Nutrition-related information-seeking behaviours of women trying to conceive and pregnant women: evidence for the life course perspective

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Objectives. To examine whether preconception and pregnancy could be an occasion triggering women’s interest, search and need for both general and pregnancy-specific nutrition-related information, in order to: (i) provide a greater understanding of the life course perspective (in this case on nutrition behaviours and pregnancy) and (ii) to contribute to the rationale of nutrition interventions aimed at women of child-bearing age.

Methods. Data were collected in a cross-sectional study with the aid of a face-to-face interview. The sample consisted of four groups each of about 100 Dutch nulliparous women each: women trying to conceive and women in the first, second or third trimester of their first pregnancy.

Results. Pregnant women were more interested in nutrition information than before preconception and before pregnancy, especially the first-trimester group. The frequency of search for nutrition information differed significantly between the groups: the first-trimester group searched for information most frequently. Women wanting to conceive and women in their third trimester of pregnancy found significantly more pregnancy-specific information topics than women in their first and second trimester of pregnancy. Women wanting to conceive had significantly higher needs for general and specific nutrition-related topics compared to pregnant women. Overall, the Internet, the midwife and books were the favourite information sources.

Conclusions. The study provided indications that preconception and pregnancy are moments in life that lead to an increased interest, need and search for particularly pregnancy-specific nutrition-related information. This should be borne in mind when healthy nutrition promotion activities are being developed.

Keywords. Behaviours, information, interest, nutrition, search.

Introduction

In her review, Whethington\textsuperscript{1} defines the life course perspective (LCP) as a theoretical orientation that addresses the balance between stability and change in health and health behaviour across the lifespan of individuals. According to this theoretical orientation, individuals have relatively stable lifestyle patterns. These are shaped and formed over time from early childhood and are influenced by many factors, such as cultural factors (e.g. gender and race), contextual factors (e.g. socio-economic status and living conditions) and social factors (e.g. being a member of a church or being married).\textsuperscript{1,2} Because of these different influencing factors shaped over time, it is difficult to change a person’s lifestyle trajectory, such as nutrition behaviour.\textsuperscript{1,3} However, according to the LCP, there are certain critical transitions in life that may influence future health and health behaviours.\textsuperscript{1} These could lead to so-called ‘transitions’ and/or ‘turning points’ that can influence or even break through a particular lifestyle trajectory.\textsuperscript{1,3}
A high quality nutrition is important to one’s health and well-being. For women, this is especially relevant in and around the period of their pregnancy and is one of the main themes of the health promotion activities directed at them. Our previous studies showed that women indeed are more worried about food and health in this period than they did during prepregnancy and are more willing to change nutrition-related behaviours than in other times, especially in case of a first-time pregnancy.4–9 This is in line with the ‘LCP’.

Previous studies4–10 indicated that the period in and around pregnancy could indeed be such a special moment in life. Women went from a passive or ‘cold’ type of nutrition awareness to a more active or ‘hot’ type of nutrition awareness; they regarded the theme ‘food and health’ (i) more salient, (ii) were more preoccupied by it and (iii) were more eager to formulate action rules in this field.11,12 This applies to general nutrition (such as vegetables, fruit and dairy) as well as to pregnancy-specific nutrition (such as raw meat and cheeses). Our qualitative studies also suggested that this increased nutrition awareness could transform into a ‘new post-partum routine or lifestyle identity’.5,8 Consequently, a pregnant woman may also be more sensitive to healthy nutrition promotion activities and may actively seek nutrition-related information,13 as nutrition becomes more personally relevant. These are important conditions for rethinking nutrition habits and are a first step in making behaviour changes.14 In one of our previous qualitative studies, we found that preconception and pregnancy are associated with increased nutrition-related information-seeking behaviours.9

The purpose of this study is to examine quantitatively whether preconception and pregnancy in a woman’s life could be an occasion triggering her interest, search and need for general nutrition information, in addition to information on more pregnancy-specific nutrition-related information topics (such as raw meat). If so, healthy nutrition promotion activities directed at the period in and around pregnancy, as transitional life stage, may be a positive exception to the general feeling that health behaviour change is difficult to achieve. Another purpose of this study is to examine quantitatively whether there are differences between prepregnancy, pregnancy and different trimesters in pregnancy with regard to the interest, search and need for nutrition information and favourite sources for information. This would be helpful to channel strategies for healthy nutrition communication.15,16 We aimed to answer three research questions:

(i) Do women trying to conceive and pregnant women have an increased interest, search and need for nutrition information?

(ii) Do women trying to conceive and pregnant women in the three trimesters differ as a group in their nutrition interest?

(iii) What are the three information sources and channels for pregnancy-related information of women trying to conceive and pregnant women?

The research questions are based on the uses and gratification theory.17 This theory suggests that we use media and are in fact gratifying needs.18 Its basic assumption is that media audiences are active. People select and use communication sources and messages to satisfy needs or desires. From this perspective, media compete among themselves for selection, attention and use.19

Method

Design and study participants

Data were collected by means of a face-to-face questionnaire administered at the homes of the study participants. Four groups of nulliparous women were selected for this cross-sectional study:

(i) Women who had stopped using contraceptives in order to become pregnant.

(ii) Women trying to conceive between 10 and 14 weeks of pregnancy.

(iii) Women between 20 and 24 weeks of pregnancy.

(iv) Women as from 32 weeks of pregnancy.

To avoid bias, women were not informed that the research was particularly directed at nutrition or that the questionnaire would focus on nutrition-related information-seeking behaviours. Instead, they were informed that the questionnaire contained questions on lifestyle information during pregnancy.

The questionnaire contained questions about women’s interest in nutrition-related information, their frequency of search and need for this information and their appreciation for different information channels and sources. See Annex 1 for examples of questions of the questionnaire. To avoid bias, women were first questioned on their search and need for nutrition-related information topics on a six-point scale (search: not, seldom, once in a while, fairly often, often, very often; need: very often, often, a bit more, not really, not, totally not). These were directed at general nutrition topics and were also directed at nutrition-related topics specific for pregnancy. The selection of nutrition-related topics used in the questionnaire was derived from the ‘rules of thumb’ designed by The Netherlands Nutrition Centre (NNC) and aimed at all Dutch pregnant women. The NNC is an official, independent and scientifically based organization that is primarily financed by the Dutch government and informs consumers on healthy nutrition. The general rules of
thumb focus on the importance of a healthy and varied diet in general and more specifically on the importance of fruit, vegetables, bread, dairy food, healthy and unhealthy fats, soft drinks and breakfast. More pregnancy-specific rules of thumb focus on alcohol, raw meat, raw cheese, raw fish, liver, coffee and herbs/spices.

Subsequently, women were asked for their interest in information in relation to health-related nutrition information on a seven-point scale: from very much (a high interest in health-related nutrition information) to very low (a very low interest in health-related nutrition information), compared to their interest before they were pregnant (the women are their own control; self-reported). Next, women were asked to give their top three of information sources in relation to pregnancy-related information including nutrition (open question).

The questionnaire was pilot tested for readability and improved before it was used in this study.

Study participants
Respondents were approached through access panels of three market research organizations:

(i) ‘GFK Script Panel’: this panel contains names and addresses of a sample of the Dutch population broken down by age, education level and residence.

(ii) ‘We Special Media’: this is an organization that has almost all the names and addresses of pregnant women in The Netherlands because it offers a free information pack to pregnant women.

(iii) ‘Intomart’: this organization undertook a study directed at intended childlessness. The nulliparous women in that study who appeared to have a future child wish were excluded for the Intomart study and approached for our study.

The target was to have at least 100 women in each group. Women included had to meet the following criteria: aged between 20 and 40 years, born and raised in The Netherlands and, if pregnant, had already consulted a midwife. (In The Netherlands, women with serious complications are seen by a gynaecologist rather than by a midwife. The profession of obstetrician does not exist in the Dutch health system.) Women who were seen exclusively by gynaecologists were excluded. Beforehand, all respondents were promised a small monetary compensation in the form of a €5 voucher and a gift (a cookery book) in appreciation for their participation.

Analyses
Statistical analyses were performed using SPSS 12.0. Comparisons between groups were performed using General Linear Models (GLMs) (analyses of variance) with F-tests and Student–Newman–Keuls post hoc tests to testing differences in the interest, the frequency of search and the need for nutrition-related information. In GLMs, the following covariates were considered: education level, age and interactions. Appreciation of information channels and sources on pregnancy-related information were analysed with means.

Results
In total, 422 women completed the questionnaire. Socio-demographic characteristics of the respondents are in Table 1. The mean age of the group of women trying to conceive was significantly higher than that of women in their first and second trimester of pregnancy (post hoc test, \( P = 0.01 \)). The education level did not differ between the groups (chi-square 8.9, df 8, \( P = 0.35 \)).

The first research question was directed at the interest, search and need for nutrition-related information.

Interest in nutrition information
Table 2 shows that all groups of women indeed reported to be more interested than before in nutrition-related information. However, the first-trimester group was significantly more interested than the other

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**Table 1** Socio-demographic characteristics of the sample by groups (n = 422)

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Trying to conceive, n = 100</th>
<th>Pregnant first trimester, n = 102</th>
<th>Pregnant second trimester, n = 110</th>
<th>Pregnant third trimester, n = 110</th>
<th>All groups of women together, n = 422</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years (mean, SD)</td>
<td>31.4 ± 0.42</td>
<td>28.5 ± 0.40</td>
<td>28.3 ± 0.36</td>
<td>29.3 ± 0.39</td>
<td>29.4 ± 0.42</td>
</tr>
<tr>
<td>Working (%)</td>
<td>98</td>
<td>95</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Education level (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Middle</td>
<td>3</td>
<td>49</td>
<td>45</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>High</td>
<td>56</td>
<td>42</td>
<td>48</td>
<td>50</td>
<td>49</td>
</tr>
</tbody>
</table>

SD, standard deviation.
groups ($P = 0.007$). No significant effects from age and educational level, neither two-way nor three-way interactions of age, educational level and the interest in nutrition information were found.

**Search for nutrition-related information in relation to health**

Table 3 shows that the first-trimester group searched for information most often (once per 1–2 weeks), followed by the second-trimester group (once per 2–3 weeks) and then the third-trimester group and the group of women wanting to conceive a child least often (once per 3 weeks). These differences are significant ($P = 0.000$). Neither age and education level nor interactions on information-seeking behaviours over the last month showed significant effects.

**Search for general and pregnancy-specific nutrition-related information**

Data analysis showed no significant differences between groups in general nutrition-related information-seeking behaviours as a whole [Likert scale construction based on information seeking (behaviours) for fruit, vegetables, bread, dairy, fats, breakfast and juices all together]. Information topics most searched for were bread, fats and juices.

There were significant differences between groups in information seeking for pregnancy-specific nutrition-related topics as a whole [Likert scale construction based on information seeking (behaviour) for alcohol, liver, raw meat, raw cheeses, fish, fresh food, herbs/spices and coffee all together]. Information topics most searched for were fresh food, raw meat and raw cheeses.

Women wanting to conceive and women in their third trimester of pregnancy found significantly more pregnancy-specific information topics than women in their first and second trimester of pregnancy ($P = 0.000$). There was no effect of age and education.

**Current need to search nutrition information**

Women wanting to conceive have significantly higher needs for information about general nutrition-related topics than pregnant women in the third-trimester groups ($P < 0.03$), except for the information topic ‘breakfast’ ($P = n.s.$). On the average, for all general nutrition-related topics taken together, 27% of the women wanting to conceive still feel a need for information, particularly on fats, dairy and vegetables.

Women wanting to conceive also have higher needs for information about pregnancy-specific nutrition-related topics than the three groups of pregnant women ($P < 0.003$). For all of these pregnancy-specific nutrition topics, 35% of the women wanting to conceive still felt a need for information, particularly on herbs/spices, fish and raw cheeses.

**Top three information channels and sources**

The second question was women’s top three of information sources for information on pregnancy-related information, including nutrition. Table 4 shows the

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**Table 2**  
*Interest in nutrition information by groups in percentages*

<table>
<thead>
<tr>
<th>Interest in nutrition information</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>More interested (%)</td>
<td></td>
</tr>
<tr>
<td>Interest has not changed (%)</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Women trying to conceive</td>
<td>61</td>
</tr>
<tr>
<td>Pregnant first trimester</td>
<td>80</td>
</tr>
<tr>
<td>Pregnant second trimester</td>
<td>66</td>
</tr>
<tr>
<td>Pregnant third trimester</td>
<td>63</td>
</tr>
<tr>
<td>All groups of women together</td>
<td>68</td>
</tr>
<tr>
<td><strong>n</strong></td>
<td><strong>284</strong></td>
</tr>
</tbody>
</table>

**Table 3**  
*Search for nutrition-related information in relation to health over the last month in numbers*

<table>
<thead>
<tr>
<th>Search for nutrition-related information</th>
<th>Once a week to daily, n</th>
<th>Once every 2 weeks, n</th>
<th>Once every 3–4 weeks, n</th>
<th>Not at all, n</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women trying to conceive</td>
<td>25</td>
<td>24</td>
<td>27</td>
<td>24</td>
<td>$1.97 \times \text{per 4 weeks}^a$</td>
</tr>
<tr>
<td>Pregnant first trimester</td>
<td>60</td>
<td>22</td>
<td>13</td>
<td>7</td>
<td>$2.91 \times \text{per 4 weeks}^b$</td>
</tr>
<tr>
<td>Pregnant second trimester</td>
<td>43</td>
<td>29</td>
<td>24</td>
<td>14</td>
<td>$2.31 \times \text{per 4 weeks}^c$</td>
</tr>
<tr>
<td>Pregnant third trimester</td>
<td>37</td>
<td>19</td>
<td>31</td>
<td>23</td>
<td>$1.75 \times \text{per 4 weeks}^d$</td>
</tr>
<tr>
<td>All groups of women together</td>
<td>165</td>
<td>94</td>
<td>95</td>
<td>68</td>
<td>$2.24 \times \text{per 4 weeks}^e$</td>
</tr>
</tbody>
</table>

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$a^{25/100 \times 4 + 24/100 \times 2 + 27/100 \times 1 = 1.97 \times \text{per 4 weeks}}$; the calculation of the mean of women trying to conceive is interpret as once per 3 weeks.

$b^{60/102 \times 4 + 22/102 \times 2 + 13/102 \times 1 = 2.91 \times \text{per 4 weeks}}$; the calculation of the mean of women in their first trimester of pregnancy is interpret as once per 1–2 weeks.

$c^{43/110 \times 4 + 29/110 \times 2 + 24/110 \times 1 = 2.31 \times \text{per 4 weeks}}$; the calculation of the mean of women in their second trimester of pregnancy is interpret as once per 2–3 weeks.

$d^{37/110 \times 4 + 19/110 \times 2 + 31/110 \times 1 = 1.75 \times \text{per 4 weeks}}$; the calculation of the mean of women in their third trimester of pregnancy is interpret as once per 3 weeks.

$e^{165/422 \times 4 + 94/422 \times 2 + 95/422 = 2.24 \times \text{per 4 weeks}}$; the calculation of the mean of all groups of women together is interpret as once per 2–3 weeks.
Conclusion and discussion

The transitional life stages may be a positive exception to the general feeling that health behaviour change is difficult to achieve. This study provided indications that preconception and pregnancy are times in life that indeed lead to an increased interest, need and search for nutrition-related information. Results showed that women wanting to conceive and pregnant women indeed were more ‘interested’ in nutrition-related information. Of those women ‘searching for’ nutrition-related information, the first-trimester group had a mean of once per 1–2 weeks, the second-trimester group had a mean of once per 2–3 weeks and finally the third-trimester group and the women wanting to conceive a child both had a mean of once per 3 weeks. The differences were significant. No significant differences between groups were found on general nutrition-related information-seeking behaviours as a ‘whole’. There were significant differences between groups on pregnancy-specific nutrition-related topics as a whole. Women wanting to conceive and women in their third trimester of pregnancy found significantly more pregnancy-specific information topics than women in their first and second trimester of pregnancy. Women wanting to conceive had higher ‘needs’ for general and specific nutrition-related topics compared to pregnant women. The Internet, the midwife and books were the most favourite information sources for pregnant women. For women wanting to conceive, these were the gynaecologist and the primary care physician.

The results here are in line with our previous qualitative study on nutrition-related information-seeking behaviours among women wanting to conceive and pregnant women in different trimesters in their pregnancy. In that study, we found that nutrition-related information-seeking behaviours were more pregnancy specific in character rather than general. This was explained by the fact that it is one of the few things that pregnant women can adjust to in their daily lives to protect the health of the foetus.9

This is online with LCP studies and reviews (see e.g. 1–3).

A limitation of this study is that the sampling did not meet the highest criteria required to guarantee randomness. We had to rely on existing panels. For practical reasons, the study participants originated from different, though representative, access panels. Although corrections were made for education and age, the samples are somewhat biased towards higher educated and older women in the group trying to conceive. With respect to the sampling procedure, we are aware that while the panels have been representative, the participants in our study may not have been representative. Unfortunately, this is an inherent feature of this kind of studies. This limits the extend of possible generalization of the results to the overall Dutch population.

**Implications for research and practice**

A number of practical implications can be inferred from this study. First, it tells health promoters that the period in and around the pregnancy is one of those few transitions in life in which women are more interested in nutrition information. The promotion of a healthy nutrition in and around the period of pregnancy thus could have positive consequences for future health behaviours. To what extent general nutrition information can be communicated together with the wanted pregnancy-specific nutrition information—without being counterproductive to get the pregnancy-specific nutrition information communicated—remains a matter of future research. Health promoters can channel strategies for nutrition communication by using the Internet and books.14

To obtain more insight into the LCP, it would be interesting to study women’s information-seeking practices.
behaviours for nutrition and other lifestyle-related issues in other special or critical life transitions, such as motherhood and retirement. It would also be interesting to study information-seeking behaviours of women in their second or third pregnancy.

Annex 1: Examples of three questions in the questionnaire

Has your interest in information about health nutrition been changed since your pregnancy?

Yes, I’m much more interested
Yes, I’m more interested
Yes, I’m slightly more interested
No, it has not been changed
Yes, I’m slightly less interested
Yes, I’m less interested
Yes, I’m much less interested

How often did you generally search for nutrition information with regard to health last month?

Nearly every day
Nearly every week
Once per fourteen days
Once per three weeks
Once a month
Not

What are your top three of sources and channels for information on pregnancy including nutrition?

1. ........................................
2. ........................................
3. ........................................

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Declaration

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Conflicts of interest: None.

References