake - not reported												
-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL
B. Interventions aimed to prevent under-nutrition, including two or more components of RF												
***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**												
Sweet snacks/sugar-dense foods between 20 and 23 months old, times/day												
2	Randomized trials	serious	serious	not serious	serious	none	165	149		MD **0.11 lower** (0.50 lower to 0.28 higher)	⊕◯◯◯ VERY LOW	CRITICAL
C. Interventions for obesity prevention, which includes two or more components of RF												
***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**												
Sweet and salty snacks + sweetened beverages, consumption at 12 months old, times/day												
1	randomized trial	not serious	not serious	not serious	serious	none	269	264	-	MD **0.02 lower** (0.06 lower to 0.02 higher)	⊕⊕⊕⊕ HIGH	CRITICAL
Sweet and salty snacks, consumption at 24 months old, >3.5 times/week vs less frequent												
1	randomized trial	not serious	not serious	not serious	serious [d]	none	101/165 (61.2%)	105/153 (68.6%)	**RR 0.89** (0.76 to 1.05)	**75 less per 1,000** (from 165 less to 34 more)	⊕⊕⊕◯ MODERATE	CRITICAL
Sweetened beverages, consumption at 24 months old, >2 times/week vs less frequent												
1 [i]	randomized trial	not serious	not serious	not serious	serious [d]	none	88/166 (53.0%)	70/155 (45.2%)	**RR 1.17** (0.94 to 1.47)	**77 more per 1,000** (from 27 less to 212 more)	⊕⊕⊕◯ MODERATE	CRITICAL
***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)**												
Sugar-sweetened beverages (SSBs) intake, at 6 months, ml/day												
1	Randomized trial	not serious	not serious	not serious	serious	none	55	42		MD **5.07 lower** (10.53 lower to 0.39 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
SSB intake at 9 months old, ml/day												
2	Randomized trials	not serious	serious	not serious	serious	none	219	206		MD **7.45 lower** (14.21 lower to 0.68 lower)	⊕⊕◯◯ LOW	CRITICAL
SSB intake between 12 and 24 months old, SMD												
4	Randomized trials	serious	serious	not serious	serious [o]	none	509	529		SMD **0.34 lower** (0.78 lower to 0.09 higher)	⊕⊕◯◯ LOW	CRITICAL
SSB intake between 3.6 to 3.7 years old, SMD												
2	Randomized trials	not serious	not serious	not serious	serious [o]	none	338	357		SMD **0** (0.15 lower to 0.15 higher)	⊕⊕⊕◯ MODERATE	CRITICAL
SSB intake at 5 years old, SMD												

2	Randomized trials	not serious	not serious	not serious	serious [o]	none	342	355		SMD **0.08 lower** (0.26 lower to 0.11 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Sweet snacks/sugar-dense food intake between 9 and 16 month old, SMD

2	Randomized trials	not serious	not serious	not serious	serious [o]	none	318	362		SMD **0.14 lower** (0.29 lower to 0.01 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Sweet snacks/sugar-dense food between at 20 months old, SMD

1	Randomized trials	not serious	not serious	not serious	serious [o]	none	139	139		SMD **0.25 lower** (0.48 lower to 0.01 lower)	⊕⊕⊕◯ MODERATE	CRITICAL

Sweet snacks/sugar-dense food intake between 3.6 to 3.7 years old, SMD

2 [cc]	Randomized trials	not serious	serious	not serious	serious [o]	none	238	286		SMD **0.22 lower** (0.45 lower to 0.01 higher)	⊕⊕◯◯ LOW	CRITICAL

Sweet snacks/sugar-dense food intake between 5 and 8 years old, SMD

2 [cc]	Randomized trials	not serious	not serious	not serious	serious [o]	none	223	263		SMD **0.22 lower** (0.40 lower to 0.04 lower)	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

.Explanations

Author(s): Natalia Elorriaga, Ariel Bardach, María Victoria Lopez, Milagros García-Diaz, Federico Rodríguez-Cairoli, Marión Figarella-de-Aguirre, Gabriela Olivera-y-Luna, Daniel Comandé, Vilma Irazola, Agustín Ciapponi

Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **energy and nutrient intakes** (O5)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

A. Interventions focused on one component of responsive feeding

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**

Energy intake (kcal/day) at 9 months old

1	Randomized trial	serious	not serious	not serious	not serious	none	122	135		MD **122 higher** (76.7 higher to 167.3 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (kcal/day) at 15 months old

1	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **100 higher** (86.7 higher to 113.3 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **3.3 higher** (2.19 higher to 4.41 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **4.6 higher** (4.12 higher to 5.08 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Iron intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	serious	none	122	135		MD **0.20 higher** (0.04 higher to 0.36 higher)	⊕⊕◯◯ LOW	CRITICAL

Iron intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **0.30 higher** (0.25 higher to 0.35 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **0.40 higher** (0.29 higher to 0.51 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **0.29 higher** (0.27 higher to 0.31 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **50 higher** (17.7 higher to 82.3 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	serious [h]	none	112	129		MD **21 higher** (1.20 higher to40.8 higher)	⊕⊕◯◯ LOW	CRITICAL

C. Interventions for obesity prevention, which includes two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 6 and 7 components of RF (C1, C5, C7, C9 and others)**

Energy intake (kcal/day) at <12 months old

1	Randomized trial	not serious	not serious	not serious	serious	none	85	77		MD **28.7 higher** (6.7 lower to 64.1 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (kcal/day) at 12 months old

1	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70		MD **26.5 higher** (33.1 lower to 86.2 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (SMD) at 24 months

2	Randomized trials	serious	not serious	not serious	serious	none	77	76		SMD **0.13 lower** (0.46 lower to 0.2 higher)	⊕⊕◯◯ LOW	CRITICAL

Protein intake (g/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **1.4 higher** (0.16 lower to 2.96 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70	-	MD **0.9 higher** (2.08 lower to 3.88 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 24 months old

1	Randomized trial	not serious	not serious	not serious	serious [p]	none	57	56	-	MD **0.3 higher** (1.86 lower to 2.46 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at <12 months old

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.50 higher** (1.16 lower to 2.16 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70		MD **0.20 lower** (1.86 lower to 1.46 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at 24 months

2[t]	Randomized trials	serious [u]	not serious	not serious	serious [v]	none	77	76		MD **0.21 lower** (-1.51 lower to 1.09 higher)	⊕⊕◯◯ LOW	CRITICAL

Iron intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.20 higher** (0.87 lower to 1.27 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Iron intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **0.00 higher** (1.40 lower to 1.40 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.13 higher** (0.07 lower to 0.33 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **0.30 higher** (0.10 lower to 0.70 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **19.0 higher** (28.5 lower to 66.4 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **6 higher** (70.5 lower to 82.5 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 24 months old

1[aa]	Randomized trial	not serious	not serious	not serious	serious [p]	none	57	56	-	MD **9.00 lower** (91.4 lower to 73.4 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

Explanations

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **growth and body composition** (O6)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

A. Interventions focused on one component of responsive feeding

Weight-related - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, and in some studies C10)**

Weight-related outcomes, weight (kg), at 12 months old

1	Randomized trials	serious	not serious	not serious	not serious	none	129	144		MD 0 (0.23 lower to 0.23 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Weight-related outcomes (SMD), at 24 months old

3	Randomized trials	not serious	serious	not serious	serious	none	227	231		SMD 0.05 higher (0.24 lower to 0.35 higher)	⊕⊕◯◯ LOW	CRITICAL

Length-related outcomes (SMD), between 15 and 24 months old

3	Randomized trials	not serious	serious	not serious	serious [f]	none	336	373		SMD 0.01 higher (0.14 lower to 0.15 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

C. Interventions for obesity prevention, which includes two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 6 and 7 components of RF (C1, C5, C7, C9, and others)**

Weight-related outcomes (BMI z-score) at 9 months, after interventions for obesity prevention

1	Randomized trial	not serious	not serious	not serious	not serious	none	62	58		MD 0.54 lower (0.93 lower to 0.15 lower)	⊕⊕⊕⊕ HIGH	CRITICAL

Weight-related outcomes (WAZ or BMI z-score) at 12 months, after interventions for obesity prevention

6	Randomized trials	serious	serious	not serious	serious [f]	none	1247	1367		MD 0.08 lower (0.23 lower to 0.06 higher)	⊕⊕◯◯ LOW	CRITICAL

Weight-related outcomes (WAZ or BMI z-score) at 24 months, after interventions for obesity prevention

6	Randomized trials	not serious	not serious	not serious	serious [f]	none	1005	1014		MD 0.09 lower (0.18 lower to 0.01 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Weight-related outcomes (BMI z-score) at 36 months old, after interventions for obesity prevention

6	Randomized trials	serious	serious	not serious	serious [f]	none	1209	1306		MD 0.04 lower (0.15 lower to 0.08 higher)	⊕⊕◯◯ LOW	CRITICAL

Weight-related outcomes (BMI z-score) at 5 years old, after interventions for obesity prevention

2	Randomized trials	not serious	not serious	not serious	serious [f]	none	334	327	88/166 (53.0%)	MD 0.01 lower (0.17 lower to 0.15 higher)	⊕⊕⊕◯ MODERATE	CRITICAL

Overweight, at 12 months old

5	Randomized trials	serious	not serious	not serious	serious [f]	None	113 / 607 (18.6%)	134 /652 (20.6%)	**RR 1.00** (0.69 to 1.46)	**0 fewer per 1,000** (from 64 fewer to 95 more)	⊕⊕◯◯ LOW	CRITICAL

Overweight/obesity, at 24 months old

8	Randomized trials	serious	not serious	not serious	serious [f]	None	220 / 1095 (20.0%)	260 / 1076 (24.2%)	**RR 0.81** (0.63 to 1.04)	**46 fewer per 1,000** (from 89 fewer to 10 more)	⊕⊕◯◯ LOW	CRITICAL

Overweight/obesity, at 32 to 36 months old

5	Randomized trials	serious	serious	not serious	serious [f]	None	164 / 1032 (15.9%)	187 / 1137 (16.4%)	**RR 0.92** (0.68 to 1.24)	**13 fewer per 1,000** (from 53 fewer to 39 more)	⊕◯◯◯ VERY LOW	CRITICAL

Overweight/obesity, at 5 to 8 years old

2	Randomized trials	not serious	not serious	not serious	serious [f]	None	64 /342 (18.7%)	73 /388 (18.8%)	**RR 1.07** (0.78 to 1.46)	**13 more per 1,000** (from 41 fewer to 87 more)	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **early child development** (O7)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

A. Interventions focused on one component of responsive feeding

Early child development - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

B. Interventions aimed to prevent under-nutrition, including two or more components of RF

Intervention B1: **Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 6-7 components of RF (C1, C3, C4, C5, C7, C9 and in some studies C10)**

Mental development at 15 to 22 months old (SMD)

3	Randomized trials	not serious	not serious	not serious	not serious	none	336	373	-	SMD **0.60 higher** (0.35 higher to 0.86 higher)	⊕⊕⊕⊕ HIGH	CRITICAL

Motor Development Score at 15 months old, Bayley Scales of Infant Development-II

1	Randomized trial	serious	not serious	not serious	serious	none	153	182	-	MD **2.40 higher** (1.09 lower to 5.89 higher)	⊕⊕◯◯ LOW	CRITICAL

C. Interventions for obesity prevention, including two or more components of RF

Early child development - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

presents GRADE evidence profile for prioritized outcomes.

Discussion and conclusion

Summary of main results

We have evaluated the safety and effectiveness on dietary and health outcomes of interventions that include elements of RF, compared with no intervention or other interventions that do not include those elements, for infants and young children from introduction of complementary foods to 23 months of age.

Interventions focused on repeated exposure of vegetables may increase the chance of accepting certain vegetables and novel vegetables in the short term. The evidence is uncertain regarding the acceptance of other food groups. The evidence is uncertain regarding the acceptance of foods after an intervention focused on exposure to diverse textures.

Also, interventions aimed to prevent under-nutrition conducted in LMICs, including several elements of RF, probably result in little to no effect in the number of mouthfuls eaten but increase the proportion of self-fed mouthfuls and reduce the number of refusals at ~24 months of age.

Interventions aimed to prevent under-nutrition, including six or more components of responsive feeding and development stimulation probably increase self-feeding and reduce child refusals, but may make little or no effect to the number of mouthfuls eaten. These interventions probably slightly increase the dietary diversity. However, the mean score in the intervention groups in all the studies was still lower than the recommended minimum dietary diversity score of 4 out of 7. These programs probably increases the frequency of intake of some healthy foods and may increase or slightly increase energy and nutrient intakes. These programs increase scores of infant development scales in mental or language domains but not with regard to motor domains. However, these interventions probably makes little or no difference to child growth indicators.

Interventions aimed to prevent obesity, including four of five components of responsive feeding and delivered as an eHealth intervention or Facebook peer groups during the first year of life probably slightly increase the perception of enjoyment of food at 12 months and the frequency of consumption of some healthy foods at 12 months, but may makes little or no difference to anthropometric outcomes.

Interventions aimed to prevent obesity, including six or more components of responsive feeding and delivered by health professionals or health students, may result in benefits with regard to food acceptance, food preferences for some healthy foods, intakes of some healthy foods and intakes of some unhealthy foods and beverages, some anthropometric outcomes particularly at 24 months.

Strengths and limitations

This comprehensive systematic review included many randomized clinical trials from all countries with no language restriction. Among them, we identified several recently published RCTs, eight of which were published in the last five years. Of the latter, five correspond to populations living in low-resource settings and/or indigenous populations

in HIC. The inclusion of studies from LMIC, high-income countries, and HIC with low resource settings allowed us to perform subgroup analyses that helped explain the results and the observed heterogeneity. Our review has also been exhaustive in terms of the group of outcomes evaluated. Moreover, we re-expressed the MD results to their original natural units, which are more easy-to-understand when we used SMD. We explored the effectiveness of RF in different settings analyzing its supporting evidence and, whenever available, the strength of recommendations according to the GRADE methodology. GRADE offers a transparent and structured process for developing and presenting evidence summaries and making recommendations[91]. Our definition of RF was based on an agreed-upon list of components of effective, responsive parenting and responsive feeding interventions.[92]

Our study has some limitations. The interventions were heterogeneous regarding the characteristic RF elements present and their quantity, duration, and intensity. In some cases, the interventions also included messages to promote adequate complementary feeding, so it is difficult to determine the isolated effect of the RF (the 'how') and what-to-eat (the 'what') components. In these cases, we included the clarification. On the other hand, it was challenging to identify which characteristic RF components were present during the intervention in some studies. In those cases, it is possible that other components were present, and we may not have identified some of them. In some studies, the control group consisted of usual care, which may differ by country, city, and provider. Even thought, because the current Complementary Feeding Guidelines[12] include responsive feeding among their recommendations, some of the studies may have included their recommendations in the control group. It was not possible to adjust the effects for the history of or breastfeeding status during the intervention. When reported by the authors, we used adjusted data, but they were not available in all cases. In several outcomes, the results were very heterogeneous in terms of measurement instruments, reporting units, or ages of data collection. Whenever possible, we used the SMD to combine outcomes expressed in different units, but it was not possible to pool the data in some cases.

Ongoing Studies

A total of 8 studies that meet our criteria were identified as ongoing.[93-100] We highlight that most of them are carried out in low and middle-income countries. We describe the methods, interventions, and outcomes of each of them in Appendix 3

Concordance with prior evidence

Our findings regarding food acceptance after repeated exposure to vegetables are pretty similar to those reported by Appleton 2018.[101] Their analyses demonstrate increased liking and intakes of the exposed vegetable after repeated exposure compared with no exposure and increased liking and intakes of a new vegetable after repeated exposure to other vegetables compared with no exposure or repeated exposure to one other vegetable. Likewise, Spill 2019[8] found moderate evidence suggesting that repeated exposure of a single vegetable or fruit or multiple vegetables or fruits per day for 8-10 or more days is likely to increase the acceptance of an exposed food in infants and toddlers aged 4 to 24 months old. This effect applies to other foods within the same category but not to foods from different categories. Food acceptance was defined either by an increase in the intake or by a faster feeding rate after comparison with before exposure period.

Findings from Bentley 2011[102] show mixed results for responsive feeding and food acceptance. The evidence revealed different outcomes depending on the aspect associated with responsive feeding. Whereas positive verbalizations are associated with higher food acceptance (defined as accepted bites) than neutral or negative verbalizations, physical behaviors of the caregivers have been associated with both more significant and lower child acceptance (described as mouthfuls and refusals). Our study found similar results considering an additional trial.[20]

Some inconsistent results regarding healthy and unhealthy foods and beverages' intakes are similar to those reported in previous reviews[102,103]. Also, the magnitude of the consumption differences seems to be small. In our review, we identified a potential source of heterogeneity by analyzing when it was possible data from low resource settings in HICs separately from HICs and LMICs.

Our findings regarding consumption of energy and nutrients after interventions to prevent under-nutrition are consistent and add information to the review of studies conducted in LMICs.[102] Previous reviews have concluded that few studies have demonstrated a positive association between RF and child undernutrition.[102] We found similar results for undernutrition prevention, even when we have included other studies. We have also found some inconsistencies between studies in trials aimed to prevent overweight and obesity. Other reviews have evaluated the effects of caregiver feeding practices or interventions based on RF on child weight outcomes in studies aimed to prevent overweight and obesity. Previous reviews have reported some positive results with different certainty of the evidence, particularly in HICs [10 103,104] .Our results regarding the prevention of overweight and obesity and weight related outcomes should be interpreted with caution, taking into account the imprecision and the inconsistency between trials for some analyses. Some differences between our results and these reviews may be due to different inclusion criteria concerning age, income restrictions or restrictions on the intervention providers.

Implications for health policy and recommendations for future research

As we previously stated, WHO recommends mothers and caregivers practice responsive feeding.[12,13] Data from this review will be useful to inform the updating global guidance on complementary feeding on this topic.

Future research should focus on outcomes for which there is insufficient information, and wherever possible, include standardized indicators of food intake, for example, those recommended by WHO and UNICEF[105]. For growth and body composition, wherever possible, growth indicators should be report, rather than weight or height alone. Explicit details on which components of responsive feeding are addressed in the intervention is also warranted. The assessment of interventions in children from low-income, minority, or indigenous communities (including subgroup analyses) should also be prioritized. Also, the potential adverse effects of interventions (e.g., increased costs of family groceries) as a routine part of intervention trials would need to be explored. Finally, there is a persistent gap in our knowledge regarding the sustainability of interventions, so those with extended follow-up periods are of particular interest.

In conclusion, to our knowledge, the present work constitutes the most comprehensive systematic review so far on RF for infants and young children. We showed that the administration of interventions with RF components generally resulted in benefits in a wide variety of outcomes, such as food acceptance and preference, intake of energy and nutrients in interventions aimed preventing under-nutrition, intake of healthy and unhealthy foods and beverages, weight related indicators in some subgroups, early child development, and physical activity and play, with varying certainty of evidence.

Figure 1. Study flow diagram

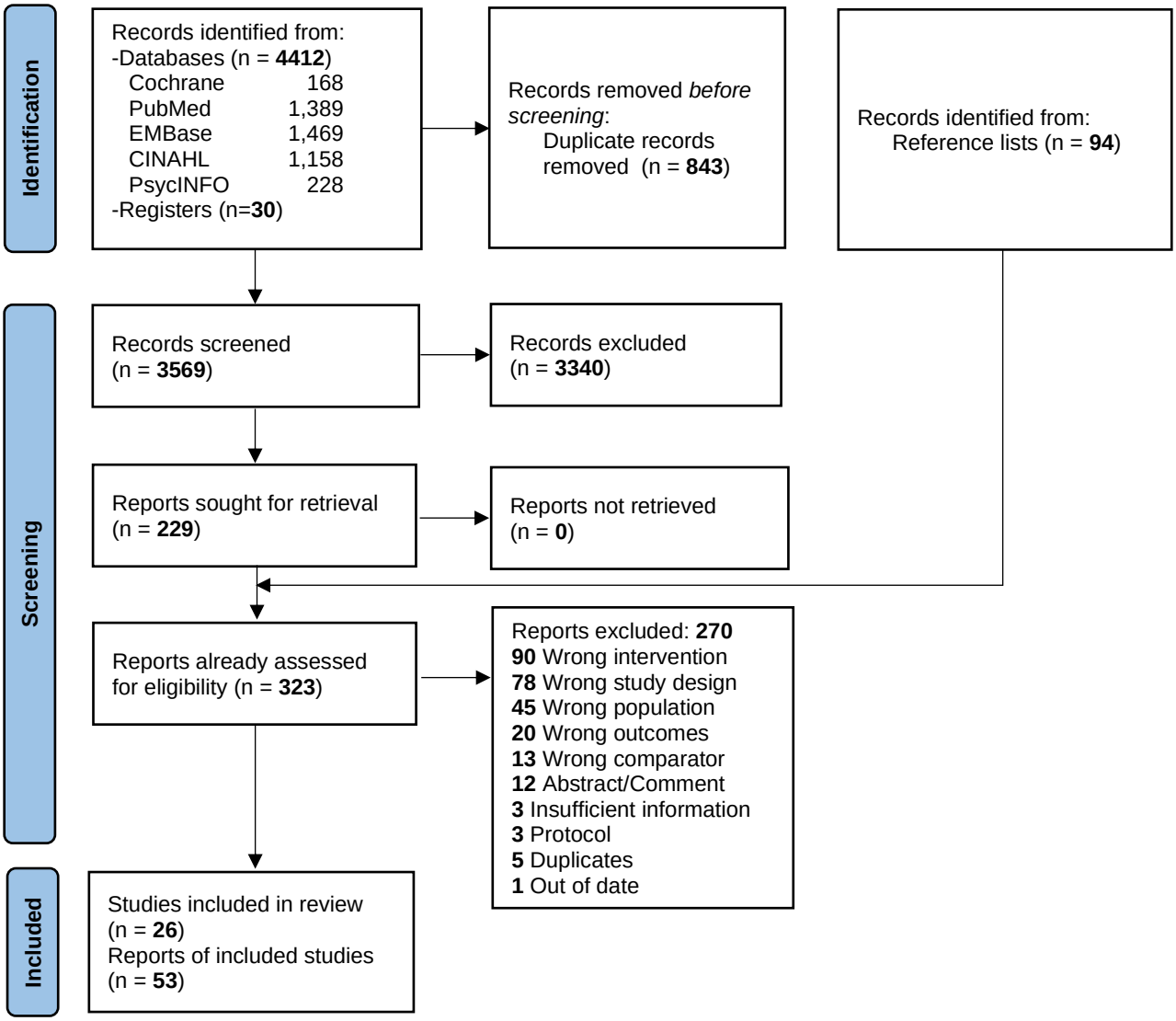

Figure 2. RoB2 assessment of included studies

Figure 3. Summary risk of bias of studies by domain

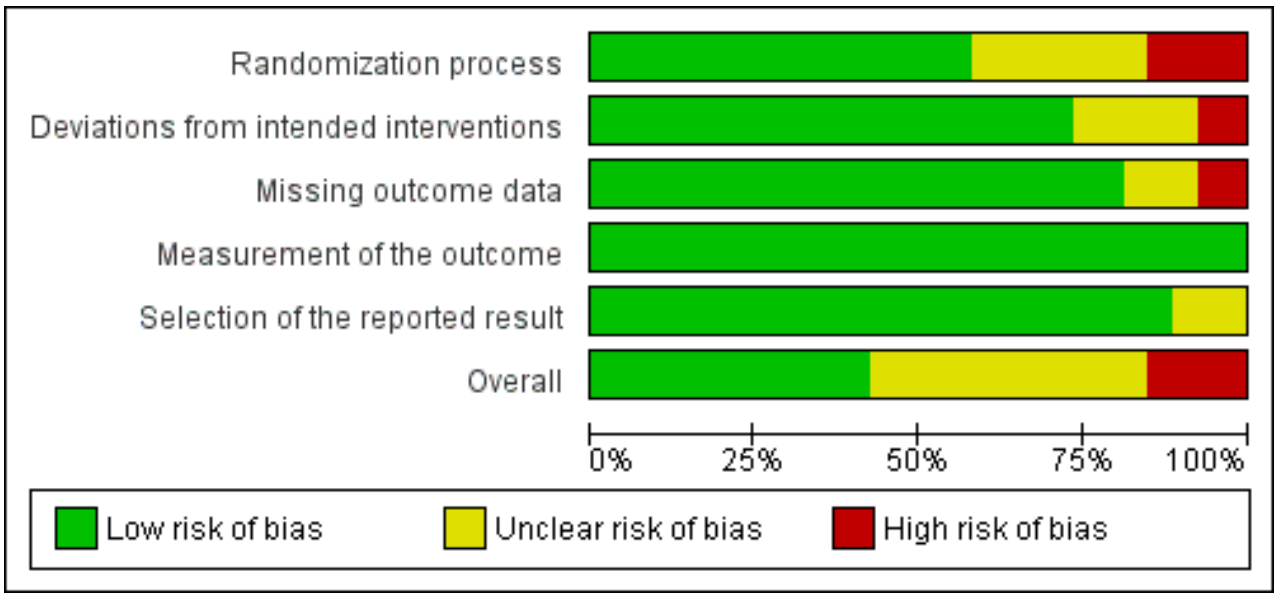

Table 1. Characteristics of included studies

e	Study name	Starting date mm/yyyy	Duration (months)	Study design	Country	Specific Population, setting	Participants (N), randomized	Child mean age (months)	Study aim	Intervention description
		03/2006	9	C-RCT	Bangladesh	Rural.	202; 36 clusters (villages)	17.4	UP	**Intervention group:** six-session (five weekly and an extra booster s responsive feeding program. These sessions, based on social-cogni emphasized child self-feeding and maternal responsiveness. Sessio discussion, demonstration and practice of self-feeding and responsiv by mothers of the village who were trained as peer educators. After t intervention group received the same five health-nutrition sessions a **Control group** received five health-nutrition sessions relevant to cor (regular program). **Both groups** had previously received twelve sessions on child deve and gentle discipline (regular program).
		04/2007	9	C-RCT	Bangladesh	Rural.	203; 37 clusters (villages)	13.9	UP	**Intervention group** participated in a six-session (five weekly and an session) educational responsive feeding program in addition to the re These sessions, based on social-cognitive theory, emphasized child maternal responsiveness. Sessions included discussion, demonstrat self-feeding and responsive feeding. Delivered by young women of t trained as peer educators. **Control group** received the regular program exclusively. The regula in 12 sessions on child development, parenting and gentle discipline information sessions on health and nutrition concerning complement
		04/2008	9	C-RCT	Bangladesh	Rural.	302 (202 included in this SR); 45 (31) clusters (villages)	14	UP	**Intervention group** participated in a six-session (five weekly and an session) educational responsive feeding program in addition to the re These sessions, based on social-cognitive theory, emphasized child maternal responsiveness. Sessions included discussion, demonstrat of self-feeding and responsive feeding and were delivered by young village who were trained as peer educators. **Control group** received program, which provided 12 informational sessions on health, nutritio development. Excluded Arm: *An intervention group (RFS+) including nutrient supp not included in this SR.*
		11/2010	14	C-RCT	Bangladesh	Rural	463; 4 clusters (unions)	6.7 and 11	UP	**Intervention group** participated in a 10-month parenting program re nutrition, communication, and play. The curriculum was informed by complementary feeding and psychosocial development guidelines, s theory social learning theories of behavior change, evidence from pr programs in Bangladesh, and baseline findings showing low levels o stimulation, hygiene and sanitation. The program consisted of 14 ses for 4 months and monthly for 6 months. Two types of program provid were used: young women with 10th grade education who were recor community leaders and government paid family welfare assistants w instructed to deliver messages during a 10-min counselling session t young children at home and at their community clinics. They were bo supervised by the implementing organization who conducted regular Mothers in the **control group** received standard care (home visits by paid family welfare assistants trained on the government model and messages about feeding and hygiene).
	TOPS	01/2009	48	RCT	USA	Urban and periurban, low-income communities	227 (183 included in the SR)	20.1	OP	**Intervention group (Tot-TOPS)** received eight sessions (four group individual telephone coaching sessions and a final group session) on parenting. "Sessions were held biweekly over four months". The inte informed by Triple-P (Positive Parenting Program) model, transaction responsive parenting and Active Parenting. It addressed the "parents recognizing and responding to toddlers' signals, behavior manageme without relying on food, promoting toddler emerging autonomy and p opportunities for healthy toddler meals and physical activity." **Contro TOPS)** received eight sessions (four group sessions, three individua coaching sessions and a final group session) on children safety. "Se biweekly over four months" It was designed as an attention control, " intervention effects could not be explained by attention alone". Excluded Arm: *An intervention group concerning maternal lifestyle w this systematic review.*
	INFANT	02/2008	20	C-RCT	Australia	Urban and periurban,	452; 62 clusters (first-time parent groups)	3.8	OP	The **intervention group** received six 2-hour sessions on infant feedi activity and sedentary behavior in addition to usual care for 15 month dietitian-delivered sessions were held during firs-time parents' regula intervention was based on an anticipatory guidance framework and s theory and "incorporated a range of delivery modes and educational

									including group discussion and peer support", "exploration of facilitat to uptake of key messages", "6 purpose-designed key messages", a newsletter. **Control group** received usual care from their Maternal and Child He nurse, who may have provided lifestyle advice. These participants al newsletters regarding unrelated aspects of child health and developr **groups** received "small gifts on receipt of completed questionnaires'
73	NOURISH	01/2008	36	RCT	Australia	Urban and periurban.	698	4.3	OP	The **intervention group** participated in a comprehensive skills-base used a cognitive behavioral approach and focused on the feeding an practices that mediate children's early feeding experiences. It comm children were 4–6 months of age and comprised two modules of six sessions (10–15 mothers per group), each of 1–1.5 h duration. Intera sessions were co-led by a dietitian and psychologist at a choice of da and at the same child health centers as those used for measuremen participants was on healthy eating patterns and growth, rather than c prevention. Content included anticipatory guidance on the 'when, wh solid feeding. The first module focused on establishing solid feeding, and texture, neutral repeated exposure to healthy foods, neutral limit non-core foods and realistic expectations of the growth and nutritiona healthy infants. The second module promoted development of a pos environment and managing toddler eating behavior in the context of autonomy and transition to eating with the family and in wider social The **control group** received self-directed access to usual communit services. This potentially included child weighing, individual appointm health nurse or access to information via a website or a telephone he
84	POI	05/2009	36	RCT	New Zealand	Urban.	802	0**	OP	4 groups: Usual Care (UC); Food, Activity, and Breastfeeding (FAB); and Sleep (Combination). All groups received standard "well-child" c intervention comprised 8 additional contacts for education and suppo breastfeeding, food, and activity. The Sleep intervention comprised 2 contacts for guidance about sleeping habits. Combination families re interventions.
	BLISS	11/2012	24	RCT	New Zealand	Urban	214	0*	OP	**Intervention group** received eight visits in addition to the standard m "Well-childcare", a government program. Visits were held antenatally were 9-month-old. During the visits, participants received education regarding the BLISS complementary feeding (ie, infant self-feeding f with modifications to address concerns about iron, choking, and grow contacts were with an international board-certified lactation consultan to 5 months, and the 3 home visits were delivered by a research ass the BLISS approach at 5.5, 7, and 9 months of age). Additional supp when requested. **Control group** received standard midwifery and "Well-childcare", fre "available to all New Zealand children from birth to 5 years of age, w involves 8 visits before 12 months of age and endorses conventional feeding methods".
	Grow2gether	03/2014	15 (estimated)	RCT	USA	Urban, low-income, low-literacy community.	87	0*	OP	**Intervention group** participants joined a private Facebook peer grou focused on healthy parenting and infant growth. The intervention sol online group activities for 11 months (2 months prenatal to facilitate m before delivery, until infant age 9 months) except for two in-person m (prenatally, for introductions and setting group ground rules, and at i months). Four separate peer groups of 9–13 women were formed ba date. Each group was facilitated by a psychologist specializing in obe and funded by the research study. Based on IOM obesity prevention recommendations, the curriculum included infant feeding practices ((7 weeks), positive parenting (12 weeks total: 4 activity, 4 parenting infant cues and calming), and maternal well-being (8 weeks). "Partic intervention and control groups received text message reminders for infant primary care visits. The **control group** received no additional
		02/2011	17	RCT	UK, Greece		146	5.2	OP	The **intervention group** received advise from a researcher or healt weaning and solid food introduction. The messages emphasized: (1) introducing vegetables early in the weaning process, (2) the beneficial different single vegetables each day, (3) the techniques of expo interpreting infants' facial reactions to food and (5) the need for per infant initially rejects a food. A leaflet reinforcing these messages (sta countries) was given to participants. Five vegetables were selected to be introduced. Mothers were provided with a small number of comm vegetable purées to use, but were told that they could prepare their preferred. They were asked to offer the five vegetables in an explic 15 days. The **control group** received country-specific standard weani recommends to introduce fruits, vegetables and baby rice or cerea Greece, paediatricians provide parents with guidance on approp commonly baby rice, cereals or fruits; in Portugal, the guidelines fo prescriptive, and health professionals are advised to adapt internati recommendations to the needs and circumstances of individual infan Excluded Subgroup (Portugal): Data from this country *was not in (wrong comparator)*

	MOMS-OP	06/2005	24	C-RCT	USA	Urban, low-income community.	306 (205 included in this SR); 3 clusters (clinics) (2 included in this SR)	2 months or younger	OP	The **intervention group** (Ounce of Prevention-OP) mothers receive program of infant feeding anticipatory guidance focusing on serving s introducing different foods for the infant. Mothers were encouraged t to determine when he or she is full, not to force the child to eat, and a reward. The **control group** (Bright Futures-BF) received usual care. Messag traditional feeding anticipatory guidance focused on recommending b introduction of infant food and table food, and avoidance of honey an lead to choking. Excluded Arm: *An intervention group focused on maternal eating hab included in this systematic review.*
67	OPPS	NR	14 weeks	RCT	Canada and USA	Native-American community.	43	21	OP	The **intervention group** participated in an obesity prevention (OP) g to parenting support (PS). PS consisted of a core parenting program on the Active Parenting curriculum and was delivered in home visits. emphasized the child's psychological and behavioral goals, logical a consequences, mutual respect, and encouragement techniques. The adapted the curriculum as necessary to make it culturally appropriate different parenting lesson topics that were covered over the 16-week educator was instructed to focus exclusively on how improved paren facilitate the development of appropriate eating and exercise behavio The **control group** received the PS intervention, but the peer educa to refrain from discussing child or parent eating and exercise behavio conversation if these issues came up. The target population of this tr American infants whose mothers had a BMI over 25 kg/m2.
	Early Food for Future health	02/2015	72	RCT	Norway		715	5.5	OP	The **intervention group** received an eHealth intervention that provid anticipatory guidance on early protective feeding practices from child months. It consisted of seven monthly video clips of 3–5 min duration feeding-related aspects like appropriate food-types and textures, how preferences evolve and responsive feeding practices; and monthly c recipes, demonstrating how to make homemade baby- and family fo available ingredients. Parents received an email each month from ch months with a link to the age-appropriate webpage showing the mon the infant feeding topic together with the corresponding recipes and Parents in the **control group** received routine care from their local c with regular consultations at child age 6, 8, 10 and 12 months.
		09/2011	NR	RCT	UK		40	4.8	OP	The infants of the **intervention group** received guidance on a step-b to vegetables in milk then rice during complementary feeding. The in consisted of 12 daily exposures to vegetable purée added to milk (da followed by 12 × 2 daily exposures to vegetable puree added to baby (days 13–24). Plain milk and cereal were given to the infants in the **c** Then **both groups** received 11 daily exposures to vegetable purée.
		10/2001	12	RCT	Brazil	Urban, low-income community.	500	0	UP/ OP	The **intervention group** received dietary advice about breastfeeding complementary feeding based on the "Ten steps for healthy feeding children from birth to 2 years of age". The counseling was carried ou undergraduate students in nutritional sciences in home visits to the m days of the child's birth, monthly up to 6 months, and with subsequen and 12 months. Each visit addressed 1 of the "Ten Steps" and lasted Mothers from the **control group** were interviewed twice during the fi children's lives for data collection only. The study did not interfere in pediatric visits of both groups.
	StEP	04/2012	38	RCT	USA	Urban, low-income Hispanic families.	533	0*.	OP	The **intervention group** participated in the Starting Early Program in standard care. The program targeted low-income Hispanic Families. received fifteen sessions: 2 individual sessions on nutrition counselin trimester of pregnancy and one postpartum and 13 group sessions o parenting support during the first 33 months of the babies' lives. The were designed using social cognitive theory to promote healthy beha informed by guidelines from the National Academy of Medicine, Ame of Pediatrics and the US Department of Agriculture. Delivery was in bilingual (English and Spanish) registered dietitians who were certifie counselors. **Control group** received standard prenatal, postpartum a primary care, including 1 prenatal nutrition consultation, 1 childbirth c class, as-needed lactation support, and pediatric visits according to A Academy of Pediatrics guidelines.
	PROBIT	07/2014	36	C-RCT	Italy	Urban,	562; 22 clusters (pediatricians)	0*	OP	The **intervention group** received an educational program on protec with particular emphasis on responsive feeding in addition to usual c well visit within the first two years of their child's life, parents are prov and written information on behaviors to adopt for their child to be pro obesity: breast feeding, feeding on demand, responsive feeding, con introduction of complementary feeding, portions shaped on the child' avoiding "pressing the child to eat more" and rewarding or punishing food, avoiding added sugar and beverages other than milk and wate active game with the child, alternating protein sources correctly and a excess. Written menus examples and colored photos of average por for complementary feeding. Parents are also provided with informatio consequences of childhood obesity. The **control group** received usu follow-up at the routine visits.

	SLIMTIME	06/2006	42	RCT	USA	Urban,	160	0**	OP	This trial had two interventions The first intervention ("Soothe/Sleep") on discriminating between hunger and other sources of infant c strategies were taught to minimize feeding for non-hunger-related prolong sleep duration, particularly at night. The second intervention Solids") taught parents about hunger and satiety cues, the timing for solid foods, and how to overcome infants' initial rejection of healt repeated There were **four experimental arms**: **Experimental 1** received soothing and Calming instructions given a Infant Sleeping and Soothing **Experimental 2** received Repeated food exposure instructions given months of life + Repeated Food Exposure **Experimental 3** received both interventions: Soothing and Calming a exposure Interventions: The **control group or Experimental 4**, like all participants in the stu standard infant parenting book that included traditional advice on har awakenings including feeding, rocking, and checking for a dirty diape
	Family Spirit Nurture	03/2017	19	RCT	USA	Navajo (Native American) community.	134	2	OP	The **intervention group** received the Family Spirit Nurture program, partnership with tribal communities. The curriculum included 6 lesson 6 months post-partum by Navajo paraprofessionals covering the follo infant feeding practices, responsive feeding, avoiding SSBs, optimal feeding practices, and whole family healthy eating practices. The **co** received 3 injury prevention lessons. The target population of this tria American Navajo mothers to an infant younger than 14 weeks, aged older.
06	INSIGHT	01/2012	63	RCT	USA	Urban.	291	0**	OP	The **intervention group** received four research nurses-conducted h visits to the research center and mail-delivered materials. The frame responsive parenting underlies the specific lessons in each of the fou states, including instructing parents: a) to recognize infant hunger an well as use feeding more selectively in response only to hunger, b) t to feeding to soothe a fussy, but non-hungry infant and toddler, c) to appropriate portions of healthy foods and allow children to determine consumed, d) to improve acceptance of developmentally appropriate vegetables by using repeated exposure and positive role modeling, e good sleep hygiene and f) to actively engage infants in play time in sedentary behaviors. In addition to these messages, intervention par education on growth charts, the meaning of growth chart percentiles growth patterns during early life. // Trained research nurses delivered RP and control intervention material to mothers during one-on-one h infants were 3–4, 16, 28, and 40 weeks of age, and at a research ce infants were 1, 2 and 3 years of age. The **control group** received ch messages at the same time points that were matched for content int
		NR	NR	C-RCT	USA		292; 4 clusters (clinics)	0**	OP	The caregivers of the **intervention group** received 12 sets of educa at pediatric visits over the first 2 years of the infants' lives in addition baby visits. The brochures emphasized a few key points and provide on infant feeding practices, physical activity, and developmental mile eating patterns. The intervention was delivered by a health care prov previously developed program (Growing Leaps and Bounds) that inc visual, and text advice and information for parents. All participating p nurse practitioners, and clinic staff attended training sessions before and every 2-3 months. The **control group** received routine well-bab
		12/2016	17	RCT	France		61	7.5	OP	**Intervention group** received advice and regular counselling for pron introduction of textured foods in addition to the standard French reco complementary feeding during seven months. The intervention was research dietitian. Advice was grouped in a booklet informed by scie governmental advice, other countries national guidelines and other n documents on texture introduction. The content of the booklet was d multidisciplinary group of experts. **Control group** received the stand recommendations on complementary feeding
		NR	12	C-RCT	India	Rural.	607 (397 included in this SR); 3 clusters (villages) (2 included in the SR)	3	UP	**Intervention group** participated in a responsive complementary fee program in addition to routine care. Mothers received education on c feeding (11 messages), eight messages and skills on responsive fee developmental stimulation messages using five simple toys (bi-weel trained village women). These age-appropriate messages and skills understand and respond to infants' cues of hunger/appetite or satiati responsive feeding intervention. The content of the intervention was PAHO/WHO Guidelines on responsive feeding. This group of mother developmentally appropriate toys five times during the intervention w on how to use them to engage and play with their children. The **control group** received routine care from the Integrated Child D Services. These services consist mainly of center-based supplemen to 1–6-year-olds, pregnant and nursing mothers, home-visit counsell breastfeeding and complementary feeding, monthly growth monitorin formal preschool education for children 3–5 years of age.

									Excluded Arm: *An intervention group focused on complementary fee was not included in this systematic review.*
	BBOFT+	01/2009	62	C-RCT	The Netherlands	Urban. Well-child visits	1995; 34 clusters (Youth Health Care teams)	0*	OP	The 'BBOFT+' intervention included targeted education and guidanc applying the principles of stimulus control, modeling and classic cond increasing positive parenting skills, by YHC professionals (communit nurses). The rationale of the intervention is that, by anticipating on c it enables parents to create the conditions that stimulate the desired in the child by increasing children's self-esteem, setting a good exam and reward, managing children's problem behaviors by setting groun clear instructions and the use of consistent measures [21]. Parents i group received the intervention during all well-child visits, i.e. 8 to 13 minutes in the first three years. To support counseling, the YHC prof small, calendar-like booklet that was placed on their desk. The front booklet consisted of pictures of parents and children illustrating the c the backside provided all age-appropriate items (8–15 per visit) to be parents by YHC professionals during the visits. The booklet was spe to be suited for all parents, including those with low literacy skill. **Control group**: care as usual (regular well-child visits).
	Mothers & Others	10/2013	50	RCT	USA	Urban, non-Hispanic black families. Low-resource setting. Home-based intervention	429	0**	OP	The **intervention group** (obesity prevention group) received eight h information toolkit, and four newsletters designed to provide anticipa and support for enactment of six targeted infant feeding and care be breastfeeding; adoption of a responsive feeding style; use of non-foc techniques for infant crying; appropriate timing and quality of comple minimization of TV/media; and, promotion of age-appropriate infant s black-families targeted interventions were delivered by trained peer e were African American women with MS/MPH degree in a health-rela BS/BA degree in a health-related field plus two or more years of exp individual or group counseling and who had breastfed their own chil was informed by multiple expert resources, including the Baby Beha Ages & Stages Learning Activities, the Start Healthy Feeding Guideli American Academy of Pediatrics Nutrition Handbook. **Control group** an attention-control injury prevention group.

NR, Not reported; OP, obesity prevention; UP, undernutrition prevention

* Recruited before birth

Table 2. Characteristics of the interventions: time of implementation, components regarding responsive feeding, setting and delivery and theoretical basis and frameworks.

Study ID	beginning	Ending	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	Intervention setting and delivery
Interventions with focus in one component of responsive feeding													
Fildes 2015	W	Y1					X						Home visits or the pediatrician's office,
Hetherington 2015	W	Y1					X						Guidance on step by step exposure to
Tournier 2021	AW	Y2			X								Advise and regular counselling by a res
Interventions aimed to prevent under/nutrition, including two or more components of responsive feeding and developmental stimulation													
Vazir 2013	BW	Y2	X		X	X	X		X		X		30 Bi-weekly visits by trained village wo
Aboud 2008	AW	Y2	X		X	X	X		X		X	X	6 Group sessions by trained village mo
Aboud 2009	AW	Y2	X		X	X	X		X		X	X	6 Group sessions by trained village wor
Aboud 2011	AW	Y2	X		X	X	X		X		X	X	6 Group sessions by trained village wor
Aboud 2013	AW	Y2	X		X	X	X		X		X	X	14 Group sessions by trained village wo minutes counselling by family welfare a RF
Interventions for obesity prevention including two or more components of responsive feeding													
Fangupo 2016	BW	Y1	X	X		X	X		X		X		8 group or individual parent contacts (d education and support (5 delivered by l research assistants trained in the BLIS (BLISS; modified version of Baby-Led V
Fiks 2017	BW	Y1	X			X			X	X			Facebook peer group with the exceptio psychologist specializing in obesity trea
French 2012	BW	Y1	X	X		X	X	X	X	X			Specific brief advice and 1-page handc clinics (5 visits)/ Tailored AG
Louzada 2012	BW	Y1	X		X	X	X	X	X	X	X		Dietary counselling, 10 home visits carr nutritional sciences / Ten steps for heal years of age. PAHO/WHO guidelines
Paul 2011	BW	Y1	X	X			X			X			2 Home visits delivered by a nurse / RP
Rosenstock 2021	BW	Y1	X					X					6 home visits delivered 3 to 6 months p (Intervention designed in partnership w
Wasser 2020	BW	Y1	X				X			X			8 Home visits by peers educators, or "p
Campbell 2013	BW	Y2	X	X	X	X	X	X	X				Six 2-hour dietitian delivered sessions i months/ Parenting support theory, AG
Daniels 2012	BW	Y2	X	X	X	X	X	X	X		X		2 modules of 6 fortnightly group session Attachment paradigm, AG, RF, Cognitiv
Fangupo 2015	BW	Y2	X			X	X		X	X			8 educational group session delivery by
Morandi 2019	BW	Y2	X			X		X	X	X			Oral and written information to prevent two years of their child's life), delivered
Schroeder 2015	BW	Y2	X	X	X	X	X	X	X	X	X		12 sets of Educational brochures at pec program)
Messito 2020	BW	Y3	X	X	X	X		X	X	X	X		2 individual and 13 group session (coor delivered by bilingual registered dietitia Social learning theory, RF
Savage 2016	BW	Y3	X	X		X	X	X	X	X			4 research nurses-conducted home vis delivered materials/ RP
Vlasblom 2020	BW	Y3			X		X	X	X	X			Counselling during all well-child visits in community physicians and nurses/ Soc Interviewing, Mediation techniques
Helle 2019	W-AW	Y1	X			X		X	X	X			e-Health Intervention (7 monthly video theory, Social cognitive theory, AG
Black 2021	AW	Y2	X			X	X	X	X	X			5 Group sessions and 3 individual telep educators/ Positive Parenting Program Parenting
Harvey-Berino 2003	AW	Y2	X		X		X	X	X	X	X		Home visits, delivered by peer educato

AG, Anticipatory guidance; AW: After the period of the introduction of solid foods: BW: before the period of introduction of solid foods; RF, Responsive feeding; RP, Responsive Parenting. W: at the time of the period of introduction of solid foods.

COMPONENTS: C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Table 3. Characteristics of included studies. Outcomes

Study ID	1	2	3	4	5	6	7	8	9	10	1
Aboud 2008	X		X	X		X					
Aboud 2009	X		X	X		X					

Aboud 2011	X		X			X	X				
Aboud 2013			X			X	X				
Black 2021			X	X		X					
Campbell 2013			X	X		X					
Daniels 2012	X	X	X	X		X				X	
Fangupo 2015						X				X	
Fangupo 2016	X	X	X		X	X		X	X	X	X
Fiks 2017						X					
Fildes 2015	X										
French 2012			X	X							
Harvey-Berino 2003					X	X					
Helle 2019	X		X	X		X				X	
Hetherington 2015	X										
Louzada 2012			X	X		X		X			X
Messito 2020			X			X					
Morandi 2019				X		X					
Paul 2011						X					
Rosenstock 2021				X		X					
Savage 2016	X					X				X	
Schroeder 2015						X					
Tournier 2021	X									X	
Vazir 2013			X		X	X	X				X
Vlasblom 2020				X		X					
Wasser 2020						X					

OUTCOMES: 1. Food acceptance; 2. Food preference; 3. Intake of healthy foods and beverages; 4. Intake of unhealthy foods/beverages; 5. Nutrient and energy intake; 6. Growth and body composition; 7. Early Child Development (ECD); 8. Safety (any adverse event); 9. Flavor preference; 10. Food intake self-regulation; 11. Nutrient status; 12. Sleep; 13. Physical activity and play; 14. Dental Health

Table 4. Average cluster size and design effect of cluster-randomized trials

Trial ID	Original N RF	Original N No-RF	Total number of clusters	Average cluster size	ICC	Design effect 1 + (M – 1)*ICC	Corrected N RF	Corrected N No-RF
Aboud 2008	102	100	36	6	0.05	1.25	82	80
Aboud 2009	108	95	37	5	0.05	1.20	90	79
Aboud 2011	92	110	50	7	0.05	1.30	71	85
Aboud 2013	226	237	47	10	0.05	1.45	156	163
Campbell 2013	271	271	62	9	0.05	1.40	194	194
French 2012	101	104	3	102	0.05	6.05	17	17
Morandi 2019	295	267	22	26	0.05	2.20	134	121
Schroeder 2015	134	144	4	70	0.05	4.45	30	32
Vazir 2012	195	202	60	7	0.05	1.30	150	155
Vlasblom 2020	901	1094	122	59	0.01	1.32	683	829

ICC, Intracluster Correlation Coefficient; RF, Intervention group (Responsive Feeding); No-RF, Control group

Table 5. GRADE. Evidence Profile

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **food acceptance** (O1)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

D. Interventions focused on one component of responsive feeding

Intervention A1: **Guidance on step-by-step repeated exposure to vegetables during the introduction of solids, delivered by research staff or health professionals, component C5**

Food acceptance of target vegetables (at ~6 months old). Amount of target vegetables consumed (g), after 24 to 35 days of repeated exposure to vegetables, measured in a laboratory setting

1 [a]	randomized trial	serious [b]	not serious	not serious	serious [c]	none	17	18	-	MD **37.6 higher** (14.0 higher to 61.2 higher) [d]	⊕⊕◯◯ LOW	CRITICAL

Food acceptance of novel vegetables (at ~6 to 7 months old). Amount of novel vegetables consumed (g), after ~ 1 month of repeated exposure to vegetables, measured in a laboratory setting

2 [e]	randomized trials	serious [f]	not serious	not serious	not serious	none	61	58	-	MD **15.6 higher** (7.2 higher to 23.9 higher) [g]	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance of novel fruit (at ~6 to 7 months old). Amount of novel fruits consumed (g), after ~ 1 month of repeated exposure to vegetables, measured in a laboratory setting

1 [h]	randomized trial	very serious [i]	serious [j]	not serious	serious [k]	none	44	40	-	MD **0.5 higher** (34.2 lower to 35.2 higher) [l]	⊕◯◯◯ VERY LOW	CRITICAL

Intervention A2: **Advice and regular counseling for promoting the introduction of textured foods, delivered by a research dietitian from 8 to 15 months of age, component C3**

Food texture acceptance of food textures (at ~15 months old). Global texture acceptance score-from 0 to 8 (highest food texture acceptance), measured in a laboratory setting.

1 [m]	randomized trial	serious [n]	not serious	not serious	very serious [k o]	none	30	30	-	MD **0.30 higher** (0.80 lower to 1.40 higher) [p]	⊕◯◯◯ VERY LOW	CRITICAL

E. Interventions aimed to prevent under-nutrition, including two or more components of RF

Intervention B1**: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**

Food acceptance at ~20 to 23 months old. Number of mouthfuls eaten, observation of a midday meal by a research assistant

3 [q]	randomized trials [r]	not serious	serious [s]	not serious	serious [k]	none	231	227	-	MD **1.98 higher** (0.84 lower to 4.8 higher) [t]	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at ~20 to 23 months old. Self-fed mouthfuls (%), observation of a midday meal by a research assistant

3 [q]	randomized trials [r]	not serious	not serious	not serious	not serious	none	231	227	-	MD **14.42 higher** (6.45 higher to 22.39 higher) [u]	⊕⊕⊕⊕ HIGH	CRITICAL

Food acceptance at ~20 to 23 months old. Child refusals (%), observation of a midday meal by a research assistant

3 [q]	randomized trials [r]	not serious	not serious	not serious	serious [k]	none	231	227	-	MD **0.69 lower** (1.28 lower to 0.09 lower) [v]	⊕⊕⊕◯ MODERATE	CRITICAL

F. **Interventions for obesity prevention, with two or more components of RF** (HICs: Norway, New Zealand, USA)

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Food acceptance at 12 months old. Enjoyment of Food scale, measured by the Child Eating Behavior Questionnaire (CEBQ), score from 1 to 5 (highest enjoyment of food)

1 [w]	randomized trial	not serious	not serious	not serious	serious [k]	none	269	264	-	MD **0.10 higher** (0.01 lower to 0.21 higher) [x]	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 24 months old. Enjoyment of Food scale (CEBQ) , score from 1 to 5 (highest enjoyment of food)

1 [y]	randomized trial	not serious	not serious	not serious	serious [k]	none	152	143	-	MD **0.04 lower** (0.16 lower to 0.08 higher) [z]	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 12 months old. Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [w]	randomized trial	not serious	not serious	not serious	serious [k]	none	269	264	-	MD **0.00 higher** (0.12 lower to 0.12 higher) [aa]	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance at 24 months old. Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [y]	randomized trial	not serious	not serious	not serious	serious [k]	none	152	143	-	MD **0.04 lower** (0.21 lower to 0.13 lower) [bb]	⊕⊕⊕◯ MODERATE	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group sessions, home visits, specific advice during well-child visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7 and others)**

Food acceptance at 12 months old, Enjoyment of Food scale, measured by the Child Eating Behavior Questionnaire (CEBQ), score from 1 to 5 (highest enjoyment of food)

1 [cc]	randomized trial	not serious	not serious	not serious	serious [k]	none	92	81	-	MD **0.22 higher** (0.04 higher to 0.40 higher) [dd]	⊕⊕⊕◯ MODERATE	CRITICAL

Food acceptance from 24 to 30 months old, Enjoyment of Food scale (CEBQ) , score from 1 to 5 (highest enjoyment of food)

3 [ee]	randomized trials	serious [ff]	not serious	not serious	serious [k]	none	422	435	-	MD **0.11 higher** (0.02 higher to 0.20 higher) [gg]	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 12 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [cc]	randomized trial	not serious	not serious	not serious	not serious [hh]	none	92	81	-	MD **0.31 lower** (0.50 lower to 0.12 lower) [ii]	⊕⊕⊕⊕ HIGH	CRITICAL

Food acceptance from 24 to 30 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

3 [ee]	randomized trials	serious [ff]	not serious	not serious	serious [k]	none	422	435	-	MD **0.16 lower** (0.26 lower to 0.07 lower) [jj]	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 3.7 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [kk]	randomized trial	serious [ll]	not serious	not serious	serious [k]	none	250	254	-	MD **0.10 lower** (0.24 lower to 0.04 higher) [mm]	⊕⊕◯◯ LOW	CRITICAL

Food acceptance at 3.7 months old, Food Fussiness scale (CEBQ), score from 1 to 5 (highest food fussiness)

1 [kk]	randomized trial	serious [ll]	not serious	not serious	serious [k]	none	213	211	-	MD **0.10 lower** (0.24 lower to 0.04 higher) [mm]	⊕⊕◯◯ LOW	CRITICAL

CI: confidence interval; **CEBQ:** Child Eating Behavior Questionnaire; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **RF COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

Explanations

[a] A total of two trials assessed the effect of the repeated exposure to vegetables during the introduction of solid foods (Hetherington 2015 and Fildes 2015). Only one individual RCT conducted in the UK (Hetherington 2015) assessed the effect on the food acceptance of vegetables that were offered as part of the intervention (carrot, green beans, spinach, and broccoli). The infants in the intervention group received guidance on a step-by-step exposure to vegetables in milk (days 1 to 12) then rice (days 13 to 24) from the beginning of complementary feeding. Plain milk and cereal were given to the infants in the **control group**. Then **both groups** received 11 daily exposures to vegetable purée.

[b] Risk of bias: Downgraded one level due to some concerns due to possible bias in randomization process, deviations from intended interventions and in the selection of the reported results.

[c] The confidence interval is precise but the study does not meet the optimal information size criteria. Downgraded one level.

[d] The mean amount of target vegetables consumed in the control group was 44.13 g.

[e] Two individual RCTs were included in the meta-analysis: Hetherington 2015 and Fildes 2015. In Fildes trial, conducted in three countries, the intervention group received advice from a researcher or health professional on weaning and solid food introduction. The messages emphasized: (1) the importance of introducing vegetables early in the weaning process, (2) the beneficial effects of offering different single vegetables each day, (3) the techniques of exposure feeding, (4) interpreting infants' facial reactions to food and (5) the need for persistence when an infant initially rejects a food. A leaflet reinforcing these messages was given to participants. Five vegetables were selected as the first foods to be introduced. Mothers were provided with a small number of commercially available vegetable purées to use, but were told that they could prepare their own foods if they preferred. They were asked to offer the five vegetables in an explicit sequence over 15 days. The control group received country-specific standard weaning advice (UK recommends to introduce fruits, vegetables and baby rice or cereal as first foods; in Greece, pediatricians provide parents with guidance on appropriate first foods, commonly baby rice, cereals or fruits). We excluded the subgroup of the third country, Portugal, because the guidelines for weaning were not prescriptive in that country and health professionals were advised to adapt international and national recommendations to the needs and circumstances of individual infants, making difficult to understand how much this control group differed from the intervention group. Novel vegetables were parsnip (Hetherington 2015) and artichoke (Fildes 2015).

[f] Risk of bias: Fildes: high risk of bias due to possible bias in the randomization process. Hetherington 2015: some concerns due to possible bias in the randomization process, deviations from intended interventions and in the selection of the reported results. Downgraded one level.

[g] The mean amount of novel vegetables consumed in the control group ranged between 23.6 and 49.0 g. In a sensitivity analysis, after excluding the trial with overall high risk of bias (Fildes et al), there was no change in direction of the primary analysis, the MD lost statistical significance: MD 17.0 [95% CI -11.46, 45.46]

[h] Fildes 2015 (UK sub-study and Greece sub-study), individual RCT.

[i] Risk of bias: Downgraded two levels because of high risk of bias in randomization process in a single study.

[j] Inconsistency: Downgraded one level due to high heterogeneity between sub-studies (I^2= 61%).

[k] Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no effect.

[l] The mean amount of novel fruits consumed in the control group ranged between 40.7 and 58.4 g. The study of Fildes et al is eliminated in the sensitivity analysis due to its overall high risk of bias.

[m] Tournier 2021 (France), individual RCT. Child mean age at the beginning of the study: 7.5 months old.

[n] Risk of bias: Downgraded one level because of some concerns due to possible bias in randomization process.

[o] The study does not meet the optimal information size criteria. Downgraded one level.

[p] The mean global texture acceptance score in the control group was 5.1 g.

[q] Aboud 2008, 2009 and 2011 (Bangladesh). Aboud 2011: Only one out of two intervention groups was included (Responsive complementary feeding and stimulation program); an intervention group which included nutrient supplementation was not included in this systematic review.

[r] The three studies are cluster-RCT. Comparators were similar. Both, intervention and control groups received the regular program. The regular program consisted in 12 sessions on child development, parenting and gentle discipline and 12 monthly information sessions on health and nutrition concerning complementary feeding.

[s] Inconsistency: Downgraded one level due to moderate heterogeneity (I^2=40%).

[t] The mean number of mouthfuls eaten in the control group ranged between 14.85 and 21.81.

[u] The mean proportion of self-fed mouthfuls in the control group ranged between 32.89 and 44.6%.

[v] The mean number of child refusals during the observed meal in the control group ranged between 2.92 and 4.12.

[w] Helle 2019 (Norway). Individual RCT. Intervention consisted of an **eHealth intervention** (a webpage with a monthly age-appropriate video addressing infant feeding topics together with corresponding cooking films/recipes), during 7 months (from 6 to 12 months old. Comparator arm was routine care.

[x] The mean score of enjoyment of food (CEBQ) in the control group was 3.99.

[y] Helle 2019. One year after the intervention.

[z] The mean score of enjoyment of food (CEBQ) in the control group was 3.89.

[aa] The mean score of food fussiness (CEBQ) in the control group was 1.87.

[bb] The mean score of food fussiness (CEBQ) in the control group was 2.47.

[cc] Fangupo 2016 (New Zealand). Individual RCT. In the Baby-Led Introduction to SolidS (BLISS) study the intervention group received **eight contacts/home visits** until the infants were 9-month-old, in addition to the standard midwifery and "Well-childcare" (a government program). During the visits, participants received education and support regarding breastfeeding and the BLISS complementary feeding (i.e. infant self-feeding from 6 months with modifications to address concerns about iron, choking, and growth). Six contents related with RF: recognition of hunger and satiety (C1), infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2), not pressuring child to eat; praising, encourage self-feeding (C4), flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9). Comparator arm was routine care.

[dd] The mean score of enjoyment of food (CEBQ) in the control group was 4.07.

[ee] Three individual RCTs: Daniels 2012 (USA, 2 modules of 6 group sessions at child health clinics delivered by a dietitian and a psychologist), Savage 2016 (USA, four nurses-conducted home visits + 2 research center visits + mail-delivered materials), Fangupo 2016 (New Zealand, 5 individual parent contacts and 3 home visits, BLISS complementary feeding, delivered by lactation consultants and trained research assistants), All the interventions included the following four contents related with RF: recognition of hunger and satiety (C1), infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2), not pressuring child to eat; praising, encourage self-feeding (C4) and pleasant and stimulating family eating environment (C7). Fangupo 2016 also included C9; Daniels: C3, C5, C6 and C9; and Savage C5, C6 and C8. Comparator arm was routine/standard care in all trials, and Savage trial also included child safety messages at the same time points.

[ff] Risk of bias: Daniels 2012: Some concerns due to missing outcome data. Savage 2016: Some concerns due to possible bias in randomization process. Downgraded one level

[gg] The mean score of enjoyment of food (CEBQ) in the control group ranged between 3.47 and 3.84.

[hh] Although it is a single study, we decided not to downgrade its certainty of evidence level because it is of low risk of bias and its sample size exceeded the optimal information size (n=68 each group).

[ii] The mean score of food fussiness (CEBQ) in the control group was 2.25.

[jj] The mean score of food fussiness (CEBQ) in the control group ranged between 2.61 and 2.89.

[kk] Daniels 2012 (USA, 2 modules of 6 group sessions at child health clinics delivered by a dietitian and a psychologist, 8 components of RF). Individual RCT. Comparator: routine care.

[ll] Risk of bias: Some concerns due to missing outcome data. Single study. Downgraded one level.

[mm] The mean score of food fussiness (CEBQ) in the control group was 2.9.

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding result in **healthier food preferences** (O2)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

D. Interventions focused on one component of responsive feeding

Food preferences - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

E. Interventions aimed to prevent under-nutrition, including two or more components of RF

Food preferences - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

F. Interventions for obesity prevention, which includes two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health interventions)**

Food preferences - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group sessions, individual contacts, home visits), including between 6 and 8 components of RF (C1, C2, C4, C5, C7, C9 + C3, C6 in one trial)**

Food preferences (at 24 months old). Perception of liking for vegetables, SMD

2 [a]	Randomized trials [b]	not serious	not serious	not serious	serious [c]	none	308	320		SMD **0.15 higher** (0.01 lower to 0.3 higher)[d e]	⊕⊕⊕◯ MODERATE	CRITICAL

Food preferences (at 3.7 years old). Perception of number of vegetables "liked" (% of listed vegetables "liked", out of 22 items)

1 [f]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	250	254		MD **2.2 higher** (1.96 lower to 6.36 higher)[h]	⊕⊕◯◯ LOW	CRITICAL

Food preferences (at 5 years old). Perception of number of vegetables "liked" (% of listed vegetables "liked" , out of 22 items)

1 [i]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	213	211		MD **1.3 higher** (3.13 lower to 5.73 higher)[j]	⊕⊕◯◯ LOW	CRITICAL

Food preferences (at 24 months old). Perception of liking for fruits, SMD

2 [a]	Randomized trials [b]	not serious	serious [k]	not serious	serious [c]	none	308	320		SMD **0.15 higher** (0.07 lower to 0.38 higher)[l m]	⊕⊕◯◯ Low	CRITICAL

Food preferences (at 3.7 years old). Perception of fruits "liked" (% of listed fruits "liked" out of 16 items)

1 [f]	Randomized trials	serious [g]	not serious	not serious	not serious	none	250	254		MD **7.0 higher** (3.4 higher to 10.6 higher)[n]	⊕⊕⊕◯ MODERATE	CRITICAL

Food preferences (at 5 years old). Perception of fruits "liked" (% of listed fruits "liked" out of 16 items)

1 [i]	Randomized trials	serious [g]	not serious	not serious	not serious	none	213	211		MD **5.2 higher** (1.6 higher to 8.8 higher)[o]	⊕⊕⊕◯ MODERATE	CRITICAL

Food preferences at 24 months old. Perception of liking for meat and fish, mean score on a response scale of 1 (dislikes a lot) to 5 (likes a lot)

1 [p]	Randomized trials	not serious	not serious	not serious	serious [c]	none	86	75		MD **0.10 higher** (0.07 lower to 0.27 higher)[q]	⊕⊕⊕◯ MODERATE	CRITICAL

Food preferences at 24 months old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 18 items)

1 [r]	Randomized trials	serious [g]	not serious	not serious	serious [c]	none	222	245		MD **2.5 lower** (5.27 lower to 0.27 higher)[s]	⊕⊕◯◯ LOW	CRITICAL

Food preferences at 3.7 years old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 17 items)

1 [f]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	250	254		MD **1.40 lower** (4.45 lower to 1.65 higher)[t]	⊕⊕◯◯ LOW	CRITICAL

Food preferences at 5 years old. Perception of number of energy-dense sweet and savory foods "liked" (% of listed sweet and savory foods "liked", out of 17 items)

1 [i]	Randomized trial	serious [g]	not serious	not serious	serious [c]	none	213	211		MD **0.20 lower** (3.25 lower to 2.85 higher)[u]	⊕⊕◯◯ LOW	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. COMPONENTS: C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Explanations

[a] Daniels 2012 (USA; it consisted of 2 modules of 6 **group sessions at child health clinics**; outcome was measured at follow up, 6 months after the second module of the intervention), Fangupo 2016 (New Zealand, it consisted of eight face-to-ace or telephone contacts and **home visits** until the infants were 9-month-old, in addition to the standard midwifery and "Well-childcare"; outcome was measured at follow up, 15 months after the intervention). During the visits, participants received education and support regarding breastfeeding and the BLISS complementary feeding (i.e., infant self-feeding from 6 months with modifications to address concerns about iron, choking, and growth). Both trials included contents with regard to several **elements of RF**: recognition of hunger and satiety (C1), infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2), not pressuring child to eat; praising, encourage self-feeding (C4), flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages (C5), pleasant and stimulating family eating environment (C7), and positive caregiver verbalization during feeding (C9). Daniels trial also included texture/ consistency responsive to child developmental needs (C3) and role modelling of healthy eating (C6).

[b] Two individual RCTs. Comparators were usual care.

[c] Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no effect.

[d] Original units: % of listed vegetables "liked" and mean score of perceived food preference on a response scale of 1 to 5. In the control group the mean percentage of listed vegetables "liked" out of 22 items was 54.3% (Daniels 2012) and the mean score of perceived food preferences for vegetables was 3.7 (Fangupo 2016).

[e] This SMD is equivalent to the following MD in the original units: a) 3.32% of listed vegetables liked (95%CI -0.22% to 6.64%), and b) 0.11 of the mean score of perceived food preferences for vegetables (95%CI -0.00 to 0.22).

[f] Daniels 2012 (outcome measured at follow up, 18-20 months after an 18-month intervention).

[g] Risk of bias: Some concerns due to missing outcome data. Single study. Downgraded one level.

[h] In the control group the mean percentage of vegetables liked at 3.7 years old was 52.2%.

[i] Daniels 2012 (outcome measured at follow up, ~3 years after the 18-month intervention).

[j] In the control group the mean percentage of vegetables liked at 5 years old was 52.6%.

[k] Inconsistency: Downgraded one level due to heterogeneity (I^2 = 42%). One trial (Fangupo 2016) presented no effect (0.00, 95% CI -0.31 to 0.31), but mean score in intervention and control groups was 4.8 from a maximum of 5. The other study (Daniels 2012) showed an increase in the perception of fruit liking (0.24, 95%CI 0.06 to 0.42), both expressed as SMD. Heterogeneity may be partially explained by heterogeneity in follow-up time.

[l] Original units: % of listed fruits "liked" and mean score of perceived food preference on a response scale of 1 to 5. In the control group, the mean percentage of listed fruits "liked" out of 17 items was 70.1% (Daniels 2012). The mean score of perceived food preferences for fruits was 4.8 (Fangupo 2016).

[m] This SMD is equivalent to the following MD in the original units a) 4.58% of listed fruits liked (95%CI -1.34% to 7.25%), and b) 0.09 of the mean score of perceived food preferences for fruits (95%CI -0.03 to 0.14).

[n] In the control group the mean percentage of fruits liked at 3.7 years old was 68.9%.

[o] In the control group the mean percentage of fruits liked at 5 years old was 68.1%.

[p] Fangupo 2016 (New Zealand). Individual RCT. Outcome was measured at follow up, 15 months after the intervention

[q] In the control group the mean score of perceived food preferences for meat and fish was 4.2.

[r] Daniels 2012. Outcome was measured at follow up, 6 months after the second module of the intervention.

[s] In the control group the mean percentage of listed sweet and savory foods "liked" was 69% (Daniels 2012).

[t] In the control group the mean percentage of listed sweet and savory foods "liked" at 3.7 years old was 78.2%.

[u] In the control group the mean percentage of listed sweet and savory foods "liked" at 5 years old was 79.4%.

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **healthy food intake** (O3)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

D. Interventions focused on one component of responsive feeding

Healthy food Intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

E. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 6-7 components of RF (C1, C3, C4, C5, C7, C9 and in some studies C10)**

Dietary diversity score, between 17 and 21 months old (# of food groups consumed out of 7 critical food groups during the previous day)

3 [a]	Randomized trials	not serious	not serious	not serious	serious [b]	none	312	313		MD **0.25 higher** (0.04 higher to 0.45 higher) [c]	⊕⊕⊕◯ MODERATE	CRITICAL

Vegetable intake, at 9 months old, consumption during the previous week (dichotomous outcome, spinach)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	18/122 (14.8%)	7/135 (5.2%)	(

Vegetable intake, at 15 months old, consumption during the previous week (dichotomous outcome, spinach)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	51/112 (45.5%)	34/129 (26.4%)	(

Vegetable intake, between 20 and 23 months old, times/day

2 [f]	Randomized trials	serious [g]	serious [h]	not serious	serious [b]	none	165	149		MD **0.09 higher** (0.88 lower to 1.06 higher) [i]	⊕◯◯◯ VERY LOW	CRITICAL

Fruit intake, at 9 months old, consumption during the previous week (dichotomous outcome, banana)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	72/122 (59.0%)	52/135 (38.5%)	**RR 1.53** (1.18 to 1.99)	**204 more per 1,000** (from 69 more to 381 more)	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit intake, at 15 months old, consumption during the previous week (dichotomous outcome, banana)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	88/112 (78.6%)	80/129 (62.0%)	**RR 1.27** (1.07 to 1.50)

Fruit intake, between 20 and 23 months old, times/day

2 [e]	Randomized trials	serious [g]	not serious	not serious	not serious	none	165	149		MD **0.23 higher** (0.12 higher to 0.35 higher) [i]	⊕⊕⊕◯ MODERATE	CRITICAL

Egg intake, at 9 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	63/122 (51.6%)	24/135 (17.8%)	

Egg intake, at 15 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	not serious	none	87/112 (77.7%)	70/129 (54.3%)	(

Meat (goat) intake, at 9 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	serious [b]	none	14/122 (11.5%)	6/135 (4.44%)	

Meat (goat) intake, at 15 months old, consumption during the previous week (dichotomous outcome)

1 [d]	Randomized trials	serious [e]	not serious	not serious	serious [b]	none	49/112 (43.8%)	42/129 (32.6%)	(

Egg intake, at 20 to 23 months old, times/day

2 [f]	Randomized trials	serious [g]	not serious [k]	not serious	serious [b]	none	165	149		MD **0.13 higher** (0.00 lower to 0.25 higher)[l]	⊕⊕◯◯ LOW	CRITICAL

Fish intake, at 20 to 23 months old, times/day

2 [f]	Randomized trials	serious [g]	not serious	not serious	serious [b]	none	165	149		MD **0.06 lower** (0.30 lower to 0.17 higher)[m]	⊕⊕◯◯ LOW	CRITICAL

F. Interventions for obesity prevention, including two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Fruit and vegetable consumption at 12 months old, times/day

1 [n]	randomized trial	not serious	not serious	not serious	serious [b]	none	269	264	-	MD **0.51 higher** (0.07 higher to 0.95 higher) [o]	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit and vegetable consumption at 24 months old, times/day

1 [p]	randomized trial	not serious	not serious	not serious	serious [b]	none	152	143	-	MD **0.21 higher** (0.32 lower to 0.74 higher) [q]	⊕⊕⊕◯ MODERATE	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 5 and 8 components of RF (C1, C4, C7, and others)**

Vegetable Intake, at 9 to 12 months old, SMD

3 [r]	Randomized trials	Serious [s]	not serious	not serious	serious [b]	none	268	274	

Vegetable Intake, at 20 to 24 months old, SMD

3 [w]	Randomized trials	serious [x]	not serious	not serious	serious [b]	none	491	511	

Vegetable Intake, at 3.5 to 3.7 years old, SMD

2 [aa]	Randomized trials	not serious	serious [bb]	not serious	serious [b]	none	349	372		SMD **0.07 higher** (0.17 lower to 0.31 higher) [cc dd]	⊕⊕◯◯ LOW	CRITICAL

Vegetable Intake, at 5 years old, SMD

2 [ee]	Randomized trials	not serious	not serious	not serious	serious [b]	none	353	370		SMD **0.08 higher** (0.06 lower to 0.23 higher) [ff gg]	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit Intake, at 9 to 12 months old, SMD

3 [r]	Randomized trials	serious [s]	not serious	not serious	serious [b]	none	268	274		SMD **0.15 higher** (0.06 lower to 0.35 higher) [hh ii]	⊕⊕◯◯ LOW	CRITICAL

Fruit Intake, at 20 to 24 months old, SMD

3 [w]	Randomized trials	serious [x]	not serious	not serious	serious [b]	none	491	511		SMD **0.09 higher** (0.03 lower to 0.22 higher) [jj kk]	⊕⊕◯◯ LOW	CRITICAL

Fruit Intake, at 3.5 to 3.7 years old, SMD

2[aa]	Randomized trials	not serious	not serious	not serious	serious [b]	none	349	372		SMD **0.17 higher** (0.02 higher to 0.32 higher)[ll mm]	⊕⊕⊕◯ MODERATE	CRITICAL

Fruit Intake, at 5 years old, SMD

2[ee]	Randomized trials	not serious	not serious	not serious	serious [b]	none	353	370		SMD **0.05 higher** (0.09 lower to 0.20 higher)[nn oo]	⊕⊕⊕◯ MODERATE	CRITICAL

Meat, poultry, fish intake, at 12 months old, g/day

2 [pp]	randomized trials	not serious	not serious	not serious	serious [b]	none	422	435	-	SMD **0.00 higher** (0.25 lower to 0.25 higher) [qq]	⊕⊕⊕◯ MODERATE	CRITICAL

Water Intake, at 9 to 12 months old, ml/day

3 [rr]	Randomized trial	not serious	not serious	not serious	serious [b]	none	268	274	

Water Intake, at 20 to 24 months old, ml/day

3 [tt]	Randomized trial	not serious	not serious	not serious	serious [b]	none	491	511	

Water Intake, at 3.6 years old, ml/day

2[vv]	Randomized trial	not serious	not serious	not serious	serious [b]	none	349	372		MD **111.3 higher** (17.0 higher to 205.6 higher)[ww]	⊕⊕⊕◯ MODERATE	CRITICAL

Water Intake, at 5 years old, ml/day

2[xx]	Randomized trial	not serious	not serious	not serious	serious [b]	none	353	370		MD **52.6 higher** (42.8 lower to 148.0 higher)[yy]	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

Explanations

a Three cluster RCT: Aboud 2009, Aboud 2011, Aboud 2013 (Bangladesh; intervention was based on stimulation and responsive feeding and consisted of village group sessions/ home visits delivered by trained village women/family welfare assistants; outcome measured during the follow up 5 months after the intervention). Aboud 2011: Only one out of two intervention groups was included (Responsive complementary feeding and stimulation program). An intervention group which included nutrient supplementation was not included in this systematic review. Aboud 2013: there were two sub-studies according to the age at the beginning of the study and both were included. Interventions in all trials included contents about the same elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9), and feeding during and after illness (C10).

b Imprecision: downgraded one level due to wide confidence intervals compatible both with benefit or no.

c The mean dietary diversity score in the control group ranged between 2.93 and 3.27 (Scale: from 0 to 7).

d Vazir 2013, cluster RCT conducted in India. The outcome, consumption of banana at least once during the last week, was measured 6 month after the beginning of the intervention. Intervention was based on stimulation and responsive feeding, and consisted in bi-weekly visits delivered by trained village women. Contents included the following elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor

preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7) and positive caregiver verbalization during feeding (C9).

e Risk of Bias: Some concerns due to missing outcome data. It is only study, Downgraded one level.

[f] Two cluster RCT: Aboud 2008 and 2009. Both trials were conducted in Bangladesh, outcome was measured at follow up, 5 months after the intervention. Intervention was based on stimulation and responsive feeding, and consisted in group sessions delivered by mothers of the village who were trained as peer educators. Contents included the following elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9), and feeding during and after illness (C10).

g Risk of Bias: Some concerns due to possible deviations from intended interventions in both trials. Downgraded one level.

h Inconsistency: Downgraded one level due to heterogeneity (I^2=91%). Both trials differ slightly with regard to the population. While population in both trials were classified as poor and very poor, family assets and mothers' education in Aboud 2009 were lower than in Aboud 2008. Also, consumption of vegetables during the previous day was more frequent both in control and intervention groups in Aboud 2009 than in Aboud 2008 trial.

i The mean vegetable intake in the control group was between 0.8 and 2.33 times/day.

j The mean fruit intake in the control group was between 0.03 and 0.32 times/day.

k Inconsistency: Both trials differ slightly with regard to the population. While population in both trials were classified as poor and very poor, family assets and mothers' education in Aboud 2009 were lower than in Aboud 2008. Heterogeneity was moderate (I^2=43%), but we decided not to downgrade because both trials reported estimations in the same direction.

l The mean egg consumption in the control group was between 0.09 and 0.15 times/day.

m The mean fish consumption in the control group was between 1.01 and 1.2 times/day.

[n] Helle 2019 (Norway). Individual RCT. Intervention consisted of an **eHealth intervention** (a webpage with a monthly age-appropriate video addressing infant feeding topics together with corresponding cooking films/recipes), during 7 months (from 6 to 12 months old. Comparator arm was routine care.

[o] In the control group fruit and vegetable consumption was 5.93 times/day.

[p] Helle 2019. One year after the intervention.

[q] In the control group fruit and vegetable consumption was 6.3 times/day.

r Campbell 2013 (Australia, group sessions, delivered by dietitians; measured during the first third of the 15-month intervention), French 2012 (USA, urban, low-resource setting, specific advice at each well visit at pediatric clinics; measured during the last session of the 12-month intervention), Savage 2016 (USA, nurses-conducted home and research center visits; outcome measured ~2 months after the last home visit, held during the first ten months postpartum). One individual RCT (Savage 2016) and 2 cluster RCTs (Campbell 2013 and French 2012). Original units: g/day, servings/day and times/day.

s Risk of Bias: Downgraded one level due to RoB-2 overall judgement was classified as some concerns or high risk in some of the studies. Risk of bias: French 2012: High risk due to possible bias in randomization process, deviations from intended interventions and missing outcome data. Savage 2016: Some concerns due to possible bias in randomization process. Campbell 2013: Low risk of bias.

t The mean vegetable intake in the control group in original units was 103.5 g/day, 1.03 servings/day and 2.8 times/day.

u This SMD is equivalent to the following MD in the original units: a) 3.0 g/day (95%CI –11.37 to 17.43), b) 0.03 servings/day (95%CI -0.12 to 0.19), and c) 0.06 times/day (95%CI -0.21 to 0.32). One additional RCTs testing the same question was identified but was not poolable: Messito 2020. Messito et al reported little or no difference in daily vegetable consumption between the intervention and the control group at 10 months of age (66.3% vs. 67.1%, RR 0.99, 95% CI 0.86 to 1.13; participants = 412). Risk of bias: low risk of bias.

[v] Results did not differ by subgroups (HICs vs. HICs low resource setting; test for subgroup difference: I^2 10.1%). In a sensitivity analysis, after excluding the study with overall high risk of bias, the SMD was -0.02 [95% CI -0.27, 0.22].

w Black 2021 (USA, measured at 6 months from baseline). Campbell 2013 (Australia, measured ~ 1 month after the 15-month intervention), Daniels 2012 (Australia, measured at 6 months after the second module of the intervention). Two individual RCTs (Black 2021 and Daniels 2012) and 1 cluster RCT (Campbell 2013). Original units: g/day, g/kg of body weight, and Total fruit score from HEI-2015.

x Risk of Bias: Downgraded one level due to RoB-2 overall judgement was classified as some concerns in some of the studies. Risk of bias: Black 2021: Some concerns due to possible bias in randomization process and deviations from intended interventions. Daniels 2012: Some concerns due to missing outcome data. Campbell 2013: Low risk of bias.

y The mean vegetable intake in the control group in original units was 80.8 g/day, 7.7 g/kg of body weight, and 2.62 points of the HEI-2015 total vegetable score (Scale: from 0 to 5).

z This SMD is equivalent to the following MD in the original units: a) -0.55 g/day (95%CI -8.31 to 7.02), b) -0.07 g/kg of body weight, (95%CI -1.15 to 0.96), and c) -0.02 points of the HEI-2015 total vegetable score (95%CI -0.34 to 0.29). Subgroups analyses: results in both subgroups differed. In the subgroup of HICs (Campbell 2013): SMD 0.08 [95% CI -0.15, 0.32]. In the subgroup of HICs- low resource setting (Black 2021): SMD -0.20 [95% CI -0.49, 0.09]; test for subgroup difference: I^2 55.1%.

aa Campbell 2013 (Follow up, ~ 24 months after the 15-month intervention), Daniels 2012 (Follow up, 18-20 months after a 18-month intervention). Original units: g/day, g/kg of body weight.

bb Inconsistency: Downgraded one level due to heterogeneity (I^2 = 54%).

cc The mean vegetable intake in the control group in original units was 80.4 g/day and 6.8 g/kg of body weight.

dd This SMD is equivalent to the following MD in the original units: a) 5.02 g/day (95%CI -12.19 to 22.23), and b) 0.58 g/kg of body weight (95%CI -1.40 to 2.55).

ee Campbell 2013 (Follow up ~ 3.5 years after the 15-month intervention), Daniels 2012 (Follow up, ~3 years after the 18-month intervention). Original units: g/day, g/kg of body weight.

ff The mean vegetable intake in the control group in original units was 116.1 g/day and 5.9 g/kg of body weight.

gg This SMD is equivalent to the following MD in the original units: a) 6.81 g/day (95%CI -5.11 to 19.57), and b) 0.66 g/kg of body weight (95%CI -0.49 to 1.89).

hh The mean fruit intake in the control group in original units was 101 g/day1, 0.94 servings/day and 2.5 times/day.

ii This SMD is equivalent to the following MD in the original units: a) 10.78 g/day (95%CI -4.31 to 25.14), b) 0.12 servings/day (95%CI -0.05 to 0.29), and c) 0.21 times/day (95%CI -0.08 to 0.49). On the other hand, other trial (Messito 2020) reported little or no difference in daily fruit consumption between the intervention and the control group at 10 months of age (RR 0.99, 95% CI 0.90 to 1.08; participants = 412, low risk of bias). After subgroups analyses, results in both subgroups differed. In subgroup of HICs, there was no change in direction of the primary analysis, the SMD was lower and lost statistical significance: SMD 0.07 [95% CI -0.13, 0.26]. In subgroup HICs- low resource settings (French 2012), the effect seems to be greater and with statistical significance, SMD 0.39 [95% CI 0.03, 0.75] (Test for subgroup difference: I2 49.9%). In a sensitivity analysis, after excluding one study with overall high risk of bias (French 2012), there was no change in direction of the primary analysis, the SMD was lower and without statistical significance: MD 0.07 [95% CI -0.13, 0.26].

jj The mean fruit intake in the control group in original units was 152.9 g/day, 11.3 g/kg of body weight, and 3.92 points of the HEI-2015 total fruit score (Scale: from 0 to 5).

kk This SMD is equivalent to the following MD in the original units: a) 7.79 g/day (95%CI -2.60 to 19.05), b) 0.81 g/kg of body weight (95%CI -0.27 to 1.99), and c) 0.29 points of the HEI-2015 total fruit score (95%CI -0.10 to 0.71). Results in did not differ by subgroups (HICs and HICs- low resource settings); test for subgroup difference: I2 0%.

ll The mean fruit intake in the control group in original units was 190.8 g/day and 10.6 g/kg of body weight.

mm This SMD is equivalent to the following MD in the original units: a) 19.60 g/day (95%CI 2.31 to 36.9), and b) 1.68 g/kg of body weight (95%CI 0.20 to 3.16).

nn The mean fruit intake in the control group in original units was 210.4 g/day and 10.4 g/kg of body weight

oo This SMD is equivalent to the following MD in the original units: a) 5.91 g/day (95%CI -10.64 to 23.65), and b) 0.49 g/kg of body weight (95%CI -0.89 to 1.97).

pp Two individual RCTs: Savage 2016 (USA, four nurses-conducted home visits + 2 research center visits + mail-delivered materials), Fangupo 2016 (New Zealand, 5 individual parent contacts and 3 home visits, BLISS complementary feeding, delivered by lactation consultants and trained research assistants), Both interventions included the following four contents related with RF: recognition of hunger and satiety (C1), infant readiness for introduction of complementary foods, taking into account the child's developmental readiness (C2), not pressuring child to eat; praising, encourage self-feeding (C4) and pleasant and stimulating family eating environment (C7). Fangupo 2016 also included C9; and Savage C5, C6 and C8. Comparator arm was routine/standard care in all trials, and Savage trial also included child safety messages at the same time points.

qq In the control group the mean intake of meat, poultry and fish in original units was 19.3 g/day and 0.8 times/day.

rr Cluster RCT. Campbell 2013 (Australia, group sessions, delivered by dietitians; measured during the first third of the 15-month intervention)

ss The mean water intake in the control group was 112.2 ml/day.

tt Cluster RCT. Campbell 2013 (Australia, measured ~ 1 month after the 15-month intervention)

uu The mean water intake in the control group was 338.7 ml/day.

vv Cluster RCT. Campbell 2013 (Follow up, ~ 24 months after the 15-month intervention)

ww The mean water intake in the control group was 475.6 ml/day.

xx Cluster RCT. Campbell 2013 (Follow up ~ 3.5 years after the 15-month intervention)

yy The mean water intake in the control group was 544 ml/day.

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding reduce **unhealthy food consumption** (O4)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		
D. Interventions focused on one component of responsive feeding												
Unhealthy food Intake - not reported												
-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL
E. Interventions aimed to prevent under-nutrition, including two or more components of RF												
***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**												
Sweet snacks/sugar-dense foods between 20 and 23 months old, times/day												
2 [a]	Randomized trials	serious [b]	serious [c]	not serious	serious [d]	none	165	149		MD **0.11 lower** (0.50 lower to 0.28 higher)[e]	⊕◯◯◯ VERY LOW	CRITICAL
F. Interventions for obesity prevention, which includes two or more components of RF												
***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**												
Sweet and salty snacks + sweetened beverages, consumption at 12 months old, times/day												
1 [f]	randomized trial	not serious	not serious	not serious	serious [g]	none	269	264	-	MD **0.02 lower** (0.06 lower to 0.02 higher) [h]	⊕⊕⊕⊕ HIGH	CRITICAL
Sweet and salty snacks, consumption at 24 months old, >3.5 times/week vs less frequent												
1 [i]	randomized trial	not serious	not serious	not serious	serious [d]	none	101/165 (61.2%)	105/153 (68.6%)	**RR 0.89** (0.76 to 1.05)	**75 less per 1,000** (from 165 less to 34 more)	⊕⊕⊕◯ MODERATE	CRITICAL
Sweetened beverages, consumption at 24 months old, >2 times/week vs less frequent												
1 [i]	randomized trial	not serious	not serious	not serious	serious [d]	none	88/166 (53.0%)	70/155 (45.2%)	**RR 1.17** (0.94 to 1.47)	**77 more per 1,000** (from 27 less to 212 more)	⊕⊕⊕◯ MODERATE	CRITICAL
***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 5 and 8 components of RF (C1, C4, C7 and others)**												
Sugar-sweetened beverages (SSBs) intake, at 6 months, ml/day												
1[j]	Randomized trial	not serious	not serious	not serious	serious[k]	none	55	42		MD **5.07 lower** (10.53 lower to 0.39 higher)[l]	⊕⊕⊕◯ MODERATE	CRITICAL
SSB intake at 9 months old, ml/day												
2[m]	Randomized trials	not serious	serious[n]	not serious	serious[o]	none	219	206		MD **7.45 lower** (14.21 lower to 0.68 lower)[p q]	⊕⊕◯◯ LOW	CRITICAL
SSB intake between 12 and 24 months old, SMD												
4[r]	Randomized trials	serious[s]	serious[t]	not serious	serious [o]	none	509	529		SMD **0.34 lower** (0.78 lower to 0.09 higher)[u v]	⊕⊕◯◯ LOW	CRITICAL
SSB intake between 3.6 to 3.7 years old, SMD												
2[w]	Randomized trials	not serious	not serious	not serious	serious [o]	none	338	357		SMD **0** (0.15 lower to 0.15 higher)[x y]	⊕⊕⊕◯ MODERATE	CRITICAL
SSB intake at 5 years old, SMD												
2[z]	Randomized trials	not serious	not serious	not serious	serious [o]	none	342	355		SMD **0.08 lower** (0.26 lower to 0.11 higher)[aa bb]	⊕⊕⊕◯ MODERATE	CRITICAL

Sweet snacks/sugar-dense food intake between 9 and 16 month old, SMD												
2[cc]	Randomized trials	not serious	not serious	not serious	serious [o]	none	318	362		SMD **0.14 lower** (0.29 lower to 0.01 higher)[dd ee]	⊕⊕⊕◯ MODERATE	CRITICAL
Sweet snacks/sugar-dense food between at 20 months old, SMD												
1 [ff]	Randomized trials	not serious	not serious	not serious	serious [o]	none	139	139		SMD **0.25 lower** (0.48 lower to 0.01 lower)[gg]	⊕⊕⊕◯ MODERATE	CRITICAL
Sweet snacks/sugar-dense food intake between 3.6 to 3.7 years old, SMD												
2 [cc]	Randomized trials	not serious	serious [hh]	not serious	serious [o]	none	238	286		SMD **0.22 lower** (0.45 lower to 0.01 higher)[ii jj]	⊕⊕◯◯ LOW	CRITICAL
Sweet snacks/sugar-dense food intake between 5 and 8 years old, SMD												
2 [cc]	Randomized trials	not serious	not serious	not serious	serious [o]	none	223	263		SMD **0.22 lower** (0.40 lower to 0.04 lower)[kk ll]	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness.

.Explanations

[a] Two cluster RCT: Aboud 2008 and 2009. Both trials were conducted in Bangladesh, outcome was measured at follow up, 5 months after the intervention. Intervention was based on stimulation and responsive feeding, and consisted in group sessions delivered by mothers of the village who were trained as peer educators. Contents included the following elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9), and feeding during and after illness (C10).

b Risk of Bias: Some concerns due to possible deviations from intended interventions in both trials. Downgraded one level.

c Inconsistency: Downgraded one level due to heterogeneity (I^2=60%). Both trials differ slightly with regard to the population. While population in both trials were classified as poor and very poor, family assets and mothers' education in Aboud 2009 were lower than in Aboud 2008.

[d] Imprecision: downgraded one level due to wide confidence intervals compatible both with benefit or no.

e The mean intake in the control group was between 1.45 and 1.52 times/day.

[f] Helle 2019 (Norway). Individual RCT. Intervention consisted of an **eHealth intervention** (a webpage with a monthly age-appropriate video addressing infant feeding topics together with corresponding cooking films/recipes), during 7 months (from 6 to 12 months old. Comparator arm was routine care.

[g] Although it is a single study, we decided not to downgrade its certainty of evidence level because it is of low risk of bias and its sample size exceeded the optimal information size.

[h] In the control group mean intake was 0.24 times/day.

[i] Helle 2019. One year after the intervention.

j Rosenstock 2021 (US, Native American, low-resource setting). Individual RCT.

k Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no. Single study

l The mean SSB intake in the control group was 5.41 ml/day. Other trial conducted in The Netherlands (Vlasblom 2020) reported a dichotomous outcome (any consumption of SSBs at 6 months old: RR: 0.90, 95% CI 0.80 to 1.00)

m Rosenstock 2021 (US, Native American, low-resource setting), Campbell 2013 (Australia). One individual RCT and one Cluster RCT.

n Inconsistency: Downgraded one level due to heterogeneity. I^2=61%. Heterogeneity may be partially explained by population heterogeneity (see subgroup analysis HIC vs HICs-low resource settings). Estimations from both trials are in the same direction.

o Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no.

p The mean SSB intake in the control group was between 6.6 and 14.53 ml/day.

q Subgroup analysis: For HICs low resource settings the MD was -11.49 (95% CI -18.62, -4.36) and for HICs (MD: -4.50, 95% CI -9.14, 0.14 (Test for subgroup difference: I^2 61.4%).

r Rosenstock 2021 (US, Native American, low-resource setting), French 2012 (US, low-resource setting), Campbell 2013 (Australia), Daniels 2012 (Australia). Original units: ml/day, % total energy intake. Two individual RCTs and two cluster RCTs.

s Risk of Bias: Downgraded one level because of high risk of bias due to possible bias in randomization process, deviations from intended interventions and missing outcome data in one of the trials (French et al).

t Inconsistency: Downgraded one level due to substantial heterogeneity (I^2 = 91%) which could be partially explained by population heterogeneity (see subgroup analysis HIC vs HICs-low resource settings).

u The mean SSB intake in the control group was between 25.4 and 425.0 ml/day and 2.4% of total energy intake.

v This SMD is equivalent to the following MD in the original units: a) 21.5 ml/day (95%CI -49.3 to 5.7), and b) 2.73% of total energy intake (95%CI -6.26 to 0.72). In addition, one trial (Vlasblom 2020) reported a dichotomous outcome at the age of 14 months, the consumption of SSBs ≥ 3 times per weekday (RR 0.95, 95% CI 0.82 to 1.09; participants = 1138; studies =1) and ≥ 3 times per weekend day (RR 0.99, 95% CI 0.87 to 1.14; participants = 1138; studies =1); risk of bias: some concerns due to possible bias in randomization process. Other trial (Morandi 2019) reported the consumption of SSBs at 24 months as a dichotomous outcome (RR 1.11, 95% CI 0.95 to 1.28); risk of bias: high risk due to bias in randomization process, measurement of the outcome and some concerns in deviations from intended interventions. In a sensitivity analysis, after excluding one study with overall high risk of bias (French et al), there was no change in direction of the primary analysis, the SMD was lower and remained without statistical significance: SMD 0.30 [95% CI -0.82, 0.23]. For HICs low resource settings the SMD was -0.76 (95% CI -1.26, -0.26) and for HICs (SMD: 0.04, 95% CI -0.10, 0.18; (Test for subgroup difference: I^2 88.9%).

w Campbell 2013 (Australia), Daniels 2012 (Australia). Original units: ml/day, % total energy intake.

x The mean SSB intake in the control group was 80.5 ml/day 1 and 2.2% of total energy intake2.

y This SMD is equivalent to the following MD in the original units: a) 0 ml/day (95%CI -21.2 to 21.2), and b) 0% of total energy intake (95%CI –1.2 to 1.2).

z Campbell 2013, Daniels 2012. Original units: ml/day, % total energy intake. One individual RCT and one Cluster RCT.

aa The mean SSB intake in the control group was 96.7 ml/day and 2.1% of total energy intake.

bb This SMD is equivalent to the following MD in the original units: a) 11.2 ml/day (95%CI -36.4 to 16.4), and b) 0.64% of total energy intake (95%CI -2.08 to 0.88).

cc Louzada 2012 (Brazil, home visits during the first year of life), Campbell 2013 (Australia). One individual RCT and one Cluster RCT.

dd The mean intake in the control group was between 14.39 and 17.78 kcal/day and 2.1 g/day.

ee Subgroup analysis: For HIC the SMD was -0.12 (95% CI -0.34, 0.10) and for LMIC (SMD: -0.15, 95% CI -0.40, 0.09). There were no differences by subgroup of country income (Test for subgroup difference: I^2 0 %).

ff Campbell 2013 (Australia), Original units: g/day. Cluster RCT.

gg The mean intake in the control group was 14.7 g/day.

hh Inconsistency: Downgraded one level due to moderate heterogeneity (I^2 = 44%).

ii The mean intake in the control group was 28.6 g/day and between 106.69 and 119.48 kcal/day.

jj Subgroup analysis: For HIC the SMD was -0.27 (95% CI -0.57, 0.02) and for LMIC (SMD: -0.19, 95% CI -0.59, 0.21). There were no differences by subgroup of country income (Test for subgroup difference: I^2 0 %).

kk The mean intake in the control group was 34.1 g/day and between 91.9 and 88.7 kcal/day.

ll Subgroup analysis: For HIC the SMD was -0.26 (95% CI -0.55, 0.03) and for LMIC (SMD: -0.19, 95% CI -0.42, 0.03). There were no differences by subgroup of country income (Test for subgroup difference: I^2 0 %).

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **energy and nutrient intakes** (O5)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

C. Interventions focused on one component of responsive feeding

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

D. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, C10)**

Energy intake (kcal/day) at 9 months old

1[a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **122 higher** (76.7 higher to 167.3 higher)[c]	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (kcal/day) at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **100 higher** (86.7 higher to 113.3 higher)[e]	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **3.3 higher** (2.19 higher to 4.41 higher)[f]	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **4.6 higher** (4.12 higher to 5.08 higher)[g]	⊕⊕⊕◯ MODERATE	CRITICAL

Iron intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	serious [h]	none	122	135		MD **0.20 higher** (0.04 higher to 0.36 higher)[i]	⊕⊕◯◯ LOW	CRITICAL

Iron intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **0.30 higher** (0.25 higher to 0.35 higher)[i]	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **0.40 higher** (0.29 higher to 0.51 higher)[k]	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	not serious	none	112	129		MD **0.29 higher** (0.27 higher to 0.31 higher)[l]	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 9 months old

1 [a]	Randomized trial	serious [b]	not serious	not serious	not serious	none	122	135		MD **50 higher** (17.7 higher to 82.3 higher)[m]	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 15 months old

1[d]	Randomized trial	serious [b]	not serious	not serious	serious [h]	none	112	129		MD **21 higher** (1.20 higher to40.8 higher)[n]	⊕⊕◯◯ LOW	CRITICAL

C. Interventions for obesity prevention, which includes two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 6 and 7 components of RF (C1, C5, C7, C9 and others)**

Energy intake (kcal/day) at <12 months old

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **28.7 higher** (6.7 lower to 64.1 higher)[q]	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (kcal/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70		MD **26.5 higher** (33.1 lower to 86.2 higher)[s]	⊕⊕⊕◯ MODERATE	CRITICAL

Energy intake (SMD) at 24 months

2[t]	Randomized trials	serious [u]	not serious	not serious	serious [v]	none	77	76		SMD **0.13 lower** (0.46 lower to 0.2 higher)[w x]	⊕⊕◯◯ LOW	CRITICAL

Protein intake (g/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **1.4 higher** (0.16 lower to 2.96 higher)[y]	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70	-	MD **0.9 higher** (2.08 lower to 3.88 higher)[z]	⊕⊕⊕◯ MODERATE	CRITICAL

Protein intake (g/day), at 24 months old

1[aa]	Randomized trial	not serious	not serious	not serious	serious [p]	none	57	56	-	MD **0.3 higher** (1.86 lower to 2.46 higher)[bb]	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at <12 months old

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.50 higher** (1.16 lower to 2.16 higher)[cc]	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	74	70		MD **0.20 lower** (1.86 lower to 1.46 higher)[dd]	⊕⊕⊕◯ MODERATE	CRITICAL

Total fat intake (% energy) at 24 months

2 [t]	Randomized trials	serious [u]	not serious	not serious	serious [v]	none	77	76		MD **0.21 lower** (-1.51 lower to 1.09 higher)[ee ff]	⊕⊕◯◯ LOW	CRITICAL

Iron intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.20 higher** (0.87 lower to 1.27 higher)[gg]	⊕⊕⊕◯ MODERATE	CRITICAL

Iron intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **0.00 higher** (1.40 lower to 1.40 higher)[hh]	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **0.13 higher** (0.07 lower to 0.33 higher)[ii]	⊕⊕⊕◯ MODERATE	CRITICAL

Zinc intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **0.30 higher** (0.10 lower to 0.70 higher)[jj]	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day) at <12 months

1[o]	Randomized trial	not serious	not serious	not serious	serious [p]	none	85	77		MD **19.0 higher** (28.5 lower to 66.4 higher)[kk]	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day) at 12 months old

1[r]	Randomized trial	not serious	not serious	not serious	serious [p]	none	75	68	-	MD **6 higher** (70.5 lower to 82.5 higher)[ll]	⊕⊕⊕◯ MODERATE	CRITICAL

Calcium intake (mg/day), at 24 months old

1[aa]	Randomized trial	not serious	not serious	not serious	serious [p]	none	57	56	-	MD **9.00 lower** (91.4 lower to 73.4 higher)[mm]	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

Explanations

[a] Vazir 2013 (India, rural), outcome measured halfway through the 12-month intervention. Cluster RCT.

[b] Risk of bias: Some concerns due to missing outcome data and single study. Downgraded on level.

c The mean energy intake (kcal/day) in the control group was 209. (We used the median and IQR as proxy of the mean and SD)

[d] Vazir 2013, measured right after the completion of the 12-month intervention.

e The mean energy intake (kcal/day) in the control group 460. We used the median and IQR as proxy of the mean and SD

f The mean protein intake in the control group was 5 g/day. (We used the median and IQR as proxy of the mean and SD)

g The mean protein intake (g/day) in the control group was 8. (We used the median and IQR as proxy of the mean and SD)

[h] Imprecision: downgraded one level due to wide confidence intervals compatible both with benefit or no.

i The mean iron intake in the control group was 0.6 mg/day. (We used the median and IQR as proxy of the mean and SD)

j The mean iron intake in the control group was 1.29 mg/day. (We used the median and IQR as proxy of the mean and SD)

k The mean zinc intake in the control group was 0.40 mg/day. (We used the median and IQR as proxy of the mean and SD)

l The mean zinc intake in the control group was 0.76 mg/day. (We used the median and IQR as proxy of the mean and SD)

m The mean calcium intake in the control group was 77 mg/day. (We used the median and IQR as proxy of the mean and SD)

n The mean calcium intake in the control group was 210 mg/day. (We used the median and IQR as proxy of the mean and SD)

[o] Fangupo 2016 (measured ~ at the 7th month; intervention finished when the infants were 9 month old).

[p] Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no and single study.

q The mean energy intake (kcal/day) in the control group was 676.6.

[r] Fangupo 2016 (Follow up, 3 months after the intervention finished when the infants were 9 month old).

s The mean energy intake in the control group was 806.2 kcal/day.

t Fangupo 2016 (Follow up, 15 months after the intervention finished when the infants were 9 month old), Harvey-Berino 2003 (Native American children -all the mothers with overweight or obesity- measured right after the completion of the 16-week intervention). Original units: kcal/day and kcal/ kg of body weight.

[u] Risk of bias: Fangupo 2016: Low risk of bias. Harvey-Berino 2003: Some concerns due to possible bias in randomization process and in the selection of the reported results.

[v] Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no.

w The mean energy intake in the control group was 956.7 kcal/day and 122 kcal/kg of body weight.

x This SMD is equivalent to the following MD in the original units: a) -22.3 kcal/day (95%CI -69.8 to 34.4), and b) -6.1 kcal/kg of body weight (95%CI -19.1 0 to 9.4).

y The mean protein intake in the control group was 16.3 g/day.

z The mean protein intake in the control group was 28.5 g/day.

aa Fangupo 2016 (Follow up, 15 months after the intervention finished when the infants were 9 month old).

bb The mean protein intake in the control group was 37 g/day.

cc The mean intake in the control group was 43.4%

dd The mean intake in the control group was 36.2%.

ee The mean energy intake in the control group was between 32.7 and 33%

ff This SMD is equivalent to the following MD in the original units: a) -22.3 kcal/day (95%CI -69.8 to 34.4), and b) -6.1 kcal/kg of body weight (95%CI -19.1 0 to 9.4).

gg The mean intake in the control group was 1 mg/day.

hh The mean intake in the control group was 3.2 mg/day.

ii The mean intake in the control group was 0.59 mg/day.

jj The mean intake in the control group was 2.6 mg/day.

kk The mean intake in the control group was 399 mg/day.

ll The mean intake in the control group was 556 mg/day.

mm The mean intake in the control group was 619 mg/day.

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **growth and body composition** (O6)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

C. Interventions focused on one component of responsive feeding

Weight-related - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

D. Interventions aimed to prevent under-nutrition, including two or more components of RF

***Intervention B1*: Responsive feeding and development stimulation program, delivered by trained women/mothers of the village, including 7 components of RF (C1, C3, C4, C5, C7, C9, and in some studies C10)**

Weight-related outcomes, weight (kg), at 12 months old

1 [a]	Randomized trials	serious[b]	not serious	not serious	not serious	none	129	144		MD 0 (0.23 lower to 0.23 higher)[c]	⊕⊕⊕◯ MODERATE	CRITICAL

Weight-related outcomes (SMD), at 24 months old

3 [d]	Randomized trials	not serious	serious [e]	not serious	serious [f]	none	227	231		SMD 0.05 higher (0.24 lower to 0.35 higher) [g] [h]	⊕⊕◯◯ LOW	CRITICAL

Length-related outcomes (SMD), between 15 and 24 months old

3 [i]	Randomized trials	not serious	serious	not serious	serious [f]	none	336	373		SMD 0.01 higher (0.14 lower to 0.15 higher) [j]	⊕⊕⊕◯ MODERATE	CRITICAL

C. Interventions for obesity prevention, which includes two or more components of RF

***Intervention C1*: Interventions aimed to prevent obesity (e-health intervention between 6 and 12 months of age), including 5 components of RF (C1, C4, C6, C7, C8)**

Energy and nutrients intake - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

***Intervention C2*: Interventions aimed to prevent obesity delivered by health professionals (group or individual sessions during home visits or at health centers, specific brief advice included in well-child visits), including between 6 and 7 components of RF (C1, C5, C7, C9, and others)**

Weight-related outcomes (BMI z-score) at 9 months, after interventions for obesity prevention

1 [k]	Randomized trial	not serious	not serious	not serious	not serious	none	62	58		MD 0.54 lower (0.93 lower to 0.15 lower)[l]	⊕⊕⊕⊕ HIGH	CRITICAL

Weight-related outcomes (WAZ or BMI z-score) at 12 months, after interventions for obesity prevention

6[m]	Randomized trials	serious	serious[n]	not serious	serious [f]	none	1247	1367		MD 0.08 lower (0.23 lower to 0.06 higher) [o] [p]	⊕⊕◯◯ LOW	CRITICAL

Weight-related outcomes (WAZ or BMI z-score) at 24 months, after interventions for obesity prevention

6 [q]	Randomized trials	not serious	not serious	not serious	serious [f]	none	1005	1014		MD 0.09 lower (0.18 lower to 0.01 higher) [r] [s]	⊕⊕⊕◯ MODERATE	CRITICAL

Weight-related outcomes (BMI z-score) at 36 months old, after interventions for obesity prevention

6 [t]	Randomized trials	serious[u]	serious[v]	not serious	serious [f]	none	1209	1306		MD 0.04 lower (0.15 lower to 0.08 higher)[w]	⊕⊕◯◯ LOW	CRITICAL

Weight-related outcomes (BMI z-score) at 5 years old, after interventions for obesity prevention

2[x]	Randomized trials	not serious	not serious	not serious	serious [f]	none	334	327	88/166 (53.0%)	MD 0.01 lower (0.17 lower to 0.15 higher)[y]	⊕⊕⊕◯ MODERATE	CRITICAL

Overweight, at 12 months old

5[z]	Randomized trials	serious [aa]	not serious	not serious	serious [f]	None	113 / 607 (18.6%)	134 /652 (20.6%)	**RR 1.00** (0.69 to 1.46)	**0 fewer per 1,000** (from 64 fewer to 95 more) [bb cc]	⊕⊕◯◯ LOW	CRITICAL

Overweight/obesity, at 24 months old

8[dd]	Randomized trials	serious [ee]	not serious[ff]	not serious	serious [f]	None	220 / 1095 (20.0%)	260 / 1076 (24.2%)	**RR 0.81** (0.63 to 1.04)	**46 fewer per 1,000** (from 89 fewer to 10 more)[gg hh]	⊕⊕◯◯ LOW	CRITICAL

Overweight/obesity, at 32 to 36 months old

5[ii]	Randomized trials	serious [jj]	serious[kk]	not serious	serious [f]	None	164 / 1032 (15.9%)	187 / 1137 (16.4%)	**RR 0.92** (0.68 to 1.24)	**13 fewer per 1,000** (from 53 fewer to 39 more)[ll]	⊕◯◯◯ VERY LOW	CRITICAL

Overweight/obesity, at 5 to 8 years old

2[mm]	Randomized trials	not serious	not serious	not serious	serious [f]	None	64 /342 (18.7%)	73 /388 (18.8%)	**RR 1.07** (0.78 to 1.46)	**13 more per 1,000** (from 41 fewer to 87 more)[nn]	⊕⊕⊕◯ MODERATE	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

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a Vazir 2013.

b Risk of bias: Some concerns due to missing outcome data.

c The mean weight in the control group was 8 kg.

d Aboud 2008, Aboud 2009, Aboud 2011. Original units: weight-for-age z-score (WAZ) and weight (kg).

e Inconsistency: Downgraded one level due to heterogeneity. (I2 =61%)

f Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no.

g The mean weight in the control group was 9.88 kg; the mean WAZ was between -1.87 and -1.86.

h This SMD is equivalent to the following MDs in the original units: a) 0.07 kg (95%CI -0.32 to 0.47), and b) 0.045 z-score (95%CI -0.22 0 to 0.32).

i Aboud 2011, Aboud 2013, Vazir 2013. Original units: length-for-age z-score (LAZ) and length (cm).

j The mean length in the control group was 73.9 cm; the mean LAZ was between -1.04 and -1.81.

k Rosenstock 2021.

l The mean BMI z-score in the control group was 0.81.

m Daniels 2012, Fangupo 2016, Rosenstock 2021, Vlasblom 2020, Messito 2020, Wasser 2020. Original units BMI z-score and WAZ.

n Inconsistency: Downgraded one level due to heterogeneity (I^2 =64%).

o The mean weight-for-age z-score in the control group was between 0.44 and 0.57, and the mean BMI z-score was between -0.26 and 1.07.

p Results differed by subgroup. Test for subgroup differences: Chi^2 = 2.15, df = 1 (P = 0.14), I^2 = 53.6%. For subgroup of HICs low resource settings the SMD was -0.19 (95% -0.35, -0.04) and for HICs (MD: 0.01, 95% CI -0.21, 0.21).

q Campbell 2013, Fangupo 2016, Fangupo 2015, Daniels 2012, Messito 2020, Savage 2016. Original units BMI z-score and WAZ.

r The mean weight-for-age z-score in the control group was 0.81, and the mean BMI z-score was between 0.11 and 0.81.

s Results differed by subgroup. Test for subgroup differences: Chi^2 = 2.53, df = 1 (P = 0.11), I^2 = 60.5%. For subgroup of HICs low resource settings the SMD was -0.25 (95% CI -0.47, -0.03) and for HICs (MD: -0.06, 95% CI -0.15, 0.04).

t Black 2021, Campbell 2013, Daniels 2012, Fangupo 2015, Savage 2016, Vlasblom 2020.

u Risk of bias: Campbell 2013 and Fangupo 2015: Low risk of bias. Black 2021, Savage 2016 and Vlasblom 2020: Some concerns due to possible bias in randomization process. In addition, Black has some concerns due to possible bias in deviations from intended interventions. Downgraded one level

v Inconsistency: Downgraded one level due to heterogeneity (I2 =50%).

w The mean BMI z-score in the control group was between -0.15 and 0.68.

x Campbell 2013 , Daniels 2012.

y The mean BMI z-score in the control group was between 0.41 and 0.5.

z Fangupo 2016, Louzada 2012, Morandi 2019, Savage 2016, Wasser 2020.

aa Risk of Bias: Downgraded one level. Risk of bias: Morandi 2019: high risk due to bias in randomization process, and deviations from intended interventions. Savage 2016: Some concerns due to possible bias in randomization process. Wasser 2020: (weight-for-length) High risk due to bias in measurement of the outcome. Fangupo 2016 and Louzada 2012: Low risk of bias.

bb In the control group was 206 per 1,000.

cc In a sensitivity analysis, after excluding one study with overall high risk of bias, there was no change in direction, the RR was similar and remained without statistical significance: RR 1.02 [95% CI 0.57, 1.83].

dd Daniels 2012, Fangupo 2015, Fangupo 2016, Harvey Berino 2003, Messito 2020, Morandi 2019, Savage 2016, Schroeder 2015.

ee Risk of Bias: Downgraded one level. Daniels 2012: Some concerns due to missing outcome data. Morandi 2019: High risk due to bias in randomization process, and deviations from intended interventions. Schroeder 2015: high risk in three domains. Savage 2016: Some concerns due to possible bias in randomization process. Harvey-Berino 2003: Some concerns due to possible bias in randomization process and in the selection of the reported results. Fangupo 2015, 2016 and Messito 2020: Low risk of bias

ff Inconsistency: I2 = 50%. Most of the results are in the same direction. We decided not to downgrade.

gg In the control group was 242 per 1,000.

hh In a sensitivity analysis, after excluding two studies with overall high risk of bias, there was no change in direction, the RR was similar and remained without statistical significance: RR 0.78 [95% CI 0.57, 1.06].

ii Black 2021, Louzada 2012, Messito 2020, Savage 2016, Vlasblom 2020.

jj Risk of bias: Aboud 2009: Some concerns due to possible bias in deviations from intended interventions. Savage 2016 and Vlasblom 2020: Some concerns due to possible bias in randomization process. Louzada 2012 and Messito 2020: Low risk of bias.

kk Inconsistency: Downgraded one level due to heterogeneity. I2 =61%

ll In the control group was 164 per 1,000.

mm Daniels 2012, Louzada 2012.

nn In the control group was 188 per 1,000.

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Question: For children from the introduction of complementary foods to 23 months of age, do interventions that include elements of responsive feeding compared to interventions that do not include those elements of responsive feeding improve **early child development** (O7)?

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Responsive feeding	No responsive feeding	Relative (95% CI)	Absolute (95% CI)		

C. Interventions focused on one component of responsive feeding

Early child development - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

D. Interventions aimed to prevent under-nutrition, including two or more components of RF

Intervention B1: **Responsive feeding and development stimulation program, delivered by trained women/mothers of the village or family welfare assistants, including 6-7 components of RF (C1, C3, C4, C5, C7, C9 and in some studies C10)**

Mental development at 15 to 22 months old (SMD)

3 [a]	Randomized trials [b]	not serious	not serious [c]	not serious	not serious	none	336	373	-	SMD **0.60 higher** (0.35 higher to 0.86 higher)[d] [e]	⊕⊕⊕⊕ HIGH	CRITICAL

Motor Development Score at 15 months old, Bayley Scales of Infant Development-II

1 [f]	Randomized trial [g]	serious [h]	not serious	not serious	serious [i]	none	153	182	-	MD **2.40 higher** (1.09 lower to 5.89 higher) [j]	⊕⊕◯◯ LOW	CRITICAL

C. Interventions for obesity prevention, including two or more components of RF

Early child development - not reported

-	-	-	-	-	-	-	-	-	-	-	-	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference. **COMPONENTS:** C1. Recognition of hunger and satiety; C2. Infant readiness for introduction of complementary foods, taking into account the child's developmental readiness; C3. Texture/ consistency responsive to child developmental needs; C4. Not pressuring child to eat; praising, encourage self-feeding; C5. Flavor preferences and repeated exposure to certain foods. It includes interventions promoting caregivers to offer a diverse diet with repeated exposure to healthy foods/beverages, and to avoid offering ultra-processed foods and sugar-sweetened beverages; C6. Role modelling of healthy eating; C7. Pleasant and stimulating family eating environment; C8. Appropriate soothing (caregivers do not use food to calm child when s/he is not hungry), sleeping, and play routines (caregivers establish well-structured daily routines for sleeping and playing as part of a responsive parenting/responsive feeding intervention); C9. Positive caregiver verbalization during feeding; C10 Feeding during and after illness

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a Aboud 2011, Aboud 2013 (Bangladesh, village group sessions/ home visits) and Vazir 2013 (India, home visits). Aboud 2011: Only one out of two intervention groups was included (Responsive complementary feeding and stimulation program). An intervention group which included nutrient supplementation was not included in this systematic review. Aboud 2013: there were two sub-studies according to the age at the beginning of the study and both were included. Vazir 2013: Only one out of two intervention groups was included (Responsive complementary feeding and play program). An intervention group focused on complementary feeding (not RF) was not included in this systematic review. Interventions in all trials included contents about the same elements of RF: recognition of hunger and satiety (C1), texture/ consistency responsive to child developmental needs (C3), not pressuring child to eat, praising, encourage self-feeding (C4), flavor preferences and repeated exposure to a diversity of healthy foods, and to avoid unhealthy foods (C5), pleasant and stimulating family eating environment (C7), positive caregiver verbalization during feeding (C9); and trials conducted in Bangladesh also included some messages about feeding during and after illness (C10).

b 3 cluster RCT.

c Inconsistency: (I^2 63%). We decided not to downgrade one level, all the results are in the same direction and heterogeneity in the results may be related with heterogeneity in scales.

d Original units: scores for Language, Receptive language (Bayley-III), Mental score (Bayley-II).The mean language score was 24.91; the mean Receptive language score was between 21.78 and 23.66; and the mean Mental score was 104.4 in the control group.

e This SMD is equivalent to the following MDs in the original units: a) mean language score of 11.85 (95%CI 6.91 to 17.0), b) receptive language score of 3 (95%CI 1.75 0 to 4.3). and c) the mean Mental score: 5.01 (95%CI 2.92 0 to 7.18).

f Vazir 2013 (India). Only one out of two intervention groups was included (Responsive complementary feeding and play program). A*n intervention group focused on complementary feeding (not RF) was not included in this systematic review.*

g Cluster RCT. Comparator: routine care.

h Risk of bias: Some concerns due to missing outcome data.

i Imprecision: Downgraded one level due to wide confidence intervals compatible both with benefit or no.

j The mean score in the control group was 114.3.

Supplementary data and plots

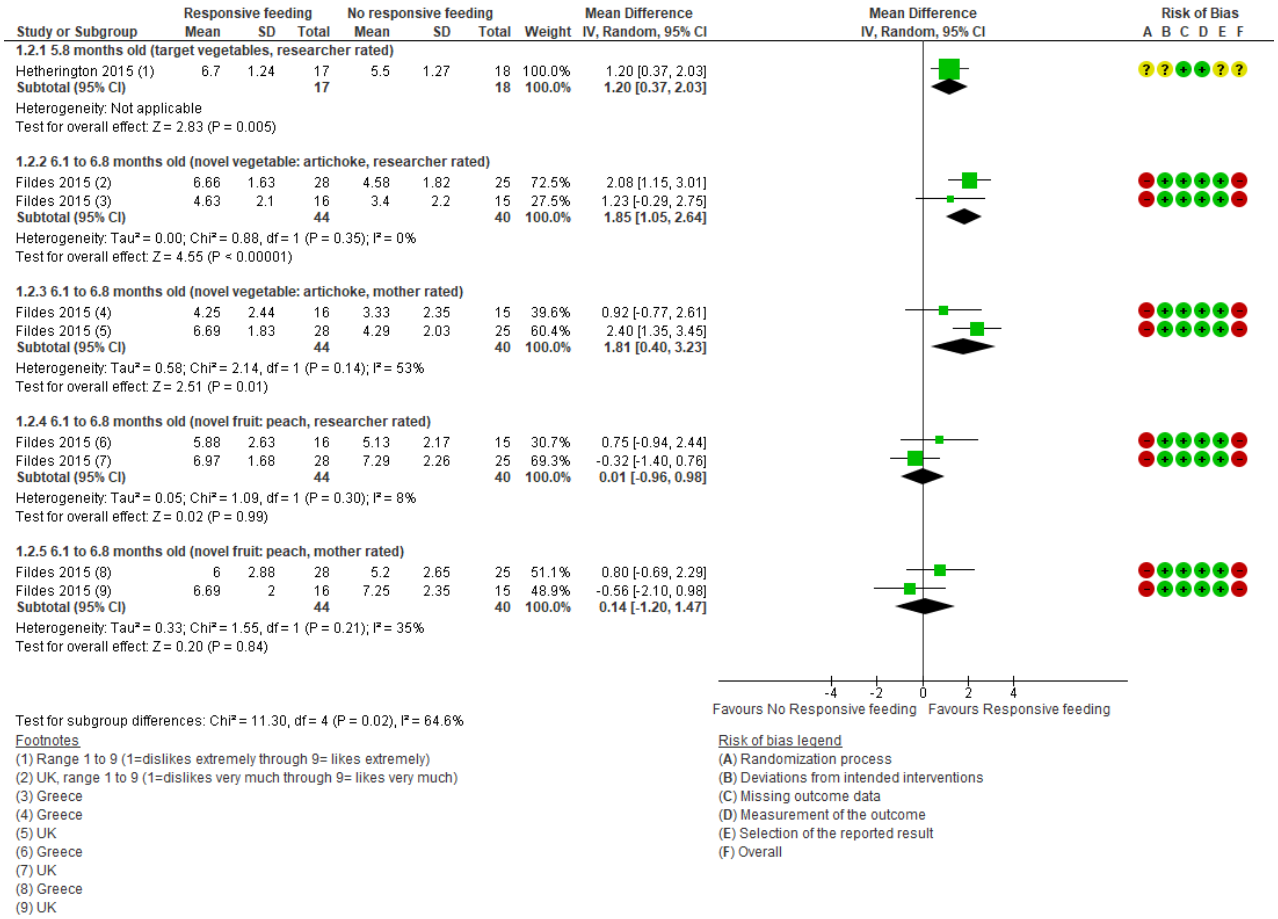
OUTCOME 1
Interventions focused on one component of responsive feeding

Intervention A1: Guidance on step-by-step repeated exposure to vegetables during the introduction of solids, delivered by research staff or health professionals, component C5

Perception of infant's liking for the target or novel foods (Scale from 1 to 9)
Trials: Hetherington 2015, Fildes 2015

The perception of infant's liking for the target or novel foods at 6 months was rated by using a scale from 1 (dislikes extremely) to 9 (likes extremely). Repeated exposure to vegetables was associated with greater scores for target vegetables (researcher rated: MD 1.20, 95% CI 0.37 to 2.03; participants = 35; studies = 1, Hetherington et al). Similar results were found for novel vegetables like artichoke, both rated by researcher (MD 1.85, 95% CI 1.05 to 2.64; participants = 84; sub-studies = 2; I^2 = 0%) or the mother (MD 1.99, 95% CI 1.10 to 2.88; participants = 84; sub-studies = 2; I^2 = 53%) at 6.8 months. There was little or no effect for other food group -a novel fruit (peach)- rated by the researcher (MD -0.01, 95% CI -0.92 to 0.90; participants = 84; sub-studies = 2; I^2 = 8%) and the mother (MD 0.14, 95% CI -0.93 to 1.21; participants = 84; sub-studies = 2; I^2 = 35%). Please see Supplementary plot 1. At 12 months old (6 months follow up from the intervention), Hetherington et al. found no differences in liking of vegetables by intervention group.

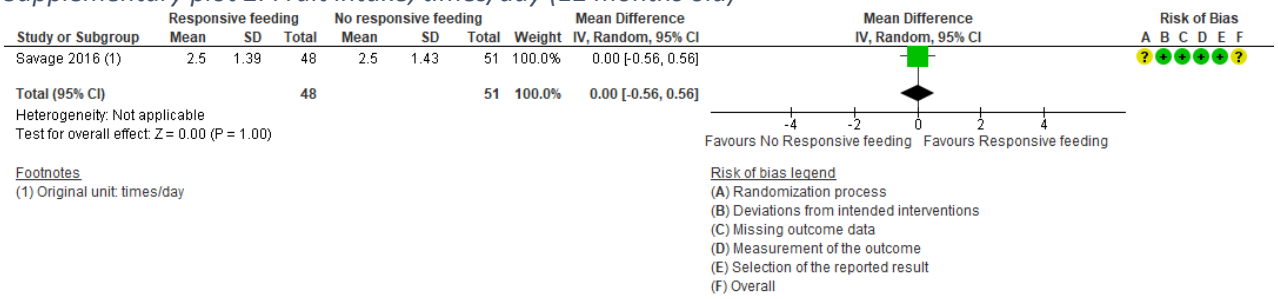
Supplementary plot 1. Food acceptance at ~6 to 7 months old. Perceived infant´s liking for the target/novel food, after 24 to 35 days of repeated exposure to vegetables.



OUTCOME 3
Interventions aimed to obesity prevention

Fruit intake at 12 months old (times per day)
Trial: Savage 2016 (INSIGHT Trial)
Supplementary plot 2 (MD 0.00, 95% CI -0.56 to 0.56; participants = 99; studies = 1)

Supplementary plot 2. Fruit intake, times/day (12 months old)



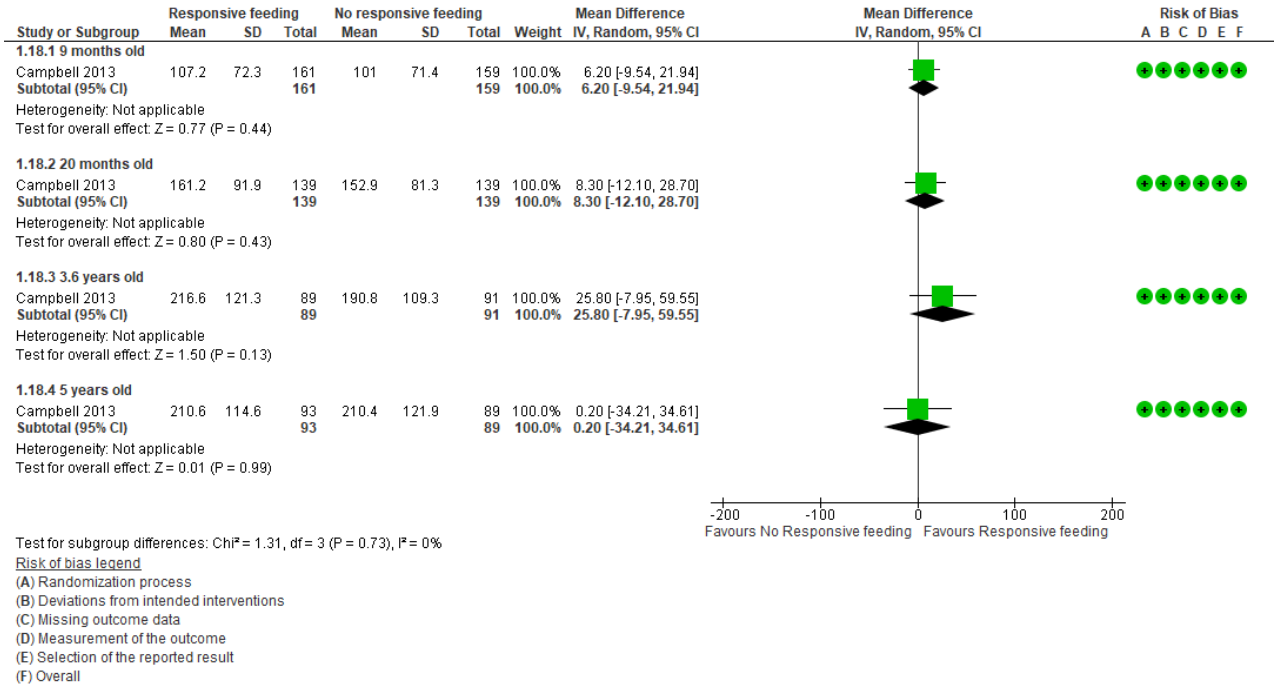
Fruit intake from 9 months to 5 years of age (grams per day)
Trial: Campbell 2013 (INFANT Trial)
Effect sizes and participants are presented below:

Fruit intake (g/day). Supplementary plot 3

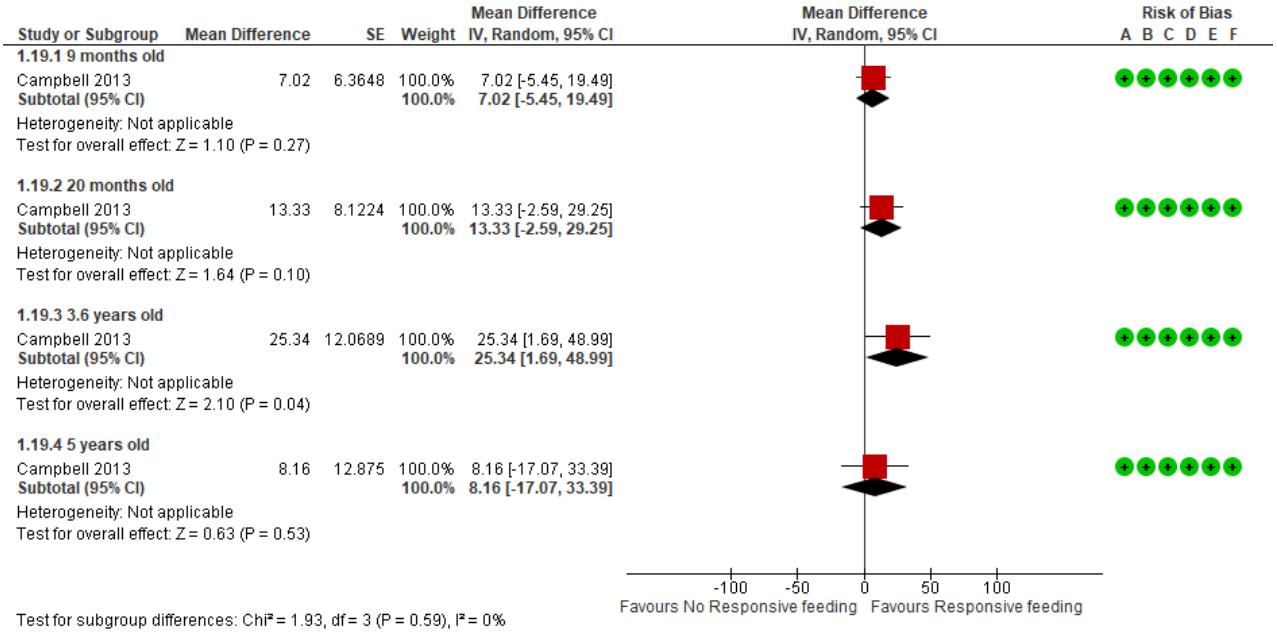
9 months old (MD 6.20, 95% CI -9.54 to 21.94; participants = 320; studies = 1);
20 months old (MD 8.30, 95% CI -12.10 to 28.70; participants = 278; studies = 1);
3.6 years old (MD 25.80, 95% CI -7.95 to 59.55; participants = 180; studies = 1);
5 years old (MD 0.20, 95% CI -34.21 to 34.61; participants = 182; studies = 1).

Fruit intake (g/day), adjusted data, as reported by authors. Supplementary plot 4
9 months old (MD 7.02, 95% CI -5.45 to 19.49; studies = 1);
20 months old (MD 13.33, 95% CI -2.59 to 29.25; studies = 1);
3.6 years old (MD 25.34, 95% CI 1.69 to 48.99; studies = 1);
5 years old (MD 8.16, 95% CI -17.07 to 33.39; studies = 1)

Supplementary plot 3. Fruit intake, g/day (9 months to 5 years old)

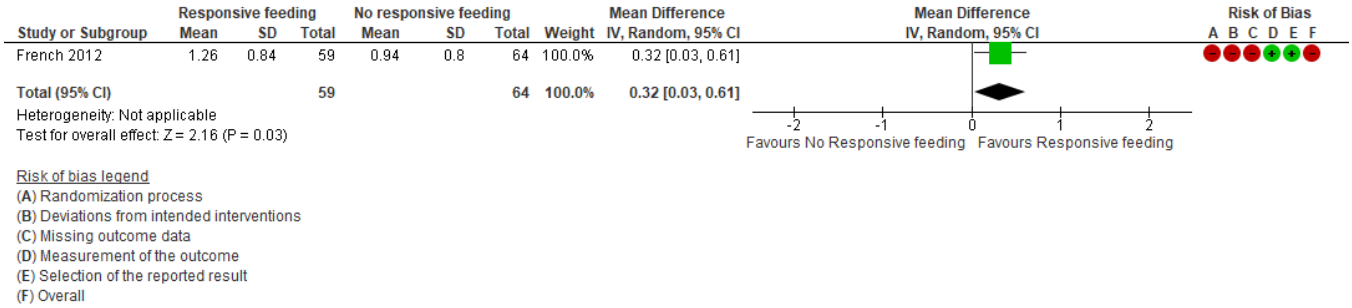


Supplementary plot 4. Fruit intake, g/day (9 months to 5 years old). Adjusted data, reported by authors



Fruit intake at 12 months old (servings per day)
Trial: French 2012[41] (Ounce of Prevention)
Supplementary plot 5 (MD 0.32, 95% CI 0.03 to 0.61; participants = 123; studies = 1)

Supplementary plot 5. Fruit intake, servings/day (12 months old)

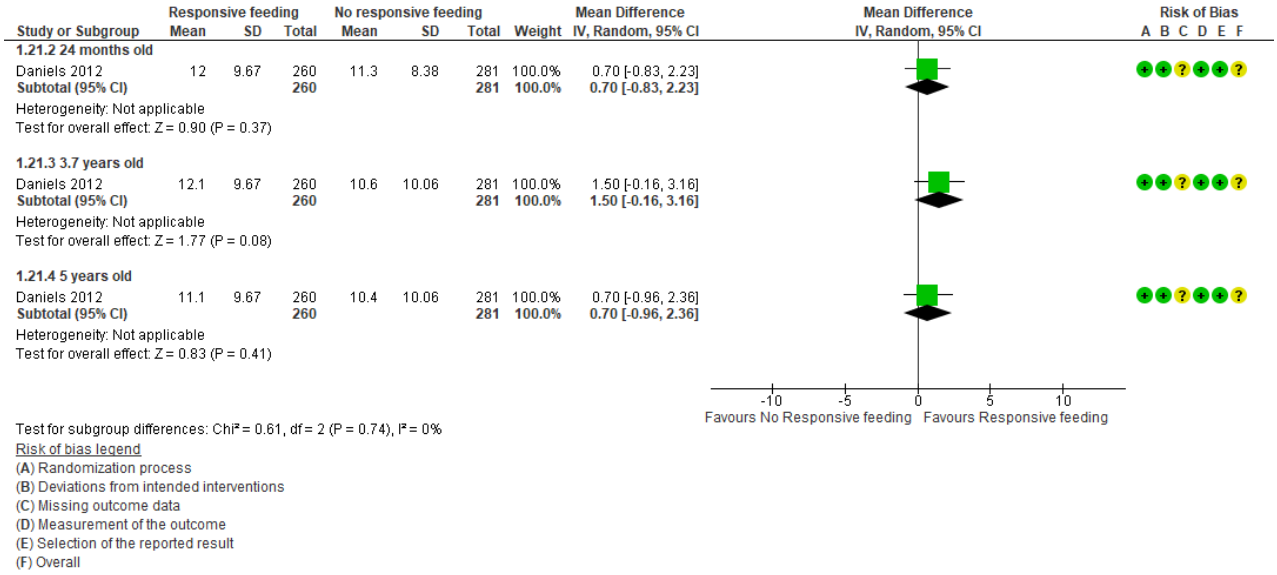


Fruit intake from 24 months to 5 years of age (grams per kg of body weight)
Trial: Daniels 2012 (NOURISH)
Effect sizes and participants are presented below:

Fruit intake (g/kg of body weight) Supplementary plot 6

24 months old (MD 0.70, 95% CI -0.83 to 2.23; participants = 541; studies = 1)
3.7 years old (MD 1.50, 95% CI -0.16 to 3.16; participants = 541; studies = 1)
5 years old (MD 0.70, 95% CI -0.96 to 2.36; participants = 541; studies = 1)

Supplementary plot 6. Fruit intake, g/kg body weight (24 months to 5 years old)



Fruit intake from 26 months and 32 months of age (HEI-2015[37], Total fruit component)
Trial: Black 2021 (Tot -TOPS)
Effect sizes are presented below:

HEI-2015, Total fruit component Supplementary plot 7

26 months old (MD 0.95, 95% CI 0.21 to 1.69; studies = 1)
32 months old (MD 0.71, 95% CI 0.02 to 1.40; studies = 1)

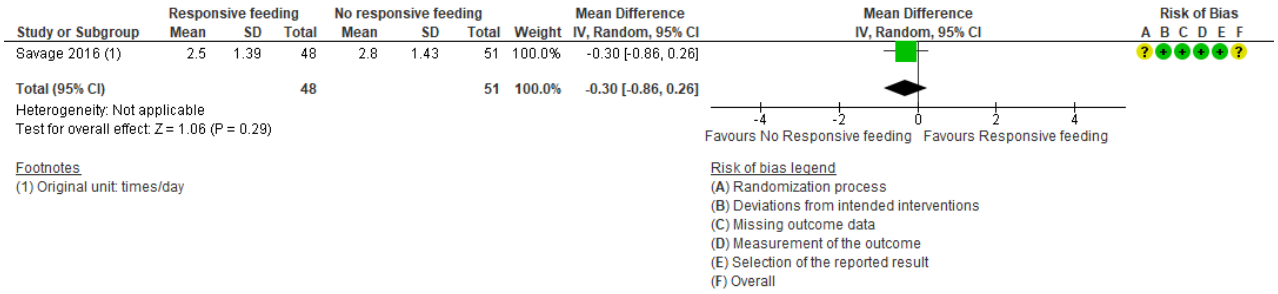
Supplementary plot 7. Fruit intake, Healthy Eating Index 2015 - Total Fruit component (26 and 32 months old)

Vegetable intake at 12 months old (times per day)

[37] Healthy Eating Index-2015

Trial: Savage 2016 (INSIGHT Trial)
Supplementary plot 8 (MD -0.30, 95% CI -0.86 to 0.26; participants = 99; studies = 1)

Supplementary plot 8. Vegetable intake, times/day (12 months old)



Vegetable intake from 9 months to 5 years of age (grams per day)
Trial: Campbell 2013 (INFANT Trial)
Effect sizes and participants are presented below:

Vegetable intake (g/day) Supplementary plot 9

9 months old (MD 4.30, 95% CI -12.31 to 20.91; participants = 320; studies = 1)

20 months old (MD 4.50, 95% CI -8.54 to 17.54; participants = 278; studies = 1)

3.6 years old (MD 16.50, 95% CI -4.46 to 37.46; participants = 180; studies = 1)

5 years old (MD 6.40, 95% CI -18.42 to 31.22; participants = 182; studies = 1)

Vegetable intake (g/day), adjusted analyses, reported by authors Supplementary plot 10

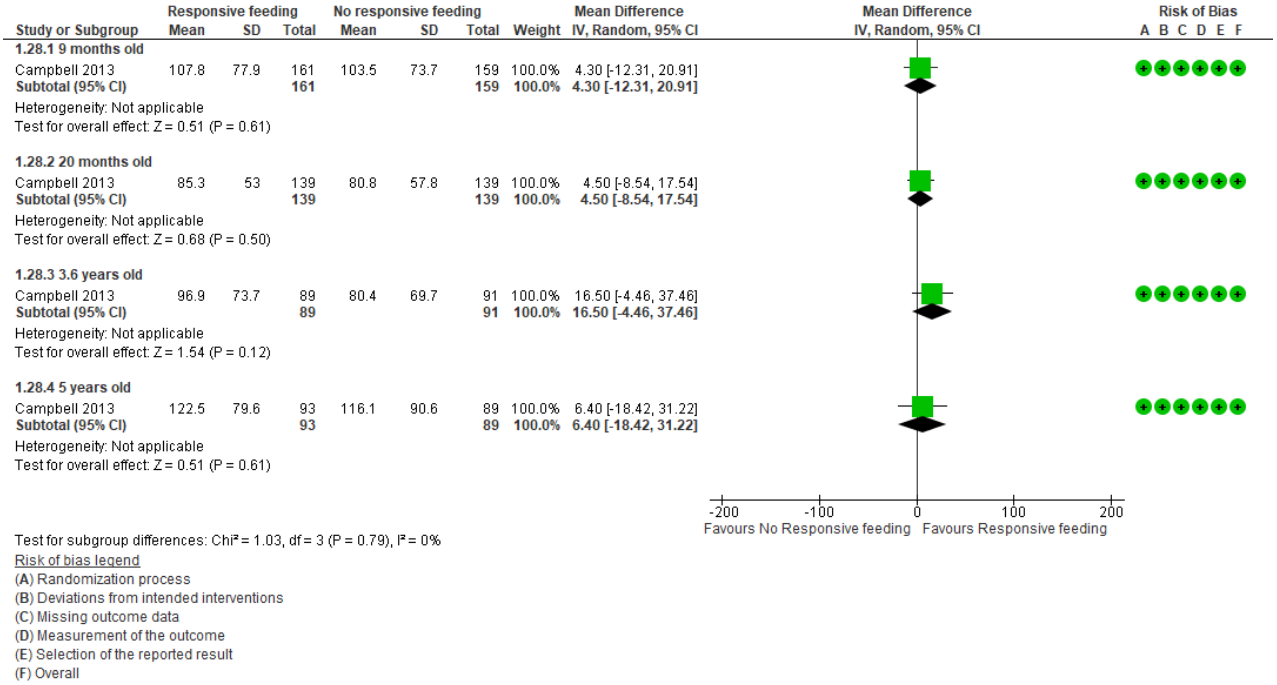
9 months old (MD 3.08, 95% CI -8.21 to 14.37; studies = 1)

20 months old (MD 6.62, 95% CI -2.51 to 15.75; studies = 1)

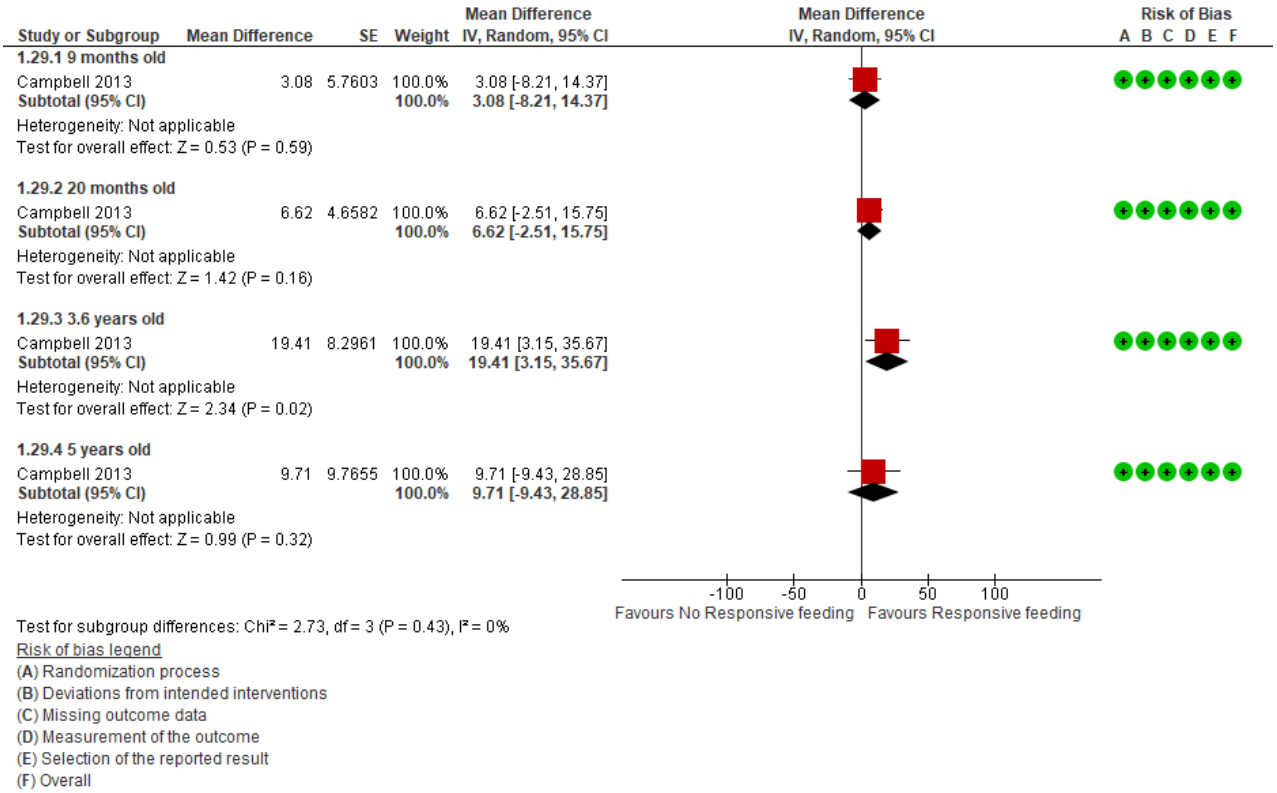
3.6 years old (MD 19.41, 95% CI 3.15 to 35.67; studies = 1)

5 years old (MD 9.71, 95% CI -9.43 to 28.85; studies = 1)

Supplementary plot 9. Vegetable intake, (g/day) (9 months to 5 years)

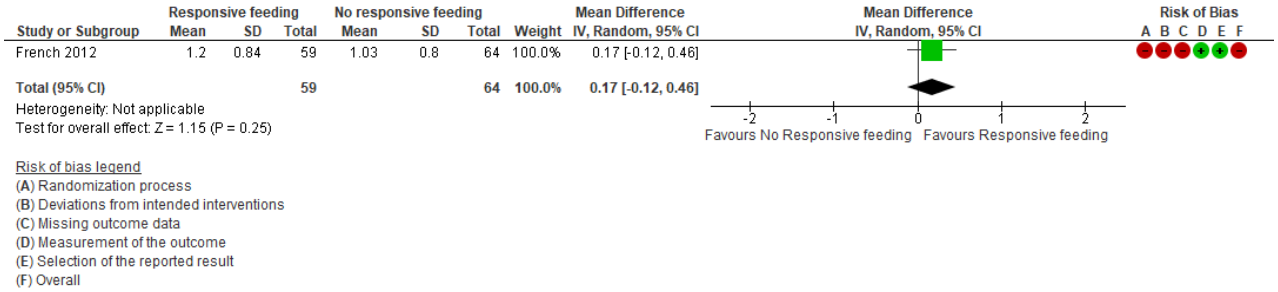


Supplementary plot 10. Vegetable intake (g/day), adjusted analyses, as reported by authors (9 months to 5 years)



Vegetable intake at 12 months old (servings per day)
Trial: French 2012[41] (Ounce of Prevention)
Supplementary plot 11. (MD 0.17, 95% CI -0.12 to 0.46; participants = 123; studies = 1)

Supplementary plot 11. Vegetable intake, servings/day (12 months old)

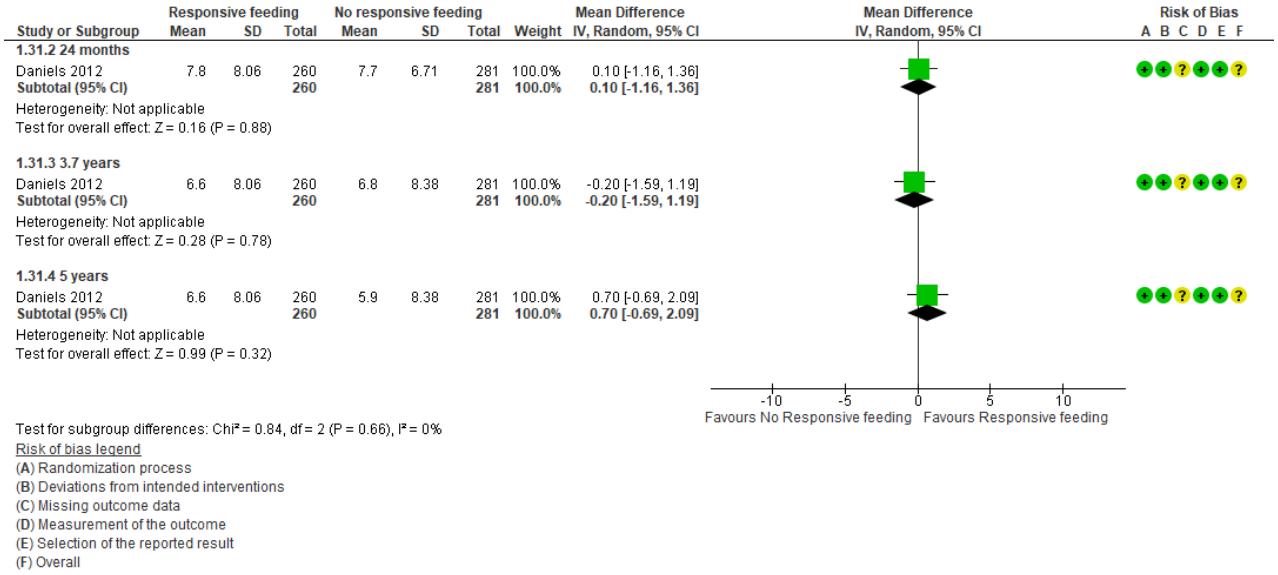


Vegetable intake from 24 months to 5 years of age (grams per kg of body weight)
Trial: Daniels 2012 (NOURISH)
Effect sizes and participants are presented below:

Vegetable intake (g/kg of body weight) Supplementary plot 12

24 months old (MD 0.10, 95% CI -1.16 to 1.36; participants = 541; studies = 1)
3.7 years old (MD -0.20, 95% CI -1.59 to 1.19; participants = 541; studies = 1)
5 years old (MD 0.70, 95% CI -0.69 to 2.09; participants = 541; studies = 1)

Supplementary plot 12. Vegetable intake, g/kg body weight (24 months to 5 years old)



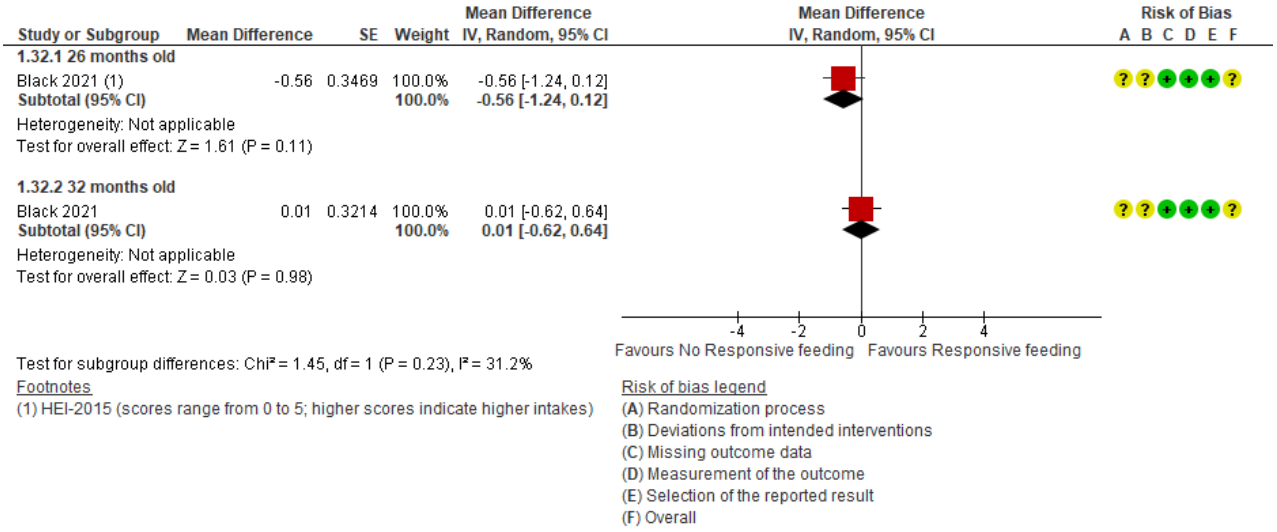
Vegetable intake from 26 months and 32 months of age (HEI-2015[38], Total vegetable component)
Trial: Black 2021 (Tot -TOPS)
Effect sizes are presented below:

Total Vegetable component- HEI-2015 Supplementary plot 13

26 months old (MD -0.56, 95% CI -1.24 to 0.12; studies = 1)
32 months old (MD 0.01, 95% CI -0.62 to 0.64; studies = 1)

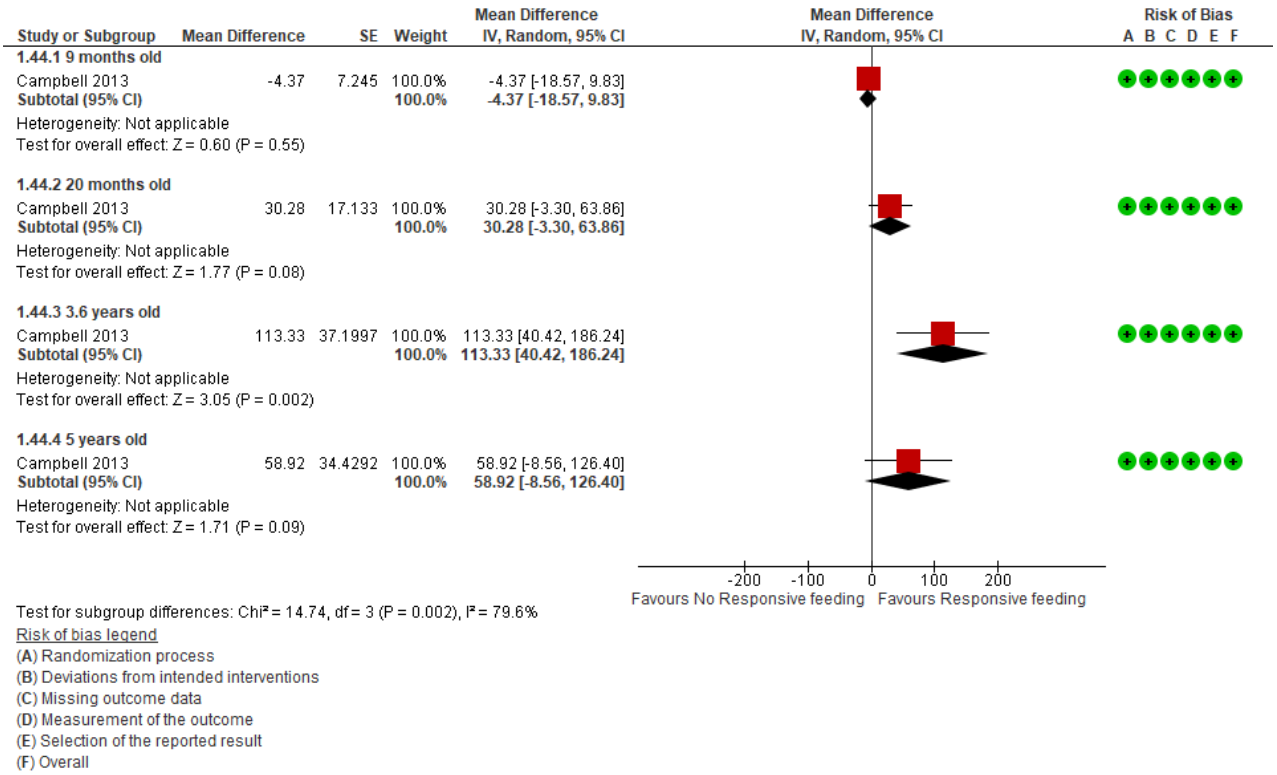
[38] Healthy Eating Index-2015

Supplementary plot 13. Vegetable intake, HEI-2015 Total vegetable component (26 to 32 months old)



Water intake from 9 months to 5 years of age (ml per day), adjusted data
Trial: Campbell 2013 (INFANT Trial)

Supplementary plot 14. Water intake, ml/day (9 months to 5 years old). Adjusted data, reported by authors



OUTCOME 4

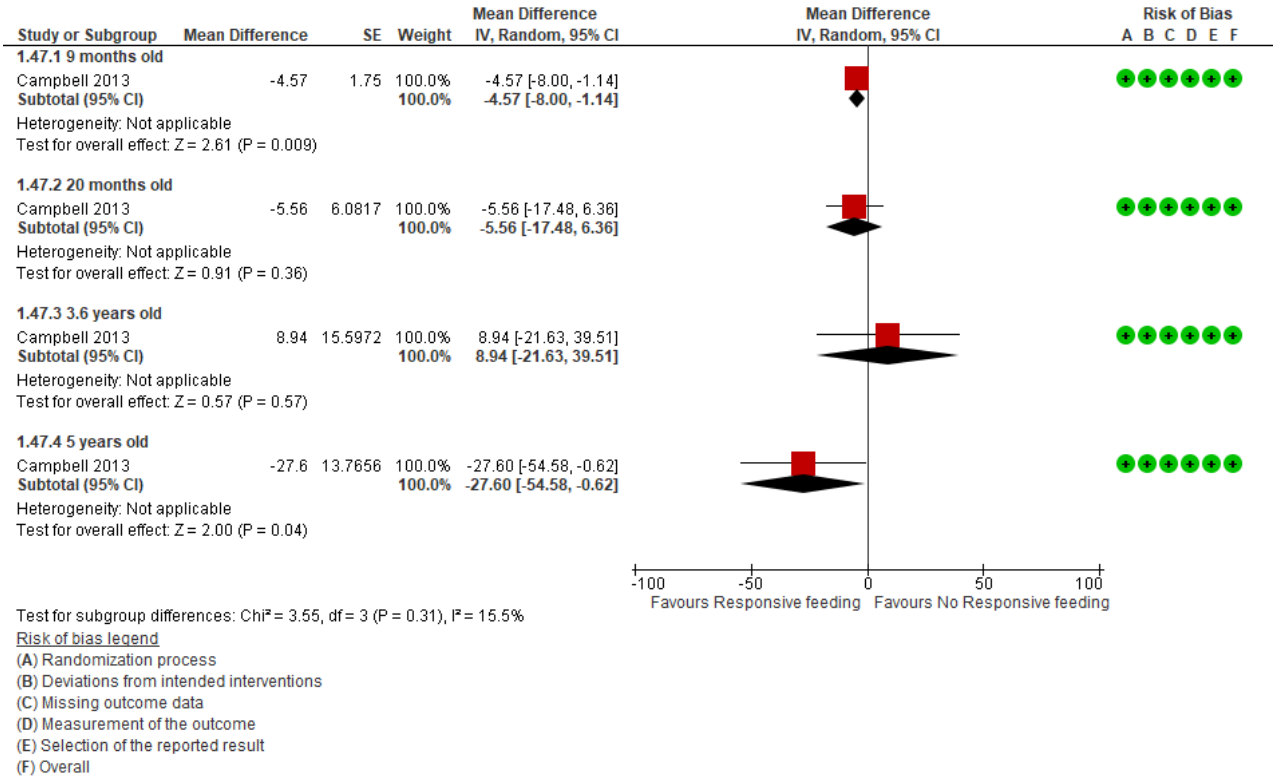
Interventions aimed to obesity prevention

SSB intake from 9 months to 5 years of age (ml per day)
Trial: Campbell 2013 (INFANT Trial)
Effect sizes and participants are presented below:

SSBs intake, ml/day, adjusted analyses, as reported by authors

9 months (MD -4.57, 95% CI -8.00 to -1.14; participants = 0; studies = 1)
20 months (MD -5.56, 95% CI -17.48 to 6.36; participants = 0; studies = 1)
3.6 years (MD 8.94, 95% CI -21.63 to 39.51; participants = 0; studies = 1)
5 years (MD -27.60, 95% CI -54.58 to -0.62; participants = 0; studies = 1)

Supplementary plot 15. Sugar-sweetened beverages (SSB) intake, ml/day, adjusted analyses, reported by authors (9 month to 5 years old)

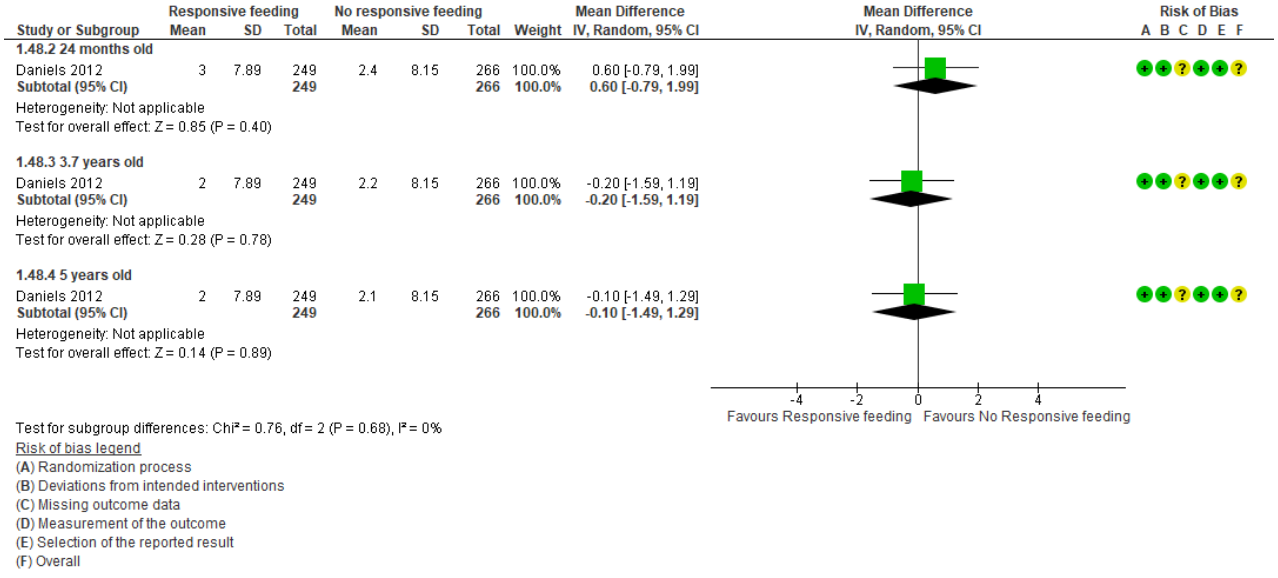


SSB (non-milk sweet beverages) intake from 24 months to 5 years of age (% of total energy)
Trial: Daniels 2012 (NOURISH Trial)
Effect sizes and participants are presented below:

Non-milk sweet beverages, % total energy (24 months to 5 years old)

24 months old (MD 0.60, 95% CI 0.79 to 1.99; participants = 515; studies = 1)
3.7 years old (MD -0.20, 95% CI -1.59 to 1.19; participants = 515; studies = 1)
5 years old (MD -0.10, 95% CI -1.49 to 1.19; participants = 515; studies = 1)

Supplementary plot 16. Non-milk sweet beverages, % total energy (24 months to 5 years old)

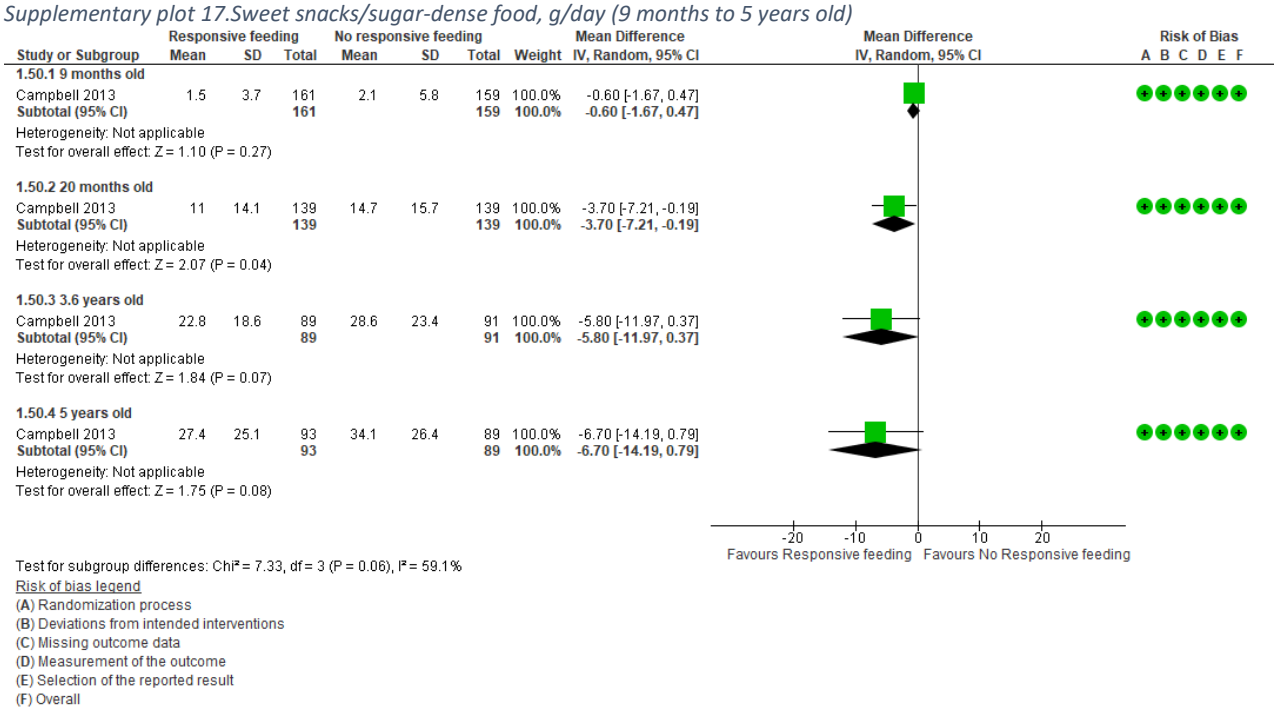


Sweet snacks/sugar-dense food intake from 9 months to 5 years of age (g/day)
Trial: Campbell 2013 (INFANT Trial)
Effect sizes and participants are presented below:

Sweet snacks/sugar-dense food, g/day (9 months to 5 years old)

9 months old (MD -0.60, 95% CI -1.67 to 0.47 participants = 320; studies = 1)
20 months old (MD -3.70, 95% CI -7.21 to -0.19; participants = 278; studies = 1)
3.6 years old (MD -5.80, 95% CI -11.97 to 0.37; participants = 180; studies = 1)
5 years old (MD -6.70, 95% CI -14.19 to 0.79; participants = 182; studies = 1)

Supplementary plot 17.Sweet snacks/sugar-dense food, g/day (9 months to 5 years old)



Sugar-dense food intake from 12 months to 8 years of age (kcal/day)
Trial: Louzada 2012

Effect sizes and participants are presented below:

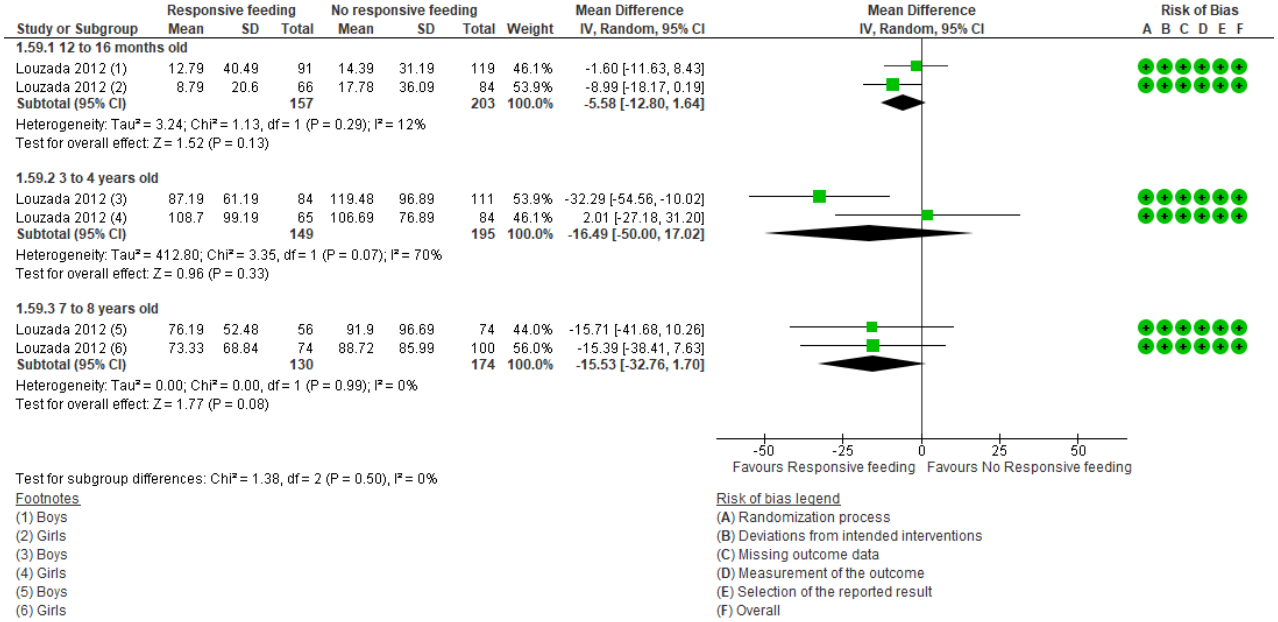
Sugar-dense foods (kcal/day)

12 to 16 months old (MD -5.58, 95% CI -12.80 to 1.64 participants = 360; studies = 2; I2 = 12%)

3 to 4 years old (MD -16.49, 95% CI -50.00 to 17.02 participants = 344; studies = 2; I2 = 70%)

7 to 8 years old (MD -15.53, 95% CI -32.76 to 1.70 participants = 304; studies = 2; I2 = 0%)

Supplementary plot 18.Sugar-dense foods (kcal/day) (12 months to 8 years)



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