National Institute for Health and Care Excellence

Draft for consultation

Maternal and child nutrition

[P] Facilitators and barriers to increase the uptake of government advice on folic acid and vitamin supplements

NICE guideline number tbc

Evidence review underpinning recommendations 1.1.1 to 1.1.3 in the NICE guideline

June 2024

Draft for consultation

This evidence review was developed by NICE

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ISBN:

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Facilitators and barriers to increase the uptake of government advice on folic acid and vitamin supplements

Review question

What are the barriers and facilitators to increasing the uptake of government advice for women and families with children up to five years in the following areas:

- folic acid supplements (including before pregnancy)
- vitamin supplements (including Healthy Start vitamins)
- healthy eating and drinking in pregnant women
- appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months
- healthy eating and drinking in children from 12 months to 5 years?

This report focuses on the topics of folic acid supplements and vitamin supplements.

Introduction

This qualitative evidence review covers two related but distinct areas: facilitators and barriers to increase the uptake of 1) folic acid supplements according to government guidance before and during pregnancy, and 2) vitamin supplements (including Healthy Start vitamins) during and after pregnancy and in children. Evidence for these is presented separately.

Facilitators and barriers to increasing the uptake of government advice for folic acid supplements before and during pregnancy

To reduce the risk of neural tube defects in babies, current UK guidance recommends that everyone who could become pregnant should take a daily folic acid supplement before conception and until the 12th week of pregnancy. However, it is recognised that compliance with these guidelines is poor with one UK study suggesting that only 31% of women reported taking folic acid supplements as recommended in their most recent pregnancy (Barbour 2012). In order to support people to take folic acid supplements in both the preconception period and during the first 12 weeks of pregnancy, it is important to gain understanding of their views, perceptions and experiences on issues that might enable or hinder their uptake of these supplements. The aim of this review is to explore facilitators and barriers for increasing uptake of folic acid supplementation before and during the first 12 weeks of pregnancy.

Facilitators and barriers to increasing the uptake of government advice for vitamin supplements (including Healthy Start vitamins) during and after pregnancy and in children

The Government recommend that people who are pregnant and/or breastfeeding, and babies and children under 5 years of age, take or are given appropriate vitamin supplements to meet heightened nutritional requirements during these periods of rapid growth and development. For pregnant people the necessary supplements are folic acid and vitamin D, and breastfeeding people should take vitamin D. Under 5s should be given vitamin D from birth, and vitamins A and C from 6 months (with the exception of infants drinking more than 500ml of infant formula a day, given that this already contains vitamins). The Government provides free vitamins to eligible people, babies and children under the Healthy Start scheme; including pregnant teenagers under 18 and those on very low incomes. These individuals are more likely to have poor quality diets which do not provide all the nutrients they need, and the vitamin supplements are intended to help address this.

However, vitamin supplement use in line with Government recommendations is very low (below 10%) amongst those who are eligible for Healthy Start scheme (Jessiman 2013).

The aim of this review was to identify the facilitators and barriers to improve uptake of the uptake of government advice for vitamin supplements (including Healthy Start vitamins) during and after pregnancy and in children.

Summary of the protocol

See Table 1 for a summary of the population and phenomenon of interest for this review.

The original review question and protocol includes the facilitators and barriers for increasing uptake of government advice in the following areas:

1. folic acid supplements (including before pregnancy) (this review)
2. vitamin supplements (including Healthy Start vitamins) (this review)
3. healthy eating and drinking in pregnant women
4. appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months
5. healthy eating and drinking in children from 12 months to 5 years.

Number 3 is reported on in evidence review Q and number 4 and 5 are reported in evidence review R.

Table 1: Summary of the protocol (population and phenomenon of interest)

Population	For folic acid supplement uptake: • women during the preconception period and first 12 weeks of a single or multiple pregnancy For vitamin supplements uptake: • breastfeeding women • women during a single or multiple pregnancy • parents and carers of babies and children up to 5
Phenomenon of interest	Facilitators to, and barriers for increasing uptake of government advice. Themes will be identified by the available literature. The committee identified the following potential themes (however, they are aware that not all of these themes may be found in the literature and that additional themes may be identified):

	• thoughts, views and perceptions of women or parents/carers • issues relating to acceptability • issues relating to accessibility • issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • women/parent/carer thoughts on discourse, ethnic and cultural attitudes to vitamin supplementation and healthy eating • acceptability and misinformation • motivational factors, including child characteristics.

1 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.

Qualitative evidence

This evidence review includes qualitative evidence on facilitators and barriers to increasing the uptake of government advice on folic acid and vitamins.

Included studies

Facilitators and barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

One qualitative study from the UK was included in this section of the review (Barbour 2012).

The included study is summarised in Table 2.

The study included mothers who had infants aged <20 weeks. The study explored the reasons for use of folic acid supplements before and during pregnancy.

There were no data identified for subgroups: men, parents or carers. Data collection methods included focus groups. Study was not industry funded.

Data were identified for some themes listed in the protocol by the committee and the additional theme 'Adequate knowledge and information' was generated (please see section below 'the outcomes that matter most' for further details).

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

Facilitators and barriers to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

Six qualitative studies (7 papers) were included in this section of the review (Brogan-Hewitt 2021, Day 2019, Dundas 2023, Jessiman 2013, Lucas 2013, Moonan 2022, Rundle 2018).

The included studies are summarised in Table 2.

The studies included perceptions of pregnant women, women who had recently given birth or had a child less than 5 years old on the uptake of vitamin supplements (including Healthy Start vitamins). Two studies (Dundas 2023, Moonan 2022) included the perceptions of mothers, 1 study (Rundle 2018) included the perceptions of currently pregnant women and mothers, 1 study included the perceptions of parents (both female and male, Day 2019), 1 study (Brogan-Hewitt 2021) included perceptions of mothers, fathers and/or grandparents and referred to them as parents, 2 studies (Jessiman 2013, Lucas 2013) included the perceptions of parents and pregnant women. Two studies (Jessiman 2013, Lucas 2013) reported experiences from the same population, however different themes/ information were available from both the papers.

Two studies focused on vitamin D (Brogan-Hewitt 2021, Day 2019), and 5 studies reported the uptake of vitamins included in the Healthy Start scheme (Dundas 2023, Jessiman 2013, Lucas 2013, Moonan 2022, Rundle 2018).

While evidence was available for all sub-groups in the protocol (women, men, parents and carers), data was not available for the subgroups separately but instead for all population groups combined.

Five studies used general qualitative inquiry as the study design (Brogan-Hewitt 2021, Dundas 2023, Jessiman 2013, Moonan 2022, Rundle 2018), 1 study used general qualitative inquiry within a mixed-methods study design (Day 2019) and 1 study used general qualitative inquiry within a report design (Lucas 2013).

Data collection methods included interviews and focus groups.

All studies were conducted in the United Kingdom, as per the protocol. One study was industry funded (Day 2019), 6 studies were not industry funded (Barbour 2012, Brogan-Hewitt 2021, Dundas 2023, Jessiman 2013, Moonan 2022, Rundle 2018) and 1 study did not report sources of funding (Lucas 2013).

Data were identified for some themes listed in the protocol by the committee and the additional theme 'Adequate knowledge and information' was generated (please see section below ‘the outcomes that matter most’ for further details).

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 J (list of excluded studies includes separate tables for folic acid and vitamins).

Summary of included studies

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

Table 2: Summary of included studies: Facilitators and barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

Study and aim of the study	Population	Methods	Themes applied after thematic synthesis
Barbour 2012 General qualitative inquiry United Kingdom **Study aim** To explore the reasoning behind women's decisions regarding the use of folic acid supplements before and during pregnancy. **Sources of funding** Not industry funded	N = 24 mothers Age of participants, years, mean (SD): Taking folic acid supplements as recommended: 32 (2) Taking folic acid supplements only in pregnancy: 27 (6) Taking folic acid supplements: 25 (6) Age of child(ren): NR	**Data collection:** Focus groups **Data analysis:** Systematic coding and similarities and differences analysis	• Thoughts, views and perceptions of women or parents/carers • Issues relating to acceptability • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • Adequate knowledge and information

NR: not reported; SD: standard deviation.

Facilitators and barriers to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

Study and aim of the study	Population	Methods	Themes applied after thematic synthesis
Brogan-Hewitt 2021 General qualitative inquiry United Kingdom **Study aim** To assess the acceptability and understanding of an infographic on vitamin D recommendations among parents or	N = 15 parents or caregivers Age of participants, years, mean (SD): NR, but n (%) 25–34: 6 (40) 35–44: 4 (27) Over 45: 5 (33) Age of child(ren), years, mean (SD): NR, but n (%) Under 1: 2 (13)	**Data collection:** Focus groups and telephone interviews **Data analysis:** Thematic analysis	• Thoughts, views and perceptions of women or parents/carers • Issues relating to accessibility • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants

Study and aim of the study	Population	Methods	Themes applied after thematic synthesis
caregivers of children under 5 years, aiming to improve vitamin D status in young children. **Sources of funding** Not industry funded.	1: 3 (20) 2: 10 (67) 3: 5 (33) 4: 1 (7)		• Adequate knowledge and information
Day 2019 General qualitative inquiry within a mixed-methods study United Kingdom **Study aim** To explore parents understanding regarding vitamin D awareness, knowledge, and perceptions, including their awareness of vitamin D recommendations, supplementation practices, knowledge and acceptance of vitamin D-fortified dietary sources. **Sources of funding** Industry funded	N=18 parents Age of participants, years, mean (SD): NR, but n (%) Under 25: 1 (5.6) 25-34: 7 (38.9) 35-44: 6 (33.3) Over 45: 2 (11.1) Not recorded: 2 (11.1) Age of child(ren): NR	**Data collection:** Focus groups and individual interviews **Data analysis:** Thematic analysis	• Factors relating to acceptability • Issues relating to acceptability • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • Adequate knowledge and information
Dundas 2023 General qualitative inquiry within a natural experiment study. United Kingdom **Study aim** To explore the factors influencing the adoption or rejection of Healthy Start vouchers, and the utilisation and perception of vouchers by women.	N = 40 mothers Age of participants, years, mean (SD): NR, but n (%) 20–9: 15 (37.5) 30–9: 16 (40) ≥ 40: 9 (22.5) Age of child(ren): NR	**Data collection:** Semi-structured interviews **Data analysis:** Thematic analysis	• Thoughts, views and perceptions of women or parents/carers • Issues relating to accessibility • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants

Study and aim of the study	Population	Methods	Themes applied after thematic synthesis
Sources of funding Not industry funded			
Jessiman 2013 General qualitative inquiry United Kingdom **Study aim** To explore the factors contributing to the limited uptake of free Healthy Start vitamins among low-income families in England. **Sources of funding** Not industry funded.	N = 107 pregnant women and parents Age of participants, years, mean (SD): NR, but n (%) <18 years: 8 (7.5) Age of child(ren): NR	**Data collection:** In-depth interviews **Data analysis:** Thematic analysis	• Thoughts, views and perceptions of women or parents/carers • Factors relating to accessibility • Issues relating to accessibility • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • Adequate knowledge and information
Lucas 2013 General qualitative inquiry within a report United Kingdom **Study aim** To examine the views of healthy start beneficiaries. **Sources of funding** Not reported	N = 107 pregnant women and parents Age of participants, years, mean: 27 Age of child(ren): NR	**Data collection:** Interviews (details not provided) **Data analysis:** Not reported	• Factors relating to accessibility • Issues relating to accessibility • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • Adequate knowledge and information
Moonan 2022 General qualitative inquiry United Kingdom **Study aim** To explore perceptions of mothers, [health professionals, and commissioners] on the uptake of Healthy Start vitamins and food vouchers, and compare the experiences in areas	N = 25 mothers Age of participants: NR Age of child(ren): NR	**Data collection:** Semi-structured interviews **Data analysis:** Framework approach	• Factors relating to accessibility • Issues relating to accessibility • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants

Study and aim of the study	Population	Methods	Themes applied after thematic synthesis
with targeted and universal implementation of these vitamins. **Sources of funding** Not industry funded			
Rundle 2018 General qualitative inquiry United Kingdom **Study aim** To explore adolescent pregnant women' knowledge and understanding of nutrition advice, as well as identify facilitators and barriers to dietary changes and supplement use in this vulnerable population. **Sources of funding** Not industry funded	N = 34 currently pregnant women and mothers Age of participants, years, mean: 17.62, and n (%)) 16: 4 (12) 17: 13 (38) 18: 9 (26) 19: 8 (24) Age of child(ren): NR	**Data collection:** Semi-structured interviews **Data analysis:** Thematic analysis	• Thoughts, views and perceptions of women or parents/carers • Issues relating to acceptability • Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • Adequate knowledge and information

NR: not reported; SD: standard deviation.

See the full evidence tables in appendix D. As this was a qualitative review, no meta-analysis was conducted (and so there are no forest plots in appendix E).

See summary of evidence section and appendix F for further details about the themes, review findings and CERQual ratings.

Summary of the evidence

Facilitators and barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

A summary of the qualitative data on facilitators and then on barriers are presented here. The data is presented by overarching theme together with a thematic map to visually illustrate the connection between the overarching themes and sub-themes.

The themes identified through analysis of all the included studies are summarised in Table 3 together with their CERQual quality rating and the number of studies contributing to each theme or sub-theme.

Table 3: Themes and sub-themes generated from analysis: Facilitators and barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

Themes and subthemes	CERQual quality	No. of studies
Facilitators to increasing the uptake of government advice on folic acid supplements for women and families with children up to five years (including before pregnancy)		
A1. Adequate knowledge and information		
A1.1 Communication of information	Low	1
A1.2 Content of information	Low	1
Barriers to increasing the uptake of government advice on folic acid supplements for women and families with children up to five years (including before pregnancy)		
B1. Thoughts, views and perceptions of women	Low	1
B2. Issues relating to acceptability	Low	1
B3. Issues relating to mis-information or a lack of information and communication of information		
B3.1 Content of information	Low	1
B3.2 Understanding the information	Low	1
B3.3 Advice and information from family and personal experience	Low	1

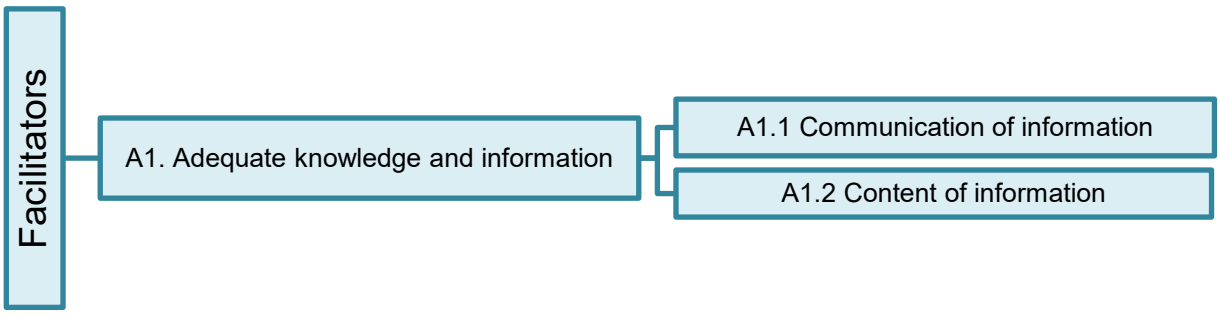
See appendix F for full GRADE-CERQual tables.

Facilitators to increasing the uptake of government advice on folic acid supplements before and during pregnancy

- The evidence generated 1 theme and 2 subthemes (Figure 1).
- The evidence was low in quality.
- The main reasons that evidence was downgraded was due to moderate concerns with methodological limitations or adequacy of evidence contributing to a theme.

The evidence reported on the facilitators for increasing the uptake of government advice for women and families with children up to five years on folic acid supplements (including before pregnancy).

Figure 1: Thematic map for facilitators to increase the uptake of government advice on folic acid supplements before and during pregnancy



A1. Adequate knowledge and information

There were 2 subthemes that contributed to this theme.

One study reported that women felt visual availability of the information at places they visit, such as posters and leaflets in general practice (GP) surgeries, information at Family Planning Clinics can increase awareness of folic acid benefits. The women suggested that Family Planning Clinics can mail folic acid leaflets to women who did not return for contraceptive advice, provide folic acid information along with pregnancy tests, and target women with notices in supermarket baby aisles.

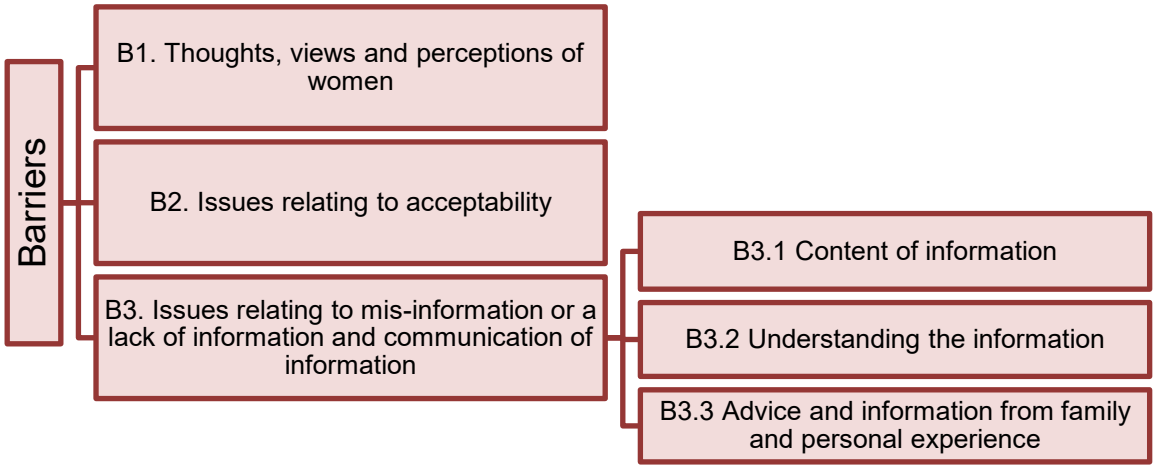
One study reported that women felt that leaflets should provide information on the risk and effects of not taking folic acid could increase awareness of folic acid benefits.

Barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

- The evidence generated 3 themes and 3 subthemes (Figure 2).
- The evidence was all low in quality.
- The main reasons that evidence was downgraded was due to moderate concerns with methodological limitations or adequacy of evidence contributing to a theme.

The evidence reported on the barriers for increasing the uptake of government advice for women and families with children up to five years on folic acid supplements (including before pregnancy).

Figure 2: Thematic map for barriers to increase the uptake of government advice on folic acid supplements before and during pregnancy



B1. Thoughts, views and perceptions of women

One study reported that some women felt self-conscious picking up posters and leaflets at GP surgeries where others are likely to take note of them.

Some women felt sceptical about the need to take folic acid in a hypothetical or subsequent pregnancy. Some women dismissed the effectiveness of folic acid in preventing birth defects, citing healthy outcomes without supplementation as justification. One woman dismissed the value of prevention efforts and claimed ethical value in having a child with spina bifida.

One woman believed that those at higher risk would already be aware of the danger and the crucial role of folic acid, indicating a perceived lack of need for additional health promotion initiatives.

Only a minority of women with positive pregnancy outcomes felt that this was a factor in deciding to take folic acid in future pregnancies.

B2. Issues relating to acceptability

One study reported that some women felt that folic acid supplements caused or contributed to morning sickness, leading to inconsistent use or discontinuation. Some women believed that they were possibly predisposed to implicating folic acid as the cause of morning sickness without sufficient evidence. Women, who were concerned about the connection between the use of folic acid and morning sickness, were found to adopt intermittent folic acid, with additional reasons including busyness from childcare or shift work.

B3. Issues relating to mis-information or a lack of information and communication of information

There were 3 subthemes that contributed to this theme.

One study reported that some women felt that receiving information about folic acid at 12 weeks' gestation was redundant as women felt that it was given too late. Some pregnant women were overwhelmed with the quantity of information given by healthcare professionals to newly pregnant women. First-time mothers reported frequent consultation of advice book, though its usage decreased in subsequent pregnancies.

One study reported that women, taking folic acid in a multivitamin, were often confused about the folic acid specific benefits, with speculations about its relation to bone development, preventing miscarriage, and increasing chances of conception. Some women were aware of the connection between folic acid and the risk of neural tube defects but found it difficult to internalise the information.

One study reported that some women relied on advice from their own mothers, who themselves were not advised on taking folic acid. Therefore, those women relied on their own sources of knowledge, with personal experiences influencing their beliefs and behaviour regarding folic acid.

Facilitators and barriers to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

A summary of the qualitative data on facilitators and then on barriers are presented here. The data is presented by overarching theme together with a thematic map to visually illustrate the connection between the overarching themes and sub-themes.

The themes identified through analysis of all the included studies are summarised in Table 4 together with their CERQual quality rating and the number of studies contributing to each theme or sub-theme.

Table 4: Themes and sub-themes generated from analysis: Facilitators and barriers to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

Themes and subthemes	CERQual quality	No. of studies
Facilitators to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years		
A1. Thoughts, views and perceptions of women or parents/carers	Moderate	2
A2. Factors relating to acceptability	Low	1
A3. Factors relating to accessibility	Moderate	2
A4. Adequate knowledge and information		
A4.1 Communication of information	Moderate	5
A4.2 Content of information	Moderate	3
A4.3 Advice and information from family and personal experience	Moderate	2
Barriers to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years in the		
B1. Thoughts, views and perceptions of women or parents/carers	Moderate	4
B2. Issues relating to acceptability	Moderate	2
B3. Issues relating to accessibility	Moderate	5
B4. Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants		
B4.1 Communication of information	Moderate	5
B4.2. Content of information	Moderate	2
B4.3. Lack of information or mis-information	Moderate	5
B4.4. Understanding the information	Moderate	2
B4.5. Food marketing and other commercial determinants	Moderate	2

See appendix F for full GRADE-CERQual tables.

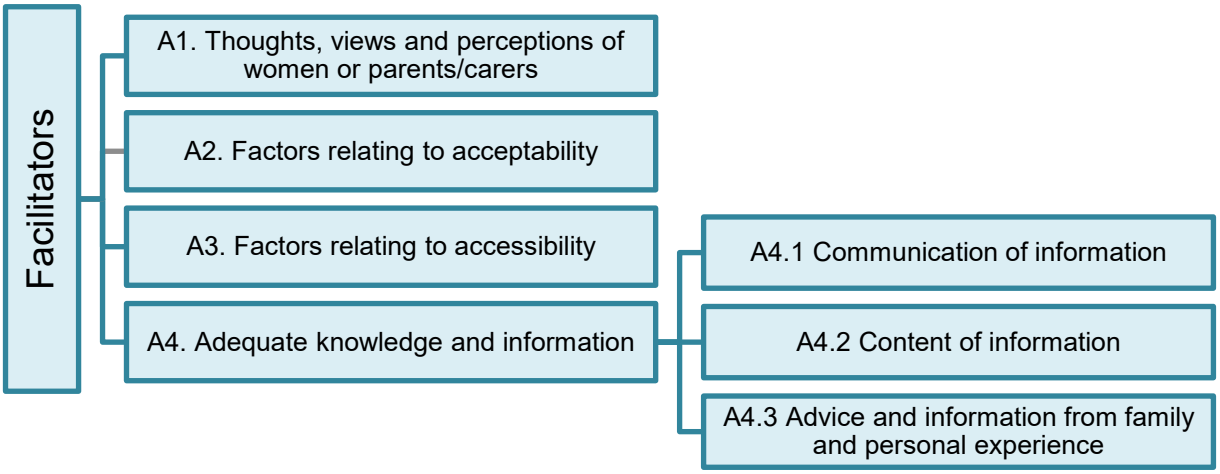
Facilitators to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

- The evidence generated 4 themes and 3 subthemes (Figure 3).

- The evidence ranged from moderate to low quality, with most of the evidence being moderate in quality.
- The main reasons that evidence was downgraded was due to moderate concerns with methodological limitations or adequacy of evidence contributing to a theme.

The evidence reported on the facilitators for increasing the uptake of government advice for women and families with children up to five years on vitamin supplements (including Healthy Start vitamins).

Figure 3: Thematic map for facilitators to increase the uptake of government advice on vitamin supplements during and after pregnancy and in children



A1. Thoughts, views and perceptions of women or parents/carers

Two studies reported that some mothers using vitamin supplements believed in their children's benefits, especially when they perceived inadequate fruit, vegetable, or calcium intake in their diet. While recognising the preference for dietary sources, they considered supplements a nutritional backup for their children.

Some mothers providing vitamin supplements to their children were motivated by their own vitamin use during pregnancy. Some mothers who did not claim Healthy Start vitamins bought vitamins for their children or had continued to provide their children with vitamins after eligibility for Healthy Start vitamins had ceased.

Some motivated young women established reminders for vitamin supplement intake, placing tablets in memorable locations (for example, by toothbrush, kettle, or in their purse), setting alarms on their mobile phones, or enlisting willing partners or women for reminders.

One mother concerned about her son's bow leg development, received advice about Healthy Start vitamins voucher from a midwife.

A2. Factors relating to acceptability

One study reported that some women preferred taking vitamin D supplements rather than having to think about the right food choices which contain vitamin D during pregnancy. This was due to convenience in the use of vitamin D supplements and also because of changes in food preferences and potential decreased appetite during

the pregnancy period. Additionally, the uncertainty about the exact amount of vitamin D obtained from food was a contributing factor in deciding to take vitamin D supplements.

Some parents expressed willingness to give their child a vitamin D-fortified yogurt, provided it was clear as to how it met the child's recommended daily intake, as they found it more convenient than remembering to provide the supplement to the child.

A3. Factors relating to accessibility

Two studies reported that some parents believed the process of applying for Healthy Start scheme worked well and had found out about the scheme by a health professional (for example, a midwife or health visitor). Additionally, some participants reported finding out about it from friends and family, or by leaflets from general practice surgeries, health clinics, the Job Centre, or at children centres. Some mothers living in areas where Healthy Start vitamin vouchers were offered universally, reported their experience of easy and immediate voucher exchange for vitamin tablets or drops at multiple locations. Some women preferred vitamins to be handed to them directly by their midwives.

A4. Adequate knowledge and information

There were 3 subthemes that contributed to this theme.

Five studies reported that some women preferred education about vitamin D to include dietary sources of vitamin D, its importance, risks of deficiency, child's vitamin D requirements during pregnancy and breastfeeding, and guidance on accessing vitamin D supplements. They also expressed their preference of the information to be delivered verbally and during routine appointments, baby weigh-in clinics, antenatal classes, health visitor clinics, breastfeeding visits, weaning sessions, a child's routine GP appointments (for example, vaccinations), online "messenger" service with a health professional, and informative YouTube videos focusing on healthy eating for children. Parents preferred smaller, more frequent information tailored to individual feeding practices, such as breastfeeding or formula feeding.

Parents preferred clearer and more specific vitamin D information presented in simpler and more visually engaging written formats, such as through better advertising in supermarkets, schools, children's centres, and other everyday locations. Some parents (including mothers, fathers and/or grandparents) emphasised the importance of offering infographics in different languages. Many parents and caregivers believed that the acceptability of infographics would increase if its source was recognised as trustworthy and reliable, particularly if it had an association with a common healthcare provider like the National Health Service (NHS).

Some parents suggested that incorporating information about fortified foods and drinks in an informational leaflet, including details on the benefits and importance of vitamin D, consequences of insufficient intake, quantity meeting the recommended daily intake (RDA), and reassurance about the safety of consuming fortified products to address concerns about vitamin D overdosing.

Some young women reported that before their first contact with a midwife or general practitioner, they were more likely to be prompted by a supportive partner, family member, or friend to start taking Healthy Start supplements. Some young women valued the practical tips and ideas from other young women's experiences.

Three studies reported that some parents expressed preference of positive messages about the health benefits of vitamin D rather than information highlighting the risks of not taking it. Some parents believed that the message should highlight both immediate and long-term benefits of vitamin D. Additionally, some parents expressed preference of inclusion of information about alternative sources of vitamin D such as sunlight and food/drink sources, along with details on why vitamin D is important and its health benefits.

Some parents believed that promotional efforts from general practitioners or health visitors, such as distributing free vitamin D drops or supplements, improved parent knowledge through clear explanations and leaflets, parent role modelling of healthy behaviours, better publicity (for example, TV ads), reminders, and clear instructions on giving vitamin D supplements and incorporating them into a daily routine (for example, mixing with food or liquids) would make changes to child's diet. Most parents preferred that all the health messages on vitamin D should focus on topics like strong bones and teeth, along with adherence to Department of Health recommendations.

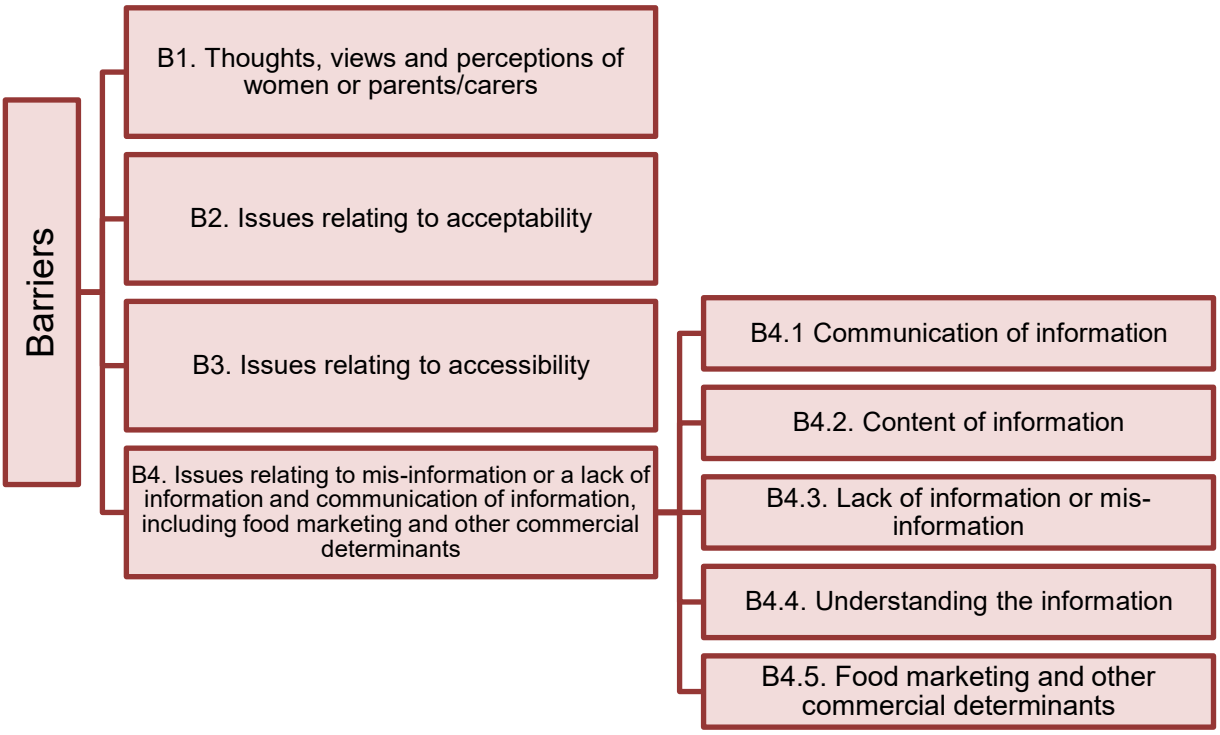
Two studies reported that some young women (currently pregnant and mothers) were aware that Healthy Start vitamins are best for baby. However, some women using vitamins weren't advised by health professionals; one mother requested information about vitamins from a healthcare provider based on her sister's recommendation, while another was told by her midwife that vitamins were unnecessary with a healthy diet.

Barriers to increasing the uptake of government advice on vitamin supplements during and after pregnancy and in children

- The evidence generated 4 themes and 5 subthemes (Figure 4).
- The evidence was moderate in quality.
- The main reasons that evidence was downgraded was due to moderate concerns with methodological limitations or adequacy of evidence contributing to a theme.

The evidence reported on the barriers for increasing the uptake of government advice for women and families with children up to five years on vitamin supplements (including Healthy Start vitamins).

Figure 4: Thematic map for barriers to increase the uptake of government advice on vitamin supplements during and after pregnancy and in children



B1. Thoughts, views and perceptions of women or parents/carers

Four studies reported that some young women were unaware of the benefits of supplements and whether Healthy Start vitamins, which contain folic acid, are safe for use throughout pregnancy.

Participants generally knew about obtaining vitamin D from sunlight, but some acknowledged challenges in winter. Limited awareness existed about vitamin D in food sources, and participants had poor knowledge of how such foods contribute to overall vitamin D needs. Some participants received vitamin D information during/after pregnancy, but they had not seen it broken down by developmental stages before.

Some mothers were unconvinced about the necessity of vitamins, thinking that children should obtain them from their diet.

Most mothers who claimed Healthy Start vitamins did not use the vitamin voucher; in some cases, mothers exchanged the voucher for vitamins but didn't use them. Additionally, they did not want to take vitamins due to successful child health outcomes in prior pregnancies without supplements. They also reported of dislike of tablets or drops by the children, concerns about potential negative health effects in children, and difficulties in accurately measuring the correct dosage with liquid drops.

Some young women reported lack of personal relevance of taking supplements, forgetting taking supplements or having other priorities. Two young women opted for alternative supplement formats, choosing fortified products like "healthy chocolate" or fruit smoothies. Some young women (currently pregnant women and mothers) reported delayed start of the vitamins due to uncertainty whether the baby will be kept.

B2. Issues relating to acceptability

Two studies reported that some women preferred giving “healthy foods” with vitamin D, as they found it challenging to administer a supplement to their child or to take the supplements themselves due to taste preferences or experiencing nausea with larger tablet sizes.

B3. Issues relating to accessibility

Five studies reported that some women were not aware of the Healthy Start scheme, such as knowing about the Healthy Start vouchers, redeeming vouchers, or remembering the information about vitamin D supplements. One mother believed the vouchers were only for vitamins, another thought they could be used for milk and vitamins, and a third believed they were exclusively for formula milk. Some parents (including pregnant women) overlooked the Healthy Start vitamins coupon that arrived in the post. Also, some parents or caregivers (including mothers, fathers and/or grandparents) reported language barrier impacting their awareness. Additionally, some individuals were unfamiliar with the appearance of vitamin D supplements.

Some parents (including pregnant women) mentioned receiving incorrect guidance regarding the collection location of Healthy Start vitamins. There were instances when the midwife or health visitor stating that they didn’t need Healthy Start vitamins if they were on a healthy diet. Most parents (including pregnant women) faced some difficulty in obtaining vitamins: for example, because of problems exchanging the voucher in pharmacies, finding it embarrassing to ask retail staff, lack of stock, or access to locations that supply vitamins.

B4. Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants

There were 5 subthemes that contributed to this theme.

Five studies reported that some women were unsatisfied with the method of communication of information of diet and supplement use. Mothers complained that Healthy Start letters didn’t specify where to get the vitamins. Additionally, some young women (including currently pregnant women) expressed dissatisfaction regarding written resources and web-based contents on diet and supplementation particularly when the information was designed for adolescent pregnancy. Some parents or caregivers found the infographics unclear and felt it required deciphering. Moreover, they felt that the colour, images, and text font in the infographics were unappealing, and they felt there was excessive text.

Some mothers (including pregnant women) couldn’t recall being informed by the healthcare professionals and they believed that there were time constraints and lack of interaction with the midwife during the clinic visits. Additionally, some parents were explicitly told by midwives or health visitors that vitamin supplementation was unnecessary.

Some young women questioned the accuracy and consistency of their advice coming partner, family, and friends.

Two studies reported that some young women were unsatisfied with the content of information communicated. They felt overwhelmed and confused when leaflets were provided with minimal opportunity for discussion. Young women were concerned about the reliability and accuracy of certain online information. Additionally, there was

a perception of a lack of reliable and often conflicting information from different sources.

Five studies reported that some young women refused pregnancy supplements, linking them to “medicine” they were advised to avoid. Some women expressed concern about the potential for vitamin D overdose in children, indicating a lack of clarity on recommended intake. Some women expressed lack of confidence or understanding in the provided information with a desire for additional support from a health professional when interpreting the infographic. Many parents or caregivers felt that the infographic lacked information on ‘why’ vitamin D is needed, where it can be found, and its health benefits.

Many parents were unaware of the need for a supplement and the importance of vitamin D for their baby/child. Some parents reported that alternative sources like food, drinks, or sunlight were not discussed by their midwife or health visitor. Some parents expressed confusion regarding current recommendations for breastfeeding and vitamin D supplement use for both mothers and infants. They also stated that there were uncertainties about administering vitamin D supplements to exclusively breastfed babies.

Some mothers expressed lack of awareness of the Healthy Start vitamin scheme or receiving vouchers and expressed a sense of ‘missing out.’ Some mothers lacked awareness of the benefits of vitamins, expressing a sense of being inadequately informed by health professionals.

Two studies reported that some young women felt that they stopped taking vitamin D early as they were concerned about safety. Some parents and caregivers struggled to interpret information on vitamin D supplementation methods and doses. Additionally, many parents and caregivers did not recognise the micrograms symbol ‘µg,’ with some having seen it on vitamin packaging, while others had never encountered it before.

Two studies reported that some young women found multi-vitamins and fish oil supplements expensive, but the premium packaging and marketing made them question if they were better than folic acid or Healthy Start vitamins alone. Some parents expressed various challenges, including a lack of awareness about available options of vitamin D fortified products, insufficient labelling of vitamin D content, and concerns about meeting child’s daily requirements. Additionally, they had concern about barriers, such as limited availability of suitable products for babies/toddlers, worries about product healthiness (for example, high sugar content), pricing considerations, fear of potential overdosing with supplement use. Perceived false perception of the lack of need for fortified products, habitual buying patterns prioritising factors, such as sugar content when deciding to buy food, preventing them from buy fortified products vitamin D.

Economic evidence

This was a qualitative review question, therefore economic evidence was not relevant and thus no economic evidence searches were conducted.

The committee’s discussion and interpretation of the evidence

The outcomes that matter most

This section includes information regarding evidence on facilitators and barriers to increase the uptake of government advice on both folic acid and vitamins.

To answer the question of factors that facilitate or hinder people's uptake of government advice on folic acid and vitamin supplements, the review was designed to include qualitative data and as a result the committee could not specify in advance the data that would be found. Instead, they identified the following main themes to guide the review, although the list was not exhaustive, and the committee were aware that additional themes could be identified:

- thoughts, views and perceptions of women or parents/carers
- issues relating to acceptability
- issues relating to accessibility
- issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants
- women/parent/carer thoughts on discourse, ethnic and cultural attitudes to vitamin supplementation and healthy eating
- acceptability and misinformation
- motivational factors, including child characteristics.

Data were identified for some of the themes (thoughts, views and perceptions of women or parents/carers, issues relating to acceptability, issues relating to accessibility, and issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants) identified by the committee. Additional theme 'Adequate knowledge and information' was generated from the evidence.

The quality of the evidence

Facilitators and barriers to increase the uptake of government advice on folic acid supplements before and during pregnancy

The evidence was assessed using GRADE-CERQual methodology and the overall confidence in the findings for the qualitative review was low quality.

The review findings were downgraded because of methodological limitations of the included study, for example, concerns with the relationship between researcher and participants, issues with the recruitment strategy, the rigour or lack of information of data analysis. Additionally, some findings were also downgraded for adequacy because the only included study did not offer rich data.

Facilitators and barriers to increase the uptake of government advice on vitamin supplements during and after pregnancy and in children

The evidence was assessed using GRADE-CERQual methodology and the overall confidence in the findings for the qualitative review ranged from moderate to low, with most of the evidence being moderate quality.

The review findings were downgraded because of methodological limitations of the included studies, for example, concerns with the relationship between researcher and participants, issues with the recruitment strategy, lack of consideration of ethical issues in study methods, and the rigour or lack of information of data analysis. Additionally, some findings were also downgraded for adequacy because together, the relevant studies did not offer rich data.

Benefits and harms

Facilitators and barriers to increase the uptake of government advice on folic acid supplements before and during pregnancy

Overall, the committee thought that the evidence on this topic was limited but they observed that the themes identified in this review align with the evidence and committee's conclusions on the quantitative review on interventions to increase uptake of folic acid supplementation before and during the first 12 weeks of pregnancy, reported in evidence report C. The committee also used the qualitative evidence on facilitators and barriers to increase the uptake of government advice on vitamin supplements more generally to inform recommendations on folic acid supplements. Therefore, the findings from this review were discussed along with the quantitative evidence on interventions to increase uptake of folic acid supplementation before and during the first 12 weeks of pregnancy to inform the recommendations.

The committee discussed the evidence on subtheme A1.1 'communication of information' (low confidence) and issues relating to subtheme B3.1 'content of information' (low confidence), which showed that some women acknowledged that information available at healthcare settings, such as GP surgeries or family planning clinics, they visit before and during pregnancy could increase awareness of folic acid benefits. However, they felt that information received in later stages of pregnancy was not helpful. The committee discussed that it is crucial to increase awareness of the importance of folic acid in various settings as all these contacts would provide opportunities to counsel people about the benefits of folic acid. Although subthemes in the qualitative evidence did not specify additional settings where information on folic acid could be provided, the committee from their experience considered a wide range of health-care settings, such as community pharmacies, sexual health clinics, contraception clinics, fertility clinics, clinics in community centres and local hubs, antenatal and postnatal care clinic in the recommendation. Evidence from subtheme B4.1 'communication of information' (moderate confidence) on barriers on uptake of government advice on vitamin supplements showed that some young women expressed dissatisfaction regarding written resources and web-based contents on diet and supplementation (including folic acid) particularly when the information was designed for adolescent pregnancy. Whilst this evidence was on vitamins more generally, the committee thought it was relevant on folic acid as well. Hence the committee agreed that reliable and accurate information on benefits of folic acid should be to be available for young pregnant people. Based on the evidence and their experience, the committee agreed to include young people's services, in the list of health care settings where information about importance of folic acid supplementation before and during pregnancy could be available.

The committee discussed the importance of discussing folic acid supplementation when giving health and wellbeing advice before and during pregnancy. The evidence from subtheme B3.1 'content of information' (low confidence) showed that women were concerned about receiving information on folic acid only at appointment at around 12 weeks of pregnancy and others felt overwhelmed by the quantity of information received when already pregnant. Based on the qualitative evidence and quantitative evidence from evidence review C, the committee agreed that the importance of folic acid supplementation should be discussed at different opportunities with anyone who may become pregnant, are planning pregnancy or are already pregnant, either during face-to-face, telephone or virtual appointments or group sessions. The committee agreed that information about folic acid could be incorporated in the discussion on topics such as contraception, sexual health and fertility because the people for whom these discussions are relevant, may become pregnant and need information about early start of folic acid supplementation. The committee discussed that currently only approximately half of pregnancies are planned in the UK. They acknowledged that anyone of childbearing age should be

aware of the importance of folic acid if they were to become pregnant in the future, regardless of whether it is their first or subsequent pregnancy.

The committee reviewed the evidence on issues related to subtheme A1.2 ‘content of information’ (low confidence), subtheme B3.3 ‘advice and information from family and personal experience’ (low confidence) and theme B1 ‘thoughts, views and perceptions of women’ (low confidence) and noted that some women prefer to receive information via leaflets while others were overwhelmed with the information and were self-conscious collecting posters or leaflets due to the possibility of someone taking note of them. The committee discussed that people are given ‘digital leaflets’, through websites, QR codes or PDFs in emails/texts and they were not always given a paper leaflet. They acknowledged the difficulties people may have identifying reliable online information on folic acid supplementation if they look for it themselves. The committee also noted that paper leaflets might not be preferred by all but they could address barriers for those who might not have easy access to the internet. However, they acknowledged that printing and providing paper leaflets may have different financial and environmental implications than web-based products. The committee acknowledged that people have differential preferences and needs and people also may receive information from several sources not limited to the healthcare practitioners. The committee therefore recommended that information should be provided in the person’s preferred format.

The evidence from the themes showed that some women were not fully aware of the importance of the information on folic acid benefits or have lack of understanding of the information given (subtheme B3.2 ‘understanding of information’, low confidence). This evidence aligned with the committee’s own knowledge and experience that in practice due to limited consultation time, healthcare professionals are not able to have a detailed discussion on the benefits of folic acid during pregnancy. They agreed that it was important for healthcare professionals to provide information in a way that is relevant to the person’s level of understanding on the topic and explain the importance of taking folic acid supplementation even before pregnancy and during the first 12 weeks of pregnancy, and how it can prevent neural tube defects and other congenital malformations in babies.

The committee reviewed the evidence on issues related to acceptability of the folic acid (theme B2 'issues relating to acceptability’, low confidence). Although the evidence from the themes showed some women reported morning sickness when taking folic acid, the committee noted that this information could be misleading, and the nausea is more likely caused by other micronutrients, such as iron included in multivitamins that also contain folic acid. The committee discussed that from their knowledge and experience folic acid does not cause nausea. Hence, they recommended that people should be reassured that folic acid supplements are generally well tolerated when taken as recommended.

The committee discussed how people may forget to take daily folic acid supplements, although this did not come up in the qualitative evidence related to folic acid supplementation. However, qualitative themes on the uptake of vitamins more generally included evidence about women forgetting to take supplements or having other priorities as well as women establishing reminders for vitamin supplement intake (facilitator theme A1 ‘thoughts, views and perceptions of women or parents/carers’, moderate confidence, and barrier theme B1 ‘thoughts, views and perceptions of women or parents/carers’, moderate confidence). The committee discussed techniques in the evidence that served as a helpful reminder to take vitamins. For example, pairing a behaviour (in this case, taking a vitamin supplement) with a routine activity such as brushing teeth or bedtime story might be helpful, or

setting up a daily reminder on a phone or through an app. Therefore, the committee came to the consensus that the healthcare provider should discuss ways to remember taking folic acid supplements daily.

The committee were aware of the government decision from 2021 which sets out plans for non-wholemeal flour to be fortified with folic acid to prevent neural tube defects in babies. They acknowledged that the plans have been reported in the media and many people might already know about it. However, they noted that this did not come up in the qualitative evidence. The committee expressed concern that the publicity of the plan could lead people to stop taking folic acid supplements if they mistakenly thought they will receive enough folic acid through flour alone. The committee also recognised that there were many other food products, such as breakfast cereals, which contain added folic acid. The committee acknowledged that it was not possible to get the required amount (400 micrograms) of folic acid from the food alone so supplementation before and during the first trimester of pregnancy was very important. The committee additionally noted that the fortification plans have not yet been implemented and only apply to white flour and there may be communities who consume less white flour. Based on their knowledge and experience, the committee recommended that information should be provided about the importance of taking folic acid supplements even when consuming foods fortified with folic acid.

No qualitative evidence was identified on accessibility of folic acid supplements. The committee from their experience noted that folic acid supplements are relatively affordable and are easily available, for example, from pharmacies or supermarkets. A GP may also be able to prescribe them, so that a person who is exempt from paying for prescriptions could get them for free. Hence, they recommended that information about where to access free or low-cost folic acid supplements should be provided to women. The committee discussed that many pregnant people are eligible for free Healthy Start vitamins which contain folic acid and vitamins C and D, although it should be noted that the Healthy Start scheme is only available from around 10 weeks of pregnancy whereas folic acid supplementation is recommended already from before pregnancy to 12 weeks of pregnancy. Regardless, they agreed via consensus that information about the Healthy Start vitamins should be provided to people during consultation.

Facilitators and barriers to increase the uptake of government advice on vitamin supplements during and after pregnancy and in children

The committee reviewed the themes and subthemes available from this evidence review for facilitators and barriers to increase the uptake of government advice on vitamin supplements. Overall, they thought that the evidence was quite informative and acknowledged that the themes identified in this review align well with the findings and the committee's conclusions of the quantitative evidence on interventions to increase uptake of vitamin supplements (including Healthy Start vitamins) in line with government advice, reported in evidence report E. Therefore, the findings from this review were discussed along with the quantitative evidence on interventions to increase uptake of vitamin supplementation to inform the recommendations.

The committee discussed the qualitative evidence relating to accessibility (theme A3 'factors relating to accessibility', moderate quality; and theme B3 'issues relating to accessibility', moderate quality), which showed that some women found out about the importance of vitamins not only from friends and family, but also from leaflets they found at general practice surgeries, health clinics, Job Centres, or at children centres. Based on the qualitative evidence and quantitative evidence from evidence report E the committee agreed that the benefits of the vitamin supplements during and after pregnancy and for children under 5 years should be discussed at every

opportunity in various timepoints and settings such as during health visitor appointments, antenatal care and postnatal care appointments, at baby developmental checks, during vaccination appointments, at pharmacies and within family hubs. The committee discussed that current government policies encourage development of family hubs as a one stop shop for families. The committee from their experience acknowledged that breastfeeding support groups are also a great setting to discuss vitamin D supplementations for both the breastfeeding person and for babies, including advice on how to administer the vitamins for young babies when breastfeeding. However, they recognised that not everyone has need or access to such groups so it's important that information about vitamin supplementations is provided in various settings and timepoints.

The committee referred to their experiences in practice and noted that sometimes parents could find it difficult to understand the information and how it applied to their individual situations. The evidence from the themes showed that women who have higher knowledge and understanding about the benefits of vitamins want to do best for their children and those who have lack of understanding of the advantages of vitamin supplementation might possibly delay the start of vitamins or not give them at all (facilitator subthemes: A4.1 'communication of information', moderate confidence; A4.2 'content of information', moderate confidence; barrier subthemes B4.2 'content of information', moderate confidence'; B4.3 'lack of information or mis-information', moderate confidence; B4.4 'understanding the information', moderate confidence; B4.5 'food marketing and other commercial determinants', moderate confidence; and barrier theme B1 'thoughts, views and perceptions of women or parents/carers', moderate confidence). The committee noted that just providing blanket information without discussion was not often sufficient as some people may have misconceptions about vitamin supplements. They discussed that sometimes people considered vitamin supplements to be artificially manufactured and not natural, and hence did not want to give them to their children. Based on the evidence and their experience, the committee recommended that health professionals should provide information that is relevant to the parents' circumstances and existing understanding on the topic.

The committee discussed how the evidence across several themes seemed to indicate that people thought vitamin supplements are not needed as long as they or their children have a healthy diet (theme B1 'thoughts, views and perceptions of women or parents/carers', moderate confidence; theme B2 'issues relating to acceptability', moderate confidence; theme B4 'issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants', moderate confidence) or that they preferred getting vitamin D through food rather than through supplements (theme A2 'factors relating to acceptability', low confidence; theme A4 'adequate knowledge and information', moderate confidence). The committee agreed that information should be provided about the importance of vitamin supplements in addition to a nutritious and healthy diet.

The committee discussed the evidence on subtheme A4.1 'communication of information' (moderate confidence), subtheme A4.2 'content of information' (moderate confidence) and theme B1 'thoughts, views and perceptions of women or parents/carers' (moderate confidence) in relation of the awareness of the importance of vitamin D, its benefits and the risks associated with not taking supplements. The evidence showed that some parents preferred more information from health professionals on the benefits of vitamin D supplements, recommended daily intake of vitamin D and the consequences of insufficient vitamin D intake. Based on the evidence and their expertise, the committee agreed that information should be provided about why and which vitamin supplements should be taken during

pregnancy, when breastfeeding, and in childhood. The qualitative evidence was mainly about vitamin D but the committee agreed that other recommended vitamins should also be discussed.

The committee discussed the evidence on subtheme B4.3 'lack of information or misinformation' (moderate confidence), subtheme B4.4 'understanding the information' (moderate confidence), and theme B1'thoughts, views and perceptions of women or parents/carers' (moderate confidence), where some women expressed concerns about the potential for vitamin D overdose in children or reported that they children dislike tablets or drops. The committee acknowledged that it is useful to know about the different formulations of vitamin supplements such as drops, sprays, tablets and capsules so that there are options if people, particularly children, may struggle with taking them. The committee also noted that supplements are often derived from animal sources, and these may be not suitable for people on a restricted diet (such as kosher, halal, vegan and vegetarian), however, non-animal based options are also available. The committee also expressed some concerns regarding supplements attributes, such as the quantity of added sugar in supplements and brand names. They reviewed the evidence on subtheme B4.5 'food marketing and other commercial determinants' (moderate confidence) and agreed that it was not necessary to mention branding of the supplements when discussing with the parents. The committee from their experience discussed that people who are not able follow the standard recommendation on vitamin supplements may need additional information for safe and appropriate intake of vitamin supplements. Therefore, the committee agreed that information provision should include information on appropriate dosages, different formulations and how supplements should be taken.

The committee discussed the evidence on facilitator and barrier themes A1 and B1 'thoughts, views and perceptions of women or parents/carers' (both moderate confidence), where some motivated women reported establishing reminders for vitamin supplement intake and others of forgetting to take supplements or having other priorities. The committee recognised forgetting to take supplements to be a real issue and discussed techniques in the evidence that served as a helpful reminder to take vitamins. For example, pairing a behaviour (in this case, taking a vitamin supplement) with a routine activity such as brushing teeth or bedtime story might be helpful, or setting up a daily reminder on a phone or through an app. Therefore, the committee came to the consensus that the healthcare provider should discuss ways to remember taking vitamin supplements daily.

The committee discussed the evidence on accessibility (theme A3 'factors relating to accessibility', moderate confidence; theme B3 issues relating to accessibility, moderate confidence) and communication (subtheme B4.1 'communication of information', moderate confidence; subtheme B4.3 'lack of information or misinformation', moderate confidence). The evidence showed that there was some confusion about eligibility for the free Healthy Start vitamins, showing how parents had different perceptions of access to the Healthy Start scheme. In areas where the Healthy Start scheme was offered universally, parents found the process of accessing the Healthy Start vouchers straight forward. However, some parents reported issues, such as lack of awareness of the scheme or receiving incorrect guidance on access to the Healthy Start vouchers. Based on the qualitative evidence and the qualitative evidence in evidence review E, the committee agreed that information about the Healthy Start scheme should be shared so that those who are eligible can access free vitamin supplements, including what vitamins are included within the scheme.

The qualitative evidence on accessibility of vitamins supplements largely related to the Healthy Start scheme, however, not everyone is eligible for the free Healthy Start vitamins. The committee from their experience noted that vitamin supplements are generally affordable and easily available from pharmacies or supermarkets, for example. Hence, they recommended that information about where to access vitamin supplements should be provided.

Cost effectiveness and resource use

This was a qualitative review question, therefore economic evidence was not relevant. The recommendations made mostly reflect current practice and aim to reiterate government advice and harmonise practice across settings, by provision of information and advice during routine or other planned appointments. Recommendations based on the evidence identified in this review question relate to approaches to communication of information and advice regarding folic acid and other vitamin supplements, as well as the content of information and advice provided, and therefore may have minor resource implications comprising health professionals' extra time to provide this information and advice.

Other factors the committee took into account

For this review question, in relation to vitamin supplementation before, during or after pregnancy, 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 1.1.1 to 1.1.3 on facilitators and barriers to increasing the uptake of government advice on folic acid supplements and recommendations 1.1.9 and 1.1.10 on facilitators and barriers to increasing the uptake of government advice on vitamin supplements. Other evidence supporting these recommendations can be found in the evidence review C on interventions to increase uptake of folic acid supplementation before and during the first 12 weeks of pregnancy and evidence review E on interventions to increase uptake of vitamin supplements (including Healthy Start vitamins) in line with government advice.

References – included studies

Qualitative

Facilitators and barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

Barbour 2012

Barbour, R S, Macleod, M, Mires, G et al. (2012) Uptake of folic acid supplements before and during pregnancy: focus group analysis of women's views and experiences. Journal of human nutrition and dietetics: the official journal of the British Dietetic Association 25(2): 140-7

Facilitators and barriers to increasing the uptake of government advice on vitamin supplements

Brogan-Hewitt 2021

Brogan-Hewitt, Ailsa, Apekey, Tanefa A, Christian, Meaghan Sarah et al. (2021) Improving Vitamin D Intake in Young Children-Can an Infographic Help Parents and Carers Understand the Recommendations?. Nutrients 13(9)

Day 2019 Day, Rhiannon Eleanor, Krishnarao, Roxane, Sahota, Pinki et al. (2019) We still don't know that our children need vitamin D daily: a study of parents' understanding of vitamin D requirements in children aged 0-2 years. BMC public health 19(1): 1119

Dundas 2023

Dundas, Ruth, Boroujerdi, Massoud, Browne, Susan et al. (2023) Evaluation of the Healthy Start voucher scheme on maternal vitamin use and child breastfeeding: a natural experiment using data linkage. CWAAHL 11(11): 1-101

Jessiman 2013

Jessiman, Tricia, Cameron, Ailsa, Wiggins, Meg (2013) A qualitative study of uptake of free vitamins in England. BMJ 8(98): 587-591

Lucas 2013

Lucas, P.J., Jessiman, T., Cameron, A., Wiggins, M., Hollingworth, K. and Austerberry, C., 2013. Healthy start vouchers Study: the views and experiences of parents. Professionals and Small Retailers in England The Views of Frontline Professionals, 2.

Moonan 2022

Moonan, May, Maudsley, Gillian, Hanratty, Barbara et al. (2022) An exploration of the statutory Healthy Start vitamin supplementation scheme in North West England. BMC public health 22(1): 392

Rundle 2018

Rundle, Rachel, Soltani, Hora, Duxbury, Alexandra (2018) Exploring the views of young women and their healthcare professionals on dietary habits and supplementation practices in adolescent pregnancy: a qualitative study. BMC nutrition 4: 45

Other

Barbour 2012

Barbour, R.S., Macleod, M, Mires, G., Anderson, A.S (2012). Uptake of folic acid supplements before and during pregnancy: focus group analysis of women's views and experiences Journal of Human Nutrition and Dietetics. Public health nutrition and epidemiology. Volume 25, Issue 2 p. 140-147.

Jessiman 2013

Jessiman, T., Cameron, A., Wiggins, M. and Lucas, P.J., 2013. A qualitative study of uptake of free vitamins in England. Archives of Disease in Childhood, 98(8), pp.587-591.

Appendices

Appendix A Review protocol

Review protocol for review question: What are the barriers and facilitators to increasing the uptake of government advice for women and families with children up to five years in the following areas:
-folic acid supplements (including before pregnancy)
-vitamin supplements (including Healthy Start vitamins)
-healthy eating and drinking in pregnant women
-appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months
-healthy eating and drinking in children from 12 months to 5 years?

Table 4: Review protocol

ID	Field	Content
0.	PROSPERO registration number	Not applicable
1.	Review title	Barriers and facilitators to increase the uptake of government advice
2.	Review question	What are the barriers and facilitators to increasing the uptake of government advice for women and families with children up to five years in the following areas: • folic acid supplements (including before pregnancy) (evidence review C) • vitamin supplements (including Healthy Start vitamins) (evidence review E) • healthy eating and drinking in pregnant women (evidence review I) • appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months (evidence review N) • healthy eating and drinking in children from 12 months to 5 years (evidence review O).
3.	Objective	To identify the barriers and facilitators to uptake of government advice in the following areas: • folic acid supplements (including before pregnancy) (evidence review C) • vitamin supplements (including Healthy Start vitamins) (evidence review E)

ID	Field	Content
		• healthy eating and drinking in pregnant women (evidence review I) • appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months (evidence review N) • healthy eating and drinking in children from 12 months to 5 years (evidence review O)

4.	Searches	The following databases will be searched:
		• MEDLINE
		• Embase
		• Emcare
		• CINAHL
		• PsycINFO
		
		Searches will be restricted by:
		• The same restrictions as in equivalent intervention reviews will be used:
		  ○ none (C)
		  ○ none (E)
		  ○ 1970 (rationale: after 1970 there was an increase in the prevalence of obesity and substantial lifestyle and socio-economic changes) (I)
		  ○ none (N)
		  ○ none (O)
		• English language only
		• human studies only.
		
		Other searches:
		• inclusion lists of systematic reviews.
		
		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.

ID	Field	Content

5.	Condition or domain being studied	Barriers and facilitators to increase government advice for families with children up to five years in the following areas:
		• folic acid supplements (including before pregnancy) (C):
		  ○ Uptake of low-dose (<1 mg daily); medium-dose folic (≥1 to <5 mg daily); high-dose (≥5 mg daily) folic acid supplementation in line with government advice https://www.nhs.uk/medicines/folic-acid/how-and-when-to-take-folic-acid/
		• vitamin supplements in pregnant and breastfeeding women (E):
		  ○ Healthy start vitamins for pregnant and breastfeeding women (https://www.healthystart.nhs.uk/healthcare-professionals/ https://www.healthystart.nhs.uk/):
		  ▪ the daily dose is 1 tablet, which contains:
		  • 70 milligrams of vitamin C
		  • 10 micrograms of vitamin D
		  • 400 micrograms of folic acid.
		  ○ vitamin A (https://www.nhs.uk/pregnancy/keeping-well/vitamins-supplements-and-nutrition/)
		  ▪ vitamin A (or retinol): Do not take cod liver oil or any supplements containing vitamin A (retinol) when you're pregnant. Too much vitamin A could harm your baby. Always check the label.
		  ○ vitamin C (https://www.nhs.uk/pregnancy/keeping-well/vitamins-supplements-and-nutrition/)
		  ▪ found in fruit and vegetables, a balanced diet can provide all the vitamin C pregnant women need.
		  ○ vitamin D (https://www.nhs.uk/pregnancy/keeping-well/vitamins-supplements-and-nutrition/ https://www.nhs.uk/start4life/pregnancy/vitamins-and-supplements-pregnancy/)
		  ▪ 10 mcg vitamin D daily during the winter months (October until the end of March).
		  ○ those at higher risk of not getting enough vitamin D (not outdoors often, live in an institution like a care home, usually wear clothes that cover most of their skin when outdoors) should take daily 10 mcg vitamin D daily throughout the year.
		  ○ people with black or brown skin may also not make enough vitamin D from sunlight, so should consider taking 10 mcg of vitamin D daily throughout the year.
		• vitamin supplementation for babies and children up to 5 years in line with government advice (E):
		  ○ Healthy Start children's vitamins drops (from birth to 4 years) (https://www.healthystart.nhs.uk/)
		  ▪ The daily dose is 5 drops, which contain:
		  • vitamin A (233µg)

ID	Field	Content
		• vitamin C (20mg) • vitamin D (10µg). ○ vitamins for children (A, C, D) Vitamin D – NHS (www.nhs.uk) https://www.nhs.uk/start4life/baby/baby-vitamins/ https://www.nhs.uk/conditions/baby/weaning-and-feeding/vitamins-for-children/ ○ babies from birth to 1 year should have a daily supplement containing 8.5 to 10mcg of vitamin D throughout the year if they are: ▪ breastfed ▪ formula-fed and having <500 mls of formula a day, as infant formula is already fortified with vitamin D. ○ all children aged 6 months to 5 years should be given vitamin supplements containing vitamins A, C and D every day (unless they are being formula fed with >500mls). • healthy eating and drinking in pregnant women (I): https://www.nhs.uk/start4life/pregnancy/healthy-eating-pregnancy/ • appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months (N): ○ Introduce solid foods at around 6 months, alongside their usual breast milk or first infant formula. Weaning teaches the baby to move solid foods around their mouth, chew and swallow solid foods. Offer a variety of foods, allow plenty of time, go at the baby's pace and stop when they show signs they've had enough. (https://www.nhs.uk/start4life/weaning/ https://www.nhs.uk/conditions/baby/weaning-and-feeding/ SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf (publishing.service.gov.uk) • Healthy eating and drinking in children from 12 months to years (O): ○ Should be having 3 meals a day, also may need 2 heathy weaning snacks in between. No need salt or sugar added to their food or cooking water. https://www.nhs.uk/start4life/weaning/what-to-feed-your-baby/12-months/
6.	Population	Inclusion: • women during the preconception period and first 12 weeks of a single or multiple pregnancy (in relation to folic acid supplementation only) • breastfeeding women (in relation to uptake of vitamins only)

ID	Field	Content
		• women during a single or multiple pregnancy (in relation to uptake of vitamins and healthy eating a drinking in pregnancy women only) • parents or carers of babies and children up to 5 (in relation to uptake of vitamins only) • parent or carers of babies up to 12 months (in relation to introduction to solids (complementary feeding only)) • parents or carers of children between 12 months and 5 years (in relation to healthy eating and drinking only)
7.	Phenomenon of Interest	Barriers to, and facilitators for increasing uptake of government advice. Themes will be identified by the available literature. The committee identified the following potential themes (however, they are aware that not all of these themes may be found in the literature and that additional themes may be identified): • thoughts, views and perceptions of women or parents/carers • issues relating to acceptability • issues relating to accessibility • issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants • women/parent/carer thoughts on discourse, ethnic and cultural attitudes to vitamin supplementation and healthy eating • acceptability and misinformation • motivational factors, including child characteristics.
8.	Comparator	Not applicable as this is a qualitative review.
9.	Types of study to be included	• Systematic reviews of qualitative studies • Studies reporting data gathered through semi-structured and structured interviews, focus groups, observations. Note: Mixed methods studies will be included but only qualitative data will be extracted and risk of bias assessed.
10.	Other exclusion criteria	Population:

ID	Field	Content
		• preterm and low-birth-weight babies (defined by the World Health Organization as a birth weight less than 2,500 g). *If any study or systematic review includes <1/3 of the excluded population, it will be considered for inclusion but, if included, the evidence will be downgraded for applicability.* <u>Setting:</u> • studies other than those conducted in the United Kingdom as the government advice in other countries might not be representative of that in the UK and attitudes in other countries may also differ significantly. *Systematic reviews or studies that include evidence from both the United Kingdom and non-United Kingdom, will only be included if the source of themes and evidence from the United Kingdom can be clearly established. Studies mixing cohorts from the United Kingdom and other countries will be excluded.* <u>Methodological details and language:</u> • studies that do not include methodological details will not be included as they do not provide sufficient information to evaluate risk of bias/ study quality • studies using quantitative methods only (including surveys that report only quantitative data) • conference abstracts will not be included because these do not typically have sufficient information to allow full critical appraisal • non-English language studies.
11.	Context	The population of this guideline may overlap with the population of women included in other NICE guidelines (such as postnatal care, antenatal care, intrapartum care, pregnancy and complex social factors or obesity prevention).
12.	Primary outcomes (critical outcomes)	Outcomes, not applicable as this is a qualitative review. For anticipated themes, see row 7 above. 'Phenomenon of interest'.
13.	Secondary outcomes (important outcomes)	Outcomes, not applicable as this is a qualitative review. For anticipated themes, see row 7 above. 'Phenomenon of interest'.

ID	Field	Content
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. • 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, including study reference, research question, theoretical approach, data collection and analysis methods used, participant characteristics, second-order themes, and relevant first-order themes (such as, supporting quotes). 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: • CASP for systematic reviews • CASP checklist for qualitative 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	Qualitative review: The GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative research; Lewin 2015) approach will be used to summarise the confidence in qualitative evidence. The overall confidence in evidence about each theme or sub-theme will be rated on four dimensions: methodological limitations, applicability, coherence and adequacy of data. Methodological limitations refer to the extent to which there were problems in the design or conduct of the studies and will be assessed with the Critical Appraisal Skills Programme (CASP) checklist for qualitative studies or systematic reviews of qualitative studies. Applicability of evidence will be assessed by determining the extent to which the body of evidence from the primary studies are applicable to the context of the review question. Coherence of findings will be assessed by examining the clarity of the data. Adequacy of data will be assessed by looking at the degree of richness and quantity of findings.
17.	Analysis of subgroups	Barriers and facilitators to increasing the uptake of government advice for women and children up to five in the following areas will be reviewed and analysed separately: • folic acid supplements (including before pregnancy) (C)

ID	Field	Content			
		• vitamin supplements (including Healthy Start vitamins) (E) • healthy eating and drinking in pregnant women (I) • appropriate and timely introduction to solids (complementary feeding) for babies from 6 to 12 months (N) • healthy eating and drinking in children from 12 months to 5 years (O). Within each of the areas identified above, the views and experiences of the following groups will be reviewed and analysed separately: • women • men • parents • carers			
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	Not applicable			
22.	Anticipated completion date	Not applicable			
23.	Stage of review at time of this submission	Review stage		Started	Completed
		Preliminary searches		☐	☑

ID	Field	Content		
		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 **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 Institute for Health and Care Excellence: • NGA Senior Systematic Reviewer • NGA Systematic Reviewer		
26.	Funding sources/sponsor	This systematic review is being completed by the National Guideline Alliance which receives funding from 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		

ID	Field	Content	
		development team. Any 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.	Reference/URL for published protocol	Not applicable	
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		
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-CERQual: Grading of Recommendations Assessment, Development and Evaluation (Confidence in the Evidence from Reviews of Qualitative research; HTA: Health Technology Assessment; NGA: National Guideline Alliance; NHS: National health service; NICE: National Institute for Health and Care Excellence

Appendix B Literature search strategies

Literature search strategies for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

Database: Medline

Date of last search: 03/10/2023

#	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	Preconception Care/
5	(periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*).tw,kf.
6	((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) adj3 (baby or babies or conceiving or pregnan* or conception* or conceive*)).tw,kf.
7	(start* adj2 family).tw,kf.
8	or/4-7
9	3 or 8
10	breast feeding/ or lactation/
11	(breastfeed* or breastfed* or breastmilk or (breast adj2 (feed* or fed* or milk*)) or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).tw,kf.
12	10 or 11
13	exp Child/ or exp Infant/ or Minors/ or exp Pediatrics/
14	(child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young).tw,kf.
15	(child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?).jw,nw.
16	or/13-15
17	3 or 12 or 16
18	exp Folic Acid/
19	(folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite).tw,kf.
20	18 or 19
21	9 and 20
22	exp Vitamins/ or Dietary Supplements/
23	(vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*).tw,kf.
24	(precursor* adj3 vitamin*).tw,kf.
25	((diet* or nutrition*) adj2 supplement*).tw,kf.
26	(calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin adj a) or retinol* or retinoid* or retinyl* or retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin adj c)).tw,kf.
27	(vit adj2 (A or C or D)).tw,kf.
28	(healthy start* or healthystart*).tw,kf.
29	or/22-28
30	20 or 29
31	17 and 30
32	"treatment adherence and compliance"/ or Guideline Adherence/
33	exp "Patient Acceptance of Health Care"/

#	Searches
34	exp Nutrition Policy/
35	(treatment* or guid* or nutriti* or diet* or supplement* or recommend* or policy or policies or requir* or allow* or protocol*).ti.
36	(guid* or recommend* or policy* or policies* or protocol*).ab. /freq=2
37	or/32-36
38	21 and 37
39	31 and 37
40	(barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or non comply* or noncomplian* or non complian* or ignor* or inconvenien*).tw,kf.
41	(facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*).tw,kf.
42	Stress, Psychological/ or Financial Stress/
43	Adaptation, Psychological/
44	Emotions/
45	Anxiety/
46	Fear/
47	Motivation/ or Intention/
48	attitude to health/ or health knowledge, attitudes, practice/ or exp patient satisfaction/ or treatment refusal/
49	(prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*).tw,kf.
50	Consumer Behavior/
51	exp Communication/
52	education/ or teaching/
53	health education/ or exp consumer health information/ or exp health promotion/ or exp patient education as topic/
54	Health Behavior/
55	decision making/ or choice behavior/
56	(advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*).tw,kf.
57	exp Commerce/
58	capitalism/
59	(commerc* or capitalis* or market* or telemarket* or advertis* or corporat* or corporation* or consumer*).tw,kf.
60	exp Population Groups/
61	exp Culture/
62	(race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*).tw,kf.
63	"ethnic and racial minorities"/ or minority groups/ or Minority Health/ or exp social environment/ or exp socioeconomic factors/
64	exp "Health Disparate, Minority and Vulnerable Populations"/
65	"Social Determinants of Health"/
66	(communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*).tw,kf.
67	Developmental Disabilities/
68	Child Development/
69	Growth Disorders/
70	Failure to Thrive/
71	feeding behavior/ or food fussiness/ or food preferences/
72	((food or feed* or diet* or eat*) adj2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*)).tw,kf.
73	((growth or grow* or develop*) adj2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*)).tw,kf.

#	Searches
74	"failure to thrive".tw,kf.
75	Premature Birth/
76	((premature* or preterm) adj2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*)).tw,kf.
77	or/40-76
78	38 and 77
79	39 and 77
80	animals/ not humans/
81	exp Animals, Laboratory/
82	exp Animal Experimentation/
83	exp Models, Animal/
84	exp Rodentia/
85	(rat or rats or rodent* or mouse or mice).ti.
86	or/80-85
87	78 not 86
88	79 not 86
89	limit 87 to English language
90	limit 88 to English language
91	ANTHROPOLOGY, CULTURAL/ or CLUSTER ANALYSIS/ or FOCUS GROUPS/ or GROUNDED THEORY/ or HEALTH CARE SURVEYS/ or interview.pt. or "INTERVIEWS AS TOPIC"/ or NARRATION/ or NURSING METHODOLOGY RESEARCH/ or OBSERVATION/ or "PERSONAL NARRATIVES AS TOPIC"/ or PERSONAL NARRATIVE/ or QUALITATIVE RESEARCH/ or "SURVEYS AND QUESTIONNAIRES"/ or SAMPLING STUDIES/ or TAPE RECORDING/ or VIDEODISC RECORDING/
92	(qualitative* or interview* or focus or questionnaire* or narrative* or narration* or survey* or experience* or themes).tw.
93	(ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic adj4 analys*) or theoretical sampl* or purposive sampl*).tw.
94	(hermeneutic* or heidegger* or husser* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).tw.
95	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them*).tw.
96	(critical interpretive synthes* or (realist adj (review* or synthes*)) or (noblit and hare) or (meta adj (method or triangulation)) or (cerqual or conqual) or ((thematic or framework) adj synthes*)).tw.
97	or/91-96
98	89 and 97
99	90 and 97
100	exp United Kingdom/
101	(national health service* or nhs*).ti,ab,in.
102	(english not ((published or publication* or translat* or written or language* or speak* or literature or citation*) adj5 english)).ti,ab.
103	(gb or "g.b." or britain* or (british* not "british columbia") or uk or "u.k." or united kingdom* or (england* not "new england") or northern ireland* or northern irish* or scotland* or scottish* or ((wales or "south wales") not "new south wales") or welsh*).ti,ab,jw,in.
104	(bath or "bath's" or ((birmingham not alabama*) or ("birmingham's" not alabama*) or bradford or "bradford's" or brighton or "brighton's" or bristol or "bristol's" or carlisle* or "carlisle's" or (cambridge not (massachusetts* or boston* or harvard*)) or ("cambridge's" not (massachusetts* or boston* or harvard*)) or (canterbury not zealand*) or ("canterbury's" not zealand*) or chelmsford or "chelmsford's" or chester or "chester's" or chichester or "chichester's" or coventry or "coventry's" or derby or "derby's" or (durham not (carolina* or nc)) or ("durham's" not (carolina* or nc)) or ely or "ely's" or exeter or "exeter's" or gloucester or "gloucester's" or hereford or "hereford's" or hull or "hull's" or lancaster or "lancaster's" or leeds* or leicester or "leicester's" or (lincoln not nebraska*) or ("lincoln's" not nebraska*) or (liverpool not (new south wales* or nsw)) or ("liverpool's" not (new south wales* or nsw)) or ((london not (ontario* or ont or toronto*)) or ("london's" not (ontario* or ont or toronto*)) or manchester or "manchester's" or (newcastle not (new south wales* or nsw)) or ("newcastle's" not (new south wales* or nsw)) or norwich or "norwich's" or nottingham or "nottingham's" or oxford or "oxford's" or peterborough or "peterborough's" or plymouth or "plymouth's" or portsmouth or "portsmouth's" or preston or "preston's" or ripon or "ripon's" or salford or "salford's" or salisbury or "salisbury's" or sheffield or "sheffield's" or southampton or "southampton's" or st albans or stoke or "stoke's" or sunderland or "sunderland's" or truro or "truro's" or wakefield or "wakefield's" or wells or westminster or "westminster's" or winchester or "winchester's" or wolverhampton or "wolverhampton's" or (worcester not (massachusetts* or boston* or harvard*)) or ("worcester's" not (massachusetts* or boston* or harvard*)) or (york not ("new york*" or ny or ontario* or ont or toronto*)) or ("york's" not ("new york*" or ny or ontario* or ont or toronto*))))).ti,ab,in.

#	Searches
105	(bangor or "bangor's" or cardiff or "cardiff's" or newport or "newport's" or st asaph or "st asaph's" or st davids or swansea or "swansea's").ti,ab,in.
106	(aberdeen or "aberdeen's" or dundee or "dundee's" or edinburgh or "edinburgh's" or glasgow or "glasgow's" or inverness or (perth not australia*) or ("perth's" not australia*) or stirling or "stirling's").ti,ab,in.
107	(armagh or "armagh's" or belfast or "belfast's" or lisburn or "lisburn's" or londonderry or "londonderry's" or derry or "derry's" or newry or "newry's").ti,ab,in.
108	or/100-107
109	(exp africa/ or exp americas/ or exp antarctic regions/ or exp arctic regions/ or exp asia/ or exp australia/ or exp oceania/) not (exp United Kingdom/ or europe/)
110	108 not 109
111	98 and 110
112	99 and 110
113	111 or 112
114	limit 113 to ed=20120101-20231031
115	limit 113 to dt=20120101-20231031
116	114 or 115

Database: Embase

Date of last search: 03/10/2023

#	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*).ti,ab,kf.
3	1 or 2
4	prepregnancy care/
5	(periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*).ti,ab,kf.
6	((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) adj3 (baby or babies or conceiving or pregnan* or conception* or conceive*)).ti,ab,kf.
7	(start* adj2 family).ti,ab,kf.
8	or/4-7
9	3 or 8
10	exp breast feeding/ or lactation/
11	(breastfeed* or breastfed* or breastmilk or (breast adj2 (feed* or fed* or milk*)) or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab,kf.
12	10 or 11
13	exp child/ or "minor (person)"/ or exp pediatrics/
14	(child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young).ti,ab,kf.
15	(child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?).jx.
16	or/13-15
17	3 or 12 or 16
18	folic acid/
19	(folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite).ti,ab,kf.
20	18 or 19
21	9 and 20
22	exp vitamin/ or dietary supplement/
23	(vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*).ti,ab,kf.
24	(precursor* adj3 vitamin*).ti,ab,kf.
25	((diet* or nutrition*) adj2 supplement*).ti,ab,kf.
26	(calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin adj a) or retinol* or retinoid* or retinyl* or

#	Searches
	retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin adj c)).ti,ab,kf.
27	(vit adj2 (A or C or D)).ti,ab,kf.
28	(healthy start* or healthystart*).ti,ab,kf.
29	or/22-28
30	20 or 29
31	17 and 30
32	patient attitude/ or exp patient compliance/ or patient engagement/ or patient participation/
33	protocol compliance/
34	nutrition policy/
35	(treatment* or guid* or nutriti* or diet* or supplement* or recommend* or policy or policies or requir* or allow* or protocol*).ti.
36	(guid* or recommend* or policy* or policies* or protocol*).ab. /freq=2
37	or/32-36
38	21 and 37
39	31 and 37
40	(barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or non comply* or noncomplian* or non complian* or ignor* or inconvenien*).tw,kf.
41	(facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*).tw,kf.
42	mental stress/
43	financial stress/
44	psychological adjustment/
45	emotion/
46	anxiety/
47	fear/
48	motivation/
49	behavior/
50	attitude to health/
51	patient preference/ or patient satisfaction/ or treatment refusal/
52	(prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*).tw,kf.
53	consumer attitude/
54	exp interpersonal communication/
55	education/
56	teaching/
57	health education/ or exp health literacy/ or exp health promotion/ or parenting education/ or patient education/
58	consumer health information/ or information dissemination/ or information gap/ or knowledge gap/ or exp information seeking/ or medical information/ or patient information/
59	health behavior/
60	decision making/ or patient decision making/
61	(advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*).ti,ab,kf.
62	commercial phenomena/ or exp advertising/ or marketing/ or social marketing/
63	capitalism/
64	(commerc* or capitalis* or market* or telemarket* or advertis* or corporate* or corporation* or consumer*).ti,ab,kf.
65	exp population group/
66	cultural anthropology/
67	exp social background/

#	Searches
68	(race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*).ti,ab,kf.
69	minority health/
70	exp social environment/
71	exp socioeconomics/
72	exp vulnerable population/
73	"social determinants of health"/
74	(communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*).ti,ab,kf.
75	developmental disorder/ or developmental delay/
76	child development/
77	growth disorder/ or failure to thrive/
78	feeding behavior/ or food fussiness/ or food preference/
79	((food or feed* or diet* or eat*) adj2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*)).ti,ab,kf.
80	((growth or grow* or develop*) adj2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*)).ti,ab,kf.
81	"failure to thrive".ti,ab,kf.
82	prematurity/
83	((premature* or preterm) adj2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*)).ti,ab,kf.
84	or/40-83
85	38 and 84
86	39 and 84
87	animal/ not human/
88	nonhuman/
89	exp Animal Experiment/
90	exp Experimental Animal/
91	animal model/
92	exp Rodent/
93	(rat or rats or rodent* or mouse or mice).ti.
94	or/87-93
95	85 not 94
96	86 not 94
97	limit 95 to English language
98	limit 96 to English language
99	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
100	97 not 99
101	98 not 99
102	CLUSTER ANALYSIS/ or CONTENT ANALYSIS/ or DISCOURSE ANALYSIS/ or ETHNOGRAPHY/ or GROUNDED THEORY/ or HEALTH CARE SURVEY/ or exp INTERVIEWS/ or NARRATIVE/ or NURSING METHODOLOGY RESEARCH/ or OBSERVATION/ or PERSONAL EXPERIENCE/ or PHENOMENOLOGY/ or QUALITATIVE RESEARCH/ or QUESTIONNAIRE/ or exp RECORDING/
103	(qualitative* or interview* or focus or questionnaire* or narrative* or narration* or survey* or experience* or themes).tw.
104	(ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic adj4 analys*) or theoretical sampl* or purposive sampl*).tw.
105	(hermeneutic* or heidegger* or husser* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).tw.
106	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them*).tw.
107	(critical interpretive synthes* or (realist adj (review* or synthes*)) or (noblit and hare) or (meta adj (method or triangulation)) or (cerqual or conqual) or ((thematic or framework) adj synthes*)).tw.
108	or/102-107
109	100 and 108
110	101 and 108
111	exp United Kingdom/

#	Searches
112	(national health service* or nhs*).ti,ab,in,ad.
113	(english not ((published or publication* or translat* or written or language* or speak* or literature or citation*) adj5 english)).ti,ab.
114	(gb or "g.b." or britain* or (british* not "british columbia") or uk or "u.k." or united kingdom* or (england* not "new england") or northern ireland* or northern irish* or scotland* or scottish* or ((wales or "south wales") not "new south wales") or welsh*).ti,ab,jx,in,ad.
115	(bath or "bath's" or ((birmingham not alabama*) or ("birmingham's" not alabama*) or bradford or "bradford's" or brighton or "brighton's" or bristol or "bristol's" or carlisle* or "carlisle's" or (cambridge not (massachusetts* or boston* or harvard*)) or ("cambridge's" not (massachusetts* or boston* or harvard*)) or (canterbury not zealand*) or ("canterbury's" not zealand*) or chelmsford or "chelmsford's" or chester or "chester's" or chichester or "chichester's" or coventry or "coventry's" or derby or "derby's" or (durham not (carolina* or nc)) or ("durham's" not (carolina* or nc)) or ely or "ely's" or exeter or "exeter's" or gloucester or "gloucester's" or hereford or "hereford's" or hull or "hull's" or lancaster or "lancaster's" or leeds* or leicester or "leicester's" or (lincoln not nebraska*) or ("lincoln's" not nebraska*) or (liverpool not (new south wales* or nsw)) or ("liverpool's" not (new south wales* or nsw)) or ((london not (ontario* or ont or toronto*)) or ("london's" not (ontario* or ont or toronto*)) or manchester or "manchester's" or (newcastle not (new south wales* or nsw)) or ("newcastle's" not (new south wales* or nsw)) or norwich or "norwich's" or nottingham or "nottingham's" or oxford or "oxford's" or peterborough or "peterborough's" or plymouth or "plymouth's" or portsmouth or "portsmouth's" or preston or "preston's" or ripon or "ripon's" or salford or "salford's" or salisbury or "salisbury's" or sheffield or "sheffield's" or southampton or "southampton's" or st albans or stoke or "stoke's" or sunderland or "sunderland's" or truro or "truro's" or wakefield or "wakefield's" or wells or westminster or "westminster's" or winchester or "winchester's" or wolverhampton or "wolverhampton's" or (worcester not (massachusetts* or boston* or harvard*)) or ("worcester's" not (massachusetts* or boston* or harvard*)) or (york not ("new york*" or ny or ontario* or ont or toronto*)) or ("york's" not ("new york*" or ny or ontario* or ont or toronto*))))).ti,ab,in,ad.
116	(bangor or "bangor's" or cardiff or "cardiff's" or newport or "newport's" or st asaph or "st asaph's" or st davids or swansea or "swansea's").ti,ab,in,ad.
117	(aberdeen or "aberdeen's" or dundee or "dundee's" or edinburgh or "edinburgh's" or glasgow or "glasgow's" or inverness or (perth not australia*) or ("perth's" not australia*) or stirling or "stirling's").ti,ab,in,ad.
118	(armagh or "armagh's" or belfast or "belfast's" or lisburn or "lisburn's" or londonderry or "londonderry's" or derry or "derry's" or newry or "newry's").ti,ab,in,ad.
119	or/111-118
120	(exp "arctic and antarctic"/ or exp oceanic regions/ or exp western hemisphere/ or exp africa/ or exp asia/) not (exp united kingdom/ or europe/)
121	119 not 120
122	109 and 121
123	110 and 121
124	122 or 123
125	limit 124 to dc=20120101-20231031

Database: Emcare

Date of last search: 03/10/2023

#	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*).ti,ab,kf.
3	1 or 2
4	prepregnancy care/
5	(periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*).ti,ab,kf.
6	((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) adj3 (baby or babies or conceiving or pregnan* or conception* or conceive*)).ti,ab,kf.
7	(start* adj2 family).ti,ab,kf.
8	or/4-7
9	3 or 8
10	exp breast feeding/ or lactation/
11	(breastfeed* or breastfed* or breastmilk or (breast adj2 (feed* or fed* or milk*)) or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab,kf.
12	10 or 11
13	exp child/ or "minor (person)"/ or exp pediatrics/

#	Searches
14	(child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young).ti,ab,kf.
15	(child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?).jx.
16	or/13-15
17	3 or 12 or 16
18	folic acid/
19	(folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite).ti,ab,kf.
20	18 or 19
21	9 and 20
22	exp vitamin/ or dietary supplement/
23	(vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*).ti,ab,kf.
24	(precursor* adj3 vitamin*).ti,ab,kf.
25	((diet* or nutrition*) adj2 supplement*).ti,ab,kf.
26	(calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin adj a) or retinol* or retinoid* or retinyl* or retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin adj c)).ti,ab,kf.
27	(vit adj2 (A or C or D)).ti,ab,kf.
28	(healthy start* or healthystart*).ti,ab,kf.
29	or/22-28
30	20 or 29
31	17 and 30
32	patient attitude/ or exp patient compliance/ or patient engagement/ or patient participation/
33	protocol compliance/
34	nutrition policy/
35	(treatment* or guid* or nutriti* or diet* or supplement* or recommend* or policy or policies or requir* or allow* or protocol*).ti.
36	(guid* or recommend* or policy* or policies* or protocol*).ab. /freq=2
37	or/32-36
38	21 and 37
39	31 and 37
40	(barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or non comply* or noncomplian* or non complian* or ignor* or inconvenien*).tw,kf.
41	(facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*).tw,kf.
42	mental stress/
43	financial stress/
44	psychological adjustment/
45	emotion/
46	anxiety/
47	fear/
48	motivation/
49	behavior/
50	attitude to health/
51	patient preference/ or patient satisfaction/ or treatment refusal/
52	(prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*).tw,kf.

#	Searches
53	consumer attitude/
54	exp interpersonal communication/
55	education/
56	teaching/
57	health education/ or exp health literacy/ or exp health promotion/ or parenting education/ or patient education/
58	consumer health information/ or information dissemination/ or information gap/ or knowledge gap/ or exp information seeking/ or medical information/ or patient information/
59	health behavior/
60	decision making/ or patient decision making/
61	(advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*).ti,ab,kf.
62	commercial phenomena/ or exp advertising/ or marketing/ or social marketing/
63	capitalism/
64	(commerc* or capitalis* or market* or telemarket* or advertis* or corporate* or corporation* or consumer*).ti,ab,kf.
65	exp population group/
66	cultural anthropology/
67	exp social background/
68	(race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*).ti,ab,kf.
69	minority health/
70	exp social environment/
71	exp socioeconomics/
72	exp vulnerable population/
73	"social determinants of health"/
74	(communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*).ti,ab,kf.
75	developmental disorder/ or developmental delay/
76	child development/
77	growth disorder/ or failure to thrive/
78	feeding behavior/ or food fussiness/ or food preference/
79	((food or feed* or diet* or eat*) adj2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*)).ti,ab,kf.
80	((growth or grow* or develop*) adj2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*)).ti,ab,kf.
81	"failure to thrive".ti,ab,kf.
82	prematurity/
83	((premature* or preterm) adj2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*)).ti,ab,kf.
84	or/40-83
85	38 and 84
86	39 and 84
87	animal/ not human/
88	nonhuman/
89	exp Animal Experiment/
90	exp Experimental Animal/
91	animal model/
92	exp Rodent/
93	(rat or rats or rodent* or mouse or mice).ti.
94	or/87-93
95	85 not 94
96	86 not 94
97	limit 95 to English language
98	limit 96 to English language
99	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
100	97 not 99

#	Searches
101	98 not 99
102	CLUSTER ANALYSIS/ or CONTENT ANALYSIS/ or DISCOURSE ANALYSIS/ or ETHNOGRAPHY/ or GROUNDED THEORY/ or HEALTH CARE SURVEY/ or exp INTERVIEWS/ or NARRATIVE/ or NURSING METHODOLOGY RESEARCH/ or OBSERVATION/ or PERSONAL EXPERIENCE/ or PHENOMENOLOGY/ or QUALITATIVE RESEARCH/ or QUESTIONNAIRE/ or exp RECORDING/
103	(qualitative* or interview* or focus or questionnaire* or narrative* or narration* or survey* or experience* or themes).tw.
104	(ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic adj4 analys*) or theoretical sampl* or purposive sampl*).tw.
105	(hermeneutic* or heidegger* or husser* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).tw.
106	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them*).tw.
107	(critical interpretive synthes* or (realist adj (review* or synthes*)) or (noblit and hare) or (meta adj (method or triangulation)) or (cerqual or conqual) or ((thematic or framework) adj synthes*)).tw.
108	or/102-107
109	100 and 108
110	101 and 108
111	exp United Kingdom/
112	(national health service* or nhs*).ti,ab,in,ad.
113	(english not ((published or publication* or translat* or written or language* or speak* or literature or citation*) adj5 english)).ti,ab.
114	(gb or "g.b." or britain* or (british* not "british columbia") or uk or "u.k." or united kingdom* or (england* not "new england") or northern ireland* or northern irish* or scotland* or scottish* or ((wales or "south wales") not "new south wales") or welsh*).ti,ab,jx,in,ad.
115	(bath or "bath's" or ((birmingham not alabama*) or ("birmingham's" not alabama*) or bradford or "bradford's" or brighton or "brighton's" or bristol or "bristol's" or carlisle* or "carlisle's" or (cambridge not (massachusetts* or boston* or harvard*)) or ("cambridge's" not (massachusetts* or boston* or harvard*)) or (canterbury not zealand*) or ("canterbury's" not zealand*) or chelmsford or "chelmsford's" or chester or "chester's" or chichester or "chichester's" or coventry or "coventry's" or derby or "derby's" or (durham not (carolina* or nc)) or ("durham's" not (carolina* or nc)) or ely or "ely's" or exeter or "exeter's" or gloucester or "gloucester's" or hereford or "hereford's" or hull or "hull's" or lancaster or "lancaster's" or leeds* or leicester or "leicester's" or (lincoln not nebraska*) or ("lincoln's" not nebraska*) or (liverpool not (new south wales* or nsw)) or ("liverpool's" not (new south wales* or nsw)) or ((london not (ontario* or ont or toronto*)) or ("london's" not (ontario* or ont or toronto*)) or manchester or "manchester's" or (newcastle not (new south wales* or nsw)) or ("newcastle's" not (new south wales* or nsw)) or norwich or "norwich's" or nottingham or "nottingham's" or oxford or "oxford's" or peterborough or "peterborough's" or plymouth or "plymouth's" or portsmouth or "portsmouth's" or preston or "preston's" or ripon or "ripon's" or salford or "salford's" or salisbury or "salisbury's" or sheffield or "sheffield's" or southampton or "southampton's" or st albans or stoke or "stoke's" or sunderland or "sunderland's" or truro or "truro's" or wakefield or "wakefield's" or wells or westminster or "westminster's" or winchester or "winchester's" or wolverhampton or "wolverhampton's" or (worcester not (massachusetts* or boston* or harvard*)) or ("worcester's" not (massachusetts* or boston* or harvard*)) or (york not ("new york*" or ny or ontario* or ont or toronto*)) or ("york's" not ("new york*" or ny or ontario* or ont or toronto*))))).ti,ab,in,ad.
116	(bangor or "bangor's" or cardiff or "cardiff's" or newport or "newport's" or st asaph or "st asaph's" or st davids or swansea or "swansea's").ti,ab,in,ad.
117	(aberdeen or "aberdeen's" or dundee or "dundee's" or edinburgh or "edinburgh's" or glasgow or "glasgow's" or inverness or (perth not australia*) or ("perth's" not australia*) or stirling or "stirling's").ti,ab,in,ad.
118	(armagh or "armagh's" or belfast or "belfast's" or lisburn or "lisburn's" or londonderry or "londonderry's" or derry or "derry's" or newry or "newry's").ti,ab,in,ad.
119	or/111-118
120	(exp "arctic and antarctic"/ or exp oceanic regions/ or exp western hemisphere/ or exp africa/ or exp asia/) not (exp united kingdom/ or europe/)
121	119 not 120
122	109 and 121
123	110 and 121
124	122 or 123
125	limit 124 to dc=20120101-20231031

Database: PsycINFO

Date of last search: 03/10/2023

#	Searches
1	exp Pregnancy/ or Prenatal Care/ or Perinatal Period/
2	(antenatal* or ante natal* or gestation* or maternal* or mother* or pregnan* or prenatal* or pre natal*).ti,ab,id.
3	1 or 2
4	(periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*).ti,ab,id.
5	((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) adj3 (baby or babies or conceiving or pregnan* or conception* or conceive*)).ti,ab,id.
6	(start* adj2 family).ti,ab,id.
7	or/4-6
8	3 or 7
9	breast feeding/ or lactation/
10	(breastfeed* or breastfed* or breastmilk or (breast adj2 (feed* or fed* or milk*)) or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab,id.
11	9 or 10
12	(child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young).ti,ab,id.
13	(child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?).jn,jx.
14	12 or 13
15	3 or 11 or 14
16	exp Folic Acid/
17	(folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite).ti,ab,id.
18	16 or 17
19	8 and 18
20	exp Vitamins/ or Dietary Supplements/
21	(vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*).ti,ab,id.
22	(precursor* adj3 vitamin*).ti,ab,id.
23	((diet* or nutrition*) adj2 supplement*).ti,ab,id.
24	(calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin adj a) or retinol* or retinoid* or retinyl* or retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin adj c)).ti,ab,id.
25	(vit adj2 (A or C or D)).ti,ab,id.
26	(healthy start* or healthystart*).ti,ab,id.
27	or/20-26
28	18 or 27
29	15 and 28
30	exp Compliance/
31	health care policy/
32	client attitudes/
33	(treatment* or guid* or nutriti* or diet* or supplement* or recommend* or policy or policies or requir* or allow* or protocol*).ti.
34	(guid* or recommend* or policy* or policies* or protocol*).ab. /freq=2
35	or/30-34
36	19 and 35
37	29 and 35
38	(barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or non comply* or noncomplian* or non complian* or ignor* or inconvenien*).ti,ab,id.
39	(facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or

#	Searches
	adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*).ti,ab,id.
40	psychological stress/
41	financial strain/
42	coping behavior/
43	Emotions/
44	Anxiety/
45	Fear/
46	Motivation/ or intention/
47	childrearing attitudes/ or health attitudes/ or exp parental attitudes/
48	health knowledge/ or health awareness/ or health behavior/
49	client satisfaction/
50	treatment barriers/ or exp health care utilization/ or treatment refusal/
51	(prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*).ti,ab,id.
52	Consumer Behavior/
53	exp communication/
54	Education/
55	Teaching/
56	health education/ or health literacy/ or health promotion/
57	health information/
58	client education/
59	decision making/ or choice behavior/
60	(advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*).ti,ab,id.
61	exp commerce/
62	capitalism/
63	(commerc* or capitalis* or market* or telemarket* or advertis* or corporate* or corporation* or consumer*).ti,ab,id.
64	exp "racial and ethnic groups"/
65	exp sociocultural factors/
66	psychosocial factors/
67	(race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*).ti,ab,id.
68	minority groups/
69	health disparities/ or cross cultural differences/
70	racial disparities/ or "racial and ethnic differences"/
71	exp social environments/
72	exp socioeconomic factors/
73	at risk populations/
74	(communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*).ti,ab,id.
75	developmental disabilities/
76	exp childhood development/
77	exp Delayed Development/
78	eating behavior/ or dietary restraint/ or emotional eating/ or food refusal/ or healthy eating/
79	food preferences/
80	eating attitudes/
81	((food or feed* or diet* or eat*) adj2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*)).ti,ab,id.
82	((growth or grow* or develop*) adj2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*)).ti,ab,id.
83	"failure to thrive".ti,ab,id.
84	premature birth/
85	((premature* or preterm) adj2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*)).ti,ab,id.

#	Searches
86	or/38-85
87	36 and 86
88	37 and 86
89	animal.po.
90	(rat or rats or rodent* or mouse or mice).ti.
91	or/89-90
92	87 not 91
93	88 not 91
94	limit 92 to English language
95	limit 93 to English language
96	"EXPERIENCES (EVENTS)"/ or CLUSTER ANALYSIS/ or FOCUS GROUP/ or CONTENT ANALYSIS/ or DISCOURSE ANALYSIS/ or ETHNOGRAPHY/ or GROUNDED THEORY/ or INTERVIEWERS/ or INTERVIEWING/ or INTERVIEWS/ or NARRATIVES/ or OBSERVATION METHODS/ or PHENOMENOLOGY/ or QUALITATIVE METHODS/ or QUESTIONNAIRES/ or QUESTIONING/ or exp SURVEYS/ or TAPE RECORDERS/
97	(qualitative* or interview* or focus or questionnaire* or narrative* or narration* or survey* or experience* or themes).tw.
98	(ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic adj4 analys*) or theoretical sampl* or purposive sampl*).tw.
99	(hermeneutic* or heidegger* or husser* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).tw.
100	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them*).tw.
101	(critical interpretive synthes* or (realist adj (review* or synthes*)) or (noblit and hare) or (meta adj (method or triangulation)) or (cerqual or conqual) or ((thematic or framework) adj synthes*)).tw.
102	or/96-101
103	94 and 102
104	95 and 102
105	(national health service* or nhs*).ti,ab,in,cq.
106	(english not ((published or publication* or translat* or written or language* or speak* or literature or citation*) adj5 english)).ti,ab.
107	(gb or "g.b." or britain* or (british* not "british columbia") or uk or "u.k." or united kingdom* or (england* not "new england") or northern ireland* or northern irish* or scotland* or scottish* or ((wales or "south wales") not "new south wales") or welsh*).ti,ab,jx,in,cq.
108	(bath or "bath's" or ((birmingham not alabama*) or ("birmingham's" not alabama*) or bradford or "bradford's" or brighton or "brighton's" or bristol or "bristol's" or carlisle* or "carlisle's" or (cambridge not (massachusetts* or boston* or harvard*)) or ("cambridge's" not (massachusetts* or boston* or harvard*)) or (canterbury not zealand*) or ("canterbury's" not zealand*) or chelmsford or "chelmsford's" or chester or "chester's" or chichester or "chichester's" or coventry or "coventry's" or derby or "derby's" or (durham not (carolina* or nc)) or ("durham's" not (carolina* or nc)) or ely or "ely's" or exeter or "exeter's" or gloucester or "gloucester's" or hereford or "hereford's" or hull or "hull's" or lancaster or "lancaster's" or leeds* or leicester or "leicester's" or (lincoln not nebraska*) or ("lincoln's" not nebraska*) or (liverpool not (new south wales* or nsw)) or ("liverpool's" not (new south wales* or nsw)) or ((london not (ontario* or ont or toronto*)) or ("london's" not (ontario* or ont or toronto*)) or manchester or "manchester's" or (newcastle not (new south wales* or nsw)) or ("newcastle's" not (new south wales* or nsw)) or norwich or "norwich's" or nottingham or "nottingham's" or oxford or "oxford's" or peterborough or "peterborough's" or plymouth or "plymouth's" or portsmouth or "portsmouth's" or preston or "preston's" or ripon or "ripon's" or salford or "salford's" or salisbury or "salisbury's" or sheffield or "sheffield's" or southampton or "southampton's" or st albans or stoke or "stoke's" or sunderland or "sunderland's" or truro or "truro's" or wakefield or "wakefield's" or wells or westminster or "westminster's" or winchester or "winchester's" or wolverhampton or "wolverhampton's" or (worcester not (massachusetts* or boston* or harvard*)) or ("worcester's" not (massachusetts* or boston* or harvard*)) or (york not ("new york*" or ny or ontario* or ont or toronto*)) or ("york's" not ("new york*" or ny or ontario* or ont or toronto*))))).ti,ab,in,cq.
109	(bangor or "bangor's" or cardiff or "cardiff's" or newport or "newport's" or st asaph or "st asaph's" or st davids or swansea or "swansea's").ti,ab,in,cq.
110	(aberdeen or "aberdeen's" or dundee or "dundee's" or edinburgh or "edinburgh's" or glasgow or "glasgow's" or inverness or (perth not australia*) or ("perth's" not australia*) or stirling or "stirling's").ti,ab,in,cq.
111	(armagh or "armagh's" or belfast or "belfast's" or lisburn or "lisburn's" or londonderry or "londonderry's" or derry or "derry's" or newry or "newry's").ti,ab,in,cq.
112	or/105-111
113	103 and 112
114	104 and 112

#	Searches
115	113 or 114
116	limit 115 to up=20120101-20231031

Database: CINAHL (Cumulated Index to Nursing and Allied Health Literature)

Date of last search: 03/10/2023

#	Searches
S94	S91 OR S92 Limiters - Published Date: 20120101-20231031; English Language; Exclude MEDLINE records; Human; Clinical Queries: Qualitative - High Sensitivity; Geographic Subset: UK & Ireland
S93	S91 OR S92
S92	S49 AND S90
S91	S48 AND S90
S90	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 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85 OR S86 OR S87 OR S88 OR S89
S89	TI (((premature* or preterm) N2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*))) OR AB (((premature* or preterm) N2 (child* or baby or babies or infan* or neonat* or newborn? Or p?ediatric*)))
S88	(MH "Childbirth, Premature")
S87	TI "failure to thrive" OR AB "failure to thrive"
S86	TI (((growth or grow* or develop*) N2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*))) OR AB (((growth or grow* or develop*) N2 (disorder* or deviat* or disabilit* or delay* or retard* or stunt* or faltering or substandard or diminish* or promot* or catchup or "catch* up" or syndrom* or problem* or milestone*)))
S85	TI (((food or feed* or diet* or eat*) N2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*))) OR AB (((food or feed* or diet* or eat*) N2 (behav* or prefer* or fuss* or habit* or picky or refus* or avers*)))
S84	(MH "Eating Behavior") OR (MH "Food Fussiness") OR (MH "Food Habits") OR (MH "Food Preferences")
S83	(MH "Growth Disorders") OR (MH "Failure to Thrive")
S82	(MH "Child Development")
S81	(MH "Developmental Disabilities")
S80	TI ((communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*)) OR AB ((communit* or environment* or social* or socioeconom* or econom* or demograph* or sociodemograph* or neighbo?rhood* or poverty or impoverish* or hardship* or privation* or income* or depriv* or financ*))
S79	(MH "Social Determinants of Health")
S78	(MH "Health Inequities") OR (MH "Health Status Disparities+")
S77	(MH "Socioeconomic Factors+")
S76	(MH "Social Environment+")
S75	(MH "Health Services for the Indigent") OR (MH "Health Services, Indigenous")
S74	(MH "Minority Groups")
S73	TI ((race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*)) OR AB ((race* or racial* or ethnic* or cultur* or religio* or custom* or ancest* or minorit* or multiracial* or multiethnic* or multicultural*))
S72	(MH "Culture+")
S71	TI ((commerc* or capitalis* or market* or telemarket* or advertis* or corporate* or corporation* or consumer*)) OR AB ((commerc* or capitalis* or market* or telemarket* or advertis* or corporate* or corporation* or consumer*))
S70	(MH "Economic Competition")
S69	(MH "Business") OR (MH "Electronic Commerce")
S68	TI ((advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*)) OR AB ((advis* or advice* or counsel* or educat* or communicat* or inform* or miscommunicat* or misinform* or learn* or lesson* or material* or resource* or teach* or tool* or train* or tutorial* or knowledg*))
S67	(MH "Decision Making") OR (MH "Decision Making, Patient")
S66	(MH "Health Behavior")
S65	(MH "Health Education") OR (MH "Patient Education") OR (MH "Parenting Education") OR (MH "Nutrition Education") OR (MH "Childbirth Education")
S64	(MH "Health Promotion+")

#	Searches
S63	(MH "Consumer Health Information+") OR (MH "Access to Information+") OR (MH "Information Literacy")
S62	(MH "Education") OR (MH "Teaching")
S61	(MH "Communication+")
S60	(MH "Consumer Attitudes")
S59	TI ((prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*)) OR AB ((prefer* or experience* or value* or perspective* or perception* or perceiv* or expectation* or choice* or choos* or willingness or attitud* or know* or belief* or believ* or opinion* or understand* or stress* or emotion* or anx* or fear* or concern* or uncertain* or unsure or thought* or feeling* or felt* or view* or aware* or priorit*))
S58	(MH "Motivation") OR (MH "Intention") OR (MH "Attitude to Health") OR (MH "Patient Attitudes") OR (MH "Patient Satisfaction+") OR (MH "Health Knowledge") OR (MH "Treatment Refusal")
S57	(MH "Fear")
S56	(MH "Anxiety")
S55	(MH "Emotions")
S54	(MH "Adaptation, Psychological")
S53	(MH "Financial Stress")
S52	(MH "Stress, Psychological")
S51	TI ((facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*)) OR AB ((facilitat* or uptak* or up-tak* or takeup* or tak*-up* or awar* or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisf* or complian* or comply* or complie* or adopt* or implement* or availab* or provision or provid* or convenience or convenient or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or deter* or identif* or adequa* or persuad* or persuasion or help* or enabl* or eligib* or decid* or decision* or afford* or deliver* or equalit* or behav* or influenc*))
S50	TI ((barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or "non comply*" or noncomplian* or "non complian*" or ignor* or inconvenien*)) OR AB ((barrier* or hinder* or block* or obstacle* or limit* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance* or refus* or decreas* or reduc* or discourag* or prevent* or disparit* or challeng* or impact* or inequalit* or deter* or inaccessib* or prohibit* or unaffordab* or unavailab* or dissatisf* or nonadher* or noncomply* or "non comply*" or noncomplian* or "non complian*" or ignor* or inconvenien*)
S49	S40 AND S47
S48	S29 AND S47
S47	S41 OR S42 OR S43 OR S44 OR S45 OR S46
S46	AB (guid* or recommend* or policy* or policies* or protocol*)
S45	TI (treatment* or guid* or nutriti* or diet* or supplement* or recommend* or policy or policies or requir* or allow* or protocol*)
S44	(MH "Nutrition Policy+")
S43	(MH "Attitude to Medical Treatment")
S42	(MH "Guideline Adherence")
S41	(MH "Patient Compliance+")
S40	S25 AND S39
S39	S28 OR S38
S38	S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37
S37	TI ((healthy start* or healthystart*)) OR AB ((healthy start* or healthystart*))
S36	TI ((vit N2 (A or C or D))) OR AB ((vit N2 (A or C or D)))
S35	TI ((calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin N1 a) or retinol* or retinoid* or retinyl* or retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin N1 c))) OR AB ((calciferol* or calcifediol* or calciol* or cholecalciferol* or hydroxycholecalciferol* or dihydroxycholecalciferol* or dihydrotachysterol* or calcitriol* or 24,25-dihydroxyvitamin D* or ergocalciferol* or ergosterol* or viosterol or vitamin d* or vitamind* or 25 hydroxy* or 25-?OH* or vitamina* or (vitamin N1 a) or retinol* or retinoid* or retinyl* or retinaldehyde* or carotenoid* or beta carotene* or betacarotene* or tocopherol* or ascorb* or Dehydroascorbic Acid* or vitaminc or (vitamin N1 c)))

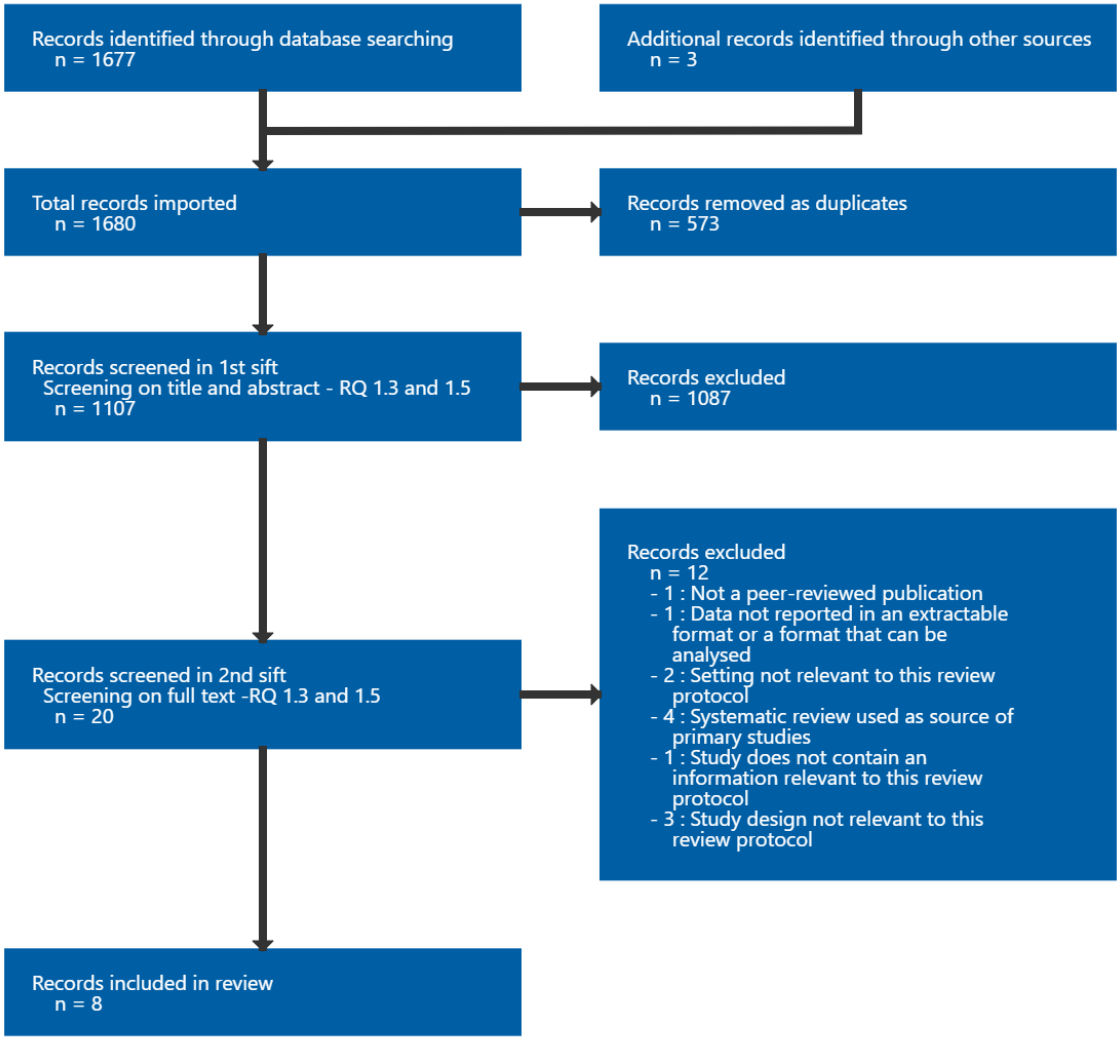
#	Searches
S34	TI (((diet* or nutrition*) N2 supplement*)) OR AB (((diet* or nutrition*) N2 supplement*))
S33	TI (precursor* N3 vitamin*) OR AB (precursor* N3 vitamin*)
S32	TI ((vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*)) OR AB ((vitamin* or previtamin* or provitamin* or multivitamin* or micronutrient* or multimicronutrient* or multi* micronutrient*))
S31	(MH "Dietary Supplements")
S30	(MH "Vitamins+")
S29	S11 AND S28
S28	S26 OR S27
S27	TI ((folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite)) OR AB ((folic acid* or folate* or folacin or vitamin b9 or vitamin b 9 or vitamin m or pteroylglutamic acid* or folvite))
S26	(MH "Folic Acid+")
S25	S5 OR S17 OR S24
S24	S18 OR S19 OR S20 OR S21 OR S22 OR S23
S23	TI ((child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?)) OR AB ((child* or baby or babies or infan* or juvenile? Or kindergar* or neonat* or newborn? Or p?ediatric* or schoolchild* or school age?))
S22	TI ((child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young)) OR AB ((child* or baby or babies or boy? Or girl? Or infan* or juvenile? Or kid? Or kindergar* or minors or neonat* or newborn? Or p?ediatric* or preschool* or schoolchild* or school age? Or toddler* or young))
S21	(MH "Pediatrics+")
S20	(MH "Minors (Legal)")
S19	(MH "Infant+")
S18	(MH "Child+")
S17	S12 OR S13 OR S14 OR S15 OR S16
S16	TI ((nursing N1 (baby or infant* or mother* or neonate* or newborn*))) OR AB ((nursing N1 (baby or infant* or mother* or neonate* or newborn*)))
S15	TI ((breastfeed* or breastfed* or breastmilk or expressed milk* or lactat*)) OR AB ((breastfeed* or breastfed* or breastmilk or expressed milk* or lactat*))
S14	TI ((breast N2 (feed* or fed* or milk*))) OR AB ((breast N2 (feed* or fed* or milk*)))
S13	(MH "Lactation")
S12	(MH "Breast Feeding+")
S11	S5 OR S10
S10	S6 OR S7 OR S8 OR S9
S9	TI (start* N2 family) OR AB (start* N2 family)
S8	TI (((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) N3 (baby or babies or conceiving or pregnan* or conception* or conceive*))) OR AB (((before or plan* or intend* or intention* or wish* or desir* or want* or prior or prepar* or try* or becom* or get* or start*) N3 (baby or babies or conceiving or pregnan* or conception* or conceive*)))
S7	TI ((periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*)) OR AB ((periconcept* or peri concept* or preconcept* or pre concept* or prepregnan* or pre pregnan*))
S6	(MH "Prepregnancy Care")
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+")

Appendix C Qualitative evidence study selection

Study selection for: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

The flow chart includes records for both folic acid and vitamins supplements sections of the review.

Figure 5: Qualitative evidence study selection flow chart



Appendix D Evidence tables

Evidence tables for review question: What are the facilitators and barriers to increasing the uptake of government advice on folic acid for women and families with children up to five years?

Table 5: Evidence tables

Barbour, 2012

Bibliographic Reference	Barbour, R S; Macleod, M; Mires, G; Anderson, A S; Uptake of folic acid supplements before and during pregnancy: focus group analysis of women's views and experiences.; Journal of human nutrition and dietetics : the official journal of the British Dietetic Association; 2012; vol. 25 (no. 2); 140-7

Study Characteristics

Study type	General qualitative inquiry Focus group
Country/ies where study was carried out	UK (Scotland)
Setting	**Setting** At the local teaching hospital, community health centres or existing mother and toddler groups. **Aim** To explore the reasoning behind women's decisions regarding the use of folic acid supplements before and during pregnancy.
Data collection and analysis	**Data collection** Focus groups. 24 women participated in 8 focus groups, comprising 2 – 5 participants each, conducted in-person (at the local teaching hospital, community health centres or existing mother and toddler groups) or by telephone. Led by an experienced qualitative researcher and assisted by a research midwife, the discussions, guided by a literature-derived

	topic guide, centred on awareness, experiences, perceptions, and reasoning related to taking folic acid supplements. Participants were encouraged to share personal stories, and stimulus material from 'Ready, Steady, Baby' was presented. Additional health education leaflets on folic acid use were provided at the end of the discussions. Interviews were audio-recorded. **Data analysis** All interviews were recorded and transcribed. The software Nvivo was used for systematic coding and data retrieval, enabling the identification of similarities and differences through constant comparison.
Recruitment strategy	Purposive sampling. Women attending health visitor led baby clinics for routine visit were approached by a research midwife. They received oral and written information about the study, provided contact details, and completed a questionnaire on folic acid use in their latest pregnancy. Diverse participants were recruited based on age, parity, education, and socioeconomic status. To ensure comparative capabilities women who reported that they had not taken folic acid or who had taken it intermittently, and who followed folic acid recommendations were recruited.
Study dates	Not reported.
Sources of funding	No industry funding (The Jennifer Brown Research Fund Fife Appeal PiggyBankKids).
Inclusion criteria	Women: • attending baby clinics in NHS Fife • have an infant aged <20 weeks
Exclusion criteria	Women: • unable to provide informed consent and complete the survey questionnaire • have limited English language and literacy skills
Sample size	N = 24 mothers
Participant characteristics	**Age of participants, years, mean (SD) [range]**

	Taking folic acid supplements as recommended: 32 (2) [19–42] Taking folic acid supplements only in pregnancy: 27 (6) [17–41] Taking folic acid supplements: 25 (6) [17–37] **Age of child(ren):** Not reported **Higher education, n (%)** Taking folic acid supplements as recommended:33 (51.6) Taking folic acid supplements only in pregnancy: 28 (24.5) Taking folic acid supplements: 5 (19.2) **SIMD mean, median [range]** Taking folic acid supplements as recommended: 6 (5) [1–10] Taking folic acid supplements only in pregnancy: 5 (4) [1–10] Taking folic acid supplements: 3 (3) [1–8]
Results	**Author's themes** • Experiences of taking folic acid supplements • Awareness and exposure to folic acid supplement recommendations • Knowledge and beliefs about folic acid supplements • Influences on lay beliefs • Ideas about encouraging awareness

Study findings

Experiences of taking folic acid supplements

Primigravidae women, who planned their pregnancies and were generally older, adhered to folic acid recommendations. Multiparous women with planned pregnancies did not take folic acid preconception. Among those who did not take folic acid at all during their latest pregnancy, all were multiparous. There were various reasons for not taking folic acid in second or subsequent pregnancies. Some participants had unplanned second pregnancies and were unaware of their pregnancy until after the recommended 12-week cut-off point.

Intermittent folic acid use was found in often attributed to concerns about its connection to morning sickness, with additional reasons including busyness from childcare or shift work.

[Quote was not provided]

Awareness and exposure to folic acid supplement recommendations

First-time mothers reported frequent consultation of advice book, though its usage decreased in subsequent pregnancies. Some parents felt that receiving information about folic acid at 12 weeks' gestation made it redundant. The quantity of information given to newly-pregnant women was considered overwhelming. Some women felt folic acid wasn't emphasised, possibly due to its integration into broader informational packages.

"My doctor said it wasn't really that big a thing. Because the second pregnancy I hadn't taken it, he said it's not such a big deal because if you're having a balanced diet, like if you're eating cereals like rice crispies and things like that, they've already got folic supplements in them and he said that if you're having a balanced diet that you would be taking folic acid anyway, so I wasn't really that worried about it" (page 143, Multip, JI – F)

Knowledge and beliefs about folic acid supplements

Some parents were aware of the connection between folic acid and the risk of neural tube defects, but found it difficult to internalise the information.

"… At the time I didn't think it prevented spina bifida, Although it says it clear as day (on the bottle) I thought it was just, kind of, to make sure that your baby was born properly and healthy…" (page 143, C)

"… really (my doctor) just said it obviously helps combat spina bifida and things like that, but to be honest with you I didn't really think much about it …" (page 143, M)

"It was never stressed like it was a scare type thing that you have to take this. It was just if you want to, it's a recommendation ..." (page 144, C)

Some women believed that taking folic acid in a multivitamin was often a cause for confusion about the folic acid specific benefits, with speculations about its relation to bone development, preventing miscarriage, and increasing chances of conception.

"I went to the doctor because I wasn't ... I was wondering how I wasn't falling pregnant, because I was trying for about 2 years. And he advised me to take folic acid" (page 144, Primigravida in Mixed Parity FG – B)

Some parents felt that folic acid supplements caused or contributed to morning sickness, leading to inconsistent use or discontinuation. Some parents believed that they were possibly predisposed to implicating folic acid.

"So after a couple of weeks of taking the folic acid I kind of convinced myself that that was making me sick" (page 144, 22-year old Multip – Telephone JI – G)

Influences on lay beliefs

Some women relied on advice from their own mothers, who themselves were not advised on taking folic acid. Therefore, those women relied on their own sources of knowledge, with personal experiences influencing their beliefs and behaviour regarding folic acid.

"See, I took folic acid in my first pregnancy and I had more problems in my first pregnancy. My wee boy was born early and everything and he was in neonatal, and I actually took folic acid in that, and the second pregnancy went like a dream. Not that I'm saying that it's all to do with folic acid …" (page 144, Multip in her 20s – Tele JI – H)

A minority of women felt that they will be taking folic acid in future pregnancies, based on their own good outcomes, but more women dismissed the effectiveness of folic acid in preventing birth defects, citing healthy outcomes without supplementation as justification.

	"If anything, I think having been through the pregnancy and, hopefully, having a healthy baby boy, it's going to come down to the fact that, if I can do anything I possibly can to, you know, made things easier for the baby growing inside me, I would do it" (page 144, 33-year-old Prim, Mixed Parity FG – A) *"My mum never took it with me and I'm perfectly fine"* (page 144, [no details details given]) *"Some folk don't know they're pregnant and they drink and everything and there's nothing wrong with the bairns, so I don't know …"* (page 144, Multip, Mixed Parity FG – B) Some parents felt sceptical about the need to take folic acid in a hypothetical or subsequent pregnancy. *"I'm not sure if I would … em … take it. I mean, I never took it much when I had (my daughter) and I don't think it's made any difference, so I'm not sure if I would. I'd have a look into it more and see if it was going to make a big difference"* (page 144, 20-year-old Prim, FG – C) *"I was trying to conceive with my oldest boy so I took folic acid 6 months before I fell pregnant, plus 3 months into my pregnancy. But with my second I just took a couple of folic acid because I didn't really see the point"* (page 144, Multip, Mixed Parity FG – B) *"I've got a wee girl of four, a wee girl at three and a wee boy on the way. And I've not taken folic acid in my life, and it didn't make any difference because they're just like any other normal bairns"* (page 144, Multip, Mixed Parity FG – B) One parent dismissed the value of prevention efforts and claimed ethical value in having a child with spina bifida. *"I don't think it's that important because if your bairn's (baby's) going to have spina bifida or anything like that, you're still going to love it the same as you would if it was normal"* (page 144, L) *"… like, somebody could take that, like, you could take that for 3 month, right, and your baby could come out with spina bifida and I could take it not at all and my baby could come out fine. It's not the chance that's going to totally stop that, it's just the chance of what your blood ... what you're carrying. It's like if you're carrying a bairn with a disability your bairn's going to have that"* (page 144, L, Excerpt from Mixed Parity, FG – B) **Ideas about encouraging awareness**

	One parent believed that those at higher risk would already be aware of the danger and the crucial role of folic acid, indicating a perceived lack of need for additional health promotion initiatives. *"… If someone in my family had had someone with spina bifida then, obviously, I would know that folic acid prevents that so you would take it …"* (page 145, Multip, JI – F) Some women felt that visual availability of the information at places they visit, such as posters and leaflets in GPs' surgeries, information at Family Planning Clinics can increase awareness of folic acid benefits. They suggested that Family Planning Clinics can mail folic acid leaflets to women who did not return for contraceptive advice, provide folic acid information along with pregnancy tests, and target women with notices in supermarket baby aisles. [Quote was not provided] Some women felt that that leaflets should provide information on the risk and effects of not taking folic acid could increase awareness of folic acid benefits. *"I think you have to be a bit ... I know that sounds horrible, but if you want somebody to take something sometimes you have to be a bit … show them what the worst case scenario (is) …"* (page 145, Multip, JI – F) Some women might feel self-conscious picking up poster and leaflets at GP surgeries where others are likely to take note of them. [Quote was not provided]

NHS: National Health Service; SD: Standard deviation; SIMD: Scottish Index of Multiple Deprivation

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(No consideration of interviewer/researcher relationship. Brief description of recruitment, data collection and analysis methods.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Evidence tables for review question: What are the facilitators and barriers to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years?

Table 5: Evidence tables

Brogan-Hewitt, 2021

Bibliographic Reference	Brogan-Hewitt, Ailsa; Apekey, Tanefa A; Christian, Meaghan Sarah; Day, Rhiannon Eleanor; Improving Vitamin D Intake in Young Children-Can an Infographic Help Parents and Carers Understand the Recommendations?.; Nutrients; 2021; vol. 13 (no. 9)

Study Characteristics

Study type	General qualitative inquiry Focus groups and telephone interviews
Country/ies where study was carried out	UK
Setting	**Setting** Playgroups and places where the participants worked within the city. **Aim** To assess the acceptability and understanding of an infographic on vitamin D recommendations among parents or caregivers of children under 5 years, aiming to improve vitamin D status in young children.
Data collection and analysis	**Data collection** Focus groups and telephone interviews. Interviews and focus groups, lasting 30–40 minutes, were digitally recorded with participants' consent, ensuring anonymity in reporting. A qualified female researcher conducted them individually, and only the researcher and participant(s) were present. The infographic was shared during focus groups, and a digital copy was sent to telephone interview participants beforehand. 4 focus groups (consisted of one group of 5 participants, one group of 4 participants, two groups of 2 participants) and two telephone interviews involved a total of 15 participants. Focus groups were conducted in convenient and permission-granted locations within the city, such as playgroups and

	workplaces of participants, chosen for accessibility, comfort and where permission had been obtained. Field notes were taken during focus groups. Interviews were audio-recorded. **Data analysis** Thematic analysis. Interviews and focus group recordings were transcribed verbatim within 7 days, incorporating additional information from field notes. Anonymised transcripts underwent thematic analysis using a six-stage trustworthiness approach for consistency. The research team developed an inductive coding framework from thematic areas, refined it, and applied it to extract major themes. Codes were interpreted and categorised, forming sub-themes and main themes. Data saturation was reached after four focus groups, with no new codes identified. The team agreed on emergent themes, selecting relevant quotations to represent each theme.
Recruitment strategy	The study was promoted on the Mumbler website, community centres, and playgroups in low-income, diverse ethnic areas. Interested parents or pregnant women were instructed to contact the researchers directly, resulting in a sample of fifteen parents/carers (including grandparents) of children under 5 years. Participants received an information sheet, a consent form, and a demographic questionnaire before participating. Any questions about the study were addressed beforehand.
Study dates	November 2019
Sources of funding	No industry funding.
Inclusion criteria	Women and/or parents and carers: • >18 years old • live in a city in the North of England • pregnant or • care for a child <4 years old
Exclusion criteria	Women: • <18 years old • not pregnant or a parent/carer • do not understand written English well enough to interpret the infographic

	• did not provide consent
Sample size	N = 15 parents or caregivers (8/15 mothers, 2/15 fathers, 5/15 grandparents)
Participant characteristics	**Age of participant in years, n (%)** 25–34: 6 (40) 35–44: 4 (27) Over 45: 5 (33) **Sex of participant, n (%)** Female: 13 (87) Male: 2 (13) **Age of child(ren) in years, n (%)** Under 1: 2 (13) 1: 3 (20) 2: 10 (67) 3: 5 (33) 4: 1 (7) **Ethnicity, n (%)** White-British (English, Welsh, Scottish, Northern Irish): 14 (93)

	Mixed-Other: 1 (7) **Highest Qualification, n (%)** 2 NVQ, CSE—grade 1/GCSE grades A *–C, Level 2 award, Level 2 certificate, Level 2 diploma, Level 2 ESOL, Level 2 national certificate, Level 1 national diploma, O-level A–C, intermediate apprenticeship): 1 (7) Level 3 (Level 3 NVQ, A-level/AS Level, access to higher education diploma, advanced apprenticeship, international baccalaureate diploma, level 3 award, level 3 certificate, level 3 diploma, level 3 ESOL, level 3 national certificate, level 3 national diploma, tech level): 1 (7) Level 4–5 (Level 4–5 NVQs, higher national certificate (HNC), higher national diploma (HND), diploma of education (DipHE)): 4 (27) Level 6 (Degree with or without honors (for example, BA, BSc): 6 (40) Level 7 (Higher degree (for example, master's degree (MA, MSc), postgraduate certificate in education (PGCE)): 2 (13) Not recorded: 1 (7)
Results	**Author's themes** • General awareness of vitamin D • Understanding of the vitamin D infographic • Acceptability of the vitamin D infographic • Barriers to using the vitamin D infographic • Recommendations for the Infographic **Study findings** **General awareness of vitamin D**

	Participants generally knew about obtaining vitamin D from sunlight, but some acknowledged challenges in winter. Limited awareness existed about vitamin D in food sources, and participants had poor knowledge of how such foods contribute to overall vitamin D needs. *"I see it printed on a lot of yoghurts, is it like green veg?"* (page 7, focus group 1, participant 3) *"If it's in their diet and in their milk, it's all a bit confusing isn't it?"* (page 7, focus group 4, participant 3) *". . .I still don't make an effort to take supplements I just hope that somehow I might be getting what I need from my diet"* (page 7, interview participant 2) Some participants received vitamin D information during/after pregnancy, but they had not seen it broken down by developmental stages before. Additionally, the need for vitamin D for mothers during breastfeeding was new information to some participants. *"I didn't know all the information on there, I didn't know the mother was supposed to take some. I didn't know there was a difference between breast milk and formula"* (page 7, focus group 3, participant 1) **Understanding of the vitamin D infographic** Many participants found the infographic on vitamin D recommendations clear and understood the supplementation guidance for various developmental stages. [page 7, Quote was not provided] Some participants found the infographic unclear and felt it required deciphering. "*Yes, it's trying to advise the recommended dosage for different scenarios at different stages"* (page 7, focus group 3, participant 1) *"It is definitely quite difficult . . . to read it. I'm here to read that, so I'm actively reading it, but I don't think at a glance at it in a doctor's surgery or something, you wouldn't know instantly"* (page 7, focus group 3, participant 1)

	Some participants struggled to interpret information on vitamin D supplementation methods and doses. The majority of the participants did not recognise the micrograms symbol 'µg,' with some having seen it on vitamin packaging, while others had never encountered it before. *"The signs, I don't know what they mean?"* (page 7, focus group 4, participant 3) *"Especially with this symbol here, I've seen it on vitamins [sic], but you would always step back and wonder, whereas all they have to do is get a vitamin D supplement"* (page 7, focus group 2, participant 1) Some participants expressed concern about the potential for vitamin D overdose in children, indicating a lack of clarity on recommended intake. *"Can you overdose on vitamin D? Because if you're not sure what's in the milk, you don't know how much they're getting?"* (page 7, focus group 4, participant 3) Some participants expressed a desire for additional information or support from a health professional when interpreting the infographic, suggesting a potential lack of confidence or understanding in the provided information. *"If I look at the infographic, I would like GP support or someone that has any connection with health, that could help more [sic]"* (page 7, interview participant 1) **Acceptability of the vitamin D infographic** Majority of the participants appreciated the visual representation of recommendations for different developmental stages. *". . .I like the stages. And obviously that it's got reliable information about all the stages in one place"* (page 8, focus group 2, participant 1) Many participants felt that the infographic lacked information on 'why' vitamin D is needed, where it can be found, and its health benefits. Including this information was seen as encouraging participants to follow the advice. *"It doesn't actually tell you what the benefits of vitamin D are? It just tells you how much people should be taking"* (page 8, focus group 3, participant 2)

	"It's not actually giving you any practical information about what you do to get your vitamin D. Do you get it naturally? You know, what supplements? Are you saying a pill?" (page 8, focus group 4, participant 2) *"It's very informative but it doesn't actually say why you need it. I mean we all just do what we're told with this kind of stuff. If we have to have it in pregnancy, we just have it in pregnancy"* (page 8, focus group 2, participant 2) Many participants found the infographic "eye-catching," "straightforward," and "practical." Some considered it "professional" and appreciated the "scientific" background images and accompanying text images. [page 8, Quote was not provided] Some participants felt that the colour, images, and text font in the infographic were unappealing, and they felt there was excessive text. *"It looks old fashioned, I don't know whether that's the font at the top. I don't mind the body text as I think that's quite a modern font, but I think the headline, and the orange/yellow makes it look quite dated"* (page 8, focus group 2, participant 1) *"I don't like the amount of text"* (page 8, focus group 3, participant 2) Many participants believed that the acceptability of the infographic would increase if its source was recognised as trustworthy and reliable, particularly if it had an association with a common healthcare provider like the NHS. *". . .it doesn't say who it's recommended by and doesn't confirm the credentials"* (page 8, focus group 3, participant 2) **Barriers to using the vitamin D infographic** Issues such as language and potential difficulty in understanding and remembering the information, along with concerns about the cost of vitamin D supplements, were noted. Some participants were not aware of the UK Healthy Start scheme. Additionally, it was emphasised that some individuals might be unfamiliar with the appearance of vitamin D supplements and may not know what to look for. *"Parents in EAL's (English as an additional language) or say if it was in the middle of Bradford or Birmingham, a lot of them might not be able to read it as easily"* (page 8, focus group 3, participant 2)

"The thing is, I wouldn't know what I'm looking for, for a vitamin D supplement" (page 8, focus group 1, participant 1)

Recommendations for the Infographic

Some participants believed that improvements for the infographic, recommending the inclusion of information about alternative sources of vitamin D such as sunlight and food/drink sources, along with details on why vitamin D is important and its health benefits. Additionally, some participants expressed a desire to know the recommendations for children over 4 years of age.

"Maybe just a paragraph at the beginning explaining why vitamin D is important. You know, what's the point in reading it if you don't know why?" (page 9, focus group 4, participant 4)

"It may be useful if you say the importance of taking vitamin D and why taking vitamin D for those stages of life for the child" (page 9, interview participant 1)

Some participants suggested a need for more concise and easily interpretable information in plain English. Recommendations included presenting information in columns or tables, using a brighter and more appealing colour, employing a modern font, and incorporating more images.

". . .so like that first one, a vitamin D supplement containing 10 micrograms for mother daily could be, 'mum needs one 10 microgram supplement daily" (page 9, focus group 3, participant 2)

". . .if you could simplify it in a set of columns where you could just tick, if I need to take one thing away what should that be? If my child is this age you need to do this", "It's just making it easy to take away what I need to do" (page 9, focus group 2, participants 1 and 2)

". . .it might help if there was a picture of a sun, to show them where it comes from?" (page 9, focus group 4, participant 1)

Some participants recommended clearer information on the appearance and appropriate doses of vitamin D supplements for children. They also suggested that the infographic should remind parents to check supplement labels to ensure they meet the recommended doses for their child.

"Maybe if it showed you the supplements, what they look like?" (page 9, focus group 1, participant 2)

	"You may think if you give your child a multivitamin they are ok. But how much is there in it?" (page 9, focus group 4, participant 3) Many participants expressed a preference for the infographic to be available in printed hard copies, while others suggested email or digital formats for download or screen capture. Some participants preferred the copies to be included in the child's progress record (red book), as a small laminated card for wallets, and in various healthcare and community locations. Some participants emphasised the importance of offering the infographic in different languages. *"When you go to see the midwife for a booking, that might be really useful to highlight it"* (page 10, interview participant 2) *"I think social media would have more impact on people's lives, because everyone nowadays has a social platform"* (page 10, interview participant 1) Participants expressed greater trust in information available in medical locations, particularly if endorsed by a healthcare organisation like the NHS. Some suggested including information on where to seek further clarification, such as contact details or a website address, and emphasised the need for healthcare practitioner support for additional assistance. *". . .if it had an NHS logo stamped at the bottom, I would be like, that is absolutely (trustworthy) . . . I'd feel like it's been validated"* (page 9, 10, focus group 2, participant 1) *"Is there like, anyone else you can ask the questions? Let's say it was confusing say between swapping from formula, could you not put on the other people to ask about that? [sic] . . . If there was a website at the bottom of it with more information"* (page 10, focus group 1, participant 3)

AS: Advanced Subsidiary level; CSE: Certificate of Secondary Education; ESOL: English for Speakers of Other Languages; GCSE: General Certificate of Secondary Education; NHS: National Health Service; NVQ: national vocational qualification.

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Minor concerns *(No consideration of interviewer/researcher relationship.)*

Section	Question	Answer
Overall risk of bias and relevance	Relevance	Highly relevant

Day, 2019

Bibliographic Reference	Day, Rhiannon Eleanor; Krishnarao, Roxane; Sahota, Pinki; Christian, Meaghan Sarah; We still don't know that our children need vitamin D daily: a study of parents' understanding of vitamin D requirements in children aged 0-2 years.; BMC public health; 2019; vol. 19 (no. 1); 1119

Study Characteristics

Study type	General qualitative inquiry within a mixed-methods study Focus groups and individual interviews
Country/ies where study was carried out	UK
Setting	**Setting** At 3 different locations within the Leeds area (3 held within the café of a popular retail outlet with families in the city centre and 2 carried out during playgroups within churches in low-income areas of Leeds). **Aim** To explore parents understanding regarding vitamin D awareness, knowledge, and perceptions, including their awareness of vitamin D recommendations, supplementation practices, knowledge and acceptance of vitamin D-fortified dietary sources.
Data collection and analysis	**Data collection**

	Focus groups and individual interviews. 13 parents participated in 5 focus groups which lasted between 25 and 40 min. 4 parents who were not able to attend the focus groups took part in a telephone interview and 1 parent who was not able to attend a focus group or interview contributed a written interview response. **Data analysis** Thematic analysis. Audio recordings of the interviews and focus groups were transcribed and anonymised replacing participant names with unique identifiers, and identifying details within the transcripts were substituted with pseudonyms. The analysis comprised several stages, beginning with verbatim transcription of all interview data. Subsequently, the evaluation team familiarised themselves with the content, leading to the development of a coding framework derived from inherent thematic areas of interest in the data. The coding framework was refined and agreed between the research team and applied to the original transcripts to extract major themes.
Recruitment strategy	Parents who had a child aged up to 2 years old, participated in the online/community-based questionnaire and expressed the interest in participating in a focus group.
Study dates	May 2017 – June 2017
Sources of funding	Industry funded (funded by Nutricia Early Life Nutrition in association with the Royal Orthopaedic Hospital Trust NHS; paper includes a disclaimer stating the funder was not involved in the design of the study, data collection, analysis and interpretation, and in writing the manuscript).
Inclusion criteria	Not reported.
Exclusion criteria	Not reported.
Sample size	N = 18 parents (17 female, 1 male) n = 13 participated in focus groups n = 5 individual interviews
Participant characteristics	**Age of participants in years, n (%)** Under 25: 1 (5.6)

	25-34: 7 (38.9) 35-44: 6 (33.3) Over 45: 2 (11.1) Not recorded: 2 (11.1) **Age of child(ren)** Not reported **Ethnicity, n (%)** White – British (English, Welsh, Scottish, Northern Irish): 15 (83.2) Asian or Asian British – Indian: 1 (5.6) Not recorded: 1 (5.6) **Highest qualification, n (%)** No qualifications: 1 (5.6) Level 2 for example, 5 or more GCSE: 2 (11.0) Level 3 for example, 2 or more A levels: 1 (5.6) Level 4 for example, HND, Degree: 10 (55.6) Not recorded: 4 (22.2)
Results	**Author's themes** • Access to vitamin D information

- Perceptions of vitamin D information/advice provided to parents
- Content of vitamin D information
- Delivery of vitamin D information
- Presentation of information
- Health messages about vitamin D
- Understanding and awareness of vitamin D/Awareness of recommendations around vitamin D intake
- Vitamin D fortified foods and drinks (facilitators and barriers to purchasing vitamin D fortified products)
- Vitamin D fortified foods and drinks (preferred ways to increase vitamin D intake)

Study findings

Access to vitamin D information

Many parents lacked sufficient information on vitamin D, receiving limited or no advice, and often lacked supportive written materials. Many parents were unaware of the need for a supplement and the importance of vitamin D for their baby/child. Some parents reported that alternative sources like food, drinks, or sunlight were not discussed by their midwife or health visitor.

"I don't remember being given any advice while pregnant or after birth. It wasn't until much later when it was brought up in a group that I became aware" (page 6, parent, interview 5)

"It was a checklist, one of the many things, no real explanation of why or benefits. In that environment, you just say okay" (page 6, parent 1, focus group 1)

Perceptions of vitamin D information/advice provided to parents

Parents struggled to effectively digest an overwhelming amount of information, making it challenging to remember details about vitamin D amongst other childbirth-related information. Some parents expressed accessibility issues about vitamin D information from a health care practitioners. Additionally, there was a perception of a lack of reliable and often conflicting information from different sources. Some parents found the presentation of vitamin D information unappealing and not visually engaging.

	"I do think when they give you the information, it is not drip fed to you, it is here is a load of information and a load of leaflets" "It was quite boring in appearance and looks like a medical document. It wasn't the one out of the whole pack of information that I got that I was drawn to and had real importance" (page 6, parent, interview 4) **Content of vitamin D information** Parents preferred to receive information on vitamin D sources, its importance, risks of deficiency, child's vitamin D requirements during pregnancy and breastfeeding, and guidance on accessing vitamin D supplements. [Quote was not provided] **Delivery of vitamin D information** Some parents expressed their preference of the information to be delivered verbally and during routine appointments, baby weigh-in clinics, antenatal classes, health visitor clinics, breastfeeding visits, weaning sessions, and a child's routine GP appointments (for example, vaccinations). *"I think probably verbally is maybe better, or maybe a mix of the two. If someone tells you about it, you've got it on your mind and then you've got a backup when you see information in writing as well"* (page 6, parent, interview 2) Some preferred information delivered through an online "messenger" service with a health professional and informative YouTube videos focusing on healthy eating for children. *"…there are Apps and websites you can sign up to about your baby that tell you what you should be doing at certain points…maybe if it was in something like that you would take notice of it because it is a weekly update and it is not too much information in one go"* (page 6,7, parent, interview 3) Parents preferred smaller, more frequent information tailored to individual feeding practices, such as breastfeeding or formula feeding. They suggested integrating vitamin D details within breastfeeding or healthy diet information and wanted regular repetition by different health professionals for consolidation, including reminders about vitamin D intake throughout pregnancy and after childbirth.

	"I do think if it were drip-fed, you were given things about feeding, things about vitamin D separately in separate meetings, you have time to read it and digest it. Whereas if it is just given to you, some people just put it in their bag and won't look at it again" (page 7, parent, interview 4) *"If you just touch on it a little bit (during pregnancy) and then later on, bring the information back when it is a bit more useful for your child"* (page 7, parent, interview 3) *"it might be reminders linked in with the check-ups, is she still eating her vitamin D? If she's not, have you made sure she's eating x, y, z to get this amount of vitamin D she should be having? And then you've got in in your head"* (page 7, parent, interview 1) **Presentation of information** Parents preferred clearer and more specific vitamin D information presented in simpler and more visually engaging written formats. Some suggested increased visibility through better advertising in supermarkets, schools, children's centers, and other everyday locations. *"Make it look like it is important, stand out and say this is important, it needs to be promoted as well as folic acid is"* (page 7parent 1, focus group 4) **Health messages about vitamin D** Some parents preferred a positive message about the health benefits of vitamin D rather than information highlighting the risks of not taking it. *"I am not sure how much scare tactics work, might make you panic more. I think by positively reinforcing the message would be the best way"* (page 8, parent, interview 2) Some parents believed that a "scary" message might be more effective in promoting behaviour change. *"People react more to it when they learn about the potential harm caused to baby"* (page 8, parent 1, focus group 3) Some parents believed that combining a positive message and a risk message about the health effects of vitamin D would encourage more people to increase their intake.

	"Because you have got the extreme of not taking it but you have also got the proactive approach of the positive outcome of taking it, so you know why you are taking it…both makes it more black and white rather than a huge grey area in the middle" (page 8, parent 2, focus group 4) Parents believed that the message should highlight both the immediate and long-term benefits of vitamin D. *"Parents want to know about the health effects on their children now and in the future"* (page 8, parent 3, focus group 4) Some parents believed that promotional efforts from GPs or health visitors, such as distributing free vitamin D drops or supplements, improved parent knowledge through clear explanations and leaflets, parent role modelling of healthy behaviours, better publicity (for example, TV ads), reminders, and clear instructions on giving vitamin D supplements and incorporating them into a daily routine (for example, mixing with food or liquids) would make changes to child's diet. *"…having that knowledge makes you want to do the best for your child and being explicit about that, like talking through leaflets and understanding the benefits. Because they did it with breastfeeding and most of my friends who were breastfeeding could reel off the benefits, but you don't ever get the same with vitamin D"* (page 8, parent, interview 4) Most parents preferred that all the health messages would be presented in the education around vitamin D, specifically focusing on topics like strong bones and teeth, along with adherence to Department of Health recommendations. [Quote was not provided] **Understanding and awareness of vitamin D/Awareness of recommendations around vitamin D intake** Some parents expressed confusion regarding current recommendations for breastfeeding and vitamin D supplement use for both mother and infant. Additionally, there were uncertainties about administering vitamin D supplements to exclusively breastfed babies. "*The health visitor didn't clearly explain at home visits. A lot more information needed around weaning as despite looking I still don't feel confident that I have the right information regarding what should I take and she receive through breastmilk or does she need drops straight away or should she be getting it by going outside?"* (page 9, parent, questionnaire feedback) *"I think the information changed once my baby was born and we were a bit confused. I was breastfeeding and taking a vitamin D supplement and the new recommendations, the advice was that my baby should also have it, because it wasn't*

	enough and then it was, is it going to be too much? Do I still take it? Is it just them? Which one is best for them? How do we give it, juice? So all of this was quite confusing" (page 9, parent, interview 4) *"No, I was not aware of those recommendations, the only thing I knew was to take my little one to catch some sun"* (page 9, written interview response) Many parents perceived a widespread lack of awareness as pregnant women and parents felt inadequately informed about the necessity for vitamin D or Healthy start supplements by their health practitioners. *"Parents are not well informed enough about the importance of vitamin D to give their children vitamin D supplements"* (page 9, parent 1, focus group 4) **Vitamin D fortified foods and drinks (facilitators and barriers to purchasing vitamin D fortified products)** Some parents expressed that lack of awareness about available options, insufficient labelling of vitamin D content and meeting child's daily requirements, concerns about inadequate vitamin D intake from incomplete food consumption, limited availability of suitable products for babies/toddlers, product healthiness concerns (for example, high sugar content), pricing considerations, fear of potential overdosing with supplement use, perceived lack of need for fortified products, habitual buying patterns prioritising other factors over vitamin D content preventing them from purchasing vitamin D fortified products. *"If they were advertised in a way where you could clearly see that they had vitamin D in. I think the problem with fortified foods in general is it is hard to trail through the back of the product and it can be really quite small on the packaging. If it was a bit clearer on the packaging that would be good, it would save a bit of time"* (page 10, parent, interview 4) Some parents suggested incorporating information about fortified foods and drinks in an informational leaflet, including details on the benefits and importance of vitamin D, consequences of insufficient intake, the quantity meeting Recommended Daily Intake, and reassurance about the safety of consuming fortified products to address concerns about vitamin D overdosing. *"I think a little more, not necessarily to scare me, but the consequences of not having it. It's alright saying they need it, but why? Maybe if I know a bit more detail as to why they need it, why it is so important, because that might increase the urgency of me taking it or making sure she gets it"* (page 11, parent, interview 1)

	"Obviously you don't want to get three products that all have vitamin D in them and find out you are having too much" (page 11, parent 1, focus group 4) **Vitamin D fortified foods and drinks (preferred ways to increase vitamin D intake)** Some parents prefer a vitamin D supplement during pregnancy due to its convenience, especially considering changes in food preferences and potential decreased intake. Additionally, the uncertainty about the exact amount of vitamin D obtained from food was a contributing factor. *"It is easier to take a supplement everyday rather than having to think about the right food choices"* (page 11, parent, interview 3) *"it would be good to know that I am getting absolutely everything I needed from my diet, but you don't always know how much is in the foods you are eating, so if you are getting enough. I think it feels more reassured that you know what you are taking, this specific dose every day, so you are getting exactly what you need"* (page 11, parent, interview 2) Some parents prefer giving "healthy foods" with vitamin D, as they find it challenging to administer a supplement due to taste preferences. *"If he was getting it all from his diet, that would be better"* (page 11, parent, interview 2) Some parents expressed willingness to give their child a vitamin D-fortified yogurt, provided it's clear how it meets the child's recommended daily intake, finding it more convenient than remembering a supplement. *"The yogurt, because I wouldn't have to worry about, I'm just thinking about when she sleeps over and she goes to places, yogurt would be easier and I know she likes yogurt, she eats yogurt"* (page 11, parent, interview 1)

GCSE: General Certificate of Secondary Education; GP: General practitioner; HND: Higher National Diploma; NHS: National Health Service.

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(No consideration of interviewer/researcher relationship. No description of inclusion/exclusion criteria.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Dundas, 2023

Bibliographic Reference	Dundas, Ruth; Boroujerdi, Massoud; Browne, Susan; Deidda, Manuela ; Bradshaw, Paul; Craig, Peter; McIntosh, Emma; Parkes, Alison; Wight, Daniel; Evaluation of the Healthy Start voucher scheme on maternal vitamin use and child breastfeeding: a natural experiment using data linkage; 2023; vol. 11 (no. 11); 1-101

Study Characteristics

Study type	General qualitative inquiry within a natural experiment study Semi-structured interviews
Country/ies where study was carried out	UK (Scotland)
Setting	**Setting** Community and parent groups. **Aim** To explore the factors influencing the adoption or rejection of Healthy Start vouchers, and the utilisation and perception of vouchers by women.

Data collection and analysis	**Data collection** Semi-structured interviews. Interviews lasted approximately 1 hour, explored various topics. These included mothers' knowledge of the scheme, how they learned about it, any reservations, and, if applicable, reasons for not using it. For those using or having used the scheme, inquiries covered when they started, who was aware, perceived financial benefits, awareness of the extra money, and its utilisation. **Data analysis** Thematic analysis. Interviews were securely recorded, anonymised, and transcribed verbatim using encrypted recorders. The transcripts underwent thorough validation against the original recordings before analysis. Coding was done based on predetermined and emergent themes using Nvivo, and systematic summarisation was carried out by charting key themes. Emerging hypotheses were tested using all relevant data, with a specific focus on the processes related to Healthy Start voucher (HSV) scheme adoption, non-adoption, or discontinuation. The analysis also explored the experiences of using HSVs and how the vouchers were utilised, comparing responses across the five groups of women.
Recruitment strategy	20 women from Growing Up in Scotland (GUS) received an invitation to participate in semi-structured interviews through an information leaflet and letter, followed by a subsequent phone call. Decliners were replaced with GUS participants matching similar characteristics. Another group of 20 women, either claiming or not claiming HSV, was selected from parent groups in deprived areas of Glasgow. Information leaflets were distributed in these groups, and interested participants were fully informed before agreeing to join the interviews. Scheduled appointments were confirmed with a reminder phone call the week before the interview. Interviews were primarily conducted face-to-face, with telephone interviews for mothers residing in rural or remote areas. The study initiated when children were 5 years old (HSV scheme applies until child is 4 years old). Sample was complemented with mothers who currently claiming or are eligible but not claiming HSVs.
Study dates	Started in 2015
Sources of funding	No industry funding (National Institute for Health and Care Research (NIHR) Public Health Research programme)
Inclusion criteria	Mothers: • GUS and received HSVs • GUS and were eligible for HSVs but who did not claim • Were receiving HSVs • Were eligible for HSVs but who did not claim

	• were nearly eligible for HSV, but did not meet the criteria
Exclusion criteria	Not reported.
Sample size	N = 40 mothers Claimed the HSVs: 22 Not claimed HSVs: 18
Participant characteristics	**Age of participants in years, n (%)** 20–9: 15 (37.5) 30–9: 16 (40) ≥ 40: 9 (22.5) **Age of child(ren):** Not reported **Ethnicity (participants' own description), n (%)** White Scottish: 24 (60) White British: 6 (15) Black African: 3 (7.5) British Pakistani: 2 (5) Pakistani: 1 (2.5)

	Nepalese: 1 (2.5) White Australian: 1 (2.5) White Irish: 1 (2.5) White Polish: 1 (2.5) **Highest level of qualification, n (%)** No qualifications: 16 (40) High school qualifications: 8 (20) College qualifications: 6 (15) Degree/studying for degree: 9 (22.5) Postgraduate qualification: 1 (2.5)
Results	**Author's themes** • Knowledge, awareness, take up and use of the HSV scheme • The effect of the HSV scheme on diet and feeding choices for their babies and children **Study findings** **Knowledge, awareness, take up and use of the HSV scheme** One mother believed the vouchers were only for vitamins, another thought they could be used for milk and vitamins, and a third believed they were exclusively for formula milk. *"Well, I think the Healthy Start Vouchers only entitle you to a wee vitamin, is that right?"* (page 44, HSV35, no claim, community group)

	"You get Healthy Start Vouchers for formula, is that right?" (page 44, HSV38, no claim, community group) **The effect of the HSV scheme on diet and feeding choices for their babies and children** Most of those who claimed HSV did not use the vitamin voucher; in some cases, mothers exchanged the voucher for vitamins but didn't use them. *"I get it but I don't even use them."* (page 54, HSV10, claimant, community group) Some mothers were unconvinced about the necessity of vitamins, thinking that children should obtain them from their diet. *"I never, ever got the free vitamins. I think it's just because I never done it wi' any of the older kids, you know?"* (page 54, HSV19, claimant, GUS) Some mothers were unsure about redeeming vouchers for the vitamin part of the scheme, for example, one woman believed she had to choose between using vouchers for milk, fruit, and vegetables or for vitamins, another, receiving HSVs for a while, was unaware of the vitamin component. *"It's the vitamins bit I don't get. Know how at the top o' them it says you could also collect your free vitamins? I don't know where tae take that tae get the free vitamins."* (page 55, HSV07, claimant, community group) *"I just thought I had to choose, basically, between whether I used it for my fruit, veg, and bread and milk, or... the vitamins."* (page 55, HSV05, claimant, community group) Some mothers using vitamins believed in their children's benefits, especially when they perceived inadequate fruit, vegetable, or calcium intake. While recognising the preference for dietary sources, they considered supplements a nutritional backup. The notion of taking vitamins to support the immune system emerged repeatedly. *"I think that's important 'cause even if they don't have access to fruit an' veg or the children won't eat anything that, things like that's a good idea because, and especially like in Scotland, like there's a one that I remember the health visitor saying to me, 'Look, vitamin D, like because there's like no sunshine."* (page 55, HSV37, no claim, community group)

	"He does look quite pale and lethargic, and things like that. And I think if you're not getting every other intake that I think you should be getting, then you'll get the vitamins." (page 55, HSV02, claimant, community group) Most mothers rarely discussed vitamin supplements with health professionals. [page 55, Quote was not provided] One mother concerned about her son's bow leg development, received advice m about HSV vitamin voucher from midwife. *"One day when the midwives were coming to visit when I had my baby, they were like... 'cause he was developing a bow leg, and then the health visitor, now she noticed that, she was like, 'Oh, are you not giving him some vitamin supplements?' And I'm like, 'No, I'm not. I'm not.' She was like, 'Yeah, they should come with your coupons for Healthy Start vouchers.' And I'm like, 'I don't know about those. That's when she told me about it and everything."* (page 55, HSV12, claimant, community group) Some mothers providing vitamin supplements to their children were motivated by their own vitamin use, including during pregnancy. *"I had already bought vitamins when I was pregnant. I had stocked up on them from when I first found out. It's like one of the first things I done. 'Cause I knew, it's quite a long story, but when I used to live with my mum, our next door neighbour, her little boy had spina bifida and so I had awareness of that and knew that you need to take like the folic acid and stuff like that. "So it was the first thing I done when I fell pregnant. Apart from go to the doctors, I went to Boots [The Boots Company Plc, Nottingham, UK] and stocked up."* (page 55, HSV32, claimant, GUS) Some mothers who did not claim HSVs bought vitamins for their children or had continued to provide their children with vitamins after eligibility for HSV had ceased. *"They got them for the first 2 years, I think. And I, back when I'm away, I'll go into Tesco's [Welwyn Garden City, UK] or Boots or something and get their own cheap brand vitamin, just wee chewy things."* (page 56, HSV23, no claim, GUS)

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(No consideration of interviewer/researcher relationship. No description of exclusion criteria. Length of the study not reported.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Jessiman, 2013

Bibliographic Reference	Jessiman, Tricia ; Cameron, Ailsa; Wiggins, Meg; A qualitative study of uptake of free vitamins in England; BMJ; 2013; vol. 8 (no. 98); 587-591

Study Characteristics

Study type	General qualitative inquiry In-depth interviews
Country/ies where study was carried out	UK (England)
Setting	**Setting** 13 primary care trusts in England. **Aim** To explore the factors contributing to the limited uptake of free Healthy Start vitamins among low-income families in England.
Data collection and analysis	**Data collection** Face-to-face interviews were the primary mode, with the option for telephone interviews if preferred. Conducted mostly by one of the female authors, written consent was obtained during face-to-face interviews or electronically for telephone

	interviews. The family-focused topic guide explored knowledge and experiences of the Healthy Start scheme, application processes, family diet, nutrition, sources of advice, and opinions about the scheme. Parent interviews ranged from 20 to 60 minutes. **Data analysis** Thematic analysis. All interviews were digitally recorded for accuracy and review. Draft analytic frameworks were developed that included key themes, subthemes that arise from study data. After finalisation, these frameworks were used to code the data, offering a detailed overview of responses categorised by theme and subtheme for each respondent. All authors participated in coding the data.
Recruitment strategy	Purposive sampling. 10 parents from 13 purposively selected Primary Care Trusts (PCTs) across England were recruited. The sampling aimed for diversity in Healthy Start eligibility and application status (current users, eligible non-applicants, previous users, and applicants who believed they were eligible but had not received coupons). Additional criteria included the age of the youngest child, the number of children in the household, ethnicity, and age. Recruitment primarily occurred face-to-face at health and children's centres, supplemented by outreach efforts through letters and telephone calls to include potentially infrequent users of these services. Participants received information about the research before engaging in interviews.
Study dates	May 2011 to February 2012
Sources of funding	No industry funding (the Policy Research Programme in the Department of Health)
Inclusion criteria	Not reported.
Exclusion criteria	Not reported.
Sample size	N = 107 (14 pregnant women and 93 parents)
Participant characteristics	**Age of participants in years, n (%)** <18 years: 8 (7.5) **Age of child(ren):**

	Not reported **Ethnicity, n (%)** Black and minority ethnic (BME): 17 (15.9) White, non-British: 4 (3.7)
Results	**Author's themes** • Low awareness among parents and poor promotion of the scheme by health professionals • Poor accessibility of vitamins • Parental motivation **Study findings** **Low awareness among parents and poor promotion of the scheme by health professionals** Many parents were unaware of Healthy Start (HS) vitamins and overlooked the vitamin coupon that arrived in the post. [page 4, Quote was not provided] Health care professionals' advice increased motivation. [page 4, Quote was not provided] Parents frequently reported that health professionals didn't mention vitamins, with some being explicitly told by midwives or health visitors that vitamin supplementation was unnecessary. *"I asked the midwife about vitamins whilst pregnant and the midwife said that if I was eating a healthy diet I wouldn't need them, but I went and got them anyway."* (page 4, mother of 6-month-old child) **Poor accessibility of vitamins**

	Some parents mentioned receiving incorrect guidance regarding the collection location of the Healthy Start vitamins. Also, some parents mentioned that their local distribution point was inconvenient or too far for them to access. *"We had the vitamin coupons and for ages and ages I was trying to find out where to get them from, I'd go to my doctors they'd say you have to ask your health visitor or the midwife. I went to Boots cos they was telling me they'd do them at pharmacies, and they were saying they'd never seen them before didn't know what I was on about…. I think one of the midwives said no its the pharmacist you go to, so I went to the pharmacist and they said they'd never. seen this before I think it's your GP. So I went back to the GP and then I think one of them says it was Sure Start."* (page 4, mother receiving HS, one child aged 10 months) Some parents preferred vitamins to be handed directly. [page 4, Quote was not provided] **Parental motivation** Some parents believed vitamins were unnecessary with a healthy diet. Additionally, they did not want to take vitamins due to successful child health outcomes in prior pregnancies without supplements, a dislike of tablets or drops, concern about potential negative health effects in children, and difficulties in accurately measuring the correct dosage with liquid drops. [page 4, Quote was not provided]

GP: General practitioner.

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(No consideration of interviewer/researcher relationship. No description of inclusion/exclusion criteria. No information on data anonymisation. Lack of information on data analysis.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Lucas, 2013

Bibliographic Reference	Lucas P; Jessiman T; Cameron A; Wiggins M; Hollingworth K; Austerberry C; Healthy Start Vouchers Study: The Views and Experiences of Parents, Professionals and Small Retailers in England; 2013

Study Characteristics

Study type	General qualitative inquiry within a report
Country/ies where study was carried out	United Kingdom
Setting	**Setting** Interviews were conducted in the participant's home or in Children's centres. **Aim** To examine the views of healthy start beneficiaries.
Data collection and analysis	**Data collection** Interviews were used to collect data. **Data analysis** Not reported *Note: study reports that more analysis details available in appendix 1, however there is no access to appendix 1 available.
Recruitment strategy	Participants were recruited either face to face from health or children's services or through the national Healthy Start database.
Study dates	Not reported.

Sources of funding	Not reported.
Inclusion criteria	Not reported.
Exclusion criteria	Not reported.
Sample size	N=107 parents (14 pregnant women and 93 parents) from 13 sites
Participant characteristics	**Mean age of participants, years:** 27 **Age of child(ren):** Not reported **Number of participants aged <18 years:** 8/107 **Parent status:** Pregnant: 14/107 Parents of ≤12 months: 50/107 Parents of 12+ months: 43/107 **Ethnicity (n):** Black and minority ethnic population: 17/107 White, non British: 4/107 **Parity (n):** 2+ children including pregnancy: 56/107
Results	**Author's themes** • Accessing and Using Healthy Start Vitamins • Barriers to using healthy start vitamins • The Experience of Teenage Mothers **Study findings**

Accessing and Using Healthy Start Vitamins

Most women taking vitamins were advised by their midwife or GP.

[Quote was not provided]

Mothers using vitamins weren't advised by health professionals; one inquired based on her sister's recommendation, while another was told by her midwife that vitamins were unnecessary with a healthy diet.

[Quote was not provided]

Two women obtained information from HS materials sent with the food vouchers or online sources.

[Quote was not provided]

Barriers to Using Healthy Start vitamins

A few participants were unaware about healthy start vitamin coupons, some were unaware of where to collect them, and some has been told by their midwife or health visitor that they didn't need them if their diet was healthy. Most faced some difficulty in obtaining vitamins: for example, because of problems exchanging the voucher in pharmacies, finding it embarrassing to ask retail staff, lack of stock, or access to locations that supply vitamins. Other reasons for not taking vitamins included beliefs that they were unnecessary, having a dislike for taking them, concerns they were harming their children, and concerns about measuring out the correct dose.

"That was the problem. We had the vitamin coupons and for ages and ages I was trying to find out where to get them from, I'd go to my doctors they'd say you have to ask your health visitor or, um the midwife. I went to Boots cos they was telling me they'd do them at pharmacies, and they were saying they'd never seen them before didn't know what I was on about....I think one of the midwives said no its the pharmacist you go to, so I went to the pharmacist and they said they'd never seen this before I think it's your GP. So I went back to the GP and then I think one of them says it was Sure Start." (page 49, mother in receipt, one child aged 10 months, Site 3)

"When I rang up my health visitor to ask them about it they sort of like, one of them didn't even know what I was talking about and the other one, I couldn't even understand what she was saying about where I needed to go to get them. It's not well known about here." (page 49, mother in receipt, Site 13, one child aged 22 months)

	The Experience of Teenage Mothers Teenage mothers lacked knowledge about vitamins and never received guidance from healthcare professionals. *"I know there are vitamins for babies but since she's doing so well I didn't want to mess up a good thing."* (page 60, mother in receipt, baby aged 9 months)

GP: General practitioner

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(Insufficient detail available to make judgement on research design, recruitment strategy, data collection, researcher participant relationship, and data analysis.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Moonan, 2022

Bibliographic Reference	Moonan, May; Maudsley, Gillian; Hanratty, Barbara; Whitehead, Margaret; An exploration of the statutory Healthy Start vitamin supplementation scheme in North West England.; BMC public health; 2022; vol. 22 (no. 1); 392

Study Characteristics

Study type	General qualitative inquiry Semi-structured interviews
Country/ies where study was carried out	UK
Setting	**Setting**

	Not reported (in two closely located areas: universal and targeted vitamin implementation areas; both areas are in the most deprived fifth of local authorities, and share similar life expectancies and childhood obesity rates). **Aim** To explore perceptions of mothers, [health professionals, and commissioners] on the uptake of Healthy Start vitamins and food vouchers, and compare the experiences in areas with targeted and universal implementation of these vitamins.
Data collection and analysis	**Data collection** Semi-structured interviews. Topic guide and participant information sheet development were influenced by quantitative results and pilot interviews with two commissioners, two midwives, and one mother. One of the authors, conducted interviews with all 25 participants (11 universal area; 14 targeted area) via telephone, ensuring written or electronic consent and emphasising the importance of the information sheet, confidentiality, and the ability to withdraw without detriment. **Data analysis** The software QRS-NVivo v9.2 was used to analyse anonymised transcripts, following Ritchie and Spencer's framework approach, particularly emphasising the 'diagnostic' (why things are so) and 'evaluative' (what affects effectiveness) aspects. The analysis comprised several stages, including familiarisation with raw data and field-notes and identifying emergent and recurrent themes. The thematic framework was developed through abstracting, conceptualising, discussions among co-authors, and coding five transcripts, incorporating deductive (from the topic guide) and inductive components. The full analysis included indexing and charting (case-charts, theme-charts), with mapping seeking associations, wide-ranging experiences, and exceptions. Voice recordings were deleted after transcript verification.
Recruitment strategy	Purposive sampling. Mothers, who were potentially eligible beneficiaries of Healthy Start (whether entitled and had accepted application or not). Recruitment was facilitated by six children's centre managers. One of the authors briefed identified mothers by telephone or in infant-toddler groups. Participants confirmed their eligibility for Healthy Start.
Study dates	2012 February to September 2012
Sources of funding	No industry funding.
Inclusion criteria	Women:

	• English-speaking • have a child aged <4 years • attending one of six children's centres
Exclusion criteria	Not reported.
Sample size	N = 25 mothers
Participant characteristics	Not reported. **Age of child(ren):** Not reported
Results	**Author's themes** • Why was vitamin voucher take-up so low? • Why might vitamin voucher take-up be more in the universal area? **Study findings** **Why was vitamin voucher take-up so low?** Some mothers expressed lack of awareness of the vitamin scheme or receiving vouchers and expressed a sense of 'missing out.' *"I have seen all these pictures and I thought 'I wonder what that is?' and then, when they [health professionals] did actually make me aware, I didn't realise it is from when you are 12 weeks pregnant… So, I had missed out on all that time, my whole pregnancy, [through] a lack of communication."* (page 4, EM13-T) *"I got the food ones, but I never got the vitamin vouchers, and this has been going on for two years! All I ever get is the food vouchers and a letter."* (page 5, EM10-U) *"No, I only just started getting the vitamin tablets with my second child; …because no one told me."* (page 5, EM06-U)

Some mothers expressed that the letter didn't specify where to get the vitamins, and they couldn't recall being informed.

"I now know it was my midwife who should have told me from day one!" (page 5, EM13-T)

Some mothers lacked awareness of the benefits of vitamins, expressing a sense of being inadequately informed by health professionals.

[Quote was not provided]

Some mothers were unaware of where to use vouchers and felt inadequately advised.

"…I've always seen the vouchers and thought… 'oh I will have to find out where you go…', but I've never actually followed it through." (page 5, EM30-T)

"Yeah [I noticed the vitamin voucher] …but it didn't say where you get them from or how…" (page 5, EM25-T)

"No, no one has spoken to me about vitamins. ...and I did actually go and ask my GP because… I was slightly overweight, so… […] she basically just told me to join Weight Watchers, and I wasn't given any other advice at all." (page 5, NEM16-T)

Some mothers complained about poor administrative processes and vitamin supply.

"I have a friend who has just turned 18 [in January] and she's pregnant. She can't get her vouchers until she claims child tax credits. She can't claim child tax credits because they've just changed the rules and her mum has to claim child benefit for her until September… So, the government is expecting her to live, and her baby, to live off £20… [sighs]…" (page 5, EM38-U)

"[children's centres] just never have them." EM26-T. Futile searching for children's vitamin drops was typical: "everywhere I ask they go 'we haven't got them in', like in the children's centre…" (page 5, EM27-T)

Why might vitamin voucher take-up be more in the universal area?

Some mothers in the universal area mentioned easy and immediate voucher exchange for vitamin tablets or drops at multiple locations.

"I can get them here [children's centre]; there's lot of places I could get them" (page 7, EM09-U)

	"they just gave me this… yellow card [a local card], and each time you come you have to have it signed" (page 7, NEM19-U) *"went to a weaning group and they told us… [and] we got them [there]"* (page 7, NEM12-U) Some mothers complained of lack of accessibility and adequate supply. *"I try [to use the vitamin vouchers], if you can get them for free, you've seen I've got the voucher right here… but… I don't know whether it's because of the cutbacks or whether they've just stopped sending them, but the [children's] centres where I go [to] ask for them—they just never have them."* (page 8, EM26-T) *"There was nowhere really to get them. Every time I'd ask in the doctors' they said, 'see your midwife', and the midwife told me to look on the internet, but I haven't got any internet at home… I have never ever got the vitamins because I don't know where to get them from or anything…"* (page 8, EM27-T) Abbreviations: (N)EM = (non-) entitled mother; U = universal; T = targeted

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(The reasons of 3 mothers refusing interviews were not explained; no consideration of interviewer/researcher relationship, no information on participants characteristics and exclusion criteria.)*
Overall risk of bias and relevance		

Rundle, 2018

Bibliographic Reference	Rundle, Rachel; Soltani, Hora; Duxbury, Alexandra; Exploring the views of young women and their healthcare professionals on dietary habits and supplementation practices in adolescent pregnancy: a qualitative study.; BMC nutrition; 2018; vol. 4; 45

Study Characteristics

Study type	General qualitative inquiry Semi-structured interviews
Country/ies where study was carried out	UK
Setting	**Setting** In the ante-natal setting, community venues or young women's homes. **Aim** To explore adolescent pregnant women' knowledge and understanding of nutrition advice, as well as identify facilitators and barriers to dietary changes and supplement use in this vulnerable population.
Data collection and analysis	**Data collection** Semi-structured interviews. Two experienced researchers conducted interviews, lasting 10 to 42 minutes (mean time 25 min), independently. A visual interview guide was used to maintain focus, using photos of information sources, nutrition supplements, and tablet formats. The researchers aimed to establish rapport, assuring participants of the importance of their individual experiences and emphasising a non-judgmental approach. Some shorter interviews (<15 mins) resulted from brief responses. Pregnant participants focused on their current experiences, while postnatal women reflected on their pregnancies. All interviews were audio recorded and transcribed verbatim. Transcriptions were professionally reviewed for consistency and completeness by both researchers. **Data analysis** The data was analysed thematically, and it involved careful reading, data coding, categorisation, and constant comparative analysis to explore similarities and differences. Two independent researchers conducted the main data analysis, verified by a third researcher (not an interviewer) to minimise bias and ensure clarity in theme/sub-theme development.

Recruitment strategy	Purposive sampling. Young women, meeting selection criteria, received an information sheet and were referred to the study by their midwife or family nurse practitioner. Written consent was obtained, and interviews were conducted in quiet spaces within the ante-natal setting, community venues, or the young women's homes.
Study dates	Not reported.
Sources of funding	No industry funding (funded jointly by Tommy's charity and the National Institute of Health Research Collaboration for Leadership in Applied Health Research and Care for South Yorkshire (NIHR CLAHRC SY)).
Inclusion criteria	Women: • 16–19 years old • currently pregnant or had given birth less than 6 months ago
Exclusion criteria	Not reported.
Sample size	N = 34 (currently pregnant women and mothers)
Participant characteristics	**Age of participants in years, n (%)**; (mean: 17.62 years) 16: 4 (12) 17: 13 (38) 18: 9 (26) 19: 8 (24) **Age of child(ren):** Not reported **Living situation, n (%)**

	Alone, own home (rented): 3 (8.5) With partner, own home (rented): 10 (30) With family, at home: 12 (17) With partner and family, at home: 6 (17) Shared house, hostel accommodation: 3 (8.5)
Results	**Author's themes** • Erratic adherence to supplementation despite uncertainty • Seeking relevant and reliable information and support **Study findings** **Erratic adherence to supplementation despite uncertainty** Some young women refused pregnancy supplements, linking them to "medicine" they were advised to avoid. [page 4, Quote was not provided] Some young woman reported that before their first contact with a midwife or GP, they were more likely to be prompted by a supportive partner, family member, or friend to take folic acid, the supplement they were most knowledgeable about. *"My mum said like as soon as I found out I was pregnant she was like you need to take some vitamins, because obviously it helps to get the folic acid there straight away."* (page 4; P1 in supplement 3, young woman) *"My mum's mate was pregnant at the same time and she said oh are you taking this?"* (page 4; P1 in supplement 3, young woman) Some young women were unaware of the benefits of supplements and that Healthy Start vitamins, which contain folic acid, are safe for use throughout pregnancy.

	"I didn't even know anyone took vitamins when they were pregnant I thought it just happened and you just got on with it and you were all right." (page 2 in supplement 3, young woman) Folic acid: *"And do you know why you need Folic acid? [Interviewer] It helps your baby's bone, its bones develop or something."* (page 4; P2 in supplement 3, young woman) Iron: *"I know that iron is something about brain development with the baby."* (page 2 in supplement 3, young woman) Healthy Start vitamins: *"I think there's vitamin C, D and E…I think something about the baby's bones…. I can't remember the rest. I just can't remember."* (page 4; page 2 in supplement 3, young woman) Some young women found the multi-vitamins and fish oil supplements expensive, but the premium packaging and marketing made them question if they were better than folic acid or Healthy Start vitamins alone. [page 4, Quote was not provided] Some young women experienced nausea with larger tablet sizes, especially with folic acid/iron combinations and vitamin D, or when taken on an empty stomach or with sugary carbonated beverages. *"Because like when you're pregnant you have like, like your folic and a fizzy drink you feel kind of sick."* (page 4; P3 in supplement 3, young woman) Some motivated young women established reminders for supplement intake, placing tablets in memorable locations (for example, by toothbrush, kettle, or in their purse), setting alarms on their mobile phones, or enlisting willing partners or mothers for reminders. *"I used to forget to take them but then I started putting like the little package in my purse, because I use that every day. So I'd see it, I'd remember to take it."* (page 4,5; page 4 in supplement 3, young woman) *"Well, what it is they're right next to the kettle in the morning and I have a brew first thing in the morning like when I get up any, and they're just right there."* (page 4,5; page 4 in supplement 3, young woman) Two young women opted for alternative supplement formats, choosing fortified products like "healthy chocolate" or fruit smoothies.

	"It wouldn't be so hard to make a smoothie with folic acid in it" (page 5; page 5 in supplement 3, young woman) *"That would be the best thing ever for pregnancy, chocolate that is good for you. Chocolate with all your vitamins in, every woman would eat that every day"* (page 5; page 5 in supplement 3, young woman) Some young women reported delayed start of the vitamins due to uncertainty whether the baby will be kept. *"I started taking it properly from 13 weeks onwards, because we didn't know if I was going to be keeping the baby or not."* (page 1 in supplement 3, young woman) Some young women reported forgetting taking supplements or having other priorities. *"Sometimes I forget, but normally I take it every morning but if I forget in the morning I remember in the night time."* (page 2 in supplement 3, young woman) *"I do remember to take my folic acid, but sometimes like in a day just forget to take it."* (page 2,3 in supplement 3, young woman) Some young women reported stopping taking supplements early and concerned about safety. *"12 weeks… you can't have it after that, you have to stop because it's not meant to be good for you"* (page 1 in supplement 3, young woman - talking about folic acid) Some young women reported lack of personal relevance of taking supplements. *"I do see the need for them if necessary… I'm not sick, it's different if there was any problems with baby, her scan was perfect, and everything came back fine, I don't have any worries, even her Down Syndrome thing came, everything is just going well with how I've been… natural"* (page 3 in supplement 3, young woman) Some young women reported being aware that supplements are best for baby. *"I know I'm meant to take it but I don't know why. I just take it because I've been told I need to."* (page 3 in supplement 3, young woman)

	Some young women concerned about tablet size and preferred smaller pills. *"I can take these because they're not that big [health start vitamins], and obviously and if they are like kind of big and fat [multi-vitamins] I just throw it up."* (page 4 in supplement 3, young woman) *"It just goes down straightaway. You don't even know that you took a tablet."* (page 5 in supplement 3, young woman) **Seeking relevant and reliable information and support** Some young women believed that partner, family, and friends were influential sources, but questioned the accuracy and consistency of their advice. *"I think that's a big barrier, that it's something new and why are you taking those pregnancy vitamins when the mum didn't take them or the older sister didn't take them"* (page 4; P2 in supplement 4, young woman) Some young women valued written resources for reference after the appointment. *"I find the physical books much easier... whereas the Internet you've got to be searching and you don't know if you're finding the right information, so I think booklets are easier."* (page 4; P3 in supplement 4, young woman) Some young women expressed apathy regarding written resources unless the information was designed specifically for adolescent pregnancy. *"Well I got leaflets but I didn't read them because to be honest with you leaflets that you get these days are so packed full of information, very tiny writing, you just can't be bothered."* (page 3 in supplement 4, young woman) Some young women frequently used online resources, for example, video format. *"I do watch online videos on YouTube of other young mums, so I type in 33 weeks pregnancy updates and the women, people usually say what kind of tablets, vitamin's they're into, what veg and fruits, things they eat."* (page 3 in supplement 4, young woman) Some women expressed dissatisfaction regarding web based relevant content.

	"Don't actually have to have cartoons and sound like you're talking to a five year old, which is quite annoying with a lot of the videos, you don't need to speak like [we] don't understand, and we're not children." (page 4 in supplement 4, young woman) Some young women felt overwhelmed and confused when leaflets were provided with minimal opportunity for discussion. *"I did read, I read everything that I was given but I don't really remember any of it. I: Did your midwife go through the leaflets…?"* (page 4; page 2 in supplement 4, young woman) *"She just gave it to me, she didn't go through it"* (page 4; page 2 in supplement 4, young woman) Some young women valued the practical tips and ideas from other young women's experiences. [page 4, Quote was not provided] Young women were concerned about the reliability and accuracy of certain online information. *"I go on NHS I know all right, these are doctors and stuff, so it's more trustworthy. Whereas I go on Facebook more... so if I know it's still the same NHS people that are providing this information, but they're providing it on Facebook, you'll find me more on Facebook. Especially if it's young mums, I think you'd find a lot more on them on social networking."* (page 4; page 4 in supplement 4, young woman) Some young women believed that there are time constraints and lack of interaction with midwife during the clinic visits. *"But we don't really talk about much, she just checks me, we don't talk about much. She checks me, asks me if I have any questions, which I usually don't."* (page 2 in supplement 4, young woman) Young women's comprehension and execution of pregnancy information had the potential to shape the changes they implemented. [page 4, Quote was not provided]

GP: General practitioner; NHS: National Health Service.

Critical appraisal - Qualitative Critical Appraisal Skills Programme (CASP) checklist

Section	Question	Answer
Overall risk of bias and relevance	Overall risk of bias	Moderate concerns *(No consideration of interviewer/researcher relationship. No description of exclusion criteria. Study dates not reported.)*
Overall risk of bias and relevance	Relevance	Highly relevant

Appendix E Forest plots

Forest plots for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

No meta-analysis was conducted for this review question and so there are no forest plots.

Appendix F GRADE-CERQual tables

GRADE- CERQual tables for review question: What are the facilitators and barriers to increasing the uptake of government advice on folic acid before and during pregnancy?

Table 6: Evidence profile for facilitators to increasing the uptake of government advice on folic acid supplements before and during pregnancy

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Theme A1. Adequate knowledge and information						
Subtheme A1.1 Communication of information						
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that women felt visual availability of the information at places they visit, such as posters and leaflets in GPs' surgeries, information at Family Planning Clinics can increase awareness of folic acid benefits. The women suggested that Family Planning Clinics can mail folic acid leaflets to women who did not return for contraceptive advice, provide folic acid information along with pregnancy tests, and target women with notices in supermarket baby aisles. [Quote is not available]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Subtheme A1.2 Content of information						
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that women felt that leaflets should provide information on the risk and effects of not taking folic acid could increase awareness of folic acid benefits. *"I think you have to be a bit ... I know that sounds horrible, but if you want somebody to take something sometimes you have to be a bit … show them what the worst case scenario (is) …"* (Multip, JI – F) [Quote: Barbour 2012, p. 145]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW

GP: General practice
1 Moderate concerns about methodological limitations as per CASP qualitative checklist

2 Studies contributing to the theme offer some rich data

Table 7: Evidence profile for barriers to increasing the uptake of government advice on folic acid supplements before and during pregnancy

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Theme B1. Thoughts, views and perceptions of women						
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that some women felt self-conscious picking up posters and leaflets at GP surgeries where others are likely to take note of them. Some women felt sceptical about the need to take folic acid in a hypothetical or subsequent pregnancy. Some women dismissed the effectiveness of folic acid in preventing birth defects, citing healthy outcomes without supplementation as justification. One woman dismissed the value of prevention efforts and claimed ethical value in having a child with spina bifida. One woman believed that those at higher risk would already be aware of the danger and the crucial role of folic acid, indicating a perceived lack of need for additional health promotion initiatives. Only a minority of women with positive pregnancy outcomes felt that this was a factor in deciding to take folic acid in future pregnancies. *"I'm not sure if I would … em … take it. I mean, I never took it much when I had (my daughter) and I don't think it's made any difference, so I'm not sure if I would. I'd have a look into it more and see if it was going to make a big difference"* (20-year-old Prim, FG – C) [Quote: Barbour 2012, p. 144]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Theme B2. Issues relating to acceptability						

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that some women felt that folic acid supplements caused or contributed to morning sickness, leading to inconsistent use or discontinuation. Some women believed that they were possibly predisposed to implicating folic acid as the cause of morning sickness without sufficient evidence. Women, who were concerned about the connection between the use of folic acid and morning sickness, were found to adopt intermittent folic acid, with additional reasons including busyness from childcare or shift work. "So after a couple of weeks of taking the folic acid I kind of convinced myself that that was making me sick" (22-year old Multip – Telephone JI – G)) [Quote: Barbour 2012, p. 144]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Theme B3. Issues relating to mis-information or a lack of information and communication of information						
Subtheme B3.1 Content of information						
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that some women felt that receiving information about folic acid at 12 weeks' gestation was already redundant. Some pregnant women were overwhelmed with the quantity of information given by healthcare professionals to newly pregnant women. Folic acid wasn't emphasised, possibly due to its integration into broader informational packages. First-time mothers reported frequent consultation of advice book, though its usage decreased in subsequent pregnancies. *"My doctor said it wasn't really that big a thing. Because the second pregnancy I hadn't taken it, he said it's not such a big deal because if you're having a balanced diet, like if you're eating cereals like rice crispies and things like that, they've already got folic supplements in them and he said that if you're having a balanced diet that you would be taking folic acid anyway, so I wasn't really that worried about it" (Multip, JI – F)* [Quote: Barbour 2012, p. 143]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Subtheme B3.2 Understanding the information						

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	**Coherence of finding**	**Adequacy**	**Relevance of evidence**	**Overall confidence**
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that women, taking folic acid in a multivitamin, were often confused about the folic acid specific benefits, with speculations about its relation to bone development, preventing miscarriage, and increasing chances of conception. Some women were aware of the connection between folic acid and the risk of neural tube defects but found it difficult to internalise the information. *"… At the time I didn't think it prevented spina bifida, Although it says it clear as day (on the bottle) I thought it was just, kind of, to make sure that your baby was born properly and healthy…"* (C) [Quote: Barbour 2012, p. 143]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Subtheme B3.3 Advice and information from family and personal experience						
1 study Barbour 2012 General qualitative inquiry with focus groups. N=24 women.	One study reported that some women relied on advice from their own mothers, who themselves were not advised on taking folic acid. Therefore, those women relied on their own sources of knowledge, with personal experiences influencing their beliefs and behaviour regarding folic acid. *"See, I took folic acid in my first pregnancy and I had more problems in my first pregnancy. My wee boy was born early and everything and he was in neonatal, and I actually took folic acid in that, and the second pregnancy went like a dream. Not that I'm saying that it's all to do with folic acid …" (Multip in her 20s – Tele JI – H)* [Quote: Barbour 2012, p. 144]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW

GP: General practice.
1 Moderate concerns about methodological limitations as per CASP qualitative checklist
2 Studies contributing to the theme offer some rich data

GRADE- CERQual tables for review question: What are the facilitators and barriers to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years in?

Table 9: Evidence profile for facilitators to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Theme A1. Thoughts, views and perceptions of women or parents/carers						
2 studies Dundas 2023 General qualitative inquiry with semi-structured interviews N = 40. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Two studies reported that some mothers using vitamin supplements believed in their children's benefits, especially when they perceived inadequate fruit, vegetable, or calcium intake in their diet. While recognising the preference for dietary sources, they considered supplements a nutritional backup for their children. Some mothers providing vitamin supplements to their children were motivated by their own vitamin use during pregnancy. Some mothers who did not claim Healthy Start vitamins bought vitamins (HSV) for their children or had continued to provide their children with vitamins after eligibility for HSV had ceased. Some motivated young women established reminders for vitamin supplement intake, placing tablets in memorable locations (for example, by toothbrush, kettle, or in their purse), setting alarms on their mobile phones, or enlisting willing partners or women for reminders. One mother concerned about her son's bow leg development, received advice about HSV vitamin voucher from a midwife. *"I had already bought vitamins when I was pregnant. I had stocked up on them from when I first found out. It's like one of the first things I done. 'Cause I knew, it's quite a long story, but when I used to live with my mum, our next door neighbour, her little boy had spina bifida and so I had awareness of that and knew that you need to take like the folic acid and stuff like that. So it was the first thing I done when I fell pregnant. Apart from go to the doctors, I went to Boots [The Boots*	Moderate concerns[1]	No or very minor concerns	Minor concerns[3]	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
	Company Plc, Nottingham, UK] and stocked up." (HSV32, claimant, GUS) [Quote: Dundas 2023, p. 55]					
Theme A2. Factors relating to acceptability						
1 study Day 2019 General qualitative inquiry with focus groups. N=18 women.	One study reported that some women preferred taking vitamin D supplements rather than having to think about the right food choices which contain vitamin D during pregnancy. This was due to convenience in the use of vitamin D supplements and also because of, changes in food preferences and potential decreased appetite during the pregnancy period. Additionally, the uncertainty about the exact amount of vitamin D obtained from food was a contributing factor in deciding to take vitamin D supplements. Some parents expressed willingness to give their child a vitamin D-fortified yogurt, provided it was clear as to how it met the child's recommended daily intake, as they found it more convenient than remembering to provide the supplement to the child. *"The yogurt, because I wouldn't have to worry about, I'm just thinking about when she sleeps over and she goes to places, yogurt would be easier and I know she likes yogurt, she eats yogurt"* (parent, interview 1) [Quote: Day 2019, p. 11]	Moderate concerns[1]	No or very minor concerns	Moderate concerns[2]	No or very minor concerns	LOW
Theme A3. Factors relating to accessibility						

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	**Coherence of finding**	**Adequacy**	**Relevance of evidence**	**Overall confidence**
2 studies Jessiman 2013 General qualitative inquiry with in-depth interviews N = 107. Moonan 2022 General qualitative inquiry with semi-structured interviews N = 25.	Two studies reported that some parents believed the process of applying for Healthy Start scheme worked well and had found out about the scheme by a health professional (for example, a midwife or health visitor). Additionally, some participants reported finding out about it from friends and family, or by leaflets from general practice surgeries, health clinics, the Job Centre, or at children centres. Some mothers living in areas where Healthy Start vitamin vouchers were offered universally, reported their experience of easy and immediate voucher exchange for vitamin tablets or drops at multiple locations. Some women preferred vitamins to be handed to them directly by their midwives. *"I can get them here [children's centre]; there's lot of places I could get them"* (EM09-U) [Quote: Moonan 2022, p. 7]	Moderate concerns[1]	No or very minor concerns	Minor concerns[3]	No or very minor concerns	MODERATE
Theme A4. Adequate knowledge and information						
Subtheme A4.1 Communication of information						
5 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15. Day 2019 General qualitative inquiry with focus groups. N=18 women. Jessiman 2013 General qualitative inquiry with in-depth interviews N = 107.	Five studies reported that some women preferred education about vitamin D to include dietary sources of vitamin D, its importance, risks of deficiency, child's vitamin D requirements during pregnancy and breastfeeding, and guidance on accessing vitamin D supplements. They also expressed their preference of the information to be delivered verbally and during routine appointments, baby weigh-in clinics, antenatal classes, health visitor clinics, breastfeeding visits, weaning sessions, a child's routine GP appointments (for example, vaccinations), online "messenger" service with a health professional, and informative YouTube videos focusing on healthy eating for children. Parents preferred smaller, more frequent information tailored to individual feeding practices, such as breastfeeding or formula feeding. Parents preferred clearer and more specific vitamin D information presented in simpler and more visually engaging written formats, such as through better advertising in supermarkets,	Moderate concerns[1]	No or very minor concerns	No or very minor concerns	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Lucas 2013 General qualitative inquiry with interviews N=107. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	schools, children's centres, and other everyday locations. Some parents (including mothers, fathers and/or grandparents) emphasised the importance of offering infographics in different languages. Many parents and caregivers believed that the acceptability of infographics would increase if its source was recognised as trustworthy and reliable, particularly if it had an association with a common healthcare provider like the NHS. Some parents suggested that incorporating information about fortified foods and drinks in an informational leaflet, including details on the benefits and importance of vitamin D, consequences of insufficient intake, quantity meeting the recommended daily intake (RDA), and reassurance about the safety of consuming fortified products to address concerns about vitamin D overdosing. Some young women reported that before their first contact with a midwife or GP, they were more likely to be prompted by a supportive partner, family member, or friend to Healthy Start supplements. Some young women valued the practical tips and ideas from other young women's experiences. *"I find the physical books much easier... whereas the Internet you've got to be searching and you don't know if you're finding the right information, so I think booklets are easier."* (young woman) [Quote: Rundle 2018, p. 4 and p. 3 in supplement 4]					
Subtheme A4.2 Content of information						
3 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15.	Three studies reported that some parents expressed preference of positive messages about the health benefits of vitamin D rather than information highlighting the risks of not taking it. Some parents believed that the message should highlight both immediate and long-term benefits of vitamin D. Additionally, some parents expressed preference of inclusion of information about alternative sources of vitamin D such as sunlight	Moderate concerns[1]	No or very minor concerns	Minor concerns[3]	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Day 2019 General qualitative inquiry with focus groups. N=18 women. Lucas 2013 General qualitative inquiry with interviews N=107.	and food/drink sources, along with details on why vitamin D is important and its health benefits. Some parents believed that promotional efforts from GPs or health visitors, such as distributing free vitamin D drops or supplements, improved parent knowledge through clear explanations and leaflets, parent role modelling of healthy behaviours, better publicity (for example, TV ads), reminders, and clear instructions on giving vitamin D supplements and incorporating them into a daily routine (for example, mixing with food or liquids) would make changes to child's diet. Most parents preferred that all the health messages on vitamin D should focus on topics like strong bones and teeth, along with adherence to Department of Health recommendations. *"…having that knowledge makes you want to do the best for your child and being explicit about that, like talking through leaflets and understanding the benefits. Because they did it with breastfeeding and most of my friends who were breastfeeding could reel off the benefits, but you don't ever get the same with vitamin D"* (interview 4) [Quote: Day 2019, p. 8]					
Subtheme A4.3 Advice and information from family and personal experience						
2 studies Lucas 2013 General qualitative inquiry with interviews N=107. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Two studies reported that some young women (currently pregnant and mothers) were aware that supplements are best for baby. However, some women using vitamins weren't advised by health professionals; one mother requested information about vitamins from a healthcare provider based on her sister's recommendation, while another was told by her midwife that vitamins were unnecessary with a healthy diet. *"I know I'm meant to take it but I don't know why. I just take it because I've been told I need to."* (young woman) [Quote: Rundle 2018, p. 8 in supplement 3]	Moderate concerns[1]	No or very minor concerns	Minor concerns[3]	No or very minor concerns	MODERATE

GP: General practitioner; NHS: National Health Service; HS: Healthy Start; HSV: Healthy Start vitamins.
**Study includes folic acid consumption among other supplements*

1 Moderate concerns about methodological limitations as per CASP qualitative checklist
2 Studies contributing to the theme offer some rich data
3 Studies contributing to the theme offer moderately rich data

Table 10: Evidence profile for barriers to increasing the uptake of government advice on vitamin supplements (including Healthy Start vitamins) for women and families with children up to five years

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Theme B1. Thoughts, views and perceptions of women or parents/carers						
4 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15. Dundas 2023 General qualitative inquiry with semi-structured interviews N = 40. Jessiman 2013 General qualitative inquiry with in-depth interviews N = 107. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Four studies reported that some young women were unaware of the benefits of supplements and whether Healthy Start vitamins, which contain folic acid, are safe for use throughout pregnancy. Participants generally knew about obtaining vitamin D from sunlight, but some acknowledged challenges in winter. Limited awareness existed about vitamin D in food sources, and participants had poor knowledge of how such foods contribute to overall vitamin D needs. Some participants received vitamin D information during/after pregnancy, but they had not seen it broken down by developmental stages before. Some mothers were unconvinced about the necessity of vitamins, thinking that children should obtain them from their diet. Most mothers who claimed HSV did not use the vitamin voucher; in some cases, mothers exchanged the voucher for vitamins but didn't use them. Additionally, they did not want to take vitamins due to successful child health outcomes in prior pregnancies without supplements. They also reported of dislike of tablets or drops by the children, concerns about potential negative health effects in children, and difficulties in accurately measuring the correct dosage with liquid drops. Some young women reported lack of personal relevance of taking supplements, forgetting taking supplements or having other priorities. Two young women opted for alternative supplement formats, choosing fortified products like "healthy chocolate" or fruit smoothies. Some young women (currently pregnant women and mothers) reported delayed start of the vitamins due to uncertainty whether the baby will be kept.	Moderate concerns[1]	No or very minor concerns	No or very minor concerns	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
	"I do see the need for them if necessary… I'm not sick, it's different if there was any problems with baby, her scan was perfect, and everything came back fine, I don't have any worries, even her Down Syndrome thing came, everything is just going well with how I've been… natural" (young woman) [Quote: Rundle 2018, p. 3 in supplement 3]					
Theme B2. Issues relating to acceptability						
2 studies Day 2019 General qualitative inquiry with focus groups. N=18 women. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Two studies reported that some women preferred giving "healthy foods" with vitamin D, as they found it challenging to administer a supplement to their child or to take the supplements themselves due to taste preferences or experiencing nausea with larger tablet sizes. *"Because like when you're pregnant you have like, like your folic and a fizzy drink you feel kind of sick."* (young woman) [Quote: Rundle 2018, p. 4 and p. 3 in supplement]	Moderate concerns[1]	No or very minor concerns	Minor concerns[2]	No or very minor concerns	MODERATE
Theme B3. Issues relating to accessibility						
5 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15. Dundas 2023 General qualitative inquiry with semi-structured interviews N = 40. Jessiman 2013	Five studies reported that some women were not aware of the UK Healthy Start scheme, such as knowing about the Healthy Start vouchers, redeeming vouchers, or remembering the information about vitamin D supplements. One mother believed the vouchers were only for vitamins, another thought they could be used for milk and vitamins, and a third believed they were exclusively for formula milk. Some parents (including pregnant women) overlooked the Healthy Start vitamins coupon that arrived in the post. Also, some parents or caregivers (including mothers, fathers and/or grandparents) reported language barrier impacting their awareness. Additionally, some individuals were unfamiliar with the appearance of vitamin D supplements. Some parents (including pregnant women) mentioned receiving incorrect guidance regarding	Moderate concerns[1]	No or very minor concerns	No or very minor concerns	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
General qualitative inquiry with in-depth interviews N = 107. Lucas 2013 General qualitative inquiry with interviews N=107. Moonan 2022 General qualitative inquiry with semi-structured interviews N = 25.	the collection location of Healthy Start vitamins. There were instances when the midwife or health visitor stating that they didn't need Healthy Start vitamins if they were on a healthy diet. Most parents (including pregnant women) faced some difficulty in obtaining vitamins: for example, because of problems exchanging the voucher in pharmacies, finding it embarrassing to ask retail staff, lack of stock, or access to locations that supply vitamins. *"We had the vitamin coupons and for ages and ages I was trying to find out where to get them from, I'd go to my doctors they'd say you have to ask your health visitor or the midwife. I went to Boots cos they was telling me they'd do them at pharmacies, and they were saying they'd never seen them before didn't know what I was on about…. I think one of the midwives said no its the pharmacist you go to, so I went to the pharmacist and they said they'd never. seen this before I think it's your GP. So I went back to the GP and then I think one of them says it was Sure Start."* (mother receiving HS, one child aged 10 months) [Quote: Jessiman 2013, p. 4]					
Theme B4. Issues relating to mis-information or a lack of information and communication of information, including food marketing and other commercial determinants						
Subtheme B4.1 Communication of information						
5 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15. Dundas 2023 General qualitative inquiry with semi-structured interviews N = 40.	Five studies reported that some women were unsatisfied with the method of communication of information of diet and supplement use. Mothers complained that Healthy Start letters didn't specify where to get the vitamins. Additionally, some young women (including currently pregnant women) expressed dissatisfaction regarding written resources and web-based contents on diet and supplementation particularly when the information was designed for adolescent pregnancy. Some parents or caregivers found the infographics unclear and felt it required deciphering. Moreover, they felt that the colour, images, and text font in the infographics were	Moderate concerns[1]	No or very minor concerns	No or very minor concerns	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
Jessiman 2013 General qualitative inquiry with in-depth interviews N = 107. Moonan 2022 General qualitative inquiry with semi-structured interviews N = 25. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	unappealing, and they felt there was excessive text. Some mothers (including pregnant women) couldn't recall being informed by the healthcare professionals and they believed that there were time constraints and lack of interaction with the midwife during the clinic visits. Additionally, some parents were explicitly told by midwives or health visitors that vitamin supplementation was unnecessary. Some young women questioned the accuracy and consistency of their advice coming partner, family, and friends. *"I now know it was my midwife who should have told me from day one!"* (EM13-T) [Quote: Moonan 2022, p. 5]					
Subtheme B4.2. Content of information						
2 studies Day 2019 General qualitative inquiry with focus groups. N=18 women. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Two studies reported that some young women were unsatisfied with the content of information communicated. They felt overwhelmed and confused when leaflets were provided with minimal opportunity for discussion. Young women were concerned about the reliability and accuracy of certain online information. Additionally, there was a perception of a lack of reliable and often conflicting information from different sources. *"I go on NHS I know all right, these are doctors and stuff, so it's more trustworthy. Whereas I go on Facebook more... so if I know it's still the same NHS people that are providing this information, but they're providing it on Facebook, you'll find me more on Facebook. Especially if it's young mums, I think you'd find a lot more on them on social networking."* (young woman) [Quote: Rundle 2018, p. 4 and p. 4 in supplement]	Moderate concerns[1]	No or very minor concerns	Minor concerns[2]	No or very minor concerns	MODERATE
Subtheme B4.3. Lack of information or mis-information						

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
5 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews N = 15. Day 2019 General qualitative inquiry with focus groups. N=18 women. Lucas 2013 General qualitative inquiry with interviews N=107. Moonan 2022 General qualitative inquiry with semi-structured interviews N = 25. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Five studies reported that some young women refused pregnancy supplements, linking them to "medicine" they were advised to avoid. Some women expressed concern about the potential for vitamin D overdose in children, indicating a lack of clarity on recommended intake. Some women expressed lack of confidence or understanding in the provided information with a desire for additional support from a health professional when interpreting the infographic. Many parents or caregivers felt that the infographic lacked information on 'why' vitamin D is needed, where it can be found, and its health benefits. Many parents were unaware of the need for a supplement and the importance of vitamin D for their baby/child. Some parents reported that alternative sources like food, drinks, or sunlight were not discussed by their midwife or health visitor. Some parents expressed confusion regarding current recommendations for breastfeeding and vitamin D supplement use for both mothers and infants. They also stated that there were uncertainties about administering vitamin D supplements to exclusively breastfed babies. Some mothers expressed lack of awareness of the Healthy Start vitamin scheme or receiving vouchers and expressed a sense of 'missing out.' Some mothers lacked awareness of the benefits of vitamins, expressing a sense of being inadequately informed by health professionals. *"I didn't know all the information on there, I didn't know the mother was supposed to take some. I didn't know there was a difference between breast milk and formula"* (focus group 3, participant 1) [Quote Brogan-Hewitt 2021, p. 7]	Moderate concerns1	No or very minor concerns	No or very minor concerns	No or very minor concerns	MODERATE
Subtheme B4.4. Understanding the information						
2 studies Brogan-Hewitt 2021 General qualitative inquiry with focus groups and telephone interviews	Two studies reported that some young women felt that they stopped taking supplements early as they were concerned about safety. Some parents and caregivers struggled to interpret information on vitamin D supplementation methods and doses. Additionally, many parents and caregivers	Moderate concerns[1]	No or very minor concerns	Minor concerns[2]	No or very minor concerns	MODERATE

Study information	Description of review finding	CERQual Quality Assessment				
		Methodological limitations	Coherence of finding	Adequacy	Relevance of evidence	Overall confidence
N = 15. Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	did not recognise the micrograms symbol 'µg,' with some having seen it on vitamin packaging, while others had never encountered it before. *"Especially with this symbol here, I've seen it on vitamins [sic], but you would always step back and wonder, whereas all they have to do is get a vitamin D supplement"* (focus group 2, participant 1) [Quote Brogan-Hewitt 2021, p. 7]					
Subtheme B4.5. Food marketing and other commercial determinants						
2 studies Day 2019 General qualitative inquiry with focus groups. N=18 women Rundle 2018* General qualitative inquiry with semi-structured interviews N = 34.	Two studies reported that some young women found multi-vitamins and fish oil supplements expensive, but the premium packaging and marketing made them question if they were better than folic acid or Healthy Start vitamins alone. Some parents expressed various challenges, including a lack of awareness about available options of vitamin D fortified products, insufficient labelling of vitamin D content, and concerns about meeting child's daily requirements. Additionally, they had concern about barriers, such as limited availability of suitable products for babies/toddlers, worries about product healthiness (for example, high sugar content), pricing considerations, fear of potential overdosing with supplement use. Perceived false perception of the lack of need for fortified products, habitual buying patterns prioritising factors, such as sugar content when deciding to buy food, preventing them from buy fortified products vitamin D. *"If they were advertised in a way where you could clearly see that they had vitamin D in. I think the problem with fortified foods in general is it is hard to trail through the back of the product and it can be really quite small on the packaging. If it was a bit clearer on the packaging that would be good, it would save a bit of time"* (parent, interview 4) [Quote: Day 2019, p. 10]	Moderate concerns[1]	No or very minor concerns	Minor concerns[3]	No or very minor concerns	MODERATE

HSV: Healthy Start vitamins.

**Study includes folic acid consumption among other supplements*
1 Moderate concerns about methodological limitations as per CASP qualitative checklist
2 Studies contributing to the theme offer moderately rich data
3 Studies contributing to the theme offer some rich data

Appendix G Economic evidence study selection

Study selection for: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

This was a qualitative review question, therefore economic evidence was not relevant and thus no economic evidence searches were conducted.

Appendix H Economic evidence tables

Economic evidence tables for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

This was a qualitative review question, therefore economic evidence was not relevant.

Appendix I Economic model

Economic model for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

No economic analysis was conducted for this review question.

Appendix J Excluded studies

Excluded studies for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

The excluded studies list below includes references for both folic acid and vitamins sections of the review question.

Excluded qualitative studies

Table 11: Excluded studies and reasons for their exclusion

Study	Code [Reason]
Barker, M, D'Angelo, S, Ntani, G et al. (2017) The relationship between maternal self-efficacy, compliance and outcome in a trial of vitamin D supplementation in pregnancy. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 28(1): 77-84	- Data not reported in an extractable format or a format that can be analysed *Study focused on experience of taking part in the primary trial (cholecalciferol vs placebo).*
Cawley, S., Mullaney, L., McKeating, A. et al. (2016) An analysis of folic acid supplementation in women presenting for antenatal care. Journal of public health (Oxford, England) 38(1): 122-129	- Setting not relevant to this review protocol *Study was conducted in Ireland.*
Doolan, A.; Cousins, J.; Sheridan-Pereira, M. (2012) Vitamin D supplementation in babies. Opinions of mothers. Irish Medical Journal 105(1)	- Setting not relevant to this review protocol *Study was conducted in Ireland.*
Khanom, Ashrafunnesa, Hill, Rebecca A, Morgan, Kelly et al. (2015) Parental recommendations for population level interventions to support infant and family dietary choices: a qualitative study from the Growing Up in Wales, Environments for Healthy Living (EHL) study. BMC public health 15: 234	- Study design not relevant to this review protocol *Study does not focus on vitamins.*
Marvin-Dowle, Katie (2020) Exploring the need for additional nutritional support in adolescent pregnancies. Dissertation Abstracts International: Section B: The Sciences and Engineering 81(5b): no-specified	- Not a peer-reviewed publication *Doctoral thesis.*

Study	Code [Reason]
McFadden, Alison, Green, Josephine M, Williams, Victoria et al. (2014) Can food vouchers improve nutrition and reduce health inequalities in low-income mothers and young children: a multi-method evaluation of the experiences of beneficiaries and practitioners of the Healthy Start programme in England. BMC public health 14: 148	- Study design not relevant to this review protocol *Study focuses on Heathy start vouchers exchanged to heathy food choices rather than vitamins and vitamin evaluation.*
Morris, T, Strommer, S, Vogel, C et al. (2020) Improving pregnant women's diet and physical activity behaviours: the emergent role of health identity. BMC pregnancy and childbirth 20(1): 244	- Study does not contain an information relevant to this review protocol *Study is on lifestyle intervention and neither focuses on folic acid nor vitamin supplements.*
Ngongalah, L., Rankin, J., Rapley, T. 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): 1017	- Systematic review used as source of primary studies *Screened for relevant references. None of the studies in the review met our review protocol criteria.*
Oliver, E M, Grimshaw, K E C, Schoemaker, A A et al. (2014) Dietary habits and supplement use in relation to national pregnancy recommendations: data from the EuroPrevall birth cohort. Maternal and child health journal 18(10): 2408-25	- Study design not relevant to this review protocol *Cohort study: questionnaire.*
Ortiz-Andrellucchi, Adriana, Doreste-Alonso, Jorge, Henriquez-Sanchez, Patricia et al. (2009) Dietary assessment methods for micronutrient intake in pregnant women: a systematic review. The British journal of nutrition 102suppl1: 64-86	- Systematic review used as source of primary studies *Screened for relevant references. None of the studies in the review met our review protocol criteria.*
Ortiz-Andrellucchi, Adriana, Henriquez-Sanchez, Patricia, Sanchez-Villegas, Almudena et al. (2009) Dietary assessment methods for micronutrient intake in infants, children and adolescents: a systematic review. The British journal of nutrition 102suppl1: 87-117	- Systematic review used as source of primary studies *Screened for relevant references. None of the studies in the review met our review protocol criteria.*
Stelle, Isabella, Venkatesan, Sruthi, Edmond, Karen et al. (2020) Acknowledging the gap: a systematic review of micronutrient supplementation in infants under six months of age. Wellcome open research 5: 238	- Systematic review used as source of primary studies *Screened for relevant references. None of the studies in the review met our review protocol criteria.*

Excluded economic studies

This was a qualitative review question, therefore economic evidence was not relevant.

Appendix K Research recommendations – full details

Research recommendations for review question: What are the facilitators and barriers to increasing the uptake of government advice for women and families with children up to five years in the following areas: folic acid supplements (including before pregnancy) and vitamin supplements (including Healthy Start vitamins)?

No research recommendations were made for this review question.