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# Attitudes and Motivations for Healthy Eating Among Pregnant Women of Different Ethnic Backgrounds Following Antenatal Care in Oslo, Norway

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## Abstract

**Background:** Rising proportions of women enter their pregnancies as overweight or gain weight excessively, increasing their risk of diet-related diseases such as gestational diabetes and preeclampsia. A good understanding of pregnant women's attitudes and motivations toward healthy eating is essential for effective nutrition communication in antenatal care. However, only few studies have investigated attitudes and motivations toward healthy eating during and after pregnancy, and little is known about women of different ethnic backgrounds.

**Objectives:** To explore attitudes toward and motivations for healthy eating by pregnant women of different ethnic backgrounds.

**Methods:** Individual interviews with 16 women were conducted twice during pregnancy and once three months postpartum. Ethnic Norwegian women (n=5), and women born in different African, Asian and South East European countries (n=11) participated in the study. An interpretative phenomenological approach inspired data collection and analysis. Findings were interpreted and discussed in relation to the Self-determination theory (SDT).

**Results:** Attitudes toward healthy eating changed due to pregnancy, but not all of the participants became more concerned about healthy eating. Three patterns were observed: pregnancy as a turn to healthier eating, also after given birth; healthy eating only during the pregnancy; and pregnancy as a 'time-off' from healthy eating. All three groups had both ethnic Norwegian women and women with immigrant backgrounds represented. Participants' attitudes could be interpreted as having motivations with different degrees of self-autonomy.

**Conclusions:** Women seem to have heterogeneous patterns of change in attitudes and motivations toward healthy eating during and after their pregnancies. Tailored nutrition communication should assess and take into account women's attitudes and motivations toward healthy eating and the extent to which these motivations are autonomously regulated.

**Keywords:** Pregnancy; Pregnant women; Over weight

## Introduction

The rise in the proportion of fertile women with an unfavorable weight creates new public health challenges. High maternal weight and excessive gestational weight gain may influence the offspring's future risk of being overweight and developing diet-related chronic diseases [1,2]. Some ethnic minority groups have been found to be disproportionally affected by being overweight and diet-related diseases, like Gestational Diabetes Mellitus (GDM) [3-5].

Overweight and diet-related chronic diseases are largely preventable through a healthy diet, physical activity and weight management. Pregnant women may be easy to reach with nutrition-related information [6]. The repeated sessions of routine antenatal care may offer a unique opportunity to promote of a healthy diet. However, studies indicate that pregnant women may change their attitudes toward healthy eating only temporarily and that they return to pre-pregnancy patterns after giving birth [7-15].

Previous research in health and nutrition communication indicates that it might be challenging for health professionals to effectively communicate about changing dietary practices and weight management, especially in multi-ethnic populations [16-18]. A particular challenge may be to communicate in a way to support long-term behavioral change [19]. Successful nutrition communication for behavioral change implies an understanding of individuals' attitudes and motivations [20]. Attitudes may be defined as a person's overall positive or negative evaluation of the target behavior, whereas motivation may be defined as the psychological energy directed at a particular behavior goal [21,22]. Ethnic background, education and social class, and, for immigrants, the level of acculturation may influence attitudes and motivations toward health behaviors [23,24].

Most behavior change theories in health and nutrition communication value the importance of attitudes and motivations toward a specific health behavior [19]. The Self-Determination Theory (SDT) may be a valuable perspective when investigating women's attitudes and motivations toward healthy eating during pregnancy [12]. It acknowledges that people not only have different amounts of motivation, but also different types and orientations of motivations toward a specific behavior. These orientations of motivation concern people's underlying attitudes that give rise to behavior change [25]. The SDT particularly distinguishes between whether a motivation is autonomous or controlled. Autonomously motivated behaviors are rooted in conscious choices and personal relevance, whereas controlled behaviors are pressured by external forces, such as a person's social environment.

Studies focusing on attitudes and motivation toward healthy eating

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during pregnancy, with emphasis on the prevention of diet-related diseases, are sparse, and primarily conducted in homogenous study populations [11,12, 26-29]. Szwajcer applied SDT to analyze pregnant women's motivations towards healthy eating in the Netherlands. [12]. Other qualitative research explored pregnant women's experiences of being overweight [29-33]. For instance, Mills et al [30] studied the experiences of being overweight among pregnant women in Australia, and the authors found cultural differences in body image ideals. Several authors explored pregnant immigrants' beliefs about health and illness [14,29,34-36]. Interviews among non-pregnant women showed that young women were strongly influenced by cultural traditions and family expectations with regard to food preparation and consumption [35,37-39].

Collectively, these studies focus on women's experiences of being overweight and their beliefs about diseases during pregnancy. No previous studies were found which investigating attitudes and motivation toward healthy eating in women of different ethnic backgrounds during and after pregnancy. A better understanding and consideration of attitudes and motivations toward healthy eating in women of different ethnic backgrounds may be important in order to promote healthy eating practices in antenatal care that last throughout the pregnancy.

## Aim

The aim of this study was to explore attitudes and motivations toward healthy eating behaviors during and after pregnancy among women of different ethnic backgrounds with an increased risk of diet-related diseases. The SDT was applied as a theoretical framework in order to add a depth to the interpretation of the participants' possible underlying motivations [22]. We discuss the findings in relation to the practical implications for nutrition communication in antenatal care.

## Methods

### Data collection

Longitudinal, individual interviews with 16 women were conducted between October of 2010 and April of 2012. The longitudinal approach implied that participants were interviewed twice during their pregnancy and once three months after giving birth in order to explore possible changes in women's attitudes and motivations toward healthy eating in the pregnancy period. The first interview was conducted before the 30$^{th}$ week of pregnancy and the second interview at least two months afterwards. The postpartum interviews were conducted approximately three months after giving birth. Two participants were interviewed only once during pregnancy due to pre-term births, resulting in a total of 46 interviews. Participants were purposively recruited by midwifes during antenatal care at eight different Mother and Child Health Centers (MCHC) in the area of [blinded information]. In order to recruit non-western immigrants, the areas with a high proportion of immigrants were chosen. Women of ethnic Norwegian background (n=5) were included to explore attitudes and motivations toward healthy eating of women of different ethnical backgrounds. Participants were pregnant with their first child and were not diagnosed with a diet-related chronic disease when they were included in the study. Recruitment was carried out until the researchers obtained a detailed and multifaceted insight into women's attitudes and motivations toward healthy eating during pregnancy (Smith 2009). The interviews, lasting from 35 to 65 minutes, were carried out by a public health nutritionist at the MCHC, participants' workplaces, or participants' homes. Interviews were carried out in Norwegian or English, and followed semi-structured interview guides which were pilot tested prior to the study, and further developed throughout the data collection. Participants were asked about their food intake the previous day. The topics in the interview guide relevant to this study's aim were: 1) perception of a healthy diet; 2) attitudes toward healthy eating; 3) motivations for healthy eating; and 4) experiences with, and attitudes and motivation toward weight management. The researcher specifically asked the women to describe their experiences of changes in attitudes and motivations throughout their pregnancy. Short summaries were written after each interview in order to explore and follow-up possible changes during the research period. Interviews were audio-taped and transcribed verbatim by the researcher who conducted the interviews. Credibility of the data was established by the researcher's repeated engagement with the study participants, as well as by the involvement of different researchers in the data collection, analysis and interpretation of the findings [40]. Participants received oral and written information about the study and gave their written informed consent. Ethics approval for this study was obtained from the National Committee for Medical and Health Research Ethics.

### Data analysis

The research process and the analytical procedure were inspired by the principles of the Interpretative Phenomenological Approach (IPA) and Fade's description of their application in public health nutrition and dietetic research [41,42]. This approach implied that the researchers looked for an insider's perspective of the participants' experiences, and the meanings they attribute to the phenomena under investigation.

A qualitative software program, ATLAS.ti (version 6.2.15, ATLAS.ti, Scientific Software Development GmbH, Berlin, Germany, 2011) was used to manage the data in the early analyses. The researchers read the transcripts from each participant several times to get an overall sense of the data, and took initial notes. The detailed case-by-case analyses and interpretation of each participant's interviews involved: 1) identifying and naming the themes (words or short phrases in the transcript); 2) creating a preliminary list of themes; 3) looking for connections between the themes and cluster them together; 4) naming the clusters representing sub-themes; 5) creating a list of sub-themes for each participant and round of interviews; and 6) looking for connections between sub-themes and arranging them into super-ordinate themes across all interviews. The three super-ordinated themes which were identified were: 1) pregnancy as a reason to turn to healthier eating behaviours; 2) healthy eating only during pregnancy, and 3) pregnancy as a 'time-off' from healthy eating. Table 1 gives a list of sub-themes and super-ordinated themes.

## Results

### Characteristics of the study participants

Participants were either ethnic Norwegians (n=5) or born in African, Asian or South Eastern European countries (n=11), namely Algeria, Albania, Pakistan, Thailand, Turkey, Sri Lanka and Somalia. Some of the participants with immigrant backgrounds had a short length of residence in Norway (<1 year) and limited Norwegian language skills. Participants were from 19 to 38 years old and had a Body Mass Index above 25 kg/m$^2$ before pregnancy. Participants varied in educational background and occupational status (Table 2). All were either married or in a relationship. The partners of the participants had either immigration backgrounds from the same country of birth (n=10), or were ethnic Norwegians (n=6). Researchers did not obtain

| | Sub-themes related to attitudes | Sub-themes related to motivations |
|---|---|---|
| **Super-ordinated theme:** Pregnancy as a reason to turn point towards healthier eating | Relaxed towards unhealthy eating behaviors prior to pregnancy<br>Acceptance of overweight prior to pregnancy<br>Bad consciousness related to unhealthy eating habits during pregnancy<br>Expresses guilt related to episodes of unhealthy eating<br>Establishment of "healthier" dinner routines<br>Perceives home-made food as healthier<br>"Got used to eat healthy" during pregnancy<br>Learned to control herself during pregnancy<br>Afraid to lose "healthy routines" after pregnancy<br>Mistrust/does not believe in cultural health believes<br>Cultural influence: importance of the first pregnancy<br>Comparison with "Norwegian pregnant women"<br>Afraid of getting overweight | Own health in relation to experiences and diagnosis with diet-related diseases<br>The health of the offspring<br>Lactation and nourishment of the child<br>Concerned about weight management during and after pregnancy<br>Adheres to advice from the midwife<br>Husband/mother (in law)<br>Being a good example<br>Cultural perception of being overweight<br>Motivation for weight loss after birth: Appearance |
| **Super-ordinated theme:** Healthy eating only during pregnancy | Relaxed towards unhealthy eating behaviors prior to pregnancy<br>Taste preferences determined eating behaviors prior to pregnancy<br>"Forces" herself to eat healthy<br>"Tries" to eat healthy<br>"Should" eat healthy<br>"Free" after pregnancy<br>Concerned about weight gain during pregnancy<br>Differentiates herself from "Norwegian" pregnant women (thin)<br>Adjusts her eating habits to oral glucose tests<br>Overweight as sensitive issue<br>Concerned about healthy eating habits only until the end of lactation<br>Loss of control over healthy eating behaviors after birth<br>Wants to get healthier after some years<br>Relaxed about overweight after given birth | The health of the offspring<br>Adheres to advice from health professionals<br>Concerned about gestational diabetes<br>Strives to fulfill expectations from her social environment<br>Weight management to avoid a too big baby<br>Difficult to plan a healthy diet after given birth<br>Healthy eating to avoid weight gain during pregnancy |
| **Super-ordinated group:** Pregnancy as a "time-off" from healthy eating | Allows herself to eat unhealthy<br>Accepting unhealthy food as her own weakness<br>Dissatisfaction with overweight prior to pregnancy<br>Excuses herself for eating unhealthy in front of the researcher<br>Tries to escape the focus on food during pregnancy<br>Guilt related to unhealthy eating habits<br>Lack of risk awareness<br>Ignorance of her increased risk to develop diet-related diseases<br>Social stigmatization related to overweight prior to pregnancy<br>Efforts to control eating behaviors after given birth<br>Unhealthy food as reward<br>Conflict between the health of the child and food preferences<br>Food preferences determine eating behaviors<br>Between health concerns and taste preferences<br>Will be better after pregnancy<br>Escaping from the health pressure/diet regimes<br>Feeling that it is already too late to start eating healthy in the end of pregnancy<br>Afraid of after birth related to control over eating habits and weight management<br>Regrets after pregnancy<br>Establishment of unhealthy eating habits during pregnancy<br>Guilt due to unhealthy eating habits/weight gain during pregnancy | Followed a strict dietary plan prior to pregnancy<br>"Allows" herself to eat unhealthy<br>The health of the offspring (only to some extend)<br>Diagnosis of diet-related disease<br>Weight loss after pregnancy in order to get a better appearance<br>Wants to "take it again" after pregnancy |

**Table 1:** List of sub-themes and super-ordinated themes.

information about the participants' socio-economic backgrounds, but most of the participants resided in areas with a population of predominantly low-to-middle socioeconomic status. On average, the participant's first visit to the MCHC was at the 19th week of pregnancy. All participants were screened for GDM by an oral 75 g glucose load test based on high weight, race, or a family history of diabetes, but only one participant was diagnosed with GDM.

## Participants attitudes toward and motivations for healthy eating

When asked, the participants perceived a healthy diet as a diet rich in fruits and vegetables, homemade food, and low in sugar. All the participants reported some changes in their attitudes and motivations toward healthy eating during and after pregnancy, but not all in the same direction. The researchers observed three groups with different patterns: women who considered the pregnancy as a reason to adopt healthy eating behavior also over time (7 participants); women who tried to eat healthy only during their pregnancy (6 participants); and women who perceived pregnancy as a 'time-off' from eating healthily (3 participants). All three groups had both ethnic Norwegian women and women with immigrant backgrounds represented.

*Pregnancy as a reason to adopt healthy eating over time*

*"Before pregnancy I didn't think, right. I ate actually not that healthy. I ate what I wanted. If I wanted to have chips, I ate it. If I wanted to eat something fatty, I didn't think about what I ate. But after giving birth, or during pregnancy, I think all the time."* (P9)

Women in this group had positive attitudes toward healthy eating and stated to have become more concerned about healthy eating during their pregnancy. Before the pregnancy, they had been more relaxed about being somewhat overweight and eating unhealthily. At this phase of their life, however, the women described episodes of eating unhealthy during their pregnancy with feelings of guilt.

A characteristic theme in this group was that they aimed to continue with healthy eating behaviors postpartum. When interviewed postpartum, the participants' statements indicated that they adopted the healthy changes made during the pregnancy as new habits: "*I*

| Characteristics | Number of participants |
|---|---|
| **Ethnicity** | |
| Ethnic Norwegian | 5 |
| Norwegian-born to Pakistani born parents | 2 |
| Foreign born and moved to Norway* | |
| Albania | 1 |
| Algeria | 1 |
| Pakistan | 1 |
| Russia | 1 |
| Sri Lanka | 1 |
| Somalia | 3 |
| Thailand | 1 |
| Turkey | 1 |
| **Years of residence in Norway (n=10)** | |
| 0-1 year | 2 |
| 1-5 years | 3 |
| 5-10 years | 4 |
| > 10 years | 1 |
| **Education** | |
| Primary school (1-7 years) or less | 2 |
| Lower secondary school (8-10 years) | 2 |
| Upper secondary school (11-13 years) | 3 |
| Higher education (3 to 5 years at University or College) | 10 |
| **Employment status** | |
| Unemployed | 2 |
| Full or part time employed | 12 |
| Language training course/education | 3 |

**Table 2:** Ethnicity, years of residence in Norway, education and employment status of the study participants.

*have got used to eat healthy during pregnancy*" (P5). *Instead of going back to the old sins and to eat more than necessary, you have learned to maintain it.*"" (P2) Although some interviews indicated that the motivation appeared to fade when the woman stopped breastfeeding, these participants still emphasized the importance of preparing healthy homemade dinners and establishing healthy eating routines for the family.

Especially the two women diagnosed with GDM and high blood pressure mentioned their own health as an important motivational factor. For instance, a woman born in Norway with parents from Pakistan stated that she gained a lot of weight because "*…in the Pakistani culture you should gain weight after marriage, so that everybody can see that you are happy*." After diagnosed with GDM, she changed her diet and worried more about her weight. She further expressed that she wanted to continue to eat healthy because "*I had to take these injections, and I don't want to do that anymore. I would like to prevent that. And I want to lose weight.*" (P4)

Other participants mentioned weight management as a motivation for eating more healthily, both in pregnancy and after giving birth. Nevertheless, participants often experienced problems with controlling their weight, and a lack of supportive advice: *"I told her [the midwife] 'What can I do? I do almost everything that you tell me to.' (...) So she replied, 'then there's nothing to do about it. Just let it [the weight] go up'."* (P 9) Some of the immigrant women expressed wishes to comply with the body ideals of the host country: "*In Norway, many pregnant women have a really big belly during pregnancy, but after giving birth, they lose weight really fast. And that is really exciting for me. (...) And I think I have to do as they do."* (P7)

*Eating healthily during pregnancy only*

"*Now I eat a lot of vegetables. I don't like them, but I force myself to eat them. After pregnancy, I'll be free.*" (P 12)

Women in this group were concerned about healthy eating only during pregnancy, without any expressed ambitions to continue with this after giving birth. We observed less positive descriptions from these women about the benefits of eating healthy and instead they expressed thoughts like: "*I force myself to eat healthy,*" "*I try to eat healthy,*" or "*I should eat healthy*." Similar to the previous group, these participants did not express major concerns about their overweight status prior to their pregnancy or eating too unhealthy. Taste preferences and enjoyment of food appeared to determine their food choices.

The women in this group often mentioned the health of the fetus as a motivation to eat more healthily. They sometimes concerned about their overall pregnancy weight gain, but mainly expressed as a fear that the baby would grow too big and that the delivery would be difficult. Several participants in this group seemed to get more motivated to change their diet if confronted with an increased risk of acquiring a diet-related disease, like GDM or high blood pressure: "*I was stricter with my diet after the [borderline] glucose tolerance test. When I took the test another time, and the results were fine, my diet has slipped again*." (P1) For these women the motivation appeared to be related to a perceived risk, but that this influenced healthy eating only temporarily.

These women commonly related their motivations to advice given by health professionals. Additionally, they stated that their husbands or other family members encouraged them to eat more healthily during their pregnancy. We did not observe descriptions from the women of similar type of encouragement after delivery. Furthermore, many participants in this group experienced less control over their healthy eating habits after giving birth and related this to their weakness for unhealthy food. Being overweight seemed to be of little concern in the postpartum phase among these women, but an emerging theme was that they planned to eat more healthily later, to be an active mother and a good example for the child.

*Pregnancy as a 'time-off' from eating healthily*

*"I thought that I did not have to think about dieting and such things during pregnancy. I thought I could eat without guilt. I could eat so many sweets, and buy a bit of cake almost every day. That was really great."* (P8)

The women in this group considered pregnancy as a 'time-off' from worries about their diets. They appeared to "allow" themselves to eat unhealthily, or as expressed by a participant: "*I accept unhealthy food as my own weakness.*" (P6). They did not appear to evaluate possible benefits of healthy eating during pregnancy. Another characteristic of these women was that they had previously attempted to diet on one or more occasions and that during their pregnancy they could escape from restrained eating and weight management.

The women in this group were less concerned about whether their diets could affect the fetus: "*In the beginning I thought that I had to eat healthy and little (…). But now I am fat, and I notice, that instead of thinking that I have to take care of the child I have been like 'now I can eat a bit of ice cream, because I am fat anyway."* (P6) These participants appeared to negotiate between thinking of the child's health and allowing themselves to eat unhealthily. The researchers observed the possible lack of knowledge regarding possible consequences of an

unhealthy diet and being overweight in pregnancy: "*I didn't think that much about preeclampsia in the first three or four months, because I didn't know about it. Afterwards I got some books and I also started to read and I asked my midwife about it. And diabetes, I did not know that women of my background are more likely to get it than ethnic Norwegian girls.*" (P8)

Participants in this group expressed more dissatisfaction with their pre-pregnancy body weight and gave examples of how being overweight was a social stigma. Although the participants appeared to be more relaxed about gaining weight during their pregnancy, they were concerned about how to lose weight again after pregnancy. Women in this group repeated their dissatisfaction with their body weight in the interviews after giving birth. One participant stated that she could not stand to weigh herself, even three months after giving birth. The motivation given for eating more healthily postpartum was often the wish to improve their figures. The participants sometimes regretted their unhealthy eating practices during pregnancy. Comparably with the women who were only motivated to eat healthy during pregnancy, this group perceived a lack of control over their eating habits after giving birth: "*Sometimes I manage to control it [episodes of unhealthy eating] and I am very pleased, but other times I don't.*" (P6).

A common theme among the participants of immigrant backgrounds across the three groups was that they perceived their diets as less healthy after migration. They believed that weight gain prior to their pregnancy was a consequence of moving to a more affluent country. These women also emphasized a wish to continue, to a varying degree, with dietary habits and foods from their country of origin. Both ethnic Norwegians and immigrant women received advice about food during pregnancy from family members. However, the researchers observed that participants were skeptical to advices based on cultural lay beliefs about appropriate food in pregnancy received from their family members.

## Discussion

In this study, we found women who became more concerned about healthy eating during pregnancy and who aimed to pursue it postpartum, women who tried to eat healthy only during their pregnancy and women who perceived pregnancy as a 'time-off' from healthy eating. Researchers observed these divergent attitudes across participants of different ethnic backgrounds. The three groups could be interpreted as having motivations with varying degrees of self-autonomy.

The pregnancy period has been considered as a phase when women are easy to reach with nutrition-related information and several studies find that women become more concerned about healthy eating when pregnant [10,12,14]. However, a study by Devine et al [11] indicates that pre-pregnancy orientations may be the most important determinant of attitudes related to diet and weight management throughout this phase. Hjelm et al [14] explored the development of beliefs about health and GDM in Middle East migrant women living in Sweden during and 14 months after pregnancy. The study showed that women's beliefs developed during the study period. In the beginning, the women were worried about the health of the baby because of GDM and tried to comply with healthy dietary advice. They reported to be less motivated to eat healthily after delivery [14]. Our study suggests that attitudes and motivations toward healthy eating during and after pregnancy may be quite varied. All our participants appeared to be somewhat concerned about healthy eating at some stage, but pregnancy itself did not necessarily motivate for healthier eating. Women who were not motivated to eat healthy during their pregnancy reported repeated attempts of dieting and a focus on weight management prior to pregnancy. Also, Fairburn et al [43] found that a history of dieting prior to pregnancy were apparent in postpartum weight management strategies. Other studies indicated that women who dieted habitually prior to pregnancy tended to gain more weight and appeared to regard themselves as less accountable for their maternal weight gain [44-46].

Although the participants in the present study had an increased risk of developing diet-related diseases, the interviews indicated that they were not aware of the possible consequences on the future health of the offspring. Researchers did not observe any differences related to participants' ethnical background, contrarily to previous studies [34,47,48]. These studies indicated that immigrant women from African and Asian countries had less knowledge and awareness of diet-related diseases, which influenced their motivations. Mills et al. found that immigrant women of Pacific Island backgrounds were less concerned about and dissatisfied with being overweight [30]. Hjelm et al [34] found cultural differences in the beliefs about GDM among Swedish and Middle Eastern-born women, which had implications for women's self-care practices.

Szwajcer et al [12] considers a mother's interest in her own health as the most autonomous form of extrinsic motivation. According to the SDT, this autonomous form of motivation is called integrated motivation. Integrated motivation implies that the person not only sees the importance for behavioral change, but that the change is in line with their own core values and beliefs, and gets fully integrated into the person's life [22]. Even though humans can experience multiple types of motivational regulations simultaneously, the three groups of participants in this study could be characterized by specific forms of motivations [49].

Women who pursued to eat healthy also 3 months postpartum often mentioned the interest in their own health as their motivation. However, as previous research indicates, some of these women needed a medical concern to consider such changes [50]. This is in accordance with the SDT which suggests that change arising from integrated regulation is considered to be more stable and enduring [22]. In the context of the present study, an integrated regulated motivation for healthy eating would also be consistent with a woman's preferred food culture. Thornton et al [39] for instance, found that Latino Women in the US followed cultural beliefs concerning safe and appropriate food during pregnancy. Hjelm et al [14] on the other hand, found that home remedies or alternative medicine measures were used by very few immigrant pregnant women in her sample.

Women who tried to eat healthy during pregnancy only tended to relate their motivations to the health of the fetus. Croghan advises health professionals not to use concerns for the health of the fetus as a motivator, as this may be an external motivator for behavior change [51]. The author suggests that external motivators may only lead to temporary changes in behavior. Some participants within this group also perceived eating healthier as personally important and meaningful, representing identified regulation as conceptualized in the SDT. However, the women did not appear to fully value and to integrate long-term healthier eating behaviors after delivery. They were often encouraged by their family members or health professionals to eat healthy and seemed to strive to fulfill the expectations of their social environment. This was also been observed in previous studies among pregnant women [9,12]. Expressions like "I should" or "I must" eat healthy might indicate feelings of pressure and a need to comply. Behaving out of a sense of obligation or guilt, considered as introjected

regulated motivation, is a less autonomous form of motivation within the SDT [22].

Women who considered pregnancy as a 'time-off' is comparable to what Ryan describes as being amotivated, the state of lacking the intention to act. Amotivation is characterized by a lack of feeling competent or expecting to yield a desired outcome from a specific behavior [22]. These participants appeared to "allow" them to eat unhealthy, and expressed this incompetence to resist their desires for unhealthy food. The pregnancy period may be one of the few times in a woman's life when society accepts and even encourages her to eat larger quantities of food [52]. The phenomena that pregnant women relax and let go of concerns over a healthy diet and body weight has been described previously [11,53].

Prentice et al [53] describe a motivational collapse in pregnant women with previous weight problems and restrained eating practices. Our findings indicated that amotivation may also be related to the lack of risk awareness.

Findings from qualitative research can provide useful explanations for the associations between attitudes, behaviors and experiences relevant for health and nutrition communication [54]. Some of the limitations of this study were that a healthy diet was defined by the participants' own perceptions, and that information on dietary changes was based on participants' self-reports. The results may be transferable only to groups with similar characteristics and in a comparable context, but not to the population at large. Language difficulties certainly influenced the quality and interpretation of the interviews. However, the use of an interpreter may give rise to methodological challenges in qualitative research [55,56]. The longitudinal approach helped to clarify language problems. Lastly, the follow-up time was too short to explore longer-term changes in women's attitudes and motivations toward eating behaviors.

## Conclusion and Relevance to Clinical Practice

This study illustrated that pregnant women receiving antenatal care seem to be heterogeneous in terms of their attitudes and motivations toward healthy eating. Pregnancy may not always motivate for healthier eating. Women who start to eat healthier during pregnancy may not be motivated to pursue after delivery. Nutrition communication in antenatal care may be important to strengthen women's motivation towards healthy eating. A growing body of the literature suggests that health and nutrition communication tailored to the individual's characteristics, motivations, and cultural beliefs are more effective [24,47,57,58]. Tailored nutrition communication may imply to assess and to take into account women's attitudes and motivations toward healthy eating and the extent to which motivations are autonomously regulated [59]. Concepts of the SDT may be applied in the development of health messages and health promotion efforts [60]. Vansteenkiste et al [61] advises health professionals to focus on helping the client to become more autonomously motivated. The temporary increased motivation for eating healthily seen in some pregnant women suggests that continuous support postpartum may be of utmost importance for longer-term dietary changes.

In the present study, participants of immigrant backgrounds emphasized a wish to pursue with their dietary habits and food items from their country of origin. As described previously, we observed that participants were skeptical to advice about safe and appropriate food during pregnancy from their traditional food culture [62]. Several authors argue that effective nutrition communication has to be sensitive to the influence of individuals' ethnic and cultural backgrounds on their dietary habits [57,63,64]. The extent to which individuals of cultural groups value and identify themselves with cultural beliefs may vary [57,63]. Tailoring may therefore consider the possible influence of cultural values related to eating behaviors during pregnancy [65].

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