




# Lessons learned from talking with adults about nutrition: A qualitative study in the PREPARED project

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## Abstract

Improving diet and dietary behaviour of men and women before pregnancy has the potential to benefit both their current and long-term health and the health of their children. Little is known, however, about adults' perception of diet's role in prepregnancy health. This study aimed to explore the state of knowledge and awareness of preconception nutritional health in adults within the fertile age range and what they perceived could motivate healthy eating using the self-determination theory as a theoretical framework. We analysed 33 short exploratory interviews with men ( $n = 18$ ) and women ( $n = 15$ ) aged 18–45 years. Participants were grab sampled from three different public locations in the southern part of Norway. Interviews were audio-recorded, transcribed verbatim in 2020 and analysed using a thematic analysis with a semantic approach in 2022. The findings suggest that adults within the fertile age range are not intrinsically motivated to eat healthily, but when they do, it is because eating healthily often aligns with other goals consistent with their values, that is, getting fit or looking good. They possess some basic knowledge of healthy behaviours during pregnancy but are generally unaware of the importance of preconception health and nutrition. There is a need to increase awareness of the impact of preconception health on the health of this and future generations. Improved nutritional education on the significance of diet before conception might facilitate optimal conditions for conceiving and for pregnancy in the adult population within fertile age range.

## KEYWORDS

behaviour, maternal nutrition, nutrition, paternal nutrition, preconception nutrition, public health, qualitative methods

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## 1 | INTRODUCTION

The foundation for lifelong health for future generations is already established in the parents' reproductive cells before conception (Lane et al., 2014; Patton et al., 2018). The preconception period has three proposed definitions (Stephenson et al., 2018). The first describes the biological perspective related to the gamete development, fertilisation and embryo development (Stephenson et al., 2018). The second, the individual perspective, describes the undefinable period from wanting a baby to the time of conception (Stephenson et al., 2018). Third, the public health perspective is related to the critical period of establishing new habits during adolescence (Stephenson et al., 2018). The period ranges from days and weeks to months and years before conception in the respective order (Stephenson et al., 2018).

In 2018, the *Lancet* published a series of three papers on the importance of parental health before conception and what could be gained from improving health in both men and women before pregnancy (Belizán et al., 2018). Combined, these articles first outline how observational studies show strong links between health before pregnancy and maternal and child health outcomes (Stephenson et al., 2018). Second, biological mechanisms of periconceptional effects on lifetime and transgenerational health (Fleming et al., 2018). Finally, how promising strategies for preconception interventions take into account individual motivation and receptiveness at different preconception action phases to guide the design and target of the intervention (Barker et al., 2018). The *Lancet* series calls for increased awareness of preconception health, particularly regarding diet and nutrition (Stephenson et al., 2018). Diet and nutrition impact fetal developmental outcomes, and is considered an important determinant during the preconception period (Gilbert, 2016). The authors argue that preconceptional effects on lifelong health are now so compelling that they call for guidance on parental preparation for pregnancy beginning before conception (Fleming et al., 2018). They also suggest inventing scalable intervention strategies that may have positive effects on a range of health outcomes (Barker et al., 2018).

Building on this call for action, we developed the PREPARED project, which is a nationwide digital randomized controlled intervention trial that aims to improve the diet of prospective parents, and in doing so, improve quality of life and health outcomes in the next generation (Øverby et al., 2021). The core elements of the intervention have been developed based on the international recommendations from FIGO on diet during the preconception period. It includes recommendations about fruit, vegetables, fish, dairy, red meat and snacks, among others (Hanson et al., 2015). The evaluation of health outcomes will be achieved by following participants until they have their first child or for up to 20 years after inclusion in the study.

To develop a successful preconception intervention, Barker et al. (2018) state that understanding and harnessing what motivates young adults to engage with preconception nutrition is key. This is supported by a systematic review conducted by Kwasnicka et al. (2016), which found that engaging content enjoyed by potential participants is important for a successful intervention. The authors

### Key messages

- Awareness of the importance of preconception diet in relation to health is low in the adult population within fertile age range of Norway.
- Fertile adults' motivation for eating healthily is connected to both internal and external pressure such as guilt, shame and reward, and benefits of eating healthily, such as improved performance during training, or the feeling of well-being.
- Nutrition education on the significance of diet before conception might facilitate optimal conditions for conceiving and for pregnancy in the young adult population.

confirm that motivation to avoid negative health outcomes is not enough to sustain behaviour change (Kwasnicka et al., 2016).

Self-determination theory (SDT) is a well-known behavioural change theory first introduced by Deci and Ryan in 1985 (2000). This theory is often used within health contexts (Ng et al., 2012), with the goal of identifying which type of motivation that leads to persistent behaviour change (Ryan & Deci, 2000). SDT divide motivation into two categories with a continuum between them: autonomous self-regulation and controlled regulation (Cook & Artino, 2016; Ryan & Deci, 2000). Autonomous self-regulation, which involves regulating behaviour based on personal interest and values (Maillet & Grouzet, 2022; Ng et al., 2012), is divided into three types of regulation: intrinsic, integrated and identified regulation. *Intrinsic motivation* is behaviour motivated by enjoyment of the behaviour itself (Maillet & Grouzet, 2022; Ng et al., 2012). *Integrated regulation* can be identified when the motivation derives from behaviours that are beneficial for other personal goals or values (Maillet & Grouzet, 2022; Ng et al., 2012). *Identified regulation* is related to motivation based on the persons' reflections of the benefits of the behaviour's outcome (Maillet & Grouzet, 2022; Ng et al., 2012). Controlled regulation is often associated with internal and external pressure, as well as guilt and shame, or reward and punishment (Maillet & Grouzet, 2022). For example, a guitar player motivated through autonomous self-regulation will play because they enjoy it, while someone motivated through controlled regulation will play because they earn a reward or feel guilty if they do not play. In a meta-analysis done by Ng et al. (2012), they found that although some forms of controlled regulation were associated with positive mental and physical health outcomes, only autonomous self-regulation was associated with long-term behaviour change.

One key goal in improving preconception health is to raise public awareness, and we need to know more about the level of awareness and knowledge about this in the general population (Barker et al., 2018). Although there is substantial scientific evidence that diet is important in the months and years before pregnancy, this knowledge might not be common among the general population. Additionally, we do not know if young people are concerned or

perceive this information as relevant to them, although some research has found a general lack of awareness about the importance of preconception health (McGowan et al., 2020).

The main objectives of this study within the PREPARED project were to explore the immediate thoughts about factors that might motivate healthy eating of adults within fertile age range and also to investigate the awareness and knowledge of the potential influence of the preconception diet on the health of their future children. By actively including the group we intend to target in the main PREPARED project, we aimed for greater insight into their knowledge and awareness about the preconception health potential, and into what may be needed to improve the diets of future parents.

## 2 | METHODS

To explore the motivations of adults within fertile age range to eating healthily and investigate their knowledge and awareness of the relevance of preconception health, we decided to use a qualitative method and conducted short exploratory interviews to elicit the immediate reaction of people in the target population.

The interviews were carried out in the southern part of Norway in 2020 by three PhD students (M. L. O., L. S. and E. N. V.) with supervision from a senior researcher with qualitative research experience (E. R. H.). All interviewers wore red t-shirts with the university logo during recruitment and interviews. The participants were conveniently recruited at three public locations with a lot of pedestrians. The first location was a hardware store, while the two others were shopping centres. Permission for recruitment and interviews was gained from the managers of all three locations beforehand. It was decided in advance that the duration of recruitment and interviews should be approximately 3–4 h per location. To increase visibility, a roll-up banner with the university logo was used. In the second and third locations, a small poster with inclusion criteria was used as well. Potential interviewees were approached and written consent was given by all participants before the interviews began. Each interview was conducted one-on-one. At the end of each interview, they were offered an umbrella as a reward. Between each interview session, there were research group discussions to identify potential improvements to the research procedure.

We included Norwegian-speaking men and women within the fertile age range of 18–45 years without biological children. The goal was to recruit people from the general adult population within the

fertile age range and a high proportion of men, as this is often an issue in health behaviour change interventions (Maher et al., 2014). Development of the semistructured topic guide was completed using the SDT as a framework by trying to identify where they were on the continuum of self-regulation. The semistructured topic guide (Table 1) included questions to explore knowledge and awareness of preconceptions and motivations for eating healthily. For the question regarding motivations regarding healthy eating, we asked indirectly, meaning that we asked what they thought other peers' motivations were. This was to make the question less sensitive and perhaps get other answers. It also included questions intended to elicit input into content for a digital intervention and on how to recruit young adults into future research projects. Data from these questions will be the subject of other publications.

During the first hour of recruitment and interviews, the potential interviewees were approached by asking if they were interested in answering a few questions about nutrition. However, we gradually began asking if they had a couple of minutes to answer some questions about nutrition as this was more effective for recruiting. The entire PREPARED project has been approved by the Norwegian Centre for Research Data (NSD), the Regional Ethics Committee (REC) and our Faculty Ethical Committee (FEC) (id-numbers: NSD: 907212, REC: 78104, FEC 20/10119).

### 2.1 | Data analysis

Each interview was recorded and transcribed verbatim by the researcher who conducted the interview, as it would be easier to remember what was said if the recording was unclear. Subsequently, each transcript was moderated and verified by a fellow researcher, then uploaded to NVIVO 12 for further analysis. We carried out a thematic analysis based on Braun and Clarke's guidelines with a semantic approach to the data (Table 2) (Braun & Clarke, 2013). This approach was chosen because the questions were specific and the answers were short and rarely went beyond the scope of the questions. Our approach was to summarize and understand the data, and further interpret its broader meaning with support from previous research (Braun & Clarke, 2013).

As a first step, all transcripts from the first location were read and reread as a whole and preliminary categories were individually developed. These preliminary categories were discussed and agreed upon as a group (E. R. H., M. L. O. and E. N. V.). Second, all interviews

**TABLE 1** Semistructured topic guide for short explorative interviews.

Questions	
Motivations for eating healthy	<ul style="list-style-type: none"> <li>• What do you think motivates young people to eat healthy?</li> </ul>
Awareness of preconception	<ul style="list-style-type: none"> <li>• Do you think the diet of young adult men and women has an impact on the health of their future children?               <ul style="list-style-type: none"> <li>– Do you know any foods or nutrients that are important for those planning to have children?</li> <li>– Do you know any foods or nutrients that you should avoid when planning to have children?</li> </ul> </li> </ul>
Education and work	<ul style="list-style-type: none"> <li>• Can you briefly tell us about your education and current work situation?</li> </ul>

**TABLE 2** The application of step-by-step thematic analysis.

The application of step-by-step thematic analysis (Braun & Clarke, 2006)	
1. Familiarising ourselves with the data	The recordings from the short individual interviews were transcribed verbatim (E. N. V., M. L. O. and L. S.). Then, the transcripts were read and reread, and our first thoughts were noted down and discussed (E. N. V., E. R. H., M. L. O. and L. S.).
2. Generating the initial codes	The initial codes were generated individually on each interview based on the research question (E. N. V., E. R. H., M. L. O. and L. S.).
3. Searching for themes	The codes were reviewed for consensus and discussed. The selected codes were collated into initial themes (E. N. V., E. R. H., M. L. O. and L. S.).
4. Reviewing and defining themes	The creation and further discussion of the themes took place during a qualitative research course (E. N. V., E. R. H., M. L. O., L. S., P. H. J. and M. B.). Several face-to-face discussions between the two main authors refined the themes (E. N. V. and E. R. H.). The analysis was carried out using a semantic approach, focusing on refining and compiling similar opinions and ideas from the transcripts. Quotations were chosen to illustrate each theme (E. N. V.), and discussed for suitability (E. N. V., E. R. H., N. O., F. N. V., M. L. O. and L. S.).
5. Producing the paper	We linked the findings back to previous literature and research question, as well as considering its impact on further research (E. N. V. and E. R. H.)

were individually coded by two researchers (M. L. O. and E. N. V.) using the agreed-upon categories. The codes were then cross-checked between the two researchers with supervision from E. R. H. The codes were revisited iteratively and further refined through these discussions.

The themes were defined, discussed, and agreed upon in the group based on the codes (E. R. H., M. L. O. and E. N. V.). We then refined and organized the main themes into several subthemes. All findings are presented as direct quotations translated from the original Norwegian. All participants have been anonymized and pseudonyms given.

### 3 | RESULTS

In total, 34 interviews were completed across three different locations in January 2020. At the first location 8 interviews were conducted, 12 at the second, and 13 at the last. We completed interviews with 19 men and 15 women. The majority of participants did not have a higher education. Each interview lasted between 2 and 10 min in total. One interview was assessed as of too low quality to include because the participant did not have sufficient language skills to answer the questions properly. Two main themes with respective subthemes were developed based on the interview data, presented in detail below (Table 3).

#### 3.1 | Theme 1: Motivations for healthy eating

Participants' answers to the question about what motivates young adults to eat healthily were classified as referring to different types of behavioural regulation of SDT (Ng et al., 2012). Some interpreted the question as what acted as facilitators

**TABLE 3** Overview of identified themes.

Overview of identified themes
Theme 1: Motivations for eating healthily
Subtheme 1: Autonomous self-regulation
Subtheme 2: Controlled regulation
Subtheme 3: Barriers and facilitators for eating healthily
Theme 2: Awareness and attitude towards food, nutrients and lifestyle related to future parenthood
Subtheme 1: Knowledge of the preconception period
Subtheme 2: Knowledge of nutritional issues of pregnancy
Subtheme 3: Parental habits

towards eating healthily. This theme is divided into three subthemes: autonomous self-regulation, controlled regulation, and facilitators of healthy eating.

##### 3.1.1 | Subtheme 1: Autonomous self-regulation

One-third of the participants stated that staying healthy was related to working out. There was a distinction between those eating healthily because it gave better results during training, and those that were motivated based on appearance. Mark and Barbara said the following:

Personally, I exercise quite a bit, and I feel like that it is my motivation to eat healthily. In general, motivation is very much connected to training. So, yes, if you eat badly while training hard, you will get bad results (Mark, primary school teacher).

I would think that it's also related to body image. If you live healthily, it's easier to maintain a good physique and that's more attractive (Barbara, general practitioner).

In addition, Andrew mentioned that one of his motivations for healthy eating was a concern for the environment and animal welfare, which resulted in him eating less meat and more vegetables.

For me personally, the environment. Like, food should be more sustainable. In fact, it's actually related to animal welfare when it comes to a vegetarian diet, which impacts the environment (Andrew, PhD student).

Some reported that eating healthily was related to feeling better, while others focused on other aspects of physical appearance, such as reducing acne. Staying healthy was one of the main motivations for eating healthily. 'Healthy' was defined as the absence of disease by some, while others associated healthy with the feeling of well-being and the ability to participate in activities. Here represented by Steven, several participants also mentioned the long-term health effects or prevention of disease as a motivation for eating healthily:

Then there is the risk of getting lifestyle diseases. You can't dismiss the fact that eating healthy is a valuable investment for the future in yourself, and your surroundings (Steven, primary school teacher).

The feeling of well-being when eating healthily was an important motivation. This was described as a feeling of having the energy needed to engage in everyday activities, illustrated by James:

A good feeling perhaps? Maybe? You probably feel good when you eat well? (James, carpenter apprentice).

### 3.1.2 | Subtheme 2: Controlled regulation

Controlled regulation involves motivation through external factors that control behaviours (Ng et al., 2012; Ryan & Deci, 2000). An opinion that was shared by several of the participants was that they associated diet with self-confidence in one's body. The need to feel like they were looking good and receiving approval from peers for their appearance was perceived as a common driver of eating well. This view was more commonly reported by men than women, as represented by Thomas:

It's difficult to say [what motivates young adults to eating healthily], the cynical part of me would say that there is a lot of 'sex appeal'. They want to look good, and feel and feel good, but preferably look good, I think (Thomas, student).

When talking about body image as a motivation for eating healthily, some participants also elaborated that this source of motivation was probably more common among younger adults than older adults, as illustrated by Michael:

Perhaps it's the wrong type of motivation, like body image. In a sense, it may be that younger adults pay a little more attention to body image than older adults (Michael, truck driver).

Some participants felt that role models could be an important factor in the promotion of healthy eating. Potential role models included athletes and other 'famous people', such as influencers on social media. Participants felt that these people could have an impact on what they eat as they might represent a lifestyle they would like to mimic. Sarah said the following:

I think social media [has an impact], like fitness and things like that which are very popular at the time. Also, what's it called – the younger people, like when they sort of post things like 'oh, they eat so healthy' and such. You also see results in pictures and such (Sarah, student).

Although most of the participants considered that role models may be a positive influence in relation to healthy eating, one participant, Lisa, had some reflections on the legitimacy of the social media industry.

Like, looking at other people, i.e. people who are role models and things like that, but there are things that are fake too, like photos and retouching, or something like that (Lisa, student).

### 3.1.3 | Subtheme 3: Barriers and facilitators for eating healthily

When asked about what they thought motivated young adults to eat healthily, underlying factors that did not directly influence motivation were discussed. The price of healthy versus unhealthy foods were discussed by many participants. Some of the participants mentioned the price of healthy food as a barrier to eating healthily. In contrast, others argued that unhealthy food is often cheaper than healthy food. This thought was shared among more men than women. Daniel also mentioned that some might prefer the convenience of fast food in a busy everyday life rather than eating healthier meals that would take longer to prepare.

I think it's very good [to eat healthily] and I feel that the number of people eating healthy is increasing. But during times when there is a tighter economy and little time during a hectic everyday life, many people will probably take shortcuts by choosing fast-food or

other easy-to-prepare foods that are often more unhealthy than fresh ingredients which take a little longer to prepare (Daniel, mechanic apprentice).

Finally, two participants said that learning about healthy foods and gaining new knowledge motivated them to eat more healthily, illustrated by Susan:

It's not like if I see a picture of someone who looks great, I get super motivated to eat healthy. I'm mostly motivated by a bit of knowledge. Like, increased knowledge about it actually motivates me (Susan, clothing store employee).

### 3.2 | Theme 2: Awareness and attitude towards food, nutrients and lifestyle related to future parenthood

Participants were asked to discuss their knowledge and understanding of preconception diet, the health of future children, and what they knew of foods that were beneficial to consume or not consume during this time. Most participants had little prior knowledge of preconception health and seemed surprised when asked about it. It was commonly confused with diet during pregnancy, as about one-third of the participants immediately mentioned dietary advice they knew of related to diet during pregnancy.

When asked if they knew of any foods or drinks that were either important during the preconception period, or that could be harmful, the only obvious substance frequently mentioned was alcohol. Approximately half of the participants mentioned alcohol as something to be avoided. The majority of participants said it in the context of pregnancy, but that it probably applied during the preconception period as well. Several participants answered that a general supplement of minerals and vitamins would be important, but only one participant who worked as a general practitioner (GP) mentioned iodine and folic acid supplementation specifically.

We developed three subthemes within this theme, the preconception period, pregnancy, and parental influence.

#### 3.2.1 | Subtheme 1: Knowledge of the preconception period

When asked about perceptions about the influence of parental diet on future children's health, over half of the participants identified a healthy diet as important, but only a minority were able to reflect on this relationship further, illustrated by John:

I'm guessing that if you're not that healthy before you get pregnant, it probably has an impact when you get pregnant. If you don't have a healthy body, and you

suddenly decide to become healthy, that is not something you can do in a day (John, bartender).

One participant said that she would try to prepare her body if she planned to become pregnant, possibly suggesting that you could be more receptive to advice if you have made a conscious decision to try to conceive. Susan said:

[About preconception] Before a pregnancy? Yes, I think so. Absolutely, I think that if I had planned to get pregnant myself, I would have prepared my body in advance (Susan, clothing store employee).

It was mentioned that it would make sense that parents having healthy diets would have increased the chance of healthy children, as said by Thomas:

If you think biologically if it has an impact, and if they have a greater chance of getting sick and stuff like that, it's hard to say, but I think that the odds of – to some extent – the child being healthy if the parents eat very healthy, against a pair of parents who eat very unhealthy, it has an impact (Thomas, student).

Some participants were sceptical about the possible connection between parental diet and offspring health. One participant, Sarah, said she believed that genes had a bigger impact, but that diet during pregnancy could have an impact.

No, not really. Because I think it depends more on things that are hereditary, like DNA. I think it would have an impact if, for example, the mother eats very unhealthy during pregnancy and things like that, but I don't know (Sarah, student).

#### 3.2.2 | Subtheme 2: Knowledge of nutritional issues of pregnancy

As mentioned above, many participants drew attention to diet *during* pregnancy in response to the question about preconception diet. This subtheme was developed based on the participants' emphasis on pregnancy rather than preconception diet. Here represented by Jessica:

When you think of children and such – at least when they are a foetus in the womb – you share all the blood circulation and everything else with the mother. Like immune systems and things like that, and the immune system is affected by diet and your physical and mental shape. That's during pregnancy, anything before I'm a bit unsure about, but while they're pregnant a lot affects them [foetus] (Jessica, student).

### 3.2.3 | Subtheme 3: The impact of parental habits

Many interviewees discussed prenatal factors that could influence child diet and health *after* birth. Within this context, a majority of participants mentioned previously established parental habits as the most influential factor on child diet and health during the child's upbringing, illustrated by Robert:

Not directly, but I think that habits have an impact. Especially when you have children, I would think that the amount of exercise will probably decrease, and then it is even more important what you eat. If you had bad habits from before in regard to what you eat, these habits are what you might return to if you have children or have a lot to do (Robert, student).

One participant had some reflections about people being overweight before parenthood, and that it would take a long time to lose this weight. However, Elizabeth focused on how habits impacted their diet and how difficult it was to change behaviour, rather than the influence of parental overweight and obesity on maternal and child health outcomes.

In a way, you can't suddenly just lose weight, if you're ten kilos too heavy and have a child, then you can't suddenly lose ten kilos and play with your child. Because you form a routine, and it is difficult to change this habit, as well as being a role model [to your child] (Elizabeth, market coordinator).

A few participants, represented by Mark, talked about how parents play a big part in what children eat as they choose what is served for dinner, and most often choose what they have in their brought lunch. They thought this would have an impact during their upbringing and might have an impact later in life.

I work as a teacher, and I see that there are a lot of people who struggle with poor diet. I don't think this is a 5–6-year old's choice, it's the parents who decide what they eat (Mark, primary school teacher).

## 4 | DISCUSSION

The aim of this study was to explore the state of knowledge and awareness of preconception nutritional health in adults within fertile age range and what they perceived could motivate healthy eating. Our findings suggest motivation towards eating healthily is connected to internal and external pressure such as guilt, shame and reward, but also to the benefits of eating healthily, such as improved performance during training, or the feeling of well-being. The participants expressed a general lack of awareness of the relevance of the preconception period and showed limited knowledge about how diet and lifestyle might impact the health of future children.

Most of the participants agreed that health status and diet might impact future children but focussed automatically on connections between mother and child during pregnancy and parental habits during the child's upbringing. Similar to McGowan et al. (2020) who found a general lack of detailed awareness of the significance of preconception health, our findings suggested that there was a lack of knowledge about the potential impact of diet before pregnancy. Most did not think that what they ate before pregnancy would make any difference, and that nutrition during pregnancy was the factor that mattered the most. This is similar to the conclusion reached by Barrett et al. (2015) who found that women with the lowest levels of pregnancy planning, also directed their focus towards pregnancy.

When asked about their thoughts on what motivated young adults to eat healthily, their replies were mostly in line with different types of behavioural regulation in the SDT. An interesting finding is that we could not identify a single participant who said that they thought people ate healthily because it tasted good, which would be the strongest sign of autonomous self-regulation and intrinsic motivation (Ng et al., 2012). Sogari et al. (2018) found that this might motivate consumption of unhealthy foods, as some participants said that they ate 'junk food' because it tasted better than healthy food. Their answer might have been different if we asked them directly about their own motivation to eat healthily instead of asking a more general question about young adults.

Ryan and Deci (2000) explain that the SDT recognizes that behaviours that are extrinsically motivated can be assimilated to become self-regulated over time. If intrinsic motivation for healthy eating behaviours is uncommon in the adult population within fertile age range, it might be beneficial to focus on immediate or long-term benefits of eating healthily, like reduced chance of noncommunicable disease (17 Diet Collaborators, 2019; Iriti et al., 2020) or its relationship with improved performance during exercise (Bytomski, 2018; Jäger et al., 2017). As a sidenote, all interviewees saw the benefit of eating healthily and no one stated that they did not bother to eat healthily.

It is concerning that there was such a general lack of knowledge about important prepregnancy diet-related behaviours, including the general advice of folic acid supplementation before trying to conceive. Only one participant who was working as a GP mentioned taking folic acid supplements. Clark and Mager (2022) found similar results in their group of rural midwestern women in the United States, where there was a general lack of awareness of the preconception period, and more focus on health and behaviours during pregnancy. Khan et al. (2019) concluded that although the women in their study sample were aware of positive preconceptional behaviour, they did not think they were in need of preconception care themselves.

In general, it is recommended to follow national dietary guidelines during the preconception period and pregnancy. In short, this includes a varied diet with whole grain products, fruit, vegetables, lean dairy products and fish, while reducing intake of processed meat, red meat, saturated fat, sugar, and salt (Norwegian Directorate of Health, 2021). None of the participants specifically mentioned the national dietary guidelines as something they knew of or a recommendation towards having a healthy diet.

One objective in the PREPARED project is to reach more people before they have any intention of becoming pregnant. One in five pregnancies is unplanned in Norway (Lukasse et al., 2015). If a pregnancy is unplanned, we can assume that expectant parents have not considered important prepregnancy nutrients such as folate and iodine. Micronutrient supplementation during pregnancy can counteract nutrient deficiencies but may not be sufficient to improve child health (Blakstad et al., 2022; Stephenson et al., 2018). Those with intentions to become pregnant are often more invested in finding information about pregnancy, and also show an increased willingness to participate in surveys (Barker et al., 2018).

#### 4.1 | Strengths and limitations

To our knowledge, only a limited amount of qualitative research has been conducted on the knowledge of preconception nutritional health in relation to health in the next generation of adults within fertile age range. The interviews were short, which was an intentional strategy to help with recruitment and gave us an indication of participants' immediate thoughts. However, it limited our possibilities to elaborate and ask follow-up questions. Furthermore, as the initial plan was to conduct focus groups discussions, we did not plan sufficiently for follow-up questions during the individual interviews, and made us opt out to ask demographic questions, which might have given us a more in-depth understanding of their knowledge and explore differences in answers across demographic groups.

Furthermore, we cannot rule out the possibility of self-selection bias in our findings (Olsen, 2011). Participants who were more interested in diet and preconception could have been more likely to participate than others. But if this was the case, it would be even more concerning as the level of awareness and knowledge was so limited to begin with. In addition, we do not know if our sample of participants gave us a representative perspective of preconception knowledge as our sample size was quite small, and we do not know if our data were saturated. The semistructured topic guide was also not piloted, and we only collected limited information about demographic characteristics.

Strengths include achieving our goal to interview a wide range of people with different levels of educational attainment based on occupation. Research projects tend to attract people with higher levels of education, so it seems that this setting during recruitment is an effective approach to recruit people with different levels of education. In these kinds of research projects, it tends to be easier to recruit women than men. In this project, there was a slight majority of men, which is unusual in studies in general, and especially in research on reproductive health (Law, 2019; Ryan et al., 2019). One possibility is that men were more comfortable participating when there were two men, and one woman conducting the interviews. The higher proportion of men may have given us a broader impression of what the general population thinks about preconception and healthy eating, providing important information for intervention development. This study was carried out in a medium-sized city in the south of Norway. It is possible that the views presented are not representative of young adults from different parts of the country.

## 5 | CONCLUSION

Our findings suggests that motivation towards eating healthily is connected to both internal and external pressure such as guilt, shame and reward, and to the benefits of eating healthily, such as improved performance during training, or the feeling of well-being. Our findings also imply that awareness of the importance of preconception diet in relation to health is low in the adult population within fertile age range. There is a need to increase awareness and knowledge of the importance of preconception health for health in the next generation. For the population of adults within the fertile age range without children of their own, diet and nutritional education seems needed to promote optimal conditions for conceiving and for pregnancy.

#### AUTHOR CONTRIBUTIONS

Nina Cecilie Øverby, Frøydis N. Vik, Lorentz Salvesen, Mona L. Omholt, and Elisabet R. Hillesund made substantial contributions to conception and design. Erlend N. Valen, Lorentz Salvesen, and Mona L. Omholt were involved in acquisition of data. All authors were involved in analysis and interpretation of data, drafting the manuscript or revising it critically for important intellectual content, final approval of the version to be published. Each author has participated sufficiently in the work to take public responsibility for appropriate portions of the content. They have agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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#### CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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