Experiences and views of midwives performing antenatal cardiotocography in Dutch primary care: A qualitative study

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A R T I C L E   I N F O

Article history:
Received 6 August 2018
Revised 14 January 2019
Accepted 6 February 2019

Keywords:
Primary health care
Antenatal care
Antenatal cardiotocography
Electronic foetal monitoring
Midwife

A B S T R A C T

Objective: In the current Dutch maternity care system, pregnant women who have an indication for an antenatal cardiotocography (CTG) to be undertaken need to be referred from primary midwife-led care to secondary obstetric-led care. Within three different regions in the Netherlands independent primary care midwives perform antenatal CTG in primary care, introduced as a pilot project. The aim of this study was to evaluate the experiences and views of primary care midwives who perform antenatal CTG in primary care.

Design: Using a qualitative approach data were collected by seventeen in depth semi-structured interviews. The interview recordings were transcribed verbatim and analysed using thematic coding.

Setting: Three regions in the Netherlands where midwives carry out antenatal CTG in primary care during this pilot project.

Participants: Seventeen primary care midwives were interviewed between July and November 2017.

Findings: In general, midwives were satisfied with performing antenatal CTG and felt it contributed positively towards the midwife-client relationship. However, midwives experienced an increased workload, partly due to time-consuming technical difficulties. Furthermore, mixed feelings existed on whether antenatal CTG contributes to a more physiological or to a more pathological approach in midwifery practice. Most midwives believed that performing antenatal CTG contributes to the physiological process: strengthening of their gate-keeper role, increased confidence of their clients and improved midwife-client relationship. In contrast, some midwives believed it contributes to a pathological process: medicalization and relying too much on technical devices.

Key conclusions: This study showed an overall positive attitude of primary care midwives towards performing antenatal CTG when required, in primary midwife-led care. However, performing the antenatal CTG can be a challenge for midwives, as midwifery care within this setting is often for healthy women who have a straightforward pregnancy. For some midwives, providing antenatal CTG monitoring in the primary care setting may be seen as using a pathological approach to midwifery care.

Implications for practice: There seems to be a place for antenatal CTG in primary midwife-led care. However, further research is needed before this practice can be implemented widely.

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Introduction

In the Netherlands, maternity care is divided in two echelons: primary midwife-led care, and secondary obstetric-led care (Perdok et al., 2016). Women at low risk for obstetric complications are in primary care where independent midwives are the responsible health care professionals. Secondary obstetric-led care takes place in the hospital. The echelons work complementary to each other, both with their own autonomy (Koninklijke Nederlandse Organisatie van Verloskundigen (KNOV), 2016; Perdok et al., 2014). In this risk-selection system, the primary care midwife acts as a gate-keeper (Warmelink, 2017). If any complications occur during pregnancy or labour, women are referred to secondary obstetric-led care (Perdok et al., 2014). In 2016, 86.8% of pregnant women started their antenatal care in primary care (Perined, 2018), 35.2% of these women were referred to secondary obstetric-led care at some point in pregnancy due to a complication or the need for further examination (Perined, 2018). Depending on the obstetricians’ findings, the pregnant woman will stay in secondary obstetric-led care or will continue her care with the midwife in primary care. Thus, many pregnant women see multiple health care
professionals in the antenatal period, leading to discontinuity in care provider (de Jonge et al., 2014; Perdok et al., 2016). Discontinuity of care is associated with inaccurate communication, decreased client safety and satisfaction and an increase in interventions (Rijnders et al., 2008; Schölerich et al., 2014). To improve maternal healthcare, especially the continuity of care and client-centred care, ‘integrated maternity care’ could be a solution. The integrated maternity care approach is a multidisciplinary system focusing on better communication and collaboration between the echelons. The expansion of the primary care midwives’ practice can play an important part in this system, as shifting responsibilities from secondary care to primary care can enhance continuity of care for pregnant women (Perdok et al., 2016; Perdok, 2014). However, broadening the scope of the midwifery profession is a complex process and requires careful planning, implementation, ongoing support and supervision (Colvin et al., 2013).

When looking at changing the scope of health care practitioners, several studies and systematic reviews were published about the effects of moving certain types of care from medical specialist to general practitioners (GP), or from GP to nurse practitioners (NP) or physician assistants (PA). These studies concluded that substitution of carer is feasible, if it maintains quality of care (Gilmer and Smith, 2009; Laurant et al., 2004; Lovink et al., 2017; Martínez-González et al., 2015; Martínez-González, 2014; Timmermans et al., 2017). Furthermore, patients report increased satisfaction if health care was provided by a NP or PA compared to a GP (Gilmer and Smith, 2009; Laurant et al., 2004; Martínez-González et al., 2014; Timmermans et al., 2017; van Hoof et al., 2016). However, substitution of carer can only be effective if all health care professionals involved are supportive (Maes and De Wilde, 2006). Research on care provider outcomes regarding substitution of carer (e.g. workload and job satisfaction) is scarce (Lovink et al., 2017; Martínez-González et al., 2015). Therefore, it is important to explore experiences of health care professionals.

In maternity care, the antenatal cardiocotgraphy (CTG) is predominantly used within secondary obstetric-led care. The CTG is used for foetal monitoring in pregnancy and during labour (Grivell et al., 2015; Nijhuis et al., 1998). For women with a healthy pregnancy, the most common indications for performing an antenatal CTG are prolonged pregnancy, reduced foetal movements, vaginal bleeding, abdominal trauma and prolonged ruptured membranes (Chandrarahan, 2017; Grivell et al., 2015). In the Netherlands, primary care midwives refer pregnant women to secondary obstetric-led care if an antenatal CTG is indicated. Since 2015, on a pilot bases, within three regions of the Netherlands midwives perform antenatal CTG when required in primary care, meaning referral to secondary obstetric-led care is no longer needed if the CTG is reassuring (Groenen and Daemers, 2015). The antenatal CTG in primary care takes place at the midwives’ practice in the community or at the clients home. This broadening of the midwives scope of practice in primary care may have benefits for pregnant women, as they receive care closer to, or even at home, with a known midwife performing and interpreting the CTG. This could reduce discontinuity of care and increase women’s satisfaction. Another potential effect could be a reduction of healthcare costs due to a decrease in the number of women being referred to secondary obstetric-led care.

Research on the performance and interpretation of CTG by midwives is limited. Some studies researched the experiences of midwives with performing intrapartum CTG. Midwives reported mixed feelings about interpreting intrapartum CTG. Overall, they felt it was easy to interpret a normal or a pathological CTG-trace. However, more difficulties were reported about interpreting unclear CTG traces (Blix and Öhlund, 2007). Furthermore, midwives mention concerns about continuous intrapartum CTG as it may lead to over-reliance on technology rather than focusing on the labouring women. This reflects attention from providing women centred midwifery care and can negatively affect the midwife client relationship. On top of that, midwives feel that the midwifery profession is changing, as traditional midwifery skills are more and more replaced by technological methods (Alraf et al., 2006; Blix and Öhlund, 2007; Diamond-Smith et al., 2016; McKevitt et al., 2011; Sinclair, 2001; Smith et al., 2012).

To enhance successful utilisation of antenatal CTG monitoring (when required) within the primary midwife-led care setting, it is important to gain insight into the perspectives of primary care midwives. Therefore, the aim of this study is to evaluate the experiences and views of midwives performing antenatal CTG in a primary care setting by undertaking a qualitative study.

**Method**

**Study design**

This study is embedded in a pilot project in which primary care midwives are performing antenatal CTG in a primary care setting. A qualitative study was conducted using semi-structured interviews to gain in-depth and detailed information about the experiences and views of midwives performing antenatal CTG. A topic-based interview guide was used based on the following themes: work satisfaction, competence, capability and collaboration with secondary obstetric-led care. Ethical approval for this study was obtained from the Medical Ethical Committee of the Amsterdam University Medical Centre, location VUMc (METC number 2016.484). Participating midwives were provided with both oral and written information about the aim and the design of the study and participants signed an informed consent form before the start of the interview.

**Study setting**

The pilot project on antenatal CTG in primary midwife-led care started in 2015 and is ongoing. The first region started the pilot in March 2015, the second region started in January 2016 and the third region in December 2016. A total of 170 primary care midwives are participating in the pilot project over the three regions. In order to be qualified to perform an antenatal CTG, all participating midwives followed an obligatory two-day course completed by an exam. The course consisted of the following topics: theoretical background of the CTG, the reading and interpretation of a CTG according to the Fédération Internationale de Gynécologie et d’Obstétrique (FIGO) guidelines (Ayres-de-Campos et al., 2015) and quality, competence and skills needed to carry out a CTG. In order to maintain ones’ competence, obligatory multidisciplinary audit meetings are organised in each region at least four times a year in which primary care midwives interpret and discuss several antenatal CTGs together with obstetricians.

By using mobile CTG machines, the antenatal CTG in primary care can either be carried out at the midwives’ practice in the community, at the clients home or at an alternative venue that is suitable. At least two primary care midwives are involved in interpreting an antenatal CTG: the first midwife performs the antenatal CTG and the second midwife logs in through an online system that enables them to interpret the antenatal CTG from a distance. When an antenatal CTG is interpreted as less than optimal, the client is immediately referred to secondary care, where, if indicated, supplementary care will be provided.

**Study participants**

To ensure diversity in experience with the pilot project, participants for the interview study were selected from all three
participating regions. Primary care midwives were approached with the request to participate via various recruitment methods, e.g., by telephone, email and face-to-face. To gain an equal distribution of participating midwives from all three regions, a purposive sampling method was used. Midwives who were not trained to perform antenatal CTG were excluded from the study. Moreover, only participants who had performed and interpreted at least two CTGs in primary care were included in the study.

Data collection

From June to October 2017, interviews took place at a location convenient for the participating midwives. At the start of the interview, the participants were asked to sign the informed consent form and to fill out a short questionnaire about socio-demographic information, including age, years of working experience and experience with performing antenatal CTG. During the interview, the researcher used the interview guide to ensure that the main elements related to the topics of interest would be discussed. Also, field notes and observations were made by the researcher. These notes included thoughts and general comments about the experiences of the participating midwives. Furthermore, after every interview, the topic list was revised and adjusted, allowing exploration of new relevant topics in subsequent interviews. Interviews were performed until data saturation occurred. All interviews were recorded for transcription.

Data analysis

The interview recordings were transcribed verbatim. Each transcript was read thoroughly and the accuracy of the transcripts was checked by comparing several transcripts with the original audio recordings. To analyse the data, thematic content analysis was used, to summarise and systematically sort data into codes. Hereafter, themes were identified within the data. The first two interviews were independently coded by two researchers and weekly team meetings were scheduled to discuss the coding. By using triangulation of researchers, consistency in the coding was obtained. The remaining interviews were coded by one researcher. ATLAS.ti version 7.5.16 (ATLAS.ti Scientific Software Development GmbH), a qualitative data analysis software program, was used for coding and analysing the transcripts. The central themes are illustrated with quotes from the participants. The quotes were translated from the Dutch verbatim transcript into English. Additional details were added: participant number (RX); explanations added by the authors are in square brackets []; and omitted text, specified by ellipsis […].

Findings

In total, 64 midwives were asked to participate, of which 17 agreed to be interviewed. 30 midwives did not respond to the invitation and 17 midwives were not willing to participate due to various reasons: high workload, maternity leave, no longer practicing midwifery or not feeling the need to participate (Fig. 1). The interviews lasted on average 42 min, with a range from 29 to 57 min. Most interviews took place at the midwives’ practice base; some at the midwife’s homes. The participating primary care midwives varied in age, working experience and experience with CTGs (Table 1). Three-quarters of the participating midwives had no experience with CTGs prior to the pilot project; two midwives (11.8%) did have experience with the use of CTGs.

Five themes emerged from the interviews: general views on antenatal CTG, views on the performance and the interpretation of antenatal CTG, midwife-client relationship, challenges in performing antenatal CTG in primary care and midwives’ perspectives on broadening their scope of practice by performing antenatal CTG.

General views on antenatal CTG

At the beginning, about three-quarters of the participating midwives were generally positive about implementing antenatal CTG in primary care. They perceived it as a substantial task-shift, in which primary care midwives can fulfil an important role for pregnant women.

“And I am very enthusiastic about the topic (the task-shift of CTG) […] I am very happy with this innovation” (R14).

Some midwives did express uncertainties and doubts about performing antenatal CTG at the beginning of the pilot. They were hesitant about implementing the innovation, as they felt uncertain about their competence. One midwife described she had the feeling she was obliged to participate, as she feared she could not engage in other developments in maternity care within the region in the future if she refused participation in this innovation. Thus, a feeling of resistance was present among some of the participating midwives.

“I have to say, at the beginning of the pilot, I had doubts about whether you can gain enough experience [with performing antenatal CTG] as a primary care midwife, or already have sufficient experience, to be able to start the pilot. So, I wasn’t completely committed, but it is good that we are doing this. But I also thought… I saw some challenges” (R7).

Although several midwives had their fears and doubts, it was mentioned that expressing these feelings is ‘not done’ among primary care midwives. Four midwives indicated that there should have been more attention for feelings of uncertainty.

“I think there has to be room [for expressing feelings of insecurities and doubts]. We shouldn’t pretend that these feelings don’t exist” (R3).

Views on the performance and the interpretation of antenatal CTG

Despite the mixed feelings at the beginning of the pilot project, gradually almost all participating midwives gained a positive attitude towards performing antenatal CTGs during the pilot as they believed it is a valuable extension of their provision of health care. Furthermore, some midwives mentioned that performing and interpreting antenatal CTGs was part of their professional development.

“I think it is an enrichment for myself, I have to say, I think it is has added value. I feel happy with it. […] I if I look where I started, hesitating, having cold feet, [and thinking]: help, now we are going to do this […], and now how it makes you feel more comfortable and that you are getting more of a grip on it. And therefore, we are...
becoming stronger for the woman in question in providing health care” (R15).

The midwives mentioned that the mandatory CTG-education at the start of the pilot made them feel competent. Furthermore, after gaining more experience with the use of the CTG machine and interpreting the antenatal CTGs throughout the pilot project, all seventeen midwives reported an increased feeling of competence and self-confidence regarding the practice.

“Yes, I actually do feel competent. I feel confident about that. I can do this. And that when a CTG is optimal [reassuring], I feel confident to let people go home” (R6).

Of the participating midwives who felt qualified in interpreting antenatal CTGs, half of them thought this is relatively simple, as they only had to distinguish between an optimal and a non-optimal antenatal CTG, using the strict FIGO-qualification guidelines. Also, a feeling of ‘shared responsibility’ was experienced as in two of the three regions, the midwives always consulted with at least one colleague to interpret the antenatal CTG; in the third region, consultation of a colleague was an option.

“Two people are doing the interpretation, and that feels good. That you aren’t responsible all by yourself, knowing that someone else also reviewed it, that feels good” (R11).

On the contrary, some midwives felt that interpreting the antenatal CTG was difficult. Although all participating midwives used the FIGO-qualification guidelines, interpreting the variability and determining the basic heart rate were sometimes considered to be difficult.

“The interpretation of cardiotocographs can be difficult […]. Interpreting the variability on the CTG is the most complex criterion” (R8).

Midwife-client relationship

The midwives shared their thoughts on the experiences of their clients with antenatal CTG in primary care. A common view amongst the midwives was that performing the antenatal CTG in the primary care setting has several benefits for pregnant women: the consultation is carried out by a familiar midwife at a well-known place, the care is provided close to home, waiting time was reduced and pregnant women experienced more confidence and trust in their pregnancy. The increased confidence and trust felt by the women was substantiated by the participating midwives who suggested that a referral to secondary obstetric-led care might lead to feelings of uncertainty and tension for the pregnant women because an impression was given that something could be wrong with the baby. The midwives also felt that, when the antenatal CTG was performed in the hospital, women often continued their pregnancy in secondary obstetric-led care, for instance, when induction of labour was offered to women at (late) term. One midwife mentioned that pregnant women would be more likely to report feeling reduced foetal movements when they know their own midwife will perform the antenatal CTG during a consultation which may feel less distressing than a hospital visit. In addition, some midwives mentioned that reassuring pregnant women is a fundamental aspect of the midwife’s role and performing antenatal CTG in primary care can attribute to this.

“The most important effect of performing the antenatal CTG in primary care is a reduced number of inductions of labour, but also to reassure people [and] provide care closer to home” (R9)

Regarding the implications for pregnant women, almost all participating midwives experienced that the pilot project contributed to a positive midwife-client relationship. The antenatal CTG – which lasts at least 30 min- provided an additional opportunity for midwives to start a conversation with the individual women. This time spent together was seen as valuable as there is not always enough opportunity for this form of deeper engagement during normal consultation hours.

“It also provides time to truly communicate with a pregnant woman, because you are just sitting with them for half an hour during the CTG. And then it’s also, well, sometimes they can get something off their chest, about everything that is going on in their lives, or that maybe they are unsure about something, which they would usually just call about. […] So, you can communicate with them for thirty minutes, instead of ten minutes during consultation hours; valuable conversations arise from this” (R11).

Challenges in performing antenatal CTG in primary care

By performing antenatal CTG, an additional task is added to the midwives’ usual practice which affects their workload. In the beginning particularly, an antenatal CTG could take a lot of time due to unfamiliarity with the CTG machine and connection issues. For three-quarters of the participating midwives this was a challenge as they reported an elevated stress-level due to their increased workload.

“So, in the beginning I thought the workload was quite high […]. I thought that workload was tough. In the beginning a CTG could sometimes take 1.5 to 2 h of your time” (R13).

Four midwives indicated that they were not always able to perform the antenatal CTG in the primary care setting. When they perceived the timing of an antenatal CTG consultation to be inconvenient or when they had experienced a high workload, pregnant women were sometimes referred to secondary obstetric-led care.

“Sometimes we also say: we don’t have space [to perform the cardiotocograph], so we are going to [refer the client to] the hospital. We do give ourselves that option. The same applies for the situation when people call [the midwife on call to report reduced foetal movements] in the middle of the night. Then I usually send them to the hospital” (R10).

Furthermore, another aspect that contributed to the increased workload for the midwives was the technical difficulties associated with using the CTG machine, especially in the beginning. In particular, the midwives experienced problems with connecting to the
device, login procedures, frequent signal loss and the quick diminishing battery level of the CTG machine.

“I have more worries about the device, and the electrical plugs, and if the connection or the streaming is working, so aside from the CTG itself, you know the device, I just find it really annoying, if the device works, then yes, that’s great” (R16)

Due to the technical problems, a number of the midwives expressed feelings of frustrations and felt that the struggle with the device made them look unprofessional. These technical problems were also time-consuming (e.g. the CTG taking over 1 to 2 h instead of the set length of 30 min), which contributed to the workload as described earlier. These difficulties would have to be resolved if the pilot project was to be implemented in other regions. Resolution may involve: using other suppliers of the technical devices, or transferring to analogue devices, similar to those used in the hospital, to improve the ease of use.

**Midwives’ perspectives on broadening their scope of practice by performing antenatal CTG**

A variety of perspectives regarding antenatal CTG in the primary care setting was expressed by the participating midwives relating to physiology, pathology and medicalization.

Midwives reported mixed feelings regarding the contribution of performing antenatal CTG towards enabling a physiological process or an increased process of medicalization. On the one hand, the midwives believed performing antenatal CTG in primary care contributed to a more physiological process for several reasons. Firstly, performing antenatal CTG strengthens the gate-keeper position of primary care midwives, in which the antenatal CTG can be used as a diagnostic tool.

“I think you can better make the distinction between physiology and pathology by performing a CTG. That by taking up these diagnostics, you can improve risk selection [...] and if you keep your risk selection specific you support the physiology. [...] We can optimise the risk selection” (R6)

Secondly, midwives believed it reduced the number of referrals to secondary obstetric-led care, whereas almost all the antenatal CTGs were reassuring and referral was no longer indicated. Consequently, the subsequent interventions which could originate from a referral, e.g. a repetition of antenatal CTG or offering induction of labour to women at (late) term, could be reduced. Thirdly, as described in the first theme, all participating midwives believed the antenatal CTG in primary care contributes to an increased sense of trust and confidence of the pregnant women and to a positive midwife-client relationship.

“It prevents medicalization because the mere fact is that we, as midwives, are carrying out this task, and talking with pregnant women, is a whole other approach, by which we are assuming that she knows how she and her baby are doing” (R3)

Contrary to the perception of the use of CTG to promote physiology, about one-third of the midwives perceived this innovation as a process of medicalization because they had the feeling they are situated on a sliding scale towards pathology and medicalization.

“It opens the doors towards medicalization, even in the primary care setting [...] Because I wonder where this will end, we can think now, that we are keeping more clients in primary care, but I think that we will eventually, because of pushing the boundary, we will become unconsciously more medicalized. Yes, I don’t want to be focused on a CTG, but on the woman” (R5)

These feelings were substantiated with two main arguments. Firstly, performing antenatal CTG in primary care will lead to a more medicalized process because both midwives and pregnant women will come to rely too much on the technology. The increased use of technology makes it more challenging for pregnant women to trust their own body.

“You are going to rely more and more on technology, and increasingly less on people [the pregnant women]” (R10)

“At some point, women do not trust their own body and their own child, but they trust the machine” (R5)

Secondly, midwives mentioned the possible risk that antenatal CTGs might be performed more often in the primary care setting, because the threshold to perform a CTG will be lower when the CTG device is available in the midwifery practice setting or when midwives become competent in using CTGs. Hence, it was emphasised by several midwives that an antenatal CTG should only be used when (medically) indicated.

“What we are trying to do, when someone calls about reduced foetal movements, is not immediately carry out a CTG. First, we evaluate if there is actually an indication for a CTG and ask ourselves, would we refer them otherwise [prior to now]? So, the procedure should be critical of which cases we do it for and which we don’t” (R3)

Because of the controversy between the physiology and pathology combined with the concept of scope of midwifery practice, for some participating midwives this raises the question on what the profession of midwives really entails.

“It’s not only about performing a CTG, it is also about a change in what it means to be a midwife [...] It is about increasing my responsibilities [...] and the thoughts behind it, like: this is not something I chose, this is not something I studied midwifery for. Because I wonder, where does it stop? [...] I think, as we keep pushing the boundaries, we become more and more medicalized (R5).

**Discussion**

In this study, experiences and views of midwives performing antenatal CTG in primary care setting were explored. In general, despite doubts in the beginning, midwives were positive about performing antenatal CTG in primary care, as they believed providing this care is an added value in the health care they provide. Furthermore, the participants believed pregnant women are satisfied with the care, as they receive care from a familiar midwife closer to home, experience less waiting time, and it enhances the midwife-client relationship. However, performing this additional task affects the workload of the midwives, which is even more increased by the experienced technical difficulties of the antenatal CTG monitoring. Furthermore, mixed feelings were expressed on the role of antenatal CTG in the profession of primary care midwives: On the one hand, midwives felt the use of antenatal CTGs in primary care contributed to a more physiological process, because it strengthens them in their role as gate-keeper, decreases the referral rate to secondary obstetric-led care, and improves the midwife-client relationship. On the other hand, concerns about the pilot project contributing to a more pathological process and medicalization were mentioned. Some midwives reported they felt this project contributes to relying mostly on technology instead of observing and listening to the pregnant women.

Previous research also found conflicting feelings among midwives on the use of technology in midwifery practice. Altaf (2006) described that midwives who were generally positive about the carrying out intrapartum foetal monitoring, also had concerns
about its continuous use. They expressed worries about medicalization and felt that foetal monitoring distracts midwives from providing women centred, personalised care (Altay et al., 2006). Blix and Öhlund (2007) and Sinclair et al. (2001) report similar findings. Sinclair (2001) found that among 446 midwives, the majority had fears about the fact that the use of CTG was deskillling them (Sinclair, 2001). Blix and Öhlund (2007) reported that midwives from Norway felt threatened by the increasing use of intra-partum CTG, as there was too much reliance on the CTG-device (Blix and Öhlund, 2007). Colvin et al. (2013) conducted a systematic review on task shifting in midwifery services and found that often clinical tasks shifted to midwives are either more complex or more focused on illness compared to their standard midwifery tasks. Although the midwives often supported these new initiatives, they struggled to balance the belief in the normalcy of pregnancy and perceiving pregnancy as a ‘risky time’ (Colvin et al., 2013).

Warmelink et al. (2015) conducted a qualitative study among primary care midwives on job satisfaction and found that direct contact with clients is the main aspect that generates job satisfaction among primary care midwives. In contrast, Warmelink also found that time with the woman is one of the most important elements requiring improvement for the midwifery profession as midwives stated they wanted more time to care for each individual woman (Warmelink et al., 2015). This could explain why the midwives in this study, despite the increased workload and technical difficulties, were positive about performing the antenatal CTG, as it provided an opportunity to truly communicate with the woman.

Van Stenus et al. (2017) explored the experiences of women with referrals during pregnancy, childbirth and the neonatal period in the Netherlands and found that women appreciate the community midwifery practice more than the hospital environment. Women described the midwifery practice setting as intimate and cozy. These findings are comparable to the midwives’ comments in this study regarding care provision closer to home by a familiar midwife (van Stenus et al., 2017). Several studies have been performed regarding the benefits of a good midwife-client relationship. Puthussery et al. (2010) showed that continuity of health care professionals was substantial to evolve a trusting relationship in which personal experiences can be shared more easily (Puthussery et al., 2010). Additionally, Nicoloro-SantaBarbara et al. (2017) also showed a decreased sense of anxiety during pregnancy among women who experienced a supportive midwife-client relationship, which involved good communication, collaboration and empowerment of the pregnant women (Nicoloro-SantaBarbara et al., 2017). Another perspective reported by the primary care midwives was that they believed women feel safe and have confidence in the midwives performing the antenatal CTG. However, in their study, Bodegom-Vos et al. (2013) found that 82% of patients thought medical specialists were more competent than general practitioners in performing complex invasive treatments, non-invasive treatments and diagnostic examinations. Therefore, it is important to explore the perspectives of pregnant women regarding the antenatal CTG and the role of primary care midwives in performing the CTG.

**Strengths and limitations**

This study has several strengths. To our knowledge, this is the first explorative study regarding the experiences of primary care midwives performing antenatal CTG. By performing semi-structured interviews, rich and detailed information of the midwives’ experiences was obtained, and findings were described in their context, which may contribute to the transferability of the findings. Furthermore, a particular strength of this study is that midwives from three different regions have participated in this study, since all three regions varied in the duration of pilot project. Time participating in the pilot might have influenced the perspectives of primary care midwives. However, as an almost equal distribution of participants was achieved, the scope of experiences was enlarged, which could have contributed to the generalizability of the findings. The latter might be helpful for other regions in the Netherlands which are considering to implement this broadening of the scope of midwifery practice as well.

This study also has limitations. One possible limitation involves the recruitment of the primary care midwives, it may be the case that midwives who were more interested in this topic, were more likely to participate in this qualitative study, which may have contributed to selection bias, and resulted in more ‘positive’ and ‘enthusiastic’ perspectives. However, in this study particular attention was paid to finding deviant cases, that is, cases whereby one or two midwives had a different/opposite views compared to the others, hereby limiting the risk for selection bias. Furthermore, we achieved data saturation. Another limitation of this study is that we did not send the full transcript of the interview to each participant to verify whether the interpretations of their experiences were correct. Nevertheless, all interviews were recorded and transcribed verbatim, which enabled the researchers to validate what had been said. Moreover, during the interviews, the researcher regularly provided the interviewee with a summary of the information which was discussed, thereby verifying the interpretation of the information.

**Recommendations**

There appears to be many advantages of introducing the use of antenatal CTGs in the primary midwife-led care setting. To improve the feasibility of implementing antenatal CTG in primary care, improvements in the technical equipment are recommended. The problems with the equipment contribute to a high workload and feelings of frustrations among the primary care midwives. Furthermore, it is important to involve midwives in the implementation process, to take into account possible feelings of resistance or insecurities. According to the participants this could be achieved through multidisciplinary team meetings where feedback can be provided and experiences regarding this pilot project can be shared.

In terms of future research, it is important to explore the experiences of the pregnant women with the introduction of antenatal CTG (when required) in the primary care setting. Also, the views of the secondary health care professionals on this expansion of the midwife’s scope of practice can provide useful information. Additionally, research is needed to investigate the effect on the health outcomes of pregnant women who receive an antenatal CTG in primary care setting, and their babies. Furthermore, as midwives in this study experienced a decrease in referrals to secondary obstetric-led care, an economic evaluation of this midwifery practice innovation can provide valuable information on potential reduction in health-care costs.

Finally, mixed feelings were noted both between as well as within midwives on whether performing antenatal CTG in primary care contributes to a more physiological or to a more pathological approach towards normal pregnancy. An additional qualitative study using focus groups could explore the views on the balance between physiology and pathology among primary care midwives more broadly. Additionally, the subject of broadening the scope of midwifery care should also be further investigated among primary care midwives, as it can provide valuable insight on the future position of the midwifery profession within Dutch maternity care.