CHAPTER 7

General discussion and implications
The aim of this thesis is to contribute to knowledge of the prenatal healthcare use of pregnant women receiving primary midwifery care and on its determinants. Two perspectives were studied, namely the use of care offered within prenatal care programmes and ancillary care use. Prenatal care programmes are based on professional guidelines and mostly concern prevention. Ancillary care is care provided alongside care from maternal healthcare providers (in this thesis the main maternal healthcare provider is a primary care midwife).

With respect to the use of care offered within prenatal care programmes, the following aims were formulated:

1. To provide a systematic review of the evidence on the determinants of prenatal healthcare use in high-income countries.
2. To examine the determinants of inadequate prenatal healthcare use by low-risk women in primary midwifery-led care in the Netherlands, and to determine whether these differ from those referred to prenatal secondary care.
3. To compare prenatal healthcare use in Belgium and the Netherlands with differently designed pregnancy care systems, as measured using the Content and Timing of care in Pregnancy (CTP) tool, and to identify their predisposing, enabling and need (pregnancy-related) determinants.

With respect to the use of ancillary care, the following aims were formulated:

4. To compare GPs consultation rates, diagnoses and healthcare management for pregnant women with those for non-pregnant women in the Netherlands.
5. To examine the prevalence and the determinants of CAM use by low-risk pregnant women in the Netherlands.

This chapter presents the main findings. In addition, we will discuss the main findings, strengths and limitations of this thesis, followed by its implications for practice, education and further research.

**MAIN FINDINGS**

**Use of care offered within prenatal care programmes**

*Aim 1 (Chapter 2): To provide a systematic review of the determinants of inadequate prenatal healthcare use in high-income countries*

We found that high quality evidence of the determinants of prenatal care use was limited, with only eight studies included in this review meeting the quality assessment criteria. These studies identified a number of individual determinants related to inadequate prenatal care use (i.e. entry after the first pregnancy trimester and/or an inadequate number of prenatal visits): low maternal age, low education level, unmarried status, ethnic minority status, planning care with a GP/midwife/midwifery team or hospital consultant compared to shared care, planning care in an urban teaching hospital compared to an urban non-
teaching hospital, not planning a place of delivery, lack of insurance, high parity, no previous premature birth, and late recognition of pregnancy. Contextual determinants associated with inadequate use were living in neighbourhoods with high rates of unemployment, being part of a single-parent family, having a medium-average family income, living in an area with low average education levels, and women reporting Canadian Aboriginal status. Regarding health behaviour, inadequate use was more likely among women who smoked during pregnancy.

Aim 2 (Chapter 3): To examine determinants of inadequate prenatal healthcare use by low-risk women in primary midwifery-led care in the Netherlands, and to determine whether these differ from those who are referred to prenatal secondary care.

We found a prevalence of 24.7% for inadequate prenatal care use (i.e. the combination of care entry after twelve weeks gestation and an insufficient number of visits) among low-risk pregnant women in Dutch primary midwifery-led care. Overall, women of non-Western origin (compared to native Dutch women), unemployed women, women reporting chronic illnesses or disabilities, and women who did not use folic acid periconceptionally were more likely to use prenatal care inadequately. Women not referred to secondary care during pregnancy were more likely to use prenatal care inadequately if they intended to deliver in a hospital, if they did not use folic acid periconceptionally, and if they were exposed to cigarette smoke during pregnancy. Women referred to secondary care were more likely to use prenatal care inadequately if they reported chronic illnesses or disabilities, and did not use folic acid periconceptionally.

Aim 3 (Chapter 4): To compare prenatal healthcare use in Belgium and the Netherlands with differently designed pregnancy care systems, as measured by the Content and Timing of care in Pregnancy (CTP) tool, and to identify its predisposing, enabling and (pregnancy-related) need determinants.

We found that women residing in the Netherlands used prenatal care adequately more often (58.3%) than women residing in Belgium (45.5%). Furthermore, 5.7% of Dutch women and 9.7% of Belgian women used prenatal care inadequately. In this study, adequacy of use of prenatal care was defined based on a combination of characteristics regarding entry to care and the content of care. However, regardless of country of residence, inadequate prenatal care content and timing were associated with lower education levels, unemployment, lower continuity of care provider and non-attendance at prenatal classes.
Use of ancillary care during pregnancy

Aim 4 (Chapter 5): To compare GP consultation rates, diagnoses and management for pregnant women and non-pregnant women in the Netherlands.

We found that pregnant women contacted their GP on average 3.6 times, compared to 2.2 times for non-pregnant women of the same age range during their pregnancy. The most frequently recorded diagnoses were ‘pregnancy’ (40.8%, indicating that the pregnancy was not recorded in 59.2% of pregnant women) and ‘cystitis/urinary infection’ (8.7%) for pregnant women, and ‘cystitis/urinary infection’ (4.0%) and ‘general disease not otherwise specified’ (3.6 %) for non-pregnant women. The mean number of prescribed medications was lower in pregnant women than non-pregnant women (2.1 against 4.4). For pregnant women, the most frequently occurring referral indication concerned obstetric care, for non-pregnant women this concerned physiotherapy.

Aim 5 (Chapter 6): To examine the prevalence and determinants of use of complementary and alternative medicine (CAM) by low-risk pregnant women in the Netherlands.

We found a prevalence of 9.4% for CAM use among low risk pregnant women. They were more likely to use CAM if they had supplementary healthcare insurance, if they rated their health as ‘bad/fair’, if they had reported chronic illnesses or handicaps, if they smoked during pregnancy and if they used alcohol during pregnancy.

DISCUSSION OF THE MAIN FINDINGS

Use of care offered within prenatal care programmes

Prenatal care programmes are organized based on professional guidelines which are determined by evidence and consensus among professionals: adequacy of prenatal care use as measured in this thesis depends on definitions derived from these guidelines. Adequacy of use of care within prenatal care programmes was measured in this thesis according to two definitions. Chapter 3 used timing and the number of prenatal care visits controlling for gestational age to measure the adequacy of prenatal care. A revised version of the Kotelchuck index was constructed, according to the prenatal care guidelines of the Royal Dutch Organization of Midwives. In Chapter 4 ‘adequacy’ not only referred to initiation of care but also to receiving a minimal package of interventions and their timely application throughout the pregnancy.

In Chapter 3 we reported that a relatively high percentage (24.7%) of low-risk pregnant women in the Netherlands did not make timely use of care and/or did not receive the number of prenatal care visits recommended by the Dutch prenatal care guidelines for primary midwifery care. Using a different definition, as described in Chapter 4, we found that 58.3% of women used care as recommended in the guidelines on prenatal care programmes. We expected that the prevalence of adequate prenatal care use would be higher than we found...
in these two studies because prenatal care is provided free of cost, and is safe, preventative and non-invasive. After all, use of prenatal care is an important determinant of maternal health.\textsuperscript{3,4} Timely and adequate use of prenatal care has been shown to be effective in reducing the likelihood of adverse pregnancy outcomes.\textsuperscript{3,6}

Our findings raise the question of what the underlying mechanisms are for this inadequate use. Many reasons are mentioned in the literature from the perspective of pregnant women. Phillippi\textsuperscript{7} reported in a review that the most common barriers for women in the US to prenatal care access concern transportation problems, lack of motivation to obtain care,\textsuperscript{a} lack of money, conflicting needs of existing children and structural barriers.\textsuperscript{b} There may also be other barriers in the Netherlands, such as lack of familiarity with the maternal healthcare system, language problems and a lack of awareness of being pregnant. Though, in the Netherlands, research is lacking about the barriers and facilitators related to adequate prenatal care use.

Provider-related factors could contribute to inadequate prenatal care use, in addition to client-related factors. After all, it is midwives who are tasked with informing pregnant women about the prenatal care programme and inviting them for follow-up consultations. Perhaps our finding reflects how midwives adjust the number of visits to the preferences and wishes of pregnant women. Moreover, midwives themselves could experience barriers, which lead to fewer prenatal visits. However, to our knowledge, evidence of provider-related factors in relation to the adequacy of prenatal care use is unavailable.

The relatively high prevalence of inadequate prenatal care use we found could cast doubt on the evidence base for the number of prenatal cares visits within the Dutch prenatal care programme. However, scientific evidence regarding the optimal number of prenatal visits is lacking. In a Cochrane Review, Dowswell et al.\textsuperscript{8} compared the effects of prenatal care programmes with fewer visits for low-risk women with standard care. They found that a reduction of the number of prenatal visits to around eight did not lead to higher perinatal mortality compared to a regular prenatal care programme (caveat: the power of the studies included was limited).\textsuperscript{8} However, there was evidence that pregnant women were less satisfied with a lower number of prenatal visits due to too long a period being left between consultations. Reducing the number of prenatal visits in the Netherlands would not be desirable without rigorous evaluation of such changes and specifically monitoring perinatal mortality and morbidity rates for specific groups of women in specific regions (e.g. deprived areas).\textsuperscript{8-10} After all, a prenatal care programme is a complex intervention in which midwives are expected to adjust care to pregnant women related to the course of their pregnancies.\textsuperscript{1}

\textsuperscript{a}Lack of awareness of pregnancy, considering abortion, depression, hiding pregnancy, belief pregnancy is unnecessary or fear of medical procedures.\textsuperscript{7} \\
\textsuperscript{b}Structural barriers consist of barriers related to clinics (e.g. location, hours, delay of initial appointment, not child-friendly facility or staff attitudes) and barriers related to providers (poor communication skills, cultural sensitivity, language issues or lack of a consistent provider).\textsuperscript{7}
The prevalences we found for inadequate prenatal healthcare use could reflect how midwives interpret the prenatal care programme guidelines. Implementation of guidelines into clinical practice is difficult. Gaps are often reported between research evidence and actual clinical practice.11

**Determinants of inadequate use**

The determinants we found for inadequate prenatal care use vary in the studies reported in this thesis, with many more determinants having been identified in the systematic review than in the other studies. Our systematic review (Chapter 2) found a wide range of determinants associated with inadequate prenatal healthcare use. However, due to internationally distinct maternal healthcare systems, different definitions of inadequate prenatal healthcare use and heterogeneous research populations (i.e. mixed high and low-risk pregnancies), it would not be legitimate to generalize these findings to primary midwifery care in the Netherlands, which is focused on low-risk pregnant women. Therefore, we performed a prospective cohort study in the Netherlands to discover whether the determinants are the same or different from countries with other maternal healthcare systems and settings (Chapter 3). We found that inadequate prenatal healthcare use is associated with a limited set of determinants in a low-risk setting. In Chapter 4 we found different determinants associated with healthcare use compared to the determinants found in Chapter 3. In both studies unemployed women were more likely to use healthcare inadequately. Unemployment (measured by occupational status) is linked to a wide range of health problems12 including low birth weight.12-14 Behaviour and psychosocial problems related to unemployment can be explanatory factors which contribute to the inadequate use of prenatal care.15

In the Dutch low-risk setting we found the following determinants to be associated with inadequate prenatal care use. Women of non-Western origin (compared to native Dutch women), unemployed women, women reporting chronic illnesses or disabilities, and women who did not adequately use folic acid periconceptionally were more likely to use prenatal care inadequately. De Graaf et al.10 showed that living in deprived areas (partly determined by the population’s employment status) and being of non-Western origin are associated with higher perinatal mortality. The determinants we found overlap with the findings of De Graaf et al.10, which suggests that it would be worth exploring a possible relationship of inadequate use with perinatal mortality further.

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10 Deprived areas were selected using eighteen indicators consisting of SES, state of housing, safety problems, noise disturbance problems, pollution etc. (Ministry of Housing, Spatial Planning and the Environment).
Ancillary care use
We measured ancillary healthcare use, i.e. the use of care during pregnancy which is not part of a prenatal care programme, with respect to care provided by GPs and by CAM providers (Chapters 5 and 6). We found that pregnant women also substantially accessed GPs and CAM providers along with visits to midwives. On average, pregnant women visited GPs 3.6 times during pregnancy and the postpartum period, and almost ten percent of low-risk pregnant women visited a CAM provider. We can assume that in reality, ancillary care use will be higher because we did not measure the healthcare use of other care providers besides GPs and CAM providers (e.g. physiotherapists, dentists or psychologists etc.).

This thesis shows that ancillary care use exists and is substantial, which could lead to a series of problems inherent to fragmented care, such as conflicting advice from multiple healthcare professionals on pregnancy problems or complications, information loss, or even errors and the receipt of more interventions than are necessary.\textsuperscript{16} We assume that coordination of care can reduce these risks. At the moment, the Dutch government, professional organizations in primary and secondary maternity care, and maternal healthcare providers are heading towards integrated maternity care, specifically aimed at integrated care between primary care professionals (midwives) and secondary care professionals (gynaecologists).\textsuperscript{17} However, our research shows that there also has to be a focus on integrated care within primary care. Inter-professional collaboration is not easy to achieve and is a complex process.\textsuperscript{18} Schölmerich \textit{et al.}\textsuperscript{19} analysed inter-professional coordination problems with regard to primary and secondary maternal care in the Netherlands. They identified five causes for poor coordination/cooperation: guidelines which do not facilitate shared care, a financial reimbursement system which does not provide incentives for cooperation, a lack of a shared maternity record system, non-proximity of care providers, and different perspectives on pregnancy and professionals speaking different ‘languages’.\textsuperscript{19} Although we cannot directly apply the knowledge of Schölmerich \textit{et al.} to primary care givers, we can assume that the sources of problems mentioned can also underlie coordination problems within primary care.

Our results raise the questions why pregnant women use ancillary care in addition to regular prenatal care and which factors contribute to this use. We do not know whether this ancillary healthcare use is additional or substitutional. Additional ancillary care use can overburden the healthcare system, which could result in high costs to society. Substitutional ancillary care further highlights the need for inter-professional collaboration.

\textbf{METHODOLOGICAL CONSIDERATIONS}

We used data provided by midwives and GPs in this thesis. We also used data from questionnaires completed by pregnant women in primary midwifery practices. The GP data
were retrieved from the Netherlands Information Network of General Practice (LINH). LINH collects structured data about contacts, prescriptions and referrals. To ensure a high level of accuracy, GPs receive instructions and manuals about recording information as participants of the LINH. Unfortunately, possible explanatory variables of healthcare utilization could not be included in the analyses due to these data being unavailable. Therefore, we could not study the determinants of healthcare use in general practice.

The DELIVER study was used for primary midwifery care data. DELIVER is a Dutch acronym meaning ‘data primary care delivery’. This study was the first large-scale study to evaluate the quality and provision of primary midwifery care. Therefore, we were able to study a large cohort of low-risk pregnant women from twenty midwifery practices located across the Netherlands. These data were linked to those from the Netherlands Perinatal Register and to electronic client records kept by midwives, which created client and provider perspectives with regard to primary midwifery care. The DELIVER database was used in the studies described in Chapters 3, 4 and 6 of this thesis. In Chapters 3 and 4 the main outcome, i.e. prenatal healthcare use, was measured using the client records of midwives. This reduces the risk of errors related to recall bias. CAM use was measured in Chapter 6 with a questionnaire completed by the clients of midwifery practices. Clients were allowed to complete this questionnaire without the presence of a potentially judgmental healthcare provider, which probably decreased non-disclosure. The response rate for the questionnaire was 62 percent, which is an acceptable response rate\(^20\), though there may have still been some selection bias. In particular, clients from ethnic minority groups were underrepresented (17%, compared to 25% of the Dutch national female population aged between 15 and 45 in 2010)\(^21\), which could have led to selection bias.

With respect to the systematic review reported on in Chapter 2, we extracted data from three databases: PubMed, CINAHL and Embase. Furthermore, we did not restrict ourselves to studies published in English. This contributed to a broad and comprehensive search. However, we did not review grey literature and did not explore bibliographies, so we may have missed some relevant studies.

**IMPLICATIONS**

**Implications for practice**

We found that many pregnant women visit a midwife less frequently than they should on the basis of professional guidelines or entry care after the first trimester. Professional organizations should be aware of this and evaluate their professional guidelines to ensure they remain current with respect to Dutch primary midwifery care. The perspectives of women and healthcare providers can help create a prenatal care programme which meets the needs of both. Furthermore, professional organizations need to consider whether...
prenatal care programmes should be adjusted to specific groups of women who are more likely to use prenatal care inadequately.

Midwives need to be aware of our findings and should identify women who deviate from professional guidelines because this could be a potential determinant for safety risk.\textsuperscript{22} They should preferably accurately record the reasons women report for using prenatal care inadequately. Such a registration could contribute to knowledge of the barriers women experience in pregnancy care, which could result in interventions tailored to pregnant women at risk of using prenatal care inadequately. Moreover, this is also required because of statutory regulations. Furthermore, the determinants associated with inadequate healthcare use overlap with the determinants associated with higher perinatal mortality.\textsuperscript{10} Therefore, midwives have to be extra alert to these specific groups of women.

We found substantial use of ancillary care showing that coordination of care is needed. To further strengthen collaboration in primary care, proximity – i.e. joint housing of GPs and midwives – can be helpful. At the moment this is rarely done.\textsuperscript{23} Face-to-face contact between professionals using existing collaboration initiatives such as the Perinatal Care Partnerships (\textit{Verloskundig SamenwerkingsVerband}) or Regional Support Frameworks (\textit{Regionale Ondersteunings Structuur}) could also support primary care workers in developing teamwork and improving the continuity of care.\textsuperscript{24} Coordination could also be improved through an electronic patient record system capable of integrating client-centred information for primary (GPs and midwives) and secondary care providers. Furthermore, although there are joint guidelines between GPs and midwives, the participation of GPs in the development of new midwifery guidelines should be expanded.

We found that women frequently contact GPs in the pregnancy and postpartum period. Midwives are the main care providers for low-risk pregnant women,\textsuperscript{25} and must therefore actively ask pregnant women at every consultation if they have also visited another healthcare provider in order to coordinate care and to identify the problems pregnant women face. Midwives and GPs complement each other and should inform and/or involve each other when taking decisions about pregnant women.

**Implications for education**

With respect to prenatal care programmes, student midwives should be aware of the fact that many women visit midwives less frequently than the Dutch midwifery guidelines recommend. During their training, students should learn how to motivate pregnant women to adequately use prenatal care. Teaching a client-centred approach could support this effectively.

With respect to ancillary care use, joint training of GPs and midwives should be organized to contribute to the integration of primary care. For example, midwives could learn from GPs and vice versa during their internships. Learning communities could also strengthen
collaboration. Furthermore, the important role GPs play for pregnant women should mean that GPs are trained to recognise and manage health problems during pregnancy and obstetric emergencies. Finally, knowledge of the aims and treatments of ancillary care should be included in midwifery training. Non-disclosure of CAM can happen for various reasons. Therefore, student midwives and midwives in general should be vigilant for CAM use.

Implications for research
Irrespective of the definition used, we found that many low-risk pregnant women visit a midwife less frequently than recommended by professional guidelines. Future research should focus on finding evidence for a prenatal care programme with an optimal number of prenatal visits. Cut-offs for definitions of inadequate prenatal care should also be considered in the development of this prenatal care programme. Additional research is also needed to improve our understanding of the healthcare needs of Dutch low-risk pregnant women by listening to these women and learning what barriers, facilitators and resistance they encounter related to prenatal care use. Research into the reasons, attitudes and beliefs of low-risk pregnant women with regard to entry and obtaining prenatal care will help overcome this knowledge gap. Knowledge of the facilitators, barriers, and resistance could also help care researchers develop interventions which could improve entry into and use of prenatal care.

Future research is also needed on whether midwives are able to comply with the existing prenatal care programme guidelines, and if not, why they choose to provide different care, as we also found that pregnant women frequently do not receive the interventions recommended by guidelines. Furthermore, we found that the determinants of inadequate healthcare use overlap with determinants associated with higher perinatal mortality and morbidity rates. Further research into this somewhat alarming issue is required.

More evidence is needed on the use of ancillary healthcare by pregnant women. This includes both research into the potential risks of ancillary care use and into whether this use is additional or substitutional care.

CONCLUSIONS
A relatively high percentage of pregnant women do not use the amount and content of prenatal care offered within prenatal care programmes. This inadequate prenatal healthcare use seems to be associated with a limited set of determinants in low-risk pregnant women: women of non-Western origin (compared to native-born Dutch women), unemployed women, women reporting chronic illnesses or handicaps, and women who do not use folic acid periconceptionally were more likely to use prenatal care inadequately.
Moreover, pregnant women use a considerable amount of ancillary care. In addition to visits to their main maternal healthcare provider, pregnant women in the Netherlands also visit their GP frequently (on average 3.6 times), and ten percent of them consult a CAM practitioner.

These findings on the use of care offered within prenatal care programmes and additional ancillary care could have considerable implications for prenatal care practice, policy, education and research. They offer potential routes to improving care for women with low-risk pregnancies and the outcomes of their pregnancies.
REFERENCES


