National Institute for Health and Care Excellence

Draft for consultation

Maternal and child nutrition

[I] Evidence reviews for interventions to increase uptake of healthy eating and drinking advice during pregnancy

NICE guideline number tbc

Evidence reviews underpinning recommendations 1.2.2 to 1.2.3 and research recommendations in the NICE guideline

June 2024

Draft for consultation

These evidence reviews were developed by NICE

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Interventions to increase uptake of healthy eating and drinking advice during pregnancy

Review question

What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Introduction

Pregnancy provides a key opportunity to promote health and well-being. A healthy diet is particularly important during all stages of pregnancy to ensure the baby grows and develops appropriately and to ensure that the mother maintains optimal nutritional status both during pregnancy and lactation. Healthy eating habits should be encouraged, including eating regularly, having breakfast and making healthier snack choices.

The Eatwell Guide from the government provides useful information on how a healthy balanced diet can be achieved during pregnancy, including eating at least 5 portions of vegetables and fruit, starchy food including wholegrains, dairy and protein-rich foods every day and at least two portions of fish (including oily fish) each week. In contrast, sugary drinks and foods may contribute to excess gestational weight gain, and eating too many fatty foods, or eating them too often, can lead to increased weight gain.

Nevertheless, the pregnant person should not be 'eating for two'. In the first 6 months, most women do not need to eat any extra food to give their baby everything they need. The recommended daily calorie intake for a woman is around 2,000 calories a day. In the third trimester, an additional 200 calories may be required, depending on how active the person is.

The aim of this review is to determine what are the most effective interventions to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice.

Summary of the protocol

See Table 1 for a summary of the Population, Intervention, Comparison and Outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

Population	Women during a single or multiple pregnancy
Intervention	Interventions will be included if the main aim is to promote healthy eating and drinking advice in the population of interest. Interventions will be organised according to the following groups: • **intervention group 1:** interventions using information provision and/or education on healthy eating and drinking advice • **intervention group 2:** behavioural interventions (for example, goal setting, self-monitoring) • **intervention group 3:** interventions aimed at improving access to heathy food and drinks (that is, provision of healthy food or drinks or welfare schemes designed to enable access to healthy food and drink) • **intervention group 4:** multicomponent interventions (interventions that combine more than 1 intervention listed above). The committee anticipated that, along with the intervention, studies would report at least 1 domain for each of the components noted below. Sensitivity analyses will be done according to these if enough data is available. • **component 1:** mode of delivery • **component 2:** intervention aimed at individuals or groups • **component 3:** individualised/tailored interventions or general • **component 4:** who delivers the intervention • **component 5:** where is the intervention delivered • **component 6:** behaviour change models, techniques and theories.
Comparison	• another intervention • status quo/treatment as usual (as defined by study authors, includes no treatment) • time (before and after)
Outcome	**Critical** • changes in calorie intake during the third trimester • changes in vegetable and fruit intake • changes in starchy foods (carbohydrates, sugar and fibre) • changes in protein intake • changes in dairy intake • changes in saturated fat intake **Important** • changes in attitude, confidence and knowledge as part of people's intention to change behaviour

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in appendix A and the methods document (supplementary document 1).

Declarations of interest were recorded according to NICE's conflicts of interest policy.

Effectiveness evidence

Included studies

This review included 8 randomised controlled trials (Anleu 2019, Bosaeus 2015, Burr 2007, Khoury 2005, Oken 2013, Papandreou 2023, Seo 2020, Yamada 2022).

As per protocol only studies from high income countries were included and they were conducted in Chile, Greece, Norway, South Korea, Sweden, UK (Wales) and USA.

The included studies are summarised in Table 2.

Population

The study population included pregnant women during single pregnancy for 5 studies (Anleu 2019, Khoury 2005, Oken 2013, Seo 2020, Yamada 2022) or otherwise was not reported (Bosaeus 2015, Burr 2007, Papandreou 2023).

Pre-pregnancy body mass index (BMI) was reported by most studies. Mean pre-pregnancy BMI at baseline was between 18.5-24.9 kg/m^2 (Bosaeus 2015, Khoury 2005 (at baseline, unclear if pre-pregnancy), Papandreou 2023, Seo 2020) or within the overweight range between 25-29.99kg/m^2 (Oken 2013, Yamada 2022 (at enrolment, unclear if pre-pregnancy). Bosaeus 2015 only included women within a healthy BMI range (self-reported, 18.5-24.9 kg/m^2), Anleu 2012 only included women within overweight and obese BMI ranges (25-29.99 kg/m^2 and ≥30 kg/m^2 respectively) while BMI at baseline was unclear for Burr 2007. Seo 2020 reported pre-pregnancy BMI to be within the underweight category (<18.5 kg/m^2) for 8.2% (n=5/61) in the intervention arm and 20% (n=4/20) in comparator arm.

Information on socio-economic status and geographical location was unclear or not reported for all except one study. Burr 2007 specifically included participants from one of the most deprived areas of Wales.

Co-morbidities were not described at baseline across studies, however, most studies specifically excluded women with certain co-morbidities during pregnancy, for example, women with prior or current diabetes diagnosis or treatment (Anleu 2012, Bosaeus 2015, Burr 2007, Khoury 2005, Papandreou 2023, Seo 2020, Yamada 2022 (excluded women with medical disease and complicated pregnancy); hypertension (Khoury 2005, Papandreou 2023, Seo 2020, Yamada 2022) or high risk pregnancy (Anleu 2012, Khoury 2005, Papandreou 2023, Yamada 2022). Oken 2013 did not report any exclusions relating to co-morbidities.

Interventions/comparators

Studies with the main aim to promote healthy eating and drinking advice in the population of interest were included. Studies focusing on weight gain, physical activity interventions or prevention of gestational diabetes have not been included in this review as this has been covered in other questions (Evidence reviews G and H).

Evidence was available for all intervention groups listed in the protocol:

- Intervention group 1: Interventions using information provision and/or education on healthy eating and drinking advice.
- Intervention group 2: Behavioural interventions (for example, goal setting, self-monitoring).
- Intervention group 3: Interventions aimed at improving access to heathy food and drinks (that is, provision of healthy food or drinks or welfare schemes designed to enable access to healthy food and drink).
- Intervention group 4: multicomponent interventions (interventions that combine more than 1 intervention listed above).

Studies reported all components of interventions apart from component 6 (behaviour change models, techniques and theories), where only one study mentioned the behaviour technique which was a clinical decision support system (Papandreou 2023).

For component 1 (mode of delivery), studies commonly delivered part or all of the intervention face-to face (Anleu 2019, Bosaeus 2015, Burr 2007, Khoury 2005, Oken 2013, Seo 2020, Yamada 2022), and also via phone call (Bosaeus 2015, Burr 2007, Papandreou 2023, Seo 2020, Yamada 2022). There were also printed and textual elements, for example, written information and leaflet (Burr 2007), booklet, shopping list notepad, wallet card (Oken 2013), brochures (Seo 2020) or electronic and textual elements via email (Oken 2013, Papandreou 2023, Seo 2020), website and text message (Yamada 2022) or online web based platform (Papandreou 2023).

For component 2 (intervention aimed at individuals or groups), most studies were individual based apart from Anleu 2019 which was unclear and Seo 2020 which was both individual and group based.

For component 3 (Individualised/tailored interventions or general), most studies were generally aimed to all the population of interest or otherwise tailored to the individual (Bosaeus 2015, Papandreou 2023) or included both general and tailored interventions with feedback on behavioural activities (Anleu 2019).

For component 4 (who delivers the intervention), a registered dietician delivered the intervention in many studies (Bosaeus 2015, Khoury 2005, Papandreou 2023, Seo 2020 Yamada 2022), a midwife delivered the intervention in Burr 2007, researchers delivered the intervention in Oken 2013 while Anleu 2019 did not mention who delivered the intervention.

For component 5 (where is the intervention delivered), interventions tended to be delivered in healthcare settings (Bosaeus 2015, Burr 2007, Khoury 2005, Yamada 2022) or otherwise during home visits (Anleu 2019), at home when using software (Papandreou 2023), online or over the phone (Seo 2020) or for Oken 2013 at home visit or research offices at baseline then online for the remainder of the study. For Seo 2020, the delivery location was unclear for the face to face component of the intervention.

Five studies compared diet counselling, advice or education on nutrition to standard care (Bosaeus 2015, Burr 2007, Khoury 2005, Oken 2013, Seo 2020). An additional study (Anleu 2019) included a diet counselling intervention as well as behavioural techniques via activities to reinforce learning and compared this to routine counselling. Content of nutrition advice differed between studies.

One study (Papandreou 2023) included a behavioural intervention whereby women tracked their nutrition status, weight gain and healthy eating based on a daily dietary plan based on Mediterranean Diet generated by a Clinical Decision Support System (CDSS) software compared to general lifestyle national guideline advice without a CDSS.

Burr 2007 and Oken 2013 additionally included interventions aimed at improving access to healthy food and drinks. Burr 2007 included a voucher group with vouchers that could be exchanged for free cartons of pure fruit juice delivered to homes by milk delivery service while Oken 2013 included an advice + gift card group which, in addition to the aforementioned advice, received additional food vouchers at baseline and weekly food vouchers and were encouraged to purchase fish.

Dietary counselling for two different diet types were compared in one study (Yamada 2022). One diet (Diet A) was a refined grain diet which was 75% of carbohydrate calories from refined grains and the other diet (Diet B) was a whole grain diet of 75% of carbohydrate calories from whole grains.

Outcomes

There was evidence available for all listed outcomes in the protocol.

None of the studies reported specifically changes in calorie intake during the third trimester. Typically change scores from first to third trimester were reported.

Where a study reported the outcome as stated in the protocol, this was reported over the individual food constituents. The exception was for fish intake and docosahexaenoic acid (DHA) consumption as the committee were interested in capturing omega 3 fatty acid intake. Where a study did not report the outcome as stated in the protocol and only included food constituent groups (for example, meats, fish, apples, bananas, oranges), these were reported instead.

Where saturated fat was not reported as an outcome, total fat was reported.

One study (Oken 2013) captured attitudes of women towards fish intake and reported this by combining two intervention arm groups (advice and voucher groups) compared to the control arm and was analysed this way.

Six studies did not report outcomes by BMI thresholds while 1 study (Boaeus 2015) reported outcomes for women with a healthy BMI range (18.5-24.9 kg/m^2) and another study (Anleu 2012) reported outcomes for combined overweight and obese BMI ranges.

Follow-up and analysis

Where there were multiple follow-up times, the longest follow-up time was considered.

Follow-up for relevant outcomes ranged between a mean of 22.3 gestational weeks to 36 gestational weeks.

Follow-up was undefined for Papandreou 2023 in terms of gestational weeks, however, the intervention was reported to run for 3 months. Follow-up was unclear for relevant outcomes for Yamada 2022 and reported as after at least 16 weeks from baseline, which would equate to a minimum of 24-39 gestational weeks. Total follow-up was mean 38.7 to 38.8 gestational weeks. For Seo 2020, follow-up for outcomes of interest was at 8 weeks (mean of 22.3 to 24.4 gestational weeks) of the 16-week total intervention.

Sensitivity analysis could not to be performed by component (mode of delivery, intervention aimed at individuals or groups, individualised/tailored interventions or general, who delivers the intervention, where the intervention is delivered, behaviour change models, techniques and theories) as there were not more than two studies per analysis.

As per protocol evidence was to be stratified according to BMI thresholds (overweight range, obesity range 1, 2 and 3), age (under 40 years, over 40 years), deprived socioeconomic group, co-morbidities where possible. For BMI, one study in the analysis was stratified under mixed BMI (overweight and obese) and all other studies in the analysis were stratified under mixed BMI (all categories). One study that only included participants within a healthy BMI threshold (BMI range 18.5-24.9 kg/m^2) was not able to be included in the analysis. Otherwise, there was no sufficient information on the above stratifications in the evidence.

Pre-specified sub-group analysis (geographical variation, religion and cultural considerations, and ethnicity) could not be conducted as there was no information within the studies to conduct the analysis.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review are listed, and reasons for their exclusion are provided in appendix K.

1 Summary of included studies

2 Summaries of the studies that were included in this review are presented in Table 2.

3 **Table 2: Summary of included studies**

Study	Population	Intervention	Comparison	Outcomes	Comments
Anleu 2019 RCT Chile	N=1002 Mean age in years (SD) Intervention: 27.9 (5.3) Comparator: 28.2 (6.1) Mean gestational age in weeks [at screening] (SD) NR Mean gestational age in weeks [at intervention] (SD) NR Mean BMI in kg/m^2 [at baseline] (SD) NR Comorbidities (n, %) NR Ethnicity n (%) NR	<u>Intervention:</u> Dietary counselling group. Aim of intervention was to lower intake of primary sources of total sugars by providing easy to follow culturally relevant recommendations. Three teaching sessions focused on education towards reduction of dietary source of sugars and behavioural techniques: Session 1: “Introduction to gestational diabetes: sugars consumption during pregnancy and consequences for the baby" with animated video and activity to guess food sugar content by placing sugar cubes on the top sugary food photos followed by education of sugar content with tailored recommendati	<u>Comparator:</u> Routine dietary counselling provided by primary health centres in the Chilean healthcare system	• changes in calorie intake • changes in vegetable intake • changes in fruit intake • changes in total sugars intake • changes in meat intake • changes in sausage intake • changes in whole milk intake • changes in low-fat milk product intake • changes in legumes intake	Intervention category 4 (combination of intervention 1 +2 (information provision and/or education to enhance healthy eating and drinking practices and behavioural interventions) Strata in analysis: single pregnancy, mixed BMI (overweight or obese), mixed age groups, mixed socio-economic groups and without any reported comorbidities Study only included BMI overweight and obese categories Follow-up for all outcomes: 35-37 gestational weeks The food frequency questionnaire was administered to women by dieticians once before the intervention at <15 gestational weeks and once after at gestational week 35-7.

Study	Population	Intervention	Comparison	Outcomes	Comments
		ons based on guesses Session 2: "Learning to substitute intelligently" with information provided on healthy food options and substitutes for high sugar content. In addition, an activity with magnetic board and images of top sugary foods and healthy or unhealthy foods was undertaken with women asked to choose two substitute alternatives for high-sugar foods in meals that they consume with choices discussed and recommendations for healthy food provided. Session 3: "Identifying my eating habits" with two activities. One used a traffic light board where women were asked to place photos of healthy, cautious or risky eating habits on the board. The second was a roulette game with direct and multiple-choice			Secondary study from the MIGHT study (Garmendia 2018, 2021) which also examined different levels of DHA supplementation with the present study combining the counselling arms with different doses and separately the control arms with different doses Details on deprivation were unclear while details on geographical variation, religion and cultural considerations were not reported

Study	Population	Intervention	Comparison	Outcomes	Comments
		questions relating to previous sessions topics to reinforce learning. General feedback of all educational sessions was provided. The first session occurred at <15 gestational weeks, second at 18 gestational weeks and third between 24-28 gestational weeks.			
Bosaeus 2015 RCT Sweden	N=101 Mean age in years (SD) NR; median IQR for intervention: 32.2 (20.3, 33.3); comparator: 30.6 (29.0, 32.5) Mean gestational age in weeks [at screening] (SD) NR Mean gestational age in weeks [at intervention] (SD) NR Mean BMI in kg/m^2 [at baseline] (SD) NR, median (IQR): Intervention: 22.3 (20.9, 23.3);	<u>Dietary counselling</u> At first hospital visit dietary counselling was provided by a registered dietician. Women were advised to: Consume three meals of fish per week with information on appropriate fish types (including avoidance of pollutants). Lower sugar intake aiming for <10 E% Eat 500g of vegetables and fruit per day Increase energy intake	<u>Comparator</u> Not defined, likely standard care routine diet advice at the maternity care centres based on flow chart and prior studies under the same trial.	• changes in calorie intake • changes in meat intake • changes in fish intake • changes in DHA intake	Intervention category 1 (information provision and/or education to enhance healthy eating and drinking practices) Single or multiple pregnancy status not reported Study only included BMI healthy range category Follow-up for all outcomes: 35–37 gestational weeks Details on deprivation, geographical variation, religion and cultural considerations were not reported

Study	Population	Intervention	Comparison	Outcomes	Comments
	Comparator: 22.3 (20.9, 22.7) Comorbidities (n, %) NR Ethnicity n (%) NR	by 350 kcal in the second trimester and 500 kcal in the third trimester. Advice was provided on vegetable and fruit quantity and options and appropriate snacks. Tailoring of diet quality was provided if required as well as counselling on fat quality, food frequency, fibre intake, and nutrient density based on the Nordic Nutrition Recommendations 2004. Subsequently, phone call reminders of recommendations were provided three times between the study visits in first and second trimesters and two times between the study visits in the second and third trimesters. First visit was during 8-12 gestational weeks and follow-up was during study visits in the second (24-26 gestational weeks) and third			

Study	Population	Intervention	Comparison	Outcomes	Comments
		trimesters (35-37 gestational weeks). Energy intake was assessed via a self-administered dietary semi-quantitative food frequency questionnaire previously validated in nonpregnant women and Swedish men. Fish and meat was ascertained by in house developed food frequency questionnaire.			
Burr 2007 RCT UK (Wales)	N=190 Mean age in years (SD) Advice group: 26.4 (5.4) Voucher group: 24.5 (5.1) Control group: 25.5 (5.7) Mean gestational age in weeks [at screening] (SD) Advice group: 15.6 (2.3) Voucher group: 15.6 (2.3) Control group: 16.0 (3.1) Mean gestational age in weeks [at intervention] (SD) NR Mean pre-pregnancy BMI in kg/m^2	<u>Advice group</u> A midwife provided advice and written information about eating more fruit and drinking more fruit juice as part of their diet. Women were provided a leaflet outlining the health benefits of fruit in pregnancy, with tips on how to incorporate fruit and fruit juice into diet as well as advising how to purchase fruit cheaply. <u>Voucher group</u> Vouchers that could be exchanged for	<u>Control group</u> Standard care which involved any nutrition advice usually provided by midwives, health visitors, general practitioners or other professionals.	• change in fruit consumption (apples) • changes in fruit consumption (oranges) • changes in fruit consumption (bananas)	Intervention category 1 (information provision and/or education to enhance healthy eating and drinking practices) and 3 (Interventions aimed at improving access to healthy foods) Single or multiple pregnancy status not reported Study specifically included participants from one of the most deprived areas of Wales Follow-up for all outcomes: 32 gestational weeks Details on deprivation, geographical

Study	Population	Intervention	Comparison	Outcomes	Comments
	[at baseline] (SD) NR Comorbidities (n, %) NR Ethnicity (n, %) NR	free cartons of pure fruit juice delivered to homes by milk delivery service. Each woman received 2 litres per week for 30 weeks.			variation, religion and cultural considerations were not reported
Khoury 2005 RCT Norway	N=290 Mean age in years (SD) Intervention: 29.6 (3.7) Comparator: 29.8 (3.4) Mean gestational age in weeks [at screening] (SD) Intervention: 19 (1.1) Comparator: 19 (1.1) Mean gestational age in weeks [at intervention] (SD) NR Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD) Intervention: 24.3 (2.9) Comparator: 24.3 (2.7) Comorbidities (n, %) NR Ethnicity (n, % NR	<u>Diet advice</u> Women received dietician advice on nutrition at visits on inclusion and at 24, 30 and 36 gestational weeks: Limit dietary cholesterol to 150 mg/day, reduce saturated fat consumption to 8% of dietary energy by replacing saturated fat by mono- and polyunsaturated fat. Total energy intake comprising 32% total fat - 8%-9% polyunsaturated fat; 16%-17% monounsaturated fat), 16-17% protein, and 50-51% carbohydrates . Promoting fatty fish, vegetable oils, especially olive oil and rapeseed oil, nuts, nut butters, margarine based on	<u>Control group</u> Continued their regular diet and asked not to introduce extra oils or low-fat meat and dairy products Aiming at 32% of energy from total fat (including 12% from saturated fat), 16% to 17% of energy from protein, and 50-51% of energy from carbohydrate.	• changes in calorie intake • changes in carbohydrate intake • changes in carbohydrate intake whereof sugar • changes in protein intake • changes in saturated fat intake	Intervention category 1 (information provision and/or education to enhance healthy eating and drinking practices) Strata in analysis: single pregnancy, mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities Follow-up for all outcomes: Until 36 gestational weeks All women: Asked to follow the diet until delivery and reminded to continue diet after 36 gestational weeks Energy intake was aimed at a weight gain of 8-14 kg from pre-pregnancy levels. Asked to suspend folate supplementation of 400 mg/day at baseline. Were recommended

Study	Population	Intervention	Comparison	Outcomes	Comments
		olive- or rapeseed oil, and avocado instead of meat, butter, cream, and fatty dairy items Encouraging at least 6 fresh fruit and vegetables per day and skimmed or low-fat dairy items (skimmed milk, fat-reduced cheese, and yogurt) to replace fat products. Advising meat as a bi-weekly main meal and legumes, vegetable main dishes, fatty fish, or fat trimmed poultry on alternate days Cooking lessons provided for assistance with specific foods such as legumes or olive oil 2 cups of filtered coffee/day were allowed			Vitamin D supplements 7.5-10 mg/d as part of a multivitamin with 200 mg/d of folate. Cod liver oil was not allowed unless the woman took it before enrolment and refused to use the multivitamin supplement instead. Iron supplementation was recommended if serum ferritin levels were <20 ug/L at 18 or 36 gestational weeks, or if blood haemoglobin level was <10 g/L at 30 gestational weeks Weighted diet records were obtained for compliance for 4 days during 19-24 gestational weeks and 6 days during 24-30 gestational weeks and 30-36 gestational weeks Details on deprivation, geographical variation, religion and cultural considerations were not reported
Oken 2013 RCT USA	N=61 Mean age in years (SD) Advice: NR, median (IQR)	<u>Advice group</u> -Given an 8-page booklet summarising health effects of DHA in	<u>Control group</u> Standard care provided a commonly administered 7-page	• changes in fish intake • changes in DHA	Intervention category 1 (information provision and/or education to enhance healthy

Study	Population	Intervention	Comparison	Outcomes	Comments
	was 32.6 (27.9, 35.9) Advice+gift card: NR, median (IQR) was 27.6 (24.5, 32.0) Control: NR, median (IQR) was 32.4 (27.7, 34.3) Mean gestational age in weeks [at screening] (SD) Advice: NR, median (IQR) was 15.2 (13.0, 18.6) Advice+gift card: NR, median (IQR) was 16.4 (13.9, 21.0) Control: NR, median (IQR) was 19.1 (14.7, 21.0) Mean gestational age in weeks [at intervention] (SD) NR Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD) Advice: NR, median (IQR) was 25.8 (22.8, 34.5) Advice+gift card: NR, median (IQR) was 23.4 (20.7, 28.3) Control: NR, median (IQR) was 22.3 (21.1, 27.0) Comorbidities (n, %) NR	pregnancy, promoted fish consumption with list of 29 low mercury fish based on DHA content and which fish to avoid based on mercury/other contaminants based on federal and local EPA advice. -Given a shopping list notepad including aforementioned list of recommended fish and 2 copies of a wallet-sized card summarizing the brochure information. -Each week thereafter during the 12 week intervention, received a "Weekly Thoughts" email with information promoting 2 weekly fish servings, fish or DHA health benefits, a recipe and website address for more information <u>Advice+ gift card</u> In addition to advice received (identical to advice group) $40 USD Whole Food	"Pregnancy Food Guide" and 1-page list of "Food Don'ts,". These included advice on many nutritional topics including which 4 fish types with highest mercury to avoid, and to eat up to 12 ounces a week of a variety of fish and shellfish that are lower in mercury. After the baseline visit, weekly emails were sent with tips on general pregnancy health and recipes, not focused on fish.	from fish intake • changes in DHA from fish+supplements intake • changes in DHA from supplements intake • fish consumption attitudes	eating and drinking practices) and 4 (intervention 1 + 3 (interventions aimed at improving access to healthy food and drinks Strata in analysis: single pregnancy, mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities Follow-up for all outcomes: Mean 30 gestational weeks All women: $25 gift card provided at baseline and the completion of the follow-up visit. The intervention ran for 12 weeks. Details on deprivation, geographical variation, religion and cultural considerations were not reported

Study	Population	Intervention	Comparison	Outcomes	Comments
	Ethnicity (n, %) Advice: White: 9 (50%) Black: 2 (11%) Asian: 2 (11%) Hispanic/other: 5 (28%) Advice+gift card: White: 9 (53%) Black: 2 (12%) Asian: 1 (6%) Hispanic/other: 5 (29%) Control: White: 9 (45%) Black: 2 (10%) Asian: 3 (15%) Hispanic/other: 6 (30%)	gift card at baseline visit and an additional gift card at each of the next 2 months totalling $120 ($10/week). women were encouraged to use gift cards to purchase fish.			
Papandreou 2023 RCT Greece	N=40 Mean age, years (SD) Intervention: 32.5 (6.4) Comparator: 29.1 (6.1) Mean gestational age in weeks [at screening] (SD) NR Mean gestational age in weeks [at intervention] (SD) NR Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)	<u>Clinical Decision Support System (CDSS group)</u> A dietician administered a personalised daily dietary plan based on the Mediterranean Diet (MD) that was generated by the CDSS software, according to the participant's needs, habits, and preferences. The CDSS dietary regimen	<u>Control group</u> Did not have access to CDSS and only received general lifestyle guidelines based on the "National Dietary Guidelines for Pregnancy" through phone call sessions with the dieticians every 15 days. Asked to keep a weekly 3 day food diary, which was emailed to the appointed dietician. Unexpected	• changes in calorie intake • changes in carbohydrates intake • changes in fibre intake • changes in protein intake • changes in total fat intake	Intervention category 2 (behavioural interventions) Strata in analysis: single pregnancy, mixed BMI (all categories), mixed age groups, mixed socio-economic groups and without any reported co-morbidities Single or multiple pregnancy status not reported Follow-up for all outcomes: 3 months (gestational

Study	Population	Intervention	Comparison	Outcomes	Comments
	NR Comorbidities (n, %) NR Ethnicity (n, %) NR	consisted of a daily eating programme that was renewed every 15 days, paired with nutritional recommendations that were in line with the "National Dietary Guidelines for Pregnancy". Participants were instructed to regularly visit their CDSS account from home and track their nutritional status, regarding body weight gain and healthy eating. On a weekly basis, participants were also instructed to input a 3-day food diary in the CDSS that was made automatically available to the dieticians. Every other week, phone interviews were performed to support nutritional and lifestyle consultations. Additionally, unexpected phone calls were made to obtain 24 h dietary recalls.	phone calls were made to obtain 24 h dietary recalls.		weeks not reported) Details on deprivation, geographical variation, religion and cultural considerations were not reported
Seo 2020 RCT	N=142 Mean age in years (SD)	Nutrition education and counselling	Standard care Women received offline	• changes in calorie intake	Intervention category 1 (information provision and/or

Study	Population	Intervention	Comparison	Outcomes	Comments
South Korea	Intervention: 33.2 (3.7) Comparator: 33.5 (3.6) Mean gestational age in weeks [at screening] (SD) Intervention: 14.3 (4.6) Comparator: 16.4 (4.6) Mean gestational age in weeks [at intervention] (SD) NR Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD) NR Comorbidities (n, %) NR Ethnicity n, (%) NR	A registered dietitian provided nutrition education for 16 weeks. Education involved a pregnancy diet guideline focused on a low-salt and sugar-diet with information on quantities in commercial food products and limiting excessive consumption. Targets for low sugar and salt consumption were based on World Health Organization (WHO) and "Dietary Reference Intakes for Koreans" (KDRIs) recommendations. The first 8 weeks involved four sessions of offline education (including cooking lesson) and individual counselling. For the 16 weeks, online nutrition education with e-mail education materials was conducted every two weeks (total 8 sessions). Follow-up education was	education only two times. Subjects in the control group received only 2 times (1st, 4th) offline education	• changes in carbohydrate intake • changes in total sugar intake • changes in sugar from processed food intake • changes in fibre intake • changes in protein intake changes in total fat intake	education to enhance healthy eating and drinking practices) Strata in analysis: single pregnancy, mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities Follow-up for all outcomes of interest :8 weeks (mean 22.3 to 24.4 gestational weeks). The intervention ran for 16 weeks in total. Details on deprivation, geographical variation, religion and cultural considerations were not reported

Study	Population	Intervention	Comparison	Outcomes	Comments
		conducted two times before birth via telephone counselling. Women were also monitored by gynaecologists.			
Yamada 2022 RCT USA	N=303 Mean age in years, mean (SD) Diet a: 28 (NR) Diet b: 28 (NR) Gestational age in weeks [at screening] 8-23 gestational weeks Gestational age timing of intervention 8-23 gestational weeks to delivery Mean [pre-pregnancy] BMI in kg/m^2 [at baseline] (SD) Diet a: 27.2 (NR) Diet b: 27.5 (NR) Comorbidities (n, %) NR Ethnicity (n, %) Diet A: Black: 5 (4) White: 58 (46) Asian: 3 (2) Other: 60 (48) Diet B: Black: 5 (4) White: 59 (48) Asian: 4 (3) Other: 54 (44)	<u>Diet a (refined grains)</u> 75% of carbohydrate calories from refined grains Involves patient dietary counselling with a registered dietician specialising in Hispanic diet counselling with food samples provided, diet brochures and recipe suggestions. Food frequency questionnaire was filled out after 16 weeks of the diet. Clinic visits were at standard frequency of obstetrical care. .	<u>Diet b (whole grains)</u> 75% of carbohydrate calories from whole grains Involves patient dietary counselling with a registered dietician specialising in Hispanic diet counselling with food samples provided, diet brochures and recipe suggestions. Food frequency questionnaire was filled out after 16 weeks of the diet. Clinic visits were at standard frequency of obstetrical care.	• changes in calorie intake • changes in carbohydrate intake • changes in sugar (sweets) intake • changes in fibre intake • changes in protein intake • changes in total fat intake	Intervention category 4: combination of intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) and 3 (interventions aimed at improving access to healthy foods) Strata in analysis: single pregnancy, mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities Industry funded (Grain Foods Foundation) Follow-up: Unclear for relevant outcomes (reported as after at least 16 weeks from baseline equating to minimum 24-39 gestational weeks). Total follow-up was mean 38.7 to 38.8 gestational weeks. General dietary instructions were the same

Study	Population	Intervention	Comparison	Outcomes	Comments
	(n calculated from %)				for each diet group and every patient had dietary counselling by a registered dietitian or physician at the initial visit and each subsequent clinic session Details on deprivation, geographical variation, religion and cultural considerations were not reported

BMI: body mass index; d: day; DHA: Docosahexaenoic acid; g: grams; IQR: interquartile range; kcal: kilocalories; Kg: kilograms: L: litres; m: metres; mg: milligrams; n: numbers; NR: not reported; RCT: randomised controlled trial; SD: standard deviation; µg: micrograms; USD: US dollar.

See the full evidence tables in appendix D and the forest plots in appendix E.

Summary of the evidence

Intervention group 1: Interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Four studies were included under this comparison.

Evidence for interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care suggested that there was an important difference between information provision and/or education to enhance healthy eating and drinking practices when compared to standard care for the outcomes of changes in sugar from processed food intake, changes in saturated fat intake and changes in DHA from combined fish and supplement intake, all favouring the intervention. There was no evidence of important differences or no important differences between interventions using information provision and/or education to enhance healthy eating and drinking practices when compared to standard care for the outcomes of changes in calorie intake, changes in fruit consumption (apples), changes in fruit consumption (oranges), changes in fruit consumption (bananas), changes in carbohydrate intake, changes in carbohydrate whereof sugar intake, changes in total sugar intake, changes in fibre intake, changes in protein intake, changes in fish intake, changes in total fat intake, changes in DHA from fish intake or changes in DHA from supplements intake.

The evidence ranged from very low to moderate quality.

Intervention group 1: Interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care in single

pregnancy: healthy BMI range (18.5-24.9 kg/m^2), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care suggested that there was no evidence of important differences between interventions using information provision and/or education to enhance healthy eating and drinking practices when compared to standard care for the outcomes of changes in calorie intake, changes in meat intake, changes in fish intake or changes in serum DHA in those with a BMI within the healthy range.

The evidence was very low in quality.

Intervention group 2: Behavioural interventions versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for interventions using behavioural interventions versus standard care suggested that there was no evidence of important differences between behavioural interventions compared to standard care for outcomes of changes in calorie intake, changes in carbohydrate intake, changes in fibre intake, changes in protein intake and changes in total fat intake.

The evidence was very low in quality.

Intervention group 3: Interventions aimed at improving access to healthy foods in single pregnancy: mixed BMI (all categories), age, socio-economic group and co-morbidities

One study was included under this comparison.

Evidence for interventions using interventions aimed at improving access to healthy foods versus standard care suggested that there were no important differences between the groups for changes in fruit consumption (apples), changes in fruit consumption (oranges), changes in fruit consumption (bananas).

The evidence was very low in quality.

Intervention group 4: Multicomponent interventions using information provision and/or education and behavioural intervention versus standard care (intervention group 1 + intervention group 2) in single pregnancy: mixed BMI (overweight or obese), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for multicomponent interventions using both information provision and/or education and behavioural interventions versus standard care suggested that there were no important differences between the groups for outcomes of changes in calorie intake, changes in vegetable intake, changes in fruit intake, changes in total sugars, changes in meat intake, changes in sausage intake, changes in whole milk product intake, changes in low-fat milk

product intake, and changes in legumes intake in those with a BMI in the overweight or obese categories.

The evidence was of moderate quality.

Intervention group 4: Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food versus standard care (intervention group 1 + intervention group 3) in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for multicomponent interventions using both information provision and/or education and aiming to improve access to healthy food versus standard care suggested that there was an important benefit for interventions using information provision and/or education for the outcomes of changes in fish intake, changes in DHA from fish intake and changes in DHA from combined fish and supplements intake. There were no important differences found between the groups for the outcome of changes in DHA from supplements intake.

The evidence ranged from very low to moderate quality.

Intervention group 1 (information provision and/or education) or Intervention group 3 (interventions aimed at improving access to healthy food) versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for interventions using information provision and/or education or interventions aimed at improving access to healthy food versus standard care suggested that there was no evidence of important difference between the groups for the outcome of fish consumption attitudes.

The evidence was of low quality.

Intervention group 4: Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food (intervention group 1 + intervention group 3): Diet A refined grains versus Diet B whole grains in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

One study was included under this comparison.

Evidence for interventions using multicomponent interventions of information provision and/or education and aiming to improve access to healthy food when comparing Diet A of refined grains versus Diet B of whole grains suggested that there was no important difference between Diet A and Diet B for outcomes of changes in calorie intake, changes in carbohydrate intake, changes in sugar (sweets) intake, changes in fibre intake, changes in protein intake and changes in total fat intake.

The evidence was of moderate quality.

See appendix F for full GRADE tables.

Economic evidence

Included studies

No economic studies were identified which were applicable to this review question. See the literature search strategy in appendix B and economic study selection flow chart in appendix G.

Excluded studies

Economic studies not included in this review are listed, and reasons for their exclusion are provided in appendix J.

Economic model

No economic modelling was undertaken for this review because the committee agreed that other topics were higher priorities for economic evaluation.

The committee's discussion and interpretation of the evidence

The outcomes that matter most

The aim of this review was to determine which interventions are the most effective to increase uptake of healthy eating and drinking advice during pregnancy. The outcomes of changes in calorie intake during the third trimester, changes in vegetable and fruit intake, changes in starchy foods (carbohydrates, sugar and fibre), changes in protein intake, changes in dairy intake and changes in saturated fat intake were prioritised as critical outcomes of interest by the committee. The committee aimed to align these outcomes with the food groups listed in the government advice to assess whether interventions were effective. The committee were interested in measuring changes in calorie intake during the third trimester, as an additional 200 calories may be required at this time, depending on how active the person is. The committee agreed that it was also important to capture changes in attitude, confidence and knowledge as part of people's intention to change behaviour and so this was considered to be an important outcome.

Evidence was identified for all critical and important outcomes.

The quality of the evidence

The quality of the evidence was assessed using Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) methodology. The quality of the evidence ranged from very low to moderate, with the majority of the evidence being low or very low in quality. Evidence tended to be downgraded due to serious or very serious risk of bias in the evidence, or imprecision around the effect estimate for some outcomes.

The risk of bias of included studies were assessed using the Cochrane Risk of Bias 2.0 tool for randomised controlled trials.

Seven studies were judged to be at high risk of bias as they did not perform intention to treat analyses, did not report any information on or reasons for missing data (with >5% of participants in each arm having missing data) and no analysis performed to determine if results were biased based on missing outcome data, potential bias introduced in measurement of outcome due to awareness of diet received and self-report in the food frequency questionnaires influencing responses. In one study, there was bias in the selection of reported results as the analysis appeared to change based on the changing ratio of intervention to control participants following loss to follow-up and missing outcome data. Common reasons for a judgement of some concerns in individual domains were no

information on allocation concealment, missing outcome data with reasons not likely to be related to true value or no protocol or pre-specified analysis reported.

One study conducted in the UK was downgraded for indirectness due to concern by the committee that the voucher intervention may be less relevant to the current UK context compared to time of study conduct (published year 2007, trial start date not reported) as pure orange juice is no longer promoted and milk delivery services are not as widely used.

Studies from high income countries were only considered as this was more applicable to the UK context. The committee acknowledged that some government recommendations in pregnancy might differ from the UK setting, for example, guidance on the energy intake of pregnant women in Sweden, which was taken into consideration with the evidence.

The committee took into account the quality and the uncertainty of the evidence in their interpretation of the evidence.

Benefits and harms

The committee acknowledged that there was limited evidence of efficacy across studies and intervention types. The committee also commented that little evidence was available for behavioural interventions as opposed to interventions on providing information or education towards a healthy diet and that this reflected the landscape of the general literature. The committee took into account the quantitative evidence from this review and from evidence review G on interventions to help achieve healthy and appropriate weight change during pregnancy, qualitative evidence on the facilitators and barriers for increasing uptake of government advice (evidence review Q) and their collective knowledge and experience to form recommendations on this topic.

The committee noted that evidence for interventions which provided information and/or education on healthy eating and drinking showed beneficial effect towards some outcomes such as changes in sugar from processed food intake, saturated fat intake and DHA from fish combined with supplement intake. These studies provided counselling and advice for appropriate consumption of a balanced and healthy diet in pregnancy or otherwise focused on aspects of a healthy diet, for example, fish consumption or salt and sugar reduction. The remaining evidence, however, suggested no differences for changes in carbohydrate, total sugar, fibre, protein, fish, DHA from fish intake and no important benefit found for changes in calorie intake, carbohydrates whereof sugar, fruit consumption (apples or oranges or bananas), total fat intake and DHA from supplement intake. The committee discussed that providing information on nutrition alone may not be enough to drive behaviour change to improve healthy eating and drinking during pregnancy. The committee agreed that how and when an intervention was delivered was important and highlighted that these elements should be considered while delivering the intervention. The committee discussed that content of information should be accurate and evidence based. In addition, it was discussed that this information should not come from commercial, non-independent sources. Based on the evidence and their experience, the committee agreed that information should be provided to pregnant people on what to eat and drink and how to eat and drink healthily rather than just on what foods and drinks to avoid as is current practice advice provided by midwives.

The committee noted that for behavioural interventions, there was no evidence of important differences for all of the outcomes and that the quality of the evidence was low to very low. As this evidence was not robust, no recommendations were made for this intervention. However, the committee did not make a research recommendation for this intervention as they did not consider it to be a priority for research recommendation.

The committee discussed studies that included interventions which aimed to increase access to healthy food by use of methods such as providing food vouchers. One study provided food vouchers in exchange for free cartons of pure fruit juice and only reported individual fruit outcomes. The committee commented that these outcomes did not appear to be of clinical

importance as this was not meaningful to inform fruit consumption as a whole. Otherwise, there was no evidence available for vegetable outcomes for interventions promoting access to healthy food and drinks. The committee discussed that poverty and food insecurity are common issues affecting many pregnant people, further limiting their possibility of following healthy eating advice. They agreed that it is important for the healthcare professional to provide information on available welfare schemes that provide access to healthy foods and drinks, including the Healthy Start scheme as well as other initiatives such as local pantries, food banks or other voucher schemes such as Rose Vouchers. The committee noted that some people, such as asylum seekers, would not be eligible for the Healthy Start vouchers but other resources such as food banks may be available. Although, it was also acknowledged that food banks may be more likely to provide processed or tinned food with limited access to fresh fruits and vegetables. The committee discussed their experience of differing availability of such schemes depending on geographical locations and noted that direct access to healthy foods may be limited for some people who are particularly disadvantaged.

The committee discussed the evidence on multicomponent interventions. One multicomponent intervention which provided information and education on eating low mercury fish whilst also providing food vouchers to promote fish intake led to a benefit for outcomes of changes in fish intake, changes in DHA from fish intake and changes in DHA from fish and supplements intake. However, this evidence was of low to very low quality. Otherwise, the committee noted for the rest of the multicomponent intervention evidence that there were no important differences between the intervention arm and the control arm across all critical and important outcomes, and the quality of the evidence ranged from very low to moderate. This included interventions that gave information and/or education on healthy eating in addition to a behavioural intervention, interventions that gave information and/or education on healthy eating or aimed to improve access to healthy food by means of a voucher in addition to evidence comparing two different diets (refined compared to whole grain diet) when giving information and/or education on healthy diet and improving access to healthy food and drinks. From their experience and knowledge of the literature, the committee discussed that behaviour change would be more likely to occur for multicomponent interventions rather than single interventions such as information provision or education. However, without robust evidence, the committee were not able to make a recommendation on multicomponent interventions. The committee did not make a research recommendation for this group of interventions as they did not consider it to be a priority for research recommendation.

The committee discussed that feedback on healthy eating habits was an important incentive towards behaviour change. This could be achieved through measures such as food diaries or apps to help set goals and self-monitor behaviours. However, there was no sufficient evidence on such interventions in the review, hence the committee did not make any specific recommendations on this.

The committee discussed the different intervention components across studies that is, mode of delivery (for example, in person, video, texts), aimed at individual or groups, tailored or general interventions, who delivered the intervention (for example, healthcare practitioner, peer), settings (for example, home, healthcare, community) and behaviour change models. The committee noted that most interventions were aimed at the general population of interest, although three studies involved tailored components for information provision or education. None of the studies that tailored their interventions on nutrition information showed any important benefits in outcomes, nor could evidence be drawn upon for tailoring of interventions towards specific population groups, for example, by deprivation status. However, based on their experience the committee agreed it is beneficial for the information and advice to be tailored based on the individual needs and circumstances.

Studies in the review commonly delivered interventions on an individual basis, and the committee commented that this was similar to current practice where information is given

individually at booking appointments with the midwife. It was discussed that delivery of the intervention in a group-based setting was not current practice unless for specific medical conditions such as gestational diabetes or hypertension. The committee agreed that group-based interventions would be useful for those that need support such as those in low socio-economic groups which would provide the added social benefits such as peer support. However, given the lack of clear evidence for either individual or group-based interventions, the committee did not make a recommendation on this component. The committee did not make a research recommendation in this area as they did not consider it to be a priority for research recommendation.

Most studies had a trained professional such as a dietician or midwife delivering the intervention and the committee agreed it was important that information is provided by professionals (for example, dietician, midwife, health visitors) who have independent, evidence-based, consistent information about healthy eating. The committee discussed that there should be consistency across local training to avoid frustrations and confusion arising from hearing different information from different health practitioners.

The committee noted that most interventions in the evidence were delivered in a healthcare setting which reflects current practice and a few studies also offered home based online or face-to-face delivery. The committee discussed that healthcare providers may currently visit a person's home and while this could benefit those from underprivileged backgrounds there was no evidence to support this potentially costly intervention.

The committee also noted that studies used different formats to deliver information such as face to face, telephone, brochures or leaflets or online and agreed that information could be provided via a variety of formats including printed and online materials.

There was no evidence for behaviour change models, techniques and theories in designing the interventions, hence the committee did not make any recommendations on this topic.

Evidence was available for women with single pregnancies and there was no evidence for women with multiple pregnancies. The committee agreed that the evidence from single pregnancies could be extrapolated to women with multiple pregnancies and hence agreed that all recommendations would apply to both women with single and multiple pregnancies.

There was no evidence for outcomes available for separate age groups of above or below 40 years, co-morbidities, geographical variation, religion and cultural considerations or ethnicity. Evidence for deprived socioeconomic group was only available for single fruit outcomes which was not of clinical importance. Where data was available, evidence was stratified by BMI. As there was no evidence for any strata or sub-groups of women, the committee did not make any specific recommendations for these groups. They agreed that the recommendations would apply to all pregnant women.

Cost effectiveness and resource use

No economic evidence was identified for this topic. The recommendations made broadly reflect current practice around discussions, information and advice on healthy eating and drinking during pregnancy. Moderate resource implications (in terms of health professionals' time) are expected in settings where discussions and advice on healthy eating and drinking are currently more limited and do not cover all aspects included in the recommendations.

Other factors the committee took into account

For this review question, the population in the evidence was women and no evidence was identified or reviewed for trans men or non-binary people. The protocol and literature searches were not designed to specifically look for evidence on trans men or non-binary people but they were also not excluded. However, there is a small chance evidence on them may not have been captured, if such evidence exists. In discussing the evidence, the

committee considered whether the recommendations could apply to a broader population, and used gender inclusive language to promote equity, respect and effective communication with everyone. Healthcare professionals should use their clinical judgement when implementing the recommendations, taking into account each person's circumstances, needs and preferences, and ensuring all people are treated with dignity and respect throughout their care.

Recommendations supported by this evidence review

This evidence review supports recommendations 1.2.2 to 1.2.3. Other evidence supporting these recommendations can be found in the evidence review G on interventions for helping to achieve healthy and appropriate weight change during pregnancy and evidence review Q on facilitators and barriers to increase the uptake of government advice on healthy eating and drinking in pregnancy.

References – included studies

Effectiveness

Anleu 2019

Anleu, Elisa, Reyes, Marcela, Araya B, Marcela et al. (2019) Effectiveness of an Intervention of Dietary Counseling for Overweight and Obese Pregnant Women in the Consumption of Sugars and Energy. Nutrients 11(2)

Bosaeus 2015

Bosaeus, Marja, Hussain, Aysha, Karlsson, Therese et al. (2015) A randomized longitudinal dietary intervention study during pregnancy: effects on fish intake, phospholipids, and body composition. Nutrition journal 14: 1

Burr 2007

Burr, M L, Trembeth, J, Jones, K B et al. (2007) The effects of dietary advice and vouchers on the intake of fruit and fruit juice by pregnant women in a deprived area: a controlled trial. Public health nutrition 10(6): 559-65

Khoury 2005

Khoury, J., Henriksen, T., Christophersen, B. et al. (2005) Effect of a cholesterol-lowering diet on maternal, cord, and neonatal lipids, and pregnancy outcome: A randomized clinical trial. American Journal of Obstetrics and Gynecology 193(4): 1292-1301

Oken 2013

Oken, Emily, Guthrie, Lauren B, Bloomingdale, Arienne et al. (2013) A pilot randomized controlled trial to promote healthful fish consumption during pregnancy: the Food for Thought Study. Nutrition journal 12(1): 1-11

Papandreou 2023

Papandreou, Panos, Amerikanou, Charalampia, Vezou, Chara et al. (2023) Improving Adherence to the Mediterranean Diet in Early Pregnancy Using a Clinical Decision Support System; A Randomised Controlled Clinical Trial. Nutrients 15(2)

Seo 2020

Seo, Yuri, Jeong, Yeon Seon, Koo, Kyung-A et al. (2020) Maternal nutrition intervention focused on the adjustment of salt and sugar intake can improve pregnancy outcomes. Food science & nutrition 8(7): 3900-3911

Yamada 2022

Yamada, Pamella, Paetow, Alexandra, Chan, Michael et al. (2022) Pregnancy outcomes with differences in grain consumption: A randomized controlled trial. Journal of Perinatal Medicine 50(4): 411-418

Appendices

Appendix A Review protocols

Review protocol for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Table 3: Review protocol

ID	Field	Content
0.	PROSPERO registration number	CRD42023390764
1.	Review title	Interventions to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice
2.	Review question	What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?
3.	Objective	To determine which interventions are the most effective to increase uptake of healthy eating and drinking advice during pregnancy
4.	Searches	The following databases will be searched: Cochrane Central Register of Controlled Trials (CENTRAL) Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Emcare • CINAHL • Epistemonikos • International Health Technology Assessment database • CRD HTA

ID	Field	Content
		Searches will be restricted by: • date: 1970 (rationale: after 1970 there was an increase in the prevalence of obesity and substantial lifestyle and socio-economic changes) • English language only • human studies only The full search strategies for MEDLINE database will be published in the final review. For each search, the principal database search strategy is quality assured by a second information scientist using an adaptation of the PRESS 2015 Guideline Evidence-Based Checklist.
5.	Condition or domain being studied	Healthy eating and drinking advice during pregnancy
6.	Population	Inclusion: Women during a single or multiple pregnancy Note: interventions aimed at advocates, parents and carers will be included only if they are representing their child or charge who is pregnant Exclusion: Specialist dietary interventions for women following a specific diet for a medical condition
7.	Intervention	Interventions will be included if the main aim is to promote heathy eating and drinking advice in the population of interest. Interventions will be organised according to the following groups: • intervention group 1: interventions using information provision and/or education on healthy eating and drinking advice • intervention group 2: behavioural interventions (for example, goal setting, self-monitoring) • intervention group 3: interventions aimed at improving access to heathy food and drinks (that is, provision of healthy food or drinks or welfare schemes designed to enable access to healthy food and drink) • intervention group 4: multicomponent interventions (interventions that combine more than 1 intervention listed above) The committee anticipated that, along with the intervention, studies would report at least 1 domain for each of the components noted below. Sensitivity analyses will be done according to these if enough data is available. Component 1: Mode of delivery

ID	Field	Content
		• face-to-face (in person, videoconference) • printed • electronic • audio • visual • textual (involving written text) Component 2: Intervention aimed at individuals or groups • individual based • group based Component 3: Individualised/tailored interventions or general • on demand, tailored interventions based on needs • general, aimed to all the population of interest Component 4: Who delivers the intervention • healthcare practitioner, health or social care worker (report what type) • peer (person with professional education on providing information and education on healthy eating) • healthy eating 'champion' Component 5: Where is the intervention delivered • during home visits • healthcare settings • community pharmacies • specialist clinics • community venues

ID	Field	Content
		• religious settings • other (report what type) Component 6: Behaviour change models, techniques and theories • trans-theoretical model (stages change) • theory of planned behaviour • theory of reasoned action • health protection theory • protection motivation theory • social cognitive theory • perceptions of risk • other (report what type) • no theory mentioned
8.	Comparator	• another intervention • status quo/treatment as usual (as defined by study authors, includes no treatment) • time (before and after)
9.	Types of study to be included	Include published full-text papers: • systematic reviews of rcts • parallel rcts • if insufficient parallel rcts*: • quasi-randomised controlled trials • non-randomised controlled trials/prospective cohort studies • retrospective cohort studies • historically controlled studies • ecological studies (geographical) • controlled before-and-after studies (including before and after surveys)

ID	Field	Content
		*Non-randomised studies will be considered for inclusion if insufficient RCT evidence is available for guideline decision making. Sufficiency will be judged taking into account factors including number/quality/sample size of RCTs, outcomes reported and availability of data from subgroups of interest. Conference abstracts will not be included because these do not typically have sufficient information to allow full critical appraisal.
10.	Other exclusion criteria	Setting: • countries other than high income countries (as defined by the OECD) If any study or systematic review includes <1/3 of women who received care in the above setting, it will be considered for inclusion but, if included, the evidence will be downgraded for indirectness. Studies conducted in the last 20 years (2003 onwards) Intervention: Population-level interventions (for example, TV and online advertising)
11.	Context	The population of this guideline may overlap with the population of women included in other NICE guidelines (such as intrapartum care, pregnancy and complex social factors or obesity prevention).
12.	Primary outcomes (critical outcomes)	• changes in calorie intake during the third trimester • changes in vegetable and fruit intake • changes in starchy foods (carbohydrates, sugar and fibre) • changes in protein intake • changes in dairy intake • changes in saturated fat intake Note: if the study reports both self-reported and objective measures, only objective measures will be reported
13.	Secondary outcomes (important outcomes)	Changes in attitude, confidence and knowledge as part of people's intention to change behaviour Note: if the study reports both self-reported and objective measures, only objective measures will be reported
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI and de-duplicated. Titles and abstracts of the retrieved citations will be screened to identify studies that potentially meet the inclusion criteria outlined in the review protocol.

ID	Field	Content
		Duplicate screening will not be undertaken for this question. Full versions of the selected studies will be obtained for assessment. Studies that fail to meet the inclusion criteria once the full version has been checked will be excluded at this stage. Each study excluded after checking the full version will be listed, along with the reason for its exclusion. A standardised form will be used to extract data from studies. The following data will be extracted: study details (reference, country where study was carried out, type and dates), participant characteristics, inclusion and exclusion criteria, details of the interventions if relevant, setting and follow-up, relevant outcome data and source of funding. One reviewer will extract relevant data into a standardised form, and this will be quality assessed by a senior reviewer.
15.	Risk of bias (quality) assessment	Quality assessment of individual studies will be performed using the following checklists: • ROBIS tool for systematic reviews • Cochrane RoB tool v.2 for RCTs and quasi-RCTs • Cochrane ROBINS-I tool for non-randomised (clinical) controlled trials and cohort studies • JBI checklist for prevalence studies • Effective Practice and Organisation of Care (EPOC) RoB Tool for before-and-after studies The quality assessment will be performed by one reviewer and this will be quality assessed by a senior reviewer.
16.	Strategy for data synthesis	Intervention review: Quantitative findings will be formally summarised in the review. Where multiple studies report on the same outcome for the same comparison, meta-analyses will be conducted using Cochrane Review Manager software. A fixed effect meta-analysis will be conducted and data will be presented as risk ratios if possible or odds ratios when required (for example, if only available in this form in included studies) for dichotomous outcomes, and mean differences or standardised mean differences for continuous outcomes. Heterogeneity in the effect estimates of the individual studies will be assessed using the I2 statistic. Alongside visual inspection of the point estimates and confidence intervals, I2 values of greater than 50% and 80% will be considered as significant and very significant heterogeneity, respectively. Heterogeneity will be explored as appropriate using sensitivity analyses and pre-

ID	Field	Content
		specified subgroup analyses. If heterogeneity cannot be explained through subgroup analysis then a random effects model will be used for meta-analysis, or the data will not be pooled. The confidence in the findings across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group: http://www.gradeworkinggroup.org/ Minimally important differences: Validated scales/continuous outcomes: published MIDs where available All other outcomes & where published MIDs are not available: 0.8 and 1.25 for all relative dichotomous outcomes ; +/- 0.5x control group SD for continuous outcomes
17.	Analysis of subgroups	Evidence will be stratified by: BMI thresholds: • overweight range: 25 to 29.99 kg/m^2 • obesity range 1: 30 to 34.99 kg/m^2 • obesity range 2: 35 to 39.99 kg/m^2 • obesity range 3: >40 kg/m^2 • follow the NICE guidance on Obesity: identification and classification of overweight and obesity (update) for people with a South Asian, Chinese, other Asian, Middle Eastern, Black African or African-Caribbean family background • age • under 40 years • over 40 years • deprived socioeconomic group • comorbidities Evidence will be subgrouped by the following only in the event that there is significant heterogeneity in outcomes:

ID	Field	Content	
		• geographical variation, for example, places without adequate provision of primary care (outside cities). • religion and cultural considerations • ethnicity • White/White British • Asian/Asian British • Black/African/Caribbean/Black British • mixed/Multiple ethnic groups • other ethnic group Where evidence is stratified or subgrouped the committee will consider on a case by case basis if separate recommendations should be made for distinct groups. Separate recommendations may be made where there is evidence of a differential effect of interventions in distinct groups. If there is a lack of evidence in one group, the committee will consider, based on their experience, whether it is reasonable to extrapolate and assume the interventions will have similar effects in that group compared with others.	
18.	Type and method of review	☒	Intervention
		☐	Diagnostic
		☐	Prognostic
		☐	Qualitative
		☐	Epidemiologic
		☐	Service Delivery
		☐	Other (please specify)
19.	Language	English	
20.	Country	England	
21.	Anticipated or actual start date	05/01/2023	

ID	Field	Content		
22.	Anticipated completion date	10/07/2024		
23.	Stage of review at time of this submission	Review stage	Started	Completed
		Preliminary searches	☐	☒
		Piloting of the study selection process	☐	☒
		Formal screening of search results against eligibility criteria	☐	☒
		Data extraction	☐	☒
		Risk of bias (quality) assessment	☐	☒
		Data analysis	☐	☒
24.	Named contact	5a. Named contact National Institute for Health and Care Excellence (NICE) 5b Named contact e-mail mandcnutrition@nice.org.uk 5c. Organisational affiliation of the review National Institute for Health and Care Excellence (NICE)		
25.	Review team members	From the National Guideline Alliance: Senior Systematic Reviewer Systematic Reviewer		
26.	Funding sources/sponsor	This systematic review is being completed by the National Institute for Health and Care Excellence (NICE)		
27.	Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any		

ID	Field	Content	
		decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.	
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10191	
29.	Other registration details	None	
30.	URL for published protocol	https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=390764	
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: notifying registered stakeholders of publication publicising the guideline through NICE's newsletter and alerts issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.	
32.	Keywords	Healthy eating, pregnancy	
33.	Details of existing review of same topic by same authors	Not applicable	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☒	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	None	
36.	Details of final publication	www.nice.org.uk	

CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; DARE: Database of Abstracts of Reviews of Effects; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HTA: Health Technology Assessment; kg: kilograms; m: metres; MID: minimally important difference; NGA: National Guideline Alliance; NHS: National health service; NICE: National Institute for Health and Care Excellence; RCT: randomised controlled trial; RoB: risk of bias; SD: standard deviation

Appendix B Literature search strategies

Literature search strategies for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Effectiveness searches

Database: MEDLINE

Date of last search: 13/04/2023

#	Searches
1	exp Pregnancy/ or Pregnant Women/ or Prenatal Care/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).tw,kf.
3	1 or 2
4	Diet/ or Diet, Healthy/
5	Feeding Behavior/ or exp Drinking Behavior/
6	Nutritive Value/ or exp Nutritional Requirements/ or Energy Intake/ or exp Maternal Nutritional Physiological Phenomena/
7	fruit/ or vegetables/
8	((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)).tw,kf.
9	((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)).tw,kf.
10	((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)).tw,kf.
11	exp Sodium, Dietary/
12	(((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*).tw,kf.
13	beverages/ or alcoholic beverages/ or artificially sweetened beverages/ or carbonated beverages/ or coffee/ or drinking water/ or energy drinks/ or fermented beverages/ or "fruit and vegetable juices"/ or milk/ or cultured milk products/ or kefir/ or koumiss/ or whey/ or milk substitutes/ or soy milk/ or sugar-sweetened beverages/ or tea/
14	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) adj2 (drink* or beverage*)).tw,kf.
15	(coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?").tw,kf.
16	or/4-15
17	3 and 16
18	Access to Information/ or Information Centers/ or Information Services/ or Information Dissemination/ or Information Seeking Behavior/ or Communication/ or Communications Media/ or Consumer Health Information/ or exp Health Information Management/ or Health Communication/ or Health Promotion/ or Health Education/ or exp Patient Education as Topic/ or Patient Education Handout/ or Pamphlets/ or Posters as topic/ or Audiovisual aids/ or Books, illustrated/ or Medical illustration/ or Computers, Handheld/ or Decision Support Systems, Clinical/ or Internet/ or Internet-Based Intervention/ or Social Media/ or Social Networking/ or Mobile Applications/ or Blogging/ or Electronic Mail/ or exp Cell phone/ or Hotlines/ or Telephone/ or Teaching materials/
19	((inform* or educat* or advice or support* or guid*) adj4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)).ti.
20	((medical or health or electronic or virtual) adj4 (inform* or educat* or support* or learn* or guid*)).ti.
21	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*).ti.
22	(mobile* adj2 app*).ti.
23	Therapy, Computer-Assisted/ or Telemedicine/
24	exp Diet Therapy/ or Behavior Therapy/ or Empowerment/
25	health behavior/ or health knowledge, attitudes, practice/ or lifestyle/

#	Searches
26	((behavio* or diet* or nutrition* or lifestyle* or life style*) adj2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)).ti.
27	(health* adj2 (behavio* or belief* or believ*)).ti.
28	role model*.ti.
29	Self Care/
30	Self-Help Groups/
31	motivation/ or goals/ or intention/ or Achievement/
32	((self or individual* or tailor* or group*) adj2 (help* or monitor* or care* or manag* or motivat*)).ti.
33	((goal* adj2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*).ti.
34	Access to Healthy Foods/ or Food Assistance/ or Dietary Services/ or Food Security/
35	exp Social Support/
36	social welfare/
37	((government* or federal or welfare or aid* or social security or relief) adj2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)).ti.
38	((food* or nutrition*) adj2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)).ti.
39	(healthy start* or healthystart*).ti.
40	((social* or communit* or peer) adj2 (support* or intervention*)).ti.
41	or/18-40
42	17 and 41
43	letter/
44	editorial/
45	news/
46	exp historical article/
47	Anecdotes as topic/
48	comment/
49	case reports/
50	(letter or comment*).ti.
51	or/43-50
52	randomized controlled trial/ or random*.ti,ab.
53	51 not 52
54	animals/ not humans/
55	exp Animals, Laboratory/
56	exp Animal Experimentation/
57	exp Models, Animal/
58	exp Rodentia/
59	(rat or rats or rodent* or mouse or mice).ti.
60	or/53-59
61	42 not 60
62	limit 61 to English language
63	randomized controlled trial.pt.
64	controlled clinical trial.pt.
65	pragmatic clinical trial.pt.
66	randomi#ed.ab.
67	placebo.ab.
68	drug therapy.fs.
69	randomly.ab.
70	trial.ab.
71	groups.ab.
72	or/63-71
73	Clinical Trials as topic.sh.
74	trial.ti.
75	or/63-67,69,73-74

#	Searches
76	meta-analysis/
77	meta-analysis as topic/
78	(meta analy* or metanaly* or metaanaly*).ti,ab.
79	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
80	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
81	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
82	(search* adj4 literature).ab.
83	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
84	cochrane.jw.
85	or/76-84
86	62 and (75 or 85)
87	Observational Studies as Topic/
88	Observational Study/
89	Epidemiologic Studies/
90	exp Case-Control Studies/
91	exp Cohort Studies/
92	Cross-Sectional Studies/
93	Controlled Before-After Studies/
94	Historically Controlled Study/
95	Interrupted Time Series Analysis/
96	Comparative Study.pt.
97	case control$.tw.
98	case series.tw.
99	(cohort adj (study or studies)).tw.
100	cohort analy$.tw.
101	(follow up adj (study or studies)).tw.
102	(observational adj (study or studies)).tw.
103	longitudinal.tw.
104	prospective.tw.
105	retrospective.tw.
106	cross sectional.tw.
107	or/87-106
108	62 and 107
109	108 not 86
110	afghanistan/ or africa/ or africa, northern/ or africa, central/ or africa, eastern/ or "africa south of the sahara"/ or africa, southern/ or africa, western/ or albania/ or algeria/ or andorra/ or angola/ or "antigua and barbuda"/ or argentina/ or armenia/ or azerbaijan/ or bahamas/ or bahrain/ or bangladesh/ or barbados/ or belize/ or benin/ or bhutan/ or bolivia/ or borneo/ or "bosnia and herzegovina"/ or botswana/ or brazil/ or brunei/ or bulgaria/ or burkina faso/ or burundi/ or cabo verde/ or cambodia/ or cameroon/ or central african republic/ or chad/ or exp china/ or comoros/ or congo/ or cote d'ivoire/ or croatia/ or cuba/ or "democratic republic of the congo"/ or cyprus/ or djibouti/ or dominica/ or dominican republic/ or ecuador/ or egypt/ or el salvador/ or equatorial guinea/ or eritrea/ or eswatini/ or ethiopia/ or fiji/ or gabon/ or gambia/ or "georgia (republic)"/ or ghana/ or grenada/ or guatemala/ or guinea/ or guinea-bissau/ or guyana/ or haiti/ or honduras/ or independent state of samoa/ or exp india/ or indian ocean islands/ or indochina/ or indonesia/ or iran/ or iraq/ or jamaica/ or jordan/ or kazakhstan/ or kenya/ or kosovo/ or kuwait/ or kyrgyzstan/ or laos/ or lebanon/ or liechtenstein/ or lesotho/ or liberia/ or libya/ or madagascar/ or malaysia/ or malawi/ or mali/ or malta/ or mauritania/ or mauritius/ or mekong valley/ or melanesia/ or micronesia/ or monaco/ or mongolia/ or montenegro/ or morocco/ or mozambique/ or myanmar/ or namibia/ or nepal/ or nicaragua/ or niger/ or nigeria/ or oman/ or pakistan/ or palau/ or exp panama/ or papua new guinea/ or paraguay/ or peru/ or philippines/ or qatar/ or "republic of belarus"/ or "republic of north macedonia"/ or romania/ or exp russia/ or rwanda/ or "saint kitts and nevis"/ or saint lucia/ or "saint vincent and the grenadines"/ or "sao tome and principe"/ or saudi arabia/ or serbia/ or sierra leone/ or senegal/ or seychelles/ or singapore/ or somalia/ or south africa/ or south sudan/ or sri lanka/ or sudan/ or suriname/ or syria/ or taiwan/ or tajikistan/ or tanzania/ or thailand/ or timor-leste/ or togo/ or tonga/ or "trinidad and tobago"/ or tunisia/ or turkmenistan/ or uganda/ or ukraine/ or united arab emirates/ or uruguay/ or uzbekistan/ or vanuatu/ or venezuela/ or vietnam/ or west indies/ or yemen/ or zambia/ or zimbabwe/
111	"organisation for economic co-operation and development"/
112	australasia/ or exp australia/ or austria/ or baltic states/ or belgium/ or exp canada/ or chile/ or colombia/ or costa rica/ or czech republic/ or exp denmark/ or estonia/ or europe/ or finland/ or exp france/ or exp germany/ or greece/ or hungary/ or iceland/ or ireland/ or israel/ or exp italy/ or exp japan/ or korea/ or latvia/ or lithuania/ or luxembourg/

#	Searches
	or mexico/ or netherlands/ or new zealand/ or north america/ or exp norway/ or poland/ or portugal/ or exp "republic of korea"/ or "scandinavian and nordic countries"/ or slovakia/ or slovenia/ or spain/ or sweden/ or switzerland/ or turkey/ or exp united kingdom/ or exp united states/
113	european union/
114	developed countries/
115	or/111-114
116	110 not 115
117	86 not 116
118	109 not 116
119	limit 117 to ed=19700101-20230430
120	limit 117 to dt=19700101-20230430
121	119 or 120
122	limit 118 to ed=19700101-20230430
123	limit 118 to dt=19700101-20230430
124	122 or 123

Database: Embase

Date of last search: 13/04/2023

#	Searches
1	exp pregnancy/ or pregnant woman/ or prenatal care/ or prenatal period/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).tw,kf.
3	1 or 2
4	diet/ or healthy diet/
5	exp feeding behavior/ or dietary pattern/
6	nutritional value/
7	nutritional requirement/
8	exp dietary intake/
9	maternal nutrition/
10	fruit/ or vegetable/
11	vegetable consumption/
12	((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)).tw,kf.
13	((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)).tw,kf.
14	((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)).tw,kf.
15	sodium intake/ or salt intake/
16	(((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*).tw,kf.
17	exp beverage/
18	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) adj2 (drink* or beverage*)).tw,kf.
19	(coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?").tw,kf.
20	or/4-19
21	3 and 20
22	*access to information/ or *information/ or *information center/ or *information service/ or *information dissemination/ or *information seeking/ or *help seeking behavior/ or *interpersonal communication/ or *communication/ or *mass medium/ or *consumer health information/ or *medical information system/ or *health promotion/ or *health education/ or *education program/ or *patient education/ or *patient information/ or *medical information/ or *publication/ or *visual information/ or *personal digital assistant/ or exp *decision support system/ or *patient decision making/ or *internet/ or *web-based intervention/ or *web browser/ or *social media/ or *blogging/ or *social network/ or *mobile application/ or *e-mail/ or *email support/ or *text messaging/ or *text messaging support/ or *hotline/ or *telephone/ or *telephone support/ or exp *mobile phone/ or *teleconsultation/ or exp *teaching/
23	((inform* or educat* or advice or support* or guid*) adj4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)).ti.

#	Searches
24	((medical or health or electronic or virtual) adj4 (inform* or educat* or support* or learn* or guid*)).ti.
25	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*).ti.
26	(mobile* adj2 app*).ti.
27	*computer assisted therapy/ or *telehealth/ or *telemedicine/
28	exp *diet therapy/ or *behavior therapy/ or *empowerment/ or *lifestyle modification/
29	*health behavior/ or *attitude to health/
30	((behavio* or diet* or nutrition* or lifestyle* or life style*) adj2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)).ti.
31	(health* adj2 (behavio* or belief* or believ*)).ti.
32	role model*.ti.
33	*self care/
34	*self help/
35	*motivation/ or *achievement/ or *goal attainment/
36	((self or individual* or tailor* or group*) adj2 (help* or monitor* or care* or manag* or motivat*)).ti.
37	((goal* adj2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*).ti.
38	*healthy food access/ or *food assistance/ or *dietary service/ or *food security/
39	exp *social support/
40	*social welfare/
41	((government* or federal or welfare or aid* or social security or relief) adj2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)).ti.
42	((food* or nutrition*) adj2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)).ti.
43	(healthy start* or healthystart*).ti.
44	((social* or communit* or peer) adj2 (support* or intervention*)).ti.
45	or/22-44
46	21 and 45
47	letter.pt. or letter/
48	note.pt.
49	editorial.pt.
50	case report/ or case study/
51	(letter or comment*).ti.
52	or/47-51
53	randomized controlled trial/ or random*.ti,ab.
54	52 not 53
55	animal/ not human/
56	nonhuman/
57	exp Animal Experiment/
58	exp Experimental Animal/
59	animal model/
60	exp Rodent/
61	(rat or rats or rodent* or mouse or mice).ti.
62	or/54-61
63	46 not 62
64	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
65	63 not 64
66	limit 65 to English language
67	random*.ti,ab.
68	factorial*.ti,ab.
69	(crossover* or cross over*).ti,ab.
70	((doubl* or singl*) adj blind*).ti,ab.

#	Searches
71	(assign* or allocat* or volunteer* or placebo*).ti,ab.
72	crossover procedure/
73	single blind procedure/
74	randomized controlled trial/
75	double blind procedure/
76	or/67-75
77	systematic review/
78	meta-analysis/
79	(meta analy* or metanaly* or metaanaly*).ti,ab.
80	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
81	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
82	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
83	(search* adj4 literature).ab.
84	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
85	((pool* or combined) adj2 (data or trials or studies or results)).ab.
86	cochrane.jw.
87	or/77-86
88	66 and (76 or 87)
89	Clinical study/
90	Case control study/
91	Family study/
92	Longitudinal study/
93	Retrospective study/
94	comparative study/
95	Prospective study/
96	Randomized controlled trials/
97	95 not 96
98	Cohort analysis/
99	cohort analy$.tw.
100	(Cohort adj (study or studies)).tw.
101	(Case control$ adj (study or studies)).tw.
102	(follow up adj (study or studies)).tw.
103	(observational adj (study or studies)).tw.
104	(epidemiologic$ adj (study or studies)).tw.
105	(cross sectional adj (study or studies)).tw.
106	case series.tw.
107	prospective.tw.
108	retrospective.tw.
109	or/89-94,97-108
110	66 and 109
111	110 not 88
112	afghanistan/ or africa/ or "africa south of the sahara"/ or albania/ or algeria/ or andorra/ or angola/ or argentina/ or "antigua and barbuda"/ or armenia/ or exp azerbaijan/ or bahamas/ or bahrain/ or bangladesh/ or barbados/ or belarus/ or belize/ or benin/ or bhutan/ or bolivia/ or borneo/ or exp "bosnia and herzegovina"/ or botswana/ or exp brazil/ or brunei darussalam/ or bulgaria/ or burkina faso/ or burundi/ or cambodia/ or cameroon/ or cape verde/ or central africa/ or central african republic/ or chad/ or exp china/ or comoros/ or congo/ or cook islands/ or cote d'ivoire/ or croatia/ or cuba/ or cyprus/ or democratic republic congo/ or djibouti/ or dominica/ or dominican republic/ or ecuador/ or el salvador/ or egypt/ or equatorial guinea/ or eritrea/ or eswatini/ or ethiopia/ or exp "federated states of micronesia"/ or fiji/ or gabon/ or gambia/ or exp "georgia (republic)"/ or ghana/ or grenada/ or guatemala/ or guinea/ or guinea-bissau/ or guyana/ or haiti/ or honduras/ or exp india/ or exp indonesia/ or iran/ or exp iraq/ or jamaica/ or jordan/ or kazakhstan/ or kenya/ or kiribati/ or kosovo/ or kuwait/ or kyrgyzstan/ or laos/ or lebanon/ or liechtenstein/ or lesotho/ or liberia/ or libyan arab jamahiriya/ or madagascar/ or malawi/ or exp malaysia/ or maldives/ or mali/ or malta/ or mauritania/ or mauritius/ or melanesia/ or moldova/ or monaco/ or mongolia/ or "montenegro (republic)"/ or morocco/ or mozambique/ or myanmar/ or namibia/ or nauru/ or nepal/ or nicaragua/ or niger/ or nigeria/ or niue/ or north africa/ or oman/ or exp pakistan/ or palau/ or palestine/ or panama/ or papua new guinea/ or paraguay/ or peru/ or philippines/ or polynesia/ or qatar/ or "republic of north macedonia"/ or romania/ or

#	Searches
	exp russian federation/ or rwanda/ or sahel/ or "saint kitts and nevis"/ or "saint lucia"/ or "saint vincent and the grenadines"/ or saudi arabia/ or senegal/ or exp serbia/ or seychelles/ or sierra leone/ or singapore/ or "sao tome and principe"/ or solomon islands/ or exp somalia/ or south africa/ or south asia/ or south sudan/ or exp southeast asia/ or sri lanka/ or sudan/ or suriname/ or syrian arab republic/ or taiwan/ or tajikistan/ or tanzania/ or thailand/ or timor-leste/ or togo/ or tonga/ or "trinidad and tobago"/ or tunisia/ or turkmenistan/ or tuvalu/ or uganda/ or exp ukraine/ or exp united arab emirates/ or uruguay/ or exp uzbekistan/ or vanuatu/ or venezuela/ or viet nam/ or western sahara/ or yemen/ or zambia/ or zimbabwe/
113	exp "organisation for economic co-operation and development"/
114	exp australia/ or "australia and new zealand"/ or austria/ or baltic states/ or exp belgium/ or exp canada/ or chile/ or colombia/ or costa rica/ or czech republic/ or denmark/ or estonia/ or europe/ or exp finland/ or exp france/ or exp germany/ or greece/ or hungary/ or iceland/ or ireland/ or israel/ or exp italy/ or japan/ or korea/ or latvia/ or lithuania/ or luxembourg/ or exp mexico/ or netherlands/ or new zealand/ or north america/ or exp norway/ or poland/ or exp portugal/ or scandinavia/ or sweden/ or slovakia/ or slovenia/ or south korea/ or exp spain/ or switzerland/ or "Turkey (republic)"/ or exp united kingdom/ or exp united states/ or western europe/
115	european union/
116	developed country/
117	or/113-116
118	112 not 117
119	88 not 118
120	111 not 118

Database: Emcare

Date of last search: 13/04/2023

#	Searches
1	exp pregnancy/ or pregnant woman/ or prenatal care/ or prenatal period/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).tw,kf.
3	1 or 2
4	diet/ or healthy diet/
5	exp feeding behavior/ or dietary pattern/
6	nutritional value/
7	nutritional requirement/
8	exp dietary intake/
9	maternal nutrition/
10	fruit/ or vegetable/
11	vegetable consumption/
12	((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)).tw,kf.
13	((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)).tw,kf.
14	((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)).tw,kf.
15	sodium intake/ or salt intake/
16	(((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*).tw,kf.
17	exp beverage/
18	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) adj2 (drink* or beverage*)).tw,kf.
19	(coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?").tw,kf.
20	or/4-19
21	3 and 20
22	*access to information/ or *information/ or *information center/ or *information service/ or *information dissemination/ or *information seeking/ or *help seeking behavior/ or *interpersonal communication/ or *communication/ or *mass medium/ or *consumer health information/ or *medical information system/ or *health promotion/ or *health education/ or *education program/ or *patient education/ or *patient information/ or *medical information/ or *publication/ or *visual information/ or *personal digital assistant/ or exp *decision support system/ or *patient decision making/ or *internet/ or *web-based intervention/ or *web browser/ or *social media/ or *blogging/ or *social network/ or *mobile application/ or *e-mail/ or *email support/ or *text messaging/ or *text messaging support/ or *hotline/ or *telephone/ or *telephone support/ or exp *mobile phone/ or *teleconsultation/ or exp *teaching/

#	Searches
23	((inform* or educat* or advice or support* or guid*) adj4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)).ti.
24	((medical or health or electronic or virtual) adj4 (inform* or educat* or support* or learn* or guid*)).ti.
25	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*).ti.
26	(mobile* adj2 app*).ti.
27	*computer assisted therapy/ or *telehealth/ or *telemedicine/
28	exp *diet therapy/ or *behavior therapy/ or *empowerment/ or *lifestyle modification/
29	*health behavior/ or *attitude to health/
30	((behavio* or diet* or nutrition* or lifestyle* or life style*) adj2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)).ti.
31	(health* adj2 (behavio* or belief* or believ*)).ti.
32	role model*.ti.
33	*self care/
34	*self help/
35	*motivation/ or *achievement/ or *goal attainment/
36	((self or individual* or tailor* or group*) adj2 (help* or monitor* or care* or manag* or motivat*)).ti.
37	((goal* adj2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*).ti.
38	*healthy food access/ or *food assistance/ or *dietary service/ or *food security/
39	exp *social support/
40	*social welfare/
41	((government* or federal or welfare or aid* or social security or relief) adj2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)).ti.
42	((food* or nutrition*) adj2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)).ti.
43	(healthy start* or healthystart*).ti.
44	((social* or communit* or peer) adj2 (support* or intervention*)).ti.
45	or/22-44
46	21 and 45
47	letter.pt. or letter/
48	note.pt.
49	editorial.pt.
50	case report/ or case study/
51	(letter or comment*).ti.
52	or/47-51
53	randomized controlled trial/ or random*.ti,ab.
54	52 not 53
55	animal/ not human/
56	nonhuman/
57	exp Animal Experiment/
58	exp Experimental Animal/
59	animal model/
60	exp Rodent/
61	(rat or rats or rodent* or mouse or mice).ti.
62	or/54-61
63	46 not 62
64	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
65	63 not 64
66	limit 65 to English language
67	random*.ti,ab.
68	factorial*.ti,ab.

#	Searches
69	(crossover* or cross over*).ti,ab.
70	((doubl* or singl*) adj blind*).ti,ab.
71	(assign* or allocat* or volunteer* or placebo*).ti,ab.
72	crossover procedure/
73	single blind procedure/
74	randomized controlled trial/
75	double blind procedure/
76	or/67-75
77	systematic review/
78	meta-analysis/
79	(meta analy* or metanaly* or metaanaly*).ti,ab.
80	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
81	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
82	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
83	(search* adj4 literature).ab.
84	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
85	((pool* or combined) adj2 (data or trials or studies or results)).ab.
86	cochrane.jw.
87	or/77-86
88	66 and (76 or 87)
89	Clinical study/
90	Case control study/
91	Family study/
92	Longitudinal study/
93	Retrospective study/
94	comparative study/
95	Prospective study/
96	Randomized controlled trials/
97	95 not 96
98	Cohort analysis/
99	cohort analy$.tw.
100	(Cohort adj (study or studies)).tw.
101	(Case control$ adj (study or studies)).tw.
102	(follow up adj (study or studies)).tw.
103	(observational adj (study or studies)).tw.
104	(epidemiologic$ adj (study or studies)).tw.
105	(cross sectional adj (study or studies)).tw.
106	case series.tw.
107	prospective.tw.
108	retrospective.tw.
109	or/89-94,97-108
110	66 and 109
111	110 not 88
112	afghanistan/ or africa/ or "africa south of the sahara"/ or albania/ or algeria/ or andorra/ or angola/ or argentina/ or "antigua and barbuda"/ or armenia/ or exp azerbaijan/ or bahamas/ or bahrain/ or bangladesh/ or barbados/ or belarus/ or belize/ or benin/ or bhutan/ or bolivia/ or borneo/ or exp "bosnia and herzegovina"/ or botswana/ or exp brazil/ or brunei darussalam/ or bulgaria/ or burkina faso/ or burundi/ or cambodia/ or cameroon/ or cape verde/ or central africa/ or central african republic/ or chad/ or exp china/ or comoros/ or congo/ or cook islands/ or cote d'ivoire/ or croatia/ or cuba/ or cyprus/ or democratic republic congo/ or djibouti/ or dominica/ or dominican republic/ or ecuador/ or el salvador/ or egypt/ or equatorial guinea/ or eritrea/ or eswatini/ or ethiopia/ or exp "federated states of micronesia"/ or fiji/ or gabon/ or gambia/ or exp "georgia (republic)"/ or ghana/ or grenada/ or guatemala/ or guinea/ or guinea-bissau/ or guyana/ or haiti/ or honduras/ or exp india/ or exp indonesia/ or iran/ or exp iraq/ or jamaica/ or jordan/ or kazakhstan/ or kenya/ or kiribati/ or kosovo/ or kuwait/ or kyrgyzstan/ or laos/ or lebanon/ or liechtenstein/ or lesotho/ or liberia/ or libyan arab jamahiriya/ or madagascar/ or malawi/ or exp malaysia/ or maldives/ or mali/ or malta/ or mauritania/ or mauritius/ or melanesia/ or moldova/ or monaco/ or mongolia/ or

#	Searches
	"montenegro (republic)"/ or morocco/ or mozambique/ or myanmar/ or namibia/ or nauru/ or nepal/ or nicaragua/ or niger/ or nigeria/ or niue/ or north africa/ or oman/ or exp pakistan/ or palau/ or palestine/ or panama/ or papua new guinea/ or paraguay/ or peru/ or philippines/ or polynesia/ or qatar/ or "republic of north macedonia"/ or romania/ or exp russian federation/ or rwanda/ or sahel/ or "saint kitts and nevis"/ or "saint lucia"/ or "saint vincent and the grenadines"/ or saudi arabia/ or senegal/ or exp serbia/ or seychelles/ or sierra leone/ or singapore/ or "sao tome and principe"/ or solomon islands/ or exp somalia/ or south africa/ or south asia/ or south sudan/ or exp southeast asia/ or sri lanka/ or sudan/ or suriname/ or syrian arab republic/ or taiwan/ or tajikistan/ or tanzania/ or thailand/ or timor-leste/ or togo/ or tonga/ or "trinidad and tobago"/ or tunisia/ or turkmenistan/ or tuvalu/ or uganda/ or exp ukraine/ or exp united arab emirates/ or uruguay/ or exp uzbekistan/ or vanuatu/ or venezuela/ or viet nam/ or western sahara/ or yemen/ or zambia/ or zimbabwe/
113	exp "organisation for economic co-operation and development"/
114	exp australia/ or "australia and new zealand"/ or austria/ or baltic states/ or exp belgium/ or exp canada/ or chile/ or colombia/ or costa rica/ or czech republic/ or denmark/ or estonia/ or europe/ or exp finland/ or exp france/ or exp germany/ or greece/ or hungary/ or iceland/ or ireland/ or israel/ or exp italy/ or japan/ or korea/ or latvia/ or lithuania/ or luxembourg/ or exp mexico/ or netherlands/ or new zealand/ or north america/ or exp norway/ or poland/ or exp portugal/ or scandinavia/ or sweden/ or slovakia/ or slovenia/ or south korea/ or exp spain/ or switzerland/ or "Turkey (republic)"/ or exp united kingdom/ or exp united states/ or western europe/
115	european union/
116	developed country/
117	or/113-116
118	112 not 117
119	88 not 118
120	111 not 118

Database: Cochrane Database of Systematic Reviews, Issue 4 of 12, April 2023 and Cochrane Central Register of Controlled Trials, Issue 4 of 12, April 2023

Date of last search: 13/04/2023

#	Searches
#1	MeSH descriptor: [Pregnancy] explode all trees
#2	MeSH descriptor: [Pregnant Women] this term only
#3	MeSH descriptor: [Prenatal Care] this term only
#4	(antenatal* or ante NEXT natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre NEXT natal*):ti,ab
#5	{OR #1-#4}
#6	MeSH descriptor: [Diet] this term only
#7	MeSH descriptor: [Diet, Healthy] this term only
#8	MeSH descriptor: [Feeding Behavior] this term only
#9	MeSH descriptor: [Drinking Behavior] explode all trees
#10	MeSH descriptor: [Nutritive Value] this term only
#11	MeSH descriptor: [Nutritional Requirements] explode all trees
#12	MeSH descriptor: [Energy Intake] this term only
#13	MeSH descriptor: [Maternal Nutritional Physiological Phenomena] explode all trees
#14	MeSH descriptor: [Fruit] this term only
#15	MeSH descriptor: [Vegetables] this term only
#16	((food* or feed* or diet* or nutrition* or nutritive or eating) NEAR/4 (habit* or behavio* or attitude* or belief* or practice*)):ti,ab
#17	((food* or nutriti* or nutrient* or micronutrient* or micro NEXT nutrient* or alimentary or diet* or energy or calor* or fruit or fruits or vegetable or vegetables) NEAR/4 (intake or consum* or requir* or value* or measur* or pattern* or track*)):ti,ab
#18	((health* or balance* or nutrition*) NEAR/4 (food* or eat* or diet*)):ti,ab
#19	MeSH descriptor: [Sodium, Dietary] explode all trees
#20	(((salt* or sugar* or sodium) NEAR/2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*):ti,ab
#21	MeSH descriptor: [Beverages] this term only
#22	MeSH descriptor: [Alcoholic Beverages] this term only
#23	MeSH descriptor: [Artificially Sweetened Beverages] this term only
#24	MeSH descriptor: [Carbonated Beverages] this term only

#	Searches
#25	MeSH descriptor: [Coffee] this term only
#26	MeSH descriptor: [Drinking Water] this term only
#27	MeSH descriptor: [Energy Drinks] this term only
#28	MeSH descriptor: [Fermented Beverages] this term only
#29	MeSH descriptor: [Fruit and Vegetable Juices] this term only
#30	MeSH descriptor: [Milk] this term only
#31	MeSH descriptor: [Cultured Milk Products] this term only
#32	MeSH descriptor: [Kefir] this term only
#33	MeSH descriptor: [Koumiss] this term only
#34	MeSH descriptor: [Whey] this term only
#35	MeSH descriptor: [Milk Substitutes] this term only
#36	MeSH descriptor: [Soy Milk] this term only
#37	MeSH descriptor: [Sugar-Sweetened Beverages] this term only
#38	MeSH descriptor: [Tea] this term only
#39	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavor* or flavour* or caffein*or diet) NEAR/2 (drink* or beverage*)):ti,ab
#40	(coffe* or coffea* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?"):ti,ab
#41	{OR #6-#40}
#42	#5 AND #41
#43	MeSH descriptor: [Access to Information] this term only
#44	MeSH descriptor: [Information Centers] this term only
#45	MeSH descriptor: [Information Services] this term only
#46	MeSH descriptor: [Information Dissemination] this term only
#47	MeSH descriptor: [Information Seeking Behavior] this term only
#48	MeSH descriptor: [Communication] this term only
#49	MeSH descriptor: [Communications Media] this term only
#50	MeSH descriptor: [Consumer Health Information] this term only
#51	MeSH descriptor: [Health Information Management] explode all trees
#52	MeSH descriptor: [Health Communication] this term only
#53	MeSH descriptor: [Health Promotion] this term only
#54	MeSH descriptor: [Health Education] this term only
#55	MeSH descriptor: [Patient Education as Topic] explode all trees
#56	MeSH descriptor: [Patient Education Handout] this term only
#57	MeSH descriptor: [Pamphlets] this term only
#58	MeSH descriptor: [Posters as Topic] this term only
#59	MeSH descriptor: [Audiovisual Aids] this term only
#60	MeSH descriptor: [Books, Illustrated] this term only
#61	MeSH descriptor: [Medical Illustration] this term only
#62	MeSH descriptor: [Computers, Handheld] this term only
#63	MeSH descriptor: [Decision Support Systems, Clinical] this term only
#64	MeSH descriptor: [Internet] this term only
#65	MeSH descriptor: [Internet-Based Intervention] this term only
#66	MeSH descriptor: [Social Media] this term only
#67	MeSH descriptor: [Social Networking] this term only
#68	MeSH descriptor: [Mobile Applications] this term only
#69	MeSH descriptor: [Blogging] this term only
#70	MeSH descriptor: [Electronic Mail] this term only
#71	MeSH descriptor: [Cell Phone] explode all trees
#72	MeSH descriptor: [Hotlines] this term only
#73	MeSH descriptor: [Telephone] this term only
#74	MeSH descriptor: [Teaching Materials] this term only

#	Searches
#75	((inform* or educat* or advice or support* or guid*) NEAR/4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)):ti
#76	((medical or health or electronic or virtual) NEAR/4 (inform* or educat* or support* or learn* or guid*)):ti
#77	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e NEXT health* or elearn* or e NEXT learn* or email* or e-mail* or facebook or facetime or "face time" or forum* or handout* or hand NEXT out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile NEXT phone* or newsletter* or online or pamphlet* or palm NEXT pilot* or personal NEXT digital NEXT assistant* or pocket NEXT pc* or podcast* or poster or posters or skype* or smartphone* or smart NEXT phone* or "social media" or social NEXT network* or sms or text NEXT messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*):ti
#78	(mobile* NEAR/2 app*):ti
#79	MeSH descriptor: [Therapy, Computer-Assisted] this term only
#80	MeSH descriptor: [Telemedicine] this term only
#81	MeSH descriptor: [Diet Therapy] explode all trees
#82	MeSH descriptor: [Behavior Therapy] this term only
#83	MeSH descriptor: [Empowerment] this term only
#84	MeSH descriptor: [Health Behavior] this term only
#85	MeSH descriptor: [Health Knowledge, Attitudes, Practice] this term only
#86	MeSH descriptor: [Life Style] this term only
#87	((behavio* or diet* or nutrition* or lifestyle* or life NEXT style*) NEAR/2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)):ti
#88	(health* NEAR/2 (behavio* or belief* or believ*)):ti
#89	role NEXT model*:ti
#90	MeSH descriptor: [Self Care] this term only
#91	MeSH descriptor: [Self-Help Groups] this term only
#92	MeSH descriptor: [Motivation] this term only
#93	MeSH descriptor: [Goals] this term only
#94	MeSH descriptor: [Intention] this term only
#95	MeSH descriptor: [Achievement] this term only
#96	((self or individual* or tailor* or group*) NEAR/2 (help* or monitor* or care* or manag* or motivat*)):ti
#97	((goal* NEAR/2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*):ti
#98	MeSH descriptor: [Access to Healthy Foods] this term only
#99	MeSH descriptor: [Food Assistance] this term only
#100	MeSH descriptor: [Dietary Services] this term only
#101	MeSH descriptor: [Food Security] this term only
#102	MeSH descriptor: [Social Support] explode all trees
#103	MeSH descriptor: [Social Welfare] this term only
#104	((government* or federal or welfare or aid* or "social security" or relief) NEAR/2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)):ti
#105	((food* or nutrition*) NEAR/2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)):ti
#106	(healthy NEXT start* or healthystart*):ti
#107	((social* or communit* or peer) NEAR/2 (support* or intervention*)):ti
#108	{OR #43-#107}
#109	#42 AND #108
#110	conference:pt or (clinicaltrials or trialsearch):so
#111	#109 NOT #110 with Cochrane Library publication date Between Jan 1970 and Apr 2023

Database: CINAHL

Date of last search: 13/04/2023

#	Searches
S82	S80 OR S81
S81	S24 AND S77 Limiters - English Language; Exclude MEDLINE records; Human; Publication Type: Randomized Controlled Trial

#	Searches
S80	S24 AND S77 Limiters - English Language; Exclude MEDLINE records; Human; Clinical Queries: Review - High Sensitivity, Review - High Specificity, Review - Best Balance
S79	S24 AND S77 Limiters - English Language; Exclude MEDLINE records; Human
S78	S24 AND S77
S77	S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S67 OR S68 OR S69 OR S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76
S76	TI ((social* or communit* or peer) N2 (support* or intervention*))
S75	TI (healthy start* or healthystart*)
S74	TI ((food* or nutrition*) N2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*))
S73	TI ((government* or federal or welfare or aid* or social security or relief) N2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*))
S72	(MH "Social Welfare")
S71	(MH "Support, Social+")
S70	TI ((goal* N2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*)
S69	TI ((self or individual* or tailor* or group*) N2 (help* or monitor* or care* or manag* or motivat*))
S68	(MH "Intention")
S67	(MH "Goals and Objectives") OR (MH "Goal Attainment") OR (MH "Goal-Setting")
S66	(MH "Motivation") OR (MH "Achievement")
S65	(MH "Support Groups")
S64	(MH "Self Care")
S63	TI role model*
S62	TI (health* N2 (behavio* or belief* or believ*))
S61	TI ((behavio* or diet* or nutrition* or lifestyle* or life style*) N2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*))
S60	(MH "Life Style Changes")
S59	(MH "Attitude to Health") OR (MH "Health Knowledge")
S58	(MH "Health Behavior")
S57	(MH "Empowerment")
S56	(MH "Behavior Therapy")
S55	(MH "Diet Therapy+")
S54	(MH "Telemedicine")
S53	(MH "Therapy, Computer Assisted")
S52	TI (mobile* N2 app*)
S51	TI (app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*)
S50	TI ((medical or health or electronic or virtual) N4 (inform* or educat* or support* or learn* or guid*))
S49	TI ((inform* or educat* or advice or support* or guid*) N4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*))
S48	(MH "Teaching Materials")
S47	(MH "Telephone")
S46	(MH "Telephone Information Services")
S45	(MH "Cellular Phone+")
S44	(MH "Blogs")
S43	(MH "Mobile Applications")
S42	(MH "Social Networking+")
S41	(MH "Internet") OR (MH "Email") OR (MH "Internet-Based Intervention") OR (MH "Social Media+")
S40	(MH "Decision Support Systems, Clinical")
S39	(MH "Computers, Hand-Held+")
S38	(MH "Books")

#	Searches
S37	(MH "Audiovisuals+")
S36	(MH "Pamphlets")
S35	(MH "Health Education")
S34	(MH "Health Promotion")
S33	(MH "Health Information Management")
S32	(MH "Consumer Health Information")
S31	(MH "Communications Media")
S30	(MH "Communication")
S29	(MH "Information Seeking Behavior")
S28	(MH "Selective Dissemination of Information")
S27	(MH "Information Services")
S26	(MH "Information Centers")
S25	(MH "Access to Information")
S24	S5 AND S23
S23	S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22
S22	TI ((coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?")) OR AB ((coffe?* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?"))
S21	TI (((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) N2 (drink* or beverage*))) OR AB (((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) N2 (drink* or beverage*)))
S20	(MH "Beverages+")
S19	TI ((((salt* or sugar* or sodium) N2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*)) OR AB ((((salt* or sugar* or sodium) N2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*))
S18	(MH "Sodium, Dietary+")
S17	TI (((health* or balance* or nutrition*) N4 (food* or eat* or diet*))) OR AB (((health* or balance* or nutrition*) N4 (food* or eat* or diet*)))
S16	TI (((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) N4 (intake or consum* or requir* or value* or measur* or pattern* or track*))) OR AB (((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) N4 (intake or consum* or requir* or value* or measur* or pattern* or track*)))
S15	TI (((food* or feed* or diet* or nutrition* or nutritive or eating) N4 (habit* or behavio* or attitude* or belief* or practice*))) OR AB (((food* or feed* or diet* or nutrition* or nutritive or eating) N4 (habit* or behavio* or attitude* or belief* or practice*)))
S14	(MH "Vegetables")
S13	(MH "Fruit")
S12	(MH "Maternal Nutritional Physiology+")
S11	(MH "Energy Intake")
S10	(MH "Nutritional Requirements+")
S9	(MH "Nutritive Value")
S8	(MH "Drinking Behavior+")
S7	(MH "Eating Behavior+")
S6	(MH "Diet")
S5	S1 OR S2 OR S3 OR S4
S4	TI ((antenatal* or "ante natal*" or gestation* or maternal* or mother* or pregnan* or prenatal* or "pre natal*")) OR AB ((antenatal* or "ante natal*" or gestation* or maternal* or mother* or pregnan* or prenatal* or "pre natal*"))
S3	(MH "Prenatal Care")
S2	(MH "Expectant Mothers")
S1	(MH "Pregnancy+")

Database: Epistemonikos

Date of last search: 13/04/2023

#	Searches
1	(title:(antenatal* OR "ante natal*" OR gestation* OR maternal* OR mother* OR pregnan* OR prenatal* OR "pre natal*") OR abstract:(antenatal* OR "ante natal*" OR gestation* OR maternal* OR mother* OR pregnan* OR prenatal* OR "pre natal*")
2	(title:(((health* OR balance* OR nutrition*) AND (food* OR eat* OR diet*))) OR abstract:(((health* OR balance* OR nutrition*) AND (food* OR eat* OR diet*))))
3	1 AND 2
4	(title:((inform* OR educat* OR guid* OR advice OR government* OR behavio* OR therap* OR intervention* OR modif* OR change* OR adher* OR strateg* OR program* OR support* OR communicat* OR aid* OR assist* OR "food stamp" OR "food bank" OR "food package" OR "food security" OR "social welfare" OR selfhelp* OR "self help*" OR goal* OR motivat* OR healthystart OR "healthy start")) OR abstract:((inform* OR educat* OR guid* OR advice OR government* OR behavio* OR therap* OR intervention* OR modif* OR change* OR adher* OR strateg* OR program* OR support* OR communicat* OR aid* OR assist* OR "food stamp" OR "food bank" OR "food package" OR "food security" OR "social welfare" OR selfhelp* OR "self help*" OR goal* OR motivat* OR healthystart OR "healthy start")))
5	3 AND 4
6	[Filters: protocol=no, classification=systematic-review, cochrane=missing, min_year=1970, max_year=2023]

Economic searches

Database: MEDLINE

Date of last search: 13/04/2023

#	Searches
1	exp Pregnancy/ or Pregnant Women/ or Prenatal Care/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).tw,kf.
3	1 or 2
4	Diet/ or Diet, Healthy/
5	Feeding Behavior/ or exp Drinking Behavior/
6	Nutritive Value/ or exp Nutritional Requirements/ or Energy Intake/ or exp Maternal Nutritional Physiological Phenomena/
7	fruit/ or vegetables/
8	((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)).tw,kf.
9	((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)).tw,kf.
10	((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)).tw,kf.
11	exp Sodium, Dietary/
12	(((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*).tw,kf.
13	beverages/ or alcoholic beverages/ or artificially sweetened beverages/ or carbonated beverages/ or coffee/ or drinking water/ or energy drinks/ or fermented beverages/ or "fruit and vegetable juices"/ or milk/ or cultured milk products/ or kefir/ or koumiss/ or whey/ or milk substitutes/ or soy milk/ or sugar-sweetened beverages/ or tea/
14	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) adj2 (drink* or beverage*)).tw,kf.
15	(coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?").tw,kf.
16	or/4-15
17	3 and 16
18	Access to Information/ or Information Centers/ or Information Services/ or Information Dissemination/ or Information Seeking Behavior/ or Communication/ or Communications Media/ or Consumer Health Information/ or exp Health Information Management/ or Health Communication/ or Health Promotion/ or Health Education/ or exp Patient Education as Topic/ or Patient Education Handout/ or Pamphlets/ or Posters as topic/ or Audiovisual aids/ or Books, illustrated/ or Medical illustration/ or Computers, Handheld/ or Decision Support Systems, Clinical/ or Internet/ or Internet-Based Intervention/ or Social Media/ or Social Networking/ or Mobile Applications/ or Blogging/ or Electronic Mail/ or exp Cell phone/ or Hotlines/ or Telephone/ or Teaching materials/
19	((inform* or educat* or advice or support* or guid*) adj4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)).ti.

#	Searches
20	((medical or health or electronic or virtual) adj4 (inform* or educat* or support* or learn* or guid*)).ti.
21	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*).ti.
22	(mobile* adj2 app*).ti.
23	Therapy, Computer-Assisted/ or Telemedicine/
24	exp Diet Therapy/ or Behavior Therapy/ or Empowerment/
25	health behavior/ or health knowledge, attitudes, practice/ or lifestyle/
26	((behavio* or diet* or nutrition* or lifestyle* or life style*) adj2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)).ti.
27	(health* adj2 (behavio* or belief* or believ*)).ti.
28	role model*.ti.
29	Self Care/
30	Self-Help Groups/
31	motivation/ or goals/ or intention/ or Achievement/
32	((self or individual* or tailor* or group*) adj2 (help* or monitor* or care* or manag* or motivat*)).ti.
33	((goal* adj2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*).ti.
34	Access to Healthy Foods/ or Food Assistance/ or Dietary Services/ or Food Security/
35	exp Social Support/
36	social welfare/
37	((government* or federal or welfare or aid* or social security or relief) adj2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)).ti.
38	((food* or nutrition*) adj2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)).ti.
39	(healthy start* or healthystart*).ti.
40	((social* or communit* or peer) adj2 (support* or intervention*)).ti.
41	or/18-40
42	17 and 41
43	letter/
44	editorial/
45	news/
46	exp historical article/
47	Anecdotes as topic/
48	comment/
49	case reports/
50	(letter or comment*).ti.
51	or/43-50
52	randomized controlled trial/ or random*.ti,ab.
53	51 not 52
54	animals/ not humans/
55	exp Animals, Laboratory/
56	exp Animal Experimentation/
57	exp Models, Animal/
58	exp Rodentia/
59	(rat or rats or rodent* or mouse or mice).ti.
60	or/53-59
61	42 not 60
62	limit 61 to English language
63	Economics/
64	Value of life/
65	exp "Costs and Cost Analysis"/
66	exp Economics, Hospital/

#	Searches
67	exp Economics, Medical/
68	exp Resource Allocation/
69	Economics, Nursing/
70	Economics, Pharmaceutical/
71	exp "Fees and Charges"/
72	exp Budgets/
73	budget*.ti,ab.
74	cost*.ti,ab.
75	(economic* or pharmaco?economic*).ti,ab.
76	(price* or pricing*).ti,ab.
77	(financ* or fee or fees or expenditure* or saving*).ti,ab.
78	(value adj2 (money or monetary)).ti,ab.
79	resourc* allocat*.ti,ab.
80	(fund or funds or funding* or funded).ti,ab.
81	(ration or rations or rationing* or rationed).ti,ab.
82	ec.fs.
83	or/63-82
84	exp models, economic/
85	*Models, Theoretical/
86	*Models, Organizational/
87	markov chains/
88	monte carlo method/
89	exp Decision Theory/
90	(markov* or monte carlo).ti,ab.
91	econom* model*.ti,ab.
92	(decision* adj2 (tree* or analy* or model*)).ti,ab.
93	or/84-92
94	quality-adjusted life years/
95	sickness impact profile/
96	(quality adj2 (wellbeing or well being)).ti,ab.
97	sickness impact profile.ti,ab.
98	disability adjusted life.ti,ab.
99	(qal* or qtime* or qwb* or daly*).ti,ab.
100	(euroqol* or eq5d* or eq 5*).ti,ab.
101	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
102	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
103	(hui or hui1 or hui2 or hui3).ti,ab.
104	(health* year* equivalent* or hye or hyes).ti,ab.
105	discrete choice*.ti,ab.
106	rosser.ti,ab.
107	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
108	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
109	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
110	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
111	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
112	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
113	or/94-112
114	62 and (83 or 93 or 113)
115	limit 114 to ed=19700101-20230430
116	limit 114 to dt=19700101-20230430
117	115 or 116

Database: Embase

Date of last search: 13/04/2023

#	Searches
1	exp pregnancy/ or pregnant woman/ or prenatal care/ or prenatal period/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).tw,kf.
3	1 or 2
4	diet/ or healthy diet/
5	exp feeding behavior/ or dietary pattern/
6	nutritional value/
7	nutritional requirement/
8	exp dietary intake/
9	maternal nutrition/
10	fruit/ or vegetable/
11	vegetable consumption/
12	((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)).tw,kf.
13	((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)).tw,kf.
14	((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)).tw,kf.
15	sodium intake/ or salt intake/
16	(((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*).tw,kf.
17	exp beverage/
18	((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavo?r* or caffein*or diet) adj2 (drink* or beverage*)).tw,kf.
19	(coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop?").tw,kf.
20	or/4-19
21	3 and 20
22	*access to information/ or *information/ or *information center/ or *information service/ or *information dissemination/ or *information seeking/ or *help seeking behavior/ or *interpersonal communication/ or *communication/ or *mass medium/ or *consumer health information/ or *medical information system/ or *health promotion/ or *health education/ or *education program/ or *patient education/ or *patient information/ or *medical information/ or *publication/ or *visual information/ or *personal digital assistant/ or exp *decision support system/ or *patient decision making/ or *internet/ or *web-based intervention/ or *web browser/ or *social media/ or *blogging/ or *social network/ or *mobile application/ or *e-mail/ or *email support/ or *text messaging/ or *text messaging support/ or *hotline/ or *telephone/ or *telephone support/ or exp *mobile phone/ or *teleconsultation/ or exp *teaching/
23	((inform* or educat* or advice or support* or guid*) adj4 (access* or dissem* or model* or need* or program* or provid* or provision or requir* or shar* or service* or seek* or network* or centre* or center*)).ti.
24	((medical or health or electronic or virtual) adj4 (inform* or educat* or support* or learn* or guid*)).ti.
25	(app or apps or blog* or booklet* or brochure* or dvd* or ehealth* or e-health* or elearn* or e-learn* or email* or e-mail* or facebook or facetime or face time or forum* or handout* or hand-out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or myspace or online or magazine* or mobile phone* or newsletter* or online or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or written or youtube*).ti.
26	(mobile* adj2 app*).ti.
27	*computer assisted therapy/ or *telehealth/ or *telemedicine/
28	exp *diet therapy/ or *behavior therapy/ or *empowerment/ or *lifestyle modification/
29	*health behavior/ or *attitude to health/
30	((behavio* or diet* or nutrition* or lifestyle* or life style*) adj2 (therap* or intervention* or modif* or change* or treat* or train* or support* or strateg* or program* or educat*)).ti.
31	(health* adj2 (behavio* or belief* or believ*)).ti.
32	role model*.ti.
33	*self care/
34	*self help/
35	*motivation/ or *achievement/ or *goal attainment/
36	((self or individual* or tailor* or group*) adj2 (help* or monitor* or care* or manag* or motivat*)).ti.

#	Searches
37	((goal* adj2 set*) or motivat* or achiev* or incentiv* or disincentiv* or intention* or intend*).ti.
38	*healthy food access/ or *food assistance/ or *dietary service/ or *food security/
39	exp *social support/
40	*social welfare/
41	((government* or federal or welfare or aid* or social security or relief) adj2 (advice or allowance* or guid* or support* or sponsor* or service* or grant* or scheme* or program* or provid* or provision* or assist* or gift* or handout* or "hand out*" or donat* or voucher* or subsid*)).ti.
42	((food* or nutrition*) adj2 (aid* or program* or assist* or stamp* or supplement* or bank* or package* or secur*)).ti.
43	(healthy start* or healthystart*).ti.
44	((social* or communit* or peer) adj2 (support* or intervention*)).ti.
45	or/22-44
46	21 and 45
47	letter.pt. or letter/
48	note.pt.
49	editorial.pt.
50	case report/ or case study/
51	(letter or comment*).ti.
52	or/47-51
53	randomized controlled trial/ or random*.ti,ab.
54	52 not 53
55	animal/ not human/
56	nonhuman/
57	exp Animal Experiment/
58	exp Experimental Animal/
59	animal model/
60	exp Rodent/
61	(rat or rats or rodent* or mouse or mice).ti.
62	or/54-61
63	46 not 62
64	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
65	63 not 64
66	limit 65 to English language
67	health economics/
68	exp economic evaluation/
69	exp health care cost/
70	exp fee/
71	budget/
72	funding/
73	resource allocation/
74	budget*.ti,ab.
75	cost*.ti,ab.
76	(economic* or pharmaco?economic*).ti,ab.
77	(price* or pricing*).ti,ab.
78	(financ* or fee or fees or expenditure* or saving*).ti,ab.
79	(value adj2 (money or monetary)).ti,ab.
80	resourc* allocat*.ti,ab.
81	(fund or funds or funding* or funded).ti,ab.
82	(ration or rations or rationing* or rationed).ti,ab.
83	or/67-82
84	statistical model/
85	exp economic aspect/
86	84 and 85
87	*theoretical model/

#	Searches
88	*nonbiological model/
89	stochastic model/
90	decision theory/
91	decision tree/
92	monte carlo method/
93	(markov* or monte carlo).ti,ab.
94	econom* model*.ti,ab.
95	(decision* adj2 (tree* or analy* or model*)).ti,ab.
96	or/86-95
97	quality adjusted life year/
98	"quality of life index"/
99	short form 12/ or short form 20/ or short form 36/ or short form 8/
100	sickness impact profile/
101	(quality adj2 (wellbeing or well being)).ti,ab.
102	sickness impact profile.ti,ab.
103	disability adjusted life.ti,ab.
104	(qal* or qtime* or qwb* or daly*).ti,ab.
105	(euroqol* or eq5d* or eq 5*).ti,ab.
106	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
107	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
108	(hui or hui1 or hui2 or hui3).ti,ab.
109	(health* year* equivalent* or hye or hyes).ti,ab.
110	discrete choice*.ti,ab.
111	rosser.ti,ab.
112	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
113	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
114	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
115	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
116	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
117	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
118	or/97-117
119	66 and (83 or 96 or 118)

Database: CRD HTA (last updated 31st March 2018)

Date of last search: 14/03/2023

#	Searches
1	MeSH DESCRIPTOR pregnancy EXPLODE ALL TREES IN HTA
2	MeSH DESCRIPTOR pregnant women IN HTA
3	MeSH DESCRIPTOR prenatal care IN HTA
4	(((antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
5	#1 OR #2 OR #3 OR #4
6	MeSH DESCRIPTOR diet IN HTA
7	MeSH DESCRIPTOR diet, healthy IN HTA
8	MeSH DESCRIPTOR feeding behavior IN HTA
9	MeSH DESCRIPTOR drinking behavior EXPLODE ALL TREES IN HTA
10	MeSH DESCRIPTOR Nutritive Value IN HTA
11	MeSH DESCRIPTOR Nutritional Requirements EXPLODE ALL TREES IN HTA
12	MeSH DESCRIPTOR Energy Intake IN HTA
13	MeSH DESCRIPTOR Maternal Nutritional Physiological Phenomena EXPLODE ALL TREES IN HTA
14	MeSH DESCRIPTOR fruit IN HTA

#	Searches
15	MeSH DESCRIPTOR vegetables IN HTA
16	((((food* or feed* or diet* or nutrition* or nutritive or eating) adj4 (habit* or behavio* or attitude* or belief* or practice*)))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
17	((((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit? or vegetable?) adj4 (intake or consum* or requir* or value* or measur* or pattern* or track*)))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
18	(((health* or balance* or nutrition*) adj4 (food* or eat* or diet*)))
19	MeSH DESCRIPTOR Sodium, Dietary EXPLODE ALL TREES
20	(((((salt* or sugar* or sodium) adj2 (intake or consum*)) or soda* or candy or candies or chocolate* or sweet* or confection*))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
21	MeSH DESCRIPTOR beverages EXPLODE ALL TREES
22	((((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavor* or flavour* or caffein*or diet) adj2 (drink* or beverage*)))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
23	(((coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop*"))) and (Project record:ZDT OR Full publication record:ZDT) IN HTA
24	#6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23
25	#5 AND #24

Database: INAHTA International HTA Database

Date of last search: 14/04/2023

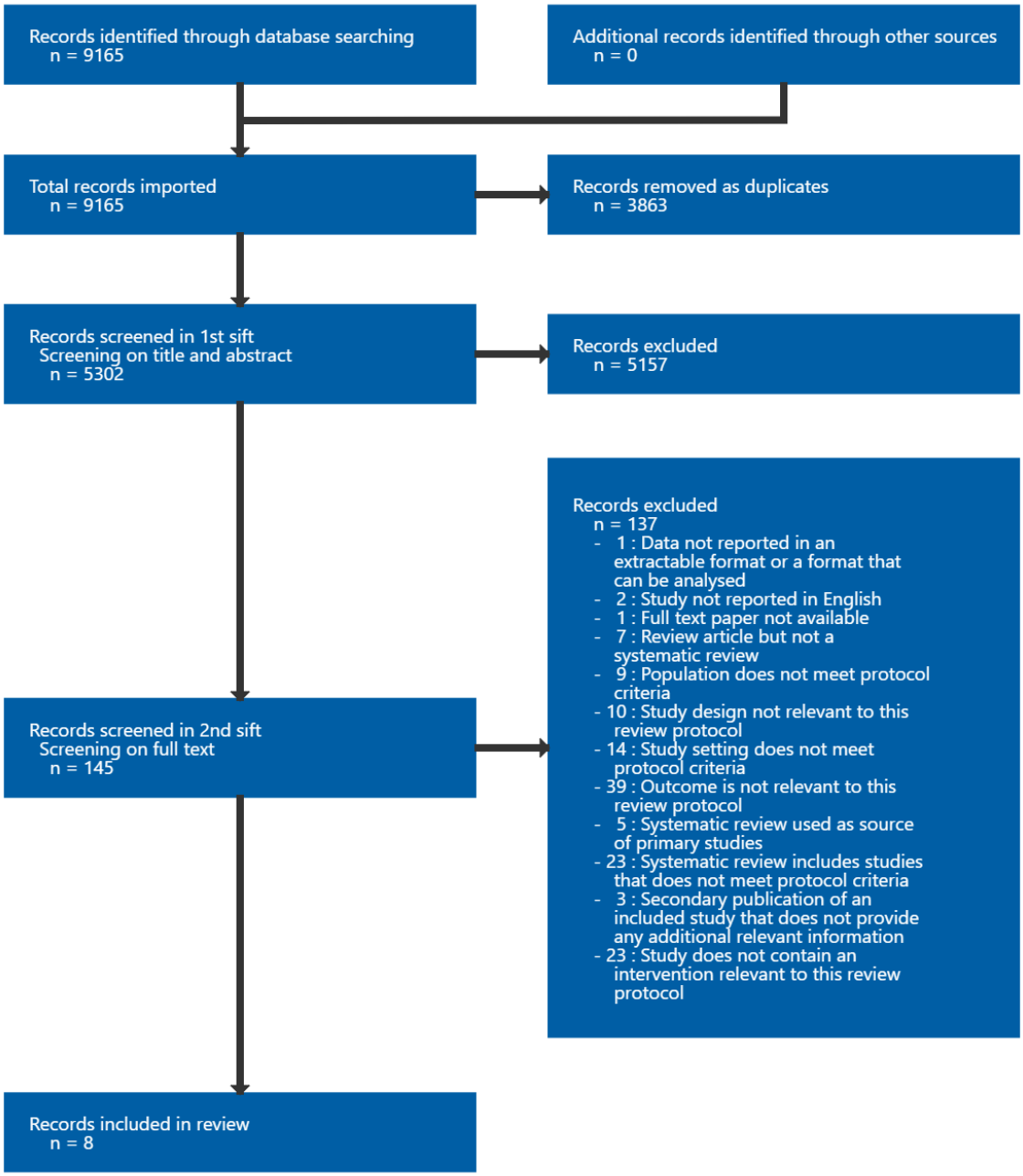
#	Searches
26	#25 AND #24
25	#4 OR #3 OR #2 OR #1
24	#23 OR #22 OR #21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5
23	((coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop*"))[Title] OR ((coffe* or chicory or tea* or tisane* or water* or alcohol* or wine* or beer* or spirit* or milk or kefir or buttermilk or kombucha or juice* or "soda pop*"))[abs]
22	(((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavor* or flavour* or caffein*or diet) AND (drink* or beverage*)))[Title] OR (((soft or fizzy or sugar* or sweet* or energy or sports or ferment* or carbonate* or fruit or vegetable* or flavor* or flavour* or caffein*or diet) AND (drink* or beverage*)))[abs]
21	"Beverages"[mhe]
20	((soda* or candy or candies or chocolate* or sweet* or confection*))[Title] OR ((soda* or candy or candies or chocolate* or sweet* or confection*))[abs]
19	(((salt* or sugar* or sodium) AND (intake or consum*)))[Title] OR (((salt* or sugar* or sodium) AND (intake or consum*)))[abs]
18	"Sodium Chloride, Dietary"[mh]
17	(((health* or balance* or nutrition*) AND (food* or eat* or diet*)))[Title] OR (((health* or balance* or nutrition*) AND (food* or eat* or diet*)))[abs]
16	(((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit or fruits or vegetable OR vegetables) AND (intake or consum* or requir* or value* or measur* or pattern* or track*)))[Title] OR (((food* or nutriti* or nutrient* or micronutrient* or micro-nutrient* or alimentary or diet* or energy or calor* or fruit or fruits or vegetable OR vegetables) AND (intake or consum* or requir* or value* or measur* or pattern* or track*)))[abs]
15	(((food* or feed* or diet* or nutrition* or nutritive or eating) AND (habit* or behavio* or attitude* or belief* or practice*)))[Title] OR (((food* or feed* or diet* or nutrition* or nutritive or eating) AND (habit* or behavio* or attitude* or belief* or practice*)))[abs]
14	"Vegetables"[mh]
13	"Fruit"[mh]
12	"Maternal Nutritional Physiological Phenomena"[mhe]
11	"Energy Intake"[mh]
10	"Nutritional Requirements"[mhe]
9	"Nutritive Value"[mh]
8	"Drinking Behavior"[mhe]
7	"Feeding Behavior"[mh]
6	"Diet, Healthy"[mh]

#	Searches
5	"Diet"[mh]
4	((antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*))[Title] OR ((antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*))[abs]
3	"Prenatal Care"[mh]
2	"Pregnant Women"[mh]
1	"Pregnancy"[mhe]

Appendix C Effectiveness evidence study selection

Study selection for: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Figure 1: Effectiveness evidence study selection flow chart



Appendix D Evidence tables

Evidence tables for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Anleu, 2019

Bibliographic Reference	Anleu, Elisa; Reyes, Marcela; Araya B, Marcela; Flores, Marcela; Uauy, Ricardo; Garmendia, Maria Luisa; Effectiveness of an Intervention of Dietary Counselling for Overweight and Obese Pregnant Women in the Consumption of Sugars and Energy.; Nutrients; 2019; vol. 11 (no. 2)

Study details

Country/ies where study was carried out	Chile
Study type	Randomised controlled trial (RCT)
Study dates	2016-2018
Inclusion criteria	• Gestational age 15 weeks or less • Aged 18 years or older • Single pregnancy, • Overweight or obese
Exclusion criteria	• Prior diagnosis of diabetes or treatment with metformin or insulin, eating disorders (bulimia or anorexia), or a risk pregnancy based on Chilean Health Ministry guide definitions
Patient characteristics	**Mean age in years (SD)** Intervention: 27.9 (5.3) Comparator: 28.2 (6.1)

	Parity (n, %) NR **Mean gestational age in weeks [at screening] (SD)** NR **Mean gestational age in weeks [at intervention] (SD)** NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** NR **BMI class (n, %)** Intervention: • Overweight: 94 (35) • Obese: 178 (65) Comparator: • Overweight: 67 (42) • Obese: 94 (58) **Comorbidities (n, %)** NR **Ethnicity (n, %)**

	NR **Education level (n, %)** Intervention: • Primary school: 70 (26) • High school: 188 (69) • University: 14 (5) Comparator: • Primary school: 33 (20) • High school: 119 (74) • University: 9 (6)
Intervention(s)/control	**Intervention:** Dietary counselling group. Aim of intervention was to lower intake of primary sources of total sugars by providing easy to follow culturally relevant recommendations. Three teaching sessions focused on education towards reduction of dietary source of sugars and behavioural techniques: • Session 1: "Introduction to gestational diabetes: sugars consumption during pregnancy and consequences for the baby" with animated video and activity to guess food sugar content by placing sugar cubes on the top sugary food photos followed by education of sugar content with tailored recommendations based on guesses • Session 2: "Learning to substitute intelligently" with information provided on healthy food options and substitutes for high sugar content. In addition an activity with magnetic board and images of top sugary foods and healthy or unhealthy foods was undertaken with women asked to choose two substitute alternatives for high-sugar foods in meals that they consume with choices discussed and recommendations for healthy food provided. • Session 3: "Identifying my eating habits" with two activities. One used a traffic light board where women were asked to place photos of healthy, cautious or risky eating habits on the board. The second was a roulette game with direct and multiple-choice questions relating to previous sessions topics to reinforce learning. General feedback of all educational sessions was provided.

	The first session occurred at <15 gestational weeks, second at 18 gestational weeks and third between 24-28 gestational weeks. **Control:** Routine dietary counselling provided by primary health centres in the Chilean healthcare system The food frequency questionnaire was administered to women by dieticians once before the intervention at <15 gestational weeks and once after at gestational week 35-7. [This falls into category 4 (combination of intervention 1 and 2 (information provision and/or education to enhance healthy eating and drinking practices and behavioural interventions) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) and visual (animated video) • **Component 2: Intervention aimed at individuals or groups** o Not mentioned • **Component 3: Individualised /tailored interventions or general** o General (aimed to all the population of interest) and tailored (feedback on activities) • **Component 4: Who delivers the intervention** o Not mentioned • **Component 5: Where is the intervention delivered** o During home visits

	• **Component 6: Behaviour change models, techniques and theories** o Not mentioned
Duration of follow-up	35-37 gestational weeks
Sources of funding	Not industry funded
Sample size	Total N =1002 Diet counselling n = 500 Control n = 502
Other information	Secondary study from the MIGHT study (Garmendia 2018, 2021) which also examined different levels of DHA supplementation with the present study combining the counselling arms with different doses and separately the control arms with different doses. The study only includes overweight and obese pregnant women. Baseline characteristics were only provide for those who had completed both food frequency questionnaires: Intervention group n = 272 and comparator group n = 161 On the food frequency questionnaire, six fruits were asked about in all months, and others only asked seasonally: an autumn–winter group from 21 March to 20 September and a spring–summer group from 21 September to 2 March. Multiple pregnancies were excluded. The study did not report outcomes by BMI thresholds, age, deprivation, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; DHA: docosahexaenoic acid; ITT: intention to treat; kg: kilograms; m: metres; MIGHT: Maternal nutriti/overweight control nutriti Healthy nutrition; n = number of participants

Study arms

Diet counselling (n = 500)

Control (n = 502)
(Routine counselling)

Outcomes

Outcome	Diet counselling, N = 500	Control, N = 502
Calorie intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-279 (761)	-68 (658)
Changes in vegetable intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-4 (15)	-3 (11)
Changes in fruit intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-34 (130)	-4 (136)
Changes in total sugars (g/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	110.72 (70.33)	123.94 (53.44)
Changes in meat intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-1 (112)	1 (107)

Outcome	Diet counselling, N = 500	Control, N = 502
Changes in sausage intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-6 (47)	-3 (41)
Changes in whole milk product intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	-52 (164)	-10 (160)
Changes in low-fat milk products (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n = 161 Mean (SD)	30 (156)	12 (143)
Changes in legumes intake (kcal/day) Change score from 15 gestational weeks to 35-37 GW; Intervention group n = 272 and comparator group n n = 161 Mean (SD)	0 (39)	1 (37)

GW: gestational weeks; n: number of participants; SD: standard deviation; kcal: kilocalories

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(The allocation sequence was random and adequately concealed. No significant differences between groups at baseline.)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	High *(Analyses were only conducted on those who answered the two food frequency questionnaires administered and was therefore not an intention to treat analysis. Reasons for not answering the second questionnaire were due to discontinuation of the intervention, loss to follow-up, miscarriage or other reasons such as preterm birth, or hospitalisation. This comprised 272/500 (54%) that were initially randomised to the dietary counselling group and 161/502 (32%) of those randomised to the routine counselling group. Participants and researchers were aware of their assigned intervention during the trial but it is unlikely to have an impact on the intervention.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(Data for relevant outcomes were not available for all or nearly all participants randomised with no FFQ outcomes for 46% of those randomised to the dietary counselling group and for 68% of those randomised to the routine counselling group. No analysis methods or sensitivity analyses were performed to determine whether bias was introduced based on missing outcome data. It is possible but not likely that missingness in the outcome depended on true value based on dropout reason of discontinuation of the intervention in each arm. The study reported exclusions only for those who filled in food frequency questionnaire 1 (dietary counselling group* n *= 408/500 and routine counselling group* n *= 264/502). Based on this information, 18% (*n *= 75/408) of those in the dietary counselling group and 29% (*n *= 76/264) of those in routine counselling group discontinued the intervention.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(Methods of measuring the outcomes are appropriate, and unlikely differences in measurement of the outcomes between intervention groups. A semi-quantitative Food Frequency Questionnaire (FFQ), previously validated, was applied for dietary assessment by dieticians. As participants were aware of the diet received and the FFQ was self-reported by participants, it is possible that this type of data collection could introduce bias (subjective outcome) where knowledge of the intervention may have influenced responses)*

Section	Question	Answer
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(The trial was analysed in accordance with a pre-specified protocol. The results are unlikely to be biased. No indication of selection of numerical results from multiple outcome measurements and reported outcome data not likely to have been selected from results of multiple analyses)*
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

FFQ: food frequency questionnaire; n=number of participants; N/A: not applicable; RCT: randomised control trial

Bosaeus, 2015

Bibliographic Reference	Bosaeus, Marja; Hussain, Aysha; Karlsson, Therese; Andersson, Louise; Hulthen, Lena; Svelander, Cecilia; Sandberg, Ann-Sofie; Larsson, Ingrid; Ellegard, Lars; Holmang, Agneta; A randomized longitudinal dietary intervention study during pregnancy: effects on fish intake, phospholipids, and body composition.; Nutrition journal; 2015; vol. 14; 1

Study details

Country/ies where study was carried out	Sweden
Study type	Randomised controlled trial (RCT)
Study dates	2009-2012
Inclusion criteria	• Aged 20–45 years old • Self-reported BMI 18.5-24.9 kg/m^2 (based on weight and height) at time of recruitment

Exclusion criteria	• Non-European descent • Self-reported diabetes • Neuroleptic drug use • Women who were vegetarian or vegan • Women who entered the study and had a miscarriage, abortion, intrauterine fetal death, sudden infant death syndrome, duplex pregnancy, or delivery prior to 34 gestational weeks
Patient characteristics	**Mean age in years (SD)** NR; median IQR for intervention: 32.2 (20.3, 33.3); comparator: 30.6 (29.0, 32.5) **Parity (median, IQR)** Intervention: 0.5 (0,1) Comparator: 0 (0,1) **Mean gestational age in weeks [at screening] (SD)** NR **Mean gestational age in weeks [at intervention] (SD)** NR **Mean self-reported BMI in kg/m^2 [at baseline] (SD)** NR, median (IQR): Intervention: 22.3 (20.9, 23.3); Comparator: 22.3 (20.9, 22.7) **BMI class (n, %)** Healthy weight (BMI 18.5-24.9 kg/m^2)

	Intervention: 49 (100) Comparator: 52 (100) **Comorbidities (n, %)** NR **Ethnicity (n, %)** NR **Education level (n, %)** 15 or more years of education: Intervention: 17 (94.4) Comparator 15 (88.2) **Income status** NR
Intervention(s)/control	**Dietary counselling:** At first hospital visit dietary counselling was provided by a registered dietician. Women were advised to: • Consume three meals of fish per week with information on appropriate fish types (including avoidance of pollutants). • Lower sugar intake aiming for <10 E% • Eat 500g of vegetables and fruit per day • Increase energy intake by 350 kcal in the second trimester and 500 kcal in the third trimester.

	Advice was provided on vegetable and fruit quantity and options and appropriate snacks. Tailoring of diet quality was provided if required as well as counselling on fat quality, food frequency, fibre intake, and nutrient density based on the Nordic Nutrition Recommendations 2004. Subsequently, phone call reminders of recommendations were provided three times between the study visits in first and second trimesters and two times between the study visits in the second and third trimesters. First visit was during 8-12 gestational weeks and follow-up was during study visits in the second (24-26 gestational weeks) and third trimesters (35-37 gestational weeks). Energy intake was assessed via a self-administered dietary semi-quantitative food frequency questionnaire previously validated in nonpregnant women and Swedish men. Fish and meat was ascertained by in house developed food frequency questionnaire. **Control:** Not defined [This falls into category intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) o Audio (phone call) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o Tailored • **Component 4: Who delivers the intervention**

	o Healthcare practitioner, health or social care worker (registered dieticians) • **Component 5: Where is the intervention delivered** o Healthcare settings (university hospital) • **Component 6: Behaviour change models, techniques and theories** o No theory mentioned
Duration of follow-up	35–37 gestational weeks
Sources of funding	Not industry funded
Sample size	Total N=101 Dietary counselling n = 49 Control n = 52
Other information	Women were recruited for the Pregnancy Obesity Nutrition and Child Health study (PONCH) study. The study only included women of a healthy weight range (BMI 18.5-24.9 kg/m^2). Women in the intervention group did not take supplements with fish oil or n-3 fatty acids during pregnancy. For the control group, one woman in the first trimester took this supplement (6%), two in the second trimester (12%) and four in the third trimester (24%). Fish/shellfish and meat intake was calculated from the number of hot meals per week containing these food items. The frequency reported was then converted into grams by assuming that a serving of fish was equal to 150 g and a serving of meat equal to 175 g, based on serving sizes recommended by the Norwegian Health Authorities. No information on single or multiple pregnancies provided. The study did not report outcomes by age, deprivation, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; E: energy; g: grams; ITT: intention to treat; IQR: interquartile range; kcal: kilocalories; kg: kilograms; m: metres; n: number of participants; NR: not reported; SD: standard deviation

Study arms

Dietary counselling (N = 49)

Control (N = 52)

Outcomes

Outcome	Dietary counselling , N = 49	Control, N = 52
Changes in calorie intake (kcal/day) follow-up to end of third trimester Intervention n = 15-17; Control n = 18 Median (IQR)	2364 (2033 to 2860)	2330 (2010 to 2678)
Changes in meat intake (g/week) follow-up to end of third trimester Intervention n = 15-17; Control n = 18 Median (IQR)	1007 (875 to 1269)	1400 (700 to 1925)
Changes in fish intake (g/week) follow-up to end of third trimester Intervention n = 15-17; Control n = 18 Median (IQR)	375 (300 to 600)	450 (300 to 525)
Changes in DHA (mg/mL) follow-up to end of third trimester Intervention n = 18; Control n = 17 Median (IQR)	0.2 (0.15 to 0.27)	0.2 (0.16 to 0.22)

g: grams; IQR: interquartile range; kcal: kilocalories; kg: kilograms; mg: milligrams: mL: millilitres; n: number of participants

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	High *(For outcomes of interest, the study did not perform ITT analysis and analysis was performed on a subpopulation of all women who participated in all three trimesters. This comprised 37% (18/49) randomised to the intervention arm and 33% (17/52) randomised to the control arm.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(37% (18/49) randomised to the intervention arm and 33% (17/52) randomised to the control arm were analysed. For outcomes of interest, the study did not perform a sensitivity analysis or use any analysis methods to correct for bias. The study did not report reasons for missing outcomes preventing judgement as to whether loss to follow-up or withdrawal was related to outcome.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(Methods of measuring the outcomes are appropriate, and unlikely differences in measurement of the outcomes between intervention groups. A semi quantitative food frequency questionnaire, previously validated, was applied for dietary assessment for energy intake and an in-house food frequency questionnaire was completed by participants for weekly intake of fish and meat. As participants were likely aware of the diet received and the FFQs were self-reported by participants, it is possible that this type of data collection could introduce bias (subjective outcome) where knowledge of the intervention may have influenced responses.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Separate paper describing the PONCH trial describes statistical methods specified prior to start of data processing and analysis. No indication of selection of numerical results from multiple outcome measurements and reported outcome data not likely to have been selected from results of multiple analyses)*

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

FFQ: food frequency questionnaire; ITT: intention to treat; n=number of participants; N/A: not applicable; PONCH: Pregnancy Obesity Nutrition and Child Health; RCT: randomised control trial

Burr, 2007

Bibliographic Reference	Burr, M L; Trembeth, J; Jones, K B; Geen, J; Lynch, L A; Roberts, Z E S; The effects of dietary advice and vouchers on the intake of fruit and fruit juice by pregnant women in a deprived area: a controlled trial.; Public health nutrition; 2007; vol. 10 (no. 6); 559-65

Study details

Country/ies where study was carried out	UK (Wales)
Study type	Randomised controlled trial (RCT)
Study dates	Not reported
Inclusion criteria	Pregnant women: • attending the booking clinic at a district general hospital • at least 17 years old • booked under the care of one of the consultant obstetricians at that hospital

Exclusion criteria	Pregnant women: • had diabetes • did not expect to reside within the area supplied by the milk delivery firm throughout the pregnancy
Patient characteristics	**Mean age in years (SD)** Advice group: 26.4 (5.4) Voucher group: 24.5 (5.1) Control group: 25.5 (5.7) **Parity (n, %)** Nulliparous: Advice group: 17 (27.0) Voucher group: 25 (39.7) Control group: 17 (26.6) **Mean gestational age in weeks [at screening] (SD)** Advice group: 15.6 (2.3) Voucher group: 15.6 (2.3) Control group: 16.0 (3.1) **Mean gestational age in weeks [at intervention] (SD)**

	NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** NR **BMI class (n, %)** NR **Comorbidities (n, %)** NR **Ethnicity (n, %)** NR **Education level (n, %)** NR **Income status** NR
Intervention(s)/control	**Advice group:** A midwife provided advice and written information about eating more fruit and drinking more fruit juice as part of their diet. Women were provided a leaflet outlining the health benefits of fruit in pregnancy, with tips on how to incorporate fruit and fruit juice into diet as well as advising how to purchase fruit cheaply. **Voucher group:** Vouchers that could be exchanged for free cartons of pure fruit juice delivered to homes by milk delivery service. Each woman received 2 litres per week for 30 weeks.

	Control group: Standard care which involved any nutrition advice usually provided by midwives, health visitors, general practitioners or other professionals. [This falls into category intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) and 3 (Interventions aimed at improving access to healthy foods) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) o Audio (phone call) o Printed and textual (written information and leaflet) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o General, aimed to all the population of interest • **Component 4: Who delivers the intervention** o Midwife • **Component 5: Where is the intervention delivered** o Healthcare settings (antenatal appointments) • **Component 6: Behaviour change models, techniques and theories**

	o No theory mentioned
Duration of follow-up	32 gestational weeks
Sources of funding	Not industry funded
Sample size	N=190 Advice group n=63 Voucher group n=63 Control group n=64
Other information	The study reports the area selected for the study to be one of the most deprived in Wales based on long-term deprivation and poverty Fruit and fruit juice rather than vegetables were selected for intervention as they don't require cooking. No information on single or multiple pregnancies provided. The study did not report outcomes by BMI, age, deprivation descriptors, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; UK: united kingdom; ITT: intention to treat; kg: kilograms; m: metres; n: number of participants; NR: not reported; SD: standard deviation

Study arms

Advice group (n = 63)

Voucher group (n = 63)

Control group (n = 64)

Outcomes

Changes in fruit intake at 32 weeks follow-up

Outcome	Advice group, N = 63	Voucher group , N = 63	Control group, N = 64
Changes in fruit consumption (apples) Net % since baseline; n advice=38; n voucher=46; n control= 37 Custom value	-13.2	2.2	-2.7
Changes in fruit consumption (oranges) Net % since baseline; n advice=38; n voucher=46; n control= 37 Custom value	-21.1	-2.2	-11.8
Changes in fruit consumption (bananas) Net % since baseline; n advice=38; n voucher=46; n control= 37 Custom value	-7.9	-17.4	-29.7

N: number of participants

Net percentage of women consuming more fruit since baseline (the number of women whose intake increased minus the number whose intake decreased, as a percentage of the number supplying information on both occasions)

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(The women were allocated to three groups, by means of cards designating these groups that were placed in random order within serially numbered opaque sealed envelopes. No significant baseline differences were observed between groups.)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(Participants and facilitators were probably aware of the intervention. It was not reported whether any deviations from intended intervention occurred.)*

Section	Question	Answer
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(Missing outcome data: 86/127 (32.3%) at 20 weeks follow-up and 75/127 (11%) at 32 weeks follow-up. No information whether study performed a sensitivity analysis or use any analysis methods to correct for bias. The study did not report reasons for missing outcomes preventing judgement as to whether loss to follow-up or withdrawal was related to outcome.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(Dietary outcomes were assessed using dietary questionnaire through by post or telephone (at 20 weeks follow-up) and interview during the appointment (at 32 weeks follow-up). Data collection method could introduce bias as dietary intake was self-reported (subjective outcome). No information whether outcome assessors aware of the intervention received by study participants.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Reported outcome data not likely to have been selected from results of multiple analyses.)*
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

N/A: not applicable; RCT: randomised control trial

Khoury, 2005

Bibliographic Reference	Khoury, J.; Henriksen, T.; Christophersen, B.; Tonstad, S.; Effect of a cholesterol-lowering diet on maternal, cord, and neonatal lipids, and pregnancy outcome: A randomized clinical trial; American Journal of Obstetrics and Gynecology; 2005; vol. 193 (no. 4); 1292-1301

Study details

Country/ies where study was carried out	Norway
Study type	Randomised controlled trial (RCT)
Study dates	1999-2001
Inclusion criteria	• Women in their first, second, or third pregnancy aged 21-38 years old • Non smokers or previous smokers that quit 5 years or more before inclusion • Body mass index (BMI) of 19-32 kg/m^2 • Not vegetarian or consuming Mediterranean-type diet • Immigrants to Norway from non-Western countries if ultrasound showed a single healthy fetus at 17-20 gestational weeks
Exclusion criteria	• High-risk pregnancies due to diabetes mellitus, endocrine disease, chronic hypertension, drug abuse, history of thromboembolic disease, or significant gastrointestinal, cardiac, pulmonary, or hematologic disease • Previous pregnancy complications such as neonatal death, still-birth, preterm delivery, or with a history of habitual abortion (more than 3 previous spontaneous abortions) • Ongoing hyperemesis gravidarum or bleeding after 12 gestational weeks in the current pregnancy
Patient characteristics	**Mean age in years (SD)** Intervention: 29.6 (3.7) Comparator: 29.8 (3.4) **Parity (n, %)** Intervention: • Nulliparous: 100 (70.9%)

	Comparator: • Nulliparous: 97 (65.1%) **Mean gestational age in weeks [at screening] (SD)** Intervention: 19 (1.1) Comparator: 19 (1.1) **Mean gestational age in weeks [at intervention] (SD)** NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** Intervention: 24.3 (2.9) Comparator: 24.3 (2.7) **BMI class (n, %)** NR **Comorbidities (n, %)** NR **Ethnicity (n, %)** NR **Education level (n, %)**

	Education >12 y Intervention: 112 (79.4%) Comparator: 126 (84.6%) **Income status** NR
Intervention(s)/control	**Diet advice:** Women received dietician advice on nutrition at visits on inclusion and at 24, 30 and 36 gestational weeks: • Limit dietary cholesterol to 150 mg/day, reduce saturated fat consumption to 8% of dietary energy by replacing saturated fat by mono- and polyunsaturated fat. • Total energy intake comprising 32% total fat -8%-9% polyunsaturated fat; 16%-17% monounsaturated fat), 16-17% protein, and 50-51% carbohydrates. • Promoting fatty fish, vegetable oils, especially olive oil and rapeseed oil, nuts, nut butters, margarine based on olive- or rapeseed oil, and avocado instead of meat, butter, cream, and fatty dairy items • Encouraging at least 6 fresh fruit and vegetables per day and skimmed or low-fat dairy items (skimmed milk, fat-reduced cheese, and yogurt) to replace fat products. • Advising meat as a bi-weekly main meal and legumes, vegetable main dishes, fatty fish, or fat trimmed poultry on alternate days • Cooking lessons provided for assistance with specific foods such as legumes or olive oil • 2 cups of filtered coffee/day were allowed **Control group:** • Continued their regular diet and asked not to introduce extra oils or low-fat meat and dairy products • Aiming at 32% of energy from total fat (including 12% from saturated fat), 16% to 17% of energy from protein, and 50-51% of energy from carbohydrate. All women: • Asked to follow the diet until delivery and reminded to continue diet after 36 gestational weeks • Energy intake was aimed at a weight gain of 8-14 kg from prepregnancy levels.

	• Asked to suspend folate supplementation of 400 mg/day at baseline. • Were recommended Vitamin D supplements 7.5-10 mg/d as part of a multivitamin with 200 mg/day of folate. • Cod liver oil was not allowed unless the woman took it before enrolment and refused to use the multivitamin supplement instead. • Iron supplementation was recommended if serum ferritin levels were <20 µg/L at 18 or 36 gestational weeks, or if blood haemoglobin level was <10 g/L at 30 gestational weeks Weighted diet records were obtained for compliance for 4 days during 19-24 gestational weeks and 6 days during 24-30 gestational weeks and 30-36 gestational weeks [This falls into category intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o General, aimed to all the population of interest • **Component 4: Who delivers the intervention** o Healthcare practitioner, health or social care worker (Dietician) • **Component 5: Where is the intervention delivered**

	o Healthcare settings • **Component 6: Behaviour change models, techniques and theories** o No theory mentioned
Duration of follow-up	Until 36 gestational weeks
Sources of funding	Not industry funded
Sample size	Total N=290 Diet advice n = 141 Control n = 149
Other information	Secondary analysis of the Cardiovascular Risk Reduction Diet in Pregnancy (CARRDIP) trial. Intention-to-treat numbers used in analysis. Gestational age at entry was mean 19 SD (1.1) although intervention started 24 gestational weeks. Multiple pregnancies were excluded. The study did not report outcomes by BMI, age, deprivation, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; d: day; g: grams; ITT: intention to treat; kg: kilograms; L: litres; m: metres; mg: milligrams; n: number of participants; NR: not reported; SD: standard deviation; µg; micrograms; y: years

Study arms

Diet advice (N = 141)

Control (N = 149)

Outcomes

Outcome	Diet advice, N = 141	Control, N = 149
Changes in calorie intake (kcal/d) follow-up at 36 GW Total calories; intervention n = 127, control n = 141 Mean (SD)	2031 (348)	2189 (335)
Changes in carbohydrate intake (% of energy) follow-up at 36 GW Intervention n = 127, control n = 141 Mean (SD)	53.7 (4.3)	52.3 (3.7)
whereof sugar (% of energy) follow-up at 36 GW Intervention n = 127, control n = 141 Mean (SD)	9.1 (4.3)	11.6 (4)
Changes in protein intake (% of energy) follow-up at 36 GW Intervention n = 127, control n = 141 Mean (SD)	15.6 (1.6)	14.7 (1.5)
Changes in saturated fat intake (% of energy) follow-up at 36 GW Intervention n = 127, control n = 141 Mean (SD)	9.1 (1.6)	13.5 (1.7)

d: day; GW: gestational weeks; kcal: kilocalories; n: number of participants; SD: standard deviation

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(The allocation sequence was random and adequately concealed. No significant differences between groups at baseline.)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	High *(The physicians and midwives caring for the women, the specialist physician, and all laboratory and other personnel except for dieticians were blinded. Participants were aware of their allocation but were asked not to discuss this with their practitioners. For outcomes of interest, the study did not perform ITT analysis.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(Outcome data was not available for all participants randomised with 10% of participants (127/141) from the intervention arm and 15% (127/149) from the control arm not included in the analysis. For outcomes of interest, the study did not perform a sensitivity analysis or use any analysis methods to correct for bias. The study did assess differences in baseline characteristics for those who withdrew compared to those who remained and noted that those that remained were less likely to be multiparous. The study did not report reasons for missing outcomes preventing judgement as to whether loss to follow-up or withdrawal was related to outcome.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Methods of measuring the outcomes are appropriate, and unlikely differences in measurement of the outcomes between intervention groups. Weighted dietary records were collected during the study from participants and entered into the database by blinded personnel. All food and beverages consumed were described and weighted by participants and use of household measures as a substitute for weighing were accepted when it was impossible to weigh the foods. This method of data collection was less likely to introduce bias (subjective outcome) than food frequency questionnaires typically used in other studies.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Some concerns *(No information provided on whether the trial was analysed in accordance with a pre-specified analysis plan. No indication of selection of numerical results from multiple outcome measurements and reported outcome data not likely to have been selected from results of multiple analyses)*

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result.)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

ITT: intention to treat; N/A: not applicable

Oken, 2013

Bibliographic Reference	Oken, Emily; Guthrie, Lauren B; Bloomingdale, Arienne; Platek, Deborah N; Price, Sarah; Haines, Jess; Gillman, Matthew W; Olsen, Sjurdur F; Bellinger, David C; Wright, Robert O; A pilot randomized controlled trial to promote healthful fish consumption during pregnancy: the Food for Thought Study; Nutrition journal; 2013; vol. 12 (no. 1); 1-11

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)
Study dates	April-October 2010
Inclusion criteria	• Singleton pregnancy at 22 weeks gestation or less • Aged 18 years or older • Plans to stay in Boston through delivery • Reported consuming fish up to 2 times per month, and with no contraindications to fish consumption such as allergy, or diet choices such as vegetarianism
Exclusion criteria	None mentioned

Patient characteristics	**Mean age in years (SD)** Advice: NR, median (IQR) was 32.6 (27.9, 35.9) Advice+gift card: NR, median (IQR) was 27.6 (24.5, 32.0) Control: NR, median (IQR) was 32.4 (27.7, 34.3) **Parity (n, %)** Nulliparous: • Advice: 6 (35) • Advice+gift card: 4 (22) • Control: 6 (30) **Mean gestational age in weeks [at screening] (SD)** Advice: NR, median (IQR) was 15.2 (13.0, 18.6) Advice+gift card: NR, median (IQR) was 16.4 (13.9, 21.0) Control: NR, median (IQR) was 19.1 (14.7, 21.0) **Mean gestational age in weeks [at intervention] (SD)** NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** Advice: NR, median (IQR) was 25.8 (22.8, 34.5) Advice+gift card: NR, median (IQR) was 23.4 (20.7, 28.3)

	Control: NR, median (IQR) was 22.3 (21.1, 27.0) **BMI class (n, %)** NR **Comorbidities (n, %)** NR **Ethnicity (n, %)** Advice: • White: 9 (50%) • Black: 2 (11%) • Asian: 2 (11%) • Hispanic/other: 5 (28%) Advice+gift card: • White: 9 (53%) • Black: 2 (12%) • Asian: 1 (6%) • Hispanic/other: 5 (29%) Control: • White: 9 (45%) • Black: 2 (10%) • Asian: 3 (15%) • Hispanic/other: 6 (30%)

	Education level (n, %) NR **Income status (n, %)** NR
Intervention(s)/control	**Advice group:** • Given an 8-page booklet summarising health effects of DHA in pregnancy, promoted fish consumption with list of 29 low mercury fish based on DHA content and which fish to avoid based on mercury/other contaminants based on federal and local EPA advice. • Given a shopping list notepad including aforementioned list of recommended fish and 2 copies of a wallet-sized card summarizing the brochure information. • Each week thereafter during the 12 week intervention, women received a “Weekly Thoughts” email with information promoting 2 weekly fish servings, fish or DHA health benefits, a recipe and website address for more information **Advice + gift card:** In addition to advice received (identical to advice group) $40 USD Whole Food gift card at baseline visit and an additional gift card at each of the next 2 months totalling $120 ($10/week). Women were encouraged to use gift cards to purchase fish. **Control**: Standard care provided a commonly administered 7-page “Pregnancy Food Guide” and 1-page list of “Food Don'ts”. These included advice on many nutritional topics including which 4 fish types with highest mercury to avoid, and to eat up to 12 ounces a week of a variety of fish and shellfish that are lower in mercury. After the baseline visit, weekly emails were sent with tips on general pregnancy health and recipes, not focused on fish. All women: $25 gift card provided at baseline and the completion of the follow-up visit. The intervention ran for 12 weeks. [This falls into category intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) and 4 (intervention 1 + 3 (interventions aimed at improving access to healthy food and drinks)) in the protocol].

	Components of intervention: • **Component 1: Mode of delivery** o Face-to-face (in person) o Printed and textual (booklet, shopping list notepad, wallet sized card summarising brochure) o Electronic and textual (email) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o General, aimed to all the population of interest • **Component 4: Who delivers the intervention** o Other (researchers) • **Component 5: Where is the intervention delivered** o Home visit or research offices (baseline visit) o Online (remainder of study) • **Component 6: Behaviour change models, techniques and theories** o No theory mentioned
Duration of follow-up	Mean 30 gestational weeks
Sources of funding	Not industry funded

Sample size	N=61 Advice n = 20 Advice+gift card n = 20 Control n = 21
Other information	The study reported in text that there were no differences between combined intervention groups (n=41) to comparator group (n=20) in attitudes about the expense of fish, the convenience of eating fish, or knowledge of how to prepare fish (no data reported). Mean (SD) pre-pregnancy BMI at baseline for total population was reported to be 25.6 (6.1) kg/m^2 Multiple pregnancies were excluded. The study did not report outcomes by BMI thresholds, age, deprivation, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; DHA: docosahexaenoic acid; EPA: Environmental Protection Agency; ITT: intention to treat; IQR: interquartile range; kg: kilograms; m: metres; n: number of participants; NR: not reported; SD: standard deviation; USA: United States of America; USD: US dollars

Study arms

Advice (N = 20)

Advice+gift card (N = 20)

Control (N = 21)

Outcomes

Outcome	Advice, N = 20	Advice+gift card, N = 20	Control, N = 21
Changes in fish intake (g/week) Follow-up at mean 30 gestational weeks; Advice n = 20; Advice+gift card n = 17; Control n = 20 Mean (SD)	14 (22)	24 (36)	2 (17)
Changes in DHA from fish intake (mg/day) Follow-up at mean 30 gestational weeks; Advice n = 20; Advice+gift card n = 17; Control n = 20 Mean (SD)	57 (114)	149 (118)	-12 (75)
Changes in DHA from fish+supplements intake (mg/day) Follow-up at mean 30 gestational weeks; Advice n = 20; Advice+gift card n = 17; Control n = 20 Mean (SD)	67 (130)	183 (144)	2 (11)
Changes in DHA from supplements intake (mg/day) Follow-up at mean 30 gestational weeks; Advice n = 20; Advice+gift card n = 17; Control n = 20 Mean (SD)	10 (52)	34 (76)	10 (80)
Fish consumption attitudes: "I enjoy eating fish" (strongly agree) Combined intervention group vs comparator data only reported. Follow-up at mean 30 gestational weeks. Advice n = 20; Advice+gift card n = 17; Control n = 20 No of events	n = 14 ; % = 38		n = 2 ; % = 10
Fish consumption attitudes: "Fish contains nutrients that are healthy for my baby" (strongly agree)	n = 26 ; % = 70		n = 7 ; % = 35

Outcome	Advice, N = 20	Advice+gift card, N = 20	Control, N = 21
Combined intervention group vs comparator data only reported. Follow-up at mean 30 gestational weeks. Advice n = 20; Advice+gift card n = 17; Control n = 20 No of events			
Fish consumption attitudes: "Some kinds of fish are better for me to eat than other kinds" (strongly agree) Combined intervention group vs comparator data only reported. Follow-up at mean 30 gestational weeks. Advice n = 20; Advice+gift card n = 17; Control n = 20 No of events	n = 29 ; % = 78		n = 11 ; % = 55
Fish consumption attitudes: "I try not to eat fish because it might be harmful for me or my baby" (strongly disagree) Combined intervention group vs comparator data only reported. Follow-up at mean 30 gestational weeks. Advice n = 20; Advice+gift card n = 17; Control n = 20 No of events	n = 22 ; % = 59		n = 7 ; % = 35

DHA: docosahexaenoic acid; g: grams; mg: milligrams; n: number of participants; SD: standard deviation

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low *(Random number table was used for randomisation and sequentially numbered opaque sealed envelopes were used for allocation. No significant baseline differences were observed between groups)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low *(Both participants and study personnel were blind to allocation prior to collection of baseline data. Modified intention to treat analysis was performed on participants with data at follow-up visits and was appropriate.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(Outcome data was not available for all participants in each arm: advice and gift card 85% (17/20); advice 90% 18/20; control 95% 20/21. No analysis methods or sensitivity analyses were performed to determine whether bias was introduced based on missing outcome data. It is possible but not likely that missingness in the outcome depended on true value based on dropout reason of discontinuation of the intervention or loss to follow-up in each arm.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low *(Participants were blinded to allocation which reduced the risk of bias of subjective outcome reporting from self-reported fish intake by National Health and Nutrition Examination Survey (NHANES) and general diet by a validated food frequency questionnaire.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Some concerns *(The study reports that a protocol was used but does not provide further details. Numerical result does not appear to have been selected on basis of multiple outcome measurements or analyses.)*
Overall bias and Directness	Risk of bias judgement	Some concerns *(The study is judged to raise some concerns in at least one domain for this result, but not to be at high risk of bias for any domain.)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

N/A: not applicable

Papandreou, 2023

Bibliographic Reference	Papandreou, Panos; Amerikanou, Charalampia; Vezou, Chara; Gioxari, Aristea; Kaliora, Andriana C; Skouroliakou, Maria; Improving Adherence to the Mediterranean Diet in Early Pregnancy Using a Clinical Decision Support System; A Randomised Controlled Clinical Trial.; Nutrients; 2023; vol. 15 (no. 2)

Study details

Country/ies where study was carried out	Greece
Study type	Randomised controlled trial (RCT)
Study dates	May 2019 to May 2022
Inclusion criteria	Women: • ≥18 years old • in the first trimester of pregnancy • without pregnancy complications • without medical conditions before pregnancy • who provided signed participation consent
Exclusion criteria	Women: • adolescent pregnancy • in the second trimester of pregnancy • with pre-pregnancy chronic diseases • with pregnancy complications • with allergies or food intolerances • with psychiatric conditions • with alcoholism or drug addiction • following a vegan or macrobiotic diet ≤5 years prior to intervention • with vitamin or mineral supplementation ≤6 months prior to fetus conception • Unable to read and understand the consent information

Patient characteristics	**Mean age, years (SD)** Intervention: 32.5 (6.4) Comparator: 29.1 (6.1) **Parity (n, %)** NR **Mean gestational age in weeks [at screening] (SD)** NR **Mean gestational age in weeks [at intervention] (SD)** NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** NR **BMI class (n, %, pre-pregnancy)** Intervention: • <18.5 kg/m^2: 0 (0.0) • 18.5–24.9 kg/m^2: 17 (85.0) • 25–29.9 kg/m^2: 3 (15.0) • >30 kg/m^2: 0 (0.0) Comparator: • <18.5 kg/m^2: 1 (5.0)

	• 18.5–24.9 kg/m^2: 17 (85.0) • 25–29.9 kg/m^2: 2 (10.0) • >30 kg/m^2: 0 (0.0) **Comorbidities (n, %)** NR **Ethnicity (n, %)** NR **Education level (n, %)** NR **Income status (n, %)** NR **Profession, n (%)** Private sector n = 13 (32.5) State employee n = 4 (10.0) Housewifery n = 14 (35.0) Other n = 9 (22.5)
Intervention(s)/control	**Clinical Decision Support System (CDSS group):** dietician administered a personalised daily dietary plan based on the Mediterranean Diet (MD) that was generated by the CDSS software, according to the participant's needs, habits, and preferences. The CDSS dietary regimen consisted of a daily eating programme that was renewed every 15 days, paired with nutritional recommendations that were in line with the "National Dietary Guidelines for Pregnancy". Participants were instructed to regularly visit their CDSS account from home and track their nutritional status, regarding body weight gain

	and healthy eating. On a weekly basis, participants were also instructed to input a 3-day food diary in the CDSS that was made automatically available to the dieticians. Every other week, phone interviews were performed to support nutritional and lifestyle consultations. Additionally, unexpected phone calls were made to obtain 24 h dietary recalls. **Control group:** did not have access to CDSS and only received general lifestyle guidelines based on the "National Dietary Guidelines for Pregnancy" through phone call sessions with the dieticians every 15 days. Asked to keep a weekly 3 day food diary, which was emailed to the appointed dietician. Unexpected phone calls were made to obtain 24 h dietary recalls. [This falls into category intervention 2 (behavioural interventions) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Electronic and textual o Audio (phone interviews to support nutritional and lifestyle consultations) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o On demand, tailored interventions based on needs • **Component 4: Who delivers the intervention** o Healthcare practitioner, health or social care worker (dieticians) • **Component 5: Where is the intervention delivered**

	o Other (home when using software) • **Component 6: Behaviour change models, techniques and theories** o Clinical Decision Support System
Duration of follow-up	3 months
Sources of funding	Not industry funded
Sample size	N = 40 CDSS N = 20 Control N = 20
Other information	No information on single or multiple pregnancies provided. The study did not report outcomes by BMI, age, deprivation descriptors, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; CDSS: Clinical Decision Support System; g: grams; h: hours; ITT: intention to treat; kcal: kilocalories; kg: kilograms; m: metres; n: number of participants; NR: not reported; SD: standard deviation

Study arms

Clinical Decision Support System (CDSS) (N = 20)

Control (N = 20)

Outcomes

Dietary intake at 3 months follow up from baseline

Outcome	Clinical Decision Support System (CDSS), N = 20	Control, N = 20
Changes in calorie intake (kcal) Follow-up after 3 months (gestational weeks not reported)	2000.0 (150.0)	2375.0 (900.0)

Outcome	Clinical Decision Support System (CDSS), N = 20	Control, N = 20
Median (IQR)		
Changes in carbohydrates intake (%) Follow-up after 3 months (gestational weeks not reported) Median (IQR)	52.0 (3.5)	52.0 (5.8)
Changes in fibre intake (g) Difference between baseline and 3 months (not defined in study) Mean (SD)	1.6 (5.82)	0.8 (5.1)
Changes in protein intake (%) Follow-up after 3 months (gestational weeks not reported) Median (IQR)	20.0 (3.0)	19.5 (2.8)
Changes in total fat Intake (%) Follow-up after 3 months (gestational weeks not reported) Median (IQR)	28.0 (3.8)	29.0 (3.0)

g: grams; IQR: interquartile range; kcal: kilocalories; mg: milligrams; n: number of participants; SD: standard deviation

Baseline not defined

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(Eligible women were randomly assigned in blocks of one to either the control arm or the intervention arm. The statistician applied simple randomisation through a computer-generated randomisation sequence. No information on allocation concealment methods. No significant baseline differences were observed between groups.)*

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(Researchers and participants were aware of the treatment allocation, except for the appointed statistician, who was blinded. and the randomisation list was available only to the principal investigator. It was not reported whether any deviations from intended intervention occurred.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low *(Data for the outcomes were available for all participants randomised.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(A semi-quantitative Food Frequency Questionnaire (FFQ), validated in the Greek population, was applied for dietary assessment. Questionnaire was self-report by participants and this type of data collection could introduce bias (subjective outcome).*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(Reported outcome data not likely to have been selected from results of multiple analyses.)*
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result.)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

N/A: not applicable

Seo, 2020

Bibliographic Reference	Seo, Yuri; Jeong, Yeon Seon; Koo, Kyung-A; Yang, Jeong In; Park, Yoo Kyoung; Maternal nutrition intervention focused on the adjustment of salt and sugar intake can improve pregnancy outcomes.; Food science & nutrition; 2020; vol. 8 (no. 7); 3900-3911

Study details

Country/ies where study was carried out	South Korea
Study type	Randomised controlled trial (RCT)
Study dates	March to December 2016
Inclusion criteria	• Pregnant women aged 20 years old or older • 22 gestational weeks or less • Attended one of three public healthcare centres, five clinics, and one university hospital in the Gyeonggi-do area
Exclusion criteria	• Mothers of multiples • Metabolic diseases such as diabetes mellitus and hypertension
Patient characteristics	**Mean age in years (SD)** Intervention: 33.2 (3.7) Comparator: 33.5 (3.6) **Parity (n, %)** Intervention: • Primiparous: 41 (62.7) Comparator: • Primiparous: 15 (75.0) **Mean gestational age in weeks [at screening] (SD)**

	Intervention: 14.3 (4.6) Comparator: 16.4 (4.6) **Mean gestational age in weeks [at intervention] (SD)** NR **Mean pre-pregnancy BMI in kg/m^2 [at baseline] (SD)** NR **BMI class (n, %)** Intervention <18.5 kg/m^2: 5 (8.2) 18.5–22.9 kg/m^2: 37 (60.7) ≥23 kg/m^2: 19 (31.1) Comparator <18.5 kg/m^2: 4 (20.0) 18.5–22.9 kg/m^2: 12 (60.0) ≥23 kg/m^2: 4 (20.0) **Comorbidities (n, %)** NR

	Ethnicity n, (%) NR **Education level (n, %)** NR **Income status** NR
Intervention(s)/control	**Nutrition education and counselling:** A registered dietitian provided nutrition education for 16 weeks. Education involved a pregnancy diet guideline focused on a low-salt and sugar-diet with information on quantities in commercial food products and limiting excessive consumption. Targets for low sugar and salt consumption were based on World Health Organization (WHO) and “Dietary Reference Intakes for Koreans” (KDRIs) recommendations. The first 8 weeks involved four sessions of offline education (including cooking lesson) and individual counselling. For the 16 weeks, online nutrition education with e-mail education materials was conducted every two weeks (total 8 sessions). Follow-up education was conducted two times before birth via telephone counselling. Women were also monitored by gynaecologists. **Control:** Women received offline education only two times. Subjects in the control group received only 2 times (1st, 4th) offline education [This falls into category intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) o Audio (phone call)

	o Electronic and textual (e-mail) • **Component 2: Intervention aimed at individuals or groups** o Mixed • **Component 3: Individualised /tailored interventions or general** o General, aimed to all the population of interest • **Component 4: Who delivers the intervention** o Healthcare practitioner, health or social care worker (Registered dietician) • **Component 5: Where is the intervention delivered** o Unclear (for face-to-face component) or online/phone • **Component 6: Behaviour change models, techniques and theories** o No theory mentioned
Duration of follow-up	For outcomes of interest: follow-up was at 8 weeks (mean 22.3 to 24.4 gestational weeks). The intervention ran for 16 weeks in total.
Sources of funding	Not industry funded
Sample size	N = 142 Nutrition education and counselling n = 98 Control n = 44
Other information	Study characteristic numbers were based on numbers analysed (intervention n=16; comparator n=20)

	Nutrient intakes were measured by the 24 hour dietary recall method and the food frequency questionnaire was used for sugar intake. Multiple pregnancies were excluded. The study did not report outcomes by BMI, age, deprivation descriptors, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index; ITT: intention to treat; kg: kilograms; m: metres; n: number of participants; NR: not reported; SD: standard deviation

Study arms

Nutrition education and counselling (N = 98)

Control (N = 44)

Outcomes

Outcome	Nutrition education and counselling, N= 98	Control, N = 44
Changes in calorie intake (kcal/day) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20 Mean (SD)	-2.4 (593.83)	80 (532.49)
Changes in carbohydrate intake (% of energy) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20 Mean (SD)	-20.3 (91.1)	8.8 (92.95)
Changes in total sugar intake (g) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20; Total sugar included sugar intake from staple foods, milk, fruit, and processed food. Mean (SD)	-2.3 (42.76)	11.9 (50.6)

Outcome	Nutrition education and counselling, N= 98	Control, N = 44
Changes in sugar from processed food intake (g) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20; Processed food included coffee, beverages, snacks, bakery products, soda, dairy products, ice cream, and simple sugar Mean (SD)	-7.6 (24.05)	13.6 (31.51)
Changes in fibre intake (g) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20 Mean (SD)	-2.4 (12.07)	0.4 (9.94)
Changes in total fat intake (% of energy) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20 Mean (SD)	6 (31.44)	6.9 (27.95)
Changes in protein intake (g) Change score from baseline to 8 weeks (mean 22.3 to 24.4 gestational weeks); Nutrition education and counselling n = 61; Control n = 20 Mean (SD)	4.4 (33.23)	-1.6 (27.65)

g: grams; kcal: kilocalories; mg: milligrams; n: number of participants; SD: standard deviation

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Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(The study used an unequal randomization trial method with aims to provide higher levels of nutrition education and counselling to more participants. No*

Section	Question	Answer
		information on allocation concealment was provided. There were statistically significant differences between arms for work status but no other demographic or health related characteristics which may suggest differences compatible with chance.)
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns *(No information provided in-text to judge whether deviations from intended allocation occurred. Appropriate modified ITT analysis was performed which excluded those with missing outcomes in each arm.)*
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(Outcome data was not available for all participants. Exclusions after randomisation in the intervention and comparator groups were due to loss to follow up (n = 24; n = 13, respectively) or missing outcome data (n = 13; n = 5, respectively). This led to a total of 62% (n = 61/98) in the intervention arm and 45% (20/44) in the comparator arm remaining in the analysis. It is unclear whether missingness in the outcome depended on true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(Methods of measuring the outcomes are appropriate, and unlikely differences in measurement of the outcomes between intervention groups. A validated block food frequency questionnaire was applied for dietary assessment. As participants were likely aware of the diet received and the FFQs were self-reported by participants, it is possible that this type of data collection could introduce bias (subjective outcome) where knowledge of the intervention may have influenced responses.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	High *(The analysis appeared change based on the changing ratio of intervention to control participants once there was loss to follow-up and missing outcome data.)*
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result.)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

FFQ: food frequency questionnaire; ITT: intention to treat; n: number of participants; N/A: not applicable

Yamada, 2022

Bibliographic Reference	Yamada, Pamella; Paetow, Alexandra; Chan, Michael; Arslan, Alan; Landberg, Rikard; Young, Bruce K; Pregnancy outcomes with differences in grain consumption: A randomized controlled trial; Journal of Perinatal Medicine; 2022; vol. 50 (no. 4); 411-418

Study details

Country/ies where study was carried out	USA
Study type	Randomised controlled trial (RCT)
Study dates	Not reported
Inclusion criteria	• healthy pregnant women • aged 18–45 years • normal pregnancy without medical disease and uncomplicated
Exclusion criteria	• abnormal fetus • multiple gestation • placenta previa • vaginal bleeding or any patient considered high risk • having a medical illness complicated pregnancy by the obstetricians

Patient characteristics	**Mean (SD) age in years** Diet A: 28 (NR) Diet B: 28 (NR) **Mean (SD) parity** Diet A: 1.0 (NR) Diet B: 1.2 (NR) **Mean gestational age in weeks [at screening] (SD)** Not reported **Gestational age when the intervention was initiated** 8 gestational weeks **Mean (SD) pre-pregnancy BMI in kg/m^2 [at baseline]** Diet A: 27.2 (NR) Diet B: 27.5 (NR) **BMI class (%)** Not reported **Comorbidities (n, %)** NR

	Ethnicity (n, %) Diet A: • Black: 5 (4) • White: 58 (46) • Asian: 3 (2) • Other: 60 (48) Diet B: • Black: 5 (4) • White: 59 (48) • Asian: 4 (3) • Other: 54 (44) (n calculated from %) **Education level** Not reported
Intervention(s)/control	Intervention: • Diet a (refined grains) 75% of carbohydrate calories from refined grains • Diet b (whole grains) 75% of carbohydrate calories from whole grains Involves patient dietary counselling with a registered dietician specialising in Hispanic diet counselling with food samples provided, diet brochures and recipe suggestions. Food frequency questionnaire was filled out after 16 weeks of the diet. Clinic visits were at standard frequency of obstetrical care. *General dietary instructions were the same for each diet group and every patient had dietary counselling by a registered dietitian or physician at the initial visit and each subsequent clinic session.

	[This falls into category 4: combination of intervention 1 (information provision and/or education to enhance healthy eating and drinking practices) and 3 (interventions aimed at improving access to healthy foods) in the protocol]. **Components of intervention:** • **Component 1: Mode of delivery** o Face-to-face (in person) o Audio (scripted phone call) o Printed and textual (brochures) o Electronic and textual (website, text message) • **Component 2: Intervention aimed at individuals or groups** o Individual based • **Component 3: Individualised /tailored interventions or general** o General, aimed to all the population of interest • **Component 4: Who delivers the intervention** o Healthcare practitioner, health or social care worker (registered dietitian or physician) • **Component 5: Where is the intervention delivered** o Healthcare setting (obstetrical clinic) • **Component 6: Behaviour change models, techniques and theories** o No theory mentioned

Duration of follow-up	Unclear for relevant outcomes (reported as after at least 16 weeks from baseline equating to minimum 24-39 gestational weeks). Total follow-up was mean 38.7 to 38.8 gestational weeks.
Sources of funding	Industry funded (Grain Foods Foundation)
Sample size	N = 303 Diet A (refined grains) n = 147 Diet B (whole grains) n = 156
Other information	Food frequency questionnaire (NutritionQuest 2018 version) was administered after at least 16 weeks on the diet. Multiple pregnancies were excluded. The study did not report outcomes by BMI, age, deprivation descriptors, comorbidities, geographical variation, religion and cultural considerations or ethnicity. ITT numbers used for analysis.

BMI: body mass index;; ITT: intention to treat; n: number of participants; NR: not reported; SD: standard deviation; USA: United States of America

Study arms

Diet A (refined grains) (N = 147)

Diet B (whole grains) (N = 156)

Outcomes

Outcome	Diet A (refined grains), N = 147	Diet B (whole grains), N = 156
Changes in calorie intake (kcal/day) Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	2041.21 (764.73)	2315.62 (1199.03)
Changes in carbohydrate intake (g) Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	257.2 (99.56)	301.6 (165.97)

Outcome	Diet A (refined grains), N = 147	Diet B (whole grains), N = 156
Changes in fibre intake (g) Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	25.41 (11.51)	29.55 (17.73)
Changes in protein intake (g) Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	75.18 (32.91)	85.28 (47.02)
Changes in total fat intake (g) Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	84.43 (33.94)	91.04 (45.72)
Changes in sugar (sweets) intake (% of kcal) follow-up minimum 24-38 GW Follow-up minimum 24-39 GW; Diet A n = 90; Diet B n = 92 Mean (SD)	36.57 (251.29)	21.29 (93.28)

g: grams; GW: gestational weeks; kcal: kilocalories; mg: milligrams; n: number of participants; SD: standard deviation

Critical appraisal – Cochrane Risk of Bias tool v2.0 for RCTs

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns *(No information on allocation sequence concealment. No significant differences between groups at baseline.)*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	High *(Participants and study personnel were aware of the intervention. However, there is no reason to believe that deviations from the intended intervention arose due to trial context. Intention to treat analysis was not performed with*

Section	Question	Answer
		exclusions from the analysis of eligible participants who had not yet delivered which may impact on the results of interest.)
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns *(Outcomes were not available for 15% (n = 22) of participants in the diet containing 75% of total carbohydrates as refined grains did not have outcomes and 21% (n = 33) of participants in the diet containing 75% of total carbohydrates as whole grains due to lost to follow-up, discontinued the intervention or did not yet deliver. One participant in the whole grains arm discontinued the intervention due to late diagnosis of diabetes. It was not likely that missingness depended on its true value.)*
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	High *(Methods of measuring the outcomes are appropriate, and unlikely differences in measurement of the outcomes between intervention groups. A block Food Frequency Questionnaire (FFQ), previously validated, was applied for dietary assessment. As participants were aware of the diet received and the FFQ was self-reported by participants, it is possible that this type of data collection could introduce bias (subjective outcome) where knowledge of the intervention may have influenced responses.)*
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low *(No indication of selection of numerical results from multiple outcome measurements and reported outcome data not likely to have been selected from results of multiple analyses)*
Overall bias and Directness	Risk of bias judgement	High *(The study is judged to be at high risk of bias in at least one domain for this result)*
Overall bias and Directness	Overall Directness	Directly applicable
Overall bias and Directness	Risk of bias variation across outcomes	N/A

N/A: not applicable

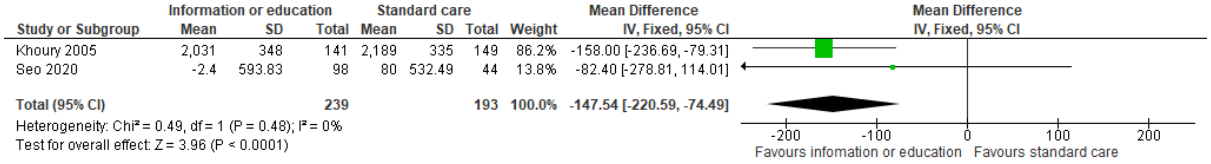
Appendix E Forest plots

Forest plots for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

This section includes forest plots only for outcomes that are meta-analysed. Outcomes from single studies are not presented here; the quality assessment for such outcomes is provided in the GRADE profiles in appendix F.

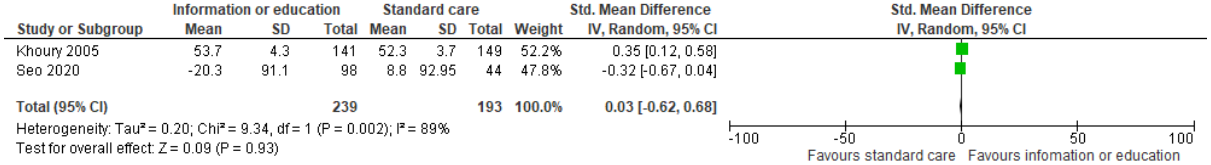
Comparison 1. Intervention group 1: Interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care in single pregnancy: mixed BMI (all categories), age, socio-economic group and co-morbidities)

Figure 2: Changes in calorie intake (kcal/day) mean 22.3-24.4 GW to 36 GW (Better indicated by lower values)



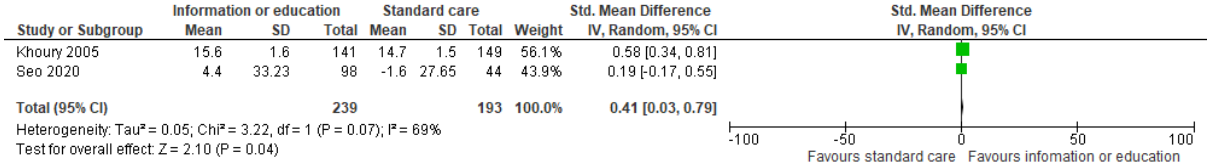
CI: confidence interval; df: degrees of freedom; GW: gestational weeks; kcal: kilocalories; SD: standard deviation

Figure 3: Changes in carbohydrate intake (g or % of energy) follow-up mean 22.3-24.4GW to 36 GW (Better indicated by higher values)



CI: confidence interval; df: degrees of freedom; g: grams; GW: gestational weeks; SD: standard deviation

Figure 4: Changes in protein intake (g or % of energy) follow-up mean 22.3-24.4 GW to 36 GW (Better indicated by higher values)



CI: confidence interval; df: degrees of freedom; g: grams; GW: gestational weeks; SD: standard deviation

Appendix F GRADE tables

GRADE tables for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Table 4: Evidence profile for intervention group 1: Interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
Changes in calorie intake (kcal/day) mean 22.3-24.4 GW to 36 GW (Better indicated by lower values)												
2 (Khoury 2005; Seo 2020) [1,2]	randomised trials	very serious[3]	no serious inconsistency	no serious indirectness	no serious imprecision	none	239	193	-	MD 147.54 lower (220.59 to 74.49 lower)	LOW NO IMP. DIFF	CRITICAL
Changes in fruit consumption (apples, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
1 (Burr 2007)[4]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[6]	none	Net % = -13.2 (5 less women)[7] 63	Net % = -2.7 (1 less woman)[7] 64	-	-	VERY LOW NO IMP. DIFF	CRITICAL
Changes in fruit consumption (oranges, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
1 (Burr 2007)[4]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[6]	none	Net % = -21.1 (8 less women)[7] 63	Net % = -11.8 (4 less women)[7] 64	-	-	VERY LOW	CRITICAL
Changes in fruit consumption (bananas, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
1 (Burr 2007)[4]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[6]	none	Net % = -7.9 (3 less women)[7] 63	Net % = -29.7 (11 less women)[7] 64	-	-	VERY LOW NO IMP. DIFF	CRITICAL
Changes in carbohydrate intake (g or % of energy) follow-up mean 22.3-24.4GW to 36 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
2 (Khoury 2005; Seo 2020)[1,2]	randomised trials	serious[5]	very serious[8]	no serious indirectness	very serious[9]	none	239	193	-	SMD 0.03 higher (0.62 lower to 0.68 higher)	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in carbohydrates were of sugar (% of energy) follow-up to 36 GW (Better indicated by lower values); Components of the intervention (face-to-face intervention, aimed at individuals, general interventions, delivered by healthcare practitioner, health or social care worker (dietician), in healthcare setting, no theory mentioned)												
1 (Khoury 2005)	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	141	149	-	MD 2.5 lower (3.46 to 1.54 lower)	MODERATE NO IMP. DIFF	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
Changes in total sugar intake (g) follow-up to mean 22.3-24.4 GW (Better indicated by lower values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals or groups, general interventions, delivered by healthcare practitioner, health or social care worker (registered dietician), unclear where delivered for face-to-face component otherwise online/phone setting, no theory mentioned)												
1 (Seo 2020) [1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[10]	none	98	44	-	MD 14.2 lower (31.38 lower to 2.98 higher)	LOW NO EV OF IMP DIFF.	CRITICAL
Changes in sugar from processed food intake (g) follow-up to mean 22.3-24.4 GW (Better indicated by lower values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals or groups, general interventions, delivered by healthcare practitioner, health or social care worker (registered dietician), unclear where delivered for face-to-face component otherwise online/phone setting, no theory mentioned)												
1 (Seo 2020) [1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[11]	none	98	44	-	MD 21.2 lower (31.66 to 10.74 lower)	LOW **IMP. BENEFIT**	CRITICAL
Changes in fibre intake (g) follow-up mean 22.3-24.4 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals or groups, general interventions, delivered by healthcare practitioner, health or social care worker (registered dietician), unclear where delivered for face-to-face component otherwise online/phone setting, no theory mentioned)												
1 (Seo 2020) [1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[12]	none	98	44	-	MD 2.8 lower (6.59 lower to 0.99 higher)	LOW NO EV OF IMP DIFF.	CRITICAL
Changes in protein intake (g or % of energy) follow-up mean 22.3-24.4 GW to 36 GW (Better indicated by higher values)												
2 (Khoury 2005; Seo 2020) [1,2]	randomised trials	very serious[3]	no serious inconsistency	no serious indirectness	serious[13]	none	239	193	-	SMD 0.41 higher (0.03 to 0.79 higher)	VERY LOW NO EV OF IMP DIFF.	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
Changes in fish intake (g/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[14]	none	20	21	-	MD 12 higher (0.08 lower to 24.08 higher)	LOW NO EV OF IMP DIFF.	CRITICAL
Changes in total fat intake (% of energy) follow-up to mean 22.3-24.4 GW (Better indicated by lower values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals or groups, general interventions, delivered by healthcare practitioner, health or social care worker (registered dietician), unclear where delivered for face-to-face component otherwise online/phone setting, no theory mentioned)												
1 (Seo 2020)[1]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	no serious imprecision	none	98	44	-	MD 0.9 lower (11.24 lower to 9.44 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in saturated fat intake (% of energy) follow-up to 36 GW (Better indicated by lower values); Components of the intervention (face-to-face intervention, aimed at individuals, general interventions, delivered by healthcare practitioner, health or social care worker (dietician), in healthcare setting, no theory mentioned)												
1 (Khoury 2005)	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	very serious[14]	none	141	149	-	MD 4.4 lower (4.78 to 4.02 lower)	VERY LOW **IMP. BENEFIT**	CRITICAL
Changes in DHA from fish intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[16]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[15]	none	20	21	-	MD 69 higher (9.63 to 128.37 higher)	LOW NO EV OF IMP DIFF.	

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
Changes in DHA from supplements intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[16]	randomised trials	serious[4]	no serious inconsistency	no serious indirectness	no serious imprecision	none	20	21	-	MD 0 higher (41.11 lower to 41.11 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in DHA from fish+supplements intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[16]	randomised trials	serious[5]	no serious inconsistency	no serious indirectness	serious[15]	none	20	21	-	MD 65 higher (7.83 to 122.17 higher)	LOW **IMP. BENEFIT**	CRITICAL

BMI: Body mass index; CI: confidence interval; DHA: Docosahexaenoic acid; Diff: difference; g: grams; GW: Gestational weeks; kcal: kilocalories; mg: milligrams; MD: mean difference; mL: millilitres; Imp: important; NR: not reported; RR: risk ratio; SMD: standardised mean difference

[1] For outcomes of interest for Seo 2020 follow-up was at 8 weeks (mean 22.3 to 24.4 gestational weeks). The intervention ran for a total of 16 weeks.
[2] See corresponding forest plot in appendix E for studies contributing to this outcome.
[3] Very serious risk of bias in the evidence contributing to the outcomes as per RoB2.
[4] The committee agreed that individual fruit item outcomes were not of clinical importance.
[5] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.
[6] Sample size <200.
[7] The number of women whose intake increased minus the number whose intake decreased, as a percentage of the number supplying information on both occasions.
[8] Very serious heterogeneity (I^2=89%). No sufficient number of studies to conduct subgroup analysis. Random effects analysis used.
[9] 95%CI crosses 2 MIDs (SMD MID=0.5).
[10] 95%CI crosses 1 MID (control SD=23.9).
[11] 95%CI crosses 1 MID (control SD=15.2).
[12] 95%CI crosses 1 MID (control SD=6.4).
[13] 95%CI crosses 1 MID (SMD MID=0.5).
[14] 95%CI crosses 2 MIDs (control SD=1.7).
[15] 95%CI crosses 1 MID (change score control SD used=11 for DHA from fish+supplements, =17 for fish intake, and =75 for DHA from fish intake).
[16] The committee agreed that the standard minimally important differences that were applied to DHA intake from fish intake, supplements or combined supplement and fish consumption also reflected clinical importance.

Table 5: **Evidence profile for intervention group 1: Interventions using information provision and/or education to enhance healthy eating and drinking practices versus standard care in single pregnancy: healthy BMI range (18.5-24.9 kg/m^2), mixed age, mixed socio-economic group and without any reported co-morbidities**

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
Changes in calorie intake (kcal/day) follow-up to end of third trimester (Better indicated by lower values); Components of the intervention (face-to-face and audio, aimed at individuals, tailored interventions, delivered by healthcare practitioner, health or social care worker (registered dieticians), delivered in healthcare setting (university hospital), no theory mentioned)												
1 (Bosaeus 2015)[1]	randomised trials	serious[2]	no serious inconsistency	serious[3]	very serious[4]	none	Median (IQR) = 2364 (2033 to 2860) 49	Median (IQR) = 2300 (2010 to 2678) 52	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in meat intake (g/week) follow-up to end of third trimester (Better indicated by higher values); Components of the intervention (face-to-face and audio, aimed at individuals, tailored interventions, delivered by healthcare practitioner, health or social care worker (registered dieticians), delivered in healthcare setting (university hospital), no theory mentioned)												
1 (Bosaeus 2015)[1]	randomised trials	serious[2]	no serious inconsistency	serious[3]	very serious[4]	none	Median (IQR) = 1700 (875 to 1269) 49	Median (IQR) = 1400 (700 to 1925) 52	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in fish intake (g/week) follow-up to end of third trimester (Better indicated by higher values); Components of the intervention (face-to-face and audio, aimed at individuals, tailored interventions, delivered by healthcare practitioner, health or social care worker (registered dieticians), delivered in healthcare setting (university hospital), no theory mentioned)												
1 (Bosaeus 2015)[1]	randomised trials	serious[2]	no serious inconsistency	serious[3]	very serious[4]	none	Median (IQR) = 375 (300 to 600) 49	Median (IQR) = 450 (300 to 525) 52	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in serum DHA (mg/mL) follow-up to end of third trimester (Better indicated by higher values); Components of the intervention (face-to-face and audio, aimed at individuals, tailored interventions, delivered by healthcare practitioner, health or social care worker (registered dieticians), delivered in healthcare setting (university hospital), no theory mentioned)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions using information provision and/or education	Control	Relative (95% CI)	Absolute		
1 (Bosaeus 2015)[1]	randomised trials	serious[2]	no serious inconsistency	serious[3]	very serious[4]	none	Median (IQR) = 0.197 (0.145 to 0.267) 49	Median (IQR) = 0.196 (0.155 to 0.217) 52	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL

BMI: Body mass index; CI: confidence interval; DHA: Docosahexaenoic acid; Diff: difference; g: grams; GW: Gestational weeks; kcal: kilocalories; mg: milligrams; mL: millilitres; Imp: important; NR: not reported

[1] For Bosaeus 2015, data was reported for the third trimester and was treated as follow-up to end of the third trimester as data to calculate a change score within the third trimester was not provided.
[2] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.
[3] Serious indirectness as Swedish government recommendations on dietary energy intake during pregnancy differ to the UK setting.
[4] Sample size <200.

Table 6: Evidence profile for intervention group 2: Behavioural interventions versus standard care in single pregnancy: mixed BMI (all categories), mixed age groups, mixed socio-economic groups and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Behavioural interventions	Control	Relative (95% CI)	Absolute		
Changes in calorie intake (kcal) follow-up after 3 months (GW NR) (Better indicated by lower values); Components of the intervention (electronic and textual and audio, aimed at individuals, on demand tailored interventions, delivered by healthcare practitioner, health or social care worker (dieticians), delivered at home when using software based on a Clinical Decision Support System)												
1 (Papandreou 2023)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	Median (IQR) = 2000.0 (150.0) 20	Median (IQR) = 2375.0 (900.0) 20	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Behavioural interventions	Control	Relative (95% CI)	Absolute		
Changes in carbohydrate intake (%) follow-up after 3 months (GW NR) (Better indicated by lower values); Components of the intervention (electronic and textual and audio, aimed at individuals, on demand tailored interventions, delivered by healthcare practitioner, health or social care worker (dieticians), delivered at home when using software based on a Clinical Decision Support System)												
1 (Papandreou 2023)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	Median (IQR) = 52.0 (3.5) 20	Median (IQR) = 52.0 (5.8) 20	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in fibre intake (g) follow-up after 3 months (GW NR) (Better indicated by higher values); Components of the intervention (electronic and textual and audio, aimed at individuals, on demand tailored interventions, delivered by healthcare practitioner, health or social care worker (dieticians), delivered at home when using software based on a Clinical Decision Support System)												
1 (Papandreou 2023)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	serious[4]	none	20	20	-	MD 0.8 higher (2.59 lower to 4.19 higher)	LOW NO EV OF IMP DIFF.	CRITICAL
Changes in protein intake (g) follow-up after 3 months (GW NR) (Better indicated by higher values); Components of the intervention (electronic and textual and audio, aimed at individuals, on demand tailored interventions, delivered by healthcare practitioner, health or social care worker (dieticians), delivered at home when using software based on a Clinical Decision Support System)												
1 (Papandreou 2023)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	Median (IQR) = 20.0 (3.0) 20	Median (IQR) = 19.5 (2.8) 20	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL
Changes in total fat intake (g) follow-up after 3 months (GW NR) (Better indicated by lower values); Components of the intervention (electronic and textual and audio, aimed at individuals, on demand tailored interventions, delivered by healthcare practitioner, health or social care worker (dieticians), delivered at home when using software based on a Clinical Decision Support System)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Behavioural interventions	Control	Relative (95% CI)	Absolute		
1 (Papandreou 2023)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	very serious[3]	none	Median (IQR) = 28.0 (3.8) 20	Median (IQR) = 29.0 (3.0) 20	-	-	VERY LOW NO EV OF IMP DIFF.	CRITICAL

BMI: Body mass index; CI: confidence interval; Diff: difference; g: grams; GW: Gestational weeks; MD: mean difference; Imp: important; IQR: interquartile range; kcal: kilocalories; NR: not reported

[1] Study does not define follow-up; intervention length was 3 months.
[2] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.
[3] Sample size <200.
[4] 95%CI crosses 1 MID (control SD=3.8)

Table 7: Evidence profile for intervention group 3: Interventions aimed at improving access to healthy foods versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions aimed at improving access to healthy foods	Control	Relative (95% CI)	Absolute		
Changes in fruit consumption (apples, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
1 (Burr 2007)[1]	randomised trials	serious[2]	no serious inconsistency	serious indirectness[3]	very serious[4]	none	Net % = 2.2 (1 more woman)[5] 63	Net % = -2.7 (1 less woman)[5] 64	-	-	VERY LOW NO IMP DIFF.	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Interventions aimed at improving access to healthy foods	Control	Relative (95% CI)	Absolute		
Changes in fruit consumption (oranges, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
1 (Burr 2007) [1]	randomised trials	serious[2]	no serious inconsistency	serious indirectness[3]	very serious[4]	none	Net % = -2.2 (1 less woman)[5] 63	Net % = -11.8 (4 less women)[5] 64	-	-	VERY LOW NO IMP DIFF.	CRITICAL
Changes in fruit consumption (bananas, net % since baseline) follow-up to 32 GW (Better indicated by higher values); Components of the intervention (face-to-face, audio, printed and textual interventions, aimed at individuals, general interventions, delivered by midwife, in healthcare setting (antenatal appointment), no theory mentioned)												
1 (Burr 2007) [1]	randomised trials	serious[2]	no serious inconsistency	serious indirectness[3]	very serious[4]	none	Net % = -17.4 (8 less women)[5] 63	Net % = -29.7 (11 less women)[5] 64	-	-	VERY LOW NO IMP DIFF.	CRITICAL

BMI: Body mass index; CI: confidence interval; Diff: difference; GW: Gestational weeks; Imp: important; NR: not reported

[1] The committee agreed that individual fruit item outcomes were not of clinical importance.

[2] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.

[3] Voucher intervention may be less relevant to the current UK context compared to time of study conduct (published year 2007, trial start date not reported) as pure orange juice is no longer promoted and milk delivery services may not be as widely used.

[4] Sample size <200.

[5] The number of women whose intake increased minus the number whose intake decreased, as a percentage of the number supplying information on both occasions.

Table 8: Evidence profile for intervention group 4: Multicomponent interventions using information provision and/or education and behavioural intervention versus standard care (intervention group 1 + intervention group 2) in single pregnancy: mixed BMI (overweight or obese), mixed age groups, mixed socio-economic groups and without any reported comorbidities)

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and behavioural intervention	Control	Relative (95% CI)	Absolute		
Changes in calorie intake (kcal/day) follow-up at 35-37 GW (Better indicated by lower values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 211 lower (299.11 to 122.89 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in vegetable intake (kcal/day) follow-up at 35-37 GW (Better indicated by lower values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 1 lower (2.63 lower to 0.63 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in fruit intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 30 lower (46.47 to 13.53 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in total sugars (g/day) follow-up at 35-37 GW (Better indicated by lower values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1(Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 13.22 lower (20.96 to 5.48 lower)	MODERATE	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and behavioural intervention	Control	Relative (95% CI)	Absolute		
											NO IMP DIFF.	
Changes in meat intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 2 lower (15.56 lower to 11.56 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in sausage intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 3 lower (8.46 lower to 2.46 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in whole milk product intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 42 lower (62.06 to 21.94 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in low-fat milk product intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 18 higher (0.53 lower to 36.53 higher)	MODERATE	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and behavioural intervention	Control	Relative (95% CI)	Absolute		
											NO IMP DIFF.	
Changes in legumes intake (kcal/day) follow-up at 35-37 GW (Better indicated by higher values); Components of the intervention (face-to-face and visual, no mention whether aimed at group or individuals, general and tailored interventions, no mention of who delivers intervention, delivered during home visits, no theory mentioned)												
1 (Anleu 2019)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	500	502	-	MD 1 lower (5.71 lower to 3.71 higher)	MODERATE NO IMP DIFF.	CRITICAL

BMI: Body mass index; CI: confidence interval; Diff: difference; g: grams; GW: Gestational weeks; kcal: kilocalories; MD: mean difference; Imp: important; NR: not reported
[1] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.

Table 9: Evidence profile for intervention group 4: Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food versus standard care (intervention group 1 + intervention group 3) in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and aiming to improve access to healthy food	Control	Relative (95% CI)	Absolute		
Changes in fish intake (g/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												

1 (Oken 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	20	21	-	MD 22 higher (4.63 to 39.37 higher)	LOW **IMP. BENEFIT**	CRITICAL
Changes in DHA from fish intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	20	21	-	MD 161 higher (100.14 to 221.86 higher)	VERY LOW **IMP. BENEFIT**	CRITICAL
Changes in DHA from supplements intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	20	21	-	MD 24 higher (23.75 lower to 71.75 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in DHA from fish+supplements intake (mg/day) follow-up mean 30 GW (Better indicated by higher values); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)[3]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[4]	none	20	21	-	MD 181 higher (117.72 to 244.28 higher)	VERY LOW **IMP. BENEFIT**	CRITICAL

BMI: Body mass index; CI: confidence interval; DHA: Docosahexaenoic acid; Diff: difference; g: grams; GW: Gestational weeks; MD: mean difference; Imp: important; mg: milligrams; NR: not reported

[1] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.

[2] 95%CI crosses 1 MID (change score control SD=17).

[3] The committee agreed that the standard minimally important differences that were applied to DHA intake from fish intake, supplements or combined supplement and fish consumption also reflected clinical importance.

[4] 95%CI crosses 2 MIDs (change score control SD=75 for changes in DHA from fish intake and =11 for changes in DHA from fish+supplements intake).

Table 10: Evidence profile for intervention group 1 (information provision and/or education) or Intervention group 3 (interventions aimed

at improving access to healthy food) versus standard care in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Information provision and/or education or interventions aimed at improving access to healthy food	Control	Relative (95% CI)	Absolute		
Fish consumption attitudes (follow-up at mean 30 GW) - "I enjoy eating fish" (strongly agree); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	14/40 (35%)	2/20 (10%)	RR 3.5 (0.88 to 13.93)	250 more per 1000 (from 12 fewer to 1000 more)	LOW NO EV OF IMP DIFF	IMPORTANT
Fish consumption attitudes (follow-up at mean 30 GW) - "Fish contains nutrients that are healthy for my baby" (strongly agree); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	26/40 (65%)	7/20 (35%)	RR 1.86 (0.98 to 3.52)	301 more per 1000 (from 7 fewer to 882 more)	LOW NO EV OF IMP DIFF	IMPORTANT
Fish consumption attitudes (follow-up at mean 30 GW) - "Some kinds of fish are better for me to eat than other kinds" (strongly agree); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												
1 (Oken 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	29/40 (72.5%)	11/20 (55%)	RR 1.32 (0.85 to 2.05)	176 more per 1000 (from 82 fewer to 577 more)	LOW NO EV OF IMP DIFF	IMPORTANT
Fish consumption attitudes (follow-up at mean 30 GW) - "I try not to eat fish because it might be harmful for me or my baby" (strongly disagree); Components of the intervention (face-to-face, printed and textual interventions, aimed at individuals, general interventions, delivered by researchers, baseline visit delivered at home or in research offices and then online for remainder of study, no theory mentioned)												

1 (Oken 2013)	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	22/40 (55%)	7/20 (35%)	RR 1.57 (0.81 to 3.04)	200 more per 1000 (from 67 fewer to 714 more)	LOW NO EV OF IMP DIFF	IMPORTANT

BMI: Body mass index; CI: confidence interval; Diff: difference; GW: Gestational weeks; Imp: important; NR: not reported; RR: risk ratio
[1] Serious risk of bias in the evidence contributing to the outcomes as per RoB2.
[2] 95%CI crosses 1 MID (1.25)

Table 11: Evidence profile for intervention group 4: Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food (intervention group 1 + intervention group 3): Diet A refined grains versus Diet B whole grains in single pregnancy: mixed BMI (all categories), mixed age, mixed socio-economic group and without any reported co-morbidities

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food : Diet A refined grains versus Diet B whole grains -	Control	Relative (95% CI)	Absolute		
Changes in calorie intake (kcal/day) follow-up minimum 24-39 GW (Better indicated by lower values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												
1 (Yamada 2022)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 274.41 lower (499.54 to 49.28 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in carbohydrate intake (g) follow-up minimum 24-39 GW (Better indicated by higher values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												
1 (Yamada 2022)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 44.4 lower (75.02 to 13.78 lower)	MODERATE NO IMP DIFF.	CRITICAL

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food : Diet A refined grains versus Diet B whole grains -	Control	Relative (95% CI)	Absolute		
Changes in sugar (sweets) intake (% of kcal) follow-up minimum 24-39 GW (Better indicated by lower values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												
1 (Yamada 2022)[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 15.28 higher (27.9 lower to 58.46 higher)	MODERATE NO IMP DIFF.	CRITICAL
Changes in fibre intake (g) follow-up minimum 24-39 GW (Better indicated by higher values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												
1 (Yamada 2022) [1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 4.14 lower (7.49 to 0.79 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in protein intake (g) follow-up minimum 24-39 GW (Better indicated by higher values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												
1 (Yamada 2022) [1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 10.1 lower (19.2 to 1 lower)	MODERATE NO IMP DIFF.	CRITICAL
Changes in total fat intake (g) follow-up minimum 24-39 GW (Better indicated by lower values for Diet B); Components of the intervention (face-to-face, audio, printed and textual and electronic and textual, individual based intervention, general intervention, delivered by healthcare practitioner, health or social care worker (registered dietitian or physician), delivered at healthcare setting (obstetrical clinic), no theory mentioned)												

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Multicomponent interventions using information provision and/or education and aiming to improve access to healthy food : Diet A refined grains versus Diet B whole grains -	Control	Relative (95% CI)	Absolute		
1 (Yamada 2022) [1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	no serious imprecision	none	147	156	-	MD 6.61 lower (15.64 lower to 2.42 higher)	MODERATE NO IMP DIFF.	CRITICAL

BMI: Body mass index; CI: confidence interval; Diff: difference; g: grams; GW: Gestational weeks; MD: mean difference; Imp: important; NR: not reported

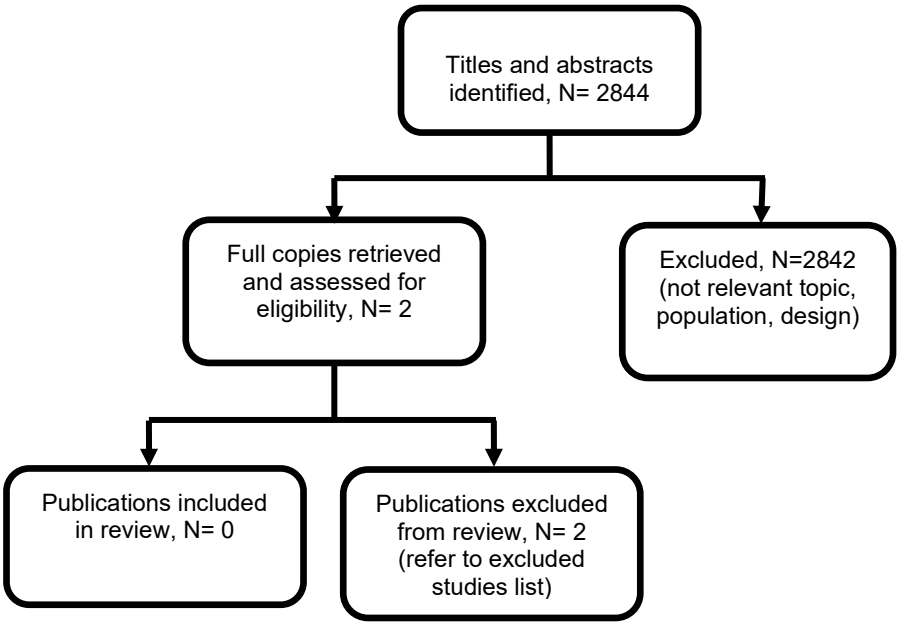
[1]Follow-up was unclear for relevant outcomes (reported as after at least 16 weeks from baseline equating to minimum 24-39 gestational weeks). Total follow-up was mean 38.7 to 38.8 gestational weeks.

[2]Serious risk of bias in the evidence contributing to the outcomes as per RoB2.

Appendix G Economic evidence study selection

Study selection for: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Figure 5: Economic evidence study selection flow chart



Appendix H Economic evidence tables

Economic evidence tables for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

No economic evidence was identified which was applicable to this review question.

Appendix I Economic model

Economic model for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

No economic analysis was conducted for this review question.

Appendix J Excluded studies

Excluded studies for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

Excluded effectiveness studies

Table 12: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Abdel-Aziz, S B, Hegazy, I S, Mohamed, D A et al. (2018) Effect of dietary counseling on preventing excessive weight gain during pregnancy. Public health 154: 172-181	- Study setting does not meet protocol criteria Study not conducted in a high income country (Egypt)
Achara, Srinaphasawadi and Kruawan, Thongpanchng (2003) Developing a Particpational Format of Nutrition Education in Pregnancy Clinic for Contol and Prevention of Iron-Deficiency Anemia (IDA). Chon buri hospital journal 28(1): 3-9	- Full text paper not available Unable to access full-text article. The journal is from Thailand and written in Thai language
Achón, M, Úbeda, N, García-González, Á et al. (2019) Effects of Milk and Dairy Product Consumption on Pregnancy and Lactation Outcomes: A Systematic Review. Advances in nutrition (Bethesda, Md.) 10(suppl2): S74-S87	- Outcome is not relevant to this review protocol Systematic review on milk and dairy product consumption with no outcomes of interest. Included studies have been checked
Adalsteinsdottir, Solveig, Tryggvadottir, Ellen Alma, Hrolfsdottir, Laufey et al. (2020) Insufficient iodine status in pregnant women as a consequence of dietary changes. Food & Nutrition Research 64: 1-8	- Study does not contain an intervention relevant to this review protocol The study collects a survey of dietary intake and relates this to iodine status during pregnancy. No intervention was implemented and no changes in diet were investigated therefore does not meet the protocol criteria
Al Wattar, Bassel H, Dodds, Julie, Placzek, Anna et al. (2017) Mediterranean diet based intervention in pregnancy to improve maternal and fetal outcomes: Methodological challenges and lessons learned from the multicentre ESTEEM study. Contemporary clinical trials communications 6: 72-77	- Outcome is not relevant to this review protocol Methodological paper describing the ESTEEM trial which was included in the MCN2.2 systematic review as part of the Teede 2022 systematic review. The trial focused on Mediterranean based diet for maternal and neonatal composite outcomes.
Alamolhoda, Seideh Hanieh, Simbar, Masoumeh, Mirmiran, Parvin et al. (2020) Effect of low trans-fatty acid intakes on preeclampsia: A randomized controlled trial. Journal of Research in Medical Sciences: 1-6	- Study setting does not meet protocol criteria Study not conducted in a high income country (Iran)
Arvizu, Mariel, Stuart, Jennifer J, Rich-Edwards, Janet W et al. (2020) Prepregnancy adherence to dietary recommendations for the prevention of cardiovascular disease in relation to risk of hypertensive disorders of pregnancy. American Journal of Clinical Nutrition 112(6): 1429-1437	- Study does not contain an intervention relevant to this review protocol The study collects a survey of dietary intake over time from the Nurses' Health Study II and relates this to gestational hypertension or pre-eclampsia outcomes . No intervention was implemented and therefore does not meet the protocol criteria
Ashman, A.M., Collins, C.E., Brown, L.J. et al. (2017) Validation of a smartphone image-based	- Outcome is not relevant to this review protocol

Study	Reason for exclusion
dietary assessment method for pregnant women. Nutrients 9(1): 73	The study assesses a new dietary assessment method focusing on validity and acceptability of the method in a cohort of women. There are no interventions or relevant outcomes of interest reported
Ashman, Amy M, Brown, Leanne J, Collins, Clare E et al. (2017) Factors Associated with Effective Nutrition Interventions for Pregnant Indigenous Women: A Systematic Review. Journal of the Academy of Nutrition and Dietetics 117(8): 1222-1253e2	- Systematic review used as source of primary studies Systematic review used as a source of primary studies as not all included studies meet the protocol criteria (published before 2003, no relevant outcomes or focused on nutrition interventions for infants)
Barenys, Marta; Masjosthusmann, Stefan; Fritsche, Ellen (2017) Is Intake of Flavonoid-Based Food Supplements During Pregnancy Safe for the Developing Child? A Literature Review. Current drug targets 18(2): 196-231	- Systematic review includes studies that does not meet protocol criteria Systematic review used as a source of primary studies as not all included studies meet the protocol criteria (published before 2003, inappropriate study design or no relevant outcomes)
Beulen, Yvette H, Super, Sabina, de Vries, Jeanne H M et al. (2020) Dietary Interventions for Healthy Pregnant Women: A Systematic Review of Tools to Promote a Healthy Antenatal Dietary Intake. Nutrients 12(7)	- Systematic review used as source of primary studies Systematic review used as a source of primary studies as not all included studies meet the protocol criteria (published before 2003, inappropriate study design or no relevant outcomes)
Bianchi, C.M., Mariotti, F., Lluch, A. et al. (2020) Computer-based tailored dietary counselling improves the nutrient adequacy of the diet of French pregnant women: A randomised controlled trial. British Journal of Nutrition 123(2): 220-231	- Data not reported in an extractable format or a format that can be analysed Study uses the PANDiet score to assess nutrient adequacy and for each nutrient component only lists probabilities of nutritional adequacy
Bower, Carol, Miller, Margaret, Payne, Jan et al. (2005) Promotion of folate for the prevention of neural tube defects: who benefits?. Paediatric and perinatal epidemiology 19(6): 435-44	- Study does not contain an intervention relevant to this review protocol Study focuses on evaluation of public health programs for folic acid
Braeken, Marijke Anne Katrien Alberta and Bogaerts, Annick (2020) Effect of Lifestyle Interventions in Obese Pregnant Women on the Neurocognitive Development and Anthropometrics of Preschool Children. Obesity facts 13(2): 256-266	- Outcome is not relevant to this review protocol Secondary study reporting infant outcomes for women who underwent a lifestyle intervention during pregnancy. Original study focused on gestational weight gain and mental health outcomes
Brantsæter, AL, Olafsdottir, AS, Forsum, E et al. (2012) Does milk and dairy consumption during pregnancy influence fetal growth and infant birthweight? A systematic literature review. Food & nutrition research 56	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies that do not meet the protocol criteria (no randomised controlled trials)
Campbell, Marci K, Carbone, Elena, Honess-Morreale, Lauren et al. (2004) Randomized trial of a tailored nutrition education CD-ROM program for women receiving food assistance. Journal of nutrition education and behavior 36(2): 58-66	- Population does not meet protocol criteria Only 20% of the study population was pregnant and results were not reported separately for those who were pregnant
Casas, Rosa, Castro-Barquero, Sara, Crovetto, Francesca et al. (2022) Maternal Dietary	- Outcome is not relevant to this review protocol

Study	Reason for exclusion
Inflammatory Index during Pregnancy Is Associated with Perinatal Outcomes: Results from the IMPACT BCN Trial. Nutrients 14(11)	Secondary study to a clinical trial of Mediterranean diet or stress reduction intervention in high risk for small for gestational age (SGA) pregnancies. The secondary study did not report relevant outcomes (association between maternal diet inflammatory index, maternal pre-pregnancy BMI and newborn birthweight percentile) and the focus of the initial trial was on SGA or composite of adverse perinatal outcomes
Chang, Mei-Wei; Brown, Roger; Nitzke, Susan (2017) A Community-Based Intervention Program's Effects on Dietary Intake Behaviors. Obesity (Silver Spring, Md.) 25(12): 2055-2061	- Population does not meet protocol criteria Population were women between 6 weeks and 4.5 years post partum and self-reported as nonpregnant
Cheatham, C.L., Goldman, B.D., Fischer, L.M. et al. (2012) Phosphatidylcholine supplementation in pregnant women consuming moderate-choline diets does not enhance infant cognitive function: A randomized, double-blind, placebo-controlled trial. American Journal of Clinical Nutrition 96(6): 1465-1472	- Study does not contain an intervention relevant to this review protocol Study does not contain intervention or outcomes of interest. Focus is on provision of choline or placebo capsules as part of a randomised trial to determine the effect on infant developmental outcomes
Chen, Qian, Chen, Yajun, Wu, Weijia et al. (2021) Low-carbohydrate diet and maternal glucose metabolism in Chinese pregnant women. British Journal of Nutrition 126(3): 392-400	- Study setting does not meet protocol criteria Study not conducted in a high income country (China)
Christifano, D N, Crawford, S A, Lee, G et al. (2022) Utility of a 7- question online screener for DHA intake. Prostaglandins, leukotrienes, and essential fatty acids 177: 102399	- Outcome is not relevant to this review protocol Secondary study to two RCTs comparing DHA supplementation doses with no intervention of interest. No outcomes of interest in secondary study (food frequency questionnaire validity outcomes only) or for initial trials (focused on birth, neurodevelopmental or blood based outcomes)
Clark, Julia, Craig, Leone, McNeill, Geraldine et al. (2012) A novel dietary intervention to optimize vitamin E intake of pregnant women to 15 mg/day. Journal of the Academy of Nutrition and Dietetics 112(2): 297-301	- Outcome is not relevant to this review protocol Study does not report outcomes relevant to the protocol (change in energy not reported for third trimester, polyunsaturated but not saturated fat intake reported, qualitative component not related to intervention content)
Costa de Oliveira, Sheyla, Carvalho Fernandes, Ana Fátima, Lavinas Santos, Míria Conceição et al. (2018) EDUCATIONAL INTERVENTIONS FOR A HEALTHY DIET PROMOTION DURING PREGNANCY. Journal of Nursing UFPE / Revista de Enfermagem UFPE 12(4): 962-975	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies either already collected or focusing on gestational weight change and were considered or included in MCN 2.2
Cruz, S.; da Cruz, S.P.; Ramalho, A. (2018) Impact of Vitamin A Supplementation on Pregnant Women and on Women Who Have Just Given Birth: A Systematic Review. Journal of the American College of Nutrition 37(3): 243-250	- Systematic review used as source of primary studies Vitamin A supplementation has been addressed in MCN1.5
de Seymour, Jamie V, Simmonds, Lucy A, Gould, Jacqueline et al. (2019) Omega-3 fatty acids to prevent preterm birth: Australian	- Study design not relevant to this review protocol

Study	Reason for exclusion
pregnant women's preterm birth awareness and intentions to increase omega-3 fatty acid intake. Nutrition journal 18(1): 74	Study provides one off cross-sectional survey on nutrition attitudes and knowledge with no intervention implemented
Ding, Ye, Lu, Xiaolong, Xie, Zhencheng et al. (2021) Evaluation of a Novel WeChat Applet for Image-Based Dietary Assessment among Pregnant Women in China. Nutrients 13(9): 3158-3158	- Study setting does not meet protocol criteria Study not conducted in a high income country (China)
Dodd, Jodie M, Louise, Jennie, Cramp, Courtney et al. (2018) Evaluation of a smartphone nutrition and physical activity application to provide lifestyle advice to pregnant women: The SNAPP randomised trial. Maternal & child nutrition 14(1)	- Study does not contain an intervention relevant to this review protocol Nested SNAPP RCT from the GRoW or OPTIMISE trials with the intervention containing multifaceted lifestyle app including physical activity
Dror, DK and Allen, LH (2012) Interventions with vitamins B6, B12 and C in pregnancy. Paediatric and perinatal epidemiology 26suppl1(suppl1): 55-74	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies prior to 2003 or do not contain relevant outcomes (adverse maternal or neonatal outcomes). Relevant studies were checked
Duley, L; Henderson-Smart, DJ; Meher, S (2005) Altered dietary salt for preventing pre-eclampsia, and its complications. Cochrane Database of Systematic Reviews	- Outcome is not relevant to this review protocol Cochrane systematic review investigating low salt diet with included studies reporting no relevant outcomes
El-mani, Souad, Charlton, Karen E., Flood, Victoria M. et al. (2014) Limited knowledge about folic acid and iodine nutrition in pregnant women reflected in supplementation practices. Nutrition & Dietetics 71(4): 236-244	- Study does not contain an intervention relevant to this review protocol Study provides cross-sectional survey to women to understand knowledge, attitudes and practices with no intervention and therefore does not meet the protocol criteria
Elmacioglu, F., Surucu, B., Alper, T. et al. (2010) Is adequate and balanced nutrition during pregnancy more effective than iron and folic acid supplements?. Central European Journal of Medicine 5(2): 235-242	- Study setting does not meet protocol criteria Study not conducted in high income country (Turkey)
English, LK, Obbagy, JE, Wong, YP et al. (2019) Types and Amounts of Complementary Foods and Beverages and Growth, Size, and Body Composition: A Systematic Review. USDA Nutrition Evidence Systematic Reviews	- Population does not meet protocol criteria Systematic review on complementary feeding for infants
Evans, William Douglas; Wallace, Jasmine L; Snider, Jeremy (2012) Pilot evaluation of the text4baby mobile health program. BMC public health 12: 1031	- Study does not contain an intervention relevant to this review protocol Intervention text message content was not focused on nutrition and covered a broad range of pregnancy topics
Faessen, Janine P M, Lucassen, Desiree A, Buso, Marion E C et al. (2022) Eating for 2: A Systematic Review of Dutch App Stores for Apps Promoting a Healthy Diet during Pregnancy. Current developments in nutrition 6(6): nzac087	- Study does not contain an intervention relevant to this review protocol Review of Dutch mobile apps on the market reporting descriptive characteristics of the apps
Favaretti, Caterina, Vandormael, Alain, Hachaturyan, Violetta et al. (2022) Participant Engagement and Reactance to a Short,	- Population does not meet protocol criteria Population is not pregnant women and therefore does not meet protocol criteria

Study	Reason for exclusion
Animated Video About Added Sugars: Web-based Randomized Controlled Trial. JMIR public health and surveillance 8(1): e29669	
Ferranti, E.P., Hartman, T.J., Elliott, A.J. et al. (2019) Diet quality of pregnant american Indian women in the Northern Plains. Preventing Chronic Disease 16(4): 180536	- Study does not contain an intervention relevant to this review protocol Study does not contain an intervention and one of the cohorts included were not from a high income country (South Africa)
Flor-Alemany, Marta, Migueles, Jairo H, Alemany-Arrebola, Inmaculada et al. (2022) Exercise, Mediterranean Diet Adherence or Both during Pregnancy to Prevent Postpartum Depression-GESTAFIT Trial Secondary Analyses. International journal of environmental research and public health 19(21)	- Study does not contain an intervention relevant to this review protocol Secondary analysis to GESTAFIT study which was not randomised and intervention contains physical activity as well as nutrition with study focus is on outcomes that do not meet the protocol (postpartum depression or association of diet habits with adherence to Mediterranean diet)
Garmendia, M.L., Casanello, P., Flores, M. et al. (2021) The effects of a combined intervention (docosahexaenoic acid supplementation and home-based dietary counseling) on metabolic control in obese and overweight pregnant women: the MIGHT study. American Journal of Obstetrics and Gynecology 224(5): 526e1-526e25	- Outcome is not relevant to this review protocol Study was also included in MCN2.2 and does not report any follow-up outcomes of interest relevant to this protocol
Geyer, Kristina, Spies, Monika, Gunther, Julia et al. (2021) Effects of a Prenatal Lifestyle Intervention in Routine Care on Maternal Health Behaviour in the First Year Postpartum-Secondary Findings of the Cluster-Randomised GeliS Trial. Nutrients 13(4)	- Outcome is not relevant to this review protocol Secondary analysis of GeliS Trial with postpartum outcomes reported. The original trial also included in MCN2.2 and was focused on weight management.
Girard, Amy Webb and Olude, Oluwafunke (2012) Nutrition education and counselling provided during pregnancy: effects on maternal, neonatal and child health outcomes. Paediatric and perinatal epidemiology 26suppl1: 191-204	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies prior to 2003, not conducted in high income countries or do not contain relevant outcomes (maternal or neonatal outcomes). Relevant studies were checked
Gomes, F., Agustina, R., Black, R.E. et al. (2022) Multiple micronutrient supplements versus iron-folic acid supplements and maternal anemia outcomes: an iron dose analysis. Ann. New York Acad. Sci. 1512(1): 114-125	- Study design not relevant to this review protocol Analysis of data from included trials of Cochrane review on multiple micronutrient supplementation. Original Cochrane review was checked and any potentially relevant studies were not from high income countries
Gomes, Filomena, King, Shannon E, Dallmann, Diana et al. (2021) Interventions to increase adherence to micronutrient supplementation during pregnancy: a systematic review. Annals of the New York Academy of Sciences 1493(1): 41-58	- Systematic review includes studies that does not meet protocol criteria Included studies in the systematic review do not meet the protocol criteria as they are not from high income countries
Goodarzi-Khoigani, Masoomeh, Baghiani Moghadam, Mohammad Hossein, Nadjarzadeh, Azadeh et al. (2018) Impact of Nutrition Education in Improving Dietary Pattern During	- Study setting does not meet protocol criteria Study not conducted in a high income country (Iran)

Study	Reason for exclusion
Pregnancy Based on Pender's Health Promotion Model: A Randomized Clinical Trial. Iranian journal of nursing and midwifery research 23(1): 18-25	
Gresham, Ellie, Bisquera, Alessandra, Byles, Julie E et al. (2016) Effects of dietary interventions on pregnancy outcomes: a systematic review and meta-analysis. Maternal & child nutrition 12(1): 5-23	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies prior to 2003 or do not contain relevant outcomes (maternal or neonatal outcomes). Relevant studies were checked
Hamad, R, Batra, A, Karasek, D et al. (2019) The Impact of the Revised WIC Food Package on Maternal Nutrition during Pregnancy and Postpartum. American journal of epidemiology 188(8): 1493-1502	- Study design not relevant to this review protocol Study design is not randomised and RCT evidence has been identified and included
Hamad, Rita, Collin, Daniel F., Baer, Rebecca J. et al. (2019) Association of Revised WIC Food Package With Perinatal and Birth Outcomes: A Quasi-Experimental Study. JAMA Pediatrics 173(9): 845-852	- Outcome is not relevant to this review protocol No outcomes of interest relevant to the protocol were reported (perinatal and birth outcomes)
Harris, Mary A, Reece, Melanie S, McGregor, James A et al. (2015) The Effect of Omega-3 Docosahexaenoic Acid Supplementation on Gestational Length: Randomized Trial of Supplementation Compared to Nutrition Education for Increasing n-3 Intake from Foods. BioMed research international 2015: 123078	- Outcome is not relevant to this review protocol Study uses nutritional education group as comparator to levels of DHA supplementation with no relevant outcomes reported
Hautero, U, Laakso, P, Linderborg, K et al. (2013) Proportions and concentrations of serum n-3 fatty acids can be increased by dietary counseling during pregnancy. European journal of clinical nutrition 67(11): 1163-8	- Secondary publication of an included study that does not provide any additional relevant information Substudy of Piirainen 2006 and Laitinen 2009 with no additional outcomes of interest reported
Herval, Alex Moreira, Oliveira, Danielle Peruzzo Dumont, Gomes, Viviane Elisangela et al. (2019) Health education strategies targeting maternal and child health: A scoping review of educational methodologies. Medicine 98(26): e16174	- Review article but not a systematic review Scoping review including studies that do not meet the protocol (not high income country, not in publication date range or not relevant intervention). Relevant studies were checked
Hurtado, J.A., Iznaola, C., Pena, M. et al. (2015) Effects of maternal omega-3 supplementation on fatty acids and on visual and cognitive development. Journal of Pediatric Gastroenterology and Nutrition 61(4): 472-480	- Outcome is not relevant to this review protocol Study reports no relevant outcomes to the protocol criteria
Imdad, A.; Yakoob, M.Y.; Bhutta, Z.A. (2011) The effect of folic acid, protein energy and multiple micronutrient supplements in pregnancy on stillbirths. BMC public health 11suppl3: 4	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies that do not meet the protocol criteria (no relevant outcomes reported, published prior to 2003, not conducted in high income country)
Iyawa, G.E.; Dansharif, A.R.; Khan, A. (2021) Mobile apps for self-management in pregnancy: a systematic review. Health and Technology 11(2): 283-294	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies that do not meet the protocol criteria (no relevant outcomes reported, no intervention of interest, not conducted in high income country). Relevant

Study	Reason for exclusion
	studies have already captured in the current search
Jackson, Rebecca A, Stotland, Naomi E, Caughey, Aaron B et al. (2011) Improving diet and exercise in pregnancy with Video Doctor counseling: a randomized trial. Patient education and counseling 83(2): 203-9	- Study does not contain an intervention relevant to this review protocol Intervention focus is counselling for combination of diet, exercise and weight gain
Jahanfar, S. and Jaafar, S.H. (2013) Effects of restricted caffeine intake by mother on fetal, neonatal and pregnancy outcome. Cochrane Database of Systematic Reviews 2013(2): cd006965	- Outcome is not relevant to this review protocol Cochrane review on caffeine intake in pregnancy with no relevant interventions or outcomes reported according to the protocol criteria
Jahangiri, Zahra, Shamsi, Mohsen, Khoorsandi, Mahboobeh et al. (2021) The Effect of Education Based on Theory of Planned Behavior in Promoting Nutrition-related Behaviors to Prevent Anemia in Pregnant Women. Arak Medical University Journal 23(6): 872-886	- Study setting does not meet protocol criteria Study not conducted in high income country (Iran)
Jasti, S., Siega-Riz, A.M., Cogswell, M.E. et al. (2005) Pill count adherence to prenatal multivitamin/mineral supplement use among low-income women. Journal of Nutrition 135(5): 1093-1101	- Study does not contain an intervention relevant to this review protocol Study focused on adherence to iron based prenatal multivitamins/mineral supplement use with no intervention or outcomes that met the protocol criteria
Jung, Mary E, Stork, Matthew J, Stapleton, Jessica et al. (2016) A systematic review of behavioural interventions to increase maternal calcium intake. Maternal & child nutrition 12(2): 193-204	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies that do not meet the protocol criteria (study published prior to 2003, pregnant and postpartum population with no separated outcomes). Relevant studies have been checked
Kamalifard, M, Charandabi, SMA, Mameghani, ME et al. (2012) The Effect of an Educational Package on Nutritional Knowledge, Attitude, and Behavior of Pregnant Women. Iranian journal of medical education 12(9): 686-697	- Study setting does not meet protocol criteria Study not conducted in a high income country (Iran)
Kavle, J.A. (2022) Strengthening maternal nutrition counseling during routine health services: A gap analysis to guide country programs. Public health nutrition: 1-52	- Study design not relevant to this review protocol Literature review to determine health system gap analysis for routine maternal counseling services which includes studies that do not meet hte protocol (inappropriate study designs, populations or not high income countries). Relevant studies were checked
Kennedy, R A K, Reynolds, C M E, Cawley, S et al. (2019) A web-based dietary intervention in early pregnancy and neonatal outcomes: a randomized controlled trial. Journal of public health (Oxford, England) 41(2): 371-378	- Outcome is not relevant to this review protocol Study reports baseline but not post intervention outcomes which were relevant to the protocol criteria
Kermack, Alexandra J, Wellstead, Susan J, Fisk, Helena L et al. (2021) The Fatty Acid Composition of Human Follicular Fluid Is Altered by a 6-Week Dietary Intervention That Includes Marine Omega-3 Fatty Acids. Lipids 56(2): 201-209	- Population does not meet protocol criteria Population were women undergoing IVF and therefore does not meet the protocol criteria

Study	Reason for exclusion
Kieffer, Edith C, Welmerink, Diana B, Sinco, Brandy R et al. (2014) Dietary outcomes in a Spanish-language randomized controlled diabetes prevention trial with pregnant Latinas. American journal of public health 104(3): 526-33	- Study does not contain an intervention relevant to this review protocol Study focus is on diabetes prevention and provides multifaceted lifestyle intervention with general pregnancy education and information, discussion, and activities aimed at developing knowledge and skills needed to reduce social and environmental barriers to healthy eating, regular exercise, and management of daily life stressors
King, SE, Yeh, PT, Rhee, DK et al. (2021) Self-management of iron and folic acid supplementation during pre-pregnancy, pregnancy and postnatal periods: a systematic review. BMJ global health 6(5)	- Systematic review includes studies that does not meet protocol criteria Systematic review research question contained a number of populations not relevant to the protocol and did not identify any studies for inclusion for pregnant woman
Koivuniemi, E., Raats, M.M., Ollila, H. et al. (2022) Characterising the use, users and effects of a health app supporting lifestyle changes in pregnant women. British Journal of Nutrition	- Study does not contain an intervention relevant to this review protocol Intervention compares an app for recording lifestyle information such as nutrition, weight, physical activity and blood glucose feedback/weekly reminders to an enhanced app wit additional information on multiple lifestyle components such as diet, weight gain and physical activity
Laitinen, K.; Poussa, T.; Isolauri, E. (2009) Probiotics and dietary counselling contribute to glucose regulation during and after pregnancy: A randomised controlled trial. British Journal of Nutrition 101(11): 1679-1687	- Study does not contain an intervention relevant to this review protocol Study is focused on probiotics with interest in glycaemic outcomes which does not meet protocol criteria
Leroy, JL, Koch, B, Roy, S et al. (2021) Social Assistance Programs and Birth Outcomes: A Systematic Review and Assessment of Nutrition and Health Pathways. The Journal of nutrition	- Systematic review includes studies that does not meet protocol criteria Systematic review included studies from middle- or low-income countries only
Li, C, Tang, L, Yang, M et al. (2020) A Study to Evaluate the Efficacy of Different Interventions for Improving Quality of Maternal Health Care Service in China. Telemedicine journal and e-health 26(10): 1291-1300	- Study setting does not meet protocol criteria Study not conducted in a high income country (China)
Li, Mengying, Grewal, Jagteshwar, Hinkle, Stefanie N et al. (2021) Healthy dietary patterns and common pregnancy complications: a prospective and longitudinal study. American Journal of Clinical Nutrition 114(3): 1229-1237	- Study does not contain an intervention relevant to this review protocol Secondary analysis observational study assessing diet of women at different timpoints with no intervention relevant to the protocol criteria. Original study was focused on differential sonogram schedules and infant development
Li, X., McLaughlin, P.W., Saitone, T.L. et al. (2021) The Magnitude and Determinants of Partial Redemptions of Food Benefits in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). American journal of health promotion : AJHP 35(6): 775-783	- Outcome is not relevant to this review protocol Study outcomes do not meet protocol criteria as they relate to household redemption of food vouchers rather than consumption or behaviour change outcomes

Study	Reason for exclusion
Liberato, SC; Singh, G; Mulholland, K (2013) Effects of protein energy supplementation during pregnancy on fetal growth: a review of the literature focusing on contextual factors. Food & nutrition research 57	- Review article but not a systematic review Review which includes studies that do not meet the protocol (not high income country, published before 2003, not relevant intervention, no relevant outcome). Relevant studies were checked
Lim, Shan Xuan, Loy, See Ling, Colega, Marjorelee T et al. (2022) Prepregnancy adherence to plant-based diet indices and exploratory dietary patterns in relation to fecundability. American Journal of Clinical Nutrition 115(2): 559-569	- Population does not meet protocol criteria Population did not meet protocol criteria and was pre-pregnant women
Louise, Jennie, Poprzeczny, Amanda J, Deussen, Andrea R et al. (2021) The effects of dietary and lifestyle interventions among pregnant women with overweight or obesity on early childhood outcomes: an individual participant data meta-analysis from randomised trials. BMC medicine 19(1): 128	- Systematic review used as source of primary studies Focus of IPD was on child outcomes with not all included trials meeting protocol criteria (focus was on weight management, included physical activity interventions). Relevant studies were checked
Lu, W., McKyer, E.L., Dowdy, D. et al. (2016) Evaluating the Influence of the Revised Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Food Allocation Package on Healthy Food Availability, Accessibility, and Affordability in Texas. Journal of the Academy of Nutrition and Dietetics 116(2): 292-301	- Outcome is not relevant to this review protocol Evaluation study of food availability, affordability and accessibility from implementation of a federal nutrition program
Lucas, Catherine; Charlton, Karen E; Yeatman, Heather (2014) Nutrition advice during pregnancy: do women receive it and can health professionals provide it?. Maternal and child health journal 18(10): 2465-78	- Systematic review includes studies that does not meet protocol criteria Systematic review contains studies that do not have a study design meeting the protocol criteria or have already been considered for inclusion. Relevant additional studies were checked
Luoto, R., Laitinen, K., Nermes, M. et al. (2010) Impact of maternal probiotic-supplemented dietary counselling on pregnancy outcome and prenatal and postnatal growth: A double-blind, placebo-controlled study. British Journal of Nutrition 103(12): 1792-1799	- Outcome is not relevant to this review protocol Probiotic-supplemented dietary counselling intervention with no outcomes of interest reported (primary outcomes were gestational diabetes and other maternal or neonatal outcomes)
Malta, MB, Gomes, CB, Barros, AJD et al. (2021) Effectiveness of an intervention focusing on diet and walking during pregnancy in the primary health care service. Cadernos de saude publica 37(5): e00010320	- Study setting does not meet protocol criteria Study not conducted in high income country (Brazil)
Martorano, L. and Stukus, D.R. (2017) Prenatal Fish Oil Supplementation and Allergy: 6-Year Follow-up of a Randomized Controlled Trial. Pediatrics 140(3): 182-s183	- Outcome is not relevant to this review protocol Follow-up study on children to original study examining DHA supplementation during pregnancy on maternal depression and neurodevelopment of young children with no relevant outcomes reported.
Masulli, M., Vitacolonna, E., Fraticelli, F. et al. (2020) Effects of probiotic supplementation during pregnancy on metabolic outcomes: A systematic review and meta-analysis of	- Systematic review includes studies that does not meet protocol criteria Systematic review focuses on probiotic-based interventions for women with or without gestational diabetes with no outcomes of

Study	Reason for exclusion
randomized controlled trials. Diabetes Research and Clinical Practice 162: 108111	interest reported (primary outcomes were gestational diabetes and other maternal or neonatal outcomes). Relevant studies were checked
Mauriello, Leanne M, Van Marter, Deborah F, Umanzor, Cindy D et al. (2016) Using mHealth to Deliver Behavior Change Interventions Within Prenatal Care at Community Health Centers. American journal of health promotion : AJHP 30(7): 554-62	- Outcome is not relevant to this review protocol Timing of outcome does not meet protocol criteria (during postpartum months 1 and 4)
May, Linda, Suminski, Richard, Berry, Andrew et al. (2014) Diet and Pregnancy: Health-Care Providers and Patient Behaviors. Journal of Perinatal Education 23(1): 50-58	- Outcome is not relevant to this review protocol No outcomes of interest reported (characteristics reported between those who did and didn't discuss diet changes with healthcare providers or did or did not make diet changes based on self reported questionnaire)
Mayer-Davis, E, Leidy, H, Mattes, R et al. (2020) Beverage Consumption During Pregnancy and Birth Weight: A Systematic Review. USDA Nutrition Evidence Systematic Reviews	- Outcome is not relevant to this review protocol Systematic reviews as part of guidelines with focus on infant outcomes not relevant to protocol criteria
Mirmolaei, ST, Moshrefi, M, Kazemnejad, A et al. (2009) The Effect of Nutrition Education on Nutritional Behaviors in Pregnant Women. HAYAT 15(4): 35-43	- Study not reported in English Full text is not in reported in English
Morales, Mary E, Epstein, Michael H, Marable, Danelle E et al. (2016) Food Insecurity and Cardiovascular Health in Pregnant Women: Results From the Food for Families Program, Chelsea, Massachusetts, 2013-2015. Preventing chronic disease 13: e152	- Outcome is not relevant to this review protocol Study focuses on referral rates, cardiovascular and blood glucose outcomes and does not report any relevant outcomes that meet the protocol
Much, D, Brunner, S, Vollhardt, C et al. (2013) Effect of dietary intervention to reduce the n-6/n-3 fatty acid ratio on maternal and fetal fatty acid profile and its relation to offspring growth and body composition at 1 year of age. European journal of clinical nutrition 67(3): 282-8	- Outcome is not relevant to this review protocol No outcomes of interest reported that relate to the protocol. Study focuses on blood based outcomes.
Ngongalah, Lem, Rankin, Judith, Rapley, Tim et al. (2018) Dietary and Physical Activity Behaviours in African Migrant Women Living in High Income Countries: A Systematic Review and Framework Synthesis. Nutrients 10(8)	- Systematic review includes studies that does not meet protocol criteria Systematic review includes studies that don't contain interventions of interest such as physical activity or are not in pregnant women. Relevant studies were checked
Nguyen, P., Nava-Ocampo, A., Levy, A. et al. (2008) Effect of iron content on the tolerability of prenatal multivitamins in pregnancy. BMC Pregnancy and Childbirth 8: 17	- Outcome is not relevant to this review protocol Study does not contain intervention or outcomes of interest. Focus is on provision of multivitamin supplementation with differing iron content as part of a randomised trial to determine adherence and side effects
Nicholas, Khristopher M, Thompson, Amanda L, Wasser, Heather M et al. (2023) Healthy home food environments of pregnant Black women are shaped by food outlet access and participation in nutrition assistance programs. American journal of human biology : the official journal of the Human Biology Council: e23903	- Study design not relevant to this review protocol Cross-sectional design using baseline data collected from a trial focusing on infant feeding educational intervention

Study	Reason for exclusion
Norris, T., Souza, R., Xia, Y. et al. (2021) Effect of supplementation of complex milk lipids in pregnancy on fetal growth: results from the Complex Lipids in Mothers and Babies (CLIMB) randomized controlled trial. Journal of Maternal-Fetal and Neonatal Medicine 34(20): 3313-3322	- Study setting does not meet protocol criteria Study not conducted in high income country (China)
O'Brien, Eileen C, Alberdi, Goiuri, Geraghty, Aisling A et al. (2017) Lower education predicts poor response to dietary intervention in pregnancy, regardless of neighbourhood affluence: secondary analysis from the ROLO randomised control trial. Public health nutrition 20(16): 2959-2969	- Outcome is not relevant to this review protocol Secondary study to ROLO study included in MCN2.2 as part of Teede 2022 systematic review with focus on gestational weight gain or birth weight
Olmedo-Requena, Rocío, Gómez-Fernández, Julia, Mozas-Moreno, Juan et al. (2018) Factors associated with adherence to nutritional recommendations before and during pregnancy. Women & Health 58(10): 1094-1111	- Study does not contain an intervention relevant to this review protocol Study compares adherence to diet recommendations before and during pregnancy with no intervention implemented
Ota, Erika, Hori, Hiroyuki, Mori, Rintaro et al. (2015) Antenatal dietary education and supplementation to increase energy and protein intake. The Cochrane database of systematic reviews: cd000032	- Outcome is not relevant to this review protocol Cochrane review on dietary education and supplementation to increase energy and protein intake which does not include any relevant outcomes of interest. None of the included studies met the protocol criteria as they were either published before 2003 or not conducted in high-income countries.
Othman, S., Jayasekara, R., Steen, M. et al. (2018) A systematic review for exploring the effectiveness of healthy eating education programmes for improving midwives' levels of knowledge and confidence in promoting healthy eating in pregnant women. Evidence Based Midwifery 16(3): 84-93	- Systematic review includes studies that does not meet protocol criteria Systematic review does not include any randomised controlled trials
Overdijkink, Sanne B, Velu, Adeline V, Rosman, Ageeth N et al. (2018) The Usability and Effectiveness of Mobile Health Technology-Based Lifestyle and Medical Intervention Apps Supporting Health Care During Pregnancy: Systematic Review. JMIR mHealth and uHealth 6(4): e109	- Systematic review includes studies that does not meet protocol criteria Systematic review on medical intervention apps with no included studies meeting protocol criteria based on population (for example,. asthmatic, not pregnant) or interventions not meeting protocol (for example, vaccination, glucose monitoring)
Palacios, C.; Kostiuk, L.K.; Pena-Rosas, J.P. (2019) Vitamin D supplementation for women during pregnancy. Cochrane Database of Systematic Reviews 2019(7): cd008873	- Outcome is not relevant to this review protocol Cochrane review on vitamin D in pregnancy with no relevant outcomes reported. Relevant included studies have been checked.
Pari-Keener, Maria, Gallo, Sina, Stahnke, Barbara et al. (2020) Maternal and Infant Health Outcomes Associated with Medical Nutrition Therapy by Registered Dietitian Nutritionists in Pregnant Women with Malnutrition: An Evidence Analysis Center Systematic Review. Journal of the Academy of Nutrition and Dietetics 120(10): 1730-1744	- Systematic review includes studies that does not meet protocol criteria Systematic review contains studies that are not conducted in high income countries, focus on weight management or do not report outcomes of interest. Relevant additional studies were checked
Peacock, Lucy, Seed, Paul T, Dalrymple, Kathryn V et al. (2020) The UK Pregnancies	- Study does not contain an intervention relevant to this review protocol

Study	Reason for exclusion
Better Eating and Activity Trial (UPBEAT); Pregnancy Outcomes and Health Behaviours by Obesity Class. International journal of environmental research and public health 17(13)	Secondary study from UPBEAT study and also included in MCN 2.2. The study focused on providing advice and goal setting for both physical activity and diet with primary outcomes focusing on reducing gestational diabetes, incidence of large for gestational age and other pregnancy or birth related outcomes
Pena-Rosas, J.P., De-Regil, L.M., Dowswell, T. et al. (2012) Daily oral iron supplementation during pregnancy. Cochrane database of systematic reviews (Online) 12: cd004736	- Outcome is not relevant to this review protocol Cochrane review on iron supplementation during pregnancy without any relevant interventions or outcomes to the protocol criteria. The review specified that co-interventions such as education were only included if this was the same in both arms
Pena-Rosas, J.P., De-Regil, L.M., Malave, H.G. et al. (2015) Intermittent oral iron supplementation during pregnancy. Cochrane Database of Systematic Reviews 2015(10): cd009997	- Outcome is not relevant to this review protocol Cochrane review on intermittent iron supplementation during pregnancy without any relevant interventions or outcomes to the protocol criteria. The review specified that co-interventions such as education were only included if this was the same in both arms.
Perreault, Maude, Mottola, Michelle F, Atkinson, Stephanie A et al. (2022) Individualized high dairy protein + walking program supports bone health in pregnancy: a randomized controlled trial. The American journal of clinical nutrition 116(4): 887-896	- Study does not contain an intervention relevant to this review protocol Secondary study of be healthy in pregnancy (BHIP) trial which was included in the MCN2.2 systematic review as part of the Teede 2022 systematic review. The study focused on physical activity and nutrition intervention to achieve recommended gestational weight gain.
Phelan, S.; Abrams, B.; Wing, R.R. (2019) Prenatal intervention with partial meal replacement improves micronutrient intake of pregnant women with obesity. Nutrients 11(5): 1071	- Outcome is not relevant to this review protocol Secondary study of Healthy Beginnings/Comienzo trial which was included in the MCN2.2 systematic review as part of the Teede 2022 systematic review. The study focused on behavioral intervention to prevent excessive gestational weight gain.
Phelan, Suzanne, Phipps, Maureen G, Abrams, Barbara et al. (2014) Does behavioral intervention in pregnancy reduce postpartum weight retention? Twelve-month outcomes of the Fit for Delivery randomized trial. The American journal of clinical nutrition 99(2): 302-11	- Outcome is not relevant to this review protocol 12 month follow-up study of Fit for delivery trial which was included in the MCN2.2 systematic review as part of the Teede 2022 systematic review. The study focused on behavioral intervention to prevent excessivegestational weight gain.
Prieto, G., Torres, M.T., Frances, L. et al. (2011) Nutritional status of iodine in pregnant women in Catalonia (Spain): Study on hygiene-dietetic habits and iodine in urine. BMC Pregnancy and Childbirth 11: 17	- Study design not relevant to this review protocol Protocol for cluster RCT study with counselling on nutritional habits in pregnant women with no subsequent relevant studies published
Ramakrishnan, Usha; Imhoff-Kunsch, Beth; Martorell, Reynaldo (2014) Maternal nutrition interventions to improve maternal, newborn, and child health outcomes. Nestle Nutrition Institute workshop series 78: 71-80	- Study design not relevant to this review protocol Book chapter review, relevant meta-analyses discussed were checked
Ramezanpoor, Maryam, Taghipour, Ali, Sharody, Mohamad Vahedian et al. (2019) The	- Study setting does not meet protocol criteria

Study	Reason for exclusion
effectiveness of an educational intervention based on social cognitive theory on fruit and vegetable intake in pregnant women. Payesh Health Monitor 18(4): 381-391	Study not conducted in a high income country (Iran)
Rani, Vandana and Joshi, Shabnam (2022) Effectiveness of different behavioral interventions on gestational weight gain, post-partum weight retention and anthropometric measures in pregnancy: A randomized controlled trial. Health promotion perspectives 12(3): 286-294	- Outcome is not relevant to this review protocol The focus of the study is on gestational weight change with no relevant outcomes reported
Reisine, Susan, Douglass, Joanna, Aseltine, Robert et al. (2012) Prenatal nutrition intervention to reduce mutans streptococci among low-income women. Journal of public health dentistry 72(1): 75-81	- Outcome is not relevant to this review protocol No follow-up outcomes reported for intervention of interest
Ridberg, Ronit A., Levi, Ronli, Marpadga, Sanjana et al. (2022) Additional Fruit and Vegetable Vouchers for Pregnant WIC Clients: An Equity-Focused Strategy to Improve Food Security and Diet Quality. Nutrients 14(11): 2328-2328	- Study design not relevant to this review protocol Study design is not randomised and RCT evidence has been identified and included
Rumbold, A., Ota, E., Nagata, C. et al. (2016) Vitamin C supplementation in pregnancy. Cochrane Database of Systematic Reviews 2016(3): cd004072	- Outcome is not relevant to this review protocol Cochrane review on vitamin D in pregnancy with no relevant interventions or outcomes reported. One relevant excluded study with nutritional advice as intervention was checked
See, V.H.L., Mas, E., Burrows, S. et al. (2016) Prenatal omega-3 fatty acid supplementation does not affect offspring telomere length and F2-isoprostanes at 12 years: A double blind, randomized controlled trial. Prostaglandins Leukotrienes and Essential Fatty Acids 112: 50-55	- Outcome is not relevant to this review protocol Study does not contain any relevant outcomes that meet the protocol criteria as the focus is on infant outcomes
Shah, Megha K, Kieffer, Edith C, Choi, Hwajung et al. (2015) Mediators and Moderators of the Effectiveness of a Community Health Worker Intervention That Improved Dietary Outcomes in Pregnant Latino Women. Health education & behavior : the official publication of the Society for Public Health Education 42(5): 593-603	- Study does not contain an intervention relevant to this review protocol Secondary study to Kieffer 2014 which has been excluded due to focus on diabetes prevention with multifaceted lifestyle intervention
Shah, P.S. and Ohlsson, A. (2009) Effects of prenatal multimicronutrient supplementation on pregnancy outcomes: A meta-analysis. CMAJ. Canadian Medical Association Journal 180(12): e99-e108	- Systematic review includes studies that does not meet protocol criteria Systematic review on multimicronutrient supplementation with all but one included study conducted in non-high income countries and no relevant outcomes of interest (neonatal outcomes only)
Sinclair, M., Stockdale, J., Holman, M.R. et al. (2017) A systematic literature review of computer-based behavioural change interventions to inform the design of an online vbac intervention for the optibirth european randomised trial (Project health - f3 - 2012-305208). Evidence Based Midwifery 15(1): 5-13	- Systematic review includes studies that does not meet protocol criteria Systematic review includes two studies with intervention that does not meet protocol criteria (smoking cessation or alcohol consumption related) and a third study already considered in this search (Jackson 2011)

Study	Reason for exclusion
Sukmawati, S., Hermayanti, Y., Fadlyana, E. et al. (2021) Stunting prevention with education and nutrition in pregnant women: A review of literature. Open Access Macedonian Journal of Medical Sciences 9(t6): 12-19	- Review article but not a systematic review Focus of review article is education or nutrition for stunting prevention with all included studies not meeting the protocol criteria as they are conducted in non high income countries
Sunuwar, D.R., Sangroula, R.K., Shakya, N.S. et al. (2019) Effect of nutrition education on hemoglobin level in pregnant women: A quasi-experimental study. PLoS ONE 14(3): e0213982	- Study setting does not meet protocol criteria Study not conducted in high income country (Nepal)
Swaney, P.; Thorp, J.; Allen, I. (2014) Vitamin C supplementation in pregnancy-Does it decrease rates of preterm birth? A systematic review. American Journal of Perinatology 31(2): 91-98	- Outcome is not relevant to this review protocol Systematic review on vitamin C supplementation in pregnancy with no relevant interventions or outcomes reported according to the protocol criteria
Sánchez-Villegas, A, Brito, N, Doreste-Alonso, J et al. (2010) Methodological aspects of the study of dietary patterns during pregnancy and maternal and infant health outcomes. A systematic review. Maternal & child nutrition 6suppl2(suppl2): 100-11	- Review article but not a systematic review Literature review with included studies focused on association between diet patterns and maternal or neonatal outcomes not relevant to this protocol
Tam, Wing Hung, Lee, Dominic Tak Sing, Chiu, Helen Fung Kum et al. (2003) A randomised controlled trial of educational counselling on the management of women who have suffered suboptimal outcomes in pregnancy. BJOG : an international journal of obstetrics and gynaecology 110(9): 853-9	- Population does not meet protocol criteria Timing of educational intervention is in the postpartum period and therefore does not meet protocol criteria
Tanner, Helen, Barrett, Helen L., Callaway, Leonie K. et al. (2021) Consumption of a Low Carbohydrate Diet in Overweight or Obese Pregnant Women Is Associated with Longer Gestation of Pregnancy. Nutrients 13(10): 3511-3511	- Study does not contain an intervention relevant to this review protocol Secondary study to the SPRING study on probiotics to prevent gestational diabetes with intervention not meeting protocol criteria
Tanvig, M.H., Jensen, D.M., Andersen, M.S. et al. (2019) Vitamin D levels were significantly higher during and after lifestyle intervention in pregnancy: a randomised controlled trial. Acta obstetricia et gynecologica Scandinavica	- Secondary publication of an included study that does not provide any additional relevant information Secondary study to the LiP study (Vinter 2011) included in MCN2.2 as part of the Teede systematic review with intervention focusing on both nutrition counselling and physical activity for weight management. No relevant outcomes reported in the secondary paper.
Taylor, Rachael M, Fealy, Shanna M, Bisquera, Alessandra et al. (2017) Effects of Nutritional Interventions during Pregnancy on Infant and Child Cognitive Outcomes: A Systematic Review and Meta-Analysis. Nutrients 9(11)	- Systematic review used as source of primary studies Systematic review focuses on nutritional interventions for child cognitive outcomes which were not relevant to the protocol criteria. Included studies that met the protocol criteria were checked
Taylor, Rachael M, Wolfson, Julia A, Lavelle, Fiona et al. (2021) Impact of preconception, pregnancy, and postpartum culinary nutrition education interventions: a systematic review. Nutrition reviews 79(11): 1186-1203	- Systematic review includes studies that does not meet protocol criteria Systematic review contains studies that cover prenatal or postpartum intervention periods, infant outcomes and studies not conducted in

Study	Reason for exclusion
	high income countries. Relevant studies were checked
Vahamiko, Sanna, Isolauri, Erika, Poussa, Tuija et al. (2013) The impact of dietary counselling during pregnancy on vitamin intake and status of women and their children. International journal of food sciences and nutrition 64(5): 551-60	- Secondary publication of an included study that does not provide any additional relevant information Substudy from Laitinen 2009 with no additional outcomes of interest (focus on vitamin concentrations in diet, serum and breast)
van Dijk, Matthijs R, Koster, Maria P H, Oostingh, Elsje C et al. (2020) A Mobile App Lifestyle Intervention to Improve Healthy Nutrition in Women Before and During Early Pregnancy: Single-Center Randomized Controlled Trial. Journal of medical Internet research 22(5): e15773	- Population does not meet protocol criteria Only 33% of women were pregnant at enrolment and it is unclear when intervention began
Villar, Jose, Merialdi, Mario, Gulmezoglu, A Metin et al. (2003) Nutritional interventions during pregnancy for the prevention or treatment of maternal morbidity and preterm delivery: an overview of randomized controlled trials. The Journal of nutrition 133(5suppl2): 1606s-1625s	- Review article but not a systematic review Review article on nutritional interventions during pregnancy containing systematic reviews that do not meet protocol criteria (published prior to 2003)
Wang, HJ and Kim, IO (2015) Effects of a Mobile Web-based Pregnancy Health Care Educational Program for Mothers at an Advanced Maternal Age. Journal of Korean Academy of Nursing 45(3): 337-346	- Study not reported in English Full-text article is not reported in English
Watt, T.T., Appel, L., Lopez, V. et al. (2015) A Primary Care-Based Early Childhood Nutrition Intervention: Evaluation of a Pilot Program Serving Low-Income Hispanic Women. Journal of racial and ethnic health disparities 2(4): 537-547	- Study design not relevant to this review protocol Study design is not randomised and RCT evidence has been identified and included
Wilkinson, S.A.; Fjeldsoe, B.; Willcox, J.C. (2023) Evaluation of the Pragmatic Implementation of a Digital Health Intervention Promoting Healthy Nutrition, Physical Activity, and Gestational Weight Gain for Women Entering Pregnancy at a High Body Mass Index. Nutrients 15(3): 588	- Study design not relevant to this review protocol Implementation and feasibility cohort study to previous pilot RCT which was included in the MCN2.2 systematic review as part of the Teede 2022 systematic review. The pilot RCT focused on multicomponent intervention of nutrition, exercise and gestational weight gain for weight management with primary feasibility outcomes.
Wilkinson, Shelley A and McIntyre, H David (2012) Evaluation of the 'healthy start to pregnancy' early antenatal health promotion workshop: a randomized controlled trial. BMC pregnancy and childbirth 12: 131	- Study does not contain an intervention relevant to this review protocol Evaluation of multicomponent health promotion workshop covering dietary intake, physical activity levels, gestational weight gain knowledge, smoking cessation, and intention to breastfeed
Willcox, J.C., Chai, D., Beilin, L.J. et al. (2020) Women's Engagement With Pregnancy Lifestyle Activity and Nutrition: An Electronic Health and Dietetic Intervention to Promote Healthy Weight Gain in Pregnancy. Journal of medical Internet research	- Outcome is not relevant to this review protocol Secondary study from feasibility study included in MCN 2.2 with focus is on lifestyle intervention for weight management

Study	Reason for exclusion
Wilson, R Douglas, Wilson, R Douglas, Audibert, Francois et al. (2015) Pre-conception Folic Acid and Multivitamin Supplementation for the Primary and Secondary Prevention of Neural Tube Defects and Other Folic Acid-Sensitive Congenital Anomalies. Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC 37(6): 534-52	- Outcome is not relevant to this review protocol Clinical practice guidelines focusing on preconception folic acid and multivitamin supplementation for congenital anomalies. No relevant intervention or outcomes reported.
Woo Baidal, Jennifer A, Nichols, Kelsey, Charles, Nalini et al. (2021) Text Messages to Curb Sugar-Sweetened Beverage Consumption among Pregnant Women and Mothers: A Mobile Health Randomized Controlled Trial. Nutrients 13(12)	- Population does not meet protocol criteria Population comprised primarily of mothers of infants with no data separately reported for pregnant women.
Yap, C., Cheung, N.W., Gunton, J.E. et al. (2014) Vitamin D supplementation and the effects on glucose metabolism during pregnancy: A randomized controlled trial. Diabetes Care 37(7): 1837-1844	- Study does not contain an intervention relevant to this review protocol The study compares high and low dose vitamin D during pregnancy with no intervention or outcomes of interest (primary outcome was oral glucose tolerance test fasting plasma insulin)
Yu, Hongli, He, Juan, Li, Keqiang et al. (2022) Quality assessment of pre- and postnatal nutrition and exercise mobile applications in the United States and China. Frontiers in nutrition 9: 942331	- Review article but not a systematic review Review of available Chinese and USA mobile apps on the market reporting descriptive characteristics between apps
Zaragoza-Martí, A, Ruiz-Ródenas, N, Herranz-Chofre, I et al. (2022) Adherence to the Mediterranean Diet in Pregnancy and Its Benefits on Maternal-Fetal Health: A Systematic Review of the Literature. Frontiers in nutrition 9: 813942	- Systematic review includes studies that does not meet protocol criteria Systematic review on adherence to Mediterranean diet containing studies with no relevant outcomes of interest (for example, focus on weight gain, sleep quality or maternal outcomes such as gestational diabetes), population (pre-pregnancy), or study design does not meet protocol criteria (for example, cross-sectional) not relevant study design. Relevant studies were checked
Zgliczynska, Magdalena; Kosinska-Kaczynska, Katarzyna; Ahmed, Faruk (2021) Micronutrients in Multiple Pregnancies—The Knowns and Unknowns: A Systematic Review. Nutrients 13(2): 386-386	- Systematic review includes studies that does not meet protocol criteria Systematic review on micronutrient supplementation with included studies conducted before 2003, in non-high income countries, not published in English, not relevant study design or containing no interventions our outcomes of interest. Relevant studies were checked
Zhang, Y, Wang, L, Yang, W et al. (2019) Effectiveness of Low Glycemic Index Diet Consultations Through a Diet Glycemic Assessment App Tool on Maternal and Neonatal Insulin Resistance: a Randomized Controlled Trial. JMIR mHealth and uHealth 7(4): e12081	- Study setting does not meet protocol criteria Study not conducted in a high income country (China)
Zinsser, Laura A, Stoll, Kathrin, Wieber, Frank et al. (2020) Changing behaviour in pregnant women: A scoping review. Midwifery 85: 102680	- Review article but not a systematic review

Study	Reason for exclusion
	Scoping review on behavioural change in pregnancy with relevant included studies checked

Excluded economic studies

Table 13: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Burr ML, Trembeth J, Jones KB, Geen J, Lynch LA, Roberts ZE. The effects of dietary advice and vouchers on the intake of fruit and fruit juice by pregnant women in a deprived area: a controlled trial. Public Health Nutr. 2007 Jun;10(6):559-65	No economic data, apart from the voucher value
Szewczyk Z, Holliday E, Dean B, Collins C, Reeves P. A systematic review of economic evaluations of antenatal nutrition and alcohol interventions and their associated implementation interventions. Nutr Rev. 2021 Feb 11;79(3):261-273.	Systematic review - individual studies checked for eligibility

Appendix K Research recommendations – full details

Research recommendation for review question: What interventions are effective to increase uptake of healthy eating and drinking advice during pregnancy in line with government advice?

No research recommendation was made for this review question.