

(HOW) DOES THE WAY MATERNITY CARE IS PROVIDED AFFECT THE HEALTH AND WELL-BEING OF YOUNG WOMEN AND THEIR BABIES?

A MIXED METHODS RESEARCH PROJECT.

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*A thesis submitted in total fulfilment of the requirements of the
degree of Doctor of Philosophy (Midwifery)*

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DECLARATION

This thesis contains no material published elsewhere or extract in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgement in the main text of the thesis.

I initiated the research questions addressed by this PhD, submitted and gained ethical approval, acquired partial funding for my project, obtained access to routinely collected perinatal data, generated qualitative data, analysed the quantitative and qualitative data separately, and integrated and interpreted the results. I was the single author of Chapters 1, 3 and 7 and the short introductory sections to each submitted/published paper. I am the first author for each of the four papers included in Chapters 2, 4, 5, and 6. As such I was responsible for deciding the topic, research aim and objectives, undertaking the data collection and analysis, conducting the majority of writing, and submitting the papers to peer-reviewed journals. All four papers have contributing authors; the extent of collaboration with others is documented in Author Statements (see Appendix 1).

All research procedures reported in the thesis received the approval of the relevant Ethics/Safety Committees (see Appendix 2). Current approved research documentation for the research components which required written, informed consent are provided in Appendices 3 and 4.

I received statistical advice during the conduct of the cohort study but I conducted the statistical analysis. This PhD has been proofread for typing, spelling, grammar and punctuation errors but it has not been professionally edited.

Signature:



Date: 13 January 2015

A STATEMENT OF APPRECIATION

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Glossary and acronyms

Term / Abbreviation	Definition
Adolescents	Adolescents are people aged 10-19 years of age (World Health Organisation, 2014a); therefore pregnant adolescents are women aged 19 years or less at the time of conception.
Adolescent multiparity (see parity)	Aged 19 years or less when giving birth to a subsequent baby.
Amniotomy	“Surgical rupture of the membranes to induce or (augment) labour” (Beischer & Mackay, 1986, p.1)
aOR	Adjusted Odds Ratio “a measure of association between an exposure and an outcome” that is adjusted for confounding variables using regression techniques (Szumilas, 2010, p.227).
Apgar score	A numerical score (0-10) used to indicate the baby’s condition at 1 minute and 5 minutes after birth (Beischer & Mackay, 1986).
Augmentation	Medical intervention / treatment to speed up labour progress.
Birth weight	The first weight of a baby (stillborn or liveborn) taken after birth (Beischer & Mackay, 1986).
BMI	Body Mass Index
Caesarean section (CS)	An operative birth by surgical incision through the abdominal wall and uterus.
Caseload midwifery	A model of maternity care that aims to offer women ‘relational continuity’ (see Glossary). Antenatal, intrapartum and postnatal care is provided by one midwife or her/his practice partner (McCourt, Stevens, Sandall, & Brodie, 2006).
CenteringPregnancy™	A trade-marked model of group antenatal care that integrates: “health assessment, education, and support into a unified program within a group setting” (Centering Healthcare Institute, 2014).

CI	“The 95% confidence interval (CI) used to estimate the precision of the Odds Ratio. A large CI indicates a low level of precision of the OR, whereas a small CI indicates a higher precision of the OR” (Szumilas, 2010, p.227).
Continuity of care	A woman knows her maternity care providers and receives care from the same provider, or small group of providers, throughout pregnancy, labour, birth and the postnatal period.
Complex intervention	“(I)nterventions with several interacting components” (Medical Research Council, 2006, p. 6)
Data	Two or more pieces of information obtained by scientific methods; one piece of information is referred to as ‘datum’.
Emotional resilience	“(T)he individual's adaptive response to adversity, stress-resistant personality traits and the ability to ‘bounce back’” (Rajan-Rankin, 2014).
Epidural analgesia	“Injection of an analgesic agent outside the dura which covers the spinal canal” which gives complete analgesia to the pelvic structures (Beischer & Mackay, 1986, p.4).
Episiotomy	An incision between the vagina and the anus to widen the vaginal opening (Beischer & Mackay, 1986).
FG	Focus group
GAC	Group antenatal care includes health education, peer support and clinical assessment within the group space at each antenatal appointment
Gestational age	The stage of pregnancy, expressed in weeks
GP	General Practitioner, a medical doctor sometimes referred to as a family physician

Health and well-being	“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organisation, 1948). Well-being is a state “in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (World Health Organisation, 2013).
HREC	Human Research Ethics Committee
Iatrogenic	Caused inadvertently by a health practitioner, treatment or diagnostic procedure.
ICM	International Confederation of Midwives
Induction of labour	A medical intervention to stimulate the onset of labour
Instrumental birth	A vaginal birth assisted by forceps or vacuum extraction
IQR	Interquartile Range
ITT	‘Intention To Treat’ analysis includes all participants in the group to which they were (randomly) allocated, regardless of the treatment they actually received.
LBW	Low birth weight (less than 2500g)
LOS	Length of stay
M@NGO Young M@NGO	Midwives At New Group practice Options: a randomised controlled trial of caseload midwifery versus standard care for women of ‘all risk’ status. The PhD candidate was an investigator on this study. The research project described in this PhD was conducted during the same period and in the same research setting as the M@NGO trial. The research project was referred to in the research

	setting as the 'Young M@NGO Study'. Please note that the Young M@NGO study was completely separate to the M@NGO trial with its own research protocol and ethics approval (see Appendices 2-4).
Maternal age	Mother's age in completed years at the time of the birth of her baby
Midwifery Group Practice (MGP)	A small group of midwives who each carry an individual caseload of women (Page, 1995).
Midwife-led care	"(C)ontinuity of care; monitoring the physical, psychological, spiritual and social wellbeing of the woman and family throughout the childbearing cycle; providing the woman with individualised education, counselling and antenatal care; continuous attendance during labour, birth and the immediate postpartum period; ongoing support during the postnatal period; minimising technological interventions; and identifying and referring women who require obstetric or other specialist attention" (Sandall, Soltani, Gates, Shennan, & Devane, 2013)
Model of care	"(A) multifaceted concept, which broadly defines the way health services are delivered" (Queensland Health, 2000, p. 4)
Neonatal	The period from birth to 28 days after birth
NICU	Neonatal intensive care unit
Opioid	Narcotic drug given as an injection for pain relief during labour
OR	Odds Ratio "a measure of association between an exposure and an outcome" (Szumilas, 2010, p.227).
p	Probability value
Parity	Number of previous pregnancies resulting in a birth (liveborn or stillborn) at 20 weeks gestation

	or greater (Beischer & Mackay, 1986).
Partnership	A relationship between the midwife and child-bearing woman based on trust, shared decision making and responsibility, negotiation and shared understanding (Guilliland & Pairman, 2010).
Preterm birth	A birth before 37 completed weeks of gestation
RCT	Randomised controlled trial
Relational continuity	“A therapeutic relationship between a patient and one or more providers that spans various health care events and results in accumulated knowledge of the patient and care consistent with the patient’s needs” (Haggerty et al., 2007, p. 336).
SEIFA	Socio-Economic Indexes for Areas
SGA	Small for gestational age
Spontaneous vaginal birth	Non-instrumental vaginal birth
STI	Sexually transmitted infection
Standard care (Australia)	Government-funded, hospital-based maternity care that is typically fragmented; provided by a number of different midwives and doctors during pregnancy, labour and birth and postpartum. Standard care models during pregnancy include midwifery clinics, obstetric care and community-based care with a GP (McLachlan et al., 2008; Tracy et al., 2013). During labour and birth, women are attended by clinicians they are unlikely to have met previously.
Team midwifery	A team of midwives who share a caseload of women (Page, 1995); the size of the ‘team’ varies depending on context (Sandall, et al., 2013).
TR	‘Treatment Received’ analysis includes all participants in the group who received the treatment or intervention; regardless of their original group allocation.

WHO	World Health Organisation
Young women	Young people are generally understood to be aged 12-25 years of age. Therefore in this PhD the term 'young women' is inclusive of adolescents (see Glossary) and young women.
Young Women's Clinic (YWC)	Multidisciplinary clinics, usually community-based, which include obstetricians, midwives, social workers and other allied health practitioners who are available for direct consultation and referral. The age range of participants varies across sites to include adolescents-only or young women (Allen, Gamble, Stapleton, & Kildea, 2012).
Young Women's Midwifery Group Practice (YMGP)	A MGP providing caseload midwifery care exclusively to young women; in this setting women were aged 21 years or younger.

FOREWORD

Throughout history and in cultures across the globe a midwife has never been just a technician...the midwife's tasks are multi-dimensional. They involve hands-on diagnosis, treatment, massage and giving comfort, together with understanding the psychology of pregnancy and birth and awareness of relationships and their effect on a woman's ability to open her body and give birth...Today the midwife's role is multi-dimensional, too. She must have up-to-date knowledge of birth-related research and the knowledge to evaluate it...she works not only in a bio-mechanical framework but with (the) emotional and social aspects of birth. She needs the skills and integrity to meld the art and the science of midwifery. She then gives each woman not only her knowledge, but the personal warmth and caring that makes her a skilled companion and friend (Kitzinger, 2000, p. ix).

This work is the result of my journey as a midwife which began during my education in the Bachelor of Midwifery program in New Zealand (NZ) (2000-2002). My commitment to providing individualised, woman-centred care was emboldened throughout my midwifery education. My confidence to provide caseload midwifery was strengthened in the final year of practice working alongside self-employed midwives providing continuity of care to approximately 50 women in home, birth centre and hospital settings.

As a new graduate I moved to Sydney to provide caseload midwifery to women booked to give birth in an integrated birth centre. I worked four days per week, had a practice partner with whom I shared the care of clients, accoucheured babies on my own responsibility in the birth centre, and accompanied clients who required transfer to birth suite for obstetric assistance. I had control over the provision of antenatal and postnatal care which I provided through individual appointments either at the birth centre or in the woman's home. If I was unable to attend an appointment due to an impending birth or personal fatigue, I would telephone the woman to re-schedule. During these two years, approximately 85% of the 90 low-risk women I attended had a spontaneous vaginal birth.

After a few years travelling and working abroad (outside of midwifery), I returned to settle in Queensland. I worked for approximately 12 months in a midwifery-led unit, approximately 60 minutes by road to the nearest obstetric/surgical facilities, in Far North Queensland. In this role I was part of a midwifery team providing care across the spectrum to low-risk women on a shift-work basis. Without access to induction, augmentation or epidural,

approximately 90% of women had a normal birth. Given my background, it was something of a culture shock to take my next post in a large tertiary referral centre.

I was appointed as one of five caseload midwives tasked with implementing a caseload midwifery model exclusively for young women (aged 21 years or less): Young women's Midwifery Group Practice (YMGP). In this model, I worked on-call five days per week and was backed up by one of my four caseload colleagues. I provided labour and birth care under medical scrutiny and control; and often felt thrust into advocating for my clients against the tide of routine medical intervention. If I was unable to attend an antenatal appointment, due to attending a woman in labour or work-related fatigue, I did not see my caseload clients; instead they attended group antenatal care sessions with the rest of my colleagues. I worked in this model for about nine months before resigning and transferring to shift work.

At this point in my career I felt disillusioned. Lack of control over one's workload, rather than the work itself, has been associated with caseload midwives' perceptions of stress and contributes to burnout (Sandall, 1997). I had rarely experienced the midwife-woman relationship or 'professional friendship' with my young clients that had been a hallmark of my previous practice in Sydney, and indeed my training program in NZ. Because I felt I did not get to know the young women and their individual preferences and idiosyncrasies, it made getting up at two in the morning to attend them in labour quite challenging. I felt I was caring for a stranger. This left me to wonder about the purpose of being on-call for women with whom I felt I had no real relationship; women I did not feel like I knew, or who knew me.

I started on a midwifery research path and acquired a small grant to evaluate the (perinatal) outcomes of the YMGP program. This developed into a larger body of work that included qualitative research about the experiences of the young women attending the YMGP, and the caseload midwives providing their care. My ultimate goal is to improve the provision of caseload midwifery for all women such that it affords them, and midwives the benefits which I have

witnessed and experienced throughout my training and the early years of my career.

ABSTRACT

BACKGROUND

Access to timely, quality maternity care improves health outcomes for mothers and babies. Inadequate antenatal care (defined as 1-5 visits) is associated with an increase in the risk of preterm birth and neonatal morbidity; even after controlling known confounders. Pregnant adolescents typically live in circumstances of socio-economic deprivation, which is exemplified by poorer general health status, domestic violence, mental health issues, inadequate nutrition, and smoking and illicit drug use. Adolescent pregnancy is associated with higher rates of preterm birth, low birth weight, and neonatal intensive care unit admission; along with lower rates of breastfeeding initiation.

LITERATURE REVIEW

A review of the literature (Paper 1 in this PhD) found some evidence to suggest that models of maternity care that are re-organised to better meet the needs of young women may increase their antenatal attendance and improve health outcomes for young women and their babies. A randomised controlled trial (n=1,049) of group antenatal care (see Glossary) for women aged 14-25 years, compared to standard care, reported improved outcomes including lower preterm birth and higher initiation of breastfeeding for women who were allocated to the intervention. Young women's clinic (see Glossary), compared to standard care, was supported by two small prospective cohort studies that reported similar improvements. Caseload midwifery (see Glossary) for young women, has not been well researched.

AIM AND OBJECTIVES

The body of work described in this PhD by Publication aimed to answer the research question (*How) does the way maternity care is provided affect the health and well-being of young women and their babies?* There were three research objectives:

- 1) To determine the feasibility of a large scale randomised controlled trial of caseload midwifery versus standard care for young women (*Feasibility Paper*);
- 2) To determine whether non-standard models of care were associated with improved perinatal outcomes for young women and babies (*Literature Review Paper, Cohort Paper*); and
- 3) To critically appraise the experiences of young women and midwives within a caseload midwifery model of care (*Ethnographic Paper*).

DESIGN

The methodology of critical pragmatism underpinned the mixed methods convergence design. The research project incorporated three empirical components that were conducted and analysed separately; and reported in three publications. The key results were then integrated such that the qualitative findings, along with the theoretical and research literature, were used to contextualise and explain the quantitative findings. A theoretical model was developed to explain how caseload midwifery functions with this population.

PARTICIPANTS

In general terms, the participants included young women (aged 21 years or less) booked for maternity care at the research hospital; and the midwives who provided caseload midwifery exclusively to young women. The sample size and participant characteristics varied between the different research components.

INTERVENTIONS

Young women aged 21 years or less were typically allocated to a young women's model of care (caseload midwifery or young women's clinic) that provided antenatal care in a community location. Some young women accessed standard care.

RESULTS

The *Feasibility Study* found that a randomised trial of caseload midwifery which recruited pregnant adolescents (aged 17 years or less) using the eligibility criteria, recruitment plan and post-consent randomisation method tested, would not be feasible. A further challenge was the proportion of pregnant adolescents

who declined randomisation because they wanted to choose their model of care.

The *Cohort Study* found that after controlling for known confounders caseload midwifery, compared to standard care, was associated with fewer preterm births and admissions to the neonatal intensive care unit for young women (aged 21 years or less). Young women's clinic, when compared to standard care, was not associated with the aforementioned benefits.

The *Ethnography Study* found an unexpected discord between how antenatal care was provided in groups and the function of the caseload midwifery model. This combination of interventions requires further evaluation.

DISCUSSION AND CONCLUSION

Caseload midwifery care for young women was associated with a statistically significant reduction in preterm birth and neonatal intensive care unit admission. Further research on other models, including young women's clinic, is warranted. There may be a role for GAC in the provision of caseload midwifery to young women because peer support is an effective health promotion strategy for this population. How GAC can be implemented within a caseload model, in such a way that the midwife-woman relationship is protected however, requires further evaluation. Prospective research to test the efficacy of caseload midwifery for young women, with the inclusion of targeted preterm birth interventions, is recommended.

**CHAPTER 1:
INTRODUCTION AND OVERVIEW**

1 OVERVIEW

This dissertation reports on a mixed methods research project which analysed outcomes and experiences of young women in relation to different models of maternity care. Throughout this PhD, the term ‘adolescent’ refers to women aged 19 years or less (synonym ‘teenage’); whereas the term ‘young’ refers to women aged less than 25 years (see Glossary). The following research question guided the overall project: *(How) does the way maternity care is provided affect the health and well-being of young women and their babies?* This research question was addressed using a mixed methods approach: triangulation design (convergence model). This design involved the separate collection and analysis of quantitative and qualitative data followed by convergence of the separate results in order to interpret their meaning and significance (Creswell, 2003). The separate research components were developed into publications which are included in this manuscript (see Table 1 overleaf).

A review of the research literature identified three ‘non-standard’ models of maternity care delivered to young women: caseload midwifery, group antenatal care and young women’s clinic (Chapter 2). The evidence supporting each of these models, specific to young women, was limited; yet all three models were being offered along with standard maternity care at the research site. The evidence supporting caseload midwifery for young women was particularly weak. I conducted a feasibility RCT which tested the ability to recruit and randomise pregnant adolescents aged less than 18 years to caseload midwifery or standard care. The findings suggested that it was not possible to recruit adolescents to an RCT of caseload midwifery at this site without significant modification to the research protocol (Chapter 4). A cohort study was then undertaken which analysed routinely collected perinatal data for young women who were allocated to one of three models: midwifery group practice for young women (YMGP), young women’s clinic (YWC) or ‘standard care’ (Chapter 5). The literature is virtually silent on young women’s experiences of maternity care when it is provided through these three models. Therefore the final paper, a focussed ethnography, explored the experiences of young women, and midwives, in the context of caseload midwifery and group antenatal care (GAC); see Chapter 6.

Table 1 PhD Outline
<p>1. Overview and Introduction</p> <p>Overview of the PhD and background to the study Updated quantitative literature review (2012-2014)</p>
<p>2. Literature Review</p> <ul style="list-style-type: none"> • Introduction to Chapter 2 • Paper 1 [published]: Allen, J., Gamble, J., Kildea, S., Stapleton, H. (2012). Does the way maternity care is provided affect maternal and neonatal outcomes for young women? A review of the research literature. <i>Women and Birth</i>, 25(2), 54-63.
<p>3. Methodology and research design</p>
<p>4. Findings: Feasibility Study</p> <ul style="list-style-type: none"> • Introduction to Chapter 4 • Paper 2 [published]: Allen, J., Kildea, S., Stapleton, H., Tracy, S. (2013). Is a randomised controlled trial of a maternity care intervention for pregnant adolescents possible? An Australian feasibility study. <i>BMC Medical Research Methodology</i>, 13:138.
<p>5. Findings: Cohort Study</p> <ul style="list-style-type: none"> • Introduction to Chapter 5 • Paper 3 [1st revision submitted and under review]: Allen, J., Gibbons, K., Beckmann, M., Tracy, M., Stapleton, H., Kildea, S. (2014). Does model of maternity care make a difference to birth outcomes for young women? An Australian cohort study. <i>International Journal of Nursing Studies</i>.
<p>6. Findings: Qualitative Study</p> <ul style="list-style-type: none"> • Introduction to Chapter 6 • Paper 4 [in press]: Allen, J., Kildea, S., Stapleton, H. (2014). How does group antenatal care function within a caseload midwifery model? A critical ethnographic analysis. <i>Midwifery</i>.
<p>7. Discussion and Conclusion</p>

The integrated findings and recommendations for midwifery practice and future research are presented in the final chapter (Chapter 7). The quantitative findings were contextualised by the qualitative findings, and integrated with reference to the literature. Critical analysis of the integrated data led to the development of a theoretical model that could explain how the complex intervention of caseload midwifery functioned with this specific population.

1.1 BACKGROUND

This section provides background to the study and is divided into five sections. Section 1.2 begins by exploring the key ideas and literature concerning adolescent pregnancy. Section 1.3 examines significant concepts and debates around the provision of maternity care. Section 1.4 considers the philosophy of midwifery and the role of midwifery-led models of care. Section 1.5 briefly describes the models of maternity care available to young women in the international context. This section includes results from research literature that have become available since the literature review was published in 2012 (Paper 1). Sections 1.6-1.8 provide an overview of the local context of maternity care in Australia, the State of Queensland, and the particular research setting. Section 1.9 concludes this chapter by providing a summary of the research problem.

1.2 ADOLESCENT PREGNANCY

In resource-rich countries like Australia, Canada, Europe, New Zealand (NZ), the United Kingdom (UK) and the United States (US), adolescents who become pregnant and continue the pregnancy are more likely to come from socio-economically disadvantaged backgrounds (Harden, Brunton, Fletcher, & Oakley, 2009; Imamura et al., 2007; Skinner & Hickey, 2003). Social disadvantage is often intergenerational with teenage mothers more likely to give birth to daughters who themselves become pregnant as adolescents (Whitehead, 2009). In this context young women are more likely to grow up in circumstances of poor housing and health, with limited opportunities for attainment through education or employment (Imamura, et al., 2007; Whitehead, 2009). While the majority of adolescent pregnancies are apparently unintended; some adolescents report planning their pregnancies (Hollowell, Oakley, Kurinczuk, Brocklehurst, & Gray, 2011), are pleased when they become pregnant and have positive feelings about being mothers (Stapleton, 2010). For

young women with few aspirations and limited prospects, adolescent pregnancy can be viewed as a legitimate pathway to adulthood (SmithBattle, 2000).

The effects of social deprivation on pregnant adolescents are cumulative and multifactorial and affect perinatal outcomes (Savitz et al., 2004). Adolescent pregnancy is associated with higher rates of smoking, alcohol and illicit drug use (Imamura, et al., 2007; Lewis, Hickey, Doherty, & Skinner, 2009; van Gelder et al., 2010), family violence and/or intimate partner violence (Covington, Justason, & Wright, 2001; Quinlivan & Evans, 2001; Reichenheim, Patricio, & Moraes, 2008), childhood sexual abuse (Francisco et al., 2008), social isolation (Klima, 2003; Quinlivan, Luehr, & Evans, 2004), mental health issues including depression (Ickovics et al., 2011; Imamura, et al., 2007; Kabir, Sheeder, & Stevens-Simon, 2008), poor nutrition and inadequate weight gain during pregnancy (Kabir, et al., 2008), and severe psychosocial stressors including low income, unemployment and housing issues (Divney et al., 2012) including homelessness (Quinlivan & Evans, 2004a). Within this context, pregnant adolescents commence pregnancy weighted towards poorer perinatal outcomes. Maternal age less than 18 years is an independent risk factor for: preterm birth (Abu-Heija, Ali, & Al-Dakheil, 2002; Khashan, Baker, & Kenny, 2010; Liran, Vardi, Sergienko, & Sheiner, 2012; Malabarey, Balayla, Klam, Shrim, & Abenhaim, 2012), low birth weight babies (Chen et al., 2007; Liran, et al., 2012), intrauterine growth restriction (Malabarey, et al., 2012), fetal death (de Vienne, Creveuil, & Dreyfus, 2009), stillbirth (Lewis, et al., 2009; Malabarey, et al., 2012), and neonatal mortality (Chen, et al., 2007). Maternity care is known to affect perinatal outcomes (Hollowell, et al., 2011), most likely by increasing attendance and antenatal engagement, while targeting risk factors that are modifiable.

1.3 MATERNITY CARE

How maternity care is provided is dependent on the context in which it occurs. In resource-rich countries the culture of birth is “medical and technocratic” (Kitzinger, 2005, p. 1) and so too is maternity care. The term ‘medicalisation of childbirth’ describes how pregnancy and giving birth have been turned into a medical process (Kitzinger, 2005). The implications of medicalisation have been escalating rates of routine obstetric intervention and caesarean birth (Johanson, Newburn, & Macfarlane, 2002) with concomitant harm to mothers and babies

(Downe, Finlayson, & Fleming, 2010) and associated costs (Dahlen et al., 2012; Tracy & Tracy, 2003). The World Health Organisation (WHO) reports that inappropriate maternity care practices continue worldwide despite research evidence of harm or ineffectiveness (Chalmers, Mangiaterra, & Porter, 2001). The effects of medicalisation can be most strongly seen in industrialised countries which lack a universal health care system (i.e. free at the point of service), and where obstetricians care for the majority of pregnant women (for example the US) (Wagner, 2008). The disciplines of obstetrics and midwifery have fundamentally different approaches to, and philosophies underpinning, maternity care (Downe, et al., 2010) and each have competing ideas of what constitutes effective maternity care and how this is best measured (Enkin et al., 2000). Broadly speaking, obstetricians are inclined towards technology and interventions (for example caesarean section and induction of labour) whereas midwives tend to be disinclined towards both (Reime et al., 2004).

1.4 MIDWIFERY

According to the International Confederation of Midwives (ICM), midwifery is defined by its approach to pregnancy and birth as normal life events, focus on health promotion and disease prevention, respect for human dignity, cultural sensitivity and partnership with, and advocacy for, child-bearing women (International Confederation of Midwives, 2005). In the context of medically-dominated maternity care systems however, “midwifery skills and knowledge have been devalued or lost” (Sakala & Newburn, 2014). Since the 1990’s there has been a shift in Australia (National Health and Medical Research Council, 1996), Canada (Public Health Agency of Canada, 2000), the UK (Department of Health, 1993) and NZ (Hendry, 2003) to re-orientate maternity services so that they provide care that is woman or family centred (Pittrof, Campbell, & Filippi, 2002). Midwives are ideally placed to be the primary maternity carer for healthy women who are at low risk of complications (Enkin, et al., 2000; Sakala & Newburn, 2014). It can be argued that each woman, regardless of risk, should have a midwife as primary carer with access to multi-disciplinary support and clear guidance for medical consultation and referral (Tracy, et al., 2013). What discerns the midwifery approach from a medical one, is a normal birth philosophy (Page, 2000), combined with an emphasis on the midwife-woman partnership (Guilliland & Pairman, 1995), and a willingness to collaborate with

medical colleagues as indicated (Australian College of Midwives, 2008; National Health and Medical Research Council, 2010) .

1.4.1 NORMAL BIRTH

Philosophically, midwifery is committed to “normalizing and humanizing birth” (Sandall, Devane, Soltani, Hatem, & Gates, 2010, p. 255). Midwifery works towards this by optimising the interconnected biological, psychological and social processes that occur during labour and birth (Fahy, Foureur, & Hastie, 2008; Sakala & Newburn, 2014). Midwives are taught to seek confirmation of the normal processes of pregnancy and parturition, while being alert to deviations from normal (Page, 2000). While the definition of normal birth is contested (Maternity Care Working Party, 2007), many would agree that a normal birth “starts, progresses and concludes spontaneously...without anaesthesia or episiotomy” (Kitzinger, 2005, p. 54). Midwives have greater autonomy to practise in accordance with a normal birth philosophy in midwife-led settings (for example midwifery-led units, birth centres and women’s homes) (Walsh & Devane, 2012). In clinical practice, a normal birth philosophy supports the use of measures to encourage normal birth, for example warm water immersion, whilst avoiding unnecessary intervention (Page, 2000).

1.4.2 MIDWIFE-WOMAN RELATIONSHIP

The relationship that develops between the same midwife and woman over time, throughout the course of the maternity care episode, is referred to as ‘relational continuity’ (see Glossary). The relationship between the woman and her midwife is central to women’s experiences of care during labour and birth (Dahlberg & Aune, 2013); as is the midwife’s ability to be ‘emotionally present’ and attentive to the woman’s needs (Walsh & Devane, 2012).

The concept of the midwife and the woman working in ‘partnership’ was first articulated in 1995 (see Glossary). The ICM has incorporated the partnership framework into the definition of a midwife:

The midwife is recognised as a responsible and accountable professional who works in partnership with women to give the necessary support, care and advice during pregnancy, labour and the postpartum period, to conduct births on the midwife’s own responsibility and to provide care for the newborn and the infant (International Confederation of Midwives, 2005).

This framework includes the construction of the midwife as an ‘advocate’ for women (International Confederation of Midwives, 2013); rather than a medical collaborator who seeks women’s consent for routine childbirth interventions (Fahy, 2002).

1.4.3 COLLABORATION AND QUALITY

Collaborative maternity care aims to provide safe, woman-centred care where the woman nominates the lead or primary maternity carer (GP, obstetrician, or midwife) and is an active participant in her own care (National Health and Medical Research Council, 2010; Queensland Maternity and Neonatal Clinical Guidelines Program, 2011). Quality maternity care seeks to achieve the best possible outcomes for mothers and babies, meet the needs of consumers and care providers, and be financially sustainable (Pittrof, et al., 2002). A key qualitative study from the UK involving consumers (n=38) and midwives (n=47) identified ten dimensions of quality maternity care including:

- continuity of caregiver,
- a home-like birthing environment,
- information to assist with informed decision-making,
- short appointment waiting times,
- rationales for tests and procedures along with sufficient explanation of results,
- feeling listened to and respected by caregivers,
- giving birth to a healthy infant,
- being cared for by competent staff,
- having partners involved in making choices and,
- feeling in control (Proctor, 1998).

Maternity care that is consistent with these attributes can arguably be best provided in midwife-led models of care, which are reported to be safe, effective, woman-centred and efficient (Sandall, et al., 2010). Such models include caseload midwifery and team midwifery (see Glossary); which increase continuity of care across the pregnancy, birth and postnatal period. A 2013 Cochrane systematic review of midwife-led models, which included team and caseload midwifery, reported significant benefits including less preterm birth, less regional analgesia, higher breastfeeding initiation and higher self-reported satisfaction with maternity care (Sandall, et al., 2013). While the evidence base

supporting midwife-led continuity of care is strong, almost all of this research is with women aged 20 years or older.

1.5 MODELS OF MATERNITY CARE FOR YOUNG WOMEN

Improving adolescent health requires attending to the realities that make up young people's daily lives, which include both risks and protective factors (Viner et al., 2012). Standard care (see Glossary) is usually fragmented whereby women see different and often unfamiliar maternity care providers at each consultation; therefore it may not meet the specific needs of pregnant adolescents (World Health Organisation, 2004b). There is increasing evidence that antenatal care which is targeted to meet the specific needs of pregnant adolescents can improve perinatal outcomes (Allen, et al., 2012; Vieira et al., 2012).

A thorough quantitative literature review was conducted by the author in 2011 and published in 2012. The results are presented in Paper 1 (Chapter 2). An updated literature review using the same eligibility criteria and search strategy retrieved three additional studies: a 2013 Cochrane systematic review of midwifery-led care, a 2011 systematic review of antenatal care programmes to target pre-term birth (including group antenatal care and young women's clinic), and a 2012 matched cohort study of a young women's clinic. The results of the updated literature review are included in the next sections (1.5.1-1.5.3). The following non-standard models, briefly described below, may be suitable for young women: caseload midwifery, group antenatal care and young women's clinic.

1.5.1 CASELOAD MIDWIFERY

Caseload midwifery provides women with antenatal, intrapartum and postnatal care from one midwife or her/his practice partner (McCourt, et al., 2006). The aim of caseload midwifery is to ensure that women have a "known, trusted midwife" with them during labour and birth (Sandall, et al., 2013, p. 2). Midwifery group practice (MGP) is a form of caseload midwifery where each midwife carries a caseload of individual women (Page, 1995) and provides back-up for his/her colleagues (see Glossary). The literature review published in 2012 (Chapter 2) retrieved just one small audit (n=375) of caseload midwifery in the UK specifically for young women (Hutchinson, 2007). Since then a 2013

Cochrane systematic review included three RCTs of caseload midwifery which recruited adolescent participants (Sandall, et al., 2013). While adolescents were eligible to participate in these RCTs, they were under-represented; the mean age range across all three trials was 26-28 years.

1.5.2 GROUP ANTENATAL CARE

Group antenatal care includes health education, peer support and clinical assessment within the group space at each antenatal appointment (see Glossary). The published literature review (Chapter 2) reported on four studies including an RCT of GAC compared to standard care; the RCT participants (n=1,047) had a mean age of 21 years (range 14-25 years) and thus the results are directly relevant for young women. A systematic review of antenatal care programmes to target preterm birth in high-income countries, concluded that group antenatal care is a promising intervention in need of further research (Hollowell, et al., 2011). A Cochrane systematic review of two RCTs of group antenatal care (CenteringPregnancy™) versus standard care reported no significant differences for key clinical outcomes including preterm birth (Homer et al. 2012). However, the largest RCT (n=1047) reported that women who received the intervention were less likely to experience preterm birth and more likely to initiate breastfeeding (Ickovics 2007).

1.5.3 YOUNG WOMEN'S CLINIC

Young women's clinic is typically a multidisciplinary, community-based, antenatal clinic for young women (see Glossary). The age range of participants varies across sites to include adolescents-only or young women (Allen, et al., 2012). The published literature review (Chapter 2) reported the results of four cohort studies of YWC. A 2011 systematic review of antenatal care programmes to target preterm birth concluded there was insufficient evidence that YWC makes a difference to preterm birth (Hollowell, et al., 2011). A 2012 Canadian matched cohort study (n=1037) of a community-based, 'adolescent-friendly', multidisciplinary antenatal clinic reported perinatal outcomes adjusted for maternal age, smoking, alcohol and drug use (using matched controls) (Fleming, Tu, & Black, 2012). The findings included a higher odds of first trimester visits (aRR 1.25, 95%CI 1.13-1.39), lower odds of preterm birth (aRR

0.47, 95%CI 0.22-1.00), and low birth weight (<2500g) (aRR 0.41, 95%CI 0.18-0.95) for the exposure group (Fleming, et al., 2012).

1.5.4 GAPS IN THE LITERATURE

Young women have specific needs, risks and protective factors that can arguably best be addressed by a tailored model of maternity care that is accessible, welcoming and responsive to their circumstances. There is scant evidence about whether caseload midwifery, GAC or YWC models are suitable or effective for young women. This gap in the research literature led to the questions that have been addressed in this PhD.

1.6 THE LOCAL CONTEXT: AUSTRALIA AND QUEENSLAND

Australia is a large country comprising 7,700,000 square kilometres with a small population (22 million people) relative to its size. It comprises a federation of six States (Queensland, New South Wales, Victoria, Tasmania, South Australia, and Western Australia) and two Territories (Northern Territory and Australian Capital Territory); each has its own government which receives federal funding for health services. The state of Queensland, the setting for this research project, is home to approximately 4.5 million people. Young people (10-24 years) make up approximately 20% of the total Australian population (Australian Bureau of Statistics, 2011). Queensland's teenage birth rate, 22 per 1000, is higher than the national average (16 per 1000) (Australian Bureau of Statistics, 2013).

1.7 UNIVERSAL HEALTH CARE

In 1974, a universal health care system (Medicare) was introduced, motivated by three principles: "social equity, universal coverage and cost efficiency" (as articulated by former Social Security Minister, Bill Hayden) (M. Green, 2014). It is a system whereby those eligible may access public hospital services free of charge on the basis of clinical need (Council of Australian Governments, 2014). The Federal Government funds maternity services through the Medicare Benefits Schedule and the Pharmaceutical Benefits Schedule (Australian Government, 2009); which together provide payments to maternity care providers and/or rebates to maternity care consumers. All Australian State and Territory governments receive funding through National Healthcare Agreements and provide maternity care through their public hospitals and associated facilities (Australian Government, 2009). Additionally, the government provides

a 30 per cent rebate for citizens who hold private health insurance (Australian Government, 2009). At the time of writing, the Medicare system is potentially subject to revision as the incumbent federal government attempts to introduce a user-pays health care system (M. Green, 2014).

1.8 MIDWIFERY IN AUSTRALIA

The majority of registered midwives in Australia are also registered nurses; and approximately two-thirds work in the public hospital system (Australian Institute of Health and Welfare, 2012). The concept of midwives working in partnership with women has been endorsed by the Australian College of Midwives (Australian College of Midwives, 2005), and is embedded into the Australian midwifery education standards (Australian Nursing and Midwifery Accreditation Council, 2014) and competency standards (Nursing and Midwifery Board of Australia, 2006). However, the majority of midwife clinicians provide antenatal, intrapartum and/or postnatal care in hospital clinics and wards on a shift-work basis, which severely limits their ability to provide continuity of care (Homer, Brodie, & Leap, 2008).

Since November 2010, private practice (elsewhere also known as independent or self-employed) midwives, who met eligibility criteria, have technically been able to provide maternity services Australia-wide for which women could claim Medicare rebates (Nursing and Midwifery Office Queensland, 2013). Eligibility criteria include: current midwifery registration with the Australian Health Practitioner Regulation Agency, three years' postgraduate experience, ongoing competency across all areas of midwifery, completion of a practice review program, and completion of a medication prescribing course (Nursing and Midwifery Board of Australia, 2013). Despite this change to legislation several challenges remain. First, the intrapartum component of homebirth care is not funded by Medicare (Nursing and Midwifery Office Queensland, 2013); which means women are required to pay. Second, although eligible midwives can provide intrapartum care in hospital (covered by indemnity insurance and Medicare-rebates), this requires midwives to be credentialed by the hospital and have an 'access agreement' in place (Nursing and Midwifery Office Queensland, 2013). Hospitals have been reluctant to grant visiting access to private practice midwives; which means hospital birth with an eligible midwife is currently limited Australia-wide to just four hospitals.

1.8.1 MODELS OF MATERNITY CARE IN AUSTRALIA

The majority of Australian women (70%) access public maternity care, with 30% accessing private obstetric care (Australian Government, 2009). Most women (55%) access antenatal care from midwives working in public hospitals, in consultation with trainee obstetricians (registrars) and obstetric consultants. A smaller proportion of women (15%) access community-based GPs (Australian Government, 2009). The 2009 Maternity Services Review reported that Australia provides relatively safe, high quality maternity care (Australian Government, 2009). Nevertheless, there is increasing research evidence and consumer pressure for an expansion of maternity care models including midwife-led models of care (Australian Government, 2009). Australian caseload midwifery models started in the 1990s and have continued to grow Australia-wide (Hartz, Foureur, & Tracy, 2012). Data about the proportion of women who access caseload midwifery through a publicly-funded midwifery group practice (MGP) model are not available; however caseload midwifery is provided in a variety of settings across Australia including tertiary hospitals, birth centres, rural units and publicly-funded home birth services (Hartz, et al., 2012).

1.8.2 MODELS OF MATERNITY CARE IN OUR RESEARCH SETTING

The setting for this research project was a metropolitan, tertiary-level hospital with co-located public and private maternity care services accessed by approximately 10,000 women annually. An estimated 5,000 women access private maternity care and give birth at the research hospital. The private maternity care model was not examined and privately-booked women were excluded from this project.

Of the estimated 5,000 women that access public maternity care: 50% have fragmented midwifery and/or obstetric antenatal care in a hospital or community outreach clinic, including specialist clinics like drug and alcohol, refugee and young women's clinic (see Glossary). Approximately 30% have antenatal care with their GP. The remaining 20% receive care through a caseload model which, at the time this study was undertaken, had an extensive waiting list. The MGPs are comprised of four midwives who provide GAC, intrapartum assessment and care in hospital, and home postnatal care for up to six weeks following birth. The MGP model became 'all-risk' in 2010 during the conduct of

the M@NGO trial (see Glossary). Specialist MGPs are available for vulnerable groups including young women and Aboriginal and Torres Strait Islander women. Each MGP has a nominated obstetric consultant who provides consultation and referral during pregnancy. There is no provision for early labour assessment at home, or for home birth. While 20% of public women have a known midwife in labour (MGP), the vast majority (80%) have their intrapartum care provided by rostered midwives, obstetric registrars and consultants whom they will most likely have not met. At the time of data collection, if women met early hospital discharge criteria (dependent on mode of birth), and they lived within the hospital catchment area, they received limited (two to three) postnatal visits at home. Community-based, government-funded postnatal care was not available to women residing outside the hospital catchment area.

1.8.3 PLACE OF BIRTH

Across Australia the vast majority of births take place in hospital birth suites (96.9%), with just 2.2 % in birth centres and 0.4% at home; the remaining 0.4% have been recorded as 'other' and include babies born before arrival to hospital (Li, Zeki, Hilder, & Sullivan, 2013). In Queensland, 61,112 women gave birth in 2011. The proportion of births in domiciliary settings was lower than the national average: 1.4% in birth centres and 0.1% at home (Li, et al., 2013). At the time of writing, only 23 birth centres had been identified across Australia, most of which provide public maternity care, but many have extensive waiting lists and rigid eligibility criteria (Laws & Sullivan, 2009). In some countries including Canada, the Netherlands, NZ and the UK, homebirth is fully or partially government funded. This is not the case for the vast majority of Australian women whose access to birth centre and home birth is severely restricted. Since 2002, self-employed midwives in Australia have worked without insurance to provide intrapartum care at home (Dahlen et al., 2011). There are a handful of state or territory funded homebirth services delivered by hospital-employed midwives; there is no publicly-funded homebirth service available in Queensland (Dahlen, et al., 2011).

1.9 CONCLUSION

Chapter One has provided an overview of the research project including the PhD structure, key terms and background literature in order to situate the

project in an international, national and local context. Chapter Two includes an introduction to the published literature review and the publication itself (Paper 1). The results from the few eligible research papers published in the years following this publication were provided in this chapter (see Section 1.5 Models of maternity care).

CHAPTER TWO: LITERATURE REVIEW

2.1 RATIONALE

The literature review was driven by the first research objective: to determine whether non-standard maternity models of care are associated with perinatal outcomes for young women and their babies. The review was guided by the research question: *Does the way maternity care is provided affect maternal and neonatal outcomes for young women?* A structured survey of the research literature enabled the researcher to “identify, evaluate and summarise the findings of all relevant individual studies” as well as identify gaps in the literature where knowledge was lacking (Centre for Reviews and Dissemination, 2009, p. v).

2.2 SIGNIFICANCE

The literature review was conducted in 2011 and published in a peer-reviewed journal (Allen, et al., 2012). An overview of the literature published since 2012 was presented in Chapter 1 (Section 1.5). The publication has been independently reviewed and included in the *Database of Abstracts and Reviews of Effects (DARE)*, which focusses primarily on systematic reviews that evaluate health care interventions and service delivery. However, the literature review did not strictly meet the criteria for a systematic review because it did not: involve more than one reviewer, use a tool to assess risk of bias in the included studies or conduct a meta-analysis of the statistical results (The Cochrane Collaboration, 2011). Nevertheless, the conduct of the review shared similar features to a systematic review:

- there was a guiding question
- methods for the conduct of the review were developed in advance
- rigorous methods for were used to identify relevant studies
- eligibility criteria (inclusion and exclusion) were used
- key data were extracted from each study
- each study was assessed for quality
- the results of the study were disseminated through publication (Centre for Reviews and Dissemination, 2009).

The literature review identified and described three models of maternity care that had been offered and evaluated within the study population: caseload midwifery, GAC and YWC. These models were directly relevant to the research

setting where maternity care was offered to young women primarily through: caseload midwifery (incorporating GAC) or YWC.

Critique of the included studies helped to identify methodological strengths and weakness that then informed the design of this research project. The literature review identified cohort studies that were predominantly retrospective, with small sample sizes, and conducted without adequate statistical control of known confounders. Therefore, a prospective study of caseload midwifery that was statically powered and could control for confounding factors, could address this gap in the literature. The findings reported by each paper identified in the literature review were contrasted and compared with the other papers. This process helped inform and justify which outcome measures should be included as primary and secondary outcomes within this research project.

This review identified a gap in the research literature; namely whether caseload midwifery or young women's clinic models are appropriate or effective for the study population. This gap led the researcher to focus on two connected questions; namely are these models effective and, if so, how do the key players (young women and midwives) interpret their experiences of them. The publication (Paper 1) is provided in its entirety here.



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REVIEW ARTICLE

Does the way maternity care is provided affect maternal and neonatal outcomes for young women? A review of the research literature

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practice;
Teenage pregnancy

Abstract

Background: Young pregnant women who continue a pregnancy are primarily from a socioeconomically deprived background. The risk factors associated with low socio-economic status may independently affect perinatal and neonatal morbidity to a greater extent than the young age of the woman. Young pregnant women are frequently sceptical about health care providers who they can perceive to be judgemental. This may lead to late booking for pregnancy care, attending few appointments, or not attending the health service for any antenatal care.

Question: Does the way maternity care is provided affect maternal and neonatal outcomes for young women?

Method: A systematic search of the major health databases.

Results: Nine research articles met the eligibility criteria: one randomised controlled trial, three prospective cohort studies, two comparative studies with concurrent controls, two comparative studies with historical controls, and one case series.

Discussion: Providing young women with a non-standard model of maternity care has some beneficial and no known detrimental effects on childbirth outcomes. While there is a dearth of evidence on the effectiveness of a Midwifery Group Practice model of care for young women, there is strong evidence to suggest that a Group Antenatal Care model increases antenatal visit attendance and breastfeeding initiation, and decreases the risk of preterm birth. There is research to indicate that a Young Women's Clinic model may also increase antenatal visit attendance and decrease the incidence of preterm birth.

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Conclusion: More well-designed and resourced midwifery models of care for young women should be implemented and rigorously researched.

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Introduction

There is growing evidence that the way in which maternity care is provided affects outcomes for the woman and her baby. There is a dearth of published research into the effects of maternity care on pregnant adolescents, who are generally considered at higher risk of adverse outcomes including: anaemia, antepartum haemorrhage, pregnancy-induced hypertension, preterm birth, low birth weight and small for gestational age babies, lower five minute Apgar scores, longer and more frequent admission to the neonatal intensive care unit, and higher rates of neonatal death.^{1–5} In Western countries (e.g. Australia, United Kingdom, United States) these outcomes are generally reported to be worse for young women aged 16 years and under^{1,2}; however a recent Australian study reported higher rates of stillbirth in older pregnant adolescents (17–18 years) compared to those aged 16 years and under.⁵ For the purposes of this paper, “adolescent pregnancy” is defined as a conception occurring in women aged 21 years or younger; these women will be referred to as “pregnant adolescents” or “young women”.⁵

The dominant view is that the young age of the woman, in itself, is the cause of poor pregnancy outcomes^{1–3}; however higher rates of adolescent conception and lower rates of termination occur in areas of socioeconomic deprivation.^{4,6} Therefore, young women requiring maternity care are more likely to come from a disadvantaged background, and have associated risk factors that may independently affect maternal and perinatal morbidity and mortality. These include low educational attainment, poor nutrition, extremes of body weight, stress, anxiety and depression, lack of social support, unstable housing, poor or non-existent relationship with parents, use of cigarettes and illicit drugs, and single marital status.^{1,4,6–8}

The poorer general health status of pregnant adolescents is confounded by inadequate antenatal care as they tend to book at a later gestation, attend fewer appointments, or receive no antenatal care at all.^{1,9} Women who have no, or

inadequate, antenatal care (<5 consultations with a maternity professional) are more likely to have low birth weight infants, and experience higher rates of fetal and neonatal death, even after controlling for known confounders.⁹

Reconceptualising antenatal care provision is consistent with primary health care approaches to improving outcomes for pregnant adolescents.¹⁰ Models of care designed to be more relevant to young women enhance access to more comprehensive health and social services.¹¹ Engaging with pregnant adolescents provides an opportunity for health providers to use health promotion strategies and targeted interventions to address modifiable risk factors including anaemia, urine and sexually transmitted infections, domestic violence, smoking, drug and alcohol use, poor nutrition, stress, unstable housing, and inadequate social support.^{1,6–8,11,12}

In the Australian context 70% of women access publically funded, hospital-based maternity care, 30% access private obstetric care.¹³ Most women (55%) access antenatal care in public hospitals by midwives, in consultation with trainee obstetricians (registrars) and obstetric consultants, while a smaller number of women (15%) access a community-based general practitioner for antenatal care.¹³ Most births take place in hospital birth suites (97%), 2% occur in birth centres and less than 1% are planned homebirths.¹⁴ Most births are attended by clinicians unknown to the woman.

This literature review originally sought to address the question, ‘Do midwifery models of care affect outcomes for teenage women and their babies?’ As the initial search generated limited results, the search question was modified thus: ‘Does the way maternity care is provided affect maternal and neonatal outcomes for young women?’ To this end studies were included if participants had a mean age of 21 years or less. Studies were included when the intervention was a non-standard model of maternity care. The term “model of care” refers to a distinct approach to maternity service delivery. In standard care, rostered hospital staff (e.g. obstetric nurses, midwives or obstetricians) provide

care throughout pregnancy, labour, birth, and the immediate postnatal period. Non-standard models of care identified in the literature include Midwifery Group Practice (MGP), Group Antenatal Care, and Young Women's Clinic.

MGP, also referred to as caseload midwifery, is defined as a group of two to three midwives providing continuity of carer throughout pregnancy, birth and the postpartum period.^{13,15} Each midwife works with approximately 40 women per year in a caseload arrangement where they provide care for nominated women and back-up care for their colleagues.^{15,16} The caseload is usually reduced when women have identified risk factors at booking. A systematic review of midwife-led models of care demonstrated that women with no identified risk factors at booking who receive this type of care experienced improved maternal and neonatal outcomes without any adverse effects.¹⁷

Group Antenatal Care, commonly referred to as "CenteringPregnancy" in the literature reviewed, is based on the trademark of a model developed and trialled in America where it was shown to improve outcomes for disadvantaged women.^{18,19} In this model a group of approximately 8–12 women of similar gestation meet regularly at a hospital or community venue for their antenatal care and education.^{18,19} There is one stable group leader, usually a midwife, who facilitates discussion according to an overall session plan that covers core education content. A second midwife simultaneously performs antenatal clinical assessments, within the group space, with the women in attendance; women are encouraged to be involved in activities like checking their own urine and checking each other's blood pressure.^{18,19} Women are offered time to socialise and build relationships with other pregnant women in their community, and may bring a support person with them to the group.¹⁸

Young Women's Clinic is a variant of standard antenatal care. These clinics are multidisciplinary including obstetricians, midwives, social workers and other allied health practitioners. Clinics may be community or hospital-based, members of the multidisciplinary team may be available for direct consultation and referral, and there may be enhanced training and practice guidelines for the management of psychosocial, sexual health or recreational drug use.^{20,21}

Control groups were used in the majority of the selected studies and included randomised control groups, case-matched control groups, historical controls groups, or no control group. Quantitative outcome measures included antenatal, birth, postnatal and neonatal outcomes.

Method

Studies were included when participants had a mean age of 21 years or under; the intervention occurred in a Western country and included a midwife; a comparison or control group may have been included; and the outcomes reported included antenatal, birth, postnatal and neonatal measures. Additional eligibility criteria restricted studies to English-language research papers published within the last 10 years (2000–2010).

A search of major health databases was undertaken and included: Academic Search Complete, CINAHL, Cochrane Library, Health Collection, Health and Medical Complete,

Health Source Nursing/Academic Edition, Interim, Maternity and Infant Care, PubMed, and Wiley Online Library.

The original search, based on key words from the original question; was performed on the identified databases. A separate PubMed search was performed using the Medical Subject Headings (MeSH) terms "midwifery" and "pregnancy in adolescence" and "outcome assessment". When this generated few results a second search was conducted where the terms related to outcomes were replaced with specific clinical outcomes i.e. "preterm birth" and "low birth weight". Although further studies were identified it was determined that the search question; and therefore search terms; be expanded to include all forms of maternity care and young women. A third and final search was conducted with the following search terms: "young women" and "obstetric outcome"; "young women" and "neonatal outcome"; "young women" and "midwife"; "young women" and "model of care"; and "young women" and "maternity care".

The final search generated 698 articles of which 237 were duplicates. The titles and abstracts of the remaining 461 articles were screened using the eligibility criteria. Studies that did not meet one or more of the eligibility criteria and duplicates were excluded and the reason for exclusion documented. When it was not clear from the title and abstract whether a study met the inclusion criteria, the full text article was obtained and read. Related citations and reference lists of all relevant articles were checked and two further articles were retrieved. Of the 13 research articles selected, four were excluded: two^{22,23} described a public health nursing intervention that did not include a midwife; one evaluation²⁴ of a midwifery support service did not detail the research design; and a RCT of extended postnatal home visiting²⁵ was excluded because the intervention was postnatal only.

There were consistent outcome measures reported across the majority of studies for: antenatal visit attendance, mode of birth (normal vaginal birth/instrumental birth/caesarean birth), preterm birth (less than 37 weeks gestation), gestational age at birth, low birth weight (less than 2500 g), neonatal birth weight, admission to neonatal intensive care unit (NICU), and breastfeeding (initiation, at hospital discharge, or at 28 days postpartum). Other maternal and neonatal outcome measures that reached statistical significance are discussed. The principal summary measures for prospective studies are odds ratios and difference in means. For retrospective and audit studies simple percentages are presented.

Results

Nine research articles which met the inclusion criteria are summarised in Table 1; please refer to this table for detailed descriptions of each study's method and results. The findings are presented and discussed below under model of care.

MGP

Only one study²⁶ of MGP was reviewed. The UK study reported on a group of pregnant adolescents who accessed an inner-city MGP. All women received pregnancy and intrapartum

Table 1 Reviewed studies presented by model of care.

Author, year, title, country	Study design and sample	Level	Antenatal Attendance	Mode of birth	Gestational age at birth	Preterm birth <37 weeks	Birth weight	Low birth weight <2500g	NICU admission	Breast-feeding
MIDWIFERY GROUP PRACTICE										
Hutchinson ²⁶ 2007 A young mothers' midwifery scheme United Kingdom	Case Series No control group 375 low-risk teenage women <i>Intervention:</i> midwifery group practice	IV	> 12 visits 11.5% n* 8-12 visits 51.5% n* < 8 visits 21.3% n* Unknown 15.7% n*	Normal vaginal birth 84% n* Forceps or vacuum 6% n* Caesarean 10% n*	NR	5% n*	NR	8% n*	NR	Initiation 73% n* 28 days Postnatal 38% n*
GROUP ANTENATAL CARE										
Ickovics et al ²⁹ 2003 Group Prenatal Care and Preterm Birth Weight: Results From a Matched Cohort Study at Public Clinics United States	Prospective cohort study Case control group 458 pregnant women <i>Intervention:</i> group antenatal care (n=229) <i>Control:</i> standard antenatal care (n=229)	III-2	<i>Intervention</i> 9.78 visits <i>Control</i> 9.64 visits p=0.65 ^{NS}	NR	<i>Intervention</i> 34.8 weeks <i>Control</i> 32.6 weeks p<0.001	<i>Intervention</i> 9.2% n=21 <i>Control</i> 9.6% n=22 p=0.83 ^{NS}	<i>Intervention</i> 2398 grams <i>Control</i> 1990 grams p<0.05	<i>Intervention</i> 7% n=16 <i>Control</i> 10% n=23 p=0.38 ^{NS}	NR	NR
Grady et al ³⁰ 2004 Pregnancy Outcomes of Adolescents Enrolled in a Centering Pregnancy Program United States	Retrospective cohort study Two historical control groups 501 teenage pregnant women (mean age 16 years) <i>Intervention</i> gave birth in 2001-2004 after receiving group antenatal care (n=124) <i>2001 control</i> group gave birth after receiving standard care in hospital antenatal clinic with nurse-midwife (n=144) <i>1998 control</i> group gave birth after receiving standard care in hospital antenatal clinic, or GP shared care, or no antenatal care (n=233)	III-3	Number of missed antenatal visits <i>Intervention</i> 19% <i>2001 control</i> NR <i>1998 control</i> 28% p*	Caesarean <i>Intervention</i> 13.7% n=17 <i>2001 control</i> 14.6% n=21 <i>1998 control</i> 15.9% n=37 p* ^{NS}	NR	<i>Intervention</i> 10.5% n=13 <i>2001 control</i> 25.7% n=57 p<0.02 <i>1998 control</i> 23.2% n=54 p<0.05	NR	<i>Intervention</i> 8.8% n=11 <i>2001 control</i> 18.3% n=42 p<0.02 <i>1998 control</i> 22.9% n=43 p<0.05	NR	Initiation <i>Intervention</i> 46% n=57 <i>2001 control</i> 28% n=65 p* <i>1998 control</i> NR

Table 1 (Continued)

Author, year, title, country	Study design and sample	Level	Antenatal Attendance	Mode of birth	Gestational age at birth	Preterm birth <37 weeks	Birth weight	Low birth weight <2500g	NICU admission	Breast-feeding
Ickovics et al ¹¹ 2007	Multi-site RCT 1047 pregnant women aged 14-25	II	Less than adequate antenatal care (Kotelchuck index) OR 0.68 95% CI 0.50-0.91 p=0.01	NR	<i>Intervention</i> 39.1 weeks <i>Control</i> 38.9 weeks p=0.40 ^{NS}	OR 0.67 95% CI 0.44-0.98 p=0.045	<i>Intervention</i> 3160.6g <i>Control</i> 3111.8g p=0.24 ^{NS}	OR 0.98 95% CI 0.64-1.50 p=0.90 ^{NS}	OR 1.06 95% CI 0.66-1.72 p=0.80 ^{NS}	Initiation OR 1.73 95% CI 1.28-2.35 p=0.001
Group Prenatal Care and Perinatal Outcomes: A randomized controlled trial. United States	<i>Intervention:</i> group antenatal care <i>Control:</i> standard care in hospital antenatal clinic									
Klima et al ¹⁹ 2009	Prospective observational study 317 pregnant women (mean age 21 years)	III-2	Number of antenatal visits attended <i>Intervention</i> 9.7 visits <i>Control</i> 8.3 visits p<0.05	NR	%*n* NS	%*n* NS	%*n* NS	%*n* NS	NR	Initiation <i>Intervention</i> 59% (n*) <i>Control</i> 44% (n*) p=0.05 Exclusive at hospital discharge <i>Intervention</i> 44.3% (n*) <i>Control</i> 31.2% (n*) p<0.05 Any at hospital discharge <i>Intervention</i> 59% (n*) <i>Control</i> 43.6% (n*) p<0.05
Introduction of CenteringPregnancy in a Public Health Clinic. United States	<i>Intervention:</i> women who elected group antenatal care (n=110) <i>Control:</i> women who elected individual midwifery visits (n=207)									
YOUNG WOMEN'S ANTENATAL CLINIC										
Bensussen-Walls and Saewyc ²⁰ 2001	Retrospective Case-controlled 106 pregnant women (mean age 16 years)	III-2	Number of antenatal visits attended NS n*	Forceps or vacuum <i>Intervention</i> 0% <i>Control</i> 12% (n*) p<0.05	<i>Young Women's Clinic compared to Hospital Antenatal Clinic</i>		<i>Intervention</i> 38.94 weeks <i>Control</i> 37.75 weeks p<0.05	<i>Intervention</i> 3295.92g <i>Control</i> 2886.42g p<0.05	NR	NR
Teen-Focused Care Versus Adult-Focused Care for the High-Risk Pregnant Adolescent: An Outcomes Evaluation. United States	<i>Two intervention groups</i> 1. Young Women's Clinic (n=27) 2. Teen Pregnancy and Parenting Clinic (n=27) <i>Two comparison groups</i> 1. University of Washington Medical Centre Antenatal Clinic (n=25) 2. Group Health Co-operative Antenatal Clinic (n=27)		Number of missed antenatal visits NS n*	Caesarean <i>Intervention</i> 14.8% n* <i>Control</i> 20% n* p<0.05						
<i>Teen Pregnancy and Parenting Clinic compared to Hospital Antenatal Clinic</i>										
			Number of antenatal visits attended <i>Intervention</i> 12.53 visits <i>Control</i> 8.69 visits p<0.0001	Instrumental and Caesarean birth <i>Intervention</i> 7.4% n* <i>Control</i> 18.2% n* p<0.05	<i>Intervention</i> 39.5 weeks <i>Control</i> 38.05 weeks p=0.233 ^{NS}	%*n* NS	<i>Intervention</i> 3333g <i>Control</i> 3373g p=0.816 ^{NS}	NR	%*n* NS	NR

Table 1 (Continued)

Author, year, title, country	Study design and sample	Level	Antenatal Attendance	Mode of birth	Gestational age at birth	Preterm birth <37 weeks	Birth weight	Low birth weight <2500g	NICU admission	Breast-feeding
			<p>Number of missed antenatal visits <i>Intervention</i> 0.78 visits <i>Control</i> 3.33 visits p<0.01</p> <p>Number of unscheduled reviews <i>Intervention</i> 1.38 reviews <i>Control</i> 2.09 reviews p<0.01</p>							
<i>Combined intervention groups compared to combined control groups</i>										
			<p>Number of missed antenatal visits <i>Intervention</i> 0.96 visits <i>Control</i> 2.29 visits p<0.05</p>	<p>Instrumental and Caesarean <i>Intervention</i> 10% n=5 <i>Control</i> 25% n=13 p<0.05</p>	NR	NR	<p><i>Intervention</i> 3330 grams <i>Control</i> 3084 grams p<0.05</p>	NR	NR	NR
Ukil et al ³³ 2002	Retrospective observational study 113 of the total number of teenagers (n=116) <i>Intervention</i> : midwife-run teen clinic (n=78) <i>Control</i> : standard hospital-based antenatal care (n=34)	III-2	NR	<p>Normal vaginal birth <i>Intervention</i> 85% <i>Control</i> NR</p> <p>Forceps or vacuum <i>Intervention</i> 7% n* <i>Control</i> 7% n* p*NS</p> <p>Caesarean <i>Intervention</i> 8% n* <i>Control</i> NR</p>	NR	<p>OR 0.15 98% CI 0.028-0.083 p=0.026</p>	NR	NR	NR	NR
Quinlivan and Evans ²¹ 2004	Multi-site prospective cohort study 794 pregnant women <i>Intervention</i> : women electing teenage antenatal clinic (n=541) <i>Control</i> : women electing standard care in the hospital antenatal clinic (n=253)	III-2	<p>Antenatal admissions <i>Intervention</i> 0.47 times <i>Control</i> 0.49 times p=0.80^{NS}</p>	NR	<p><i>Intervention</i> 38.7 weeks <i>Control</i> 37.4 weeks p<0.0001</p>	<p>Threatened preterm labour OR 0.45 95% CI 0.29-0.68 p <0.0001</p>	<p><i>Intervention</i> 3183g <i>Control</i> 3114g^a p=0.33^{NS}</p>	NR	NR	<p>Initiation <i>Intervention</i> 77% n=345 <i>Control</i> 72% n=146 p=0.16^{NS}</p>

Table 1 (Continued)

Author, year, title, country	Study design and sample	Level	Antenatal Attendance	Mode of birth	Gestational age at birth	Preterm birth <37 weeks	Birth weight	Low birth weight <2500g	NICU admission	Breast-feeding
Australia						Preterm prelabour rupture of membranes OR 0.34 95% CI 0.18-0.63 p=0.0002				
Das et al ³⁴ 2007	Retrospective observational Historical control group The impact of a dedicated antenatal clinic on the obstetric and neonatal outcomes in adolescent pregnant women	III-3	Clinic attendance Intervention 42% Control 15% p*	Forceps or vacuum Intervention 15% n=19 Control 13% n=17 p ^{NS} Unplanned caesarean Intervention 9% n=12 Control 7% n=9 p ^{NS}	NR	Intervention 4% n=6 Control 8% n=11 p ^{NS}	NR	Intervention 5% n=6 Control 14% n=18 p=0.01	Intervention 5% n=7 Control 11% n=15 p=0.08 ^{NS}	28 days postnatal Intervention 20% n=25 Control 2% n=3 p<0.0001
United Kingdom	Control: gave birth in 2001 after standard care in hospital antenatal clinic									

NHMRC Levels of Evidence: (I) a systematic review of Level II studies (II) a randomised controlled trial (III) a pseudo-randomised controlled trial (III-2) a prospective study with concurrent control/s (III-3) a comparative study with historical control/s (IV) case series; a adjusted mean CI confidence, n number of participants, NR outcome not reported, NS not statistically significant, n* number not reported, OR odds ratio, p probability value, p* probability value not reported, %* percentage not reported

care from a primary midwife, or back-up midwife who was known to them. Birth occurred either in the hospital birth suite, birth centre, or at home. Postnatal home-based care was available to women living in the hospital catchment area. It was provided by unfamiliar, hospital-based, midwives. A control group was not used and hence outcomes are presented as simple percentages. The study reported "high" rates of antenatal attendance, normal vaginal birth, and breastfeeding at 28 days postnatally, but did not provide comparative data. According to national UK statistics the rate of preterm birth was lower than the UK average,²⁷ and the rate of low birth weight babies was similar.²⁸

The sample in the study was described only in terms of age and ethnicity which does not address additional, and important, confounding variables known to affect outcomes for young women (e.g. parity, smoking status, body mass index, socio-economic status). Continuity of carer was not provided across the continuum of pregnancy, birth and the postnatal period because postnatal care was either provided by core staff midwives or not provided at all. Since neither control group nor comparative benchmark data were provided it is not possible to independently assess maternal and neonatal outcomes.

Group Antenatal Care

Four US-based studies were identified^{19,29-31} that investigated Group Antenatal Care for young women. All four studies defined and described the intervention in accordance

with the essential elements of CenteringPregnancy.¹⁸ Across the studies, however, there were differences with respect to implementation of the model including setting (hospital or community), and type of facilitator (midwife or obstetrician). These two factors could be considered as independent variables that have potential to affect outcomes.

A 2003 prospective cohort study²⁹ compared outcomes for women with a mean age of 21 years attending Group Antenatal Care to those attending standard care. The intervention described as the CenteringPregnancy model was facilitated by a nurse-midwife or obstetrician, and a trained group facilitator. The control group, who received standard antenatal clinic care with individual appointments, were matched by age, parity, race and past history of preterm birth. Significant outcomes included later gestation at birth and higher birth weight for preterm babies born to mothers in the intervention group compared to the control group.

A 2004 retrospective study³⁰ reported outcomes for three discrete groups of young women aged 11-17 years attending the same hospital at different points in time (1998, 2001, and 2001-2004). A CenteringPregnancy model was introduced in the hospital-based clinic during 2001-2004. The outcomes for women who received this type of care were compared with women who received standard antenatal clinic care in 2001, and women who received standard care in 1998 through the hospital antenatal clinic, a GP, or who received no antenatal care. The researchers reported a higher rate of antenatal attendance and breastfeeding at hospital dis-

charge, and a lower rate of preterm birth and low birth weight babies for women in the CenteringPregnancy group.

This study used historical comparison groups generated over six years (1998–2004). Changing hospital protocols, midwifery practices and other historical factors, however, may have influenced the results. Furthermore, the 1998 control group included women who received no antenatal care, which is an independent predictor for perinatal and neonatal morbidity and mortality.⁹ Including these women in the sample is likely to have resulted in poorer outcomes for standard care.

A 2007 multi-site randomised controlled trial (RCT) evaluated the effectiveness of CenteringPregnancy for women with a mean age of 20 years.³¹ The sample size was powered to detect a statistically significant difference in the rate of preterm birth between the intervention and control groups. The intervention was well-defined and implemented according to CenteringPregnancy guidelines with groups facilitated by the same midwife or obstetrician throughout the antenatal period. Women randomised to CenteringPregnancy care were less likely to receive inadequate antenatal care according to the Kotelchuck Index,³² less likely to experience a preterm birth, and more likely to initiate breastfeeding.

Despite randomisation the control group was significantly different to the intervention group which contained a higher proportion of African American women; however this was controlled for in the statistical analysis. Data were generated by independent medical abstractors who were blinded to the model of care which limited the potential for bias.

Similar results were found in a 2009 prospective observational study¹⁹ that included young African American women (98%) with a mean age of 21 years accessing a CenteringPregnancy model of care. The sample included similar numbers of young women in the intervention group and the control group. The intervention group received Group Antenatal Care from known midwives at a community-based clinic. The control group received individual midwifery visits with the same group of midwives at the same community venue during the same time period (2004–2006). The researchers reported statistically significant improvements in antenatal attendance and breastfeeding at hospital discharge for the intervention group, but no differences for other outcomes.

It could be argued the sample size was too small ($n = 317$) to detect a statistically significant difference in preterm birth, a power calculation would have been needed to determine the sample size for this outcome.³¹

Young Women's Clinic

A total of four studies were retrieved, two of which were undertaken in the UK,^{33,34} one in the USA²⁰ and one in Australia.²¹ The four studies involved very different models of care. These differences included setting, protocols, staff training, continuity of antenatal carer, multidisciplinary input, and level of access to allied health professionals.

A 2001 retrospective case-controlled study²⁰ compared outcomes for young women aged 13–18 years who received antenatal care through multi-disciplinary Young Women's Clinics or standard adult clinics in the USA. This multi-site study involved two intervention groups both of which offered a similar model of care. Participants in the control group accessed standard care from the adult antenatal clinics in

either of the two participating hospitals. Controls were matched on a least half of the following variables: age, parity, out-of-home status, past juvenile justice involvement, history of depression, illicit drug use, history of abuse, ethnicity, and trimester of entry into antenatal care. The researchers reported outcomes in two ways: analysis of each young women's clinic compared with the adult antenatal clinic in the same hospital, and analysis of both the young women's clinics compared with both adult clinics. For the latter comparison, the authors reported differences in attendance, mode of birth, neonatal birth weight, and breastfeeding.

The major limitation of this study was the small sample size which was further sub-divided into four comparison groups. The researchers attempted to find case controls on nine identified risk variables, but noted difficulties in matching cases beyond a small number of variables. Reasons for attrition were well described and reflect the typical characteristics of the pregnant adolescent population i.e. transience, preference for traditional care, being uncontactable and loss to follow up. The challenges encountered by this study could remind future researchers to anticipate higher attrition rates when designing studies involving young women.

A 2002 UK retrospective cohort study³³ used concurrent controls to analyse outcomes for women aged 16 years and under who birthed at a metropolitan hospital during 1996–1999. The intervention group attended a "Teen Clinic" where they accessed care from a known midwife in an "informal setting" that offered drop-in appointments. The control group accessed standard hospital-based care. Significant differences were reported for women in the intervention group in terms of lower rates of preterm birth and caesarean birth compared with women in the control group.

The "Teen Clinic" participants self-selected to attend either the non-standard, or the standard, antenatal clinic. Demographic differences between these two groups were not described or analysed, therefore potential confounding variables were not controlled for in the analysis. This problem was compounded by the small sample size ($n = 113$), which made it difficult to detect any statistically significant differences.

A 2004 Australian multi-centre prospective study²¹ compared outcomes for women aged 16–17 years who accessed care from a community-based dedicated Young Women's Clinic compared to a standard antenatal clinic. The intervention group received comprehensive care within the context of a multi-disciplinary, hospital-based Young Women's Clinic, which had additional protocols for sexual health, psychosocial issues, and drug use. Women attending the Young Women's Clinic had lower rates of threatened preterm labour, preterm prelabour prolonged rupture of membranes, and preterm birth compared with women using the standard antenatal clinic. They were more likely to be discharged home on contraception; Pap smear and sexually transmitted infection screening rates were also substantially higher.²¹ Psychosocial risk factors (e.g. domestic violence and homelessness) were significantly more likely to be assessed in the Young Women's Clinic compared to standard care.

While the participants were not randomised, no statistically significant differences were reported between the intervention and control groups on socio-economic and other risk factor variables that are commonly identified as confounding (e.g. smoking, body mass index). These results suggest that a Young Women's Clinic model that provides

more comprehensive sexual health and psychosocial screening than standard care, can improve maternal and neonatal health outcomes.

A 2007 UK retrospective cohort study³⁴ used historical controls to compare the outcomes for young women aged 11–17 years who received standard antenatal clinic care in 2001 compared to young women who received care through the “Young and Pregnant” clinic. The intervention group received antenatal care from a named midwife and/or obstetrician in a community-based clinic compared to the intervention group who received standard antenatal care from staff in the hospital antenatal clinic. Significant differences were reported on the following measures for the intervention group: a higher rate of spontaneous onset of labour, a lower rate of low birth weight babies, and a higher rate of breastfeeding and use of contraception.

This study used a self-selecting control group which the researchers matched by age and smoking status only. This meant that other confounding variables, which might be expected to affect outcomes (e.g. ethnicity, parity), were not controlled for in the analysis.

Discussion

Many of the studies did not report on antenatal visit attendance, or did not report it well. Group Antenatal Care was the only model to demonstrate an association with improved antenatal visit attendance in three^{19,30,31} of the four studies. Antenatal visit attendance is associated with improved outcomes for women and newborns; therefore the association between Group Antenatal Care and improved antenatal attendance is a clinically significant finding.

It is difficult to draw firm conclusions about the affect of model of care on mode of birth as many studies did not report on this outcome. The one study of MGP²⁶ reported a higher than average rate of normal vaginal birth (85%), which is impressive but not surprising as these women were low risk and gave birth in settings associated with higher rates of normal vaginal birth i.e. birth centre and at home.²⁶ Only one³⁰ of the four studies^{19,29,31} of Group Antenatal Care reported on mode of birth, and it reported no significant difference in the rate of caesarean section. One study²⁰ of Young Women’s Clinic found a significantly lower instrumental and caesarean section rate in the intervention group, however confidence in this finding is limited by small numbers, as only five women experienced instrumental or surgical birth in the intervention group.

There is reasonable evidence to suggest that how maternity care is provided to young women can affect the incidence of preterm birth. The one study of MGP²⁶ presented a lower rate of preterm birth (5%) for young women in MGP than the national UK average (7.6%),²⁷ which is an unexpected finding given that teenage women tend towards a higher than average rate of preterm birth. Two^{30,31} of the four studies of Group Antenatal Care, along with two^{21,33} of the four studies of Young Women’s Clinic reported a significantly lower preterm birth rate for the intervention group. Preterm birth has been historically impervious to prevention strategies, but there is now growing evidence that the model of maternity care can make a significant difference for those most at risk, such as pregnant adolescents. This is an area for future research through randomised controlled trial.

None of the reviewed studies demonstrated a clear association between how maternity care is provided and the incidence of low birth weight babies. It is unexpected and surprising that the rate of low birth weight babies for young women in MGP was similar to the UK average for all women (7%),²⁸ as it would tend towards being higher for young women. Three of the four studies^{19,29,31} of Group Antenatal Care reported no significant difference in the incidence of low birth weight babies. The one study³³ of Young Women’s Clinic that found a significant difference on this measure is unreliable because it did not account for confounding factors that influence birth weight. These factors include maternal smoking, gestation at birth, maternal body mass index, and antenatal care attendance.²¹

The majority of the reviewed studies did not report on the rate of admission to NICU. The RCT of Group Antenatal Care found no significant difference on this outcome between the intervention and control groups,³¹ which is surprising given that there were significantly higher numbers of preterm births in the control group. The two studies^{33,34} of Young Women’s Clinic that reported on this outcome found no significant difference.

There was diversity in reporting of breastfeeding outcomes in the reviewed studies. The MGP study²⁶ reported a high rate of breastfeeding initiation and breastfeeding at 28 days postpartum. Confidence in the latter finding is limited, however, by the design of the model which restricted home-based postnatal care to women living in the hospital’s inner-city catchment area. The majority of Group Antenatal Care studies^{19,30,31} reported higher rates of breastfeeding initiation, or breastfeeding on hospital discharge, for women in the intervention groups. Two studies of Young Women’s Clinic reported on breastfeeding outcomes. The prospective cohort study²¹ found no significant difference in rates of breastfeeding initiation while the retrospective study³⁴ reported higher rates of breastfeeding at 28 days postnatally for the intervention group. Future research of breastfeeding outcomes could measure longer-term breastfeeding data.

Limitations

The limitations of this literature review centre on the eligibility criteria. Only English-language articles were reviewed which excluded many studies published by researchers in the developing and non-English speaking world. Only studies which included a midwife in the maternity care intervention were included; this excluded several US studies with nurses as the primary caregivers. This could be considered an unnecessary restriction which was informed by a personal bias towards, and interest in, midwifery care for pregnant women. This review was primarily interested in maternity care for teenage women; however the search terms and eligibility criteria referred to women in the upper and lower limits of adolescence (11–12 years and 20–21 years). This could be considered a weakness as women aged at these outer limits are not, strictly speaking, teenage women, and may not necessarily have the same vulnerabilities and risk factors.

Conclusion

Does the way maternity care is provided affect maternal and neonatal outcomes for young women? The research analysed

in this paper suggests that it does. There is some evidence from one study that MGP can make a difference for young women but there is a dearth of literature about this. The strongest evidence demonstrating the benefit of a non-standard model of care for young women comes from one RCT and two prospective cohort studies of Group Antenatal Care. This evidence suggests Group Antenatal Care is associated with higher antenatal attendance, lower preterm birth and higher breastfeeding initiation. There is growing evidence from several retrospective studies and one prospective cohort study that a multi-disciplinary Young Women's Clinic may also improve antenatal visit attendance and reduce preterm birth.

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CHAPTER 3:
RESEARCH DESIGN AND METHODOLOGY

3 INTRODUCTION

This chapter describes the research design and methodology that guided the conduct of this research project. Section 3.1 describes the research aim, question and objectives. Section 3.2 outlines the mixed methods research design applied to this project. Section 3.3 explores the methodology of critical-pragmatism and how it was applied in this research project. Section 3.4 describes the ethical considerations relevant to this population who may be considered as vulnerable, both as young people and as pregnant women. Section 3.5 describes the researcher's reflexivity and how it informed the analytical and interpretive processes. Section 3.6 provides a conclusion to this chapter.

3.1 AIM AND OBJECTIVES

The aim of this research project was to generate evidence to inform the provision of maternity care for young women. The research question was: *(How) does the way maternity care is provided affect the health and well-being of young women and their babies?* In order to effectively answer this question, three objectives were developed:

- 1) To determine whether non-standard maternity models of care were associated with improved perinatal outcomes for young women and their babies
- 2) To determine the feasibility of a large scale randomised controlled trial of caseload midwifery versus standard care for young women
- 3) To critically appraise the experiences of young women and midwives within the caseload midwifery model of care

To address the first objective, quantitative research methods were used to identify and measure variables (Harris, 2004) in order to examine any potential association between model of maternity care and perinatal outcomes. This objective was met through a structured literature review (Chapter 2), and a cohort study (Chapter 5). The second objective was addressed through the conduct of a feasibility RCT and analysis of recruitment data (Chapter 4). To address the third objective, qualitative research methods were used to generate data followed by a critical interpretation of the meanings young women and midwives ascribed to their experiences, and the underlying "social structures

and processes that shape(d) these meanings” (Popay, 1992, p. 100). This objective was met through the conduct of a critical, ethnographic study that involved interviewing young women and midwives in the caseload midwifery model (Chapter 6).

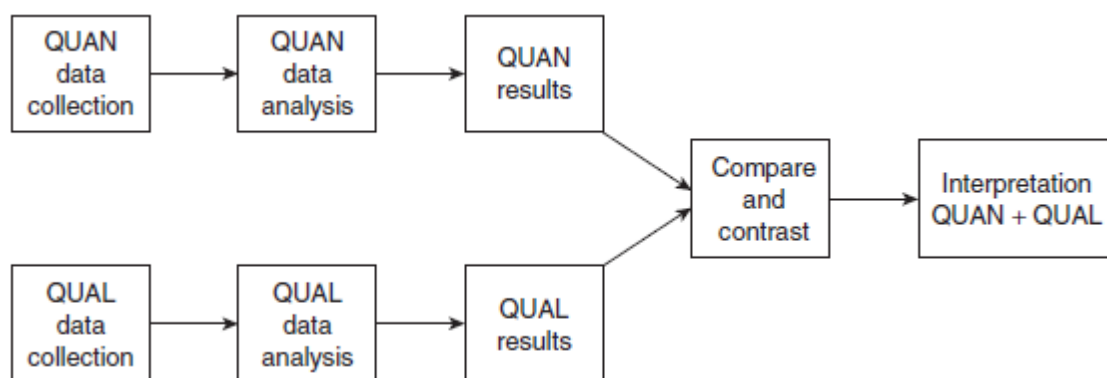
3.2 MIXED METHODS RESEARCH

Mixed methods research includes use of a specific study design, the collection and analysis of both quantitative and qualitative data, and the integration of two or more data sources (Creswell, 2012). This section will describe how these elements were applied in this research project.

3.2.1 TRIANGULATION DESIGN: CONVERGENCE MODEL

Mixed methods was chosen because it enabled the researcher to look at phenomena from different perspectives in order to enhance appreciation and understanding of these phenomena (Jick, 1979). There are four major types of mixed methods design (Triangulation, Embedded, Explanatory and Exploratory); and numerous variations of each major design type (Creswell & Plano Clark, 2007). Explanatory and exploratory designs are sequential; each phase of the study builds on the previous phase (Creswell & Plano Clark, 2007). In triangulation design models, however, the phases are merged in order to compare quantitative and qualitative results (Fetters, Curry, & Creswell, 2014). Within the triangulation design (convergence model), adopted here, the quantitative and qualitative research components occurred fairly simultaneously; see Figure 1 (Creswell & Plano Clark, 2007, p. 63).

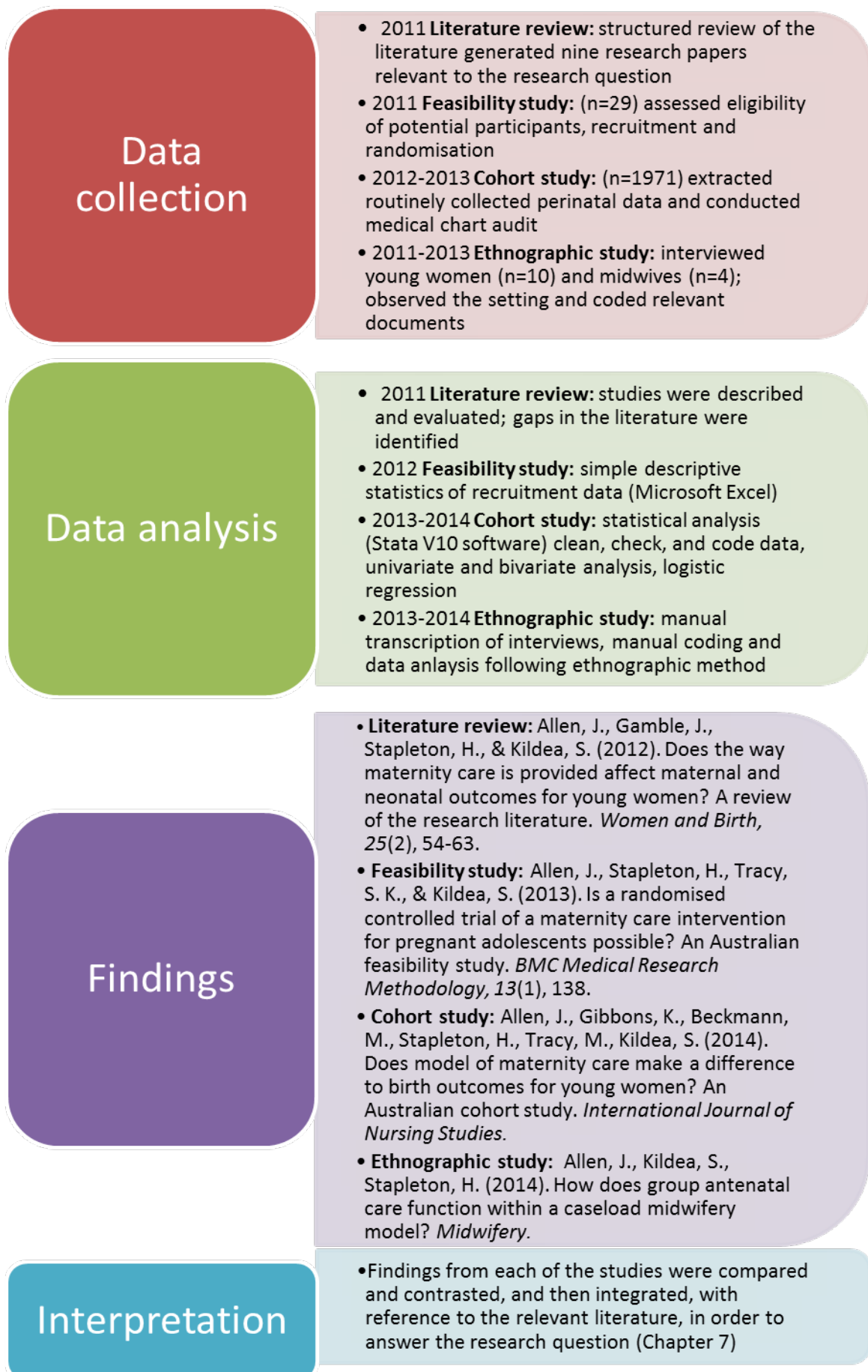
FIGURE 1 TRIANGULATION DESIGN: CONVERGENCE MODEL



This meant that the findings from one component did not inform the conduct of the other components. Triangulation is a well-established research technique whereby data collection and analysis is approached by different methods in

order to strengthen the credibility of the findings (Morse, 1991). The quantitative and qualitative findings were granted equal, but different, significance within the overall research project (Brannen, 2004; Creswell & Plano Clark, 2007). The individual research components of this project are depicted in Figure 2.

FIGURE 2 RESEARCH PROJECT DESIGN



3.2.2 COLLECTION AND ANALYSIS OF QUANTITATIVE AND QUALITATIVE DATA

Quantitative and qualitative data were collected and analysed independently, in accordance with the research question and method that generated the data (Brannen, 2004). This meant that quantitative data were collected and analysed using appropriate statistical methods as described in Papers 2 and 3.

Qualitative data were analysed using appropriate critical-interpretive methods as described in Paper 4. This chapter, therefore, does not repeat the methods of the individual research components because these are described in the published/submitted papers (Chapters 2, 4, 5, 6).

3.2.3 INTEGRATION OF TWO OR MORE DATA SOURCES

In triangulation design (convergence model) integration occurs at the stage of results interpretation. Integration and critical interpretation of the knowledge generated by both quantitative and qualitative modes of enquiry occurs in order to best answer the research question (Creswell & Plano Clark, 2007).

Integration enables the “fitting of the results from each study into a cohesive and coherent outcome or theory” (Morse, 1991, p. 121). Integration enabled the results of the quantitative components to be contextualised, validated and understood in more depth than would otherwise be possible (Collins, Onwuegbuzie, & Sutton, 2006). Further, it enabled the researcher to develop a theoretical model to explain how models of maternity care affect health outcomes for young women and their babies.

The integration process involved highlighting and comparing the key findings from each component of the project. Concepts were generated when there was interaction between key quantitative and qualitative data either around the same topic (e.g. first booking visit), or in such a way that the qualitative findings could assist with explaining the quantitative outcomes. Convergent findings strengthened confidence in the overall research conclusions, while divergent ones pointed to “unseen contextual factors” that would otherwise have been missed (Jick, 1979, p. 608). Integration was conducted using a ‘weaving’ narrative approach whereby both quantitative and qualitative findings were woven together on a concept-by-concept basis (Fetters, et al., 2014). Relevant theoretical and/or research literature was retrieved and woven into integrated findings in order to contextualise and justify them. The integration and interpretation of findings are presented in Chapter 7.

3.3 METHODOLOGY

Pragmatism is commonly adopted as the methodology of choice for mixed methods research (R. B. Johnson, Onwuegbuzie, & Turner, 2007; Teddlie & Tashakkori, 2012). First, this section will outline the philosophy of pragmatism and how it applies to mixed methods research. Next, it will provide a brief critique of pragmatism by introducing 'critical pragmatism' which was the methodology used in this project.

3.3.1 PRAGMATISM

Philosophers Charles Peirce (1839-1914) and William James (1842-1910) developed the theory of pragmatism which was modified by their peers including John Dewey (1859-1952) and more recently Richard Rorty (1931-). Pragmatism holds that meaning and truth are discovered by the application of an idea to an action that has observable, practical outcomes; if it works it is true (W. James, 1980). Thus, pragmatism is concerned with the consequences of actions rather than formal theories, principles or intentions behind actions (Forester, 2013). Pragmatists focus on solving practical problems in the 'real world' in order to produce results that are useful in the context of peoples' lives (Creswell & Plano Clark, 2007; Felizer, 2010; Forester, 2013).

3.3.2 PRAGMATISM AND RESEARCH

Pragmatic researchers pose and attempt to answer specific research questions with whichever research method "offers the best chance to obtain useful answers" (R. B. Johnson & Onwuegbuzie, 2004, p. 18). According to pragmatism, researchers do not need to make a choice between an inductive-subjective-contextual approach and a deductive-objective-generalising approach (Evans, Coon, & Ume, 2011). Pragmatism offers a third way through an abduction-intersubjectivity-transferability approach (Morgan, 2007): "reason moves back and forth between induction/deduction and subjectivity/objectivity, just as practicing researchers actually do" (Evans, et al., 2011, p. 277). Pragmatism encourages mixed methods researchers to identify the methodological assumptions and select the research methods that best fit the research questions and the researcher's persuasions and strengths (Teddlie & Tashakkori, 2012). I initially chose pragmatism as a methodology because I was

conducting a mixed methods study. Nevertheless, as a researcher with a background in critical theory, pragmatism did not quite fit.

3.3.3 CRITICAL PRAGMATISM

Pragmatism has been criticised, particularly by the Frankfurt School of Critical Theorists, as being apolitical and amoral (a “crude apology for the status quo”); pragmatic researchers have been admonished for being “decidedly unsuspecting about structures of power” (Kadlec, 2006, p. 525). Pragmatism has also been accused of being anti-foundational which means it is not interested in universal values like ‘truth’, ‘goodness’ or ‘moral rightness’ (Kadlec, 2006). Instead pragmatists accept phenomena at face value and evaluate them according to values of “efficiency, expediency and predictability” (Kadlec, 2006, p. 528). This can mean just “getting things done” (Forester, 2013, p. 18) rather than being overtly focussed on structural or revolutionary change (R. B. Johnson & Onwuegbuzie, 2004). This is where methodology becomes a political as well as a practical choice. Pragmatic values have been identified as conservative, embedded within the prevailing cultural associated with consumerism and business culture (Kadlec, 2006). In order to be “explicit about how researchers can address issues of social justice” (Teddlie & Tashakkori, 2012, p. 781) one must look to the approach offered by ‘critical pragmatism’.

3.3.4 CRITICAL PRAGMATISM AND RESEARCH

Critical pragmatism is an approach with a “radical political spirit” that provides a methodological foundation for those researchers who wish to take account of, and transform, existing social relations and power structures (Vannini, 2008). Pragmatism and critical pragmatism share a number of methodological assumptions; both reject dualism (subjectivity versus objectivity) and reductionism, view knowledge as dynamic (both constructed and based on reality), endorse pluralism (multiple means of collecting and analysing data) and practical theory (theory which is relevant to the extent it can inform practice) (R. B. Johnson & Onwuegbuzie, 2004). Critical pragmatism accepts these assumptions and adds others addressing issues of social justice for marginalised people (Creswell, 2003; Vannini, 2008). Critical pragmatism looks beneath the surface of phenomena to recognise the existence of power relations and how they may manifest and operate, leading to inequalities, misrepresentations, exaggerations and information withholding (Forester,

2013). Research informed by critical pragmatism focusses on “the relations of power and authority that can make alternative frames and knowledge claims more or less plausible” (Forester, 2013, p. 10).

Research which uses a critical-pragmatic approach has the potential to “change the lives of the participants, the institutions in which individuals work or live, and the researcher’s life” (Creswell, 2003, pp. 9-10). Where pragmatism fails to provide a satisfactory answer to the question “for *whom* is a pragmatic solution useful?” (Mertens, 2003, italics added); critical pragmatism answers: the solution must be useful to those people who are marginalised.

Critical pragmatism has been adopted as the theoretical framework for this research project. This means that the research is primarily motivated to find pragmatic solutions to the problems identified in the literature that are, first and foremost, *in the best interests of young women*. How the critical methodology informed the qualitative data analysis is described in Paper 4.

3.4 ETHICAL CONSIDERATIONS

All phases of the research project were approved by the relevant Hospital Human Research Ethics Committee (HREC 1553M) and the University Human Research Ethics Committee (HREC Q2011-69); see Appendix 2. According to the Australian National Statement on Ethical Conduct in Human Research, the participants included in this research project required additional ethical consideration because they were both: (i) women who were pregnant and (ii) children and/or young people (National Health and Medical Research Council, 2007). As with all research with human participants, the well-being of the pregnant woman and her fetus “always takes precedence over research considerations” (National Health and Medical Research Council, 2007). When pregnant participants are also children and/or young people, this raises additional ethical concerns including: their ability to sufficiently understand the research process in order to provide consent to participate, their susceptibility to be coerced by parents, researchers or authoritative others to participate, and a potential for conflict between the values of parents and their child/ren (National Health and Medical Research Council, 2007).

Young pregnant women aged less than 18 years were included in this research project. It was considered that participation of pregnant and parenting adolescents in the research presented negligible risk for themselves and their babies. Furthermore, the exclusion of adolescents was not ethically justifiable, not least because women under 18 years have increased medical and psychosocial risks that may benefit from models of maternity care designed to meet their specific needs (Allen, et al., 2012). Caseload midwifery may be one such model; however its efficacy and suitability for young women needed to be tested. Therefore women less than 18 years were invited to participate in the feasibility RCT (see Appendix 3, Participant Information Sheet and Consent Forms). Women aged 14 years or younger were required to have parental consent to participate. For the ethnographic study, the focus groups provided young women (aged 16-21 years) the opportunity to provide feedback and hence to shape future service provision to better meet the needs of their peer group (see Appendix 4, Participant Information Sheet and Consent Forms).

3.5 REFLEXIVITY

Reflexivity is a fundamental qualitative research strategy (Seale, Gobo, Gubrium, & Silverman, 2004) and an important component of ethnographic research (Atkinson & Hammersley, 1998). Reflexivity has been described as a “confessional account of methodology or as examining of one’s own personal, possibly unconscious, reactions. It can also mean exploring the dynamics of the researcher-researched relationship and how the research is constituted” (Finlay, 2002, p. 531).

Through critical self-reflection, I identified important personal values and assumptions that could potentially affect the research process (Holloway, 2005; Walker, Read, & Priest, 2013); including how I interacted with participants and interpreted the data (Grbich, 1999). Clarifying researcher values, and reporting them, assists readers to judge the trustworthiness of the study’s findings when they are published (Lambert, Jomeen, & McSherry, 2010). This enabled me to become conscious of previously unconscious assumptions and motivations (e.g. wanting the caseload model to be seen as effective). Prior to commencing this research I engaged in a reflective process by responding to a series of personal questions (Etherington, 2004), which are presented below (Sections 3.5.1 – 3.5.3).

3.5.1 HOW HAS MY PERSONAL HISTORY LED TO INTEREST IN THIS TOPIC?

I was educated as a direct-entry midwife in New Zealand and gained the majority of my early clinical experience working there alongside caseload midwives (2000-2002). Following my return to Australia, I held two positions as a caseload midwife in an integrated birth centre (2003-2004) and in a free-standing birth centre (2007). I then joined the Young women's Midwifery Group Practice (YMGP) as a caseload midwife (2008). Helping to establish a new caseload midwifery service for pregnant adolescents was an exciting opportunity; however I resigned from my position as a YMGP midwife after just nine months in the role. My (generally unhappy) experience over those nine months generated my interest in the research topic.

My subject-position as a resigned YMGP midwife created two challenges when planning to interview midwives who were currently employed in the YMGP. Firstly, I was concerned that the midwives may be less forthcoming if they perceived I was judgemental about the YMGP model; as evidenced perhaps by my resignation. Fortunately, perhaps, none of the YMGP midwives currently employed at the time of this research project, and who were therefore eligible to be interviewed, were my colleagues during my period of employment. Secondly, my personal and generally negative experience of having worked in the model may have prompted me to be overly 'interventionist' as a facilitator during the focus group (FG) (for example by asking leading questions) (Macnaghten & Myers, 2004). These challenges were managed by utilising one of my academic supervisors to lead the midwives FG, while I took a supportive role in recording interaction data and writing field notes during the interview. I am not sure this was as effective as it could have been, as the data generated were a little 'thin', most likely because my supervisor lacked the in-depth knowledge about the history of the YMGP and hence was not well positioned to probe beneath surface responses.

3.5.2 HOW AM I POSITIONED IN RELATION TO THIS KNOWLEDGE?

I am a white, middle-class, Australian single mother. My passion for normal birth and home birth led me to NZ to be educated as a direct-entry midwife, before this option was available in Australia. New Zealand midwifery education is based on the concept of a 'partnership model' and this has shaped what I value in midwifery practice, including the midwife-woman partnership and shared

decision-making (Guilliland & Pairman, 2010). My education and experience in midwife-led settings has led to a deep appreciation of normal birth and an aversion to routine clinical interventions in maternity care. By identifying these personal values I have endeavoured to remain open to the meanings and explanations offered by the participants, rather than uncritically coding their utterances with respect to my beliefs and values.

My subject position is explicitly critical and feminist. Critical feminism cautions qualitative researchers that “experience is at once always already an interpretation *and* in need of interpretation” (J. Scott, 1991, p. 779). Thus, I wanted to do more than attempt to un-problematically reproduce the participants’ understandings of themselves and their experiences. I wanted to address the power structures that create the context for midwives and adolescents’ experiences (Olesen, 1994).

3.5.3 WHAT ARE MY PRESUPPOSITIONS ABOUT KNOWLEDGE IN THIS FIELD?

I had formed beliefs about the YMGP model through my previous employment as a YMGP midwife. For example, I believed that group antenatal care was not being conducted effectively and that the group was operating more like a team-model rather than a caseload model (e.g. getting to know all the pregnant women through group antenatal care, rather than getting to know one’s own caseload of women through one-to-one visits). My previous engagement with the topic, prior to conducting this research, was not necessarily an impediment however, as it brought a deeper level of awareness which drove more probing questions that could be explored with participants (Holloway, 2005).

During data analysis, I needed to diligently keep checking the raw data and re-confirm that my interpretations were grounded in these data and consistent with the available research literature. One important element, based on my reflexive process, was to re-read the data that I had *not* coded to detect for any thematic bias that may have led to its exclusion. Additionally, my academic supervisors read the coded transcripts and prompted me to reflect on my assumptions including the inclusion and exclusion of certain datum.

3.6 CONCLUSION

This chapter has both described and justified the use of a mixed methods research design underpinned by the methodology of critical pragmatism. The

specific research triangulation design (convergence model) was described. This chapter explored the ethical implications and considerations when working with pregnant adolescent participants. Reflexivity is an essential strategy that I used to raise my awareness and become mindful of how my thoughts, beliefs, feelings and experiences may have shaped how I approached the research process. The following findings chapters (4-6) will provide a brief introduction to the published/submitted papers, followed by the papers themselves. Each paper details the discrete research methods used to conduct the individual research components, and thus specific quantitative and qualitative research methods have not been described in this chapter.

CHAPTER 4:
FEASIBILITY RANDOMISED CONTROLLED TRIAL

4.1 RATIONALE

The literature review concluded that, due to the dearth of robust studies on the efficacy of caseload midwifery for young women, a prospective study was needed. At this time the research site was part of a multi-centre RCT of caseload midwifery for women of 'all risk': the M@NGO study (Tracy, et al., 2013). The eligibility criteria for the M@NGO study excluded women aged less than 18 years. This provided ideal conditions to conduct a parallel feasibility RCT with women aged 17 years and younger who were not eligible for the M@NGO study. A feasibility study is research that is done before a main study in order to answer the question: 'can this study be done?' (National Institute of Health Research, 2014). A feasibility study could be considered an essential pre-requisite prior to the conduct of a large, expensive, full-scale study (Thabane et al., 2010).

4.2 SIGNIFICANCE

The feasibility study enabled the assessment of processes, resources, management and to calculate the statistical power needed for a main study (Thabane, et al., 2010).

Processes that were evaluated included the adequacy of eligibility criteria (sufficient or too restrictive) (Thabane, et al., 2010) and recruitment parameters (rates of recruitment, retention, refusal, and cross-over) (Arain, Campbell, Cooper, & Lancaster, 2010). The recruitment parameters were then used to assist in the sample size calculation for the main study (Arain, et al., 2010). Because feasibility studies are not statistically powered (Arain, et al., 2010) the main outcome of interest (preterm birth) was not assessed.

The feasibility study highlighted processes which hindered recruitment. In clinical settings, close and on-going collaboration between health professionals and researchers is essential to successful recruitment; whereas 'clinician gatekeeping' negatively affects recruitment (Newington & Metcalfe, 2014). Information about the study was discussed with relevant staff during team meetings and provided in written form through a Staff Information Sheet (Appendix 3). While the hospital managers and senior clinicians were keen for the study to be conducted, the YMGP midwives did not appear to be. Paper 2

explores the why these midwives may have been motivated to act as a barrier to a trial of caseload midwifery for young women.

Because recruitment was so low, research management issues, including the suitability of data collection tools and outcome measures (Arain, et al., 2010), were not able to be assessed. Nor could estimates of treatment effect and variance in treatment effect be made (Thabane, et al., 2010).

The feasibility study included randomisation of participants because it was important to assess whether the idea of being randomised was acceptable (Lancaster, Dodd, & Williamson, 2004), particularly to this population of pregnant women. One of the main reasons people participate in research is altruism (Newington & Metcalfe, 2014), which develops during childhood and becomes stronger as children move towards older adolescence (Fehr, Rutzler, & Sutter, 2011). Adolescents however, are renowned for being difficult to recruit to research studies. Barriers to recruitment can be, and indeed should be, described and assessed in the context of a feasibility study; this may provide for suitable modifications to the research protocol before the main study. Barriers to recruitment, and other obstacles identified in the feasibility study, may be of such magnitude as to render a larger (main) study impractical. The publication of this 'failed' feasibility study (Allen, Stapleton, Tracy, & Kildea, 2013), is actually "a success – because (it has) avoided wasting scarce resources on a study destined for failure!" (Thabane, et al., 2010, p. 6). The publication (Paper 2) is provided in its entirety here.

RESEARCH ARTICLE

Open Access

Is a randomised controlled trial of a maternity care intervention for pregnant adolescents possible? An Australian feasibility study

Jyai Allen^{1,2*}, Helen Stapleton^{1,2}, Sally Tracy^{3,4} and Sue Kildea^{1,2}

Abstract

Background: The way in which maternity care is provided affects perinatal outcomes for pregnant adolescents; including the likelihood of preterm birth. The study purpose was to assess the feasibility of recruiting pregnant adolescents into a randomised controlled trial, in order to inform the design of an adequately powered trial which could test the effect of caseload midwifery on preterm birth for pregnant adolescents.

Methods: We recruited pregnant adolescents into a feasibility study of a prospective, un-blinded, two-arm, randomised controlled trial of caseload midwifery compared to standard care. We recorded and analysed recruitment data in order to provide estimates to be used in the design of a larger study.

Results: The proportion of women aged 15–17 years who were eligible for the study was 34% (n=10), however the proportion who agreed to be randomised was only 11% (n = 1). Barriers to recruitment were restrictive eligibility criteria, unwillingness of hospital staff to assist with recruitment, and unwillingness of pregnant adolescents to have their choice of maternity carer removed through randomisation.

Conclusions: A randomised controlled trial of caseload midwifery care for pregnant adolescents would not be feasible in this setting without modifications to the research protocol. The recruitment plan should maximise opportunities for participation by increasing the upper age limit and enabling women to be recruited at a later gestation. Strategies to engage the support of hospital-employed staff are essential and would require substantial, and ongoing, work. A Zelen method of post-randomisation consent, monetary incentives and 'peer recruiters' could also be considered.

Background

The rising rate of preterm birth (the birth of an infant before 37 completed weeks of pregnancy) is a serious, complex and unresolved public health problem for which there are very few known preventative interventions [1]. Preterm birth is a leading cause of perinatal mortality, serious neonatal morbidity and moderate to severe childhood disability [2-5]. Although preterm births currently comprise 10% of all births internationally [6], they contribute to more than two-thirds of perinatal mortality (fetal loss and neonatal death) [4]. At

present there is an incomplete understanding of the mechanisms responsible for spontaneous preterm labour however multiple aetiologies and/or pathological processes are closely associated [3,5].

Idiopathic preterm birth correlates strongly with poverty and lower socio-economic status [7]. Pregnant adolescents are more likely to come from socio-economically disadvantaged backgrounds [8,9]. Maternal age of 17 years or less is considered an independent risk factor for preterm birth [10-14]; whether older teenagers 18–19 years of age are at increased risk of preterm birth is contested [15-17]. The effects of social deprivation on pregnant adolescents are cumulative and multifactorial; they directly affect perinatal outcomes including preterm birth [7]. These include smoking, alcohol and illicit drug use [8,18,19], family violence and/or intimate partner violence [20-22], social isolation [23,24], mental health

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issues including depression [8,25,26], poor nutrition and inadequate weight gain during pregnancy [25], genitourinary infection [27,28], and severe psychosocial stressors including low income, unemployment and housing issues [29] or homelessness [30]. These effects are compounded as teenage women tend to book for pregnancy care at a later gestation, attend fewer appointments or attend no antenatal care at all [31,32]. Both non-attendance and under-attendance of antenatal care are independently associated with poor perinatal outcomes including preterm birth [15,32].

Improving adolescent health requires improving the factors that make up young people's daily lives by addressing the risks and perhaps more importantly strengthening protective factors and resilience [33]. Targeted interventions to address modifiable risk factors for preterm birth have shown promising results, but more research through randomised controlled trial (RCT) design is required [34]. Two models of care demonstrate potential to reduce the preterm birth rate for this population; group antenatal care [34,35] and young women's clinic [30]. Whether caseload midwifery improves perinatal outcomes for adolescent women has not been tested [36].

The trademarked version of group antenatal care, "Centering Pregnancy", was designed specifically for socio-economically disadvantaged women including adolescents [37]. In this model groups of 8–12 pregnant women of similar gestation meet regularly for a two-hour facilitated discussion and clinical assessment within the group space [38]. A 2007 RCT of group antenatal care for young women (14–25 years) found it was associated with lower rates of "inadequate prenatal care" (as determined by the Kotelchuck Index [39]), and lower rates of preterm birth [35].

Young Women's Clinic (YWC) is a model that operates internationally and varies considerably. The key elements include a community clinic setting, multi-disciplinary involvement (including obstetric and allied health presence at the clinic), midwives with additional training, and staff consulting clinical guidelines for working with pregnant adolescents (e.g. sexual health, illicit drug use) [36]. A 2004 prospective cohort study demonstrated that YWC is associated with higher rates of routine antenatal attendance and lower rates of preterm birth (including preterm prelabour rupture of membranes and threatened preterm labor) for women aged less than 18 years [30]. These findings should be interpreted with caution however, given that participants were able to self-select either YWC or standard care [34].

A 2011 systematic review of midwife-led models of care (i.e. team midwifery and caseload midwifery) demonstrated that women who receive this type of maternity

care, experience improved maternal and neonatal outcomes without any adverse effects [40]. Caseload midwifery is provided by a small group of midwives who each provide care for a specific caseload of women on an on-call basis; there is an emphasis on providing a known carer in labour with all women having a named midwife [41]. While the systematic review included two RCTs of caseload midwifery; the mean age of participants was 27 years (SD 5 years) in both studies [42,43], hence the findings are not generalisable to the adolescent population. Midwifery group practice (MGP) is a common form of caseload midwifery in Australia (the terms will be used synonymously in this paper) whereby a small group of midwives provide continuity of care throughout pregnancy, birth and the postnatal period for four to six weeks following birth [41]. An Australian multi-centre trial of caseload midwifery, the Midwives at New Group practice Options (M@NGO) trial, was conducted from 2009–2011 [44]. The setting for this feasibility study was one of the sites for the M@NGO trial which included women of 'all-risk' status but excluded women aged 17 years or less. The M@NGO trial was not powered to detect a significant difference in preterm birth [44].

We hypothesised that care through a MGP, which incorporates strategies to address the risk factors associated with preterm birth into the one model of care, could decrease preterm birth in pregnant adolescents. We proposed that improving young women's access to regular, comprehensive antenatal care [35,45–50], and increasing their sense of trust and safety with their midwife [51–53], could affect their willingness to accept infection screening and treatment [30,54], to disclose high-risk behaviors or circumstances [30,55,56], and to adopt strategies which promote health and minimise harm to themselves and their babies [57,58]. Although MGP looked promising as an intervention, we were unsure if pregnant adolescents would agree to be randomised into a study as the literature on pregnant adolescent recruitment is scant; thus a feasibility study was conducted.

Methods

Study design and objectives

We have designed an un-blinded, two-arm, randomised controlled trial to analyse Preterm birth Risk for Adolescents in Midwifery group practice or Standard maternity care (PRAMS trial; main study). The primary objective of the PRAMS trial will be to determine whether the proportion of pregnant adolescents experiencing preterm birth less than 37 weeks gestation is similar for those receiving MGP care and those receiving standard care. The current feasibility study was designed to estimate important recruitment parameters needed for the

main study, rather than assess the outcome of interest [59,60]. The aim of the feasibility study was to assess the likelihood of recruiting women aged 17 years or less into a RCT of caseload midwifery. The objectives were to test the eligibility criteria, to assess the willingness of potential participants to be randomised and to generate recruitment data to assist in the calculation of the study population required for the PRAMS trial.

Participants

This feasibility study ran parallel to the M@NGO trial at site two, and recruited women who were ineligible for the M@NGO trial because of their age; otherwise similar eligibility criteria were used [44]. Eligible participants were all women who were 13–17 years of age, who booked for public maternity care at the study hospital, and were 23 weeks pregnant or less, with a single, live fetus at the time of recruitment. Exclusion criteria were maternal age 18 years or older, inability to provide consent (e.g. serious mental illness or lack of English fluency), residence outside of the hospital catchment area (because of the requirement for home visiting), 24 weeks gestation or greater, and multiple pregnancy.

Ethical aspects

The study received ethical approval from both the Hospital and University Human Research Ethics Committees (HRECs). The Australian National Statement on Ethical Conduct in Human Research recognises that children and young people have different levels of maturity and therefore capacity to make informed decisions about research participation; these levels are not attached to fixed ages [61]. Contemporary Australian law recognises that young women aged 15–17 years may be broadly categorised as “young people who are mature enough to understand and consent, and are not vulnerable through immaturity in ways that warrant additional consent from a parent or guardian” [61]. Women who could not demonstrate that they understood the implications of participation in the study, would have been excluded; however this situation did not occur. Young women aged 13–14 years were considered as competent to understand the relevant information, however their relative immaturity rendered them vulnerable thus, on the advice of the HREC, both participant and parental consent would have been sought; in the event there were no potential participants aged less than 15 years. The Consent Form included that the purpose of the study was to assess the feasibility of conducting a RCT with pregnant adolescents.

Setting

This Australian-based study took place at an inner-city, tertiary maternity hospital and its associated community-

based clinic. The hospital conducts approximately 5000 births for publicly-insured women annually. Women aged 17 years or less account for around 80 births (2%) per annum. The Young Mother's Partnership Program is an alliance between hospital staff (clinicians and allied health) and a local non-government organisation (NGO) that specialises in supporting pregnant and parenting young women and their families. The NGO provides a community clinic venue with peer support workers who provide assistance with identified needs including housing, income support, health and legal issues, and facilitates access to education and training. Two models of maternity care operate within this setting: MGP for young women (YMGP) and Young Women's Clinic (YWC); both provide care to women aged 20 years or less. All young women see an obstetrician routinely at 16–18 weeks of pregnancy at the community clinic.

Intervention and control groups

Women randomised to the intervention (YMGP) received antenatal, intrapartum and postnatal care from a known midwife. Women randomised to the control group were able to select any other available model of antenatal care including YWC, care with a general practitioner, or a community or hospital-based antenatal clinic. For a detailed description of the differences between YMGP and other models of maternity care, see Table 1.

Outcomes

The primary outcome measure for the PRAMS trial will be the proportion of women who experience preterm birth. The secondary outcome measures will include gestation, birth weight, mode of birth, Apgar score less than 7 at 5 minutes, breastfeeding initiation and at hospital discharge, admission to a separate neonatal nursery, length of maternal and neonatal stay.

The feasibility study outcomes included the proportion of participants who were eligible, willing to be randomised, withdrew from the study, were lost to follow up, and changed model of care (cross-over). The criteria for determining feasibility were eligibility and recruitment rates of 65% or more; which were based on rates achieved in the RCT of group antenatal care with young women [35]. Simple descriptive statistics were used to analyse the feasibility outcomes.

Sample size

For the PRAMS trial we calculate we would have 80% power to detect a 33% reduction in preterm birth ($p < 0.05$) with a targeted sample size of 1864 ($n=932$ in each group). A feasibility study is not powered to detect a statistically significant difference on any measure. With a six month recruitment period we estimated we could

Table 1 Differences between YMGP and other types of maternity care

	Intervention	Control
Model of maternity care	Young women's Midwifery Group Practice (YMGP)	Young Women's Clinic (YWC) GP shared care Antenatal clinic in the hospital or community outreach clinics
Booking appointment	YMGP midwife conducts a home visit	Rostered midwife conducts the booking visit in hospital or a community outreach clinic
Antenatal care	YMGP midwives provide group antenatal care in the community venue. Individual visits with the obstetrician or social worker at the community venue as part of routine care	Rostered midwife or doctor in the hospital antenatal clinic or community outreach clinics Referral to social worker if indicated
Antenatal education	Education is incorporated into the group antenatal care sessions; no separate classes	YWC clients can access specific 'active birth' classes for young women at community venue Young women in all other models of care can access standard classes at the hospital
After hours contact	YMGP midwife via mobile telephone; diverted to a back-up YMGP midwife when required	Rostered midwife via hospital telephone number
Intrapartum care	YMGP midwife in the hospital assessment unit or birth suite	Rostered midwife or doctor in the hospital assessment unit or birth suite
Inpatient postnatal care		Rostered midwife or doctor in the public postnatal ward
Outpatient postnatal care	YMGP midwife home visits for 4–6 weeks following birth Young women invited to the community clinic venue for a Postnatal Group	Rostered midwives provide two to three home visits until 10–14 days after birth for women in the hospital catchment area

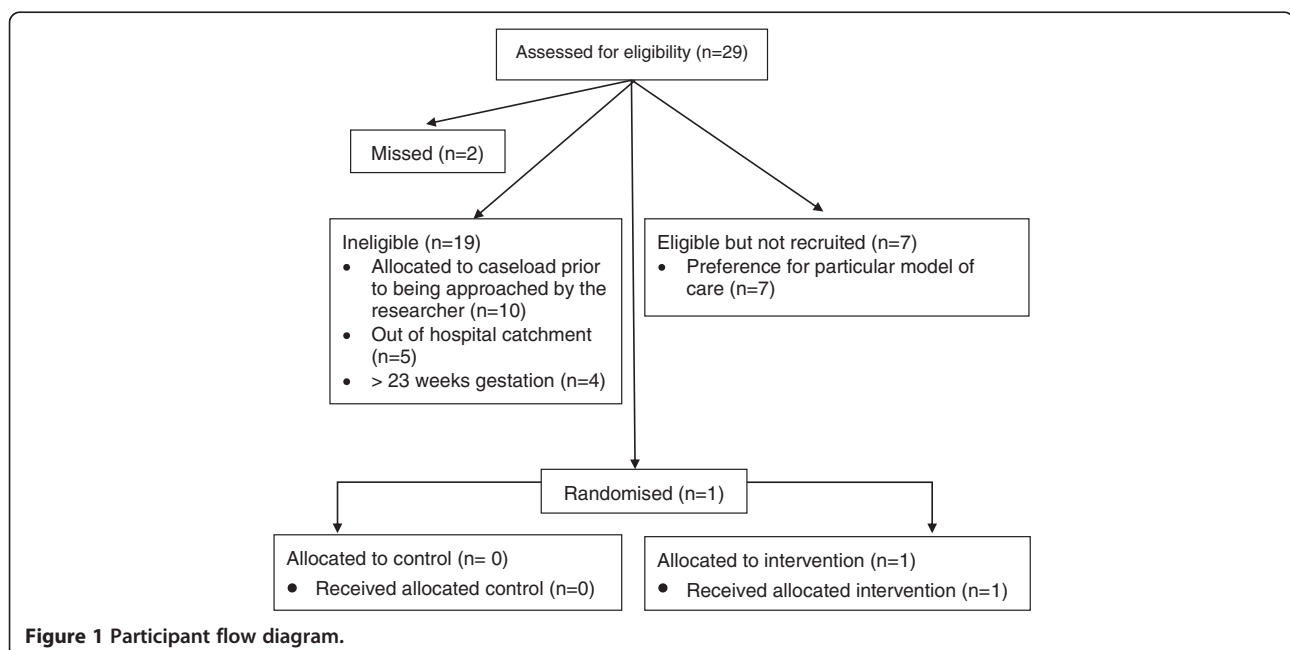
assess approximately 40 pregnant adolescents for eligibility and that 20 participants could be recruited.

Results

Recruitment

Recruitment occurred during October 2010 to March 2011. The flow of participants through each stage of

recruitment is described in Figure 1. The GP referral letter to the hospital was used to identify women who were eligible to participate. Eligible women received the routine letter of hospital acceptance and a brochure describing models of maternity care; with the addition of a M@NGO trial brochure. Telephone recruitment was the initial method used to approach participants.



Telephone recruitment

Approximately five days after the research information was posted to potential participants, the research midwife attempted to telephone them on three separate occasions. The telephone call aimed to ensure the study information was received, confirm eligibility, answer any questions, and offer participation in the study. If the woman gave verbal consent to participate, she was randomised to intervention or control using a random sequence of envelopes. Participant details were then entered on the research database. Women allocated to the intervention (YMGP) confirmed and formalised participation in the trial by giving written consent at the first booking visit (in the home). In the control group, written consent was obtained at the first booking visit in the hospital or community-based antenatal clinic. Women who refused to give written consent were excluded from the trial. Less than 20% ($n = 5$) were contactable by the telephone method described above. If women were un-contactable after three separate attempts, then the referral was returned to the administration office to make a first booking appointment with the YWC midwife. The researcher undertook a parallel process of face-to-face recruitment at the community clinic. This recruitment process described is similar to the method conducted successfully in the M@NGO trial [44].

Face-to-face recruitment

Most potential participants ($n = 22$) were approached by the research midwife at their routine obstetric visit. Women were given an opportunity to discuss the study and review the Participant Information Sheet and Consent Form. If written consent was obtained, women were randomised as per protocol. If women declined to participate, or were found to be ineligible, their reason for declining or ineligibility was recorded on the research database.

Outcomes

Twenty-nine young women aged 15–17 years were assessed for eligibility, 66% ($n = 19$) were deemed ineligible because they were: already booked into YMGP ($n = 10$), out of the hospital catchment area ($n = 5$), or more than 23 weeks gestation ($n = 4$). This resulted in only a small pool of eligible women ($n = 10$) of which 70% ($n = 7$) declined to be randomised, 20% ($n = 2$) were missed, and 10% ($n = 1$) were recruited; see Figure 1. All the eligible participants who declined to be randomised expressed a strong preference for a particular model of care: YMGP ($n = 4$), GP shared care ($n = 2$), or the antenatal clinic ($n = 1$). Two women were missed by the researcher because they were un-contactable by telephone and repeatedly did not attend their obstetric booking

appointment. Only one young woman was able to be recruited; therefore the proportion of women withdrawing, being lost to follow up, or crossing over from one model to the other was unable to be calculated due to the small sample size.

Discussion

Difficulty recruiting pregnant adolescents does not justify their exclusion from research [62], particularly when they are at higher risk of adverse perinatal outcomes including preterm birth. Health research with low-income pregnant participants suggests it is ideal to access a study population at least double the size of the intended sample [62]. For the PRAMS trial this would mean access to approximately 4000 pregnant adolescents. If the research protocol was used without modification and 4000 young women were screened for eligibility, approximately 1360 would meet the eligibility criteria (34%) and of those around 136 would be recruited (10%). This is clearly not feasible. An effective research protocol could be developed through modification of the eligibility criteria, recruitment strategies, and research design.

Eligibility criteria

The age of participants was limited to women 17 years or less, which typically accounts for a very small proportion of the pregnant population, including the adolescent pregnant population. This age limit was chosen because the feasibility study ran alongside the M@NGO trial, which included women 18 years and older and we did not want to threaten recruitment to M@NGO in any way. Including participants aged 19 years or less would double the pool of potentially eligible pregnant adolescents at this site.

A small proportion of women (14%, $n = 4$) were ineligible to participate because they were 24 weeks gestation or greater by the time they were approached about the research. Pregnant adolescents often book late for pregnancy care [32] and are more likely to be un-contactable by traditional methods for research follow up [45]. Therefore including participants at a gestation of 27 weeks or less would be useful to capture those women who book later for antenatal care. This would balance a gestation cut-off that is early enough to give participants time to be exposed to the intervention (YMGP) prior to birth. This is particularly significant for the PRAMS trial, as the primary outcome will be preterm birth (< 37 weeks gestation).

Four of the five most disadvantaged areas are outside the catchment area of this inner city hospital [63]. During the time of the trial women considered disadvantaged (e.g. young or Aboriginal and Torres Strait Islander women) were accepted to the hospital for

maternity care if they resided on the south-side of the city even if it was outside the hospital catchment area. However access to YMGP, with associated home visiting, was strictly limited to women in the hospital catchment area. This meant that 17% of young women ($n = 5$), who lived outside the designated area, were ineligible to participate. Flexibility regarding the hospital catchment area would increase the pool of the eligible young women in this study setting.

Recruitment plan

Telephone contact was chosen as a recruitment method for two reasons. Firstly, women allocated to YMGP receive their first booking visit in the home, and this is considered an important element of the intervention. Therefore randomisation ideally needed to occur prior to the first booking visit. Secondly, this method is effective in recruiting potential participants who do not respond to a written research invitation [64]. This was effective at our site in recruiting 18–21 year old women into the M@NGO trial; more than 70% had been contactable by telephone and approximately 50% were recruited over the telephone. Nevertheless, most women in the feasibility study were not contactable because mobile telephone numbers were not provided or were disconnected, or telephones were switched off, or telephone calls were simply not answered. Anecdotally, it is not uncommon for people to leave telephone calls unanswered when the telephone number displays as unknown or 'blocked' (which it does from any hospital extension number). When a similar problem was encountered in the M@NGO trial, the research midwives made contact through text message in the first instance and invited the women to telephone the researcher at the hospital. This successful strategy was not repeated here, due to ethical considerations and limited time resources. Ethical considerations included the potential to cause harm by leaving a text message that unintentionally alluded to an undisclosed adolescent pregnancy. While a fully-funded RCT, like the M@NGO trial, enabled a researcher to recruit every weekday, this unfunded feasibility study allowed one day per week for recruitment. Therefore the researcher was not able to reliably or promptly answer the phone calls of potential participants who may respond to a text message. Nevertheless, the use of text message to follow up potential research participants, after a research pack has been posted, could be considered as a modification for the PRAMS trial.

Prior to recruitment there was one meeting between the YMGP midwives, their manager, the lead obstetrician and the research team. The researcher then discussed study recruitment with the YMGP midwives at the community clinic on a weekly basis. The YMGP midwives

consistently expressed concerns that involvement in the study would result in young women being randomised out of their service. This was troubling to the midwives because they strongly believed that caseload care was the most appropriate model for pregnant adolescents. A 2002 Australian study of paediatric support for RCTs involving children, found that those clinicians with research experience were the most supportive, while those with a strong preference for a particular intervention hindered recruitment [65]. Thus, it is understandable that the YMGP midwives, who perhaps had little experience of research themselves and a strong personal investment in the intervention (YMGP), would not support the feasibility RCT. Furthermore, the midwives voiced concerns that if women were randomised to other models of care, then they would fail to meet their minimum caseload requirements, with imagined implications from management. Despite official management approval for the trial, there seemed to be lingering budgetary and job security concerns if the YMGP was not operating at full capacity. The notion that half of all women who met YMGP criteria and were willing to accept YMGP care would be randomised elsewhere, was understandably troubling to all staff who are invested in demonstrating a sustainable service. In this context, it is perhaps unsurprising that the YMGP midwives booked 34% ($n = 10$) potential participants into caseload midwifery care prior to the women being approached about the research.

Two other strategies that have demonstrated effectiveness in recruiting adolescents and/or women from minority groups to a RCT could be considered as protocol modifications. First, offering incentives to adolescents who complete postal research questionnaires is known to be an effective strategy, therefore monetary incentives to promote adolescent participation in a RCT could be considered [66]. A second strategy would be to train 'peer recruiters', other young women already enrolled in the trial, to disseminate information and discuss the research with other pregnant adolescents at the community venue. This method has showed promising results for increasing recruitment rates of other minority groups (i.e. Hispanic women in the United States) [66].

The randomised controlled trial design

Once young women were informed of their options for maternity care, the majority of eligible participants declined participation in the study so that they could choose their preferred model of care. The mothers of pregnant adolescents often play an important role in their daughter's decision-making processes [67], and some mothers voiced concerns about maternity care that was not provided by a doctor. Some young women didn't actually decline but rather became confused by

being presented with options for care that were then removed by randomisation. In addition to being young, pregnant adolescents tend to live with circumstances of socio-economic deprivation including poor educational opportunities and achievements [8,68]. Perhaps it is not surprising then, that the concept of randomisation for research purposes was difficult to understand and this became a barrier to participation in the study. A Zelen randomised consent design where eligible participants are randomly allocated to the intervention or control group prior to being approached about the trial or gaining consent should be considered. Those participants allocated to the intervention group are then approached and offered the intervention, which they can decline or accept; those allocated to the control group are also approached to participate [69]. This design has been used successfully in other trials of maternity care interventions [70-72], including those with pregnant adolescents [73]. Giving participants the opportunity to 'opt out' of the research, rather than 'opt in', has been shown to increase participation in survey research [74]; and could assist in increasing recruitment for the PRAMS trial.

Conclusions

Our study demonstrated that an RCT of caseload midwifery which exclusively recruited pregnant adolescents (aged 17 years or less) using the eligibility criteria, recruitment plan and post-consent randomisation method tested would not be feasible without modification. Eligibility criteria which include adolescent participants up to 19 years of age, with a gestation of up to 27 weeks, and more relaxed catchment boundaries, could increase the pool of eligible women. It would be useful to consider a Zelen method of post-randomisation consent where participants need to 'opt out' of the study, monetary incentives for participation, and employing 'peer recruiters' to address the recruitment barriers described.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

JA participated in the design of the study, conducted recruitment, interpreted data, and drafted the manuscript. HS assisted with data interpretation and has been involved in critical revisions of the manuscript. ST was primarily responsible for the conception and design of the M@NGO trial on which this feasibility study was based; she has been involved in critical revisions of the manuscript. SK participated in the design of the study, and has been involved in critical revisions of the manuscript. All authors read and approved the final manuscript.

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**CHAPTER 5:
RETROSPECTIVE COHORT STUDY**

5.1 RATIONALE

A RCT is considered the 'gold standard' research design to assess the effects of health care interventions (National Health and Medical Research Council, 1999). However, in the context of this doctoral study a RCT design was tested (through a feasibility study) and deemed not possible (Chapter 4). Not all research questions are answerable through an experimental method; some are not ethical and some are just not possible (Bland, 2000). For example it would not be ethical to conduct a RCT of planned caesarean section, compared to planned vaginal birth, for nulliparous women because the known risks of caesarean section for participants (mother and baby) outweigh the potential benefit of the study to generate new knowledge. The recent cohort study of vaginal birth after caesarean (VBAC) with a nested RCT, included a large participant preference arm (n=2,323) and a very small randomisation group (n=22) (Crowther et al., 2012). This highlights the difficulties of trying to conduct a RCT when prospective research participants decline randomisation because they have a strong treatment preference (Crowther, et al., 2012). Along with clinical-gatekeeping, adolescent preference for a particular model of care was a major barrier to recruitment in the feasibility RCT. Without appropriate endorsement and buy-in, a prospective study of caseload midwifery in this setting would not be feasible. Therefore a retrospective cohort study was undertaken.

5.2 SIGNIFICANCE

A cohort study is a research design which "focusses on groups of people who have or have not been *naturally* exposed to something (a factor) in the course of their everyday lives" (National Centre for Biotechnology Information, 1989 original emphasis). Both cohort studies and RCTs compare outcomes between groups that did, or did not, receive an intervention (Rochon, Gurwitz, & Sykora, 2005). In a cohort study, however, people are being observed in their everyday 'natural' setting rather than under experimental conditions (Bland, 2000). A strength of the observational design, such as a cohort study, is the ability to measure and compare the incidence of multiple outcomes; and to demonstrate the direction of causality (Hennekens & Buring, 1987). The intervention that people were exposed to, or not exposed to, (i.e. model of maternity care), was hypothesised to influence the probability of the occurrence of particular

outcomes (e.g. preterm birth, breastfeeding initiation) (National Centre for Biotechnology Information, 1989). However, it was not possible to establish causation because of the complex interaction of multiple and intervening factors (Bland, 2000). Therefore, the cohort study refers to 'association' rather than 'causation' between model of care and perinatal outcomes.

The major weakness of cohort studies is the risk of confounding (Hennekens & Buring, 1987). Confounding is defined as a:

situation in which the estimated intervention effect is biased because of some difference between the comparison groups apart from the planned interventions such as baseline characteristics, prognostic factors, or concomitant interventions. For a factor to be a confounder, it must differ between the comparison groups and predict the outcome of interest (Consolidated Standards of Reporting Trials (CONSORT) Group, 2010).

In a RCT design, random assignment means that the groups being compared should have similar baseline characteristics, which in turn minimises selection bias and confounding (Grimes & Schulz, 2002). In this study, decisions made by pregnant young women and care providers influenced whether or not participants received a particular model of maternity care (Rochon, et al., 2005). The researcher therefore had to carefully consider the many factors that may have contributed to a young woman being allocated to, accepting or refusing a particular model of maternity care (e.g. social class, ethnicity, parity) which may also be related to the outcome of interest (i.e. perinatal outcomes) (Bland, 2000). Selection bias occurs when cohorts "differ in measured or unmeasured baseline characteristics because of the way in which participants were selected for the study or assigned to their study groups" (Consolidated Standards of Reporting Trials (CONSORT) Group, 2010).

In the cohort study, the researchers took steps to "minimise, assess, and deal with selection bias" (Rochon, et al., 2005, p. 4). To minimise selection bias, exclusion criteria were used to eliminate obvious confounding factors (e.g. women with multiple pregnancies or who received no antenatal care, and babies with congenital abnormalities). To assess for selection bias, a thorough literature review was conducted to identify the most appropriate outcome measures and potential confounders. Additionally, bivariate analysis was used to identify and control for variables associated with the primary outcomes through logistic regression. Relevant baseline characteristics which were

confounding because: (a) they were significantly different between the comparison groups and (b) were predictors for the primary outcomes, were controlled for in the analysis. All significant confounders, relevant to the adolescent population, were routinely measured and therefore able to be controlled for in the analysis. These actions strengthened internal validity, the “extent to which the observed difference in outcomes between the two comparison groups can be attributed to the intervention rather than other factors” (Rochon, et al., 2005, p. 2).

Compared to a prospective design, a retrospective cohort design is more efficient in terms of time and resources, but has several limitations. Significantly for our cohort study, because data collection occurred in the past it was not tailored to the research, some data were incomplete, inaccurate or inconsistently measured (Song & Chung, 2010).

While it is acknowledged that not all research can be conducted experimentally (i.e. using RCT design), it appears increasingly difficult to publish quantitative research that uses other study designs. I encountered repeated difficulties in having the cohort study paper reviewed by journals precisely because it was not a RCT. The paper was first submitted to the high impact factor journal *Birth: Issues in Perinatal Care* where it was reviewed but rejected on the basis of “allocation bias...differences in primary outcomes might be caused by other factors than type of maternity care”. The paper was revised for clarity and submitted to the *Journal of Adolescent Health* whose Editor rejected the paper stating: “(t)his study is flawed in that it is not an RCT and the assignment process may artificially lead to better outcomes”. A third submission was made to the *International Journal of Nursing Studies* with an extensive covering letter justifying the conduct of a cohort study in the context of a ‘failed’ feasibility study. The paper was reviewed and has recently been re-submitted with revisions; the authors are awaiting a final decision.

The revised submission (Paper 3) is provided in its entirety here. The paper uses the STROBE reporting guidelines for observational studies (von Elm et al., 2008). Please note the paper is formatted within a boxed border to highlight this is the submitted version because the paper was not published until April 2015; after the PhD dissertation had been submitted for examination.

PAPER 3 [SUBMITTED VERSION]: ALLEN, J., GIBBONS, K., BECKMANN, M., TRACY, M., STAPLETON, H., KILDEA, S. (2014). DOES MODEL OF MATERNITY CARE MAKE A DIFFERENCE TO BIRTH OUTCOMES FOR YOUNG WOMEN? AN AUSTRALIAN COHORT STUDY. *INTERNATIONAL JOURNAL OF NURSING STUDIES*.

Abstract

Background	Adolescent pregnancy is associated with adverse outcomes including preterm birth, admission to the neonatal intensive care unit, low birth weight infants, and artificial feeding.
Objective	To determine if caseload midwifery or young women's clinic are associated with improved perinatal outcomes when compared to standard care.
Design	A retrospective cohort study.
Setting	A tertiary Australian hospital where routine maternity care is delivered alongside two community-based maternity care models specifically for young women aged 21 years or less: caseload midwifery (known midwife) and young women's clinic (rostered midwife).
Participants	All pregnant women aged 21 years or less, with a singleton pregnancy, who attended a minimum of two antenatal visits, and who birthed a baby (without congenital abnormality) at the study hospital during May 2008 - December 2012.
Methods	Caseload midwifery and young women's clinic were each compared to standard maternity care, but not with each other, for four primary outcomes: preterm birth (<37 weeks gestation), low birth weight infants (<2500g), neonatal intensive care unit admission, and breastfeeding initiation. Two analyses were performed on the primary outcomes to examine potential associations between maternity care type

	and perinatal outcomes: intention-to-treat (model of care at booking) and treatment-received (model of care on admission for labour/birth).
Results	<p>1908 births were analysed by intention-to-treat and treatment-received analyses. Young women allocated to caseload care at booking, compared to standard care, were less likely to have a preterm birth (adjusted Odds Ratio (aOR) 0.59 (0.38-0.90, p=0.014) or a neonatal intensive care unit admission aOR 0.42 (0.22-0.82, p=0.010). Rates of low birth weight infants and breastfeeding initiation were similar between caseload and standard care participants.</p> <p>Participants allocated to young women's clinic at booking, compared to standard care, were less likely to have a low birth weight infant aOR 0.49 (0.24-1.00, p=0.049), however when analysed by treatment-received, this finding was not significant. There was no difference in the other primary outcomes.</p>
Conclusions	Caseload midwifery for young women is associated with fewer preterm births and neonatal intensive care unit admissions.
<p>Introduction</p> <p>This cohort study is part of mixed methods evaluation of two models of maternity care that were designed for, and delivered to, young women aged 21 years or less. The participants in this study have been termed 'young women'. Young adulthood includes the period from 20-24 years of age (World Health Organisation, 2004a), whereas adolescence is typically defined as the period from 10-19 years of age (World Health Organisation, 2014b). Research literature on adolescent pregnancy is considered in this paper because it is the most closely related to the participants; however women aged 20-21 years may not have the same predictors for poor perinatal outcomes that adolescents have.</p>	

This study was set in a context where women have access to a number of different models of maternity care. A model of maternity care is a 'complex intervention'; it has a number of 'active ingredients' that work together in order to be effective (Medical Research Council, 2008). The ingredients which define a model of maternity care include: who provides the care (doctors, midwives, allied health), whether the providers are known to the woman, where the care occurs (at home, in hospital, community venue), when the care occurs (gestation at booking, frequency and length of visits, after hours contact), and how the care is provided (one-to-one or group visits). Two models of maternity care (caseload midwifery and young women's clinic) were defined and compared to routine care (standard care). Caseload midwifery and young women's clinic were not compared with each other.

Background

Pregnant adolescents are more likely to come from socio-economically disadvantaged backgrounds (Imamura, et al., 2007), which is associated with smoking, alcohol and illicit drug use (van Gelder, et al., 2010), social isolation and mental health issues (Ickovics, et al., 2011), poor nutrition and inadequate weight gain (Kabir, et al., 2008), and psychosocial stressors including low income, unemployment and housing issues (Savitz, et al., 2004). These factors directly affect perinatal outcomes (Malabarey, et al., 2012). Maternal age less than 18 years is an independent risk factor for preterm birth (Khashan, et al., 2010), low birth weight (LBW) infants (de Vienne, et al., 2009), intrauterine growth restriction and stillbirth (Khashan, et al., 2010), and neonatal mortality (de Vienne, et al., 2009).

Modifying the risk and protective factors in young women's daily lives, particularly for those who are socio-economically disadvantaged, can improve health outcomes (Viner, et al., 2012). Young women attend specialist programs more frequently than standard antenatal care (Allen, et al., 2012); attendance increases the opportunities for health interventions to occur. There is increasing evidence that 'adequate' antenatal care (e.g. minimum five visits) can improve perinatal outcomes (Raatikainen, Heiskanen, Verkasalo, & Heinonen, 2005;

Vieira, et al., 2012). The different types of maternity care referenced in the literature are defined and described below.

Standard care

Maternity care in Western countries including Australia, Canada, New Zealand (NZ), the United Kingdom (UK) and the United States (US) is typically provided through one-to-one visits with a doctor or midwife. In Canada and the US over 90% of antenatal care is provided by doctors, compared with NZ and the UK where care is generally provided by midwives and is government-funded (public) (Ehiri & Child, 2009). The majority (70%) of Australian women access public maternity care which is provided by hospital-based midwives or obstetricians, and to a lesser extent community-based family physicians; 30% of women access private obstetric care (Department of Health and Ageing, 2008). Ninety-seven percent of women give birth in a hospital delivery suite; while two percent access a birth centre and less than one percent give birth at home (Laws & Sullivan, 2009). Public maternity care is often fragmented, with women typically meeting numerous clinicians (Hartz, et al., 2012). This is slowly changing in Australia, and elsewhere, as more hospitals are reorganising services to optimise midwifery continuity of care (Hartz, et al., 2012).

Caseload midwifery

Caseload midwifery is increasingly common in countries including Australia, Canada, NZ and the UK (Hartz, et al., 2012). The primary purpose of caseload midwifery is relationship building whereby women feel supported by a “known, trusted midwife” throughout pregnancy, birth and the postpartum period (Sandall, et al., 2013). In Australia, caseload midwifery is characterised by a midwife undertaking responsibility for the continuum of care throughout pregnancy, birth and postpartum, for a caseload of approximately 40 women per annum in low or all-risk models (Hartz, et al., 2012). Caseload midwives often work in a midwifery group practice (MGP) of four midwives, who are on-call for labour and birth; and then continue care up to six weeks following birth (Hartz, et al., 2012). A feature of the model is that women have 24-hour

telephone access to their primary or back-up midwife (Forti, Stapleton, & Kildea, 2013).

A 2013 systematic review included 13 trials of midwife-led models of care either team midwifery (n=10) or caseload midwifery (n=3); both models aimed to provide known midwives during pregnancy, birth and postpartum (Sandall, et al., 2013). While adolescent women were eligible to participate in the three trials of caseload midwifery (Sandall, et al., 2013); the mean age of participants ranged from 26-31 years. Therefore, the systematic review does not address the suitability and efficacy of caseload midwifery for young women. Access to caseload midwifery has been mostly limited to 'low risk' women; indeed two of the three caseload midwifery trials excluded participants deemed to have risk factors. A recently published randomised controlled trial (RCT) demonstrates that caseload midwifery is safe and cost-effective for women of 'all risk' (Tracy, et al., 2013); participants in this trial however were aged 18 years or older.

In the research setting, group antenatal care was provided within the caseload model for young women; therefore group antenatal care research literature is briefly described here. A Cochrane systematic review of two RCTs of group antenatal care (CenteringPregnancy™) versus standard care reported no significant differences for key clinical outcomes including preterm birth (Homer et al. 2012). However, the largest RCT (n=1047) reported that women who received the intervention were less likely to experience preterm birth and more likely to initiate breastfeeding (Ickovics 2007). The inclusion of group antenatal care in the caseload model is potential limitation that will be explored further in this paper.

Young women's clinic

Young women's clinic describes an antenatal model of care that focuses exclusively on pregnant young women (Allen, et al., 2012). Key elements include a community clinic setting, multi-disciplinary involvement at the clinic, with midwives following additional clinical guidelines and accessing specialist training (e.g. sexual health, illicit drug use) (Allen, et al., 2012). Two cohort studies report an association between young women's clinic and fewer preterm

births for adolescent women (Fleming, et al., 2012; Quinlivan & Evans, 2004b) and lower adjusted relative risk of LBW infants (Fleming, et al., 2012). There are three other published research papers assessing young women's clinic however the results are unreliable as they were small, underpowered retrospective cohort studies, with differences in baseline characteristics that were not controlled for in the analysis (Allen, et al., 2012).

Aim

There is a paucity of evidence evaluating the specific effects of models of maternity care on perinatal outcomes for young women. The aim of this study was to determine if caseload midwifery or young women's clinic were associated with improved perinatal outcomes when compared to standard care.

Methods

Study design

Ethical approval was granted by the University and Hospital Human Research Ethics Committees prior to study commencement. A retrospective comparative cohort study was designed using routinely collected perinatal data from the hospital's electronic database. Three mutually exclusive study groups: (1) standard care, (2) caseload midwifery and (3) young women's clinic were defined at first booking visit and on admission to hospital for labour/birth. The primary outcomes were then analysed by both intention-to-treat (model of care at booking) and treatment-received (model of care on admission for labour/birth). The secondary outcomes were analysed by treatment-received. Caseload midwifery and young women's clinic were each compared to standard care. Caseload midwifery and young women's clinic were not compared with each other. The model of care at the time of maternity booking was recorded electronically by the booking midwife. The model of care at the time of admission for labour / birth was recorded electronically by the intrapartum midwife after reviewing the woman's antenatal attendance record. If the model of care at the time of maternity booking was different to the model recorded at the time of admission for labour / birth, then the researcher reviewed the electronic appointment system to confirm the model of care received. The

model of care received was defined as the one through which the woman accessed the majority of her antenatal care.

Setting

The site was an Australian tertiary-level, maternity hospital with around 5000 public births per year, where both hospital and community-based antenatal services are provided. Two midwifery-led services for young women operated at this site: young women's clinic began in 1994 and a caseload midwifery group exclusively for young women began in May 2008. Pregnant women aged 21 years or less are generally referred to caseload midwifery in the first instance. If caseload midwifery is full, women decline caseload midwifery, or women are unable to be contacted via telephone to arrange a home booking visit; then they are usually allocated to the young women's clinic. If spaces subsequently become available in caseload midwifery, young women's clinic attendees are invited to transfer to caseload care. After the first booking visit, women may 'opt out' of either of these programs and choose standard care if they prefer to see their family physician (GP), or another specialist service (e.g. Refugee women), do not like the way the care was provided, cannot easily access the community venue, or develop serious medical risk factors that required hospital-based care (e.g. access to medical physician).

Caseload care is provided by a group of four hospital-employed midwives who provide care to 'all risk' women aged ≤ 21 years with a reduced annual caseload of 35 women per midwife (see Table 2). The woman's primary midwife is available on-call five days per week; in the event the midwife is unavailable (e.g. day off or annual leave) the woman will be cared for by a back-up caseload midwife that she has previously met.

TABLE 2 DIFFERENCES BETWEEN EXPOSURE GROUPS AND CONTROL GROUP

	Caseload care (MGP)	Young women's clinic (YWC)	Standard care (control group)
First visit	Primary MGP midwife conducts a home visit One of two obstetricians conducts obstetric visit at the community venue	One of four YWC midwives conducts visit in community venue One of two obstetricians conducts obstetric visit at the community venue	Rostered midwife conducts visit in a community or hospital clinic Hospital-based obstetric visit with junior or senior obstetrician
Subsequent antenatal care	All four MGP midwives provide group antenatal care at community venue	One of four YWC midwives provides individual visits at community venue	Rostered midwives provide individual visits in a community or hospital clinic
Relationship with care providers	Continuity of carer with a primary MGP midwife Meets the back-up MGP midwives at group antenatal care Continuity of care from one of two obstetricians	Continuity of care from four rostered midwives Continuity of care from one of two obstetricians	Maternity care provided by multiple different midwives and obstetricians. Some women see a family physician
Antenatal planning and support	Weekly conferences of complex cases includes input and planning from MGP and YWC midwives, an obstetrician, social worker and child protection On-site psychosocial assessment and support available from a social worker, who can see women immediately if required Peer support workers assist with housing, income support, legal issues and access to education and training		Referral to a risk planning meeting with clinicians and allied health unfamiliar with the individual Referral to allied health with typical two week wait time No direct access to this community-based service
After hours contact	Primary or back-up MGP midwife available 24 hours a day via mobile telephone	Rostered midwife available via hospital telephone number	
Intrapartum care	Primary or back-up MGP midwife in the birth suite Known midwifery carer in labour is provided Obstetric care by rostered doctors is provided if indicated	Rostered midwife in the birth suite Known midwifery carer in labour is not provided Obstetric care by rostered doctors is provided if indicated	
Inpatient postnatal care	Provided by rostered doctors, nurses and midwives who are unfamiliar to the women.		

Outpatient postnatal care	Primary or back-up MGP midwife provides home visits for six weeks Known midwifery carer is provided	Known midwifery carer is not provided Rostered midwives provide home visits for 10-14 days
Midwives conditions	Caseload midwives are employed on an annual salary. They work in cycles of 152 hours over four (4) weeks; and do not work in excess of twelve (12) consecutive hours in any twenty four (24) hour period Each midwife cares for about 35-40 women per annum; and provides back-up care for a further 35-40 women	Midwives are rostered prospectively to individual work units. They may rotate across all shifts and between work areas Rostered midwives are paid according to the award for their level of service and whether they are full time (38 hours per week) or part time

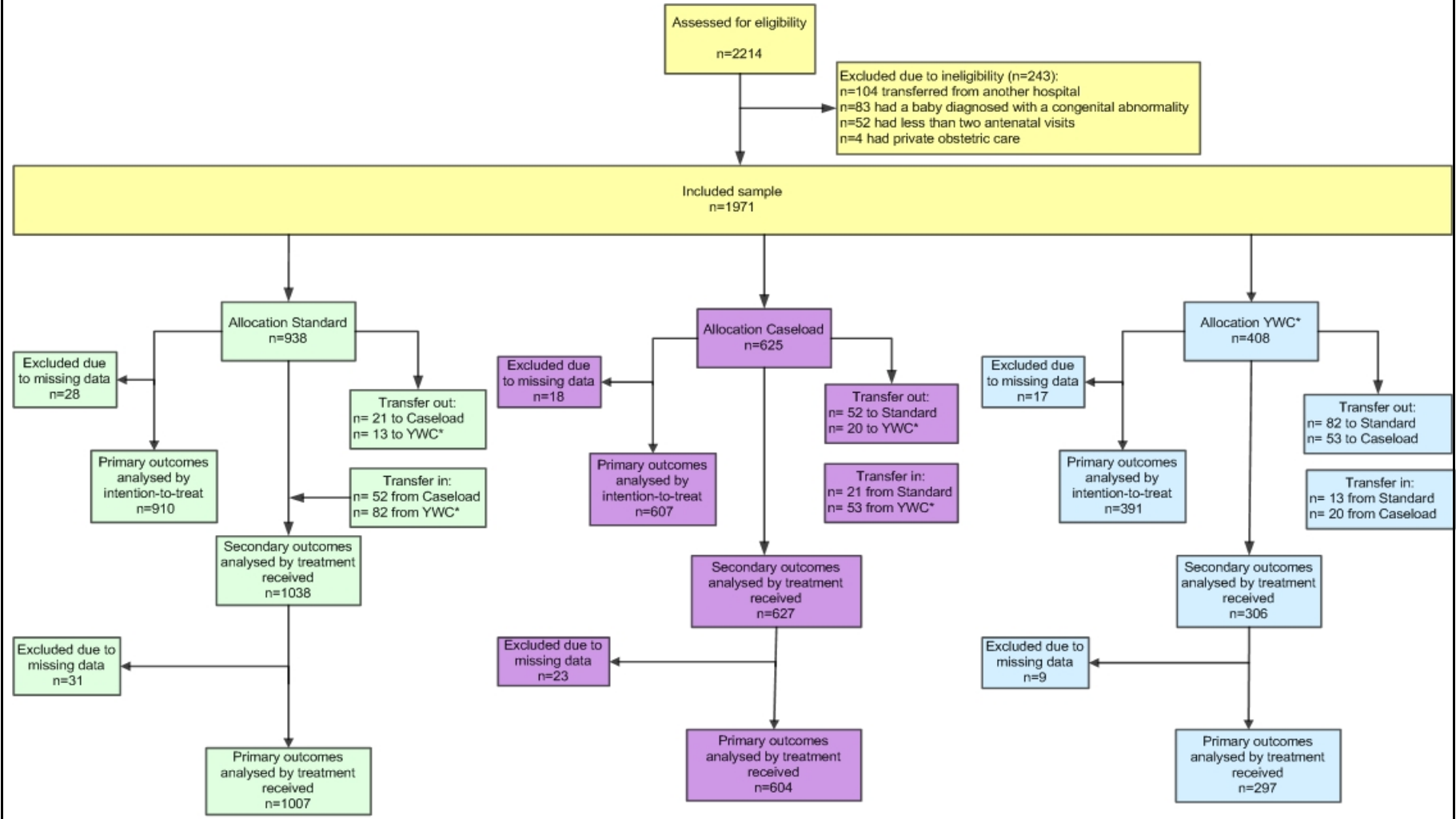
Young women's clinic is staffed by a small team of midwives who provide individual antenatal visits for women aged ≤ 21 years at the same aforementioned community venue (see Table 2). During labour and birth, young women will be seen in hospital by clinicians they have not previously met. Women may receive postnatal home visiting following birth by rostered midwives who they are unlikely to have met.

Standard care is defined as public maternity care offered by hospital clinicians or family physicians where the care was not organised to provide continuity of care and was not specific to young women (see Table 2). The former part of this definition of standard care was used by a 2013 Australian RCT of caseload midwifery compared to standard care (Tracy, et al., 2013).

Participants and study size

All women who gave birth at the study hospital during the study period, who were aged 21 years or less at the time of birth, were considered for inclusion (see Figure 3). Additional eligibility criteria were: singleton pregnancy, baby without a diagnosed congenital abnormality, attendance for at least two scheduled antenatal appointments, booked as a public patient. Exclusion criteria were: unbooked or attendance at less than two scheduled antenatal appointments, multiple birth, baby with a congenital abnormality, or in-utero transfer to the tertiary hospital (due to complications of pregnancy). The sample size was determined by the number of records available. All records from when caseload midwifery commenced births in May 2008 -December 2012 were considered for inclusion in the study; see Figure 3. Crossovers between allocation (model at first booking visit) and allocation received (model on admission for labour/birth) are detailed overleaf.

FIGURE 3 PARTICIPANT FLOW DIAGRAM



*Young Women's Clinic

Data Sources

Midwives prospectively enter standardised information into the electronic hospital perinatal database. Information is entered at the first booking appointment, and during any inpatient care episode including labour and birth. At the time of this study information was not entered during outpatient antenatal appointments. Medical chart audit was used to locate missing data for pre-pregnancy body mass index (BMI).

Routinely collected data were obtained from two obstetric databases (Obstetric Clinical Reporting System (Obstetric CRS), Clinical Reporting Systems Pty Ltd, New South Wales (NSW), Australia and MatriX, Meridian Health Informatics, NSW, Australia). Obstetric CRS is checked on a daily basis to identify potential data entry errors and incomplete records. If discrepancies are found, they are rectified within the system. MatriX has rules programmed into the system to alert the user as they are entering data to any entries that are inconsistent, missing, or appear erroneous, allowing the user to correct errors immediately. Data were extracted based on maternal age at birth (21 years or less), singleton pregnancy (yes), and baby's date of birth (May 2008 – December 2012). Once extracted from both databases, data were merged and imported into a statistical program for manipulation.

The first author identified participants in the dataset with missing pre-pregnancy BMI, then used their unique numeric identifiers to request and review patient charts to obtain this information from the hand-written notes. The pre-pregnancy BMI field was then updated in the statistical program.

Variables

Demographic characteristics included maternal age (years), adolescent multiparity (aged 19 years or less when giving birth to a subsequent baby), nulliparity, ethnicity, socio-economic status (Socio-Economic Indexes for Areas [SEIFA] quintile (Australian Bureau of Statistics, 2008)), relationship status, smoking during pregnancy (at first booking appointment), history of illicit drug

use, pre-pregnancy BMI, history of sexually transmitted infection (STI), history of mental illness, psychology referral offered and accepted, history of family involvement with the Department of Child Safety, social work referral offered and accepted, medical / obstetric risk factors (composite); see Table 3. Data regarding how frequently allied health referrals were offered and accepted were routinely entered into the hospital database at the first booking visit for all women. Subsequent allied health referrals (e.g. throughout pregnancy) were not routinely recorded.

TABLE 3 BACKGROUND DEMOGRAPHICS AND ANTENATAL RISK FACTORS (BY TREATMENT-RECEIVED)

Baseline characteristics	Standard care (n=1038)	Caseload care (n=627)	Young women's clinic (n=306)	p value
Age (years)	20 (2)	19 (2)	19 (2)	<0.001
Adolescent multiparity^b	84 (8%)	28 (4%)	23 (7%)	0.015
Nulliparity	736 (71%)	534 (85%)	250 (82%)	<0.001
Ethnicity^c				
<i>Caucasian</i>	561 (54%)	486 (78%)	209 (68%)	<0.001
<i>Aboriginal and/or Torres Strait Islander</i>	141 (14%)	16 (3%)	18 (6%)	
<i>Maori and/or Pacific Islander</i>	72 (7%)	64 (10%)	35 (11%)	
<i>Other e.g. Asian, African, Middle-Eastern</i>	262 (25%)	60 (10%)	44 (14%)	
Socio-Economic Index For Areas^d				
<i>SEIFA 1</i>	274 (27%)	123 (20%)	45 (15%)	<0.001
<i>SEIFA 2</i>	34 (3%)	10 (2%)	5 (2%)	
<i>SEIFA 3</i>	188 (18%)	86 (14%)	61 (20%)	
<i>SEIFA 4</i>	252 (24%)	176 (28%)	77 (25%)	
<i>SEIFA 5</i>	286 (28%)	232 (37%)	118 (39%)	
Relationship status, single^e	554 (54%)	341 (55%)	188 (63%)	0.023
Smoking at booking^f	295 (28%)	149 (24%)	86 (28%)	0.097
History of illicit drug use^g	247 (24%)	203 (33%)	1(37%)	<0.001

Pre-pregnancy body mass index^h	22.46 (6.63)	22.43 (6.12)	22.72 (6.17)	0.642
History of sexually transmitted infection	58(6%)	49 (8%)	26 (9%)	0.089
History of mental illnessⁱ	163 (16%)	153 (24%)	72 (24%)	<0.001
Psychology referral offered and accepted^j	21 (2%)	47 (8%)	12 (4%)	<0.001
History of family involvement with Department of Child Safety^k	53 (5%)	60 (10%)	18 (6%)	0.002
Social work referral offered and accepted^l	320 (31%)	317 (51%)	137 (48%)	<0.001
Medical / obstetric risk factors				
<i>At hospital booking</i>	132 (13%)	46 (7%)	25 (8%)	0.001
<i>At onset of labour</i>	113 (11%)	35 (6%)	17 (6%)	<0.001
<i>Hospital admission during pregnancy</i>	61 (6%)	26 (4%)	7 (2%)	0.024
<i>At booking and/or onset of labour</i>	191 (18%)	69 (11%)	33 (11%)	<0.001

TABLE 3 LEGEND

Categorical data are analysed with a chi-squared or Fisher's exact test and are presented as n (%). Continuous data are analysed with Kruskal-Wallis test and/or Wilcoxon rank sum test and are presented as median {interquartile range}.

- The complete data set (n=1971) was used in the analysis of secondary outcomes. Missing data are reported for each data item.
- Adolescent multipara defined as participants aged 19 years or less who gave birth to a subsequent baby.
- Ethnicity missing data n=3.
- The Socio-Economic Indexes for Areas (SEIFA) was used to categorise socio-economic status. SEIFA divides areas into quintiles based on postcode with reference to income, education, employment, occupation, housing and other indicators of advantage and disadvantage. SEIFA quintile is used here; score of 1 is the lowest and 5 is the highest. Missing data n=4.
- Relationship status was defined dichotomously as partnered (married, defacto) or un-partnered (single, widow); missing data n=23.
- Smoking during pregnancy was either smoking or not smoking as self-reported at the booking visit; missing data n=2.
- History of illicit drug use during pregnancy was either any history of drug use (e.g. cannabis, cocaine, heroin) or no history of drug use as self-reported at the booking visit; missing data n=15.
- Pre-pregnancy body mass index; missing data n=32.
- Mental health condition was analysed as any self-reported history of mental health diagnosis (e.g. depression, anxiety, schizophrenia), compared to no previous mental health diagnosis; missing data n=3.
- Psychology referral; missing data n=1

- k. Department of Child Safety involvement; 'not able to ask' considered as missing data n=18; additional missing data i.e. question not answered n=3.
- l. Social work referral; missing data n=1.

Two medical / obstetric risk variables were generated: risk at booking and risk at birth. These variables were determined by literature review and limited by the data items that were routinely collected. Risk factors at hospital booking included cardiac disease, endocrine disease, hypertension, diabetes, and hepatitis; multiple pregnancies and fetal anomalies were excluded. Risk at birth included (a) any medical indication for induction of labour or planned caesarean section (i.e. abnormal fetal welfare studies, antepartum haemorrhage, cardiac disease, cerebro-vascular disease, cholestasis, chorioamnionitis, diabetes (all types), fetal anomaly, fetal death, fetal growth disturbance, fetal growth restriction, hypertension (all types), isoimmunisation, maternal medical/surgical indication (unspecified), non-reassuring fetal status and/or (b) any antenatal hospital admission to an inpatient ward. For the multivariate logistic regression a dichotomous variable was created: medical/obstetric risk identified at booking and/or birth (yes/no).

Four primary outcome measures were defined a priori: preterm birth (<37 weeks gestation), low birth weight (LBW) infant (<2500g), admission at birth to a NICU (yes/no), and breastfeeding initiation. Breastfeeding was defined dichotomously as either fully breastfeeding (including expressed breast milk) or not fully breastfeeding (including artificial feeding or a combination of artificial and breastfeeding). The combined results of the intention-to-treat and treatment-received analyses are presented in Table 4.

TABLE 4 ANALYSIS FOR PRIMARY OUTCOMES BY INTENTION-TO-TREAT (ITT) AND TREATMENT-RECEIVED (TR)

		Standard	Caseload	Young women's clinic	Caseload vs. Standard		YWC vs. Standard	
					Odds ratio (95% CI)	p value	Odds ratio (95% CI)	p value
Preterm birth	ITT	103 (11%)	35 (6%)	30 (8%)	OR 0.48 (0.32-0.71)	<0.001	OR 0.65 (0.43-1.00)	0.048
					aOR^a 0.59 (0.38-0.90)	0.014	aOR ^a 0.79 (0.50-1.25)	0.313
	TR	110 (11%)	35 (6%)	23 (8%)	0.50 (0.34-0.74)	0.001	0.68 (0.43-1.09)	0.113
					aOR^a 0.65 (0.42-0.99)	0.042	aOR ^a 0.84 (0.51-1.37)	0.476
Low birth weight infant	ITT	89 (10%)	28 (5%)	19 (5%)	OR 0.45 (0.29-0.69)	<0.001	OR 0.47 (0.30-0.80)	0.004
					aOR ^b 0.74 (0.41-1.37)	0.340	aOR^b 0.49 (0.24-1.00)	0.049
	TR	95 (9%)	28 (5%)	13 (4%)	0.47 (0.30 – 0.72)	0.001	0.44 (0.24-0.80)	0.007
					aOR ^b 0.79 (0.43-1.44)	0.441	aOR ^b 0.46 (0.21-1.00)	0.051
Admission to neonatal intensive care unit	ITT	61 (7%)	14 (2%)	13 (3%)	OR 0.33 (0.18-0.59)	<0.001	OR 0.48 (0.26-0.88)	0.018
					aOR 0.42^c (0.22-0.82)	0.010	aOR 0.56 ^c (0.28-1.09)	0.089

	TR	67 (7%)	12 (2%)	9 (3%)	0.28 (0.15-0.53)	<0.001	0.44 (0.22-0.89)	0.022
					aOR^c 0.35 (0.18-0.69)	0.003	aOR ^c 0.54 (0.25-1.17)	0.117
Breastfeeding initiation^d	ITT	687 (79%)	494 (83%)	317 (83%)	OR 1.38 (1.05-1.80)	0.020	1.36 (0.99-1.85)	0.057
					aOR ^e 1.31 (0.92-1.84)	0.130	aOR ^e 1.39 (0.95-2.05)	0.092
	TR	783 (79%)	513 (84%)	250 (83%)	1.41 (1.08-1.83)	0.011	1.33 (0.95-1.87)	0.094
					aOR ^e 1.24 (0.89-1.75)	0.208	aOR ^e 1.17 (0.78-1.77)	0.442

TABLE 4 LEGEND

Grey shaded results by intention-to-treat analysis (n=1908): Standard (n=910), Caseload (n=607), Young women's clinic (n=391). Unshaded results by treatment-received analysis (n=1908): Standard (n=1007), Caseload (n=604), Young women's clinic (n=297). Outcome data are reported as n (%). Odds Ratios (OR) and Adjusted Odds Ratios (aORs) are presented with 95% Confidence Intervals (CIs) and Probability values (p value).

- Adjusted for antenatal attendance, body mass index (BMI), ethnicity, marital status, medical and/or obstetric risk, smoking at booking, and socio-economic status.
- Adjusted for antenatal attendance, BMI, ethnicity, medical and/or obstetric risk, preterm birth, smoking at booking and socio-economic status.
- Adjusted for antenatal attendance, caesarean birth, ethnicity, low birth weight, preterm birth, smoking at booking and socio-economic status.
- Breastfeeding initiation includes breastfeeding and/or expressed breast milk only. Stillborn babies excluded. Feeding recorded as either 'not applicable', 'gavage' or 'other' treated as missing data (n=64).
- Adjusted for admission to a neonatal nursery, birth weight, BMI, ethnicity, marital status, maternal age, medical and/or obstetric risk, mode of birth, nulliparity, opioids / regional analgesia in labour, preterm birth, smoking at booking, and socio-economic status.

Other outcome measures listed in the Cochrane systematic review of midwifery-led care (Sandall, et al., 2013) for which routinely collected data were available, have been reported as secondary outcomes. These include: antenatal attendance (less than five visits), antenatal hospitalisation, induction of labour, amniotomy, oxytocin augmentation during labour, opiate analgesia in labour, regional analgesia in labour (epidural/spinal), mode of birth (spontaneous vaginal, instrumental vaginal, caesarean section) (Table 5).

Secondary neonatal outcomes were gestational age at birth, weight at birth, stillbirth, Apgar score less than seven at five minutes, breastfeeding on hospital discharge, small-for-gestational age (SGA; <10th centile using customised birth weight centiles) (Gibbons et al., 2013), and admission to a neonatal nursery (Table 5).

TABLE 5 BIVARIATE ANALYSIS FOR SECONDARY OUTCOMES BY TREATMENT RECEIVED (MODEL OF CARE ON ADMISSION FOR LABOUR / BIRTH)

	Standard care (n=1038)	Caseload care (n=627)	Young women's clinic (n=306)	p value
Maternal Outcomes				
Less than five antenatal visits	120 (12%)	41 (7%)	24 (8%)	0.002
Antenatal hospitalisation	88 (8%)	44 (7%)	18 (6%)	0.256
Labour onset				
Spontaneous	693 (67%)	434 (69%)	217 (71%)	0.312
Induction	276 (28%)	176 (29%)	74 (25%)	0.531
Planned CS	69 (7%)	17 (3%)	15 (5%)	0.003
Labour augmentation				
Amniotomy ^b	252 (37%)	187 (44%)	98 (46%)	0.025
Oxytocin ^c	138 (20%)	119 (28%)	70 (32%)	<0.001
Analgesia in labour^d				
Opiate analgesia	304 (29%)	195 (31%)	92 (30%)	0.724
Regional analgesia	374 (39%)	228 (37%)	129 (44%)	0.124

Mode of birth^e				0.402
Spontaneous	737 (71%)	440 (70%)	205 (67%)	
Instrumental	112 (11%)	82 (13%)	42 (14%)	
Caesarean	189 (18%)	105 (17%)	59 (19%)	
Neonatal Outcomes				
Gestation at birth, median weeks^f	39 (2)	40 (1)	39 (1)	<0.001
Birth weight, median grams^f	3330 (700)	3450 (644)	3406 (690)	<0.001
Small for gestational age^g	119 (12%)	60 (10%)	37 (12%)	0.436
Stillbirth	12 (1%)	5 (1%)	0 (0%)	0.154
Apgar <7 at 5 minutes^h	30 (3%)	15 (2%)	1 (0.33%)	0.032
Admission to a separate neonatal nursery	129 (12%)	46 (7%)	24 (8%)	0.001
Breastfeeding on dischargeⁱ	740 (75%)	493 (80%)	220 (73%)	0.010

TABLE 5 LEGEND

- a. The complete data set (n=1971) was used in the analysis of secondary outcomes. Missing data are reported for each data item.
- b. of those who went into spontaneous labour (n=1354) and were augmented with ARM; missing data n=33.
- c. of those who went into spontaneous labour (n=1354) and were augmented with oxytocin; missing data n=4.
- d. Analgesia in labour excluded participants who did not labour i.e. had a planned caesarean section; missing data n=1.
- e. Instrumental vaginal includes forceps and vacuum assisted births.
- f. Two-sample Wilcoxon rank sum test; p value for significance adjusted to 0.025.
- g. Small-for-gestational age, defined as <10th centile on customised birth weight model; missing data n=70.
- h. Apgar score less than 7 at 5 minutes; missing data n=9.
- i. Breastfeeding at the time of hospital discharge; missing data n=62.

Potential confounders were identified through review of the research literature. Confounders which demonstrated a significant effect on the primary outcome through bivariate analysis were included in the logistic regression modelling: admission to a neonatal nursery, antenatal attendance less than five antenatal visits, birth weight, BMI, caesarean birth, ethnicity, LBW, marital status, maternal age, medical and/or obstetric risk, mode of birth, nulliparity, opioids / regional analgesia in labour, preterm birth, smoking at booking and socio-economic status.

Statistical Methods

Analyses were undertaken in StataSE version 10 (StataCorp Pty Ltd, College Station, Texas). Bivariate analysis to compare variables between the three study groups was performed using chi-square tests for categorical data. The continuous data were not normally distributed so Kruskal-Wallis tests were performed, followed by Wilcoxon rank sum tests to compare caseload midwifery to standard care, and young women's clinic to standard care; probability value (p value) adjusted to 0.025.

Multivariate logistic regression was performed on the primary outcomes to calculate adjusted odds ratios (aORs) and associated 95% confidence intervals (CIs); p values less than 0.05 were considered statistically significant. Only those participants with no relevant missing data, for confounding variables, were included in the bivariate and multivariate analyses of primary outcomes. Two analyses were conducted on the primary outcomes: intention-to-treat (model of care at booking) and treatment received (model of care on admission for labour / birth).

Multivariate logistic regression was performed on the primary outcomes to calculate adjusted odds ratios (aORs) and associated 95% confidence intervals (CIs); p values less than 0.05 were considered statistically significant. Prior to analysis of primary outcomes we conducted two processes. First, we excluded participants with missing data. Second, because there were a large number of differences in the baseline characteristics of each group, we could not include them all as potential confounders in the multivariate logistic regression without losing statistical power. Therefore, we conducted a review of the research

literature to identify potential predictors for each primary outcome. We then conducted bivariate logistic regression on each potential predictor to identify those variables that were statistically associated with the primary outcome (p value <0.1). For example, for the primary outcome of preterm birth we identified 21 predictors in the research literature. Of these 21 potential confounders, 8 variables had a relationship with preterm birth with a statistical significance of $p < 0.1$. These 8 variables were therefore included in the multivariate logistic regression as confounders, while the remaining 13 were excluded. Table 4 footnotes indicate which confounders were used in the multivariate regression for each primary outcome. Two analyses were conducted on the primary outcomes: intention-to-treat (model of care at booking) and treatment received (model of care on admission for labour / birth).

Results

Participants

All publicly insured young women (aged 21 years or less) who had given birth to a singleton baby between May 2008 and December 2012 ($n=2214$) were considered for inclusion. 1971 women met the inclusion criteria and 243 women were excluded; complete data were available for 1908 participants (see Figure 3).

Descriptive data

Table 3 shows the baseline characteristics of the participant groups with caseload midwifery and young women's clinic providing care to a significantly higher proportion of women who were younger, nulliparous, Caucasian, living in areas of the highest advantage, with a higher incidence of mental health issues, a history of illicit drug use, and a lower incidence of medical/obstetric risk factors. The standard care cohort had a significantly higher proportion of older young women, teenage multiparas, women who were non-Caucasian, who lived in areas of the greatest disadvantage, with medical / obstetric risk factors. There was no significant difference between the three groups on measures of smoking at booking, pre-pregnancy BMI, or history of STI.

Outcome data

The secondary outcomes were analysed by the model of care women were accessing at the time of admission for labour/birth. Baseline characteristics between the groups were not adjusted for; therefore the results require cautious interpretation.

Participants in caseload care and young women's clinic had lower rates of inadequate antenatal attendance, higher median birth weight, and lower rates of admission to a separate neonatal nursery compared to participants in standard care (Table 5). Furthermore, participants in the exposure groups had lower rates of planned caesarean section and higher rates of labour augmentation compared to standard care participants (Table 5); this is likely due to the higher proportion of nulliparous women in the exposure groups.

Exposure to caseload care was associated with higher median gestational age and higher rates of breastfeeding at the time of hospital discharge (Table 5). Babies from the young women's clinic group had lower rates of Apgar less than seven at five minutes (Table 5); due to the low number of outcomes in this variable the result is likely an anomaly.

Main results

After adjustment for potential confounders the chances of preterm birth and admission to NICU were significantly lower for women allocated, and exposed, to caseload midwifery (Table 4), compared to standard care. Allocation to young women's clinic was weakly associated with fewer LBW babies; however when analysing women who actually received young women's clinic care this association became non-significant (Table 4). Neither caseload midwifery nor young women's clinic were associated with differences in the odds of initiating breastfeeding, when compared to standard care (Table 4). A sensitivity analysis was performed to assess whether the higher proportion of Indigenous young women in standard care, compared to caseload care, was associated with the significant differences found. Sensitivity analysis did not change the findings which remained significant.

Discussion

Key Results

This cohort study suggests that, compared to standard care, caseload midwifery may benefit young women and their infants. While we showed no differences between young women's clinic and standard care on any of the primary outcomes; the ability to detect differences was limited by the relatively small number of women in this cohort. After controlling for differences in baseline characteristics and known confounders, caseload midwifery was associated with fewer preterm births and fewer admissions to NICU by both intention-to-treat and treatment-received analyses.

Strengths and Limitations

Participants were routinely assigned to a model of maternity care by hospital staff with the choice to opt out after the first booking visit. This choice may have been influenced by age, ethnicity, parity, socio-economic status or medical risk factors. Indeed there were significant differences in the baseline characteristics of the participant groups i.e. maternal age, nulliparity, ethnicity, socio-economic status and medical / obstetric risk status. To address this potential source of bias we included these variables as confounders and controlled for them in the statistical analysis for primary outcomes. Furthermore, a strength of this study is that data were analysed both by intention-to-treat, and by treatment-received. So while participant choice and baseline characteristics may have influenced which model of care they ultimately received (treatment received analysis); these factors had limited power over the model of maternity care they were first allocated (intention-to-treat analysis).

No power calculation was performed on primary outcomes. An Australian cohort study, which included a larger number of participants in young women's clinic (n=541), reported a significant reduction in preterm birth (OR 0.40 p<0.001) although the analysis did not control for known confounders (Quinlivan & Evans, 2004b). In the intention-to-treat analysis, the young women's clinic cohort was much larger (n=394) than in the treatment-received analysis (n=298). It is possible that the reduction in the number of participants is responsible for the

shift from a significant to a non-significant difference on the outcome of LBW infants. The sample size for young women's clinic may therefore simply be too small to make robust conclusions about efficacy.

Interpretation

Preterm birth has very few known preventative interventions and many efforts to modify or eliminate specific risk factors have not succeeded to date (Lang & Lams, 2009). Pregnancy in adolescence is a risk factor for preterm birth (Chen, et al., 2007; Khashan, et al., 2010; Shrim et al., 2011). The Cochrane systematic review finds women randomised to midwifery-led care, compared to standard care, are less likely to give birth preterm (Sandall, et al., 2013). Our study is the first to report similar findings specific to young women; albeit not randomised.

Caseload midwifery is a safe and cost-effective maternity care intervention for women of all-risk (Tracy, et al., 2013). Higher levels of satisfaction are generally reported in models providing a known carer (Novick, 2009; Sandall, et al., 2013); adolescents are no exception (Payne & Smythe, 2007). Women who received caseload care had continuity of antenatal carer and telephone access to their midwife, or a known back-up midwife, 24 hours a day. The 'midwife-woman partnership' (Guilliland & Pairman, 1995) encourages women to engage in antenatal care: (i) to attend appointments (Raatikainen, et al., 2005), (ii) to disclose risk factors (Stanley, Borthwick, & Macleod, 2006) and (iii) to follow professional recommendations (Sheppard, Zambrana, & O'Malley, 2004). We hypothesise that antenatal engagement is the mechanism by which the complex intervention of caseload midwifery may affect perinatal outcomes for young women and their babies.

In this study, young women who received caseload midwifery were more likely to attend five or more antenatal visits compared to those in standard care. Adolescent attendance is more likely in the event of a good relationship with a care provider (Novick, 2009); 'vulnerable' women are less likely to attend when they perceive that clinicians treat them disrespectfully (Milligan et al., 2002). Attendance at five or more antenatal visits is associated with improved birth outcomes (Raatikainen, Heiskanen, & Heinone, 2007); it increases

opportunities to screen for conditions that are amenable to intervention (e.g. genito-urinary infection). Further, adolescents who know and trust their care provider may be more likely to disclose harmful behaviours and difficult life circumstances (Sheppard, et al., 2004). A significantly higher proportion of young women in caseload midwifery reported illicit drug use, mental health issues and Department of Child Safety involvement. Because pregnant women are more likely to disclose mental health concerns in the context of continuity of care with an accepting health professional (Stanley, et al., 2006); this finding may reflect increased disclosure rather than an increased incidence. This is significant because disclosure of risk factors confers opportunities for intervention. Indeed, young women receiving caseload midwifery were more likely to be offered, and to accept, psychology and social work referral.

While we have demonstrated a reduced likelihood of NICU admission under caseload care, this may be an artefact of fewer preterm births. Of the 98 admissions to NICU, 57 admissions (58%) were associated with complications of prematurity. Preterm birth and associated conditions (LBW, respiratory distress, poor feeding and/or hypoglycaemia) frequently lead to NICU admission (Celik, Demirel, Canpolat, & Dilmen, 2013). The resultant separation between young mothers and their babies has negative implications for maternal well-being (Lasiuk, Comeau, & Newburn-Cook, 2013) and breastfeeding (M. Parker et al., 2013). Admission to NICU is associated with significantly increased direct health care costs (Gilbert, Nesbitt, & Danielsen, 2003). Reduced preterm birth and subsequent NICU admission could improve maternal well-being and breastfeeding initiation; while delivering substantial health care savings

Conclusion

Some maternal behaviours and stressors common to pregnancy in adolescence are independently associated with preterm birth. We hypothesise that caseload midwifery may be able to address these modifiable risk factors by enhancing antenatal engagement. Young women's clinic showed promising results; further research that is statistically powered to assess its efficacy is warranted. We recommend caseload midwifery, with obstetric and allied health support, be offered more widely to young women within a research evaluation framework.

**CHAPTER 6:
CRITICAL, FOCUSED, ETHNOGRAPHY**

6.1 RATIONALE

The aim of the qualitative research component was to understand how participants (young women and midwives) viewed and made sense of their experiences (Cook, 2005) of caseload midwifery which included GAC (see Glossary). Ethnographic research facilitates in-depth analysis of social phenomena as they occur in their natural setting (Fetterman, 2010); in this instance the community venue where GAC was provided. Ethnography is 'focused' when it involves a limited number of participants, a focus on a discrete community, and a pre-selected topic; interviews may be highly structured around the issues (Muecke, 1994); see Appendix 5. Focussed ethnography is pragmatic as it is less time and resource intensive than traditional ethnography, and can be used to gather data on a specific topic of clinical interest in the health care setting (Higginbottom, Pillay, & Boadu, 2013).

A FG interview is a "carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment" (Krueger, 1994, p. 6). Focus group interviews were chosen as the most appropriate method for pragmatic reasons including suitability for participants and efficient use of resources. Focus group interviews are a common method of data collection for program evaluation (Heary & Hennessy, 2002; Straw & Smith, 1995), and when gathering data from health professionals to assess service delivery (St John, 2004). This may be because FG interviews have the potential to generate plentiful information in a short period of time. This is not simply because multiple informants can be interviewed together, but that data collection is driven and generated through interactions between the participants. Dialogue, disagreement, consensus, questioning, and the further development of ideas are facilitated through the group process (Macnaghten & Myers, 2004).

Focus group interviews have strengths and limitations compared to one-to-one interviews. Participants in FG interviews may feel more comfortable talking to a group of people about everyday topics rather than to a single interviewer (Macnaghten & Myers, 2004). This could be particularly relevant for adolescent participants who may feel intimidated by the one-to-one interviews (Peterson-Sweeney K, 2005); particularly if the interviewer is in a position of power by way of education, age and ethnicity. Further, FG interviewing addresses a potential

threat to validity in the adult-child relationship (interviewer-interviewee) whereby the child/adolescent may respond in ways they believe the researcher wants (Heary & Hennessy, 2002). A potential limitation, however, is that some participants may feel intimidated in a group setting which could inhibit participation or interaction (Heary & Hennessy, 2002). Optimal data collection during a FG occurs when the group is fairly homogenous (e.g. sex, class) and has a small number of participants (St John, 2004). For adolescent participants a size of four to six group members is ideal (Heary & Hennessy, 2002). Focus group interviewing was an appropriate method for participants (midwives and young women) as they already knew each other, and thus a presumption was made that they would feel more comfortable about freely expressing their ideas in the group setting (Heary & Hennessy, 2002).

6.2 SIGNIFICANCE

What makes ethnography useful for, and relevant to, health care research is that it situates people within, and links everyday interactions to, the wider cultural context (Savage, 2006). Thematic analysis is a fundamental qualitative research process which involves identifying, analysing and reporting patterns within data; these patterns are referred to as 'themes' (Braun & Clarke, 2006). A traditional ethnographic approach is inductive; themes are said to spontaneously 'emerge' from the data during analysis. A critical approach is deductive; it focuses on the latent meanings within the text such that participants' stories are deconstructed to reveal underlying assumptions and ideologies (Andrews, Sullivan, & Minichiello, 2004; Braun & Clarke, 2006). The process of listening to interview data, however, is not about words

our critical listening has to reach beyond gullibility to recognize ideology and sound bites, to assess racial and gendered stereotypes and presumptions, to wonder about other parties' self-serving reassurances (Forester, 2013, p. 10).

Study findings are therefore not passively received, but actively generated and constructed through critical investigation of the data (Higgs, 2001). While traditional ethnography describes 'what is', critical ethnography seeks to understand "why this is and what can be done about it" (Schwandt, 1997, p. 22). The critical ethnographic approach meant that the voices of the young women were privileged; analyses of the women's interviews were compared and/or contrasted with data from all other sources, including that generated from the midwives FG.

The 'in press' version of Paper 4 is provided in its entirety here because the paper was not published until April 2015; after the PhD dissertation had been submitted for examination.



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How does group antenatal care function within a caseload midwifery model? A critical ethnographic analysis

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Group antenatal care

Models of care

ABSTRACT

Background: caseload midwifery and CenteringPregnancy™ (a form of group antenatal care) are two models of maternity care that are separately associated with better clinical outcomes, maternal satisfaction scores and positive experiences compared to standard care. One study reported exclusively on younger women's experiences of caseload midwifery; none described younger women's experiences of group antenatal care. We retrieved no studies on the experiences of women who received a combination of caseload midwifery and group antenatal care.

Objective: examine younger women's experiences of caseload midwifery in a setting that incorporates group antenatal care.

Design: a critical, focused ethnographic approach.

Setting: the study was conducted in an Australian hospital and its associated community venue from 2011 to 2013.

Participants: purposive sampling of younger (19–22 years) pregnant and postnatal women ($n=10$) and the caseload midwives ($n=4$) who provided group antenatal care within one midwifery group practice.

Methods: separate focus group interviews with women and caseload midwives, observations of the setting and delivery of group antenatal care, and examination of selected documents. Thematic analyses of the women's accounts have been given primary significance. Coded segments of the midwives interview data, field notes and documents were used to compare and contrast within these themes.

Findings: we report on women's first encounters with the group, and their interactions with peers and midwives. The group setting minimised the opportunity for the women and midwives to get to know each other.

Conclusions: this study challenges the practice of combining group antenatal care with caseload midwifery and recommends further research.

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Introduction

This paper arose from a mixed methods research study examining younger women's experiences of, and outcomes associated with, caseload midwifery. In the research setting, however, caseload midwifery was combined with group antenatal care (GAC). This paper, therefore, focuses on younger women's experiences of this combination of models.

The standard model of maternity care in Western countries including Australia, Canada, the United Kingdom (UK) and the United States (US) is often medically-led and can be 'fragmented'.

Fragmentation of care occurs when women meet numerous maternity clinicians throughout their maternity experience (Tracy et al., 2011). Antenatal care is usually provided during one-to-one consultations with a different midwife or doctor at each visit. Midwives who are unknown to the woman typically provide care during labour and birth and postnatal inpatient care. Home postnatal visiting may be provided, again with different midwives providing care at each visit.

Literature review

Caseload midwifery

Caseload midwifery aims for the woman to receive all her midwifery care from a known, trusted midwife (Sandall et al., 2013). A primary ('named') midwife is the lead carer for a caseload

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of women across the continuum of pregnancy, labour and birth, and the first few weeks after birth (Page et al., 2000). Caseload midwives in the setting for this study (urban Australia) typically work in a midwifery group practice (MGP) (the term 'caseload' and 'MGP' will be used synonymously in this paper). An MGP generally consists of four midwives providing antenatal care through a series of individual appointments in a range of settings (home, hospital or community-based) (Hartz et al., 2012). Midwives in MGP are on-call for labour and birth; and work as a 'back-up' midwife for each other in the event of a rostered day off or period of leave (Hartz et al., 2012). In Australia, women are able to contact their primary or back-up midwife 24 hours a day for any concerns via a mobile telephone number or pager (Forti et al., 2013). Postnatal care is usually provided in the home for up to six weeks, as determined by the needs of the woman and her infant.

The highest level evidence for the efficacy of caseload midwifery comes from the Cochrane systematic review of midwife-led models of care which included 10 trials of 'team midwifery' and three trials of caseload midwifery (Sandall et al., 2013). The review found improved clinical outcomes for mothers and babies along with increased maternal satisfaction. Two Australian studies have since been published that report caseload midwifery is safe and cost-effective compared to standard care (Tracy et al., 2013, 2014).

The midwife–woman relationship that develops through caseload midwifery has been described as a 'professional friendship' (Walsh, 1999) or 'partnership' (Pairman, 2000). A meta-synthesis of 11 qualitative research studies on midwife-led care (Walsh and Devane, 2012) reported that the midwife–woman relationship increased women's sense of agency (or power) and promoted empathetic midwifery care. Analysis of in-depth interviews explored how a trusting relationship with the midwife facilitated women's ability to cope with pain in labour and experience birth positively (Leap et al., 2010). Ethnic minority women in the UK valued the relationship with a known midwife as it facilitated individualised, sensitive and 'quality' care (McCourt and Pearce, 2000; Beake et al., 2013). An Australian survey reported that 'continuity of care/familiarity' was the factor most appreciated by women who received MGP care; along with the flexibility of home-visiting and 24-hour contact (Fereday et al., 2009). One New Zealand (NZ) study with adolescent women ($n=11$) found that continuity of carer was also important to these participants: '(she) has been with me since I was first pregnant, it's different and it's like a friendship. It is a very important relationship' (Payne and Smythe, 2007, p. 23).

CenteringPregnancy™ and group antenatal care

Group health care describes a health professional facilitating a group of individuals with similar health concerns, while providing health assessment, education and peer support (Centering Healthcare Institute, 2009). A group model of health care with pregnant women was piloted 20 years ago (Rising, 1998) and has been delivered primarily to women who were socio-economically disadvantaged in resource-rich countries (Manant and Dodgson, 2011).

The trademarked model of GAC is known as CenteringPregnancy™. Groups of 8–12 pregnant women of similar gestation meet 10 times across the course of pregnancy for approximately two hours (i.e. 20 hours in total); sessions are facilitated by the same doctor and/or midwife throughout the pregnancy (Rising et al., 2004). The content of group discussion is driven by the interests and concerns of the women, and is only loosely structured to ensure all 'education' topics are covered by the end of the pregnancy. Women are given clinical checks on a mat just outside the group space, whilst their peer group is facilitated to contribute to a group discussion (Rising et al., 2004). The mat check lasts less

than five minutes as women are encouraged to bring questions back to the group rather than have them answered one-on-one (Rising et al., 2004). Women who attend a CenteringPregnancy model of antenatal care typically receive care during labour, birth and postnatally by clinicians who are unknown to them.

A Cochrane systematic review of two RCTs of group antenatal care (CenteringPregnancy™) versus standard care reported no significant differences for key clinical outcomes including preterm birth (Homer et al., 2012). However, the largest RCT ($n=1047$) reported that women who received the intervention were less likely to experience preterm birth and more likely to initiate breast feeding (Ickovics, 2007). An integrative review which included 12 studies identified that knowledge about pregnancy-related issues and maternal satisfaction scores were higher in the intervention group (Manant and Dodgson, 2011).

The highest-level qualitative evidence comes from (i) a US sub-study of a RCT that conducted structured telephone interviews post partum ($n=234$) (Kennedy et al., 2009), (ii) a US ethnographic study that used observation of group sessions and semi-structured interviews ($n=21$) (Novick et al., 2011), and (iii) a Canadian study that conducted in-depth interviews ($n=12$) and validated the findings with a separate focus group (McNeil et al., 2012). These studies reported that women felt comfortable to share their fears, concerns and experiences in the group space which in turn helped them to feel less alone during pregnancy and to develop trusting relationships with their care providers (Kennedy et al., 2009; Novick et al., 2011; McNeil et al., 2012). An Australian survey (Teate et al., 2011) and small US focus group (Klima et al., 2009) reported similarly positive findings. Women's negative experiences included feeling 'exposed' during clinical examinations (Kennedy et al., 2009; Novick et al., 2011) and the desire for at least one scheduled one-to-one visit with a care provider (Kennedy et al., 2009). In one study, it was noted that sensitive topics including domestic violence and family stressors were not brought to the group for discussion; and that postnatally women were not pro-active in maintaining relationships with others from their antenatal group (Novick et al., 2011).

Versions of GAC have been introduced into maternity care settings including low income countries. A systematic review demonstrated that participatory learning and action groups are both clinically and cost effective for low income countries (Prost et al., 2013). International health organisations including JHPEIGO have included a women's 'Care Group Model' as a key maternal health initiative; however research and evaluation of this model is needed (Perry et al., 2014). Two studies reported on GAC models where the education and clinical assessment components were separated rather than integrated as they are in CenteringPregnancy™. A qualitative study based on interviews with women and their partners reported that the education component was appreciated and the groups helped to normalise the symptoms of pregnancy (Andersson et al., 2012). However, the midwife was reported to have adopted a 'didactic pedagogic style' rather than a facilitative approach and participants were disappointed that the social network rarely continued after the birth (Andersson et al., 2012, p. 506). In contrast, a 2010 survey of 75 women reported that peer support was developed through GAC and maintained at six months post partum (Wedin et al., 2010).

Gaps in the literature

Younger women's experiences of caseload midwifery have been reported in just one NZ study; the methods for analysis were poorly described, however, which undermines confidence in the findings. While younger women were not excluded from qualitative studies of CenteringPregnancy™, the mean age of participants indicates that their participation was rare. We found

no published research about the combination of GAC with a caseload midwifery model. To our knowledge this study is the first to address this gap in the literature by addressing the research question: How does group antenatal care function within a caseload midwifery model?

Methods

Study approval was granted by the Hospital (1553M) and University Human Research Ethics Committees (Q2011-69). This study used a critical, focussed ethnographic methodology (Cook, 2005; Venzon Cruz and Higginbottom, 2013). Ethnography is a research design that allows in-depth analysis of social phenomena as they occur in their natural setting (Fetterman, 2010). Ethnography is 'focussed' when it involves a discrete number of participants, structured interviews, episodic and short-term field visits, and rigorous data analysis (Venzon Cruz and Higginbottom, 2013). Triangulation of data occurred through analysis of focus group (FG) interview data (women and midwives), observational field notes, and relevant documents.

The critical paradigm enabled the researcher to acknowledge power relations and to see the world from the perspective of the less privileged group (women participants) rather than the more privileged group (midwife participants) (Kadlec, 2006). The critical approach had several significant implications for data analysis. First, it meant that the voices of the childbearing women were privileged and became the foundation for each theme, which was then compared or contrasted with data from all other sources. Second, participants' words were not simply taken at 'face value'; instead they were analysed and interpreted through a critical lens (Forester, 2013). Third, the researchers' thoughts and feelings were recorded through field notes; the researchers' experiences being a valid source of information that was used to inform the analysis (Altheide and Schneider, 2013).

Research setting

The research occurred at an Australian health service; while the editors have been informed of the exact year and location of data collection these details have been omitted in order to further anonymise participants. In the research setting, there were a number of MGPs including ones for specific groups identified as vulnerable. We focussed on one MGP of four midwives where each provided caseload midwifery care to 35 women of all-risk status aged 21 years or less. This MGP had been operating since 2008 during which time approximately 15 midwives have worked in the model. Women typically received a first booking visit in their homes. All subsequent antenatal care was provided in group sessions in a community outreach setting. The primary midwife or a back-up MGP midwife provided labour and birth care in the hospital. Postnatal care was delivered in the woman's home for up to six weeks following birth. At the time of interview, none of the midwives had received group facilitation training; it was not a prerequisite for providing GAC at the study site.

Participant selection and recruitment

Information sessions about the research project were presented at MGP meetings. The midwives were aware of the research project and agreed to be contacted with further information about the study. The researchers provided the Participant Information and Consent Form via email. All midwives agreed to participate in a FG interview, which occurred during work hours at a suitable time and venue nominated by the midwives. The midwives written informed consent acknowledged that all reasonable

precautions would be taken to protect their identity if the results were published. The midwives are a small and potentially identifiable group of participants therefore pseudonyms have been used and individual participant characteristics (e.g. age, ethnicity) have not been provided.

Recruiting younger pregnant and parenting women, who were booked with the MGP and had attended group sessions, proved challenging. Pregnant women were informed about the study through posters and flyers at the community venue and were given face-to-face information by the MGP midwives. Women could register their interest in participation by phoning the research team or letting their midwife know; contact with the research team could then be made on the woman's behalf. No participants were recruited after a three month period, despite an AUD\$30 voucher incentive to attend a FG interview. Hence, the researchers asked to attend some GAC sessions to meet potential participants, provide them with any additional information and answer their questions. Approximately 20 potential participants were given information about the research in this way; 10 subsequently attended for FG interviews. Lack of interest, time, and/or inability to attend a FG alone (e.g. lack of transport) were cited by women to the researchers as reasons for non-participation. Women who confirmed they wished to participate were sent a reminder text message the day beforehand.

Younger mothers (postnatal women) were recruited face-to-face by a social worker who they knew because she regularly facilitated postnatal support groups. The social worker endorsed the research and explained that participation would help to ensure the voices of younger women were heard and could therefore influence future changes/improvements to the service. Of the 12 postnatal women who were given information by the social worker, six attended for a FG interview. Both pregnant and postnatal participants (Table 1) provided written informed consent prior to the FG interviews.

Data collection

Data collection methods included focus group interviews, observation, and examination of documents (Table 2).

Research team

The first and final authors conducted the FGs. The first author was a full-time PhD student at the time of the study and had received postgraduate training in qualitative methods. She is a direct-entry midwife whose clinical experience has predominantly been in caseload midwifery. The second author has been a midwife for over 20 years with experience of conducting and supervising mixed methods research. She is the clinical chair of midwifery at the research site and an academic supervisor to the first author. The final author is a full-time Senior Research Fellow and an academic supervisor of the first author. She has a background in midwifery practice and has many years of qualitative research experience, including the use of ethnographic approaches involving younger women and midwives.

Data analysis

The first author transcribed the audio files verbatim (Bird, 2005). Participants were ascribed pseudonyms and identifying features in the data were anonymised. Analysis followed Roper and Shapira's framework for ethnographic data analysis (Roper and Shapira, 2000). The process of identification, comparison and synthesis of data continued until analytical 'fit' was obtained (Morse and Singleton, 2001). Participants did not give feedback on the findings. Themes were revised, named and finalised

Table 1
Pregnant and postnatal participants' demographic information.

Pseudonym	Age at interview*	Ethnicity [†]		Home living situation	Employment status during pregnancy	SEIFA index [‡]
Pregnant women			Gestation, parity			
Sam	19	Caucasian	36 weeks, nullipara	Partnered	Attending university	6
Leah	19	Caucasian	34 weeks, nullipara	Alone	Not studying or working	9
Michelle	20	Maori	36 weeks, multipara	Married	Not studying or working	8
Olivia	22	Maori	36 weeks, nullipara	Sharing with a friend	Not studying or working	8
Postnatal women			Age of baby			
Nadia	20	Caucasian	7 month old baby	Parents, siblings, and partner	Paid employment	8
Rebecca	20	Caucasian	6 month old baby	Sharing with her sister	Attending university	8
Veronica	20	Caucasian	8 month old baby	Parents	Not studying or working	8
Sheila	21	Caucasian	10 month old baby	Parents	Attending university	8
Andrea	21	Caucasian	5 month old baby	Parents	Paid employment	1
Ann	21	Caucasian	20 and 8 month old babies	Alone	Paid employment	8

* Women were accepted into the young women's MGP program if they were 21 years or less at the time of booking for pregnancy care. Thus at the time of interview some young women were older than 21 years.

[†] Maori: a member of the native Polynesian population of New Zealand.

[‡] The Socio-Economic Indexes for Areas (SEIFA) was used to categorise socio-economic status. SEIFA divides areas based on postcode with reference to median income, education, employment, occupation, housing and other indicators of advantage and disadvantage. Score of 1 is the lowest and 10 is the highest.

Table 2
Details of data collection methods.

Type	Role of method	Participants	Data collection strategies	Amount of data
Observation	To gain greater understanding of how the group antenatal care sessions were run	Midwife facilitators and group antenatal care participants	The first and final author conducted observations on four occasions between June and July 2013 All observations were documented in the form of field notes	Approximately two hours of observation in total
Focus group interviews	To obtain midwives perspectives on providing group antenatal care to young women To obtain young women's perspectives on receiving group antenatal care	Midwives who were currently employed in the Young Women's Midwifery Group Practice (YW-MGP), and consented to interview Young women who were currently pregnant or parenting and who had received care from YW-MGP in previous 12 months; and consented to interview	The first and final authors carried out all the semi-structured focus group interviews; no-one else was present A semi-structured interview guide was driven by the research objective and included open questions and group activities Each audio-recorded FG lasted approximately 60–75 minutes During the interview both researchers facilitated the discussion and recorded field notes immediately afterwards; both sets of field notes described similar observations	One focus group interview with four midwives Four small focus group interviews: antenatal (n=2), antenatal (n=2), postnatal (n=4), postnatal (n=2); total of 10 young women interviewed
Examination of selected documents	To obtain information about how the young women first informed about group antenatal care and how the group antenatal care was structured	Not applicable	The first and final authors coded both documents; and recorded these in the form of field notes	Coded <i>Invitation Letter</i> Coded <i>Pregnancy Topic Guide</i>

through a process of vigorous, critical discussion amongst the researchers.

whereas words added/changed to clarify meaning are enclosed by (brackets).

Findings

Younger women who participated (n=10) were primarily Caucasian, well supported, and living in affluent areas (Table 1). In general terms, the MGP midwives interviewed (n=4) were 40 years or older, Caucasian and received their midwifery qualification outside Australia. Critical analysis of the data generated three themes: (i) women's first group encounters (ii) the woman–midwife interaction (iii) women's limited opportunities to 'get to know (each other)'. Direct quotes from interview data are *italicised*. Quotes from selected documents are placed within "inverted commas". Excerpts from field notes are presented in a *different font*. Deleted segments of data are indicated by the use of '...'

Women's first group encounters

People typically 'encounter' a group long before they first meet other participants. How participants perceive their first encounters with a group impacts how readily (and frequently) they attend, participate and engage in the group process (Bourke and Pye, 2013). Women's experiences of these first encounters are considered in this theme.

Women's first encounter with their antenatal group was usually a telephone call by a MGP midwife who notified them of their allocation to the caseload model:

"...women who are (under a certain age) that live in the catchment area automatically come to us" (Kate, midwife)

“... that's really the only model of care they get offered” (Jacki, midwife)

“It's not really a choice” (Kate, midwife).

According to the midwives, women were typically offered a 'booking in' visit at home or other venue deemed suitable by the woman (e.g. café). Some women refused home-visiting which was perceived by the midwives as a missed opportunity to gain insight into the woman's life. Most women interviewed reported they transferred to MGP after their first booking visit at the hospital had already occurred. Therefore these participants received no home visits during pregnancy. Some that received a home visit appreciated the opportunity to build a “*rapport*” with their midwife, whereas others depicted a somewhat impersonal encounter:

“she did all my pre-check stuff and then signed me up for my class (group antenatal care)” (Leah)

Following the first booking visit, women received an invitation to the group typed on hospital letterhead paper. The purpose of the group was clearly stated:

“The pregnancy groups are an excellent time to get to know other young women and meet the other midwives in the program”.

No information was provided as to whether the woman's partner or other support people were invited. Group dates and times were listed for the entire pregnancy: eight one-hour sessions (i.e. eight hours total) between 20 and 40 weeks' gestation. Women liked that they got access to childbirth education and antenatal care at the same time and in the same place. However, they wanted the sessions to start earlier in pregnancy, occur more frequently and be longer in duration. Group antenatal care was delivered to different groups on two weekdays during working hours. The invitation letter read:

“If you have difficulty attending the group please talk to us about this”

There did not appear to be adjustments made for women who could not attend on the day they had been allocated:

“I couldn't come on the same day [that groups were running], so I kinda just came myself, and there was just the three midwives with me...[group laughter]... I was on my own for every appointment” (Andrea).

Lack of flexibility with scheduling appointments and group sessions may be related to the MGP midwives limited access to the community venue.

The community venue was located in an inner city suburb approximately one kilometre from the hospital. Most women reported an 80–120 minutes round trip via two forms of public transport. The venue is comprised of two separate converted houses adjacent to a historic church. While Michelle was “*taken aback*” by the church façade, she liked the “*homely environment*” created inside. Leah preferred the community venue to a hospital clinic because she didn't want to “*be around sick people*” during pregnancy. However, the layout of the venue could be overwhelming: “*I came in, I was just like, I didn't know where to go, I was like 'Oh my god, what do I do'*” (Leah). The following excerpt describes one of the researcher's first encounters with the community venue:

I walk up a ramp into a wooden house which has a reception desk that is unattended, through to a space which is open plan and busy with activity...I find someone wearing a name badge and am given directions to the upstairs level...I walk up a dark

staircase which opens directly into an open plan room....I sit down in the small waiting area at the top of the stairs. There is a large square, bare, table (made up of school desks) around which women (and others) are sitting quietly in chairs; it does not look inviting or comfortable...Beyond the table is a small stage where the midwives have set up a yoga mat with clinical equipment on the floor and a privacy screen [first author, field notes].

Women's narratives confirmed that arrival at the venue for the first time did not feel comfortable. Most recalled sitting down quietly in a group which fluctuated between 3 and 12 women, and waiting for the group to start. Even Ann, who was quite talkative in the FG interview, described encountering her first group as “*really overwhelming*”. She was unlike Leah, who described introducing herself to a peer, with whom she initiated a conversation while waiting for the group to start.

The group session commenced with the midwives undertaking clinical checks on their individual clients:

All the midwives in attendance moved around the table to take blood pressures, check blood results, document in the notes, and invite their caseload women to have an abdominal assessment and fetal heart rate auscultation on the mat on the stage [first author, field notes].

When it was their turn, women were asked by their MGP (or back-up) midwife to go up to the stage to lie down on a yoga mat. Some found this process uncomfortable and challenging whereas others commented it was “*comfortable*” and gave the check up a “*relaxed*” feeling. Women who preferred the floor for their checks reported it felt less medical, and normalised the experience.

While women were lying on the yoga mat, their midwife enquired about any issues she would like to discuss. Some women reported they felt “*worried*” or “*self-conscious*” about having their clinical check in the group space, particularly when asked personal questions:

“I've got the...it's so awkward... ‘So have you got any (vaginal) discharge of like funky colours?’ [laughs]” (Leah)

“Oh gross!” (Michelle).

“Everyone is in your personal space and, you know, and you might feel pressure...and not be wanting to share something because you know, someone else is sitting next to you...” (Michelle).

In summary, women's first encounters of the group were mixed. Women tended to appreciate the community venue and an atmosphere which normalised the experience of pregnancy. At the same time they were not offered other options for antenatal care, felt overwhelmed and uncomfortable on arrival to the first group, and raised concerns about lack of privacy.

The woman–midwife interaction

The midwives considered that GAC was beneficial to the young women because:

“...they get to know all of us throughout their antenatal period, we all go to the (group) sessions...so none of us are unknown to them, unless they haven't attended” (Susan, midwife).

However, despite being beyond 36 weeks pregnant and regular attendees of group sessions, some participants could not distinguish individual midwives:

"Is Barbara (midwife) the one with the short hair that had the orange scarf on this morning?" (Michelle).

"No" (Leah).

"No that's (midwife) Susan" (Interviewer)

"Susan?" (Michelle)

"Susan was sitting there at the corner" (Interviewer)

"I didn't know who Susan was [laughs]" (Leah)

"Which one is Barbara?" (Michelle)

"She's the one, she has short hair, she's younger, she's a lot younger than the others" (Leah).

There was no scheduled one-to-one time outside of the group visits. According to the initial invitation letter:

"If there is something that you would like to talk to your midwife about in private please let her know and she will arrange a suitable opportunity".

However the midwives were perceived by the women as:

"rushing...very short on time" (Sam)

"running around and doing everyone at the same time" (Michelle)

"they rush everything..." (Veronica).

For some women, like Sam, personal time with a midwife remained an unmet need:

"I wish there was more one-on-one, I do...you don't want to sound silly and like you have questions as well that you don't want to say out loud... I know we are very short on time but like a two minute space where you went into a room with one of them and you could just blab away, spill your heart..." (Sam)

The women described they would sometimes text their midwife to ask questions. One of the midwives interpreted that women often texted or phoned in order to seek additional emotional support. Women expressed how re-assuring they found talking to a midwife who was familiar. Ann explained that she felt comfortable to call her midwife because:

"she didn't make me feel stupid, she made me feel better about (what was going on)".

Michelle speculated that she may have felt more confident to take the advice of a midwife who was familiar to her, rather than a midwife she had not met.

During labour, the telephone call enabled the midwife and woman to assess whether labour assessment was warranted and to make arrangements to meet together at the hospital birth suite. Sometimes their clients presented to hospital directly rather than telephoning their midwife:

"A lot of the time they'll come in to the (hospital) and they've not called us..." (Jacki, midwife).

"That happened with me...one of (your) caseload ladies wasn't it? ...She hadn't really attended; you didn't know her very well. I'd never seen her before...she went in (to hospital) three times unannounced and each time I said, please phone me!" (Susan, midwife).

Whereas women interviewed in this study wanted to have a midwife in labour that they recognised and were acquainted with:

"They're all lovely – just as long as there is a familiar face" (Michelle)

"...because I knew their faces and everything I would have been comfortable with them, a lot better than just a random (stranger) ... [laughs]" (Rebecca)

A minority expressed a wish to have their primary midwife with them. Olivia said: "I just want to stick with that one midwife that you have and got introduced to." Whereas Ann did not feel comfortable with one of the MGP midwives and did not want her to attend her in labour:

"I was just scared of her to be honest...I just wasn't absolutely comfortable to just [open hands gesture and whistle to indicate spreading ones' legs] in front of her"

Andrea was unusual in that she reported:

"I really wanted Susan, I only wanted Susan, and then she wasn't there [giggles]. I think I cried for like a solid hour..."

She was the only participant who expressed that she felt upset when she realised that her primary midwife would not be attending her in labour.

Pregnant participants discussed the importance of having a 'normal birth' yet their midwives had "no idea" (Sam) about their wishes. Olivia explains:

"I see videos and stuff on Facebook and I'm like I want to do this, you know, have the baby in the bath...I just want everything normal. I don't want no drugs, no nothing. I just want a natural birth" (Olivia)

"So does [your midwife] know that?" (Interviewer)

"I don't think we've ever spoken about it" (Olivia)

Postnatal women, like Andrea and Sheila, thought it was not important to have a 'birth plan', a sentiment that appeared to be supported by the midwives:

"Young women do just tend to" (Kate, midwife)

"(interjects) They've (got) no expectations" (Jacki, midwife)

"Go with the flow a bit more" (Kate, midwife)

"They just come into labour and go with the flow...they don't have a birth plan as long as their arm and" (Jacki, midwife)

"(interjects) It's laminated" (Kate, midwife)

"...and signed by the lawyer" (Marilyn, midwife)

(Group laughter).

It is interesting to note that Sheila echoed the midwives own words:

"...I really didn't care about my birth plan, I was like 'I'll just go with the flow...I was like 'I'll just do whatever the midwife says and then it should be okay'..."

This could be interpreted as either compliance with, or trust in, the midwife. The way labour care was provided was described by midwife Marilyn:

"I make sure that the woman and the baby are safe, yeah, good fetal heart things like that, but I don't do anything else, nothing else, that is their (woman's labour supporters) job, to massage her, talk her through, put her in the shower, get her up to the toilet, do all that, cause that's their loved one, it's not my loved one"

This sentiment could be interpreted to demonstrate the absence of any relationship between Marilyn and her client.

In summary, women appreciated a 'familiar face' in labour but rarely expressed an attachment to their primary midwife. The women typically wanted more one-on-one time with their midwife. Some women interpreted that their wishes for labour and birth were not known to their midwife.

Women's (limited) opportunities to "get to know (each other)"

According to the Hospital's Pregnancy group topics guide, the first GAC session included an 'ice-breaking' activity designed to

introduce participants to one another. However the women recalled:

"I think we all just sat at the table and introduced ourselves, isn't that what we did?" (Olivia)

"Yeah I think we said our name and how pregnant we were, I'm not even sure if we did that..." (Sam).

Nevertheless, the participants enjoyed being around younger women like themselves:

"(I like) see(ing) what other people are doing and what they're feeling like" (Sam)

"They are around my age and they kind of know what you're going through..." (Leah).

The women frequently reported feeling disappointed, however, that they did not to 'get to know' each other during the group sessions:

"I think more than an hour would be nicer, cause then you could get to know the other people" (Rebecca).

"I don't think there was like enough time to get to know them (the other women)" (Nadia).

The midwives attributed lack of group interaction to the women themselves:

"...some will take over, some will just be like a little sparrow in the corner... you'll get some groups who just don't..." (Marilyn, midwife)

"Don't gel" (Kate, midwife)

"...it depends who you've got in the group...sometimes they really interact...and others it's like pulling teeth" (Jacki, midwife)

Some participants reported that their partners/significant others did not feel comfortable. In regard to her partner Ann commented:

"(He was) dragged along (although) he hated it! He hated all the girlie stuff they'd talk about".

Sam explained that her partner had suggested that convening a separate father's group would be helpful to address men's particular interests and concerns. Olivia's partner attended one group session during her pregnancy and chose not to return:

"Yeah once I have brung my partner along" (Olivia)

"And what did your partner think about it?" (Interviewer)

"Oh he just...sat in the corner" (Olivia)

"What back there away from the table?" (Interviewer)

"Yep...he didn't really say nothing (about it afterwards), oh just 'boring'" (Olivia)

"He didn't want to come back?" (Interviewer)

"No" [laughs] (Olivia)

"Did you want him to come back?" (Interviewer)

"I wanted him to come back but I didn't think he would" (Olivia).

The women frequently used words such as "classes" and "lessons" to describe the groups; the midwives referred to giving "talks". During one observation the researcher documented:

What struck me was the silence of the young women, the central positioning of the midwives (all in a line), and the didactic style in the way in which the information was delivered. One of the midwives was waving a catheter and drip bags about as she talked about the use of these objects [final author, field notes].

The topics covered by the midwives during each session were listed in the Pregnancy group topics guide, and commented on by the women:

"They (midwives) had like a little program, like they kind of said what they would teach each week... if anyone had any questions about anything else or that topic, they would answer" (Nadia)

"Was there time for questions?" (Interviewer)

"Not really" [giggling] (Andrea)

Sam explained there was limited opportunity to ask questions, and when questions were asked by other women, Nadia recounted that one of the midwives would answer. Michelle and Leah agreed that while women may talk in the group, this was generally only to address a question to the midwives, rather than initiate, or contribute to, discussions:

"(The women) don't talk" (Leah)

"Not to each other" (Michelle)

Some postnatal women commented that they had laughed and joked with each other in the group antenatal sessions; they built "a really good network" (Ann) and it helped them with "making friends" (Veronica). However, these new friendships tended to be short-lived:

"And have you kept on with those friendships?" (Interviewer)

"Oh, I tried but...no good" (Veronica)

"Do you think you will catch up with these same women after you've had your babies?" (Interviewer)

"Probably not...to be honest" (Michelle)

"No" (Leah)

Friendships which might have carried through into the postnatal period were generally not established.

In summary, the young women expressed a desire to get to know others like themselves yet were disappointed that this rarely occurred either during or outside group sessions. How the groups were facilitated may have acted as a barrier to their getting to know each other.

Discussion

To our knowledge this the first study to analyse the experiences of women who received GAC within a caseload midwifery model. The younger age of participants, however should be borne in mind when considering the findings.

The Australian mixed methods study of CenteringPregnancy™ included older participants (mean = 29 years) who chose to attend a group model of care because they wanted friendship, reassurance, support, sharing, information or fun (Teate et al., 2011). In contrast, younger women (19–22 years) in this study were allocated to group care and may not have had the same motivation to engage in the group process. Younger women in general may be more difficult to engage in (group) discussion due to common adolescent feelings of shyness, embarrassment and shame (Stapleton, 2010). This may have been compounded by negative first encounters which diminished their readiness to talk within the group or initiate conversation outside the group. Women's perceptions of the midwives as busy may have inhibited them from taking up more time by asking questions or voicing concerns (Kirkham et al., 2002) during the hour-long group sessions.

The introduction of a GAC model that diverges significantly from the intervention results in 'model infidelity'; which may explain why some of our study findings are incongruent with the wider qualitative CenteringPregnancy™ literature (Manant and Dodgson, 2011; Novick et al., 2013). Groups should be

appropriately facilitated to maximise peer interaction. This might be achieved, at least in part, if group discussions and clinical assessments occurred simultaneously. Group facilitation requires specific knowledge and skills: it takes practice for midwives to develop the confidence and patience to “throw things back to the group – not talk too much myself” (Teate et al., 2013). Group facilitation is not currently included in midwifery curricula in Australia (Australian Nursing and Midwifery Accreditation Council, 2014) and training was not provided systematically to all midwives at the study site, and not to any of the midwives who participated in this study. Our findings suggest that many of the negative encounters women described could be addressed through MGP midwives being supported to acquire group facilitation skills.

It appears that GAC may affect the development of a ‘professional friendship’ between women and midwives. Friendship has been described as a psychological process that involves moving through phases of being *strangers* to becoming *acquaintances* to becoming *friends* (Adams and Blieszner, 1994). The initiation and development of a friendship requires certain conditions including:

“repeated interactions, meet(ing) in dyads or very small groups, hav(ing) an appropriate degree of privacy, and interact(ing) frequently enough and for a long enough duration to enable them to become comfortable with one another” (Blieszner and Roberto, 2003, p. 165).

Accordingly, repeated one-to-one visits, in a private location, with sufficient time, would seem to provide the necessary conditions for the development of a friendship-type relationship. Private time and space is also a pre-requisite to discuss sensitive issue and confide in someone (*‘to blab away, spill your heart’*), a process which facilitates emotional closeness and intimacy for both parties (Adams and Blieszner, 1994); in this case woman and midwife.

Younger women contributing to this study rarely described their relationship with the MGP midwives in terms that evoked the notion of a friendship; instead they described the midwives collectively in acquaintance terms: *‘a familiar face’*. However, the notion that younger women would want to form a ‘professional friendship’ with a midwife who is closer to their mother’s age than their own cannot be assumed. It has been argued that the midwife–woman partnership presumes that both partners are similar (e.g. age, class, ethnicity) and therefore “willing and able to be partners” (Skinner, 1999, p. 17).

Most women commented to the effect that receiving care provided by someone who was familiar to them was satisfactory; certainly better having a “random” midwife they had not previously met. Research derived largely from surveys of maternal satisfaction suggest that participants commonly give positive reports about their maternity care, regardless of the type of care they received, because “users tend to value the status quo over (other types of care) of which they have no experience” (Porter and McIntyre, 1984, p. 1200). When participants were asked which midwife they wanted to be with them in labour, only one woman (Andrea) repeatedly used her midwife’s name and described that she “cried for an hour” when her midwife, who we interpret she knew and trusted, could not be with her. For Andrea, who most likely had experienced a different level of interaction with her midwife, having a familiar face was no longer sufficient.

Limitations

As described above, one limitation of this study is the younger age of participants which may limit the transferability of the findings to the wider childbearing population. However, the age

range (19–22 years) represents the upper end of adolescence and young adulthood, and hence the sample shared characteristics (e.g. Caucasian, in further education or employed, stable relationships) in common with the general childbearing population.

The sample of participants was also small; four caseload midwives and 10 women. Regardless of size, however, interactions between focus group participants can generate rich data that may not emerge through in-depth interviews and hence datasets should not be discounted on the basis of size alone (Toner, 2009).

The sampling plan for women excluded those that did not regularly attend for antenatal care and those who began with the MGP and then changed models of antenatal care; and it excluded postnatal women who did not attend the optional postnatal support group. The sampling plan for midwives excluded those who had resigned from the MGP program. We acknowledge they are a potential source of critical information and hence their non-inclusion is a limitation.

Recommendations

According to research evidence in resource-rich countries it is CenteringPregnancy™, not GAC per se, which is associated with better clinical outcomes, maternal satisfaction scores and positive experiences. Therefore the delivery of GAC in a way that significantly diverges from the intervention (as was tested) would be difficult to justify (Manant and Dodgson, 2011; Novick et al., 2013).

Further research about women’s and midwives’ experiences of working within a combined model of GAC and caseload midwifery would elucidate themes emerging from this study. Qualitative research about younger women’s experience of caseload midwifery in a setting where one-to-one antenatal care is provided would be useful.

Separate one-to-one home visits with the primary midwife, in addition to the group sessions, may assist women to talk in-depth about personal issues and may help midwives to get to know their individual clients. These home visits could take place routinely (e.g. at booking, 36 weeks gestation and 41 weeks gestation); or in response to women’s individual circumstances and requests.

Conclusion

This study challenges the practice of combining GAC with caseload midwifery and recommends further research.

Conflict of interest

The authors declare there were no conflicts of interest.

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CHAPTER 7: DISCUSSION AND CONCLUSION

7 INTRODUCTION

This research project aimed to answer the question:

(How) does the way maternity care is provided affect the health and well-being of young women and their babies?

Three research objectives drove the project:

- 1) To determine whether non-standard maternity models of care were associated with improved perinatal outcomes for young women and their babies
- 2) To determine the feasibility of a large scale randomised controlled trial of caseload midwifery versus standard care for young women
- 3) To critically appraise the experiences of young women and midwives within the caseload midwifery model of care

The research objectives were addressed using a mixed methods research design which included*: 1) a structured literature review,¹ 2) a feasibility study of a RCT,² 3) a retrospective cohort study,³ and 4) an ethnographic study.⁴ These research components were conducted and analysed simultaneously, and have been considered separately, in previous chapters. In accordance with the triangulation design (convergence model), after completion of the discrete analyses of the individual research components, an integrative process was conducted to “draw out new insights beyond the information gained from the separate quantitative and qualitative results” (Fetters, et al., 2014, p. 10). The methods for integrating the research results were presented in Chapter 3 (Section 3.2.3). This chapter presents the integrated results, combined with relevant theory and current research, in order to address the research question.

The cohort paper³ demonstrated that caseload midwifery, in this research setting, was associated with significant benefits for young mothers and their babies. The most significant finding from this paper was that young women booking into young women’s midwifery group practice (YMGP), compared to

* Each research component has been included in the manuscript as four submitted/published papers and are referenced in this chapter using superscript^{1,2,3,or 4}

standard care, were less likely to have a preterm birth (aOR 0.59 (0.38-0.90, $p=0.014$).³ This finding remained significant when analysed for women who actually received caseload midwifery (TR analysis).³ These findings concur with a recent Cochrane systematic review of midwife-led models of care ($n=16,242$) which has shown that women randomised to midwife-led care, compared to standard care, are less likely to give birth preterm (Sandall, et al., 2013). The cohort study³ is the first however, to report similar findings for young women, who are at greater risk of preterm birth (da Silva et al., 2003). The focus of the integration, and this chapter, therefore focused on exploring and understanding *how* caseload midwifery was effective for young women. Qualitative data were collected on midwives' and young women's experiences of caseload midwifery. As such, some of the results presented in the ethnographic paper⁴ were able to integrate with, and make sense of, the cohort study outcomes³ around preterm birth and associated predictors.

The caseload model in this setting included the provision of antenatal care in groups (GAC) that followed a one-on-one booking visit with a midwife (usually in the home). A RCT of GAC, compared to standard care, for young women (aged 14-25 years) found a significantly lower incidence of preterm birth for those randomised to the intervention (Ickovics et al., 2007). Therefore, the inclusion of GAC in the caseload model in this setting is a potential confounding factor that may have positively affected preterm birth rates for young women in the caseload cohort. The implementation of GAC in the caseload model warrants further consideration.

Young women's clinic (YWC) will not be a focus of the integrated discussion in this chapter. While YWC showed promising results in the cohort study,³ unlike caseload midwifery it did not show significant improvements on the primary outcome measures when analysed by both ITT and TR analyses. The sample size for this cohort was small which may explain why significant differences were not found. Furthermore, qualitative data were not collected on women's and midwives' experiences of the YWC model. However, when quantitative findings from bivariate analysis are presented for caseload midwifery, compared to standard care, YWC findings have been included to ensure accurate statistical reporting (i.e. YMGP, YWC, Standard, p value).

This chapter is divided into five sections (7.1-7.5). Section 7.1 briefly describes the theoretical model and how this model was developed including key concepts. Section 7.2 applies the theoretical model to weave together the key research results. Section 7.3 discusses the strengths and limitations of this research project. Section 7.4 considers recommendations for midwifery practice and future research. Section 7.5 provides a conclusion to this PhD.

7.1 THEORETICAL MODEL AND KEY CONCEPTS

A central question when evaluating a complex intervention like caseload midwifery is “what are the active ingredients within the intervention and how are they exerting their effect? Only by addressing this kind of question can we build a cumulative understanding of causal mechanisms” (Medical Research Council, 2006, p. 7). To understand and answer this question requires critical analysis of the various elements of the intervention, the literature that currently exists to support the intervention, and the development of a theory. A theory is a systematic view of phenomena that defines and specifies interrelationships between concepts for the purpose of explanation and prediction (Bryar & Sinclair, 2011; Chinn & Kramer, 2010; John Scott & Marshall, 2005). Theory is important for research because it enables structured analysis and interpretation of the issues under investigation (Willis et al., 2007). In the context of newly introduced maternity care models, theory enables researchers to identify factors that promote or inhibit their implementation and function (Forster, Newton, McLachlan, & Willis, 2011). It is important to realise that one of the limitations of theory, which postmodernists refer to as ‘metanarrative’, is that any components which do not ‘fit’ tend to be erased, in order to build a coherent argument (Lyotard, 1984). The danger then is that theories “oversimplify and blind us to subtleties, complexity and exceptions” (Fahy, et al., 2008, p. 172). Therefore it should be borne in mind that while important and useful; a theory cannot fully represent the complexities, conflicts and contradictions within research findings.

I have developed a theory to suggest how caseload midwifery might function with this population (i.e. young childbearing women). I theorise that:

Optimal caseload midwifery facilitates synergistic health engagement which modifies predictors for preterm birth; this is the mechanism by which the incidence of preterm birth is lowered.

Three key concepts which were derived through the integrative process, and which underpin the theoretical model, will be described in this section: 1) modification of predictors for preterm birth, 2) (synergistic) health engagement and 3) optimal caseload midwifery.

7.1.1 MODIFICATION OF PREDICTORS FOR PRETERM BIRTH

The social determinants of health are the circumstances in which people live, that are shaped by wider economic and social forces, and lead to avoidable health inequalities between groups of people (World Health Organisation, 2008). Adolescent pregnancy is commonly affected by factors that compromise health including poor nutrition, extremes of body weight, stress, anxiety, depression, lack of social support, housing issues and use of cigarettes and illicit drugs (Imamura, et al., 2007; van der Klis & Westenberg, 2002). Not surprisingly these same factors are predictors for preterm birth (see Table 6). These factors will be defined and discussed in Section 7.2.

TABLE 6 MODIFIABLE RISK FACTORS FOR PRETERM BIRTH

Modifiable risk factors for preterm birth	
Anxiety	(Orr, Reiter, Blazer, & James, 2007)
Depression	(Accortt, Cheadle, Dunkel Schetter, 2014)
Domestic violence	(Covington, et al., 2001; Quinlivan & Evans, 2001)
Exposure to environmental tobacco	(Ashford et al., 2010; Crane, Keough, Murphy, Burrage, & Hutchens, 2011; Savitz & Murnane, 2010)
Genito-urinary infections	(H. L. Johnson, Ghanem, Zenilman, & Erbeding, 2011; Sangkomkamhang, Lumbiganon, Prasertcharoensook, & Laopaiboon, 2008).
Inappropriate gestational weight gain	(Harper, Chang, & Macones, 2011)
Illicit drug use	(Pinto et al., 2010; Savitz & Murnane, 2010; Steer, 2006; van Gelder, et al., 2010)
'Inadequate' antenatal care	(Debiec, Paul, Mitchell, & Hitti, 2010; Raatikainen, et al., 2007)
'Late' booking for antenatal care	(Raatikainen, et al., 2007)
Poor nutrition	(Bloomfield, 2011; Haggarty et al., 2009)
Smoking	(T. S. Johnson, Rottier, Luellwitz, & Kirby, 2009; Mehaffey, Higginson, Cowan, Osborne, & Arbour, 2010; Savitz & Murnane, 2010; Smith et al., 2006; Steer, 2006; Wills & Coory, 2008)
Stress	(Savitz, et al., 2004)

A number of risk factors are potentially amenable to antenatal intervention (Quinlivan & Evans, 2002). Indeed, there is some evidence that antenatal care programmes that are targeted to meet the needs of socially disadvantaged women can effectively reduce preterm birth (Hollowell, et al., 2011). However, the effective antenatal intervention relies on young women's willingness to 'engage' with their maternity care providers, and the willingness of providers to offer a service that meets their needs.

7.1.2 HEALTH ENGAGEMENT

Health engagement has been described as "actions individuals must take to obtain the greatest benefits from the health care services available to them" (Gruman et al., 2010, p. 350). Engagement of 'patients' or 'adolescents/youth' with health care services or interventions is commonly reported in the research literature; and often measured simply in terms of initiation, attendance and retention (Pullmann et al., 2013). In the context of maternity care, health engagement may be measured by several data items that are routinely collected in most settings. These include: booking for antenatal care (yes or no); gestation at first visit (early or late); and whether attendance is deemed 'adequate' (various measures). In other words, most research on health engagement, including maternity related, is measured and reported simply as the patient 'turning up' for care.

The term 'engagement', however, may be more broadly interpreted to encompass "the feeling of being involved in a particular activity" (MacMillan Dictionary, 2014). I suggest that in order to achieve the greatest benefits, pregnant adolescents need to do more than just 'turn up' to their maternity appointments; they need to 'buy-in' to health care. Participants 'buy-in' when they make "emotional investment and commitment to [care because they believe] that it is worthwhile and beneficial" (Staudt, Lodato, & Hickman, 2012, p. 185). Likewise, midwives need to 'buy-in' for health engagement to be synergistic (see Section 7.1.4).

7.1.3 OPTIMAL CASELOAD MIDWIFERY

I have conceptualised 'optimal caseload midwifery' as being comprised of the following interacting components: 1) institutional infrastructure, 2) midwife

characteristics (knowledge, skills, attributes etc.) and 3) philosophical commitments.

7.1.3.1 Institutional infrastructure

The infrastructure for caseload midwifery included: a 24-hour on-call roster, home booking visit, 24-hour telephone support from primary or back-up midwife, community-based antenatal and postnatal care, and intrapartum care in hospital with known midwife. All together these features could be considered the 'active ingredients' of caseload midwifery as was provided in this setting. However, the caseload model was also unique because of the inclusion of group antenatal care at the research site.

Group antenatal care is usually provided within a fragmented maternity care model where the focus is on peer-peer relationships that will sustain pregnant women into new motherhood. Participants expressed they appreciated getting their antenatal care and education during the one appointment as well as being around other pregnant young women⁴; which potentially increased the proportion of young women who participated in childbirth education and gave the opportunity for peer support to occur. However, the group setting provided limited opportunities for the midwife to provide emotional support, engage in active listening, assist the woman to identify her thoughts and feelings, involve her in decision-making, and/or facilitate informed consent for midwifery interventions; all of which form the basis of midwifery partnership and are deemed core competencies for Australian midwives (Nursing and Midwifery Board of Australia, 2006). Group facilitation training and skills for midwives are essential and could potentially improve how young women experience GAC in this setting. However, I suggest that GAC may be fundamentally incompatible with a caseload midwifery model.⁴ Therefore, in the theoretical model GAC has been identified as an additional (confounding) factor that influenced how young women and midwives engaged with each other, rather than an essential element of optimal caseload midwifery.

How the infrastructure of caseload midwifery and GAC interacted and functioned will be explored in Section 7.2 (Integrated Findings). Arguably, the caseload midwifery model alone provides the optimal conditions for the development of the midwife-woman partnership (Walsh, 1999).

7.1.3.2 Midwife characteristics

Caseload midwifery and midwifery partnership commonly operate together, indeed some have coined the term 'partnership caseload midwifery' (Benjamin, Walsh, & Taub, 2001); but they are not synonyms. In terms of developing positive relationships with childbearing women, the midwife's characteristics may be just as important as the caseload infrastructure. A systematic review that summarised women's satisfaction with their childbirth experience reported that feeling supported by caregivers, having a high quality caregiver-patient relationship, and feeling involved in decision-making were factors so important to women that they overrode differences in age, ethnicity and socioeconomic status (Hodnett, 2002). It makes sense then that the midwife's personal qualities and communication skills, including honesty and trustworthiness, being a good listener, displaying patience and tactfulness, sensitivity and compassion (Waugh, Smith, Horsburgh, & Gray, 2014); are as important as clinical knowledge and competence (Borrelli, 2014; Butler, Fraser, & Murphy, 2008).

A literature review on women's satisfaction with continuity of carer reported that women did not value having a 'known carer' for its own sake; consistency, trust and quality of care were as important, if not more so (J. M. Green, Renfrew, & Curtis, 2000). A limitation Green et al's (2000) study was that women who had *not* received continuity of carer were also surveyed. Early research suggested that women tend to interpret whatever type of maternity care they receive as 'best' (Porter & McIntyre, 1984); and indeed this has been substantiated by more recent research (van Teijlingen, Hundley, Rennie, Graham, & Fitzmaurice, 2003). It is also perhaps not possible to consider the importance of something when one has had no personal experience of it. Despite these limitations, the authors concluded that continuity of carer should not be a priority for maternity services (J. M. Green, et al., 2000). I suggest that perhaps women benefit from continuity of carer when that carer has an appropriate mix of personal attributes to facilitate quality engagement and a trust-based partnership. A methodologically stronger study which involved a meta-synthesis of qualitative studies involving women and midwives who received/provided midwifery-led care, reported that midwifery-led care increased women's sense of agency (or power) and promoted empathetic midwifery care (Walsh & Devane, 2012). It has been argued that the relationship between the midwife and the woman is

“fundamental to a range of improved outcomes of care” (Page, 2008, p. 123) as demonstrated in the caseload midwifery model.

7.1.3.3 Philosophical commitments

In addition to having the personal characteristics that facilitate relational continuity (see Glossary), theorists argue there are philosophical commitments that are foundational to optimal midwifery care. These include being informed by evidence in order to avoid harm associated with unnecessary interventions (Page & McCandlish, 2006). In the context of young women, I suggest evidence should be used in midwifery practice to promote health for mothers and babies. Health promotion is “the process of enabling people to increase control over, and to improve, their health” (World Health Organisation, 2015). Examples of health promotion in midwifery practice include nutritional education and advice, and promotion of self-care activities (e.g. harm minimisation around smoking and/or illicit drug use).

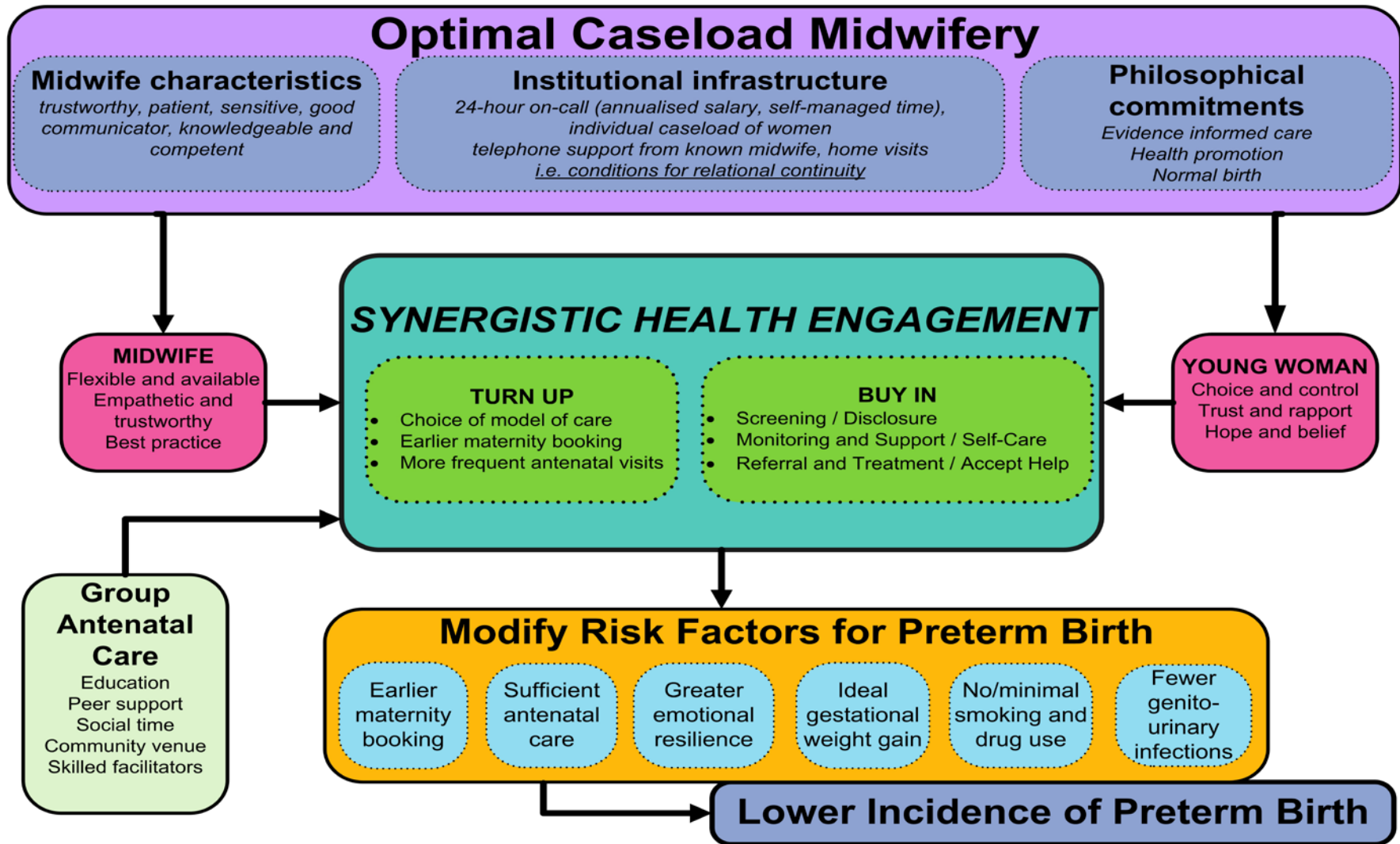
A ‘philosophy of normality’ is considered part of being a midwife (Australian College of Midwives, 2005; International Confederation of Midwives, 2008). Normalising childbearing can facilitate women “to experience childbirth as a journey of transformation that is both empowering and safe” (Walsh, El-Nemer, & Downe, 2004, p. 116). Kemp and Sandall (2008) conducted a qualitative study around the inclusion of a 36-week birth talk into a caseload midwifery model. The main conclusion from this study was the effectiveness of this intervention, to promote normal birth, is dependent upon the midwives’ philosophy and the continuity of carer provided in the model (Kemp and Sandall, 2008). In the context of the increasing medicalisation of childbirth, however, not all midwives practise with a normal birth focus. A metasynthesis of midwife-led care found that while midwives had greater agency in these models, this was mediated by where birthing occurred (home, freestanding or integrated birth centre, or hospital birth suite) (Walsh & Devane, 2012). The impact of the location of the model is a significant consideration in this research setting where intrapartum care was provided by caseload midwives within a tertiary birth suite.

7.1.4 SYNERGISTIC HEALTH ENGAGEMENT

It is important to consider *how* caseload midwifery can facilitate young women, and midwives, to make the requisite emotional investment and commitment to achieving optimal maternity outcomes. Synergy, from the Greek *synergos*,

refers to the “increased effectiveness that results when two or more people (or elements) work together” (Merriam-Webster Dictionary, 2014). I propose that when both the midwife and the young woman act in accordance with this shared goal, maternity care is more effective than if the midwife or young woman acted in isolation. I term this ‘synergistic health engagement’ as it requires both people (midwife and young woman) to act in the young woman’s best interests. A theoretical model is a graphical representation of the relationships between theoretical concepts. Figure 4 (overleaf) depicts my argument by presenting a model of synergistic health engagement.

FIGURE 4 THEORETICAL MODEL OF SYNERGISTIC HEALTH ENGAGEMENT



The institutional infrastructure of caseload midwifery provides ideal conditions for relational continuity to occur. When the caseload midwife is accessible, empathetic and committed to best practice, then optimal caseload midwifery can be provided. I theorise that young women respond to optimal caseload midwifery by turning up for appointments and engaging in the care and support that is available. Just like in other health settings, young women 'buy in' because they hope and believe that taking action will improve the health and well-being of themselves and their babies. Hope and belief is predicated on trust in the health providers advice and guidance (Sheppard, et al., 2004). Young women demonstrate 'buy in' when they disclose risk factors, invest in self-care activities, and accept help. I theorise that these actions modify predictors for preterm birth that are common to young women (see Table 6); such that young women may develop greater emotional resilience, have ideal gestational weight gain, reduce or stop smoking and drug use, and have fewer genito-urinary infections. I suggest that this modification of risk factors is the mechanism by which preterm birth was lowered in this setting. The theoretical model (Figure 4) underpins the integrated findings that will now be explored.

7.2 INTEGRATED FINDINGS

Key quantitative and qualitative findings concerning 'turn up' and 'buy in' will be presented in this section. Where there is insufficient data from the submitted/published papers, the wider research literature has been used to contextualise the findings, as well as assist with the development of recommendations for further research.

7.2.1 *TURN UP*

This theme weaves together results concerning allocation to the model, gestation at first booking visit and on-going antenatal attendance. As previously stated, booking for antenatal care at a 'late' gestation and not receiving 'adequate' antenatal care, defined in the research literature using various measures, are predictors for preterm birth (see Table 6 in this chapter). These outcomes are discussed in consultation with the qualitative results, and wider research literature, that pertain to these outcomes. The integration of these results is significant because booking earlier for maternity care (see Section 7.2.1.2), and attending antenatal care more frequently (see Section 7.2.1.3),

may be one mechanism by which the incidence of preterm birth was reduced for young women in the caseload midwifery model.

7.2.1.1 Choice of model of maternity care

In Australia, midwifery-led models are relatively invisible to women who are pregnant for the first time, which effectively limits their choices (Zadoroznyj, 2000). Young women contributing to this study recalled putting time and thought into their choice of maternity hospital (including reading reviews of other hospitals and even relocating temporarily to ensure their address was within the catchment area); but there was no discussion about choice of care provider or preference for model of care.⁴ The clinician responsible for managing maternity referrals automatically allocated young women (aged 21 years or less) to caseload care until it reached capacity.³ This process was different to usual practice, which was to accept the referral and send women a 'model of maternity care brochure' that summarised all the available options and eligibility criteria, so that women could exercise their preference.²

The MGP midwives believed that the process of direct allocation to the model was defensible because young women, particularly those with psycho-social risk factors, were (arguably) getting a better service than they would otherwise, for example if they had been allocated to standard care, or GP shared care.⁴ This rather paternalistic approach is problematic, particularly in the context of marginalised young women. It also echoes findings of recent research (S. Parker, McKinnon, & Kruske, 2014) which confirmed that women who are socially disadvantaged are commonly offered fewer choices and feel less able to exercise control in maternity care settings.

Most young women have the capacity to make informed decisions around the model of maternity care that best suits their needs and preferences.

Adolescents aged 16 years or older are considered adults in terms of their ability to make competent decisions around their health care. Indeed, research suggests that by 15 years of age most adolescents demonstrate decision-making 'competence', including the ability to understand options, make choices and compromises, and appreciate consequences (Mann, Harmoni, & Power, 1989). Adolescents aged under 16 years of age may be deemed mature enough to understand the implications of a treatment or procedure and to make

autonomous decisions regarding their medical care; this is known as 'Gillick competency' (Hunter & Pierscionek, 2007). The Gillick competency rule may be applied in research settings when the research is likely to generate health advantages for the participants, while exposing them to relatively minor risks (Hunter & Pierscionek, 2007). The feasibility paper² described how women aged 15-17 years were able to give/refuse consent to participate in the research on their own behalf. The vast majority (87.5%) of eligible adolescents invited to join the feasibility study, though small in number (n=9), declined randomisation because they wanted to choose their model of care.² I suggest that having the option to make informed decisions about care provider and model of care sets the scene for young women continuing to engage in health care throughout their childbearing experience, and possibly beyond.

7.2.1.2 Earlier maternity booking

Several international guidelines recommend that women receive their first booking visit prior to 12 weeks gestation (Cresswell et al., 2013). Gestation at booking, proportion of women who have a booking visit in the first trimester, or 'late' booking, is commonly measured as a proxy for inadequate antenatal care (Bollini & Quack-Lotscher, 2013). Some NZ and UK studies have used the definition of 19 weeks gestation or later to define 'late' booking (Baker & Rajasingam, 2012; Corbett, Chelimo, & Okesene-Gafa, 2014). In the cohort study,³ young women who received caseload midwifery, compared to standard care, had their first booking visit at an earlier median gestation {IQR} (YMGP: 15 weeks {6}, YWC: 18 weeks {8}, Standard: 19 weeks {11}, $p < 0.001$). In other words, young women in caseload care were typically seen at the beginning of the second trimester, compared to women in standard care who were seen an average of four weeks later. Early booking for maternity care allows for timely identification and management of risk factors for preterm birth. Therefore, this statistically significant difference between median gestation at booking between caseload and standard care, therefore, may be a clinically significant finding contributing to reduced preterm birth. It should be borne in mind however, that confounding variables (including parity, ethnicity, and cultural norms) impact on gestation at booking for antenatal care (Kildea, Stapleton, Murphy, Low, & Gibbons, 2012). The standard care cohort had higher rates of Aboriginal and Torres Strait Islander women and higher rates of socio-economic deprivation,³

which may explain why there was a significant difference in gestation at booking between caseload care and standard care.

Research reports that some women delay booking maternity care because of ambivalence or fear; while system failures also result in delayed booking (Haddrill, Jones, Mitchell, & Anumba, 2014). Caseload midwives in the study setting were ideally placed to address the impact that fear of turning up and prevent administration delays. The first contact was initiated by the caseload midwife who made a telephone call to introduce herself to the young woman, describe the service, and arrange a home booking visit.⁴ It is possible that this personal contact, compared to simply receiving an official appointment letter in the post, facilitated earlier booking visits. Furthermore, the caseload midwives had flexibility to schedule their booking visits at a time and a place that was suitable to both themselves and their clients.⁴ Whether offering a home visit to conduct the 'booking-in' facilitated earlier commencement of antenatal care warrants further research.

7.2.1.3 More frequent antenatal visits

Antenatal care is generally thought to improve pregnancy outcomes including preterm birth (Hollowell, et al., 2011). In one study in a public health setting, inadequate antenatal attendance (defined as 1-5 visits) was associated with an eight-fold increase in preterm birth, after adjusting for known confounders (Raatikainen, et al., 2007). Young women in caseload care and YWC also had lower rates of inadequate antenatal attendance, defined in our study as 2-4 visits, compared to standard care (YMGP: 7%, YWC: 8%, Standard: 12%, $p=0.002$).^{3*} This accords with the results of a RCT of group antenatal care for young women (aged 14-25 years) which reported that those randomised to the intervention had a lower risk of inadequate antenatal care (Ickovics, et al., 2007) as defined by the Kotelchuck Index (Alexander & Kotelchuck, 1996).

Qualitative research suggests that women generally attend antenatal care to improve pregnancy outcomes, receive information about their baby's health (including hearing the heartbeat), improve their own health, prepare for labour, and socialise (Novick, 2009). Despite this motivation, it is likely that where and

* It is important to note that women who were unbooked or received just one visit were excluded from our study because they had not been adequately exposed to any model of maternity care.

how antenatal care is provided affects young women's willingness to attend routine appointments. For marginalised women, factors that promote continuing antenatal attendance include a non-threatening environment, non-judgemental, trustworthy and culturally sensitive staff, and a service that is perceived as providing quality care (Downe, Finlayson, Walsh, & Lavender, 2009). In the cohort study,³ women receiving caseload care accessed a community venue, received clinical care from their primary midwife and participated in GAC education sessions. Whereas women in standard care typically accessed a hospital clinic or GP surgery, received clinical care from an unknown midwife or doctor, and did not access childbirth education.³

Community-based antenatal care is valued by Australian women who report less waiting time and easier access to care (Homer, Davis, & Brodie, 2000). In this research setting, the young women appreciated getting everything in one place at one time (clinical care and childbirth education) through the group antenatal care sessions.⁴ They especially valued what they learnt about breastfeeding, labour and birth, and taking care of a baby.⁴ Generally women prefer an informal, relaxed, aesthetically-pleasing (Novick, 2009; Sword et al., 2012), welcoming environment that "does not feel clinical" (Sword, et al., 2012, p. 6). In this setting, young women appreciated the "*homely*" community setting, despite having to commute long distances, because they didn't want to be in a hospital around "*sick people*".⁴ Most young women liked having their check-up take place on a yoga mat on the floor, rather than an examination table, because it felt "*less medical*".⁴ Hence the informal setting acted as a normalising influence on their experiences of pregnancy.

Generally women want the layout of the antenatal clinic to ensure their privacy and confidentiality (S. James, Rall, & Strumpher, 2012; Sword, et al., 2012). However, in this setting young women raised concerns that conversations with their midwife about topics which they considered personal, and with the potential to cause embarrassment, such as responding to "*gross*" questions, could be overheard by their peers.⁴ Nevertheless, informal environments appear to afford protection against the shame adolescents can feel when sitting in a waiting room with older pregnant women (Arthur, 2007; S. James, et al., 2012). Venues where they can just hang-out and talk with their peers are valued by this age group (Arthur, 2007); the venue for this study lacked this facility.

In summary, young women should be offered choice over model of maternity care which may in turn strengthen their willingness to engage in antenatal care. It appears that negotiating a time and a place to provide a home booking visit may have facilitated booking at an earlier gestation for women in caseload care. Furthermore, providing on-going antenatal care at a community venue may have enabled easier access, and created a non-threatening environment that normalised the experience of pregnancy, and assisted young women to feel more relaxed about turning up for antenatal care. While the facilitation of GAC needs significant improvement,⁴ young women were motivated to attend for care because they wanted to get access to the information that the midwives provided about childbirth preparation. All together the organisation of antenatal care worked effectively to encourage earlier and more frequent antenatal care attendance for women in the caseload midwifery model. Both earlier and more frequent antenatal attendance increases the opportunity for effective antenatal intervention and support to be provided, which may protect against preterm birth.

7.2.2 BUY IN

This theme weaves together results about screening/disclosure, ongoing support/self-care, and referral/acceptance in relation to modifiable risk factors for preterm birth. Buy in to the caseload model may be the primary mechanism by which preterm birth was lowered in this setting.

7.2.2.1 Screening and disclosure

Psychosocial issues including anxiety, depression, domestic violence and stress are predictors for preterm birth (see Table 6 in this chapter). Therefore effectively screening for, and addressing these issues with young women during pregnancy, may improve their overall health and increase their ability to manage.

The first antenatal booking visit is the recommended time for routine screening to be conducted with respect to mental health issues and domestic violence (Bollini & Quack-Lotscher, 2013). The Edinburgh Depression Scale (EDS) is a validated screening tool for anxiety and depression that is widely used during pregnancy and postpartum. At the research site, the EDS is routinely administered once during pregnancy at the booking visit (in the home, community venue or hospital clinic); unless there is a clinical indication to re-

administer the EDS at later time points. There were considerable missing data for this variable, however for the data that were available there was no difference in the EDS score at booking between women in YMGP, YWC and standard care.³ However, young women in caseload midwifery reported higher rates of diagnosed mental health issues than those in standard care (YMGP: 24%, YWC: 24%, Standard: 16%, $p < 0.001$);³ for example depression, anxiety, schizophrenia, bi-polar and eating disorders. The difference on this measure could reflect differences in the actual incidence of mental ill health or in rates of disclosure. If the difference is in rates of disclosure then this may be because how and where the screening takes places in the caseload model differs to standard care.

In caseload care, the first booking visit is typically provided in the woman's home or chosen venue.⁴ The first booking visit in the caseload model is conducted by the primary midwife who will be responsible for the woman's care throughout pregnancy, birth and postpartum. This potential for an on-going interaction, and the development of a midwife-woman partnership, may increase young women's willingness to disclose difficult life circumstances. One participant reported the home visit enabled her to develop "*rapport*" with her midwife.⁴ While lack of relationship with a known midwife can undermine young women's willingness to openly discuss their concerns (Price & Mitchell, 2004); I suggest that having an empathetic relationship with a midwife may facilitate disclosure.

The midwives reported perceiving home visits as opportunities to gather information about the woman's life and family circumstances (both risks and protective factors).⁴ This information, or risk assessment, could then be used to inform the type of support or referrals that might be offered. The literature suggests, however, that women 'at risk' may feel apprehensive about accepting service providers into their home (Jack, DiCenso, & Lohfeld, 2005). Indeed focus group data from midwives indicated that some young women refused home-visiting:

"as soon as I said I'll do your booking at home she was not into it at all. So that triggered me to think she had something to hide...you can hide a little bit better in the (antenatal clinic)" (Marilyn, midwife).⁴

Home visits for young pregnant women are complicated because many are still living in the family home which means the content of any discussion is potentially not private due to the presence of family members. In some instances a home visit may prevent disclosure of highly relevant and sensitive information (e.g. domestic violence) because the perpetrator is present in the home. This may also occur, however, in the hospital setting if the woman comes to the visit accompanied by an abusive partner or family member.

While disclosure of key indicators of 'risk' at booking was high, it is unclear how caseload midwives identified relevant issues throughout pregnancy in the context of group antenatal care. In particular, young women's concerns around privacy and confidentiality in the group setting may have inhibited further disclosure during pregnancy.⁴ It is possible that when an antenatal group is facilitated so that women feel safe to talk openly about their relationships and emotional lives, midwives could identify pertinent issues as they are brought to the group. Clearly, more research in this area is needed.

Another area that requires screening during pregnancy is infection; because many genito-urinary infections have been associated with preterm birth. Ascending vaginal tract infection including bacterial vaginosis, chlamydia, trichomonas, gonorrhoea, and syphilis are associated with preterm prelabour rupture of membranes and preterm birth (Sangkomkamhang, et al., 2008). Therefore, routine screening and appropriate treatment in the antenatal period may result in fewer preterm births (Sangkomkamhang, et al., 2008). In accordance with national guidelines for antenatal care, screening for asymptomatic bacteria is routine for all women, and screening for chlamydia and gonorrhoea (urine PCR) is routine for women less than 25 years of age (Australian Health Ministers' Advisory Council, 2012). There was no difference between YMGP, YWC and standard care on the rate of sexually transmitted infection.³ Routine vaginal swabs that could indicate the presence of bacterial vaginosis and trichomonas were not taken, however according to current guidelines routine vaginal swabs are only indicated for women who have a history of preterm birth (Australian Health Ministers' Advisory Council, 2012).

7.2.2.2 On-Going Support and Self-care

What happens between antenatal consultations is arguably more important than what occurs during them. Feeling involved and in control of one's health and well-being is strongly linked to healthy behaviours in young adults (less than 25 years) (Hargreaves, 2014). Therefore optimal caseload midwifery, that ensures young women feel at the centre and in control of their pregnancy care, may facilitate increased self-care behaviours. Self-care behaviours relevant to risk factors for preterm birth include seeking social support, reducing harmful behaviours (e.g. smoking and illicit drugs), and accessing adequate nutrition.

Social support acts as a buffer against stress and assists women to develop coping strategies (McCourt & Percival, 2000). Pregnant adolescents are particularly vulnerable to stressful events including issues with money, employment, and moving house; interventions that strengthen social support may reduce the negative impact of stressors and improve the emotional-wellbeing of young expectant parents (Divney, et al., 2012). Both midwives and the young women interviewed⁴ recalled using text messaging and telephone contact as a way to talk about additional issues that they did not feel comfortable raising in the group setting. The young women described that they found it "*re-assuring*" to communicate with a midwife with whom they were familiar.⁴ Ann explained that she felt comfortable to call her midwife because: "*she didn't make me feel stupid; she made me feel better about (what was going on)*".⁴ One of the caseload midwives interpreted that women often phoned on the pretence of a clinical issue as a strategy for seeking additional emotional support.⁴ When social support is provided by an empathetic midwife, whom the young woman is familiar with, it may act as a buffer against young women's experiences of anxiety and depression during pregnancy. The effect of the midwife-woman relationship on young women's emotional resilience during pregnancy would benefit from qualitative research.

Peer support may effectively lessen maternal anxiety (as measured by the stress hormone cortisol) and lessen antenatal depression (Field, 2013). Women value talking with other pregnant women in groups to receive support and normalise their experiences of pregnancy (Novick, 2009). Pregnant adolescents specifically want to meet other pregnant women their own age (Price & Mitchell, 2004). In the ethnographic study,⁴ participants described that although they

didn't get to know each other very well, they found simply being around other young pregnant women enjoyable and re-assuring. The effect of peer support on maternal anxiety and depression may be one mechanism by which preterm birth was reduced in the caseload group. This is an area in need of further research particularly in maternity models that incorporate group antenatal care.

Stress is commonly reported by pregnant adolescents (Divney, et al., 2012); while smoking and illicit drugs are typically used to 'manage' stress. Smoking and illicit drug use are predictors for preterm birth that are, to some extent, within the young woman's control. At the first booking visit, women in YMGP, YWC and standard care reported similar rates of smoking.³ A systematic review of psycho-social interventions to assist women to stop smoking during pregnancy reported that targeted peer support, as well as health education combined with counselling, were effective (Chamberlain et al., 2013). It does not appear that these interventions were provided through the group sessions in the caseload model. Smoking and illicit drug use were also not on the *Pregnancy Topics Guide* used to facilitate the GAC session⁴. Although that is not to say these topics were not discussed informally. Smoking was recorded at the first visit, but not again during pregnancy, in all three models.³ This means that the influence of caseload midwifery on smoking cessation could not be measured;³ Harm minimisation interventions typically measure smoking and illicit drug use at booking, 36 weeks of pregnancy, and six weeks postpartum via self-report. Data collection to match this time line for reported smoking would be useful in future research to assess the efficacy of caseload midwifery on smoking cessation during pregnancy. Young women in caseload care and YWC reported higher rates of illicit drug use than those in standard care (YMGP: 33%, YWC: 37%, Standard: 24%, $p < 0.001$).³ The differences on these measures could reflect differences in the actual incidence of illicit drug use or in rates of disclosure. Disclosure is crucial in the development of effective strategies to minimise the impact of illicit drugs on the young woman's pregnancy and to provide effective support and monitoring during pregnancy.

Pregnant adolescents have nutritional deficits that are typically compounded by social factors including poverty, living away from home, not having cooking knowledge or equipment, and being vulnerable to body image issues and eating

disorders (Stapleton, 2010). Therefore in order to be effective, any intervention to address nutrition and gestational weight gain must take these factors into consideration. A systematic review of energy and protein intake in pregnancy reported that nutritional advice was associated with an increase in maternal protein intake and fewer preterm births (Ota, Tobe-Gai, Mori, & Farrar, 2012). Pre-pregnancy weight was electronically recorded at the first visit to enable pre-pregnancy BMI calculation, but at no further time point during pregnancy.³ Women who were under weight (BMI<18) or over weight (BMI>35) were routinely commenced on a hand-written 'weight tracker' so that they could monitor their own weight gain during pregnancy. As results from the weight tracker were not recorded on the hospital database, information about inadequate or excessive weight gain during pregnancy was not available for analysis. Further research on a nutritional / gestational weight gain intervention for young women, delivered in a caseload midwifery model, could be helpful.

7.2.2.3 Referral, treatment / acceptance of help

Antenatal home visiting includes physical and psychosocial care, management of risk in conjunction with other professionals, and health promotion (Kemp et al., 2006). Women in caseload care and YWC had higher rates of being offered and accepting referral to social workers (YMGP: 51%, YWC: 48%, Standard Care 31%, $p<0.001$) and psychologists (YMGP: 8%, YWC: 4%, Standard Care: 2%, $p<0.001$) at the first booking visit compared to women in standard care.³ It is possible that the way in which information about mental health referral is presented, where and by whom, can influence acceptance of referral during pregnancy. In the caseload model this typically occurred during the booking home visit between the primary midwife and her young client. Enquiry by a health professional about women's past or current mental health is associated with help-seeking throughout the perinatal period (Reilly, 2014). Referrals to allied health (e.g. social work, psychology) that were made at any point during pregnancy *after the first booking visit*, were not routinely collected on the hospital electronic database, and are therefore not available.

Being under- or over- weight, in terms of pre-pregnancy body mass index (BMI), along with inadequate or excessive gestational weight gain, are predictors for preterm birth (see Table 6). Caseload midwives are ideally placed to identify young women who may benefit from the input of a dietician throughout pregnancy to provide nutritional advice and monitor their weight gain during

pregnancy. Referral to a dietician was not reported on in the cohort study; but would be a useful measure to collect in future studies.

7.3 STRENGTH AND LIMITATIONS OF THIS RESEARCH PROJECT

7.3.1 STRENGTHS

The mixed method triangulation design (convergence model) enabled the research question and objectives to be considered through the most appropriate quantitative and qualitative methods. The cohort paper³ is currently the largest study of caseload midwifery for young women (n=1971). Prior to this study, the evidence for caseload midwifery provided to young women was weak.¹ The qualitative paper is the first published study to explore the combination of caseload midwifery and GAC.⁴ The integration of qualitative data strengthens the findings by exploring and providing a theoretical mechanism for the efficacy of caseload midwifery; albeit in a model where GAC was incorporated.

7.3.2 LIMITATIONS

There were several limitations including the convergent design, use of retrospective cohort data, the inclusion of non-adolescent participants (aged 20-21 years), and the potential confounding of GAC on the caseload midwifery model.

The research design involved simultaneous collection of quantitative and qualitative data, rather than sequential collection. This was a pragmatic decision to meet candidature requirements, however it also meant the qualitative data collection tool (i.e. interview guide) could not be targeted to take account of the quantitative outcomes, as these outcomes were not yet known. Therefore not all quantitative data were able to be contextualised, or explained, by qualitative data. However, this may have occurred regardless.

The retrospective cohort data were collected from 2008-2012, whereas the women were interviewed in 2012. Women's experiences of caseload midwifery in 2012 may not have relevance for how caseload midwifery was delivered in preceding years. The use of retrospective, rather than prospective, cohort data limited the amount of data items that were available. As the integration of findings progressed it became clear that some quantitative data that would have

been useful was missing (e.g. EDS) or not collected (e.g. smoking status and weight at 36 weeks gestation).

There is a strong body of literature correlating adverse perinatal outcomes, including preterm birth, and pregnancy in adolescence (aged 19 years or less). This research setting included women up to 21 years of age in both the YMGP and YWC models; therefore participants who were not strictly adolescents were included in the cohort study. Young women who are 20-21 years may not have the same risks associated with childbearing; therefore their inclusion could be considered confounding.

Two models of care, caseload midwifery and GAC, were amalgamated at the research site. This made it difficult to unpick which elements of this complex intervention affected outcomes; and whether it was caseload midwifery or GAC that was effective; or indeed the combination of both elements. The paper from the qualitative study,⁴ which is currently in press, calls for further research in this area.

7.4 RECOMMENDATIONS

Models of maternity care should be designed, monitored and evaluated, around the needs of clients. In this setting, young women were not involved in the design or implementation of the combined caseload-GAC model. The following recommendations might usefully be considered prior to the development and implementation of a caseload model of midwifery which is intended to attract and retain a younger clientele.

TABLE 7 RECOMMENDATIONS FOR A CASELOAD MIDWIFERY MODEL FOR YOUNG WOMEN

Choice of model of care	<ul style="list-style-type: none"> • Subject to eligibility criteria, young women should be facilitated to make an informed decision about their preferred model of maternity care.
Relational continuity	<ul style="list-style-type: none"> • A known, trusted midwife may be just as important to younger women as it is to older women. • The way antenatal care is provided should support the development of a midwife-woman relationship.
Antenatal home-visiting	<ul style="list-style-type: none"> • A primary midwife conducting home visits may increase women’s rates of disclosure and concomitant acceptance of referral for investigation/treatment, and to appropriate support services • A flexible approach to home visiting at key points in pregnancy, and as individual circumstances dictate, should be instituted.
Group antenatal care	<ul style="list-style-type: none"> • All midwives should receive group facilitation training prior to commencement in the model. • If GAC is provided then additional one-to-one consultations should be offered. • GAC should occur in a community venue that easily accessible and has rooms available for private consultations. • GAC should be delivered in accordance with the principles of CenteringPregnancy™; the model that has been tested.
Peer support	<ul style="list-style-type: none"> • Midwives should be provided with training to acquire sufficient group facilitation skills to enable young women to get to know each other • Dedicated time for socialising before, during and after clinic times, is necessary to promote peer interaction.

7.4.1 FUTURE RESEARCH

Risk factors for preterm birth, that are potentially modifiable in the antenatal period, could be addressed by a caseload midwifery model that incorporates evidence-based interventions to support and facilitate:

- 1) Earlier maternity booking and adequate antenatal attendance
- 2) The development of greater emotional resilience
- 3) Ideal gestational weight gain
- 4) No/minimal smoking and illicit drug use
- 5) A reduction in genito-urinary infections.

A complex intervention could then be tested in comparison to standard care using a prospective research design. Ideally this research would occur in a setting where caseload midwifery is not confounded by the inclusion of group antenatal care sessions; or where caseload midwifery and group antenatal operate as two separate arms of the study. Measurement of adolescent health engagement in the context of maternity care would be useful. This would require adapting and piloting the current adolescent health engagement survey which includes items to measure experience of health care, health access and health self-efficacy (Sebastian et al., 2014). In-depth interviewing combined with observations of young women's consultations with caseload midwives might help to elucidate whether there is a connection between the establishment of a trusting relationship with a midwife and disclosure of risk factors/acceptance of help and support.

7.5 CONCLUSION

Optimal caseload midwifery may facilitate young women and midwives to synergistically engage in maternity care, which may modify predictors for preterm birth and lower the incidence of preterm birth. There may be a role for GAC in the provision of caseload midwifery to young women because peer support is an effective health promotion strategy for this population. How GAC can be implemented within a caseload model, in such a way that the midwife-woman relationship is protected however, requires further evaluation. There is sufficient evidence to recommend caseload midwifery as a model of care for this population; further research on other models, including young women's clinic, is warranted. There is also scope to incorporate a number of additional interventions that target modifiable risk factors for preterm birth; and to test the

efficacy of caseload midwifery for young women through a prospective research design.

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APPENDIX 1 RESEARCH PORTFOLIO APPENDIX

TABLE 8 PUBLICATIONS INCLUDED IN THIS PHD

<p>Paper 1 [published]: Allen, J., Gamble, J., Kildea, S., Stapleton, H. (2012). Does the way maternity care is provided affect maternal and neonatal outcomes for young women? A review of the research literature. <i>Women and Birth</i>, 25(2), 54-63.</p>
<p>Paper 2 [published]: Allen, J., Kildea, S., Stapleton, H., Tracy, S. (2013). Is a randomised controlled trial of a maternity care intervention for pregnant adolescents possible? An Australian feasibility study. <i>BMC Medical Research Methodology</i>, 13:138.</p>
<p>Paper 3 [submitted version]: Allen, J., Gibbons, K., Beckmann, M., Tracy, M., Stapleton, H., Kildea, S. (2014). Does model of maternity care make a difference to birth outcomes for young women? An Australian cohort study. <i>International Journal of Nursing Studies</i>.</p>
<p>Paper 4 [in press]: Allen, J., Kildea, S., Stapleton, H. (2014). How does group antenatal care function within a caseload midwifery model? A critical ethnographic analysis. <i>Midwifery</i>.</p>

TABLE 9 RELEVANT PUBLICATIONS AND CONFERENCE PRESENTATIONS NOT INCLUDED IN THIS PHD

<p>Allen, J. (2011). Does the way maternity care is provided affect outcomes for young women and their babies? (concurrent session) <i>Australian College of Midwives National Conference</i>, Sydney, Australia.</p>
<p>Tracy, S., Hartz, D., Hall, B., Allen, J., Forti, A., Lainchbury, A., White, J., Welsh, A., Tracy, M., Kildea, S. (2011). A randomised controlled trial of caseload midwifery care: M@NGO (Midwife @ New Group practice Options). <i>BMC Pregnancy Childbirth</i>, 11(1), 82.</p>
<p>Allen, J. (2013). No space to 'blab away, spill your heart': young women's experiences of group antenatal care (poster presentation) <i>Australian College of Midwives National Conference</i>, Hobart, Australia.</p>
<p>Hartz, D., Hall, B., Allen, J., Lainchbury, A., Forti, A., Kildea, S., Tracy, M., Foureur, M., Homer, C., Tracy, S. (2013). The M@ngo Trial: Does caseload midwifery reduce caesarean section operation rates? <i>Women and Birth</i> 2013, 26, S1-S21</p>
<p>Tracy, S.K., Hartz, D.L., Tracy, M.B., Allen, J., Forti, A., Hall, B., White, J., Lainchbury, A., Stapleton, H., Beckmann, M., Bisits, A., Homer, C., Foureur, M., Welsh, A., Kildea, S. (2013). Caseload midwifery care versus standard maternity care for women of any risk: M@NGO, a randomised controlled trial. <i>The Lancet</i>, 382(9906), 1723-1732.</p>

PUBLICATION 1: AUTHOR STATEMENTS

Reference:

Allen, J., Gamble, J., Kildea, S., Stapleton, H. (2012). Does the way maternity care is provided affect maternal and neonatal outcomes for young women? A review of the research literature. *Women and Birth*, 25(2), 54-63.

Author statements:

Jyai Allen (Candidate)

I conceived and designed the research question and method, carried out the literature review, drafted and critically revised the manuscript. I acknowledge that my contribution to the above paper is 70%.

Signed:
2015



Date: 27 January

Jenny Gamble

I acknowledge that my contribution to the above paper is 10%.

Signed:
2015



Date: 22 January

Sue Kildea

I acknowledge that my contribution to the above paper is 10%.


Signed:
2015



Date: 27 January

Helen Stapleton

I acknowledge that my contribution to the above paper is 10%.

Signed: 
2015

Date: 27 January

PUBLICATION 1: EVIDENCE OF PEER REVIEW

Women and Birth publishes on all matters that affect women and birth, from pre-conceptual counselling, through pregnancy, birth, and the first six weeks postnatal. All papers accepted will draw from and contribute to the relevant contemporary research, policy and/or theoretical literature. We seek research papers, quality assurances papers (with ethical approval) discussion papers, clinical practice papers, case studies and original literature reviews.

Our women-centred focus is inclusive of the foetus and the newborn, both well and ill, and covers both normal and abnormal pregnancies and births. The journal seeks papers on midwifery practice, theory, research, education and leadership. Topics may include where appropriate neonatal nursing, child and family health, women's health and lactation consultancy. Papers from academics and health professionals from fields outside of midwifery are encouraged. We seek papers on reproductive physiology and neurophysiology where the links to the childbearing woman and her baby are made explicit. We also seek relevant papers on natural and complementary therapies, local, national and international policy, management, politics, economics, societal and cultural issues as they affect childbearing women and their families.

Articles are double-blind peer-reviewed by experts in the field of the submitted work. The journal is indexed in PubMed, Index medicus (Medline), SCOPUS, and CINAHL.

Impact Factor: 1.696

PUBLICATION 2: AUTHOR STATEMENTS

Reference:

Allen, J., Kildea, S., Stapleton, H., Tracy, S. (2013). Is a randomised controlled trial of a maternity care intervention for pregnant adolescents possible? An Australian feasibility study. *BMC Medical Research Methodology*, 13:138.

Author statements:

Jyai Allen (Candidate)

I conceived and designed the research question and method, carried out the recruitment, analysed the data, drafted and critically revised the manuscript. I acknowledge that my contribution to the above paper is 70%.

Signed:
2015



Date: 27 January

Sue Kildea

I acknowledge that my contribution to the above paper is 10%.

Signed:
2015



Date: 27 January

Helen Stapleton

I acknowledge that my contribution to the above paper is 10%.

Signed:
2015



Date: 27 January

Sally Tracy

I acknowledge that my contribution to the above paper is 10%.

Sally K Tracy

Digitally signed by Sally K Tracy
DN: cn=Sally K Tracy, o=University of Sydney,
ou=Midwifery and Women's Health Research
Unit, Royal Hospital for Women, Sydney,
email=sally.tracy@sydney.edu.au, c=AU
Date: 2015.01.29 12:52:33 +11'00'

Signed:
2015

Date: 29 January

PUBLICATION 2: EVIDENCE OF PEER REVIEW

BMC Medical Research Methodology is an open access, peer-reviewed journal that considers articles on methodological approaches to healthcare research. Articles on the methodology of epidemiological research, clinical trials and meta-analysis/systematic review are particularly encouraged, as are empirical studies of the associations between choice of methodology and study outcomes. *BMC Medical Research Methodology* does not aim to publish articles describing scientific methods or techniques: these should be directed to the BMC journal covering the relevant biomedical subject area.

BMC Medical Research Methodology is part of the BMC series which publishes subject-specific journals focused on the needs of individual research communities across all areas of biology and medicine. We offer an efficient, fair and friendly peer review service, and are committed to publishing all sound science, provided that there is some advance in knowledge presented by the work.

BMC series - open, inclusive and trusted.

Each article type published by *BMC Medical Research Methodology* follows a specific format, as detailed in the corresponding instructions for authors; please choose an article type from the list on the left to view the instructions for authors.

The instructions for authors includes information about preparing a manuscript for submission to *BMC Medical Research Methodology*, criteria for publication and the online submission process. Other relevant information about the journal's policies, the refereeing process and so on can be found in '[About this journal](#)'.

Impact Factor: 2.17

PUBLICATION 3: AUTHOR STATEMENTS

Reference:

Allen, J., Gibbons, K., Beckmann, M., Tracy, M., Stapleton, H., Kildea, S. (2015). Does model of maternity care make a difference to birth outcomes for young women? An Australian cohort study. (Submitted to *International Journal of Nursing Studies*, revision 24th November 2014).

Author statements:

Jyai Allen (Candidate)

I conceived and designed the research question and method, carried out the recruitment, analysed the data, drafted and critically revised the manuscript. I acknowledge that my contribution to the above paper is 60%.




Signed:
2015

Date: 27 January

Kristen Gibbons


I acknowledge that my contribution to the above paper is 10%.

Signed: 
2015

Date: 22 January

Michael Beckmann

I acknowledge that my contribution to the above paper is 10%.

Signed: 
2015

Date: 22 January

Mark Tracy

I acknowledge that my contribution to the above paper is 5%.



Signed:
2015

Date: 30 January

Helen Stapleton

I acknowledge that my contribution to the above paper is 5%.

Signed: 
2015

Date: 27 January

Sue Kildea

I acknowledge that my contribution to the above paper is 10%.

Signed: 
2015

Date: 27 January

PUBLICATION 3: EVIDENCE OF PEER REVIEW

The *International Journal of Nursing Studies (IJNS)* provides a forum for original research and scholarship about **health care** delivery, organisation, management, workforce, policy and research methods relevant to **nursing, midwifery** and other health related professions. The *IJNS* aims to support evidence informed policy and practice by publishing research, systematic and other scholarly reviews, critical discussion, and commentary of the highest standard.

The journal particularly welcomes studies that aim to evaluate and understand complex health care interventions and health policies and which employ the most rigorous designs and methods appropriate for the research question of interest. The journal also seeks to advance the quality of research by publishing methodological papers introducing or elaborating on analytic techniques, measures, and research methods.

The journal has been publishing original peer-reviewed articles of interest to the international health care community since 1963, making it one of the longest standing repositories of scholarship in this field. The *IJNS* offers authors the benefits of:

- A highly respected journal in its field with consistently high impact
- Indexed in major databases: PubMed, Medline, Thomson Reuters - Science Citation Index, Scopus, Thomson Reuters - Social Science Citation Index, CINAHL and the BNI (British Nursing Index).
- A truly global readership
- Highly efficient editorial processes: average time from submission to first decision of 4 weeks
- Rapid initial screening for suitability and editorial interest
- Excellent peer reviewers drawn from a range of health service research disciplines
- Early online publication as Article in Press - fully citable by your peers - on average 8 weeks after acceptance.

The *IJNS* endorses the Equator Network (<http://www.equator-network.org/>) an international initiative that seeks to improve reliability and value of research literature in health care by promoting transparent and accurate reporting of studies. We ask our authors to make use of appropriate reporting guidelines to ensure excellence in scientific reporting. Guidelines for authors can be accessed at <http://ees.elsevier.com/ijns>.

Impact Factor: 2.248

PUBLICATION 4: AUTHOR STATEMENTS

Reference:

Allen, J., Kildea, S., Stapleton, H. (2015). How does group antenatal care function within a caseload midwifery model? A critical ethnographic analysis. *Midwifery* (Forthcoming, accepted 19th January 2015).

Author statements:

Jyai Allen (Candidate)

I conceived and designed the research question and method, carried out the recruitment, analysed the data, drafted and critically revised the manuscript. I acknowledge that my contribution to the above paper is 60%.



Signed:
2015

Date: 27 January

Sue Kildea

I acknowledge that my contribution to the above paper is 15%.



Signed:
2015

Date: 27 January

Helen Stapleton

I acknowledge that my contribution to the above paper is 25%.



Signed:
2015

Date: 27 January

PUBLICATION 4: EVIDENCE OF PEER REVIEW

Midwifery

Officially recognised by the European Midwives Association

Midwifery publishes the latest peer reviewed international research to inform the safety, quality, outcomes and experiences of pregnancy, birth and maternity care for childbearing women, their babies and families. The journal's publications support midwives and maternity care providers to explore and develop their knowledge, skills and attitudes informed by best available evidence.

Midwifery provides an international, interdisciplinary forum for the publication, dissemination and discussion of advances in evidence, controversies and current research, and promotes continuing education through publication of systematic and other scholarly reviews and updates. **Midwifery** articles cover the cultural, clinical, psycho-social, sociological, epidemiological, education, managerial, workforce, organizational and technological areas of practice in preconception, maternal and infant care.

The journal welcomes the highest quality scholarly research that employs rigorous methodology. **Midwifery** is a leading international journal in midwifery and maternal health with a current impact factor of 1.707 (© Thomson Reuters Journal Citation Reports 2014) and employs a double-blind peer review process.

Hide full aims and scope

Editor-in-Chief: Debra Bick

View full editorial board

Impact Factor: 1.707

APPENDIX 2 HREC APPROVAL LETTERS



MATER HEALTH SERVICES HUMAN RESEARCH ETHICS COMMITTEE

2nd September 2010

Professor Sue Kildea
Obstetrics / Gynaecology
Mater Mothers' Hospital (Public & Private)
Raymond Terrace
South Brisbane 4101

Dear Professor Kildea

Re: Protocol Ref No. 1553M - Young M@NGO: A pilot study of a randomised controlled trial of caseload midwifery care for young women

I write to advise that the Mater Health Services Human Research Ethics Committee considers the above study to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* and has granted ethical approval for your research proposal. Please accept our very best wishes for the success of this study. *In all future correspondence with the Committee please quote the Mater reference number.*

Documents reviewed and approved include:

- Mater Ethics Application Form
- Study Protocol – V2 Final
- Funding
- Curriculum vitae for Professor Sue Kildea
- Participant Information Sheet
- Consent Form – V1 100610 (submitted 2/09/10)
- Staff Information Sheet
- Trial Brochure
- 6 week postpartum questionnaire
- 6 month postpartum questionnaire

This approval is valid until 2nd September 2013. Please note the following conditions of approval.

- Any departure from the protocol detailed in your proposal must be reported immediately to the Committee.
- When you propose a change to an approved protocol, which you consider to be minor, you are required to submit a written request for approval to the Chairperson, through the Secretary. Such requests will be considered on a case by case basis and interim approval may be granted subject to ratification at the next meeting of the Committee.
- Where substantial changes to any approved protocol are proposed, you are required to submit a full, new proposal for consideration by the Human Research Ethics Committee.

Mater Misericordiae Health Services Brisbane Limited
ACN 096 708 922

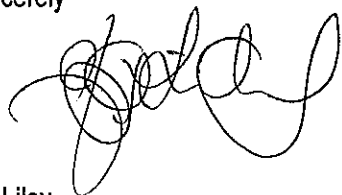
Raymond Terrace,
South Brisbane,
Queensland 4101 Australia
Phone + 61 7 3163 8111
www.mater.org.au



- You are required to advise the Research Ethics Coordinator immediately of any complaints made, or expressions of concern raised, in relation to the study, or if any serious or unexpected adverse events occur.
- Under the *NHMRC National Statement on Ethical Conduct in Research Involving Humans*, research ethics committees are responsible for monitoring approved research to ensure continued compliance with ethical standards, and to determine the method of monitoring appropriate to each project. You are required to provide written reports on the progress of the approved project annually, the first report being due on 2nd September 2011 and finally on completion of the project. (The Progress Report is located at <http://www.mater.org.au/Home/Research/Human-Research-Ethics-Committee.aspx> or can be accessed through the Mater Intranet, Applications, Research Register then under the project name or alternately can be emailed to you). Please inform the Committee of publications, presentations at Conferences, education and quality improvement outcomes from this study. The Committee may also choose to conduct an interim audit of your research.
- Please be aware that all study procedures including follow up of participants and data analysis should be completed within the approval time frame or an extension should be requested.

Please contact the Executive Director in the participating hospital/hospitals prior to commencing of the study. To access medical records, for the purpose of this study, please provide a copy of this approval letter to the Corporate Health Information Manager. I would also be grateful if you could confirm the date of commencement. (All correspondence should be directed to the Mater Research Ethics Coordinator.)

Yours sincerely



Dr Helen Liley
Chairperson
Mater Health Services Human Research Ethics Committee

Human Research Ethics Committee
Committee Approval Form

Principal Investigator/Supervisor: Sue Kildea

Co-Investigators:

Student Researcher : Jyai Allen

Ethics approval has been granted for the following project:

Young M@NGO

for the period: 7 October 2011 to 31 March 2012

Human Research Ethics Committee (HREC) Register Number: Q2011 69

Special Condition/s of Approval

Prior to commencement of your research, the following permissions are required to be submitted to the ACU HREC:

Mater Health Services Human Research Ethics Committee

It is noted that this application has already received Ethics Approval from the Mater Health Services HREC. ACU HREC accepts the approval. Please note, however, researchers are asked to provide ACU HREC of copies of all documents relating to this research, including progress reports, amendments, etc. Should there be any adverse events reported, ACU HREC should also be informed. (National Statement 5.3.3)

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans (2007)* apply:

- (i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
 - security of records
 - compliance with approved consent procedures and documentation
 - compliance with special conditions, and

- (ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
 - proposed changes to the protocol
 - unforeseen circumstances or events
 - adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.



Signed:

(Research Services Officer, McAuley Campus)

..... Date: 07.10.2011.....

APPENDIX 3 FEASIBILITY STUDY DOCUMENTS

PARTICIPANT INFORMATION SHEET

A pilot randomised controlled trial of caseload midwifery care for young women

The Young M@NGO Project: Midwives @ New Group practice Options

WHAT IS THIS RESEARCH ABOUT?

You are invited to participate in a research study of maternity care. We hope to learn about the differences between having the same midwife (or small group of midwives who you will get to know) for your entire pregnancy, labour, birth and postnatal time compared with having the usual care at this hospital. You were selected as a possible participant in this study because we are asking all young women who book here over the next six months to consider if they would participate in the study.

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, we will randomly assign you to one or other of the care options. This randomisation process is very important for the study so that women with a variety of differences (e.g. age, number of previous births, health status) are equally distributed across both groups. This means you have a 50% chance of being allocated to either caseload midwifery care or usual hospital maternity care. The amount of care you receive will not be different according to whether you are cared for by the caseload group of midwives or not. The only difference you will notice is that you may be given the name of a midwife or small group of midwives to contact instead of ringing the antenatal clinic or birth suite when you want advice.

CASELOAD MIDWIFERY CARE

Caseload midwifery is the care you receive with a named midwife who works within a small Midwifery Group Practice. The same midwife or her 'back up' partner provide care during your pregnancy, when you have your baby and in the first few weeks after you have your baby when you are getting breastfeeding established at home. You will get to know the other midwives in the Midwifery Group Practice so that if your caseload midwife is having her days off when you require care, you will have met the other midwives who can help. In the event that you have health problems identified at the time of booking in or problems develop during your pregnancy or birth, your care will also be overseen by obstetricians, specialist medical doctors or other health professionals as you require, as is the case with usual hospital maternity care.

USUAL HOSPITAL MATERNITY CARE

Usual Hospital Maternity Care is the care that you may be offered when you book in for maternity care at any public hospital. Midwives and/or doctors within the maternity service of a public hospital provide usual hospital maternity care. You may be booked to receive: midwife clinic care; doctor's clinic care; or general practitioner shared antenatal care; depending on the options available at the hospital. The only care option that is not standard at present is the Caseload midwifery care option where women receive care from the same midwife or small group of midwives for the entire pregnancy, birth and postnatal time.

ARE THERE ANY RISKS?

There are very few if any risks because the research has been carefully designed. We are doing the study because we need more information about the best way to offer maternity care for women booking at our hospital.

WHY HAVE I BEEN ASKED?

You have been asked because you are able to give us the information we need to find out about how to improve maternity care for women. All women who book at this hospital in the next six months will be asked if they would consent to being part of our study.

DO I HAVE TO SAY YES?

You don't have to say yes. Participation in the research study is voluntary.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. If you elect not to be involved in the study you will be able to select your preferred model of care, subject to availability. We won't contact you about this research again and you will receive the best care available at the hospital regardless of being involved in this study or not.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

You can change your mind at any time and you don't have to say why.

WHAT DO I HAVE TO DO

If you agree to participate in the study a research midwife will use a computer system to randomly allocate you to either receive usual hospital maternity care or Caseload midwifery care. You will then be asked to sign a consent form by the midwife at either your first or an early antenatal visit.

If you are allocated usual hospital maternity care you will be given your next antenatal visit within the appropriate hospital clinic or model of care. You will be given a unique study number.

If you are allocated care with a Caseload midwife, the Caseload midwife will contact you to organise your next antenatal visit. You will also be given a unique study number.

The research team will collect information on your pregnancy, birth and postnatal care. Towards the end of your pregnancy and again six weeks after your baby is born, you may be invited to participate in a group interview with other women your age to talk about your experiences of midwifery care. You may also be offered a Women's Questionnaire to fill in at six weeks after the birth of your baby, and at six months after the birth of your baby. All of your health and personal details recorded will be given a study code (number). This means that the researchers can use your study code to find out information about your health information and the pregnancy and birth information from your health records but only as it relates to this study. It will be de-identified which means we will not use your name at all.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

This study has been reviewed and approved by the Mater Health Services Human Research Ethics Committee and participants may **contact the Mater Research Ethics Coordinator** on 07 3163 1585, should they have any complaints about the conduct of the research, or wish to raise any concerns. The Research Ethics Coordinator may contact the Patient Representative or Hospital Ethicist at its discretion.

If you wish to withdraw from the study or have any questions or concerns relating to your involvement, you are welcome to contact the chief investigator at the Mater Site: Professor Sue Kildea (Tel: 07 3163 6388 or sue.kildea@mater.org.au).

If you have any problems or queries about the way the study was conducted, and you do not feel comfortable contacting the research staff, you may contact the Research Support Office within the hospital Tel: 07 3163 1585 and quote the M@NGO study. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Consent Form to Participate in the Research Project
A RANDOMISED CONTROLLED TRIAL OF CASELOAD MIDWIFERY FOR YOUNG WOMEN

I,

(Name of participant)

of

(Street) (Suburb/town) (State & postcode)

have been invited to participate in a research project entitled **A RANDOMISED CONTROLLED TRIAL OF CASELOAD MIDWIFERY FOR YOUNG WOMEN**

In relation to this project I have read the Participant Information Sheet and have been informed of the following points:

1. Approval for the protocol has been given by the Human Research Ethics Committee (HREC) of the Mater Hospital
2. The aim of the project is to (i) assess the feasibility of conducting a randomised controlled trial of caseload midwifery care compared to standard care for teenage childbearing women (ii) evaluate women's experiences of care through the Young women's Midwifery Group Practice through focus group interviews.
3. The results obtained from the study may or may not be of direct benefit to my medical management.
4. The procedure will involve the allocation of eligible women booking for maternity care with one of the following models of care as they are defined within the participant information sheet.
 - Usual existing maternity care or
 - Caseload midwifery care
5. There are no adverse effects or risks related to this project that the investigators are aware of.
6. My involvement in this project may be terminated if I decide to withdraw from the project.
7. Should I develop a problem which I suspect may have resulted from my involvement in this project or should I have any queries relating to my involvement in the study, I am _____ aware that I may contact – Professor Sue Kildea on 07 3163 6335.
8. Should I have any concerns or I am unhappy with the conduct of this trial and I do not feel comfortable contacting the research staff, I am aware that the Research Ethics Coordinator (phone: 07 3163 1585) will assist in contacting the Hospital Ethicist or Patient Representative.
9. I can refuse to take part in this project or withdraw from it at any time without affecting my medical care.

10. I understand that participating in this Maternity Service Clinical Trial may or may not benefit my Maternity care directly however my participation may assist in the development of treatments and/or procedures for the future.
11. I understand that my research records will be stored in the following manner: in a locked cabinet and locked in the researchers' office. The research team, authorised personnel and regulatory entities may have access to my study records to protect my safety and welfare.
12. I consent to the collection, processing, reporting and transfer within or outside Australia of my personal and/or sensitive information for healthcare and/or medical research purposes. All data to be transferred will be de-identified, therefore not including my name, address or phone number. My information will be identified by my baby's date of birth, my Medical Record Number as well as a numerical random code.
13. I understand that my baby's date of birth, my medical record number and a unique study number will identify my medical information. This information is potentially identifiable but all precautions will be taken by the clinical staff to ensure the information will be kept confidential.
14. If the results of my tests or information regarding my medical history are published, my identity will not be revealed.
15. During the course of this study, I will be informed of any significant new findings (either good or bad) such as changes in the risks or benefits resulting from participation in the research or new alternatives to participation that might cause me to change my mind about participating. If such new information is provided to me, my consent to participate will be re-obtained.
16. In giving my consent, I acknowledge that the Government Health Department Officials, and the Clinical Trial Centre Staff directly involved in the study, may examine my medical records only as they relate to this project.

After considering all these points, I accept the invitation to participate in this project. I am aware that I will be given a copy of the Participant Information Sheet and Consent Form. I also state that I have/have not participated in any other research project in the past 3 months. If I have, the details are as follows:

Date: _____ Witness: _____

(Please print name)

Signature: _____

Signature: _____

(of participant)

(of witness)

THIS SECTION MUST BE COMPLETED IF PARTICIPANT IS AGED LESS THAN 15 YEARS

Guardian: _____

Signature: _____

(Please print name)

(of Guardian)

Investigators' confirming statement:

I have given this research subject information on the study, which in my opinion is accurate and sufficient for the subject to understand fully the nature, risks and benefits of the study, and the rights of a research participant. There has been no coercion or undue influence. I have witnessed the signing of this document by the subject.

Date: _____

Investigator's Name: _____

Investigator's Signature: _____

Withdrawal from Participation

Protocol Title: A RANDOMISED CONTROLLED TRIAL OF CASELOAD MIDWIFERY FOR YOUNG WOMEN

An option should I wish to withdraw my consent to participate in the research protocol entitled above is to contact the researcher and/or return this slip. I understand that if I withdraw from the research protocol my medical care, my relationship with the Hospital and medical attendants will not be affected.

Patient's Name: _____

Patient's Signature: _____

Date: _____

Please detach the Withdrawal of Participation Section and send to **Prof Sue Kildea, Women's Health and Newborn Services (Maternity), Mater Health Services, Level 1, Aubigny Place, Raymond Terrace, South Brisbane, Qld. 4101**. If I would like to speak to a member of the study investigation team I may contact **Prof Sue Kildea – 07 31636335**.

APPENDIX 4 FOCUS GROUP INTERVIEW DOCUMENTS

PARTICIPANT INFORMATION SHEET Version 3, 040213

Young M@NGO: focus groups for young women

WHAT IS THIS RESEARCH ABOUT?

You are invited to participate in a research study of maternity care for young women. We hope to learn about the experience of having the same midwife (or small group of midwives who you will get to know) for your entire pregnancy, labour, birth and postnatal time.

IF I SAY YES, WHAT WILL IT INVOLVE?

We will be undertaking two 90-minute focus group interviews. One interview will take place towards the end of your pregnancy (about 36 weeks). The other interview will be at approximately 6 weeks after the birth of your baby. If you decide to participate, you will be free to attend either or both interviews. During the interview, you will be asked to talk about your experiences of midwifery care with the Young Women's Midwifery Group Practice. The interviews will be digitally recorded. You will be compensated for your time with a \$30 Target voucher (per interview) and refreshments will be provided.

ARE THERE ANY RISKS?

There are very few if any risks because the research has been carefully designed. We are doing the study because we need more information about the best way to offer maternity care for young women.

WHY HAVE I BEEN ASKED?

You have been asked because you are able to give us the information we need to find out about how to improve maternity care for young women.

DO I HAVE TO SAY YES?

You don't have to say yes. Participation in the research study is voluntary.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. We won't contact you about this research again and you will receive the best care available at the hospital regardless of being involved in this study or not.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

You can change your mind at any time and you don't have to say why.

WHAT DO I HAVE TO DO

If you are interested or would like more information please telephone 3163 1901 or email Jyai.Allen@mater.org.au. You will be asked to sign a consent form at the start of the focus group interview.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

This study has been reviewed and approved by the Mater Health Services Human Research Ethics Committee and participants may **contact the Mater Research Ethics Coordinator** on 07 3163 1585, should they have any complaints about the conduct of the research, or wish to raise any concerns. The Research Ethics Coordinator may contact the Patient Representative or Hospital Ethicist at its discretion. If you wish to withdraw from the study or have any questions or concerns relating to your involvement, you are welcome to contact the chief investigator at the



Mater Site: Professor Sue Kildea (Tel: 07 3163 6388 or sue.kildea@mater.org.au). If you have any problems or queries about the way the study was conducted, and you do not feel comfortable contacting the research staff, you may contact the Research Support Office within the hospital Tel: 07 3163 1585 and quote the M@NGO study. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Consent Form to Participate in the Research Project

Young M@NGO

I,

(Name of participant)

of

(Street) (Suburb/town) (State & postcode)

have been invited to participate in a research project entitled **Young M@NGO**

In relation to this project I have read the Participant Information Sheet and have been informed of the following points:

1. Approval for the protocol has been given by the Human Research Ethics Committee (HREC) of the Mater Hospital
2. The aim of the project is to (i) evaluate women's experiences of care through the Young women's Midwifery Group Practice through focus group interviews.
3. The results obtained from the study may or may not be of direct benefit to my medical management.
4. The procedure will involve participation in a 90-minute focus group interview which will be
digitally recorded. The first focus group will occur when you are approximately 36 weeks pregnant. The second focus group will occur approximately 6 weeks after the birth of your baby. You may choose to participate in one or both focus groups.
5. There are no adverse effects or risks related to this project that the investigators are aware of.
6. Should I develop a problem which I suspect may have resulted from my involvement in this project or should I have any queries relating to my involvement in the study, I am aware that I may contact – Professor Sue Kildea on 07 3163 6335.
8. Should I have any concerns or I am unhappy with the conduct of this project and I do not feel comfortable contacting the research staff, I am aware that the Research Ethics Coordinator (phone: 07 3163 1585) will assist in contacting the Hospital Ethicist or Patient Representative.
9. I can refuse to take part in this project or withdraw from it at any time without affecting my medical care.
10. I understand that participating in this Maternity Service Clinical Trial may or may not benefit my Maternity care directly however my participation may assist in the development of treatments and/or procedures for the future.
11. I understand that my research records will be stored in the following manner: in a locked cabinet and locked in the researchers' office. The research team,



authorised personnel and regulatory entities may have access to my study records to protect my safety and welfare.

12. I consent to the collection, processing, reporting and transfer within or outside Australia of my personal and/or sensitive information for healthcare and/or medical research purposes. All data to be transferred will be de-identified, therefore not including my name, address or phone number. My information will be identified by my baby's date of birth, my Medical Record Number as well as a numerical random code.
13. I understand that my medical record number and a unique study number / pseudonym will identify my information. This information is potentially identifiable but all precautions will be taken by the clinical staff to ensure the information will be kept confidential.
14. If the results of this study are published, my identity will not be revealed.

After considering all these points, I accept the invitation to participate in this project. I am aware that I will be given a copy of the Participant Information Sheet and Consent Form. I also state that I have/have not participated in any other research project in the past 3 months. If I have, the details are as follows:

Date: _____ Witness: _____

(Please print name)

Signature: _____

Signature: _____
(of participant)

(of witness)

Investigators' confirming statement:

I have given this research subject information on the study, which in my opinion is accurate and sufficient for the subject to understand fully the nature, risks and benefits of the study, and the rights of a research participant. There has been no coercion or undue influence. I have witnessed the signing of this document by the subject.

Date: _____

Investigator's Name: _____

Investigator's Signature: _____

Protocol Title: Young M@NGO

An option should I wish to withdraw my consent to participate in the research protocol entitled above is to contact the researcher and/or return this slip. I understand that if I withdraw from the research protocol my medical care, my relationship with the Hospital and medical attendants will not be affected.

Patient's Name: _____

Patient's Signature: _____

Date: _____

Please detach the Withdrawal of Participation Section and send to **Prof Sue Kildea, Women's Health and Newborn Services (Maternity), Mater Health Services, Level 1, Aubigny Place, Raymond Terrace, South Brisbane, Qld. 4101**. If I would like to speak to a member of the study investigation team I may contact **Prof Sue Kildea – 07 31636335**.

PARTICIPANT INFORMATION SHEET

Young M@NGO: focus group for clinicians

WHAT IS THIS RESEARCH ABOUT?

You are invited to participate in a research study of maternity care for young women. We hope to learn about the experience of providing care in a community-based, multi-disciplinary, midwifery group practice model

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, you will be invited to attend a focus group interview with your midwifery or obstetric colleagues. At this interview, you will be asked to talk about your experiences of providing midwifery or obstetric care to young women who are part of the Young Women's Midwifery Group Practice.

ARE THERE ANY RISKS?

There are very few if any risks because the research has been carefully designed. We are doing the study because we need more information about the best way to offer maternity care for young women.

WHY HAVE I BEEN ASKED?

You have been asked because you are able to give us the information we need to find out about how to improve maternity care for young women.

DO I HAVE TO SAY YES?

You don't have to say yes. Participation in the research study is voluntary.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. We won't contact you about this research again.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

You can change your mind at any time and you don't have to say why.

WHAT DO I HAVE TO DO

If you are interested or would like more information please telephone 3163 6118 or email Mango.Trial@mater.org.au. You will be asked to sign a consent form at the start of the group interview.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

This study has been reviewed and approved by the Mater Health Services Human Research Ethics Committee and participants may **contact the Mater Research Ethics Coordinator** on 07 3163 1585, should they have any complaints about the conduct of the research, or wish to raise any concerns. The Research Ethics Coordinator may contact the Patient Representative or Hospital Ethicist at its discretion.

If you wish to withdraw from the study or have any questions or concerns relating to your involvement, you are welcome to contact the chief investigator at the Mater Site: Professor Sue Kildea (Tel: 07 3163 6388 or sue.kildea@mater.org.au). If you have any problems or queries about the way the study was conducted, and you do not feel comfortable contacting the research staff, you may contact the Research Support Office within the hospital Tel: 07 3163 1585 and quote the M@NGO study. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Clinicians' Consent Form to Participate in the Research Project

Young M@NGO

I,

(Name of participant)

of

(Street) (Suburb/town) (State & postcode)

have been invited to participate in a research project entitled **Young M@NGO**

In relation to this project I have read the Participant Information Sheet and have been informed of the following points:

1. Approval for the protocol has been given by the Human Research Ethics Committee (HREC) of the Mater Hospital
2. The aim of the project is to evaluate clinicians' experiences of providing care through, or in conjunction with, the Young Women's Midwifery Group Practice through focus group interviews.
3. The procedure will involve participation in a 90-minute focus group interview.
5. There are no adverse effects or risks related to this project that the investigators are aware of.
6. Should I develop a problem which I suspect may have resulted from my involvement in this project or should I have any queries relating to my involvement in the study, I am _____ aware that I may contact – Professor Sue Kildea on 07 3163 6335.
8. Should I have any concerns or I am unhappy with the conduct of this project and I do not feel comfortable contacting the research staff, I am aware that the Research Ethics Coordinator (phone: 07 3163 1585) will assist in contacting the Hospital Ethicist or Patient Representative.
9. I can refuse to take part in this project or withdraw from it at any time.
10. I understand that my research records will be stored in the following manner: in a locked cabinet and locked in the researchers' office. The research team, authorised personnel and regulatory entities may have access to my study records to protect my safety and welfare.
11. I consent to the collection, processing, reporting and transfer within or outside Australia of my personal and/or sensitive information for healthcare and/or medical research purposes. All data to be transferred will be de-identified, therefore not including my name, address or phone number.
12. I understand that a unique study number will identify my information. This information is potentially identifiable but all precautions will be taken by the clinical staff to ensure the information will be kept confidential.
13. If the results of my tests or information regarding my medical history are published, my identity will not be revealed.



After considering all these points, I accept the invitation to participate in this project. I am aware that I will be given a copy of the Participant Information Sheet and Consent Form.

Date: _____ Witness: _____

(Please print name)

Signature: _____
Signature: _____
(of participant) (of witness)

Investigators' confirming statement:

I have given this research subject information on the study, which in my opinion is accurate and sufficient for the subject to understand fully the nature, risks and benefits of the study, and the rights of a research participant. There has been no coercion or undue influence. I have witnessed the signing of this document by the subject.

Date: _____

Investigator's Name: _____

Investigator's Signature: _____

Withdrawal from Participation

Protocol Title: Young M@NGO

An option should I wish to withdraw my consent to participate in the research protocol entitled above is to contact the researcher and/or return this slip. I understand that if I withdraw from the research, my relationship with the Hospital will not be affected.

Patient's Name: _____

Patient's Signature: _____

Date: _____

Please detach the Withdrawal of Participation Section and send to **Prof Sue Kildea, Women's Health and Newborn Services (Maternity), Mater Health Services, Level 1, Aubigny Place, Raymond Terrace, South Brisbane, Qld. 4101**. If I would like to speak to a member of the study investigation team I may contact **Prof Sue Kildea – 07 31636335**.

APPENDIX 5 FOCUS GROUP INTERVIEW GUIDES

ANTENATAL FOCUS GROUP INTERVIEW GUIDE

12.00

Information sheets, demographic sheet, sign consent form, refreshments, sticker for name

12.05

- Thanks for coming: Jyai (asking the questions and recording the interview), Helen who is helping me (writing notes and may chip in a bit)
- This is a group interview and it will last about an hour – aim to finish at 1 o'clock
- Toilets, refreshments, vouchers at the end, mobile phones silent
- We don't know much about how this place works so we are relying on you to tell us
- We are going to ask lots of questions – there are no right or wrong answers – we just want to know what your experience has been coming here
- Confidentiality, what is said here may be personal and private, don't talk about it or bad mouth each other outside the group
- Respect; allow everyone a chance to speak. If you notice someone is shy, try and encourage them
- It is okay to disagree with each other, it's good to have different ideas and talk about different experiences, these are important
- Introduce yourself: name, how far along you are in pregnancy, having a boy or a girl?

12.10

We call this place Young Mothers for Young Women

- What do you call it? What do other people call it?
- Do you know what they do here?
- What supports can you access her now while you're pregnant?

- What about after you've had your baby?
- How did you find out about coming here for your pregnancy care?
- Who else have you seen in pregnancy – your GP? Do you see them as well?
- Do you have friends, sisters or aunts who are pregnant? Who do they see?
- Why didn't you just go to the hospital for your pregnancy care?

12.20

Some young women complain that it is hard to get to West End for appointments.

- How do you get here (drive, get a lift, catch the bus)?
- Are the appointments at a good time for you?

Have you had to contact your midwife between your appointments – like to ask a question or because you were worried about something?

- How do you contact your midwife? Phone or text
- How has your midwife been when you phone her? Answered your questions? feel silly?

12.25

- Do you know all the midwives in the group?
 - Do you know their names?
 - Who is your midwife?
 - Have any of you had to change midwives for any reason?
 - Does your midwife let you know if she is going on holidays or not going to be available?
- So pregnancy care is done here in a group isn't it?
 - Can you think back to the first time you came here for a group session – what was that like?
 - How did you feel about talking in a group?
 - How did you feel about getting on the floor for your check up?
 - How did you feel about meeting other young mums?
 - Did you know that care was going to be in a group like this? If you did would you have still come here? Would you prefer to just see the midwife on your own? Can you ever do that?
 - What do you say about coming to the group to people like your mum

or your partner?

- Did your mum or partner ever come to the group with you?
 - If yes, what did they say about it? Did they come back?
 - If not, why not?
- Do you care which midwife was going to be with you in labour?
 - Why, what difference do you think it will make?
 - Have you talked to your midwife about what you want for your birth?
 - Have you and your midwife made a birth plan?
 - Are you looking forward to giving birth? What do you think it will be like?
 - Where do you get your information for about birth – midwives? Internet? Friends? Books? Mother or aunties?

12.50

- Suppose your friend just found out she was pregnant, and you had one minute to tell her about [*use women's term to describe YMGP*].
 - Would you recommend it to her?
 - What would you say?

Have we missed anything?

POSTNATAL FOCUS GROUP INTERVIEW GUIDE

9.55

Information sheets, demographic sheet, sign consent form, refreshments, sticker for name

10.05

- Thanks for coming: Jyai (asking the questions and recording the interview), Helen who is helping me (writing notes and may chip in a bit)
- This is a group interview and it will last about an hour – aim to finish at 11 o'clock
- Toilets, refreshments, vouchers at the end, mobile phones silent
- We don't know much about how this place works so we are relying on you to tell us
- We are going to ask lots of questions – there are no right or wrong answers – we just want to know what your experience has been coming here
- Confidentiality, what is said here may be personal and private, don't talk about it or bad mouth each other outside the group; all names will be changed
- Respect; allow everyone a chance to speak. If you notice someone is shy, try and encourage them
- It is okay to disagree with each other, it's good to have different ideas and talk about different experiences, these are important
- Introduce yourself: name, how old is your baby, tell us one thing your baby is doing a lot at the moment?

10.10

We call this place Young Mothers for Young Women

- What do you call it? What do other people call it?
- Do you know what they do here?
- Did you get any help from them during pregnancy
- What supports can you access here now you have bub?

All of you had care with the Young Women's MGP midwives didn't you?

Think back to your last home visit with the midwife...

- What did she do for the baby?
- What did she do for you?
- How many times did you see her?
- Did you feel ready to stop seeing her?

After your baby was born did you ever contact your midwife because you were worried about something or to ask a question?

- How do you contact your midwife? Phone or text
- How has your midwife been when you phone her? Answered your questions? feel silly?

10.20 BUTCHER'S PAPER – SENTENCE COMPLETION

- When I first thought I was in labour I...
- When I first called the midwife she said...
- When I got to the hospital the midwife...
- When the baby was born the midwife...
- When the baby first fed the midwife...

10.25 KEY QUESTIONS

- When you were pregnant, did you care which midwife was going to be with you in labour?
 - Did you have a birth plan or talk to your midwife about what you want for your birth?
 - Where did you get your information for about birth – midwives? Internet? Friends? Books? Mother or aunties?
- Did you know the midwife who was with you in labour?
 - Imagine if you had a midwife in labour you had never met before,

would it have been different?

- Did you know the midwife who visited you at home after birth?
 - Imagine if you had different midwives visiting you and the baby at home, would that have been different?

10.50

- Suppose your friend just found out she was pregnant, and you had one minute to tell her about [*use women's term to describe YMGP*].
 - Would you recommend it to her or not recommend it to her?
 - What would you say?

Have we missed anything?

