Midwifery continuity of care and vaginal birth after caesarean section: A randomised controlled trial

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AUTHOR CONTRIBUTIONS

The study was conceived, designed and led by Caroline Homer who wrote the first draft of the paper. Maralyn Foureur and Deborah Davis played a key role in the design of the study, the attraction of funding, supervised aspects of data collection and the interpretation of the findings. Sabera Turkmani supported data collection, and with Rachel Smith, assisted with the analysis and writing of the manuscript. Lyndall Mollart, Marian Bullard and Bernadette Leiser led the implementation of the trial at the study site and supported the Steering Committee for the study. All authors contributed to the writing of the paper, assisted with revisions and responses to this journal and approved the final version.

ABSTRACT

Problem and Background: Caesarean section (CS) rates in Australia and many countries worldwide are high and increasing, with elective repeat caesarean section a significant contributor.

Aim: To determine whether midwifery continuity of care for women with a previous CS increases the proportion of women who plan to attempt a vaginal birth in their current pregnancy.

Methods: A randomised controlled design was undertaken. Women who met the inclusion criteria were randomised to one of two groups; the Community Midwifery Program (CMP) (continuity across the full spectrum – antenatal, intrapartum and postpartum) (n=110) and the Midwifery Antenatal Care (MAC) Program (antenatal continuity of care) (n=111) using a remote randomisation service. Analysis was undertaken on an intention to treat basis. The primary outcome measure was the rate of attempted vaginal birth after caesarean section and secondary outcomes included composite measures of maternal and neonatal wellbeing.

Findings: The model of care did not significantly impact planned vaginal birth at 36 weeks (CMP 66.7% vs MAC 57.3%) or success rate (CMP 27.8% vs MAC 32.7%). The rate of maternal and neonatal complications was similar between the groups.

Conclusion: Model of care did not significantly impact the proportion of women attempting VBAC in this study. The similarity in the number of midwives seen antenatally and during labour and birth suggests that these models of care had more similarities than differences and that the model of continuity could be described as informational continuity. Future research should focus on the impact of relationship based continuity of care.

Keywords

Cesarean section; vaginal birth; midwifery; midwives; Vaginal Birth after Cesarean

STATEMENT OF SIGNIFICANCE

Problem	Too few women are able to choose a vaginal birth for their next birth after caesarean section despite evidence indicating its safety in the context of a well-resourced maternity system.
What is Already Known	Caesarean section rates in many countries are increasing and repeat elective caesarean section is a significant contributor. Attitudes of maternity caregivers and trust between woman and caregiver may influence choices.
What this Paper Adds	Continuity of antenatal midwifery care does not impact choice of planned mode of birth after caesarean section.

INTRODUCTION

The global caesarean section (CS) rate has doubled in the last 15 years (1) and it is argued that the rate in Australia and other similar countries is too high (2, 3). While a CS can be a life-saving operation, there are also short and long term impacts on the health of mothers and babies (4). Elective repeat CS is a significant contributor to the current CS rate in Australia and many other countries worldwide (5).

Offering women the option of vaginal birth after caesarean section (VBAC), in a well-resourced maternity unit is considered a safe and ethical option (6). The recent series on *Optimising Caesarean Section* in The Lancet highlighted the importance of clinical interventions to reduce the frequency of caesarean section including VBAC (7). VBAC does not increase maternal mortality or major morbidity such as hysterectomy (8). Other maternal morbidities such as requiring a blood transfusion, endometriosis and uterine rupture may be increased if the VBAC attempt is not successful (6, 9). However, upwards of 65% of women who attempt a VBAC in a hospital-setting will be successful (10). In regard to neonatal mortality, a small increased risk has been noted but this is comparable to the background risk of mortality present in first pregnancies (6). Fortunately, major complications occur rarely in women and babies undertaking a VBAC in Australia and in similar countries.

Factors influencing the uptake of planned vaginal birth following CS are wide and varied. Some factors affecting the decision for planned VBAC include women's and clinicians' fear; availability of organisational support and resources; development of trust between the woman and her care provider; and careful review of clinical suitability for VBAC (11). Evidence examining clinician-centred interventions aimed to increase the uptake of VBAC such as facility audit with feedback to staff and the use of antenatal x-ray pelvimetry is inconclusive (12). A earlier systematic review examining clinical interventions that increase uptake and success of VBAC found that interventions such as artificial rupture of membranes; use of prostaglandins; use of oxytocin infusions; and, use of cervical ripening agents have lower VBAC success rates when compared with spontaneous onset of labour in women with previous caesarean section (13). It is recognised that interventions should provide women with a sense of empowerment, recognising their previous experience of birth, the short and long term consequences of caesarean section and the provision of emotional support (7).

Clinicians' experiences and attitudes in regard to VBAC are known to be a major influence on women's decision to attempt a VBAC (14). Clinicians identify the need to build trusting relationships with women, to provide support so that women can successfully navigate the systems of care and to ensure women are provided with the necessary support (14). Foureur and colleagues (14) also discuss clinicians' acknowledgement of the power of words and personal influence in the discussions around mode of birth. Clinicians identified the need to try to remain impartial when presenting and discussing risk factors and the importance of shared decision making (14).

Much evidence exists on the benefits of continuity of care in relation to the ability of pregnant women to build a trusting relationship with their care provider. Benefits of continuity of midwifery care when compared with other models of care include a higher spontaneous vaginal birth rate; less regional analgesia use; lower rates of instrumental birth; and reduced rate of preterm birth although no statistically significant difference in CS rates were seen (15). This review did not include the impact of continuity of midwifery care on women's decision in relation to VBAC. A recent systematic review has also shown that women allocated to midwife-led continuity of care implemented across

pregnancy, labour and birth, and the postnatal period were, on average, less likely to experience CS compared to women who received models of fragmented care (16).

In 2010, the Australian National Maternity Services Plan (The Plan) recognised emphasised the need to prevent the primary CS and noted a lack of support for VBAC (17). Whilst some women and babies will benefit from an elective repeat CS in subsequent birth, many women and babies benefit from planned VBAC (6). Since 2010 in the most populous state, New South Wales (NSW), mandated policy requires health services to either provide or facilitate access for women to VBAC (18). Despite this state-level policy initiative, data demonstrated a downward trend in VBAC in NSW since 2010 (from 17.0% in 2010 to 14.9% in 2018) (19).

Our study addressed the issues raised in The Plan and focussed on the care provider relationship in relation to decision making for the next birth after initial CS. The aim was to examine whether women who have a known care provider through full spectrum midwifery continuity of care (antenatal, intrapartum and postpartum) in their next pregnancy following a CS will be more likely to choose to attempt labour and a vaginal birth than woman who have only antenatal continuity of care (20). The primary hypothesis was that women with a previous CS, who are eligible for a vaginal birth and receive midwifery continuity of care across the full spectrum of continuity, will be more likely to choose to attempt a vaginal birth in their current pregnancy than similar women only receiving antenatal continuity of care.

METHODS

The study used a two arm randomised controlled design to determine whether midwifery continuity of care provided across the full spectrum of antenatal, intrapartum and postpartum care increased the proportion of women attempting VBAC. Participants were recruited from a sample of all eligible women booking for maternity care at one study site in NSW, Australia. In Australia, women are encouraged to book for antenatal care in the first trimester but often the first hospital visit is closer to 20 weeks gestation.

The study hospital was a Level 5 Maternity Unit attached to a district hospital in an outer metropolitan area of Sydney in New South Wales, Australian's most populous state. Level 5 Maternity Services can provide care to women with most risk factors except for known or suspected placenta accreta, increta or percreta and triplets or other higher order multiple pregnancies. The special care nursery can care for babies born at greater than or equal to 32 weeks gestation (21). In the year the study was planned (2012), the hospital catered for 2500 births per year (22).

Women were recruited to the study at their first hospital visit if they met the following inclusion criteria:

- Most recent birth was by lower-segment CS
- No more than one previous CS or other uterine surgery
- Considered low risk, other than a history of one previous CS (as per National guidelines from the Australian College of Midwives)
- No contraindications for vaginal birth at the time of enrolment
- English proficiency (spoken and written)
- Public health insurance (Medicare)

- No known preference for a certain model of care, such as: GP-Shared Care or midwifery continuity of care

Women were automatically excluded from recruitment if the following were present:

- Place of residence outside of hospital postnatal- visiting zone
- Requesting an elective repeat CS at booking
- BMI over 35kg/m^2

Participants

There were 235 women identified as eligible for participation in the trial and 221 of these were randomised at the first hospital booking visit. Figure 1 provides information on the numbers enrolled, excluded, randomised and analysed. Women were recruited from October 2012 to November 2015. Follow-up was completed by July 2016.

Interventions

Women were allocated to two forms of midwifery continuity of care – the Community Midwifery Program (CMP) and the Midwifery Antenatal Care Program (MAC). Both models included an appointment with an obstetric consultant to discuss VBAC suitability and birth plan. Women who required an escalation in care continued to see midwives in addition to other necessary consultations. To ensure safe practice in relation to escalating care the National Midwifery Guidelines for Consultation and Referral were used to determine when consultation and/or referral was required (23). These two models of care were selected as both were in place at the hospital for women with a previous caesarean section and the hospital was interested in the outcomes as each had different implications for staffing, costs and potentially women's preference.

Community Midwifery Program

The Community Midwifery Program (CMP) provided midwifery continuity of care from a small team of midwives throughout their pregnancy, labour and birth and the postnatal period. The intention of the model was to provide women with a known caregiver through the full continuum of care - pregnancy, at the time of labour and birth and for two weeks following the birth of the baby. Midwives were on call using a rostered system to provide labour and birth care.

Midwifery Antenatal Care

The Midwifery Antenatal Care (MAC) program provided antenatal of care through the hospital antenatal clinic from a small group of midwives who worked a rotating roster. If women attended the clinic on the same day they generally saw the same midwives but this was not necessarily in a planned way. Women received care during labour and birth from the midwives usually rostered onto the labour ward. Some of the MAC midwives also rotated through the Birthing Unit although being allocated to MAC women in labour was not intentional, although did occur from time to time.

Outcomes

The primary outcome measure was the rate of attempted vaginal birth after CS. The primary hypothesis was that eligible women who had a previous CS and midwifery continuity of care through

the CMP would be more likely to choose to attempt a vaginal birth in their current pregnancy than those who received only midwifery antenatal continuity of care.

A secondary aim of the study was to determine if the intervention, midwifery continuity of care demonstrates an increase in the number of women having a vaginal birth after CS. Neonatal outcomes and maternal emotional outcomes were also measured. Midwifery continuity of care was assessed using a questionnaire sent to all women eight weeks after birth. The questions related to continuity of care were drawn from a previous study in Australia that examined continuity of care from the perspective of women (24).

Sample Size

Sample size was determined by the need to detect a clinically significant increase in the primary outcome of women attempting a vaginal birth. Previous research on VBAC in this context of practice revealed that 35% of eligible women attempted a vaginal birth following a previous CS (25). A clinically significant difference was determined as an increase from 35.0% to 52.5%. Providing 80% power with a two-tailed alpha level of 0.05 we calculated that 274 women would be required. Unfortunately, towards the end of the trial, the health service changed the models of care available and therefore the trial had to be stopped prematurely hence 218 women were ultimately randomised.

Randomisation

Upon recruitment to the study, the woman was registered as a participant and the remote allocation service provided by the University Research Department was contacted so that the woman was randomly allocated to a group. Randomisation was on a 1:1 basis and allocation concealment was assured due to the use of the remote allocation service. The study research assistant was responsible for phoning the University allocation service and provided the necessary details. Whereupon the allocation service utilised a randomisation schedule, developed independently from the research assistant.

Once allocated to a group, the midwife providing care at the initial visit was informed of the allocation and a follow-up appointment in the appropriate group was organised. The woman was allocated a study number and details recorded in the Trial Register and Log Book. Given the nature of the intervention it was not possible to blind participants or care providers although no identification of being part of the study was recorded in the woman's antenatal records.

Data collection

Data on the clinical outcomes were sourced from the hospital's health information system for maternal and perinatal outcomes (known as ObstetriX). The medical record numbers of the enrolled women were provided to the ObstetriX data managers who extracted the outcome data. A research assistant allocated the randomised group to each woman in the data set from the randomisation log.

Data on the number of antenatal visits and the level of continuity of carer were collected from woman's perceptions in two surveys. The first survey was handed to women by a research assistant when they were attending the antenatal clinic at 36 weeks gestation. The second survey was posted, or an online version emailed, to women at 6-8 weeks postpartum and collected information on their

experiences with the care and decision making. Two questions from the survey have been extracted for this analysis – number of antenatal visits and whether they knew the midwife who provided care during labour (midwifery continuity of care).

The primary outcome, planned vaginal birth at booking and at 36 weeks was extracted from the ObstetriX database and confirmed in the women's surveys.

Analysis

The analysis was undertaken on an intention to treat basis with researchers blinded to the allocation (known as group A and B only). Composite maternal and neonatal outcomes were created to assess complications after birth. A composite outcome was used because there were small numbers of outcomes making identification possible. The adverse maternal composite outcome included postpartum haemorrhage (>500ml), need for blood transfusion, third degree perineal tear and other complications (including anaesthetic complication, wound infection and/or breakdown, chest infection, uterine rupture). The adverse neonatal composite outcome included low birth weight (<2500g), preterm birth (<37 weeks), Apgar less than 7 at 5 minutes and admission to the Special Care Nursery (SCN). We selected this composite outcome as we knew the study was not going to include highly complex women whose babies would be at risk of severe morbidity. In addition, there is also evidence that midwifery continuity of care is associated with fewer preterm births (26). The definition of postpartum haemorrhage was used as this is the standard definition in NSW (27).

Univariate descriptive statistics were used including t-tests for continuous data and chi-squared tests for categorical data. A multivariate analysis was not undertaken as this was not planned. Self-perception of the number of antenatal visits and the level of continuity of carer were analysed descriptively.

FINDINGS

Of the 230 women identified as being eligible to participate in the study and approached to participate, 218 were randomised: 108 into the Community Midwifery Program group and 110 to the Midwifery Antenatal Care group. The demographic characteristics of the two groups were on the whole well balanced (Table 1.). The mean age in both groups was 31 years. There were more women with a BMI under 18.5 kg/m^2 and between 30.0-34.9 kg/m^2 in the CMP group although this was not statistically significant and despite an exclusion criteria of a BMI above 35 kg/m^2, there were three women in each group with a BMI above this cut off. Almost all women (>90%) entered the study at or before 20 weeks of pregnancy.

<Table 1>

Planned and actual mode of birth

Just over two thirds of women in each group planned a vaginal birth at their first antenatal visit (booking visit) with most of the remainder being unsure. There was a small decrease in the planned vaginal births at 36 weeks in the Midwifery Antenatal Care group although this was not statistically significant (Table 2).

The overall VBAC success rate was not statistically different between the groups with 27.8% in the Community Midwifery Program group and 32.7% in the Midwifery Antenatal Care group having a vaginal birth (p=0.5). Of the 135 women who at 36 weeks planned to have a vaginal birth, 61 (42.2%) achieved this; 29 (40.2%) from the Community Midwifery Program and 32 (50.8%) from the Midwifery Antenatal Care group (p=0.2).

<Table 2>

Maternal and neonatal complications

The rates of maternal and neonatal complications were similar between the groups even when maternal and neonatal composite outcomes were calculated (Table 3). Immediate skin to skin contact was relatively high given the high rate of caesarean section as was the breastfeeding rate on discharge from hospital.

<Table 3>

There were no maternal or perinatal deaths. There was one severe adverse outcome, a woman in the Community Midwifery Program group who had a uterine rupture. She went into labour and had an in-labour CS due to poor progress in labour. A uterine rupture was found at CS which was repaired. She did not experience any additional adverse outcomes and was discharged home on day three with her baby.

Continuity of care and carer

Women in the two groups reported to have had a similar number of antenatal visits (9.8 for CMP vs 8.3 for MAC) and a similar number of different midwives during pregnancy (5.6 vs 4.5) and labour and birth (2.3 vs 2.3). These differences are statistically significantly different (see Table 4) but the actual numbers themselves may not be clinically relevant. Midwifery continuity of carer in labour was higher in the CMP group (82.2% vs 52.9%; p=0.007) showing that some midwives in the Midwifery Antenatal Care program also provided intrapartum care although this was not planned around individual women. More than two-thirds of women in both groups would have liked to have known their midwife in labour better.

<Table 4>

DISCUSSION

The primary aim of this study was to determine the impact of midwifery continuity of care on the intention to attempt a vaginal birth after a previous caesarean section. Two antenatal models were tested – one that provided continuity across full spectrum of childbearing (antenatal, labour and birth and postnatal) and one that provided only antenatal continuity on an unplanned or ad hoc basis. There were no statistically significant differences in stated intention at the end of pregnancy for a vaginal birth or CS however more women in the Community Midwifery Program group planned a vaginal birth. Encouragingly, more women in each group planned a vaginal birth than in previous research in this Australian state, although being able to measure 'planned' or 'attempted' is never easy in routine data collection systems (28). Ultimately, 28% in the Community Midwifery Program and 33% in the Midwifery Antenatal Care groups achieved a vaginal birth which is higher than the vaginal birth after CS rate for state for that time (which was <15%) (19). Overall, 49% (66/135) of the women who planned a vaginal birth at 36 weeks achieved this aim which is similar to other

Australian research (where 43% of women with a planned VBAC achieved this aim) (29) but lower than research from New Zealand (where 73% of women who had a 'trial of labour' achieved a VBAC) (30).

Women in the two groups were similar in all measured demographic profiles. The adverse maternal and neonatal outcomes in the study were similar. There was one woman who experienced a uterine rupture giving a uterine rupture rate of 1 in 200 which is the number often quoted in clinical guidelines (31, 32). More babies in the Midwifery Antenatal Care groups were admitted to the SCN or experienced an adverse outcome although this was not a statistically significant difference.

Women reported being seen by four to six midwives during their pregnancy which more likely equates to a continuity of care approach rather than continuity of carer. It is possible that women in both groups experienced less interpersonal or relational continuity and more informational continuity where information is shared between providers and longitudinal continuity where care is provided in a familiar place by an organised team of providers (33). Midwife-led continuity of care has been associated with a range of improved outcomes although not a reduction in caesarean section rate in the systematic review (26). Therefore, it is potentially unsurprising that we did not see reductions in the repeat CS rate in this study. Further studies should examine whether an increased rate of relationship-based continuity of carer (that is, less midwives, more intensive continuity) would make a difference.

While antenatal continuity of carer provides similar outcomes to continuity across the childbearing spectrum, women clearly still value knowing the midwife who cared for them in labour. Interestingly, 69% of women in both groups reported that they would have liked to get to know the midwife who attended them before they were in labour. While the Midwifery Antenatal Care model was designed primarily to provide antenatal continuity care, a number of women who responded to the postnatal survey had one of the Midwifery Antenatal Care midwives they had met before attend them in labour and at home in the postnatal period. This suggests that the two models were actually more similar than different and this could account for the little difference in outcomes between the groups.

Qualitative research has shown that the perceptions and values of the care givers makes a difference. A previous study undertaken at the same hospital where our trial was conducted showed that the hospital's midwives and doctors were positively oriented towards assisting and supporting women to attempt a VBAC (34). These providers recognised that women who have experienced a prior CS need access to midwifery continuity of care with a focus on support, information-sharing and effective communication. Both groups of women in our trial would have received care from these providers and therefore it is likely that this influenced the outcomes for women in both trial arms.

Other qualitative research from a number of European countries with high VBAC rates has shown that women who have had a previous CS valued being able to share decision making with clinicians who were supportive of vaginal birth and value being in a hospital culture that supports vaginal birth (35). In these same countries (Finland, Sweden, The Netherlands), clinicians highlighted the importance of VBAC being considered the first alternative and being confident about VBAC with good communication and teamwork as keys to success. Again, a model of shared decision making was important where agreements were made with the woman (36). Knowing that around half of

women who planned a vaginal birth were ultimately successful when provided with either model of midwifery continuity of care might be useful information to share with women who are deciding on their planned mode of birth.

This trial was limited due to a sample size than was less than planned. The trial was closed early due to operational changes at the hospital which meant the models of care were all being re-structured. This means that the lack of differences may be due to the lack of expected sample size and having less midwifery continuity of carer than would be ideal. The study was undertaken in one hospital in NSW which may limit its generalisability. Nonetheless, it is hoped that this study will encourage others to examine specific elements of continuity in relation to improving the VBACs rate and these data can be included in a future systematic review. We also recognise that some of the neonatal indicators are limited in their ability to predict long term benefit or risk (Apgar score and admission to SCN). However, these are widely used in the services in NSW for monitoring purposes and so were included. It is also possible that the composite neonatal outcome included infants with both low birth weight and preterm birth as these issues often occur together however, each baby was counted only once as either having the composite outcome or not.

Conclusion

Repeat elective caesarean section is a significant contributor to the overall rate of caesarean section rate in Australia and many countries worldwide. In addressing high rates of caesarean section, mode of birth in the next birth after caesarean section must be addressed with a view to increasing planned vaginal birth. In this study comparing two different models of care, continuity of midwifery care did not significantly impact planned mode of birth at 36 weeks. The model of continuity operationalised in this study did not represent relational continuity of midwifery care and this is an area worthy of further research.

Fig. 1 Flowchart describing participants progress through the trial

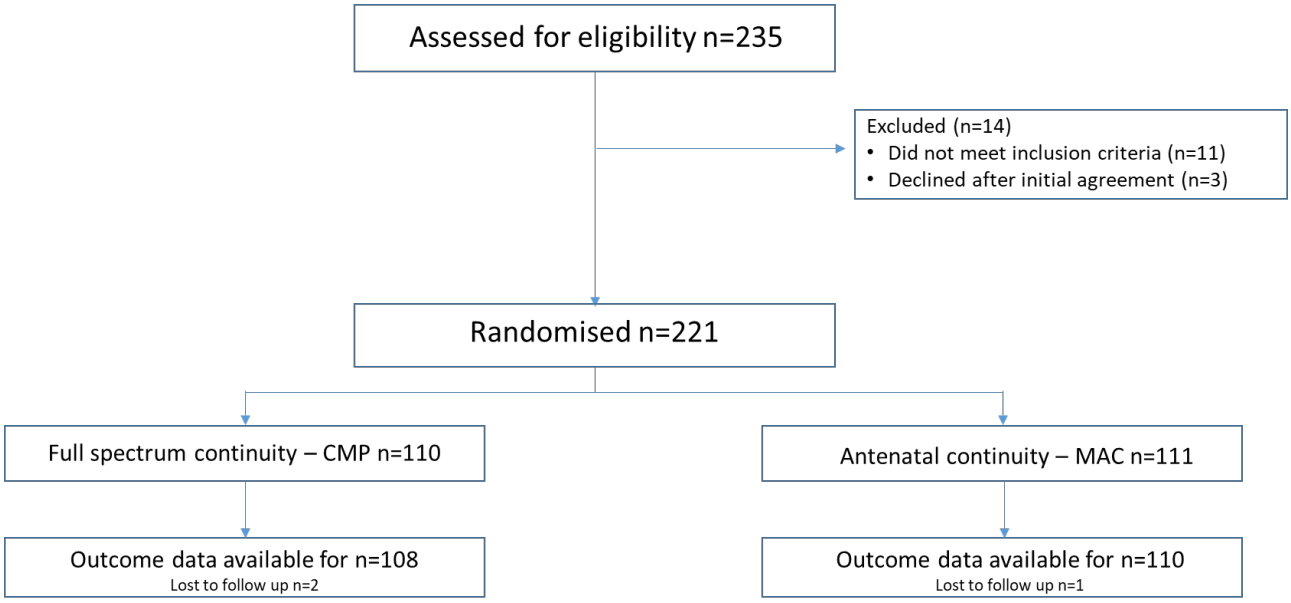

Table 1: Demographic characteristics of the women by randomised group

	Community Midwifery Program n= 108 (%)	Midwifery Antenatal Care n= 110 (%)	P value
Age group			0.8
• <25 years	14 (7.7)	11 (10)	
• 25-30 years	36 (33.3)	38 (34.5)	
• 31-35 years	37 (34.2)	35 (31.8)	
• 36-39 years	18 (16.6)	24 (21.8)	
• >40 years	3 (2.7)	2 (1.8)	
Parity (>20 weeks)			
• One previous birth	92 (85.1)	95 (86.3)	0.8
• Two previous births	10 (9.2)	8 (7.2)	
• Three or more previous births	6 (5.5)	7 (6.3)	
Last birth by CS	101 (93.5)	104 (94.5)	0.6
Body Mass Index (BMI) prior to pregnancy or before 20 wks			
• Under 18.5 kg/m^2	1 (0.9)	8 (7.2)	0.2
• 18.5-24.99 kg/m^2	49 (45.3)	50 (45.4)	
• 25-29.99 kg/m^2	35 (32.4)	34 (30.9)	
• 30-34.99 kg/m^2	20 (18.5)	15 (13.6)	
• Greater than 35 kg/m^2	3 (2.7)	3 (2.7)	
Gestation at time of hospital booking*			
• <12 weeks	32 (29.6)	37 (33.6)	0.5
• 13-20 weeks	65 (60.2)	64 (58.2)	
• 21-24 weeks	9 (8.3)	9 (8.2)	
• >25 weeks	2 (1.9)	0	
Complications during pregnancy			
• Gestational diabetes	8 (7.4)	6 (7.2)	0.8
• Hypertension#	12 (11.1)	13 (11.8)	1.0

#Due to small number (cell sizes <5) hypertension includes pre eclampsia and gestational hypertension

*hospital booking was the time of randomisation

Table 2: Planned and actual mode of birth by randomised group

	Community Midwifery Program n= 108 (%)	Midwifery Antenatal Care n= 110 (%)	P value
Planned mode of birth at booking			
• Vaginal birth	71 (65.7)	71 (64.5)	0.9
• Caesarean section	2 (1.9)	2 (1.8)	
• Uncertain	35 (33.4)	37 (33.6)	
Planned mode of birth at 36 weeks			0.3
• Vaginal birth	72 (66.7)	63 (57.3)	
• Caesarean section	31 (28.7)	37 (33.6)	
• Uncertain	5 (4.6)	10 (9.1)	
Actual mode of birth			0.5
• Vaginal birth	30 (27.8)	36 (32.7)	
○ Normal vaginal birth	18 (16.7)	20 (18.2)	
○ Instrumental vaginal birth	12 (11.1)	16 (14.5)	
• Caesarean section	78 (72.2)	74 (67.3)	
○ In-labour CS	24 (22.2)	19 (17.3)	
○ Pre-labour CS	9 (8.3)	10 (9.1)	
○ CS – unknown timing	45 (41.7)	45 (40.9)	

Table 3: Maternal, neonatal and infant feeding outcomes by randomised group

	Community Midwifery Program n= 108 (%)	Midwifery Antenatal Care n= 110 (%)	P value
Maternal complications			
• Postpartum haemorrhage (>500ml)	15 (13.9)	15 (13.6)	1.0
• Composite adverse maternal outcome#	22 (20.4)	17 (15.5)	0.4
Neonatal complications			
• Respiratory distress	7 (6.5)	12 (10.9)	0.2
• Admission to SCN	12 (11.1)	20 (18.2)	0.2
• Composite adverse neonatal outcome*	13 (12.0)	21 (19.1)	0.2
Immediate skin to skin contact	82 (75.9)	79 (71.8)	0.7
Breastfeeding on discharge	95 (88.0)	97 (88.2)	0.7

#Maternal composite outcome included postpartum haemorrhage (>500ml), need for blood transfusion, third degree perineal tear and other complications (including anaesthetic complication, wound infection and/or breakdown, chest infection, uterine rupture)
*Neonatal composite outcome included low birth weight (<2500g), preterm birth (<37 weeks), Apgar less than 7 at 5 minutes and admission to the Special Care Nursery (SCN).

Table 4: Self-reported continuity of care by randomised group

Aspect of care	Community Midwifery Program	Midwifery Antenatal Care	Test statistic and p-value
Pregnancy			
Total number of check-ups during your pregnancy (mean, SD) (50/34)	9.86 (3.6)	8.29 (1.6)	Mean diff 1.57, P =0.021
Number of different midwives seen during pregnancy (mean, SD) (49/34)	5.65 (1.9)	4.47 (1.9)	Mean diff 1.18, P=0.007
Labour and birth			
Number of midwives who provided care in labour (mean, SD) (44/33)	2.32 (1.3)	2.33 (2.0)	Mean diff 0.015, P=0.9
Had met at least one of midwives providing care in labour at least once before (%) (45/34)	37 (82.2)	18 (52.9)	P=0.007
Would have liked to get to know midwife attending birth better before had baby (%) (49/34)	34 (69.9)	25 (69.9)	P=0.9
Postnatal period			
During my hospital stay I saw a midwife I had met before (%) (46/35)	32 (69.6)	25 (71.4)	P=0.85
Had a least one postnatal visit at home with midwife met before (%) (44/33)	24 (54.5)	8 (24.2)	P=0.03

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