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Antenatal cardiotocography in primary midwife-led care: Women's satisfaction

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Abstract

Background: In the Netherlands, antenatal cardiotocography (aCTG), used to assess fetal well-being, is performed in obstetrician-led care. To improve continuity of care, an innovation project was designed wherein primary care midwives perform aCTGs for specific indications. The aim of this study was to examine the satisfaction and experiences of pregnant women who received an aCTG in primary midwife-led care and explore which factors were associated with high satisfaction.

Methods: Data were collected through a self-administered questionnaire based on the Consumer Quality Index. The primary outcome was general satisfaction on a 10-point scale, with a score above nine indicating participants were "highly satisfied".

Results: In total, 1227 women were included in the analysis. The study showed a mean general satisfaction score of 9.2. Most women were highly satisfied with receiving an aCTG in primary midwife-led care (77.4%). On the Consumer Quality Index, the mean satisfaction level varied from 3.98 (SD ± 0.11) for the subscale "client satisfaction" to 3.87 (SD ± 0.32) for the subscale "information provision" on a 4-point scale. Women at between 33 and 36 weeks' gestation were more

likely to be highly satisfied (adjusted OR [aOR] = 3.35). Compared with a completely comfortable position during the aCTG, a mostly comfortable or somewhat comfortable level had decreased odds of being associated with a ranking of highly satisfied (aOR 0.24 and 0.19, respectively).

Conclusions: This study shows that pregnant women are satisfied with having an aCTG in midwife-led care. Providing aCTG in midwife-led care can increase access to continuity of care.

KEYWORDS

antenatal cardiotocography, midwife-led care, satisfaction, value-based health care, women's experiences

1 | INTRODUCTION

Healthcare systems are increasingly being set up according to value-based healthcare (VBHC) principles, aiming to organize care based on the best possible quality of care for patients with optimal use of resources.[1] In the Netherlands, the maternity care system is divided into primary (midwife-led) and secondary (obstetrician-led) care. Independent primary care midwives provide care for healthy pregnant women during pregnancy and childbirth.[2] In cases of suspected complications, the midwife refers the woman to hospital-based obstetrician-led care.[3,4] Over recent years, the referral rate from primary to secondary care has increased.[5] Women's suggestions for improving midwifery care in the current maternity care model include client-centered communication and information provision, a personal approach, sufficient time and attention for the individual, and continuity of care practitioner throughout the prenatal, intrapartum, and postnatal period.[6] A previous study showed that pregnant women in the Netherlands who received midwife-led care perceived more continuity of care than women referred to obstetrician-led care.[7]

In Dutch maternity care, innovations based on VBHC principles have been initiated. One of these innovations started in 2015 (and is still ongoing) and concerned the possibility of pregnant women having an antenatal CTG (aCTG) to assess fetal well-being, if indicated, in primary midwife-led care. Currently, the procedure is mostly carried out as part of obstetrician-led care.[8] E-health developments enable aCTGs to be performed outside the hospital in midwife-led care for specific indications: reduced fetal movements, after external cephalic version, and postdate pregnancy.[8] It is expected that in the Netherlands, approximately 21,000 women (12%) a year could be offered an aCTG in midwife-led care.[9] Within the innovation project, 89.7% of the aCTGs were reassuring, meaning these women continued their care in midwife-led care and were not referred to the hospital where they otherwise would have had the aCTG, thus increasing rates of midwife-led continuity of care.[8,10] Implementing aCTGs in primary midwife-led care meets the aim of VBHC; it improves patient outcomes by providing more continuity- and client-centered care while also lowering healthcare costs and eliminating (often harmful) waste.[8,9,11] Only one study has addressed the strategy of offering an aCTG to healthy women with a specific aCTG indication in primary midwife-led care.[10] Van der Pijl et al. focused on the experiences and views of midwives performing an aCTG. This study showed that, in general, midwives were satisfied and felt that performing aCTGs in primary care contributed positively to the midwife–client relationship. However, it was also a challenge: Providing aCTGs in the primary care setting was seen by some midwives as promoting a pathology-based approach to midwifery care. The authors recommended exploring the experiences of pregnant women once aCTG in primary care setting is introduced as there is currently no evidence about women's satisfaction and experiences with aCTGs performed in primary midwife-led care.

Data on women's satisfaction, preferences, and experiences are increasingly being considered as important parameters of good quality of care[15–18] and such data are essential for achieving a client-centered, value-driven system.[8] Evaluating women's satisfaction and experiences can help to improve the implementation of aCTG monitoring in midwife-led care.

Thus, the aim of this study was to determine the satisfaction of pregnant women who received an aCTG in primary midwife-led care. In addition, factors that influence a high level of satisfaction among pregnant women who have an aCTG in primary midwife-led care were investigated.

2 | METHODS

2.1 | Study design

We conducted a prospective study among women who received an aCTG in Dutch primary midwife-led care practices.

The participants were given verbal and written information about the aim and procedures involved in the study and provided their written informed consent. Participation in the study was completely voluntary, and women could withdraw their consent at any time during the study period (September 2016–November 2020).

2.2 | Study setting

This study was embedded in a VBHC-based innovation project performed in three regions in the Netherlands (Zwolle, Nijmegen, and Amsterdam). Healthy pregnant women receiving care in midwife-led practices were offered an aCTG in midwife-led care, autonomously performed and assessed by a primary care midwife, for specific indications: reduced fetal movements, external cephalic version, or postdates pregnancy (41 + 0–41 + 6 weeks' gestation). All three regions performed aCTGs for reduced fetal movements. For the indications "external cephalic version" and "postdates pregnancy", an aCTG was only performed by primary care midwives in the Nijmegen region. Pregnant women fulfilling the above criteria were offered an aCTG by their midwife, either at home, in the midwifery practice, in a community healthcare center nearby, or by a professional in obstetrician-led care in a hospital. We have described carrying out aCTGs in midwife-led care in detail elsewhere.[12]

2.3 | Respondents and data collection

Healthy women with a singleton pregnancy at between 28 and 42 gestational weeks who received an aCTG in primary care for one of the indications mentioned were invited to participate. During the study period, pregnant women from 50 midwifery practices were approached by their midwives before the aCTG. Women filled out the questionnaire during or right after the consultation or in the privacy of their homes. The respondents were asked to return the questionnaire after the consultation or at the next appointment at the midwifery practice in a closed envelope to ensure confidentiality. If a woman had more than one aCTG, only her first experience was included, as two experiences within one person may be interrelated, which could cause bias.

2.4 | Measurement tool

A questionnaire was developed to assess the satisfaction of pregnant women with an aCTG in primary midwife-led care. The questionnaire included baseline characteristics of maternal age (<20, 20–36, >36), gestational age in completed weeks (28–32 weeks, 33–36 weeks, 37–40 weeks, and >41 weeks), socioeconomic position (low, medium, and high), the indication for the aCTG (reduced fetal movements, after external version, and postdate pregnancy), the aCTG location (own midwifery practice, different midwifery practice, ultrasound or birth center, and home), and travel distance (the same as, shorter, or longer than traveling to the hospital). The socioeconomic position was based on the respondents' postal code and categorized according to Statistics Netherlands (CBS).[13,14]

The satisfaction of pregnant women with an aCTG in primary midwife-led care was measured in two ways. (1) The questionnaire was based on the Consumer Quality Index (CQ-I).[15] The CQ-I is a standardized and validated instrument for measuring, analyzing, and reporting client satisfaction with health care.[15] The Cronbach's α of the CQ-I is 0.8, showing good internal consistency. The CQ-I consisted of 14 evaluation questions with the following response options: (1) No, not at all, (2) Somewhat, (3) Mostly, and (4) Yes, completely. The CQ-I contained four different subscales: communication (four questions), information provision (four questions), client-oriented care (three questions), and treatment (three questions). (2) The general satisfaction level was measured using a 10-point Visual Analog Scale, with 0 meaning "not at all satisfied" and 10 meaning "completely satisfied".[16] The general satisfaction score was included in the questionnaire in two regions. Data collection started at different time points in each region (September 2016, November 2016, and December 2016). In the region where data collection started first, the question about general satisfaction was not included.

To address the multidimensional nature of satisfaction, questions were asked about who carried out the aCTG (own midwife yes/no), the additional examination by ultrasound (yes/no), waiting time (none, <15 min, 15–30, >30), the time between the first contact with the care practitioner and the moment the aCTG took place (<30 min, 30–60, 60–90, > 90), level of comfort during the aCTG (not at all, somewhat, mostly, completely comfortable), and the care practitioner and location women considered most suitable for having an aCTG.

2.5 | Statistical analyses

The patient characteristics, details of the aCTG care process, and the satisfaction of pregnant women were

analyzed with descriptive statistics. Frequencies and percentages were calculated for categorical variables and mean and standard deviation for continuous variables by using descriptive statistics.

The CQ-I's mean satisfaction scores on the four subscales were calculated. A sum score was calculated for each subscale and divided by the number of questions.

On a scale of 1–10, pregnant women often report high satisfaction with their care, scoring a 9 or 10.[17] For the analyses, the satisfaction about aCTG was therefore dichotomized into ≥9 or <9.

Univariable and multivariable logistic regression analyses were performed to investigate factors associated with the satisfaction of women with an aCTG in primary midwife-led care, resulting in odds ratios (OR) with 95% confidence intervals (CI). The dichotomized general satisfaction score was used as the dependent variable for this analysis. The factors included were maternal age, gestational age, socioeconomic position, own care practitioner involved, additional examination by ultrasound, location, travel distance, waiting time, level of comfort during the aCTG, and time between first contact and the moment the aCTG was conducted.

All analyses were performed using the Statistical Package for Social Sciences (SPSS) version 26.0 for Windows (SPSS Inc., Chicago, I1, USA). *P*-values <0.05 were considered statistically significant.

3 | RESULTS

During the period of data collection using the questionnaire in the three regions, 4550 aCTGs were performed in primary midwife-led care. The questionnaire was returned by 1303 women. Of these respondents, five (0.4%) were excluded because data on general satisfaction and CQ-I were missing, and 28 (2.1%) because they completed the questionnaire for a second time. In addition, 43 respondents (3.3%) were excluded because they received an aCTG in obstetrician-led care, leaving 1227 respondents with relevant data for analyses (Figure 1).

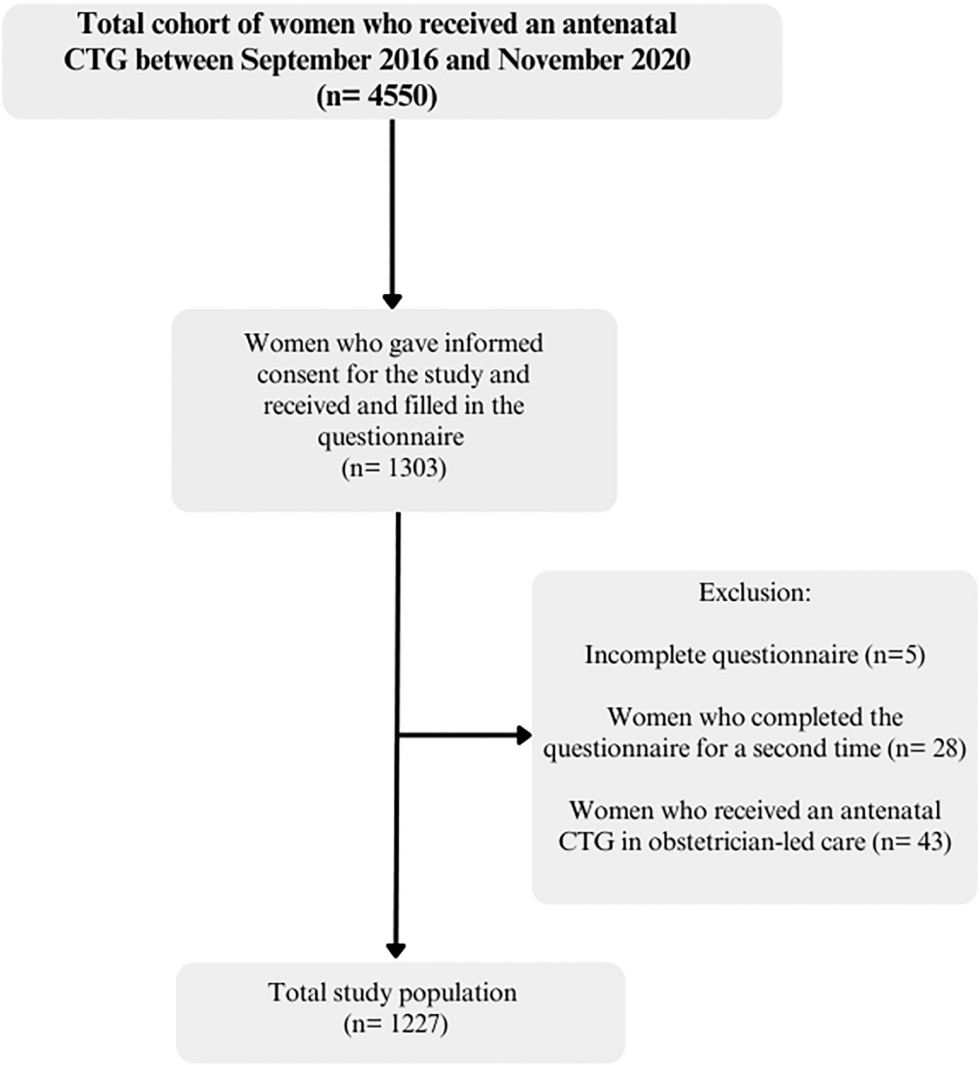

FIGURE 1 Flowchart of the respondents include in the analysis.

TABLE 1 Baseline characteristics of the study population.

	Overall *n* = 1227 (%)
Characteristics of respondents receiving an aCTG in midwife-led care	
Maternal age (years)	
<20	11 (0.9)
20–36	982 (84.4)
>36	171 (14.7)
Missing	63
Socioeconomic position	
Low	366 (31.2)
Medium	500 (42.7)
High	306 (26.1)
Missing	55
Characteristics of the aCTG care process in midwife-led care	
aCTG consultation location	
Own midwifery practice	981 (80.0)
Different midwifery practice	52 (4.2)
Ultrasound or birth center	153 (12.5)
Home	41 (3.3)
Missing	0
aCTG performed by own midwife	
Yes	1061 (87.7)
No	149 (12.3)
Missing	17
Accessibility of the location	
No problem	1194 (98.4)
Minor problem	14 (1.2)
Major problem	5 (0.4)
Missing	14
Travel distance	
Same as to hospital	413 (34.6)
Shorter than hospital	688 (57.7)
Longer than hospital	91 (7.6)
Missing	35
Additional examination by ultrasound	
Yes, immediately	924 (79.3)
Yes, within a week	151 (13.0)
No[a]	90 (7.7)
Missing	62
aCTG indication	
Reduced fetal movements	876 (71.9)
After external cephalic version	140 (11.5)
Postdate pregnancy	197 (16.2)
Other[b]	6 (0.5)
Missing	8
Gestational age (weeks)	
28–32	165 (13.8)
33–36	361 (30.2)
37–40	461 (38.5)
>41	210 (17.5)
Missing	30
Waiting time (minutes) for appointment	
None	981 (82.2)
<15	143 (12.0)
≥15	70 (5.9)
Missing	33
Time between first contact and when the aCTG was done (hours)[c]	
<1	222 (50.1)
1–2	162 (36.6)
>2	59 (13.3)
Missing	433
Comfortable during aCTG	
Yes, completely	788 (65.8)
Mostly	318 (26.6)
Somewhat	91 (7.6)
Missing	30

Abbreviation: aCTG, antenatal cardiotocography.

[a]Reasons for not performing an ultrasound were that an ultrasound had already been performed within 10 days before the aCTG, or the woman was referred to obstetrician-led care after aCTG in midwife-led care.

[b]Other reasons for performing an aCTG included vaginal blood loss, concerns of the mother about the child's condition, and the waters breaking spontaneously.

[c]Not applicable for the aCTG indications "external cephalic version" and "postdate pregnancy."

The baseline characteristics are presented in Table 1. Most women were aged between 20 and 36 ($n = 982$, 84.4%). Nearly half of the respondents had a medium socioeconomic position ($n = 500$, 42.7%).

Of all aCTGs, 461 were performed between 37 and 40 weeks' gestation (38.5%). The main indication for an aCTG was reduced fetal movements ($n = 876$, 71.9%). Most aCTGs were performed at the women's midwifery practice ($n = 981$, 80.0%). For the majority of women, the aCTG was completed by their own midwife ($n = 1061$, 87.7%), and they had no problem getting to the location of the aCTG ($n = 1194$, 98.4%). The time between first contact with a midwife about reduced fetal movements and receiving the aCTG was less than 1 h generally ($n = 222$, 50.1%). Most women were able to sit or lie in a completely comfortable position during the aCTG ($n = 788$, 65.8%).

Table 2 shows client satisfaction based on the CQ-I per question and the four subscales (4-point scale, 1 to 4). The mean satisfaction level varied from 3.98 (SD ± 0.11) for the subscale "client satisfaction" to 3.87 (SD ± 0.32) for the subscale "information provision".

The scoring for specific questions varied from a mean score of 3.99 (SD ± 0.11) for the question "being taken seriously" to 3.80 (SD ± 0.54) for the question "possible further examination". In general, client satisfaction based on the CQ-I was very high.

In total, 623 (50.8%) respondents answered the question about general satisfaction (10-point scale). The mean general satisfaction was 9.19 (SD ± 0.93). The cohort was then divided into two subgroups: high general satisfaction score ≥9 ($n = 482$, 77.4%) (highly satisfied) and general satisfaction score <9 ($n = 141$, 22.6%). Table 3 shows the results of the logistic regression analyses.

Compared with women who had a completely comfortable position during the aCTG, women with a mostly comfortable or somewhat comfortable position had decreased odds of being highly satisfied of 0.24 (95% CI 0.13–0.44) and 0.19 (95% CI 0.08–0.45), respectively. Women between 33 and 36 weeks' gestation were more

TABLE 2 Client satisfaction of respondents who received an aCTG in primary care based on the Consumer Quality Index ($n = 1227$).

Subscale	Question[a]	Mean (SD)
	Overall score	3.96 (0.13)
Communication	(1) Did the healthcare practitioner show interest in your personal situation?	3.95 (0.22)
	(2) Did the caregiver explain things in an understandable way?	3.97 (0.17)
	(3) Did you have confidence in the expertise of your healthcare practitioner?	3.95 (0.24)
	(4) Was your healthcare practitioner willing to talk to you if things were not well in your opinion?	3.98 (0.17)
	Missing	86
Information provision	Overall score	3.87 (0.32)
	(1) Did the healthcare practitioner tell you why the examination was necessary in advance?	3.91 (0.36)
	(2) Did the healthcare practitioner tell you in advance what the examination entailed?	3.88 (0.40)
	(3) Did the healthcare practitioner tell you about the outcome of the examination in an understandable way?	3.88 (0.39)
	(4) Did the healthcare practitioner understandably tell you about the possible further examination?	3.80 (0.54)
	missing	80
Client-oriented care	Overall score	3.97 (0.15)
	(1) Did the healthcare practitioner give you space to think about what is best for you and your unborn child?	3.94 (0.25)
	(2) Was the care practitioner open to your wishes?	3.97 (0.18)
	(3) Were you able to ask the healthcare practitioner the questions you wanted?	3.98 (0.12)
	Missing	72
Treatment	Overall score	3.98 (0.11)
	(1) Did the healthcare practitioner carefully listen to you?	3.98 (0.15)
	(2) Did the healthcare practitioner take you seriously?	3.99 (0.11)
	(3) Did the healthcare practitioner have enough time for you?	3.98 (0.14)
	Missing	34

Abbreviations: aCTG, antenatal cardiotocography; SD, standard deviation.

[a]Women's' experiences were rated using a 4-point scale: (1) No, not at all, (2) Somewhat, (3) Mostly and (4) Yes, completely.

TABLE 3 Association between variables and high general satisfaction (≥9) for the Amsterdam and Zwolle regions ($n = 427$).

	General satisfaction ≥9 $n = 482$ (77.4%)	General satisfaction <9 $n = 141$ (22.6%)	OR [95% CI]	AOR [95% CI][a]
Maternal age (years)				
<20 ($n = 7$)	6 (85.7)	1 (14.3)	1.69 (0.20–14.19)	NA[b]
20–36 ($n = 496$)	387 (78.0)	109 (22.0)	Ref	Ref
>36 ($n = 87$)	61 (70.1)	26 (29.9)	0.66 (0.40–1.10)	0.77 (0.37–1.61)
Gestational age (weeks)				
28–32 ($n = 116$)	84 (72.4)	32 (27.6)	0.81 (0.50–1.31)	0.52 (0.26–1.01)
33–36 ($n = 164$)	137 (83.5)	27 (16.5)	1.56 (0.96–2.55)	**3.35 (1.50–7.46)**
37–40 ($n = 310$)	237 (76.5)	73 (23.5)	Ref	Ref
>41 ($n = 26$)	18 (69.2)	8 (30.8)	0.69 (0.29–1.66)	0.70 (0.18–2.65)
Socioeconomic position				
Low ($n = 185$)	137 (74.1)	48 (25.9)	0.79 (0.51–1.22)	1.17 (0.60–2.25)
Medium ($n = 264$)	207 (78.4)	57 (21.6)	Ref	Ref
High ($n = 146$)	116 (79.5)	30 (20.5)	1.07 (0.65–1.75)	1.40 (0.67–2.93)
aCTG performed by own midwife				
Yes ($n = 592$)	459 (77.5)	133 (22.5)	Ref	Ref
No ($n = 24$)	18 (75.0)	6 (25.0)	0.87 (0.34–2.23)	1.06 (0.21–5.24)
Additional examination by ultrasound				
Yes, directly ($n = 428$)	332 (77.6)	96 (22.4)	Ref	Ref
Yes, within a week ($n = 118$)	92 (78.0)	26 (22.0)	1.02 (0.63–1.67)	0.51 (0.24–1.06)
No ($n = 41$)	33 (80.5)	8 (19.5)	1.19 (0.53–2.67)	0.74 (0.24–2.33)
Location for aCTG				
Own midwifery practice ($n = 533$)	407 (76.4)	126 (23.6)	Ref	Ref
Different midwifery practice ($n = 19$)	16 (84.2)	3 (15.8)	1.65 (0.47–5.76)	2.58 (0.25–26.75)
Ultrasound or birth center ($n = 31$)	25 (80.6)	6 (19.4)	1.29 (0.52–3.22)	0.90 (0.25–3.20)
Home ($n = 40$)	34 (85.0)	6 (15.0)	1.75 (0.72–4.27)	2.03 (0.36–11.28)
Travel distance				
Same as to hospital ($n = 183$)	140 (76.5)	43 (23.5)	0.94 (0.62–1.43)	0.96 (0.52–1.78)
Shorter than hospital ($n = 371$)	288 (77.6)	83 (22.4)	Ref	Ref
Longer than hospital ($n = 44$)	33 (75.0)	11 (25.0)	0.87 (0.42–1.79)	0.68 (0.23–2.01)
Waiting time (minutes) for appointment				
None ($n = 499$)	396 (79.4)	103 (20.6)	Ref	Ref
<15 ($n = 67$)	50 (74.6)	17 (25.4)	0.77 (0.42–1.38)	0.68 (0.29–1.60)
≥15 ($n = 48$)	31 (64.6)	17 (35.4)	**0.47 (0.25–0.89)**	0.82 (0.30–2.21)
Comfort during aCTG				
Yes, completely ($n = 380$)	325 (85.5)	55 (14.5)	Ref	Ref
Mostly ($n = 174$)	119 (68.4)	55 (31.6)	**0.37 (0.24–0.56)**	**0.24 (0.13–0.44)**
Somewhat ($n = 59$)	30 (50.8)	29 (49.2)	**0.18 (0.10–0.31)**	**0.19 (0.08–0.45)**
Time between first contact and when the aCTG was done (hours)				
<1 ($n = 214$)	170 (79.4)	44 (20.6)	Ref	Ref
1–2 ($n = 156$)	119 (76.3)	37 (23.7)	0.83 (0.51–1.37)	0.77 (0.42–1.43)
>2 ($n = 59$)	41 (69.5)	18 (30.5)	0.59 (0.31–1.13)	0.58 (0.25–1.34)

Note: Statistically significant differences have been reported in bold.

Abbreviations: aCTG, antenatal cardiotocography; AOR, adjusted odds ratio; NA, not applicable; ref, reference category.

[a]Adjusted odds ratios corrected for maternal age, gestational age, SES, own care practitioner involved, additional examination by ultrasound, travel distance, waiting time, time between first contact and the CTG.

[b]Group too small for analysis.

likely to be highly satisfied (adjusted OR (aOR 3.35 [95% CI 1.50–7.46])).

Although women were less likely to be highly satisfied when they had to wait 15 minutes or more at the aCTG consultation location (OR 0.47 [95% CI 0.25–0.89]), this association was not significant after adjusting for confounders (0.82 [95% CI 0.30–2.21]).

No associations were found between the remaining variables and high general satisfaction.

Most of the respondents indicated that a primary care midwife is the most suitable professional for assessing the aCTG ($n = 604$, 50.0%), whereas 468 women did not have a preference (38.7%).

Almost half the women stated that the best location for performing an aCTG was their own midwifery practice ($n = 592$, 49.1%).

4 | DISCUSSION

4.1 | Main findings

The aim of this study was to examine the satisfaction of pregnant women who received an aCTG in primary midwife-led care and the factors that were related to satisfaction.

The overall client satisfaction based on the CQ-I was very high. The mean satisfaction level varied from 3.98 (SD ± 0.11) for the subscale "client satisfaction" to 3.87 (SD ± 0.32) for the subscale "information provision".

This study showed a mean general satisfaction score of 9.19 on a scale from 1 to 10. In total, 77.4% of the respondents rated general satisfaction as a nine or higher. Women between 33 and 36 weeks' gestation were more likely to be highly satisfied. Compared with a completely comfortable position during the aCTG, women in a mostly comfortable or somewhat comfortable position had decreased odds of being highly satisfied.

4.2 | Interpretation

Pregnant women reported a high level of satisfaction with aCTGs in primary midwife-led care. A study by Hildingsson et al.[18] showed that overall satisfaction with antenatal care was high in Sweden and Australia (90%–92%). Furthermore, they observed that the most important factors contributing to low satisfaction with antenatal care were deficiencies in information about pregnancy-related issues and in being taken seriously by the midwife. We found high satisfaction levels on the CQ-I in our study for the subscale "information provision" (3.87) and for the question "being taken seriously" (3.99) on a 4-point scale, showing this care meets these expactations.

The maternity care CQ-I was also used in a study by Wiegers et al.[19] on the quality of maternity care in the Netherlands as experienced by women. For midwife-led care, this study showed an average quality of treatment score of 3.79, which is slightly lower than our finding of 3.98 for this subscale. For general satisfaction, they found a score of 9.16, which is in line with the 9.19 in our results.

In terms of healthcare technology, Goberna et al.[20] found that women are often satisfied with new developments in this field. They also found three main aspects that are perceived as essential to high-quality care: safety (the hospital and its technological facilities and the technical expertise of health professionals), the structural aspects that determine the context in which health care is provided, and the relationship between the carers and the service user. This may explain the high satisfaction rate in our study, as we found that the question about women's confidence in their healthcare practitioner's expertise scored 3.95. Furthermore, the literature shows that continuity of caregiver is positively associated with women's experiences of maternity care.[7,19,21,22] For this reason, our findings aboutsatisfaction level may partly be related to the fact the aCTG was performed by the woman's own midwife in 87.7% of the cases. Lastly, for most women, the travel distance to the aCTG location was shorter than the nearest hospital (57.7%), which may have improved the accessibility of care.

We found that a high level of comfort during the aCTG was associated with being highly satisfied. Women in a less than completely comfortable position were less likely to be highly satisfied. This finding corresponds with a report from the Netherlands Institute for Health Services Research (NIVEL), that examined performance indicators for consumer and patient satisfaction.[23] The report showed that the quality of basic physical facilities that influence comfort during medical examination is decisive for the satisfaction of care. To increase the level of satisfaction even further, a comfortable position for women during the aCTG should be ensured.

The other significant and possible clinically relevant association was found for the variable "gestational age". Women were more likely to be highly satisfied when the aCTG was performed at between 33 and 36 weeks' gestation. Further research will be needed to explain this finding.

In this study, almost half of the respondents considered a primary care midwife the most suitable healthcare practitioner for performing an aCTG and 36.4% did not have a preference. This partly contradicts the study by Hofstede et al.; they found that 82% of the patients thought medical specialists were more competent than general practitioners in diagnostic examinations. This difference in findings may partly be related to differences

in patient populations: We examined the preference of healthy women, while Hofstede's study investigated the preferences of patients with a complication. There is also evidence that the extent to which women know their care practitioner also affects how women assess their care.[19]

4.3 | Strengths and limitations

To our knowledge, this is the first study focusing on the satisfaction of healthy women with aCTG in primary midwife-led care. The large study population of 1227 healthy women with a specific aCTG indication contributed to the reliability of the results, which is the main strength of this study. Another strength of this study was using the CQ-I to measure the quality of care experienced by healthcare users. The CQ-I is a standardized method for measuring patient satisfaction and with a Cronbach's α of 0.8, the internal consistency is good. The study by Delnoij et al.[15] states that the recognition of the CQ-I by the medical profession implies that healthcare professionals accept the notion that patient satisfaction is an independent but integral part of the quality of care. For maternity care specifically, a study by Nair et al. showed the important impacts of information provision, communication, and patient satisfaction on the quality of care.[15]

A limitation of the study is that data related to possible confounders such as ethnicity and parity were lacking, as these questions were not included in the questionnaire. For that reason, adjusting for these variables was not possible, which may have biased our findings. In terms of age, the national proportion of pregnant women aged 30–34 was 80.5% in 2018,[24] which is comparable with our study population in which 84.4% of the women were aged between 20 and 36. According to CBS, 38% of women between 25 and 44 had a medium socioeconomic position in 2018.[25] This is in line with the socioeconomic position of the respondents in our study population (42.7% medium). For future research, various additional personal and pregnancy characteristics should be included in the questionnaire. This can help to determine the representativeness of the study population and allows adjustments for relevant factors in the data analysis.

Another limitation of the study is that the question about general satisfaction with an aCTG in primary midwife-led care was not included in the version of the questionnaire in one of the three regions (Nijmegen). Despite the large study population, only slightly more than half of the women answered the general satisfaction question. Furthermore, aCTGs for the indications "external cephalic version" and "postdates pregnancy" were only performed in the Nijmegen region. It was therefore impossible to analyze the association between these indications and the general satisfaction of pregnant women with an aCTG in primary midwife-led care.

Not all women who received an aCTG in midwife-led care were invited to participate in the study as some midwives did not approach women during the inclusion period due to logistical issues, time constraints, or emergencies. This means selection bias of the study population cannot be excluded and may have affected the results.

Lastly, the questionnaire was filled out by pregnant women receiving primary midwife-led care and not by pregnant women receiving an aCTG in obstetrician-led care. In this study, we intended to include women who received an aCTG in obstetrician-led care to compare satisfaction rates. However, this was not achieved as there was reluctance among professionals in obstetrician-led care to take part in the study. However, the high levels of satisfaction suggest that performing aCTG in midwife-led instead of obstetrician-led care does not negatively influence women's satisfaction.

4.4 | Recommendations

We found a very high satisfaction score among healthy pregnant women with an aCTG in primary midwife-led care. Although the high satisfaction levels leave little room for improvement, securing a comfortable position during the aCTG could be valuable to maintain or improve satisfaction further.

In this study, we found no association between aCTG performed by the woman's own midwife compared with an unknown professional and high satisfaction. This suggests that centralizing aCTGs in a community ultrasound or birth center could be an acceptable option.

The high satisfaction rates are promising in terms of VBHC. To establish this, it is also important to determine the cost-effectiveness.[15] An economic evaluation of this innovation may provide valuable information about potential reductions in healthcare costs. Based on our results, implementing aCTGs in midwife-led care could benefit continuity of care and improve women's satisfaction levels. In terms of further research, it is important to explore the facilitators and barriers for broader implementation.

5 | CONCLUSION

This study shows that women are highly satisfied with aCTGs received in midwife-led care. Improving the level of comfort during the aCTG consultation may lead to even higher satisfaction scores for pregnant women receiving an aCTG in primary midwife-led care.

In terms of women's satisfaction levels, performing aCTGs in primary midwife-led care, thereby improving the continuity of care, seems to be a valuable change in the organization of maternity care in the Netherlands.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

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

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