


Barriers to nutritional pregnancy preparation and support needs in women and men: Qualitative study based on the Theoretical Domains Framework

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Abstract

Purpose: Eating behaviours prior to conception may impact the health of the offspring at birth and throughout life. Women and men of childbearing age often follow a nutritionally poor preconception diet. Nutritional support before pregnancy has the potential to improve the health of future offspring. This study examined barriers to nutritional preparation for pregnancy and perceived support needs of women and men of childbearing age.

Design: Qualitative interviews based on the Theoretical Domains Framework.

Setting: Online.

Participants: Eligible individuals were (1) New Brunswick residents (all genders), (2) over 19 years old, and (3) intended to have offspring in the future.

Methods: Interviews were conducted via online instant messenger and analysed thematically.

Results: Interviews of participants (n = 19, age = 19–23 years, 14 women, 5 men) gave rise to five key theoretical domains: lack of knowledge; lack of beliefs about capabilities; suboptimal environmental context and resources; unfavourable social influences; and restrictive social roles. Suggestions to address pregnancy preparation support needs included healthcare professional consultations; accessible and credible references; increasing access to healthy food; proactive engagement; and gender-specific support.

Conclusion: Women and men called for various types of preconception support to address identified barriers, ranging from healthcare professional advice and credible informational resources to broader interventions such as making healthy food more affordable and normalizing discussion of preconception health throughout the life course.

Keywords

behaviour, behaviour change, nutrition, psychological theory, public health

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Introduction

The 3-month period before conception may impact the health of offspring, both at birth and throughout their lifespan.¹ The ‘Developmental Origins of Health and Disease’ (DOHaD) concept suggests that poor maternal and paternal behaviours before conception can negatively affect gamete function and embryo potential, and increase disease risk in later life.² Conversely, if parental risk factors are mitigated and behaviours are optimized, the embryo can be provided with environmental cues in utero that positively influence long-term health.²

Addressing parental behaviours during preconception presents a key opportunity for preventing non-communicable diseases such as obesity, diabetes, or cardiovascular

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disease in future generations.¹ In addition to substance use behaviours such as smoking tobacco and drinking alcohol, maternal and paternal diet quality in the preconception period can lead to long-term health consequences for the child.² The negative effect of overnutrition and undernutrition in both parents during preconception on the future child's health makes preconception eating behaviours a key area for intervention and support.²

In Canada, minimally nutritious diets are widespread and are promoted by the Canadian food environments that promote nutritionally poor eating.³ Food environments, and other socioeconomic influences, serve as the blueprint for potentially unhealthy behaviours that begin in a prospective parent's youth and often translate into unhealthy behaviours and poor health outcomes by the time young people consider having a child of their own.¹ In 2018, more than half (51.3%) of young adults between 20 and 34 years of age living in Canada were classified as having overweight or obesity, with considerable variation across provinces.⁴ In New Brunswick, for example, the proportion of residents aged 18 years or older who were classified as obese was 35.3%, substantially higher than the Canadian average of 26.8%.⁴

Guidelines by the Canadian government underline healthy eating as a key component to preconception health practices.⁵ Healthy eating includes consumption of vegetables, fruit, whole grains, meat or meat alternatives, low fat milk, fish, and unsaturated oils, and to limit salt, sugar, and processed foods. Moreover, Canadian clinical practice guidelines by Obesity Canada suggest that adult women with obesity who are considering a pregnancy should be provided with behaviour change interventions, including both support to change nutrition and physical activity, to achieve the goal of entering pregnancy with a lower body mass index.⁶ Effective translation of guidelines and recommendations into practice requires the provision of support based on the best available evidence and theories.

Individuals preparing for pregnancy encounter an accumulation of barriers to healthy eating behaviours during their lifetime. Qualitative studies have started to provide in-depth information on barriers to preconception health behaviours. Several qualitative studies suggest that young adults lack a detailed understanding of preconception health,⁷ the importance of preconception health,⁸ and not having specific information about recommendations for pregnancy preparation.⁹ Interview studies by McGowan and colleagues⁸ and Khan and colleagues⁹ suggest that adults are more likely to seek out information online than through a healthcare professional.^{8,9} No qualitative study has comprehensively examined barriers to nutritional pregnancy preparation and support needs in Canadian adults of childbearing age.

Behaviour change interventions at many levels are essential to address barriers to healthy eating and provide

support for change in women and men in the preconception period.¹⁰ This study examined barriers to nutritional preparation for pregnancy and perceived support needs of women and men of childbearing age.

Methods

Design

This descriptive qualitative research, using semi-structured interviews, was based on the Theoretical Domains Framework (TDF).¹¹ The TDF provides a comprehensive list of theory-based explanations of behaviour, which can be used to examine factors that might impede the performance of behaviours.¹² A semi-structured topic guide was created based on the theoretical domains in addition to questions about support needs perceptions (see Supplementary File).

Inclusion criteria

Individuals were included if they were aged 19 years or older, lived in New Brunswick, Canada, did not have children but considered having future children, and could use online instant messenger. No formal exclusion criteria were specified. Participants could win one of two CAD\$50 gift cards.

Recruitment and procedures

Interviews took place between 8 May and 31 May 2020. Recruitment occurred through social media advertisements by posting a recruitment advertisement flyer which read: 'Intend to have a baby sometime in the future? We want to hear from you!'. The flyer then listed inclusion criteria and the 1 in 10 chance of winning a \$50 shopping voucher. Those who indicated interest in participating were contacted by the researcher through instant messenger by sending a participant information sheet outlining the full study details. Participants gave informed consent in form of a typed statement confirming that they have read and understood the information sheet and are willing to participate.

The interviews were conducted remotely through an online instant messaging service provided as part of the social media platform Facebook. A trained female researcher (undergraduate student) conducted semi-structured interviews and received ongoing supervision by an academic Health Psychologist (S.U.D.). Interviews were undertaken via instant messenger through synchronous typing in a single interaction. Interview questions were copied into the instant messenger using the pre-specified topic guide. Participants typed their answers in the chat window, and submitted these to the chat once they considered their reply to be complete. Replies could be submitted

in one block of text, or several sentences and chunks of writing. The interviewer followed up on responses using additional prompts, or posted a further question. Interviews took between 39 and 203 min to complete (median=65). No formal field notes were taken following interviews and transcripts were not returned to participants for further comment. After the interviews were completed, the chat histories were downloaded as transcriptions and anonymized. Following interviews, participants completed a short demographic questionnaire. No personal information was extracted from the social media platform. Data saturation was judged in line with recommendations for theory-driven interview studies,¹³ with the last three interviews not leading to new ideas emerging. The final three interviews did not contribute substantially new ideas indicating saturation. This study received approval from the University of New Brunswick Research Ethics Board (#2020-045).

Analysis

Interview transcriptions underwent thematic analysis in NVivo 12 to identify salient themes. Transcripts were first coded by the first author (F.Q.) using a deductive approach based on the domains listed in the TDF.¹¹ Additional codes were generated to identify suggestions participants made for health interventions, as well as whenever participants discussed preconception experiences and support needs for men. Coding of transcripts involved familiarization followed by line-by-line coding to identify key domains and subthemes. After initial coding to domains, subthemes were identified within each of the TDF domains. All subthemes were defined in a codebook to ensure consistency of coding. Domains were classified as a 'key domain' based on the number of codes generated within a domain and strength of opinion voiced within the codes. Additional codes captured suggestions that participants made about addressing pregnancy preparation support needs. All codes were checked by a health psychologist (S.U.D.) with experience of using the TDF to ensure that the transcriptions were accurately and consistently coded according to framework.

Results

Participants

Nineteen individuals (14 women and 5 men) participated in the study (see Table 1). Participants were educated, holding a high school diploma (n=14) or Bachelor's degree (n=5). Most were university students (n=16), and half were in a relationship (n=8). Participants were between the ages of 18–20 years (n=12) and 21–25 years (n=7) and the majority (n=16) resided in urban areas in New Brunswick (classified as an area with a population of

greater than 50,000). Weight status based on body mass index (BMI) (kg/m²) was classified as normal for most (n=14), with some participants classified as overweight (n=2), obese (n=2), or an unknown weight status (n=1).

Key domains

Each of the 12 theoretical domains was identified within the interview transcriptions. Five domains were judged to be key in the pregnancy preparation process: *knowledge, beliefs about capabilities, environmental context and resources, social influences, and social role and identity.*

Knowledge. Two types of knowledge about pregnancy preparation were identified: *awareness* and *procedural knowledge.*

Awareness included being aware of the importance of preparing for pregnancy and current healthy eating recommendations for pregnancy preparation. The majority of participants demonstrated some degree of awareness of the importance to prepare for pregnancy, and that behavioural changes like eating healthily are beneficial while preparing. However, most also indicated '*not having much information*' about specific eating recommendations for the preconception period:

I just know that they should be eating right. I'm not sure if they have to eat certain amounts of food, or limit intake in certain foods, or take vitamins etc. (Participant 14, female)

Procedural knowledge consisted of knowing what steps and behaviours to perform to prepare for pregnancy, such as which resources or support to access or the logistics of eating healthy:

I think regular doctor visits, and possibly consulting a dietitian to discuss important points of what would keep the baby and myself healthy. Foods to avoid, foods that are safe. (Participant 3, female)

Beliefs about capabilities. Two subthemes emerged in beliefs about capabilities: '*trying your best*' and *confidence.* The '*trying your best*' subtheme included diverse barriers to healthy eating and pregnancy preparation recommendations, and acknowledged that couples preparing for pregnancy may not be able to fully implement these recommendations. Participants who covered this subtheme felt that individuals preparing for pregnancy should attempt this to the best of their abilities, while acknowledging that '*implementing diet changes is NOT easy*' and to not '*get down a path of not wanting to become pregnant*' because of '*pressure to do everything by the book*':

... it is a recommendation [to follow healthy eating guidelines] and couples would try their very best to be able to do that. (Participant 15, male)

Table 1. Participant demographics.

ID	Age range (years)	Location ^a	BMI category (kg/m ²)	Relationship status	Gender	Student	Highest level of education
1	19–20	Urban	18.5–24.9	Relationship	Female	Yes	High school diploma
2	21–25	Urban	35.0–39.9	Single	Female	No	Bachelor's degree
3	19–20	Rural	30.0–34.9	Single	Female	Yes	High school diploma
4	19–20	Urban	18.5–24.9	Single	Male	Yes	High school diploma
5	19–20	Urban	Unknown	Relationship	Female	Yes	High school diploma
6	21–25	Urban	18.5–24.9	Relationship	Male	No	Bachelor's degree
7	19–20	Urban	18.5–24.9	Single	Female	Yes	High school diploma
8	21–25	Urban	18.5–24.9	Relationship	Male	Yes	High school diploma
9	19–20	Urban	18.5–24.9	Single	Female	Yes	High school diploma
10	21–25	Urban	18.5–24.9	Single	Female	Yes	Bachelor's degree
11	19–20	Urban	25.0–29.9	Relationship	Female	Yes	High school diploma
12	21–25	Urban	18.5–24.9	Relationship	Female	Yes	High school diploma
13	19–20	Urban	25.0–29.9	Relationship	Female	Yes	High school diploma
14	19–20	Rural	18.5–24.9	Relationship	Female	Yes	High school diploma
15	19–20	Urban	18.5–24.9	Relationship	Male	Yes	High school diploma
16	19–20	Urban	18.5–24.9	Relationship	Female	Yes	High school diploma
17	19–20	Rural	18.5–24.9	Single	Female	Yes	High school diploma
18	21–25	Urban	18.5–24.9	Relationship	Male	No	Bachelor's degree
19	21–25	Urban	18.5–24.9	Single	Female	Yes	Bachelor's degree

BMI: body mass index.

^aUrban is classified as an area with a population of greater than 50,000.

In the *confidence* subtheme, participants discussed their confidence in being able to attain life goals and have the skills and means to nutritionally prepare for pregnancy. Factors described as increasing confidence included being in a 'stable relationship', having 'other people's advice and help', and currently having a 'healthy eating pattern that can be expanded to incorporate the healthy eating recommendations'. The majority of participants were confident that they would be able to 'acquire' the skills and resources necessary for pregnancy preparation, if they did not already have these assets:

I try to eat healthy food even now but would be more strict if I was thinking on getting pregnant. (Participant 12, female)

Some participants acknowledged factors that decreased confidence, which consisted of financial instability, and a lack of emotional preparedness:

I feel like I would [be confident about my ability to prepare for pregnancy] but it entirely depends on how our financial and emotional status is. (Participant 15, male)

Environmental context and resources. Two environmental context and resources barriers to pregnancy preparation were identified in: *finances* and *accessibility*.

Participants frequently mentioned that *finances* and financial preparation would be a major factor in pregnancy preparation, as the ability to eat healthily was seen as directly tied to one's ability to afford healthy food:

It all comes back to money. It's cheap to buy junk food, grains, carbs . . . Etc. It's expensive to eat healthy. (Participant 2, female)

Issues with *accessibility* included a lack of access to healthcare professionals for preconception-related matters, particularly in rural areas, as well as 'really long wait times' when trying to access services:

If I'm from a rural town, it could also be difficult to access healthcare professionals and dieticians. (Participant 19, female)

However, most participants either indicated they were unaware of how difficult it would be to access a healthcare professional, or thought it would be 'pretty easy' to access a healthcare professional.

Social influences. Four major social influences on pregnancy preparation were: *communities*, *partners*, *models*, and *credibility*. Participants discussed how common practices in their *communities*, peers, and cultural background influenced their outlooks on pregnancy preparation and eating behaviour. Responses on communities were mixed; some participants noted that pregnancy preparation was common in their surroundings, while others felt it would only start after conception. Communities could exert negative influence on eating practices, with participants noting that within their peers or culture, unhealthy eating was normalized or encouraged:

My community is very much known for the lavish food feasts they have, which includes unhealthy and junk food, a lot of the times. (Participant 4, male)

The influence of *partners* on pregnancy preparation was most apparent in the anticipated effects on motivation to eat healthy. Many female participants remarked that it was imperative that their male partners ‘*try to follow similar [healthy eating] guidelines*’, ‘*because they expect for men to ‘support*’, ‘*encourage*’, and ‘*reassure women*’ making the transition to healthier eating:

I would have to have my partner support me through the process as we’d be a team and I’d get jealous if I saw him eating a hamburger all the time and I was stuck to salads and fish. (Participant 2, female)

Models were mentioned as a common social influence, as many participants had experience with friends or family who have gone through pregnancy. Participants noted that sometimes observing people who had a pregnancy provided examples of what not to do:

I know a woman who drank and smoked marijuana during her pregnancy, and the poor child struggles with FASD amongst many more complications. Shame. (Participant 18, male)

Some participants noted that they would seek recommendations from ‘*other women online*’ about tips for pregnancy preparation:

[Online support groups] may help with seeing some of struggles that other women and their partners have faces; what works and didn’t work for some individuals; and allows to make some educated decisions of how you would like to personally proceed with your own pregnancy by reading stories of others. (Participant 4, female)

Participants viewed the *credibility* of support and resources as crucial when seeking pregnancy preparation information. Healthcare professionals were commonly viewed as the most credible source of information, along with peer-reviewed online and print resources. Some participants felt that online support groups could potentially cause the spread of misinformation if not moderated by an informed professional:

Every person is different and one person’s pregnancy is handled differently from another so it is important to not rely on word of mouth and listen to professional advice. (Participant 18, male)

Social role and identity. Two social role and identity sub-themes were *men* and *social support systems*. Both female and male participants viewed *men* as ‘*playing a huge role as the woman’s support system*’ during pregnancy preparation for heterosexual couples. Some female participants

commented on ‘*double standards*’ for men and women, where men traditionally were not expected to engage in pregnancy preparation:

In some cultures, men do not take part or involve themselves in pregnancy milestones. In my opinion, a man’s role is to engage and be present, emotionally prepared, supportive, working together, helping the partner stay safe and healthy. (Participant 17, female)

Social support systems consisting of the female’s partner, family, and friends were viewed as important. Some participants noted that same-gender couples or individuals identifying as transgender could potentially be subject to stereotypes and prejudice by their communities or the healthcare system, weakening their social support systems:

Women in gay relationships preparing for pregnancy could face their own unique hurdles and challenges, such as which one of them is choosing to conceive and carry the child and of course, thanks to society’s rough and close-minded views. (Participant 19, female)

Other relevant domains

Behavioural regulation. The *behavioural regulation* domain described action planning with regard to nutritional pregnancy preparation. This action planning consisted of planning which resources to use, how to monitor long-term changes in eating, and when to start preparing for pregnancy. Planning for resource use would often entail ‘*lining up*’ consultations and check-ins with ‘*family doctors*’ and ‘*dieticians*’. A few participants said they would search for preconception nutritional advice online and visit multiple groups of healthcare professionals to ‘*compare all their information*’ to see what would ‘*fit best with [their] lifestyle*’. Most participants said that pregnancy preparation should occur over 2–3 months before conception, with the majority stating it would take a year to develop sustainable healthy eating patterns:

I think a year in advance would be reasonable. This way, it would become more a regular habit for the two of you by the time you want to work to become pregnant. Of course, the early you start the better though. (Participant 13, female)

Some participants acknowledged that the time to nutritionally prepare for pregnancy may differ depending on one’s pre-existing health conditions and eating practices:

I think it differs based on what your current health and eating practices are. If you are someone who suffers from obesity, it may be prudent to start earlier . . . (Participant 10, female)

Beliefs about consequences. Two consequences sub-themes were *outcomes for the mother* and *outcomes for the baby*.

Outcomes for the mother included beliefs that inadequate pregnancy preparation could affect the mother's physical and mental health leading up to and during pregnancy, as well as decrease the chances of getting pregnant.

Outcomes for the baby included beliefs that inadequate pregnancy preparation would negatively affect the baby, either in terms of miscarriage, developmental disorders, and short- and long-term health consequences. Some participants demonstrated awareness of the health consequences for both the mother and child:

[. . .] if one doesn't change their eating habits, they're not only placing their own body at risk but that of their baby and to avoid the baby being born with certain conditions. (Participant 19, female)

Health outcomes for the baby mentioned included that the '*baby could be malnourished or have some underlying non-genetic health issues*', the '*baby not being able to fully develop due to low nutrient levels*', and Foetal Alcohol Spectrum Disorders (FASDs). A few participants strongly believed that avoiding alcohol and other substances while preparing for pregnancy was important, but that the consequences of not receiving proper nutrition during pregnancy preparation were not severe:

I think you should follow [healthy eating recommendations] to the best of your ability however, I don't think it's entirely important to ensure you always hit the marks because like people have had healthy children for years without following these guidelines perfectly. Avoiding known fetal damaging foods and drinks are important though I don't think the consequences of not following all the healthy eating precautions are grave though. (Participant 11, female)

Emotion. The *emotion* domain captured several emotions that participants anticipated during pregnancy preparation, with two emerging subthemes: *negative emotions* and *emotional preparation* during pregnancy preparation.

The most common *negative emotions* anticipated during pregnancy preparation were stress and worry. Sources of stress and worry included decision-making, '*pressure*' to do things perfectly, and coping with the process of preparing for pregnancy for the first time. One participant referred to previously having an eating disorder, and that tracking eating practices could potentially '*trigger*' *negative emotions* tied to their eating disorder.

Many participants felt that *emotional preparation* before becoming pregnant would be essential to sufficient maturity to go through the pregnancy preparation process, and subsequent care for a child. Many participants referred to *emotional preparation* as an essential step of pregnancy preparation alongside nutritional preparation:

For one, both partners need to make sure that their bodies are healthy enough to care for a child. Secondly, children can

have a massive toll on parents at times and both parents need to mentally be in right mind set and make sure they are ready for the highs and lows of babies. (Participant 13, female)

Motivations and goals. The *motivations and goals* domain captured two subthemes: *pre-preparation standards* and '*not on their radar*'.

Pre-preparation standards referred to discussion of what general life conditions and standards participants want to achieve before embarking on pregnancy preparation. Many indicated that adequate pregnancy preparation would involve both partners being '*emotionally, financially and psychologically ready*' to eat healthier and make other behavioural changes. Having a child in the distant future after finishing other life goals such as additional schooling and having a stable job was seen as important by many, so that they could in turn '*secure a successful pregnancy*'.

The '*not on their radar*' subtheme referred to participants indicating that a lack of awareness of pregnancy preparation stemmed from how they were not planning to have a child at the moment, and that their motivation for pregnancy preparation would become stronger once they plan to have a child:

I feel like I don't need to know much at this point as guidelines change so frequently and it is not on my radar. (Participant 11, female)

Nature of the behaviour. The nature of the behaviour domain encompassed three subthemes: *food choices*, *substance use*, and the *pregnancy preparation experience*. Common *food choices* for participants included out-of-home-eating, while *substance use* referred to some participants and their peers regularly consuming alcohol and marijuana. Some participants alluded to their *food choices* and *substance use practices* being influenced by university culture and norms:

. . . Because we're young and chances of liver cirrhosis at our age is not as much as those older than us. (Participant 19, female)

Participants believed the *pregnancy preparation experience* differs for men and women in terms of the expectations placed upon partners in heterosexual relationships. Pregnant women were viewed as having physical and mental responsibilities towards the child, making both nutritional and emotional preparation important for women. Conversely, nutritional preparation was seen as less important for men than emotional preparation:

I think for women it's more kind of 'all-in' where women may have to literally change their habits to prepare since they are physically going to be the ones pregnant. They also have to prepare mentally. For men, it's probably more of a mental

thing where they prepare for the idea of a child rather than the physical. (Participant 10, female)

Female participants still expected male partners to adhere to the same healthy eating recommendations, despite anticipated differences in the *pregnancy preparation experience*. A commonly cited reason for this expectation was that it could otherwise ‘*cause the female to struggle with the preparation*’:

I would also be quite clear with my husband that we are in this together so if I’m changing, he’s changing with me! I’m not going to be drinking some cucumber water and eating healthy foods only to see him inhaling McDonald’s in the corner. (Participant 19, female)

Skills. Four pregnancy preparation *skills* were identified as important to develop: ‘*communication*’, ‘*caregiving*’, ‘*discipline*’, and ‘*research*’. ‘*Communication*’ between partners was regarded as essential to ensure awareness of each other’s needs, emotions, when they need help, and to cope with possible difficulties during pregnancy preparation.

Similarly, ‘*caregiving*’ emerged as a subtheme in terms of partners acting as caregivers towards each other and demonstrating empathy and compassion, particularly for men towards female partners:

I think for the next 9 months after conceiving and in the few months before, men would try to adapt to the role of a caregiver. (Participant 6, male)

‘*Discipline*’ emerged as a necessary skill to monitor eating and avoid falling back into former unhealthy behaviours. Strategies to maintain discipline included self-monitoring food intake on a chart or app, motivating one’s partner to share routines, and attending regular appointments with a healthcare professional.

‘*Research*’ was seen as a skill for pregnancy preparation. Good research as described by participants entails comparing information from multiple sources, such as multiple healthcare professionals, online or print resources, peer experiences, and filling in knowledge gaps:

I would do research into what the best foods are to eat and definitely make sure I am eating enough that the nutrients will positively help myself and a baby. (Participant 7, female)

Memory, attention, and decision-making processes. The memory, attention, and decision-making processes domain covered whether participants felt they would remember to follow healthy eating recommendations during pregnancy preparation. Most participants felt that they would be aware of the general healthy eating recommendations, but would appreciate a reminder of the details

particularly as they relate to preconception-related eating recommendations.

Perceived pregnancy preparation support needs

Participants made numerous suggestions about ways to address pregnancy preparation support needs, including *healthcare professionals, references, increasing access to healthy food, engagement, and gender-specific support*.

Healthcare professionals were regarded as critical contacts, with most participants viewing them as ‘*credible and a first source of information for pregnancy preparation*’:

I would trust in a doctor or family doctor support for them to be able to give me proper resources and recommendations before looking myself! (Participant 7, female)

Specific healthcare professionals that participants would contact included ‘*OBGYNs* [obstetrician-gynaecologist], ‘*family doctors*’, ‘*dieticians*’, ‘*nutritionists*’, and ‘*paediatricians*’. A few participants with existing health conditions noted that health professionals would provide specific pregnancy preparation information tailored to their condition.

References from ‘*peer-reviewed*’ online websites, informational videos, books, and brochures or pamphlets were viewed as ideal resources, which one could ‘*refer back to*’. Participants noted that for those with limited healthcare professional access, publicly available resources could fill support gaps. Some participants felt that remote interventions such as text messaging support and online support groups could be useful to feel less ‘*alienated*’.

Ideas for *increasing access to healthy food* included delivery services for produce and healthy meals, community food bags, and tax breaks for couples under 35 years of age planning pregnancy to assist with ‘*the economic strain of starting a family*’.

Suggestions for ways to boost *engagement* with individuals thinking of having a child included signage in doctor’s offices or high traffic areas, social media outreach, email or phone number registration lists, hosting events or booths, and ‘*normalizing conversations*’ of preconception health and pregnancy in high school classes.

The need for *gender-specific support* was mixed – although many participants felt that both partners should participate in support activities such as consultations or classes, some felt the need to provide men specifically with emotional support tailored to their role as a ‘*caregiver*’:

Hmm I think there should be communal but also options for gender-specific. Like if men wish to join an all male class (because thanks to toxic masculinity, they may not always

feel comfortable discussing certain topics or issues in front of women). (Participant 19, female)

Discussion

Principal findings

The study explored barriers and support needs in relation to nutritional pregnancy preparation in women and men. Based on the TDF,¹¹ key theoretical domains were as follows: knowledge, beliefs about capabilities, environmental context and resources, social influences, and social role and identity. Participants demonstrated a general understanding of the benefits of nutritional pregnancy preparation before conception, but few knew about specific nutritional recommendations for this period. Major preparation barriers were a lack of finances and access to support and resources. Male partners were viewed as major sources of emotional support for women in heterosexual relationships, and both male and female participants viewed pregnancy preparation as a collaborative effort. Healthcare professionals were seen as crucial for pregnancy preparation-related support, alongside reference material such as websites and books.

Strengths and weaknesses of the study

This study had several strengths, including the use of a comprehensive theory-based framework to explore pregnancy preparation views in women and men. Conducting interviews over instant messenger through real-time chat may have engaged participants who would otherwise not participate in an in-person or audio call interview. The anonymity of the chat function as compared to a face-to-face conversation might have provided a comfortable environment for participants to express their views. Data collection in written form potentially allowed participants to formulate thoughts in a coherent and reflected manner as they can draft responses to questions prior to submission these to the researcher.

Several weaknesses should be kept in mind when interpreting the findings of this study. Although all generated codes were checked to ensure accuracy, there was a lack of independent double coding. Instant chat-based interviews may have limited the breadth and spontaneity of responses compared to in-person interviews. The study sample mostly consisted of educated young university students living in urban areas. Most participants seemed to have a heterosexual orientation, although this was not explicitly assessed. The sample was not specifically recruited to represent those experiencing disadvantage, and the level of disadvantage of the current sample was not assessed. Although several participants referenced belonging to ethnic minority groups, ethnic background information was not collected systematically.

Relation to other studies

In contrast McGowan and colleagues⁸ and Khan and colleagues,⁹ participants reported being eager to seek out information from a healthcare professional compared to online references.^{8,9} Male participants perceived a greater responsibility on in terms of supporting female partners than described by McGowan and colleagues.⁸ Male and female participants' perceptions of important skills for pregnancy preparation were in line with Lewis and colleagues⁷ study about couple's perceptions of preconception health, in which communication, support, and relationship quality were paramount.⁷ Participants in this study similarly viewed pregnancy preparation behaviours like improving healthy eating practices, reducing stress, and securing finances to be a team effort between both partners.

Knowledge of pregnancy preparation and preconception health among participants was similar to that of other studies by Khan and colleagues,⁹ Lewis and colleagues,⁷ and McGowan and colleagues.⁸ Most participants had a general comprehension of the benefits of preparing for pregnancy before conception and which general behaviours to adopt in this period. However, participants in this study lacked in-depth knowledge of specific healthy eating recommendations for the preconception period. Some participants felt that not eating healthily during preconception would not have significant consequences for the child, which is not supported by evidence.² Concrete awareness of DOHaD concepts such as developmental programming of the embryo was absent from participant accounts. In contrast to studies by Tuomainen and colleagues¹⁴ and Corchia and Mastroiacovo,¹⁵ where participants viewed changing health behaviours commonly after conception, participants in this study largely viewed pregnancy as a process that would take at least 3 months to prepare for.^{14,15}

Participant responses indicated that barriers to eating healthy for many families in New Brunswick were financial, as is supported by Minaker and colleagues'³ review examining how low-income populations are more vulnerable to having minimally nutritious diets. Participant suggestions for support were similar to those noted by McGowan et al.,⁸ who suggested raising preconception health throughout the life course through a variety of approaches, including social media, education, and healthcare professional contacts.⁸ Participants in this study formulated new, less direct ideas for interventions to address financial barriers to nutritional preparation, such as low household income and high costs of healthier foods, as studied by Minaker and colleagues.³

Implications and future research

This study might inform behaviour change interventions to support women and men to prepare nutritionally

for pregnancy. Although general notions of the benefits to prepare for pregnancy were found, a detailed understanding of DOHaD concepts was not present and awareness of the importance of preconception preparation was vague. Participants' accounts on nutritional pregnancy preparation often veered into responses about pregnancy and beyond, suggesting that the preconception period per se is not a recognized or concrete time period for many young adults of childbearing age.

Men appear to be an underused resource in the context of heterosexual relationships and could be considered as targets for interventions, alongside women. Future research might benefit from examining dyadic processes in women and their romantic partners to inform interventions targeted at couples. The development of any interventions would benefit from including healthcare professionals who are seen as credible and reliable sources of information. Beyond face-to-face consultations and services, health professionals may contribute to the preconception health through endorsement and signposting of preconception healthy eating initiatives and interventions.

Intervention efforts aimed at improving preconception healthy eating may consider focusing on defining the preconception period, specifying what healthy eating during preconception entails, including how it differs from recommendations for the general population and why it is critical during this period.

Conclusion

Despite some general appreciation of the benefits of nutritional preparation for pregnancy before conception, most participants lacked concrete knowledge of specific healthy eating recommendations. Major barriers to nutritional pregnancy preparation were a lack of finances and access to support and resources, and a lack of confidence in one's ability to prepare nutritionally for pregnancy. Male partners were viewed as major sources of emotional support for women in heterosexual relationships. Both male and female participants viewed pregnancy preparation as a collaborative effort between partners.

Healthcare professionals were seen as crucial for pregnancy preparation-related support, alongside quality reference material such as websites and books. With the implementation of initiatives to address barriers to nutritional pregnancy preparation, as well as adequate support and resources offered to those in the preconception period, the long-term health outcomes of future children may see an improvement.

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Author contributions

S.U.D. conceptualized the research, obtained funding, and supervised the conduct of the study. F.Q. collected the data, curated the data, conducted the initial analysis, and wrote the first draft of the manuscript with regular input from S.U.D. throughout. Both authors approved the final manuscript for submission.

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Supplemental material

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