

## Review Article

# Barriers and facilitators to healthy gestational weight gain amongst pregnant women from ethnic minority groups: A systematic search and narrative synthesis

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## ABSTRACT

**Background:** Excessive weight gain can be detrimental to the health and wellbeing of both mother and child. There is evidence that women from ethnic minority groups are more likely to gain excessive weight during pregnancy. For the purpose of this review, ethnic minority women are defined as those with different national or cultural traditions from the main population.

**Aim:** Our aim was to identify barriers and facilitators to healthy gestational weight gain in pregnant women in ethnic minority groups.

**Methods:** Databases searched were MEDLINE, CINAHL, PsycInfo and PsycArticles between 2011 and 2022. Inclusion criteria were empirical studies of any method considering gestational weight gain in ethnic minority women published in English. Data were extracted according to aim, participants, methods, and findings in relation to barriers and facilitators. Included papers were assessed for quality according to relevant Joanna Briggs Institute checklists.

**Findings:** Twenty-six studies were identified. Five themes were revealed: (1) knowledge and beliefs, (2) cultural and social influences, (3) confidence, (4) physical experiences, and (5) personal and environmental factors.

**Discussion:** Some barriers and facilitators were relevant to all groups and others were more specific to ethnic minority groups. The latter included social and cultural influences, which were reported extensively. Our search was comprehensive, although it is possible we may not have captured all relevant papers.

**Conclusion:** We recommend that the barriers and facilitators identified here are considered in designing future, or adjusting current, health care practitioner mediated interventions to support healthy gestational weight gain in ethnic minority women.

## Introduction

## Statement of significance

<i>Problem or issue</i>	Excessive weight gain during pregnancy is linked with poorer health outcomes for the mother and baby.
<i>What is already known</i>	Evidence suggests that women from ethnic minority groups are more likely to gain excessive weight during pregnancy.
<i>What this paper adds</i>	This paper summarises current findings in relation to the barriers and facilitators to healthy gestational weight gain amongst women from ethnic minority groups. Key barriers included cultural preferences for a larger body size, food norms, expectations of other household members and socio-cultural myths, e.g. that pregnancy cravings must be satisfied to prevent unpleasant incidents.

The risks associated with excessive gestational weight gain (GWG) and obesity during pregnancy are well-documented. The former include an increased risk of caesarean delivery (de Oliveira Reis et al., 2019; Goldstein et al., 2017), longer labour induction (Brewton et al., 2023) and pregnancy-related hypertension (Dude et al., 2021). There is evidence that women with obesity during pregnancy have an increased risk of foetal acidosis (high levels of acid in the unborn child's blood) (Cardona-Benavides et al., 2022) and a greater need for neonatal intensive care (Saini et al., 2018). Obesity during or prior to pregnancy has also been correlated with an increased risk of cerebral palsy in children (Hu et al., 2023), lower IQ scores amongst children

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(England-Mason et al., 2023), asthma in children (Liu et al., 2020; Rosenquist et al., 2023) and obesity in childhood (Heslehurst et al., 2019).

Women from ethnic minority groups in this paper are defined as those with different national or cultural traditions from the main population. There is evidence that they are more likely to experience: (1) overweight or obesity, (2) excessive gestational weight gain, and (3) adverse health outcomes related to weight. However, there are variations in the relationship between ethnicity and GWG. For instance, a population-based study in Sweden identified a significantly greater risk of excessive GWG amongst women born in Central Europe, Eastern Europe and Central Asia compared with those born in Sweden. However, women born in Sub-Saharan Africa had a greater risk of inadequate GWG compared with women born in Sweden (Henriksson et al., 2020). Furthermore, some ethnic minority groups are more prone to the complications of GWG. For example, South Asian women have shown a higher prevalence of diabetes in pregnancy at a lower BMI threshold compared with the general population in England (Nishikawa et al., 2017) and Canada (Read et al., 2021). Furthermore, the absence of Asian-specific BMI thresholds in antenatal settings (Denison et al., 2019; NICE, 2010) suggests that the prevalence of obesity in pregnancy amongst these groups may be higher than standard BMI criteria suggest (Daida and Pedula, 2023). A previous review identified barriers and facilitators to healthy GWG amongst all women such as interactions with healthcare professionals and feelings of stigmatisation (Escañuela Sánchez et al., 2022). However, there is a need to understand ethnically specific barriers and facilitators to women achieving healthy GWG. The aim of this review is to address the question: What are the barriers and facilitators associated with healthy GWG as reported by women from ethnic minorities?

## Methods

The review was conducted as part of a PhD study to inform the subsequent research stages. Therefore, the protocol was not registered but realised through following the methods outlined below. A narrative review (Ferrari, 2015) was conducted according to (1) systematic search, (2) data extraction, (3) quality appraisal, and (4) narrative synthesis using thematic analysis (Clarke et al., 2015).

### Search strategy

This review considered studies with women from ethnic minority groups, which were defined as those with different national or cultural traditions from the main population (American Psychological Association, 2020). We included papers reporting women's barriers and facilitators to healthy GWG.

The electronic databases searched using PRISMA methodology (Page et al., 2021) were American Psychological Association (APA) PsycArticles, APA PsycInfo, Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete, and Medical Literature Analysis and Retrieval System Online (MEDLINE) as this combination was considered likeliest to capture all relevant papers. The search was conducted on 12th April 2021 and updated on 11th April 2022.

The search strategy included the following terms related to the review question: (*pregna\**) AND (*attitude\** or *belief* or *percept\** or *view\** or *experience\** or *barrier* or *facilitator*) AND (*obes\** or *weight* or *diet* or *nutrition\**) AND (*ethni\** or *cultur\** or *Asian* or *India\** or *Pakistan\** or *Bangladesh\** or *Chin\** or *Black* or *Africa\** or *Caribbean* or *Arab\** or *Latin\** or *Hispanic* or *migra\** or *minorit\** or *BME* or *BAME*). The terms BME and BAME refer to individuals from Black and Minority Ethnic and Black, Asian and minority ethnic groups. The use of these acronyms helped to ensure a comprehensive search of studies exploring the views of women from ethnic minority backgrounds. However, they remain contested terms that often mask disparities for specific ethnic groups and are no longer used in UK government (Commission on Race and Ethnic

Disparities, 2021).

An initial scoping review revealed that many studies did not report the ethnic category of participants in the abstract. Consequently, a full-text search was applied to the key words related to ethnic minorities. For inclusivity Office for National Statistics (Office for National Statistics, 2016) terms were used alongside broad and colloquial terminology. Backward and forward citation searches of the included studies were also conducted. This involved screening the reference lists for relevant studies and identifying relevant articles that cited the included papers in Google Scholar.

### Eligibility

Table 1 provides a summary of the inclusion and exclusion criteria.

### Study selection

All identified citations were uploaded to Microsoft Excel and duplicates were removed. Titles, abstracts and full texts were independently screened by two reviewers. Where there were disagreements, these were resolved through discussion with a third author. A summary of the study selection process is provided in Fig. 1.

### Data extraction and quality assessment

Data were extracted using a bespoke spreadsheet which captured the aim, participants, study design, findings and exceptions to quality following appraisal. Table 2 summarises included studies. Eligible studies were critically appraised for methodological quality using the Joanna Briggs Institute critical appraisal tools (Moola et al., 2017). These included the qualitative checklist (Francis, 2022) (including stated philosophical perspective and methods, congruity between methods and research question, analysis and results, researcher positionality and influence, representation of participant voices, ethics, and conclusion's representation of data), and the checklist for analytical cross-sectional studies (Moola et al., 2017) (including clarity of inclusion criteria, sufficiency of detail in description of participants and setting, validity and reliability of exposure measurement, identification of confounding factors and strategies to deal with these, and validity and reliability of outcomes measured). For comprehensiveness all studies were included irrespective of quality. Assessment of risk of bias was not conducted due to largely qualitative nature of the studies.

### Analysis and synthesis of the findings

We undertook an inductive thematic analysis of barriers and facilitators using the six stages of Braun and Clarke (2006) (familiarisation with the data, initial code generation, searching for themes, reviewing themes, defining and naming themes, and producing the report).

**Table 1**  
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Empirical studies using any method including literature reviews to ensure a comprehensive overview	Non-empirical studies (including editorials and opinion papers)
Obesity during pregnancy/gestational weight gain	Women in the postnatal/post-partum stage
Women from an ethnic minority	
Published from 2011 - 2022 (comprehensive yet contemporary)	
Published in English language	Focus of paper is on medical complications

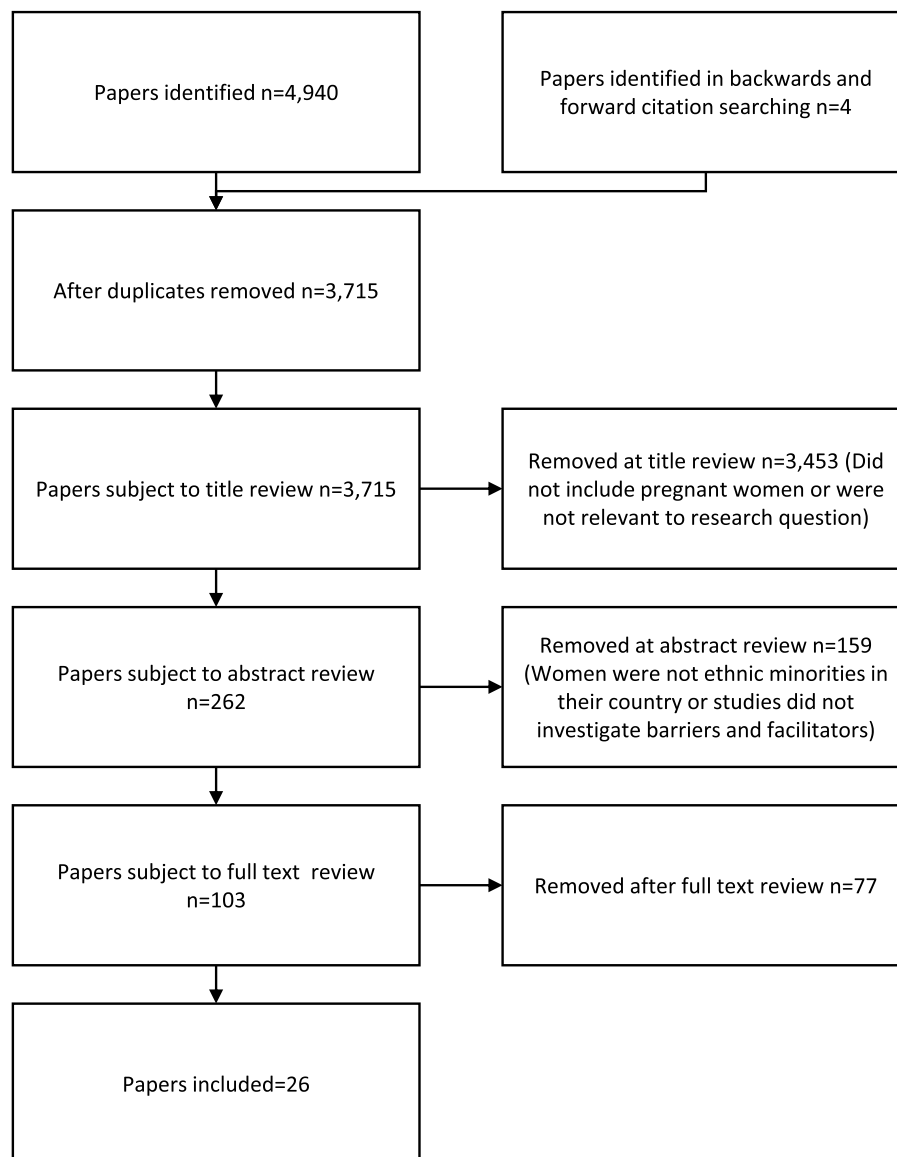


Fig. 1. PRISMA flow diagram of the study.

## Findings

In total 26 papers were included (see PRISMA diagram Fig. 1). Details relating to study characteristics, findings and exceptions are summarised in table 2.

### Study characteristics

Twenty-six papers were included. Studies were conducted in the USA ( $n = 19$ ), Canada ( $n = 3$ ), Singapore ( $n = 3$ ), and England ( $n = 1$ ). Most studies focused on African American women ( $n = 10$ ). Eight papers considered women from low-income groups. Eleven studies conducted interviews, whilst nine used focus groups and the remainder used a combination, with two of these including questionnaires.

### Methodological quality

The methodological quality was generally robust, although there was often a lack of explicit theoretical underpinning and reflexivity.

## Themes

The barriers and facilitators associated with healthy GWG amongst women from ethnic minorities were grouped into five themes. These were related to (1) knowledge and beliefs, (2) cultural and social influences, (3) confidence, (4) physical experiences, and (5) personal and environmental factors. Each of these are presented in turn below and summarised in Fig. 2.

### Theme 1: Knowledge and beliefs

This theme related to a lack of knowledge, uncertainty about information sources, and beliefs about the inevitability and impact of excessive weight gain regarding diet and exercise. Women reported a lack of knowledge about appropriate levels of weight gain during pregnancy (Goodrich et al., 2013; Herring et al., 2012; Lindsay et al., 2019). Moreover, one study revealed that some women misunderstood the meaning of BMI (Ngongalah et al., 2021). Healthcare providers' targets for weight gain were perceived as restrictive (Herring et al., 2012). Some women reported receiving limited (Lindsay et al., 2017) or inconsistent or contradictory guidance (Herring et al., 2012; Kominiarek et al., 2015) about healthy weight gain:

**Table 2**  
Summary of included papers.

First author (year)	Aim and participants	Methods	Findings in relation barriers (B)/facilitators (F)	Quality appraisal exceptions
Ayers (2021)	Examine GWG beliefs. Pregnant Marshallese, USA ( <i>n</i> = 33)	Survey and semi-structured interviews	B: Lack of understanding of healthy infant size, practitioner advice and family encouragement, and difficulty in controlling food intake. F: Church and family encouragement of healthy eating/exercise, knowledge of healthy weight, concerns about the impact of excessive GWG.	8/10: Qualitative philosophy or researcher reflexivity
Darroch (2016)	Investigate the understanding GWG. Aboriginal women. Canada ( <i>n</i> = 25)	Focus groups and semi-structured interviews	B: Belief that excessive weight gain is inevitable, normalisation of obesity in the community, lack of family encouragement to exercise, others "eat for two", tiredness, lack of guidance from doctor, lack of culturally tailored care.	10/10
Davis (2021)	Explore exercise perceptions. Pregnant African American /Black women USA ( <i>n</i> = 14)	Questionnaire and semi-structured interviews	B: Misinformation from friends/family, tiredness, depression, self-consciousness of body, safety concerns, unsafe neighbourhood. F: Reminders (e. g. sticky notes), enjoyment, having an exercise partner, support from friends/family, and beliefs of physical and psychological benefits. A nurse-led exercise group was viewed positively.	Questionnaire: 6/6 Interviews: 7/10: Qualitative philosophy, researcher reflexivity
Fletcher (2018)	Explore understanding of healthy GWG. Pregnant Latina women, USA ( <i>n</i> = 50)	Focus groups	B: Lack of eating control and motivation, a belief resisting cravings will harm baby and healthy GWG not linked to baby health, partner food choices, lack of time, cultural practice of large portions, physical symptoms, negative emotions, and poor body image. F: Partner encouragement, positive beliefs, and health behaviour advice.	8/10: Qualitative philosophy or researcher reflexivity
Goodrich (2013)	Explore the barriers and health behaviours influencing GWG, pregnant and post-partum African American women with obesity or classed as overweight. USA ( <i>n</i> = 33)	Semi-structured interviews	B: Distorted perception of optimal weight gain. Fatigue, pain, nausea, and safety concerns impacted exercise. Cravings, availability of fast/unhealthy food influenced diet. F: Safe neighbourhood, enjoyment, beliefs of easier labour impacted exercise. Beliefs about improved baby and woman health influenced diet.	9/10: Qualitative philosophy
Groth (2012)	Understand weight management. Pregnant African American, low-income background women. USA ( <i>n</i> = 26).	Focus groups	B: Belief GWG will benefit baby, influenced by partners and family. Being larger a cultural norm/considered attractive and inevitable. F: Concerns of impact of excessive GWG on appearance and ability to activities.	9/10: Qualitative philosophy
Groth (2013)	Explore exercise and nutrition during pregnancy in pregnant African American. Low-income women. USA ( <i>n</i> = 26)	Focus groups	B: Lack of energy, motivation, time, fear of harming the baby inhibited exercise. Changes in taste, appetite, cravings, lack of belief in doctor impacted diet. F: Encouragement of family and others improved exercise, perceptions of impact on baby impacted diet.	7/10: Qualitative philosophy, researcher reflexivity, not all points supported by data
Groth (2016)	Investigate the factors affecting diet choices of pregnant, low-income African American pregnant women. USA ( <i>n</i> = 25)	Semi-structured interviews	B: Cravings, changed taste in pregnancy, time, finances, lack of understanding. F: Beliefs of benefit to baby, information from practitioners, own mother and internet.	8/10: Philosophical perspective, not all points supported by data.
Hackley (2014)	Explore the barriers to health behaviours in pregnancy in Hispanic and Black nulliparous, pregnant and post-partum women, USA.	Questionnaire ( <i>n</i> = 43) and focus groups (FG) ( <i>n</i> = 15)	Questionnaire: Knowledge and self-efficacy scored highly but <50 % engaged in diet and exercise behaviours. B in FGs: poor knowledge, physical symptoms, and lack of resources (e.g. high quality foods).	Questionnaire 6/6 Focus group 8/10: Qualitative philosophy, researcher reflexivity
Herring (2012)	Investigate the perceptions of GWG in pregnant, low-income, African American women. USA ( <i>n</i> = 31)	Focus groups	B: Increased hunger, belief eating and high GWG healthy and beneficial for baby, lack of eating control, pressure from families to eat more, practitioner set weight targets seen as restrictive, lack of consistent advice, social influence of women's mothers over practitioners, GWG considered attractive. F: Perception of negative health outcomes of high weight gain.	9/10: Qualitative philosophy
Kandasamy (2021)	Understand the perceptions of diet and exercise during pregnancy amongst pregnant or recently pregnant South Asian women. Canada ( <i>n</i> = 10)	Semi-structured interviews and focus groups	B: Lack of time, poor advice from older relatives, cultural food practices. F: Feelings of control, advice from friends and practitioners. Women suggested practitioners provide diet and exercise advice in the first trimester and raise community awareness.	10/10
Kominiarek (2015)	Explore the GWG perceptions and strategies in pregnant Black ( <i>n</i> = 16) Hispanic ( <i>n</i> = 2) women, USA.	Focus groups	B: Beliefs of lack of control over GWG, time (cooking), and cultural practices (e.g. family expect fried not baked). Suggestions for interventions: group-based diet and exercise support, acknowledgement of the role of mental health in GWG, and improved provider support.	7/10: Qualitative philosophy and not all points are supported with data

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Table 2 (continued)

First author (year)	Aim and participants	Methods	Findings in relation barriers (B)/facilitators (F)	Quality appraisal exceptions
Krans (2011)	Identify barriers and facilitators to exercise amongst pregnant, low-income African American women. USA ( $n = 34$ )	Focus groups	B: Physical symptoms, lack of time, funds, facilities, and information about safe exercises from practitioners. Perception exercise not fitting culture. Suggestions: group-based classes to facilitate social support, affordable facilities, and childcare provision.	7/10: Qualitative philosophy, researcher reflexivity
Krans (2012)	Explore the exercise beliefs of African American pregnant women, USA ( $n = 34$ )	Focus group discussions	Although exercise during pregnancy was generally viewed as beneficial, there was a belief that some activities could cause problems.	8/10: Qualitative philosophy, researcher reflexivity
Kroeger (2019)	Explore the reasons for late-night eating during pregnancy and solutions among low-income Black women with obesity or classed as overweight. USA ( $n = 18$ )	Focus group discussions	B: Physical symptoms, "baby hunger", habit, influence of household members, time negates the need to share food with family members, convenience, and considered an appropriate time to consume sweet foods. F: Perceived risk to child.	10/10
Ku (2022)	Understand the barriers and facilitators to engaging in a lifestyle intervention amongst pregnant Chinese ( $n = 9$ ), Indian ( $n = 4$ ) or Malay ( $n = 2$ ) women with obesity or classed as overweight in Singapore	In-depth interviews	B: Time for exercise or cooking, lack of knowledge, culturally tailored information resources. F: Beliefs about health of the baby, support from family and partner, access to a peer support group, practical guidance on diet and exercises. Suggestions: a single platform/app for information on preconception, pregnancy and post-partum with reminders, classes, monitoring, support, and activities to do with partner.	9/10: Qualitative philosophy
Lau (2018)	Gain insight into preferences for a healthy lifestyle mobile app for pregnant Malay ( $n = 6$ ), Indian ( $n = 4$ ), Chinese ( $n = 3$ ), other ( $n = 1$ ) women with obesity or classed as overweight in Singapore.	Semi-structured interviews	Content: Culturally tailored diet plans specific to pregnancy, multiple content (diet, exercise, weight management), credible source and current information, online communication with practitioners, peer support discussion forums, weight monitoring, and food diary. Appearance: attractive, visual, user-friendly, interactive, and multimedia (e.g. videos, and quizzes)	8/10: Qualitative philosophy, researcher reflexivity
Lee (2016)	Explore the influence and strategies for changes Central American Immigrant (CAI) pregnant ( $n = 20$ ) or postpartum ( $n = 10$ ) women make to their diet. USA	In-depth interviews	Influencers were family (wanting to see children grow up) and beliefs of GWG risks. Strategies included capitalising on women's feeling toward family, their wish to provide the best chance for their family in a new country and raising awareness of risks for baby.	10/10
Lindsay (2017)	Explore first pregnancy Latina (Hispanic or Brazilian) women's experiences of communicating with primary healthcare providers about GWG and exercise. ( $n = 23$ ) USA	Semi-structured interviews	B: Limited advice and a lack of concern about GWG and exercise. They relied on multiple sources of information (e.g. internet, books, friends, and family), and experienced discomfort when discussing weight gain with practitioners through an interpreter.	8/10 Qualitative philosophy, researcher reflexivity
Lindsay (2019)	To explore first pregnancy Latina (Hispanic or Brazilian) women's beliefs, attitudes, and experiences of communicating with primary healthcare providers about GWG and exercise. USA ( $n = 23$ )	Semi-structured interviews	B: Acceptance, uncertainty, and feelings of a lack of control re GWG. Friends and family endorsement of eating in pregnancy and socio-cultural beliefs (e.g. bad things happen if cravings are not satisfied). F: Women expressed concerns for baby's health and their appearance.	8/10: Qualitative philosophy or researcher reflexivity
Nagourney (2019)	Understand the perceptions of diet and exercise amongst pregnant, obese, low-income obese African American women. USA ( $n = 21$ )	Semi-structured interviews	B: Cravings for unhealthy food, appetite changes, tiredness, cost of healthy food, reliance on internet advice, and uncertainty in information sources (practitioners and internet). Self-efficacy with GWG and support of friends/family was variable. F: Baby's health and awareness of importance of healthy eating and portion sizes.	10/10
Ngongalah (2021)	Explore the perspectives of African migrant women regarding pre- and post-migration influences on GWG. England ( $n = 23$ ; 5 were pregnant at the time, 9 < 12 months post-partum and 9 over 12 months post-partum)	Semi-structured interviews	B: Fast food alluring, aggravated by bad weather (need for convenience), influence of household, friends and relatives (sometimes positive), greater access to vehicles, lack of time and more mechanised appliances. Cultural views that exercise is sport for men and larger size is preferable. Practitioner's advice difficult to relate to cultural food practices and a conflict between African and Western exercise advice. F: Growing awareness of risks of high GWG and cost of fast food.	9/10: Qualitative philosophy
Quintanilha (2016)	Explore determinants of diet and exercise in Northeast African migrant women during pregnancy and post-partum. Canada ( $n = 80$ )	Focus groups	B to diet: Lack of social and financial support, low-cost fast foods, lack of time, tiredness, weather prohibits growing fruit and vegetables. B to exercise: Weather, cost, lack of time.	8/10: Qualitative philosophy, researcher reflexivity
Reyes (2013)	Explore factors influencing diet of low-income African American pregnant women who are classed as overweight. USA ( $n = 21$ )	Semi-structured interviews	B: Lack of knowledge, belief eating more benefits baby, pressure from friends/ family to eat more, reduced control over food shopping due to living in multigenerational households, access to healthy	9/10: Qualitative philosophy

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Table 2 (continued)

First author (year)	Aim and participants	Methods	Findings in relation barriers (B)/facilitators (F)	Quality appraisal exceptions
Shum (2022)	Explore views on exercise among pregnant and post-partum Malay (n = 12), Chinese (n = 8), Indian (n = 1) and Filipino (n = 1) women in Singapore.	Semi-structured interviews	food, and tiredness. F: Motivation due to beliefs about dietary impact on baby. B: Housework considered enough exercise, demanding job, physical symptoms, discouragement from family members, lack of information from practitioners, fear of harming baby, and time. F: Beliefs relating to health benefits for mother and baby and easier delivery, and encouragement from friends, family, and practitioners. Suggestion – information brochure.	8/10: Qualitative philosophy researcher reflexivity
Wang (2015)	Explore the factors linked with excessive GWG amongst Latina pregnant women of different pre-pregnancy BMI categories. USA (n = 62)	Semi-structured telephone interviews	B: Emotional eating, low levels of control over eating, and cravings. Time, family eating patterns, conflicting advice, practitioner advice hard to follow, acceptability of high GWG, beliefs that GWG resulted in healthier pregnancies and babies, and they would lose the pregnancy weight after childbirth.	9/10: Qualitative philosophy

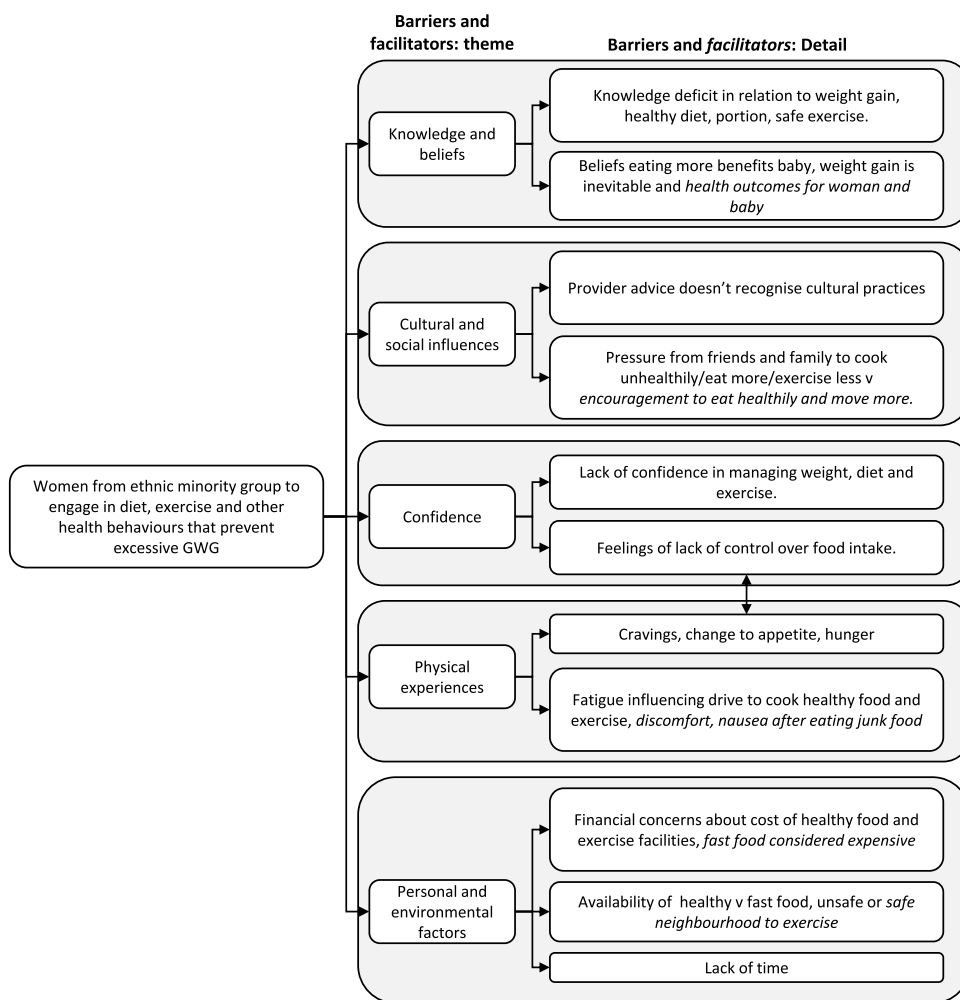


Fig. 2. Summary of barriers and facilitators.

“I feel like I am gaining a lot more weight now [33 weeks pregnant], but my doctor never really says anything about my weight gain being bad. I don't ask either. If he doesn't say anything, I don't feel like asking.” (Lindsay et al., 2017 (p 6))

There was a gap in some women's knowledge about what constitutes a healthy diet, which revealed a lack of awareness of nutrition and portion sizes (Groth et al., 2016; Hackley et al., 2014). Some women

indicated misconceptions, for example, viewing pregnancy as the right time to consume sweet foods (Kroeger et al., 2019) or that their hunger or food preferences were attributable to the baby (Herring et al., 2012; Kroeger et al., 2019; Wang et al., 2015): “But I just can't help it. I just keep eating and eating, and then what makes it so bad is the baby never gets full” (Herring et al., 2012 (p 1839)). A range of beliefs were expressed. For example, some adhered to the old adage that they needed

to “eat for two” (Darroch and Giles, 2016) and expressed a benefit of weight gain to the baby: “For me the more you gain the healthier you feel and [the healthier] the baby is. This is the only time that you can splurge.” (Wang et al., 2015 (p 815)). Weight gain was considered by some as inevitable and a product of factors such as age, hormones and genetics (Groth et al., 2012). Conversely, having an awareness of the health risks associated with excessive GWG and an understanding of the importance of healthy eating and sensible portion sizes served as a facilitator of a healthy diet (Lee, 2016; Nagourney et al., 2019). An example is provided below:

*“I started to take them [changes] more seriously since I am pregnant again because I want everything to go well for me...if I am well my baby will be too. If I don't take care of myself there is a risk that I can pass something to my baby.” (Lee, 2016 (p 107))*

Some women expressed concerns about the safety of exercise during pregnancy (Davis et al., 2021; Goodrich et al., 2013; Krans and Chang, 2012), whereas others reported an awareness that being active may contribute to a simpler labour (Davis et al., 2021; Goodrich et al., 2013; Shum et al., 2022) or benefit the baby's health (Krans and Chang, 2011; Shum et al., 2022). As with diet some women reported a lack of guidance from providers about safe exercise during pregnancy (Krans and Chang, 2011). When given, guidance on weight and exercise was generally trusted (Ngongalah et al., 2021).

When asked about content of information, women wanted examples of healthy food choices (Kominiarek et al., 2015), practical advice on managing cravings (Wang et al., 2015) and a focus on healthy behaviours rather than advice on weight gain (Fletcher et al., 2018). They reported preferences for advice in the first trimester (Kandasamy et al., 2021), delivered by health practitioners, online, and in apps (Lau et al., 2018). Whilst some women considered leaflets unsuitable (Ngongalah et al., 2021), others stated that these had an influence on their food choices (Groth et al., 2016).

### Theme 2: Cultural and social influences

In some instances, there were cultural preferences for larger body sizes, particularly among families and partners of African women (Groth et al., 2012; Ngongalah et al., 2021). Similarly, some women aspired to be bigger, particularly slimmer women (Herring et al., 2012): “I want some [weight] I'm all tiny. I want big boobs like everybody else” (Herring et al., 2012 (p 1840)). In contrast, other African women reported desiring a smaller body size with increasing socialisation in Western culture (Ngongalah et al., 2021). There was also evidence that women encountered social and cultural barriers to healthy dietary patterns. For instance, some women felt pressure to cook fried foods, arising from South American norms and the expectations of household members (Kominiarek et al., 2015). One study with Latina women uncovered socio-cultural myths that pregnancy cravings must be satisfied to prevent unpleasant incidents (Lindsay et al., 2019).

Women frequently reported that their friends and families pressurised them to eat more during pregnancy (Herring et al., 2012; Lindsay et al., 2019; Ngongalah et al., 2021; Reyes et al., 2013). One example is: “I don't force myself to eat, my mom be trying to do that. She be like, ‘T—you gotta eat something’...I be like mom, it's gonna make me sick.” (Herring et al., 2012 (p 1839)). Family-level influences also included a preference for fast food or rich meals (Fletcher et al., 2018; Kroeger et al., 2019; Ku et al., 2022; Reyes et al., 2013; Wang et al., 2015). However, there were several instances in which women's social networks served as facilitators of healthy eating. For example, African migrant women described connections with their identity and family as reasons for traditional cooking practices (Ngongalah et al., 2021), whilst Central American immigrant women linked a healthy diet with the likelihood of seeing their children grow up (Lee, 2016). Additionally, food choices were positively influenced by friends and family (Kandasamy et al., 2021; Kroeger et al., 2019; Nagourney et al., 2019; Ngongalah et al., 2021). This is illustrated in the following example: “She was,

like, ‘No more sodas, no more sodas.’ She'd see me with a soda, she would take it and she'd call my boyfriend.” (Kroeger et al., 2019 (p 602)).

Similar cultural and social barriers were described for exercise. These included a lack of encouragement or support from family and friends (Darroch and Giles, 2016; Krans and Chang, 2011; Ngongalah et al., 2021), and concerns about the impact on the baby (Ngongalah et al., 2021; Shum et al., 2022). An example of the latter is: “They say that if a pregnant woman is doing a lot of things, like bending down to wash things, ... walking for a long distance, it can cause miscarriage or make the baby come before time” (Ngongalah et al., 2021 (p 12)). Conversely, some women reported being encouraged to exercise by their family and partners (Davis et al., 2021; Groth and Morrison-Beedy, 2013; Kandasamy et al., 2021; Shum et al., 2022), whilst others reported the enabling effect of having an exercise partner (Davis et al., 2021; Groth and Morrison-Beedy, 2013; Shum et al., 2022).

Women often regarded advice from providers as disconnected from cultural practices (Darroch and Giles, 2016; Ngongalah et al., 2021) and financial constraints (Quintanilha et al., 2016). One woman shared: “When the midwife says eat more . . . vitamin complex or whatever . . . I don't know if my eba and egusi soup has that or not [laughs]” (Ngongalah et al., 2021 (p 10)). Social and cultural norms influenced what women thought would be helpful in supporting healthy GWG. These included group-based classes in cooking or exercise (Kominiarek et al., 2015; Krans and Chang, 2011; Ngongalah et al., 2021; Wang et al., 2015), sharing knowledge across communities to reduce pressure to eat excessively at social gatherings (Kandasamy et al., 2021) and the inclusion of partners (Ku et al., 2022).

### Theme 3: Confidence

Women described a lack of confidence in their ability to manage weight despite knowing how (Lindsay et al., 2019). This often stemmed from a perceived lack of control over food intake (Fletcher et al., 2018; Herring et al., 2012; Nagourney et al., 2019) or weight (Kominiarek et al., 2015; Lindsay et al., 2019; Nagourney et al., 2019; Wang et al., 2015). For example, one woman reported: “Throughout my pregnancy I have tried as much as possible to watch what and how much I eat, but no matter what I do, I keep gaining a lot of weight . . . I feel it's beyond my control.” (Lindsay et al., 2019 (p 9)). Some women described late-night eating with no underlying reason (Kroeger et al., 2019). Furthermore, self-consciousness about appearance led to a decline in mental health for some (Davis et al., 2021; Fletcher et al., 2018; Lindsay et al., 2019). However, for others it was a motivator to exercise: “I don't want this baby weight on me, you know. I want to exercise so that's my fear about weight gain during pregnancy” (Groth et al., 2012 (p 7)). In some instances, women reported self-efficacy in managing diet or physical activity (Kandasamy et al., 2021; Nagourney et al., 2019).

### Theme 4: Physical experiences

Women reported various physical experiences including those that were diet-related, such as cravings and changes in taste or appetite (Goodrich et al., 2013; Groth and Morrison-Beedy, 2013; Groth et al., 2016; Hackley et al., 2014; Herring et al., 2012; Nagourney et al., 2019; Wang et al., 2015). Fatigue was also a common barrier (Quintanilha et al., 2016; Reyes et al., 2013), and was linked with a reduced motivation to make healthy food choices. Furthermore, physical experiences such as foetal movement, hunger and nausea during the day were reported as triggers of late-night eating (Kroeger et al., 2019). Other women stated that physical symptoms such as nausea and heartburn helped to prevent over-eating and their consumption of unhealthy foods (Herring et al., 2012; Reyes et al., 2013). Some examples of these include: “All the sodas that I drink, it brings the acid reflux. So therefore I can't drink it . . . so now I'm left to drink water” (Herring et al., 2012 (p 1841)) and: “[I used to eat] a lot of processed foods, fried foods, but now, I can't even take fried foods. I'll have heartburn for hours, and it's just horrible” (Reyes et al., 2013 (p 1177)). There was also evidence that

physical symptoms hindered women's ability to remain active. Examples of these included tiredness (Darroch and Giles, 2016; Davis et al., 2021; Goodrich et al., 2013; Groth and Morrison-Beedy, 2013; Kandasamy et al., 2021; Krans and Chang, 2011; Nagourney et al., 2019; Shum et al., 2022), pain (Goodrich et al., 2013; Krans and Chang, 2011), nausea (Goodrich et al., 2013) and challenges with mental health (Davis et al., 2021).

#### Theme 5: Personal and environmental factors

Women's personal resources often served as barriers to healthy eating. Examples include a lack of time to cook meals (Fletcher et al., 2018; Groth et al., 2016; Kominarek et al., 2015; Ku et al., 2022; Quintanilha et al., 2016; Wang et al., 2015) and financial concerns regarding the cost of healthy food (Groth et al., 2016; Nagourney et al., 2019; Quintanilha et al., 2016; Reyes et al., 2013). These are highlighted in the following extracts: "I can cook, but when I'm coming home at 9:00 at night and I gotta feed my family, we gonna stop and get something to eat if I got anything to do with it" (Kominarek et al., 2015 (p 1702)) and "Healthy stuff adds up ... why is a double cheeseburger a dollar but a salad, five? Like wait a minute that doesn't make sense to me" (Nagourney et al., 2019 (p 2233)). Conversely, others regarded fast food as a costly purchase, which prompted reduced consumption (Ngongalah et al., 2021). Physical activity was discussed in relation to similar barriers, namely a lack of time due to work and/or family commitments (Groth and Morrison-Beedy, 2013; Kandasamy et al., 2021; Krans and Chang, 2011; Ku et al., 2022; Ngongalah et al., 2021; Quintanilha et al., 2016; Shum et al., 2022) and financial constraints in accessing gyms or exercise facilities (Krans and Chang, 2011; Quintanilha et al., 2016). Environmental barriers to healthy eating included the availability and accessibility of fast food (Goodrich et al., 2013; Ngongalah et al., 2021; Quintanilha et al., 2016) and limited access to affordable healthy food (Hackley et al., 2014; Quintanilha et al., 2016; Reyes et al., 2013). Additionally, poor weather was linked with a greater need for convenience, thereby prompting fast food purchases:

*"Walk like 10 or 15 min in that cold? I couldn't. There was one ummm . . . one chicken and chips shop just opposite my house . . . so, it was easy for me to just jump in there, get my food, and jump back out."* (Ngongalah et al., 2021 (p 5)).

Women's perceived environmental barriers to physical activity included limited neighbourhood facilities (Krans and Chang, 2011), concerns about community safety (Davis et al., 2021) and the weather (Darroch and Giles, 2016; Ngongalah et al., 2021; Quintanilha et al., 2016): "And in my neighborhood, half our equipment don't work . . . It's like they want to trick you. Plus, there's nowhere to walk to. There's no parks no more" (Krans and Chang, 2011 (p 784)). Some women cited living in a safe neighbourhood and the availability of parks as facilitators of being physically active (Goodrich et al., 2013). African American participants suggested a need for more affordable exercise facilities, ideally with childcare available (Krans and Chang, 2011).

#### Discussion

This narrative review is the first to have systematically identified published barriers and facilitators to healthy GWG in ethnic minority groups. We included 26 papers and the methodological quality was generally robust. Key themes were (1) knowledge and beliefs, (2) cultural and social influences, (3) confidence, (4) physical experiences, and (5) personal and environmental factors. Some barriers and facilitators are likely to be relevant to wider groups of women. However, some are largely pertinent to women from ethnic minorities – particularly the social and cultural influences of family groups and practices, and lack of culturally tailored information about food.

There are two previous literature reviews related to GWG in ethnic minority groups. The first considered attitudes to weight management during pregnancy but was limited to women from a Black African

background living in high-income countries (Moore et al., 2021). This similarly highlighted social norms such as preferences for a larger body shape and a lack of confidence in weight management amongst women. The second investigated diet and physical activity amongst pregnant women and those of childbearing age who have migrated from African to high-income countries (Ngongalah et al., 2018). Again, the focus was on African women; only four studies included pregnant women and of these only one considered barriers or facilitators (Quintanilha et al., 2016).

Some of the findings of this review correspond with previous reviews of weight management during pregnancy amongst the general population. For instance, Rockliffe et al. (2021) similarly reported social influences as barriers and enablers of healthy behaviours during pregnancy, whilst the baby's health was a motivator. Furthermore, the need for clearer guidance from health professionals was also reported in a meta-synthesis of studies across high-income countries (Escañuela Sánchez et al., 2022). However, cultural and social influences were more dominant in the current review, which was revealed in numerous accounts of challenges with healthy eating and physical activity.

There were strengths and limitations to our review. It was conducted using the pre-specified methodology and was inclusive and comprehensive. To illustrate, our search strategy and screening process was diligent. However, as with all searches, it is possible we may not have captured all relevant papers. Nevertheless, included papers were of good quality. This additional understanding of the experiences of women from ethnic minority groups may be transferable to other comparable preventative health behaviours.

#### Conclusion

This review has identified several barriers and facilitators to healthy GWG amongst women from ethnic minority groups. Some of these are likely to be relevant to women from all backgrounds, whilst social and cultural influences may be more dominant for those from ethnic minority groups. We know that theoretically underpinned interventions (Craig et al., 2008) that are tailored to address assessed barriers and optimise identified facilitators (Baker et al., 2015) are more likely to be effective than those that are not. We therefore recommend that the barriers and facilitators identified here are considered in designing future, or adjusting current, health care practitioner mediated interventions to support healthy GWG in ethnic minority women. This could be achieved through co-design, which involves collaborative working between the public, practitioners and researchers towards a common goal (Robert et al., 2022). Furthermore, evidence indicates that interventions that are co-designed are considered as useful and acceptable to end-users (Santin et al., 2019).

#### Ethical approval

Not applicable.

#### CRediT authorship contribution statement

**Sereena Raju:** Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Fiona Cowdell:** Conceptualization, Data curation, Validation, Writing – review & editing. **Judith Dyson:** Conceptualization, Data curation, Validation, Writing – review & editing.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.



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## Supplementary materials

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