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Mothers' satisfaction with group antenatal care versus individual antenatal care – A clinical trial

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ABSTRACT

Objective: The aim of this study was to compare women's satisfaction with group based antenatal care and standard care.
Design: A randomised control trial where midwives were randomized to perform either GBAC or standard care. Women were invited to evaluate the two models of care. Data was collected by two questionnaires, in early pregnancy and six months after birth. Crude and adjusted odds ratios with a 95% confidence interval were calculated by model of care.
Settings: Twelve antenatal clinics in Sweden between September 2008 and December 2010.
Participants: Women in various part of Sweden (n = 700).
Findings: In total, 8:16 variables in GBAC versus 9:16 in standard care were reported as deficient. Women in GBAC reported significantly less deficiencies with information about labour/birth OR 0.16 (0.10–0.27), breastfeeding OR 0.58 (0.37–0.90) and time following birth OR 0.61 (0.40–0.94). Engagement from the midwives OR 0.44 (0.25–0.78) and being taken seriously OR 0.55 (0.31–0.98) were also found to be less deficient. Women in GBAC reported the highest level of deficiency with information about pregnancy OR 3.45 (2.03–5.85) but reported less deficiency with time to plan the birth OR 0.61 (0.39–0.96). In addition, women in GBAC more satisfied with care in supporting contact with other parents OR 3.86 (2.30–6.46) and felt more support to initiate breastfeeding OR 1.75 (1.02–2.88).
Conclusions: Women in both models of care considered the care as deficient in more than half of all areas. Variables that differed between the two models favoured group based antenatal care.

Introduction

In Sweden, as in many high-income countries, antenatal care was introduced in the 1940s, and was fully developed within a period of 20 years [1].

The main goals of antenatal care are to provide health check-ups, information about pregnancy, labour and birth and the forthcoming parenthood as well as prepare parents for birth [1,2].

The compliance rate in Sweden is high, with almost 99% of pregnant women attending antenatal care [2]. Antenatal care in Sweden is provided by midwives within the primary healthcare sector and is free of charge. Usually a woman meets the same midwife during the 6–9 antenatal visits recommended in the national guidelines for an uncomplicated pregnancy. Besides providing health check-ups to detect pregnancy complications, midwives also offer antenatal education classes, mainly to first time parents. As part of their work, midwives also prescribe contraceptives and perform screening for detecting gynaecological cancer. If complications occur during pregnancy, women are referred to an obstetrician or a family doctor for assistance [3]. In addition, there has also been research conducted on psychosocial subjects during pregnancy, which influences antenatal care to focus on matters other than medical issues [4,5].

One attempt to develop antenatal care was the introduction of group-based antenatal care, or Centering Pregnancy, as it is called in the U.S. This model is an outgrowth of the *Childbearing Childrearing Centre* at the University of Minnesota, and was established as an alternative to the medical, illness-based model of pregnancy [6]. The initiator in the U.S. was a midwife, Sharon Schindler Rising. Her idea was to bring the focus from the caregiver to the women [7]. The Centering Pregnancy model comprises three major components: health assessment, education, and support. The caregiver acts as a facilitator, and may be a nurse, a midwife, a social worker, or another type of healthcare provider.

Group-based antenatal care (GBAC) was introduced in Sweden in 2000, inspired by models from Denmark and the U.S. Around 11 clinics in different areas in Sweden have implemented group

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models for antenatal care (personal contact with antenatal care coordinators, 2007). There is, however, a lack of evaluations of the models and there is no consensus about what the model should include, the optimal number of sessions to offer, or the content of the sessions.

The theory behind the group model of antenatal care is based on knowledge from different disciplines such as feminist theory, midwifery, social cognitive theory and learning theory, which were brought together to form bases to facilitate group interactive processes that will strengthen the social network, build capacity and improve perinatal outcome [8].

International studies have found some benefits from group-based antenatal care in a decreased number of pre-term births [9,10]. Other benefits to the approach are increased knowledge and better preparation for labour and birth [10–12], as well as for infant care [8]. However, the generalizability of many studies is compromised by the characteristics of their study samples. In many cases, the samples consist of disadvantaged populations living below the socio-economic norm [13–15].

There have been several studies focusing on satisfaction with GBAC [14,16], which show that the overall satisfaction is generally high. These studies ask about women's level of satisfaction with care, but it is unknown how satisfaction is defined. Generally, satisfaction is poorly described in research on antenatal care [17]. Studies comparing GBAC with standard individual care generally favour the group settings [9,15], only one study, [18] found higher overall satisfaction in the control group than in women attending the GBAC.

Few studies on GBAC have been conducted in Sweden. A descriptive pilot study by Wedin and co-authors compared standard care with GBAC in terms of women's experiences [19]. The results showed only small differences in satisfaction with information and support between the two models of care. Another study from Sweden used group discussions and telephone interviews in order to assess parents' experiences of GBAC. The parents were generally very satisfied with the model, but found midwives problematic in terms of gender issues; that is to say, they were not addressing the prospective fathers and their needs enough [20].

Although there seem to be some benefits from group models of antenatal care according to two recent reviews and one meta-analysis [8,21,22], the authors of these studies emphasized the importance of further randomized controlled trials to ensure the effectiveness of group-based antenatal care. The aim of this study was to compare women's satisfaction with GBAC and standard care, where midwives are randomized into the two different models of care.

Method

Design

The design of this study builds upon a randomization where at least two midwives working in the same antenatal clinic were allotted to provide either group-based antenatal care or standard care within each unit. Justification for this design rests on practical consideration and was suitable to evaluate antenatal care under natural conditions. Detailed information about the RCT has been published in the Karolinska clinical trial registration: KCTR CT20120059 and ClinicalTrials.gov Identifier: NCT01224275.

Inclusion criteria for midwives

To be enrolled in the randomized clinical trial (RCT), a minimum of two midwives working in the same antenatal clinic and willing to be randomized to one of the two models was necessary to be accepted.

Education and randomization of midwives

All participating midwives attended a meeting prior to randomization, where information about the study and the two models was provided. The midwives were then randomized to provide either group-based antenatal care (intervention) or individual care (standard care). In total, 31 midwives from 12 antenatal clinics in Sweden accepted the invitation to participate. After randomization, midwives who provided group-based care also attended a specific workshop where the group model was explained and they received training in it. They received both written and oral instructions and a manual to follow in the GBAC during the study period. Midwives were also urged to write a diary to report their experiences as well as how closely the manual was followed. After the study was completed, a questionnaire was sent to all participant midwives in the intervention group to evaluate their adherence to the protocol according to the manual.

Models of antenatal care

After the first individual visit, the care took place in group settings beginning at twenty weeks gestational age. The visits last for two hours and in the second hour, the women each met the midwife for a 10 min, individual check-up while the remaining women continued with discussing or practicing specific topics as a group. An overview of the content in each visit is shown in Fig. 2. Gestational age should not differ by more than a month. Women attending the GBAC sessions did not attend parent education classes, as they were already built into the program.

In both model of care, the national guidelines were followed and additional visits were offered if needed for medical or psychosocial reasons. First-time mothers in standard care were offered parent education classes.

Participating women and recruitment

Between September 2008 and December 2010, pregnant women booking their first antenatal care visit were informed about, and subsequently invited to participate in, the study to evaluate their care. Women received care from the midwives who either provided GBAC or standard care. To be eligible, women should speak and understand the Swedish language. Large clinics chose to recruit women regarding day of birth (1–15 group-based care versus 16–31 control group) and small units chose to recruit every second woman to each model of care.

Data collection

Data were collected by two questionnaires, the first (baseline) in the first trimester before the antenatal program began, and the second, six months after birth.

After giving consent, the women received the first questionnaire (baseline), which could be filled out either at the clinic or at home and returned in a pre-paid envelope.

The first questionnaire included information about the women's socio-demographic background (e.g., age, parity, civil status, country of birth, financial situation, tobacco use, chronic diseases and if the pregnancy was planned or not).

The follow-up questionnaire, which was distributed six months postpartum, included questions on opinions about the number of antenatal visits and their caregivers. The questionnaire also covered other questions about content of care. The questionnaire was validated using face validity with 12 pregnant women. The

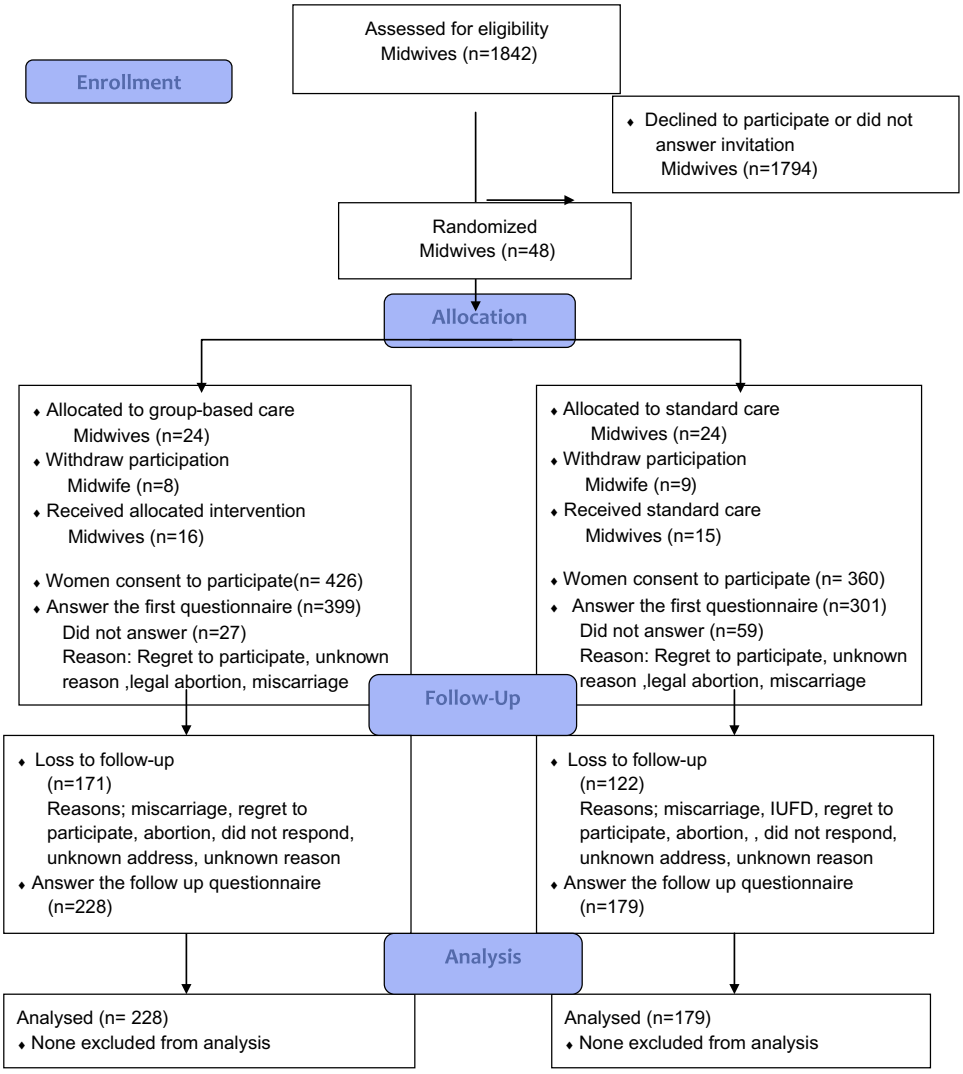

Fig. 1. Flow of midwives and women from recruitment to follow-up after six months.

results of this validation resulted in small changes in wording. The questions about the content of antenatal care showed acceptable internal consistency, with a reported Cronbach alpha coefficient of .88 for perceived reality, and .86 for subjective importance.

To assess the content of antenatal care, detailed questions seeking information about the approach of the midwives, and the medical and emotional aspects of care were assessed on four-point Likert scales. Each question was assessed in two ways; first, the women assessed their own experience on how they perceived the given care (perceived reality). Thereafter, they evaluated how important this aspect of care was to them (subjective importance). The questions were rated from "do not agree at all" (1), to "totally agree" (4) for the former; and the latter question's response options ranged from "of little importance" (1) to "of very great importance" (4). Constructing questions in this way has previously been developed for hospital-based care for women by Wilde Larsson [23].

An index was created by combining the answers of subjective importance (SI) and the perceived reality (PR). The index followed the protocol described by Wilde Larsson et al. [24]. 'Balanced' care occurs when the care given reflects the needs, for example as when corresponding high or low scores are encountered on both the SI and the PR. 'Deficient' care contains aspects that are judged by the woman as important, however, her received care was viewed as less than good. 'Excessive' care contains aspects that are not assessed as important by the woman, but the actual care is perceived as being beyond her expectations.

When the instrument is used in hospital settings, it is recommended that if the results report deficient care on more than 20% of a certain issue, actions should be taken to improve the care [24].

Sample size

Sample size needed to estimate the size of the study population and have adequate statistical power were calculated based on 8% differences in primary outcome (satisfaction), a two-sided test, a power of 0.80 and a significance level of 5% showed that 400 women had to be enrolled in the study (200 in each model). The level of satisfaction was based on an earlier national cohort study in Sweden where 87% of the women were satisfied with the overall satisfaction [25].

Analysis

Data analysis was undertaken using SPSS version 19.0 (IBM Statistical Package for Social Sciences) software. Women in the group-based antenatal care were compared with women in standard care by intention to treat analysis. Descriptive statistics, *t*-tests, and

chi-square tests were used in the analysis. Crude and adjusted odds ratios with a 95% confidence interval were calculated between women in the GBAC and standard care groups.

Ethical approval

The Regional Ethical Review Board at Karolinska Institutet made approval of the study. (File record 2007/553).

Results

Thirty-one antenatal midwives were randomized to provide either group-based ($n = 16$) or standard care ($n = 15$), for a total of 786 women recruited to the study.

Twenty seven (6.3%) women in the group-based care group and 59 (16.3%) women in the standard care group did not return the first questionnaire due to miscarriage [21], legal abortion [6], regret over participation [30], or for unknown reasons [29]. There was no difference between the groups according to reasons, leaving 399 women in the group-care group and 301 women in the standard care group remaining.

Six months after giving birth, 228 of 426 (53.5%) women in the group-based care group and 179 of 360 (49.7%) in the standard care group completed the follow-up questionnaires (Fig. 1).

There were some demographic differences apparent when the women who were lost from the study were compared to those who remained and answered the follow-up questionnaire. There were a greater number of tobacco users (p 0.047), women born outside Sweden (p 0.003), and women with a lower level of education (p 0.000), which did not answer the follow-up. Women who did not return the follow-up questionnaire were more likely not to have a planned or welcomed pregnancy (p 0.03) and were more often younger than 25 years (p 0.007).

Characteristics

There were no differences in mean age of the participants; 29.7 years in the group model versus 29.5 years in the standard model (Table 1). The majority in both groups were married or cohabiting, and born in Sweden. The majority had a university level of education, and most of the women ranked their financial situation as being very good. Few women were tobacco users, and a minority reported a diagnosed disease. The vast majority of the women had planned the pregnancies.

The background characteristics showed two significant differences between the two groups. Women in the group-based care group had a dominance of primiparas compared to the standard care (Table 1). There was also statistically significant difference between the groups regarding level of education, with more women in the GBAC having university degree compared to women in the standard group.

Table 1
Sociodemographic characteristics of women in the study.

	Group based care $n = 399$ mean (range)/n (%)	Individual care $n = 301$ mean (range)/n (%)	p-value
Age	29.7 (19–44)	29.5 (17–44)	0.507
Primipara	292 (73.6)	169 (57.3)	<0.000
Married/cohabiting	377 (95.0)	284 (94.4)	0.722
Born in Sweden	359 (91.6)	276 (92.6)	0.619
College/University	235 (60.3)	146 (49.2)	0.004
Very good economy	299 (72.9)	251 (76.7)	0.257
Tobacco user	29 (4.4)	13 (7.4)	0.106
Chronic disease	56 (14.2)	30 (10.1)	0.101
Planned pregnancy	378 (97.4)	289 (97.6)	0.860

Antenatal care

Table 2 shows that the mean number of visits to a midwife was 9.35 in GBAC versus 8.44 in standard care, which was a statistical significant difference. However, it was the opposite regarding the number of visits to a physician (Table 2). There were no differences between the two groups regarding opinion about the number of visits.

Parent education was incorporated into the GBAC sessions for all women regardless of parity. In the standard care, parent education classes were mostly offered to first-time women. In this study, 85% of the primiparas in the standard group attended the parental classes. Of those who attended, 28% judged the overall experience of parental classes not fulfilling. Other activities besides the parental education care were reported in both groups; aqua aerobics and yoga had similar numbers of participants (Table 2). Psychoprophylaxis showed initially significant differences between the two groups, but after adjusting for parity and level of education the significance disappeared. Mental training was used more often in standard care but with very small numbers of women

Regarding the opinion about antenatal care helped to support contact with other parents, women in the GBAC reported higher satisfaction compared to women in standard care, both before and after adjusting for background characteristics as parity and level of education.

Gestation age	Content
Weeks 5-10	Conversation and information about health issues, group or individual.
Weeks 10-12	Individual booking visit and sample
Week 16	Extra individual visit (if needed)
Week 20 First group session	Presentation of group members and content of care. Topics:Breastfeeding, foetal development, ultrasound and physical and emotional changes. Suggested reading: foetus and child
Week 25	Topic: The baby´s capacity and life inside and outside uterus, parental leave and relaxation practice. Suggested reading: breastfeeding 10 minutes antenatal assessment
Week 28	Topic: Changes in third trimester, martial relationship, breastfeeding Suggested reading: Changes and transitions to parenthood 10 minutes antenatal assessment
Week 31	Topic: Physical and mental preparation for childbirth and parenthood. Practical exercises: breathing, relaxation and mental training. Film. Suggested reading: labour and birth 10 minutes antenatal assessment
Week 33	Topic: Normal birth, non-pharmacological pain relief, demonstration of massage. Initial breastfeeding and role models. Ten minutes antenatal assessment
Week 35	Topic: Further reflection on the birth, and pharmacological pain relief methods. Interventions/complications. Talk about expectations for giving birth. Partner/relatives role at birth. Suggested reading: postpartum and first time follows birth. 10 minutes antenatal assessment
Week 37	Topic: Changes in the body/soul after birth. Partner/relatives reactions. The child's first time. Group contact after birth. Suggested reading: Transition to parenthood. 10 minutes antenatal assessment
Week 39	Topic: Continue childbirth discussion, preparation for parenthood. Child health and child care. Practical exercises: Relaxation. 10 minutes antenatal assessment
Week 41	Individual visits including antenatal assessment and contact with birth clinic.
8-12 weeks after birth	Topic: Birth experiences, Contraception. Talk about sex life/sexuality. 30 minutes health assessment.

Fig. 2. Manual for group-based antenatal care in RCT.

Table 2
Care content and women's opinion of care.

	Group based care	Standard care				
	n = 228 *n* (%)	*n* = 179 *n* (%)	Crude Odds ratio (95% CI)	*p*-value	Adjusted[a] Odds ratio (95% CI)	*p*-value
Number of midwives						
One	112 (50.5)	86 (48.6)	1.0 Ref.		1.0 Ref.	
Two	77 (34.7)	69 (39)	0.85 (0.55–1.30)	0.45	0.70 (0.44–1.12)	0.20
Three or more	33 (14.9)	22 (12.4)	1.14 (0.62–2.09)	0.68	0.97 (0.51–1.84)	0.92
Number of visits to midwife mean (Sd)	9.32 (3.44)	8.17 (2.99)		(*t*-test) 0.001		
Opinion about number of visits to midwife						
Sufficient	188 (84.5)	157 (87.2)	0.68 (0.38–1.23)	0.21	0.69 (0.37–1.27)	1.00
Not sufficient	35 (15.7)	21(11.8)	1.0 Ref.		1.0 Ref.	
Number of visits to physician	1.43 (1.39)	1.87 (2)		(*t*-test) 0.04		
Opinion about number of visits to physician						
Sufficient	151 (75.9)	128 (76.2)	0.98 (0.61–1.59)	0.94	0.96 (0.60–1.66)	0.96
Not sufficient	48 (24.1)	40 (23.8)	1.0 Ref.		1.0 Ref.	
Other antenatal activities						
Aqua aerobics	43 (10.8)	33 (11.0)	1.04 (6.32–17.29)	0.86	0.90 (0.54–1.48)	0.67
Yoga	35 (8.8)	23 (9.3)	0.99 (0.58–1.71)	0.98	0.90 (0.51–0.58)	0.71
Mental training	4 (1)	8 (2.7)	0.38 (0.11–1.26)	0.38	0.34 (0.98–1.18)	0.09
Psycho prophylaxis	55 (13.8)	20 (6.7)	2.57 (1.48–4.40)	0.001	1.82 (1.02–3.24)	0.04
Auditorium lecture	33 (8.0)	23 (7.7)	1.17 (0.66–2.07)	0.6	0.93 (0.52–1.68)	0.81
Pilates	5 (1.7)	5 (1.3)	0.76 (0.22–2.65)	0.67	0.55 (0.15–1.99)	0.36
Satisfaction with activities						
Yes	112 (88.2)	74 (91.4)	0.71 (2.28–1.82)	0.47	0.69 (0.24–1.92)	0.48
No	15 (66)	7 (8.6)	1.0 Ref.		1.0 Ref.	
Care support contact with other parents						
Yes	133 (62.7)	31 (30.1)	3.86 (2.33–6.40)	0.000	3.86 (2.30–6.46)	0.000
No	79 (37.3)	72 (69.9)	1.0 Ref.		1.0 Ref.	
Group and parental classes help initiate for breastfeeding						
Yes	83 (39.5)	34 (31.5)	1.42 (0.87–2.32)	0.16	1.75 (1.02–2.88)	0.04
No	126 (60.5)	75 (68.5)	1.0 Ref.		1.0 Ref.	
Overall assessment about the antenatal care	1.72 (1–5)	1.73 (1–5)				
Satisfied	187 (83.5)	156 (88.1)	0.68 (0.38–1.21)	0.19	0.75 (0.40–1.40)	0.37
Less than satisfied	37 (16.5)	21 (11.9)	1.0 Ref.		1.0 Ref.	

[a] Adjusted for parity, level of education.

We also found differences between the groups regarding if the care received was helpful to initiate breastfeeding (60.5% versus 68.5%), (Table 2).

There was no difference between the models of care regarding the overall satisfaction; the majority in both groups reported a positive opinion about the overall assessment of their antenatal care (83.5% versus 88.1%).

In Table 3, the results from the indexed variables of the content of care are presented. In total, 8 of 16 variables in group-based care versus 9 of 16 in standard care were reported with deficiencies (>20%). Information about breastfeeding, the time following birth, birth preparation, support from the midwife, opportunities to plan the birth and the midwife's involvement of the partner all showed a >20% deficiency for both groups. Information about pregnancy and the medical aspects of care were only deficient in GBAC, while women in SC reported deficiencies regarding information about labour and birth, the midwife's engagement and the midwife's understanding of the woman's situation.

When GBAC and SC were compared women in the GBAC were more dissatisfied about information about pregnancy (OR 3.45). On the other hand, women who received GBAC were more satisfied with information about labour and birth, information about breastfeeding, the time following birth, being taken seriously and engagement by the midwife and the opportunities to the plan the birth.

As parent education was in-built in GBAC and this group consisted of more first-time mothers, the analysis were repeated only in first-time mothers. The majority of the identified differences from the whole group remained statistically significant. First-time mother who received GBAC were more dissatisfied with information about pregnancy (OR 3.56; 1.9–6.6) and medical issues (OR 1.99; 1.05–3.80) but less dissatisfied with the information about labour and birth (OR 0.17; 0.10–0.30) other previously defined differences was no longer statistically significant when only first-time mothers in both groups were analysed. First time mother in GBAC reported nine variables out of 16 with deficiency compare to mothers in SC who reported 10 of 16 with deficiency.

Discussion

The major findings in this study were that women reported deficiencies in their antenatal care to a high degree in both models of care. No differences between the groups were detected in overall satisfaction.

Group based care facilitated initiation of breastfeeding, contact with other women and the majority of information issues.

Quality of antenatal care

The finding that women were dissatisfied with the quality of their antenatal care when assessed on the combined variables measuring both perceived reality and subjective importance regardless of model of care, has previously been reported in another Swedish study that compared antenatal care in Sweden and Australia [26]. This finding challenges the well-established

Table 3
Index of women's perceived reality and subjective importance of antenatal care.

Variables	Group based care ***n* = 228**		Standard care ***n* = 179**			
	Deficiency *n* (%)	Balance/excess *n* (%)	Deficiency *n* (%)	Balance/excess *n* (%)	Crude OR (95% CI)	Adjusted OR (95% CI)[#]
Information about pregnancy	84 (**38**)	137 (62)	23 (13.2)	151(86.8)	3.98 (2.40–6.74)***	3.45 (2.03–5.85)***
Information about labour and birth	35 (15.9)	185 (84.1)	80 (**44.7**)	78 (49.4)	0.20 (0.12–0.31)***	0.16 (0.10–0.27)***
Information about breastfeeding	73 (**32**)	143 (66.2)	70 (**42.7**)	94 (57.3)	0.68 (0.44–1.03)	0.58 (0.37–0.90)**
Information about time following birth	88 (**40.4**)	130 (59.6)	83 (**49.1**)	86 (50.9)	0.69 (0.46–1.04)	0.61 (0.40–0.94)*
Felt well-prepared for birth	66 (**30.3**)	152 (69.7)	62 (**35.6**)	112 (64.4)	0.78 (0.51–1.20)	0.72 (0.47–1.13)
Support from midwife	43 (**20.3**)	169 (79.7)	35 (**21**)	132 (79)	0.96 (0.58–1.59)	0.84 (0.50–1.41)
Midwife's engagement with the woman	29 (12.7)	189 (86.7)	39 (**22.3**)	136 (77.7)	0.54 (0.32–0.91)*	0.44 (0.25–0.78)**
Midwife's understanding of the woman's situation	37 (17.2)	178 (82.8)	42 (**23.5**)	134 (76.1)	0.64 (0.39–1.06)	0.62 (0.37–1.03)
Midwife taking the woman seriously	28 (12.6)	194 (87.4)	33 (18.6)	144 (81.4)	0.63 (0.37–1.10)	0.55 (0.31–0.98)*
Satisfaction with the emotional aspects	11 (5)	207 (95)	11 (7.4)	162 (92.6)	0.66 (0.29–1.52)	0.59 (0.25–1.39)
Satisfaction with the medical aspects	59 (**28**)	154 (72)	31 (18.9)	133 (74.3)	1.67 (1.02–2.69)*	1.55 (0.93–2.58)
Opportunities for own questions	31 (14.4)	185 (85.6)	19 (10.9)	155 (89.1)	1.37 (0.74–2.53)	1.05 (0.55–2.00)
Opportunities to making decisions about pregnancy	33 (16)	173 (84)	25 (15.3)	138 (84.7)	1.02 (0.58–1.80)	0.99 (0.55–1.80)
Opportunities for talk about health issues	24 (13.4)	155 (86.6)	16 (14.2)	97 (85.8)	0.90 (0.45–1.79)	0.70 (0.34–1.45)
Opportunities to plan the birth with midwife	61 (**27.4**)	162 (72.6)	61 (**36.1**)	108 (63.9)	0.66 (0.43–1.01)	0.61 (0.39–0.96)*
Midwife's involvement with the partner	51 (**23.8**)	163 (76.2)	45 (**27.2**)	119 (72.6)	0.83 (0.52–1.33)	0.70 (0.43–1.14)

Bold number = <20% deficiencies.
[#] Adjusted for parity, education.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

reputation of antenatal care. Listening to women's expectations and experiences would be valuable in developing antenatal care programs. In a previous national Swedish study [27], women wanted visits more frequently in early pregnancy, and parent education offered to all women in order to make contact with other women.

Satisfaction with information

Women in GBAC reported significantly less deficiency with the information on various issues related to birth and lactation than information on pregnancy issues compared to women in the standard care group. These findings can be discussed in relation to a review comprising 18 studies about individual care and GBAC where five studies reported that overall information was insufficient in individual care [28], which led to frustration and lack of trust.

There is usually a manual included in GBAC for the content of every visit, and such was the case in the present study. This could be an explanation of the satisfaction with information about birth related issues in GBAC. Every topic in each visit was known beforehand and followed, thereby giving control over the content of care. Information about pregnancy, however, showed a deficiency greater than 20% in the GBAC. Usually a lot of information about pregnancy-related issues occurred prior to the start of the group sessions, and could therefore be harder to remember. Other possible explanations could be that it was the process of peer learning with interaction and reflection that made ailments becomes normalized, or that it was the time allocated to each topic, or the non-didactic approach. Similar findings were also shown in an interview study about another group-based antenatal care program [20].

In the current study showed that women in GBAC had more often a university education, and this may have influenced satisfaction level. However, there are studies showing that women with higher educational status was associated with less positive responses [29].

Midwives engagement

Women in the GBAC reported less deficiency with the midwives' engagement and the way they were taken seriously. We do not know the reason for this, as the midwives in the participating clinics, were randomized after they consented to perform one of two models and were not able to choose the model. The finding of a more encouraging midwife could, however, be related to the longer time spent with the other women in the GBAC. Another explanation could be that women could experience the midwife's encouraging capacity, in terms of interaction with other women in group settings. It is well known that pregnant women feel frustrations when professionals do not listen to them or treat their questions as unimportant [30].

Another finding was that women in GBAC reported less deficiency in having time to plan the birth with a midwife. A birth plan could enhance women's emotional wellbeing and the way they feel supported in their birth preparation. In this study we have no information about if or how the birth plan was followed up. A previous longitudinal study have highlighted the importance that caregivers read and acknowledge women's birth plans as interruption of birth plans and the lack of support from maternity providers has a negative impact on maternal psychological health [31].

Contact with other parents

An important finding was that a majority in the GBAC group thought that the care facilitated contact with other parents. Compared to standard care, women in the GBAC in the present study were more satisfied when care supported the contact with other parents. Similar findings have been found by Kennedy et al. [10] and Novick [28], which showed that group-based care could provide an opportunity to socialize. This can also be compared to a Swedish national study of parenting classes focusing on primiparas. The study showed that attending more than five antenatal sessions resulted in increased social networking [32]. To initiate contact with other parents was one of the main goals when parent education was introduced into Swedish standard care [33].

Overall satisfaction

No differences appeared between women in the GBAC and standard care in the present study regarding the overall satisfaction with antenatal care. This is not surprising, as several studies have found a lack of variability when global questions of satisfaction

are asked [34,35], as women usually rate overall satisfaction with care very highly. Asking about particular issues of care will probably give more-specific answers that could be more helpful in improving care.

However, there were differences in the assessment of women's care in the two models in specific areas. It is possible that the available time in group care further created opportunities for exchange of information and the development of relationships between pregnant women and midwives.

Methodological consideration

Although this study had the ambition to provide a randomized controlled trial where midwives working in the same antenatal clinic provided two different models of antenatal care, several limitations must be recognized.

One limitation of this study is the representativeness of the clinics. All of the 500 antenatal clinics received information about the study from the midwife coordinators in their area. Only a few clinics showed interest in participating in the trial. Another limitation is that providers of GBAC also provided standard care for women who did not participate in the study; however, it was not possible to segregate them to only providing GBAC due to a heavy workload. This meant the midwives could compare the two different models of care and the women's reactions towards content of care. It could be possible that the midwives were inspired to change the concept due to the women's opinions and requests. It is because of this, that we encouraged the midwives to write a diary to report different issues and reflections during the study, such as reactions from women. We also arranged a meeting with midwives during the trial to encourage and control the study protocol. By these procedures, we controlled that the manual was followed in the GBAC group.

Our intention was to compare group model with standard care as it is usually performed. This will imply that mainly first-time mother in standard care received parent education. However, when a stratified analysis was done based on parity there were only few differences. It could, however, be a limitation that women who received standard care did not have a standardized parent education especially when it comes to interaction with other parents. Notice that standard care in Sweden includes parental education for primiparas but are not standardized in Sweden [36].

Earlier research has identified problems such as the concept of "satisfaction" often being poorly defined [34]. There is little evidence that it captures the subjective experiences of healthcare. Some sources of bias in earlier research have been found, as studies are mainly conducted on minority populations [21]. There are different cultures and contexts within earlier research on group-based care compared to the present study, which leads to difficulties in drawing conclusions and comparisons when it comes to measuring satisfaction.

The way GBAC was provided in this study is not comparable to the original Centering Pregnancy model where procedures such as health check-ups, for example, are performed on a mat in the group session, rather inspired by the Danish model [19]. We believe that women in Sweden value the 10 min individual check up with the midwife to have the opportunity to ask personal questions. This was also confirmed with the attending midwives who stressed the importance of having control over the detection of pregnancy complications.

The study sample is fairly representative compared to national data on women of the same age and so is the national data (medical birth register) in terms of level of education and tobacco use. The majority of women in the present study were born in Sweden (91.6% versus 92.6%) compared to national data of 76.6%; this discrepancy could be explained by a part of the inclusion criteria, which was mastering of the Swedish language.

In addition, the characteristics of the participants in the present study show some discrepancies between the two groups regarding level of education (university 60.3% versus 49.2%) and parity (primiparas 73.6% versus 57.3%). There were more primiparas in both groups compared to the national level according to the Swedish medical birth register in 2010 (primiparas 43.4%), same discrepancy between parity was found in another RCT by Kennedy et al. [10]. This could be explained by multiparas (160 compared to 45 primiparas) who chose not to participate in the study, mainly for the reason of having less time to spend in the group (two hours per session) at the antenatal clinic. In our study, the women were allocated to a midwife, and they did not know beforehand into which care group the midwife had been randomized.

Another limitation in our study could be the numbers of participant women; the loss of follow-up totalled 293 women, with 46.5% in the intervention group, versus 50.3% in the standard care group. Nevertheless, methodology studies on longitudinal loss to follow-up suggest the number of follow-up loss rates at 50–60% [37–39].

The recruiting process was sometimes failing due to organisational changes during the long recruitment period where midwives had to stop the group antenatal care.

Although the low number of midwives who were interested in participating in the study affected the number of women who were recruited to evaluate care.

Conclusion

Women in both models of care considered the care as deficient in more than half of all areas. Variables that differed between the two models favoured group based antenatal care. Group-based antenatal care offers a model for antenatal care that showed some benefits regarding information and interaction with midwives, as well as helpfulness in creating contacts with other women. The results also indicate that the antenatal care offered in Sweden is not sufficient when it comes to women's satisfaction with care.

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