



New Zealand
College of Midwives

TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

JOURNAL

Celebrating 30 years

Low-cost, self-paced, educational programmes increase birth satisfaction in first-time mothers

Rethinking engagement: Exploring women's technology use during the perinatal period through a Kaupapa Māori consistent approach

Midwives' perspectives of maternal mental health assessment and screening for risk during pregnancy

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New Zealand College of Midwives Journal

The New Zealand College of Midwives Journal is a double-blind peer-reviewed journal that presents research undertaken within a continuity of midwifery care framework. It is the official publication of the New Zealand College of Midwives and is provided as a benefit to all College members. The Journal is aimed at both national and international readers with an interest in pregnancy and childbearing, including midwives, student midwives, midwifery managers and educators, allied health professionals and consumers.

The Philosophy of the Journal is:

- To promote women's health issues as they relate to childbearing women and their families
- To promote the view of childbirth as a normal life event for the majority of women, and the midwifery professional's role in effecting this
- To provoke discussion of midwifery issues
- To support the development of New Zealand midwifery scholarships
- To support the development and dissemination of New Zealand and international research into midwifery and maternal and child health

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For full information about the Journal and how to submit a manuscript, see <https://www.midwife.org.nz/midwives/publications/college-journal/>.

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GUEST EDITORIAL

Celebrating 30 years

Helen Manoharan
Inaugural Co-editor with Judy Hedwig



Helen Manoharan

This issue celebrates the 30th birthday of the New Zealand College of Midwives Journal and I feel highly privileged to be asked to write this editorial at such a significant time. We celebrate 30 years of providing an accessible source of scholarly articles on clinical midwifery sciences and current practice issues which are all rigorously peer reviewed, edited and printed, all contributing to midwifery knowledge development.

We knew we were a very special group then and we know we are a very special group now. Those “rebirth” midwifery days were monumental and have made a positive stand in the childbirth/midwifery history of New Zealand, of which I am very proud to have been a part.

We were phenomenally fortunate, particularly during the 1980s, to have global childbirth explorers who made a significant impact in the philosophy and practice of midwifery and childbirth. Our very own Joan Donley, and remember Michel Odent, Marsden Wagner, Murray Enkin, Sheila Kitzinger, Lesley Page, Wendy Savage? All of these and many others visited New Zealand to support our cause.

1989 was New Zealand midwifery’s year:

- the launch on 2nd April of the New Zealand College of Midwives, which for many years had been a shadow of the nursing profession
- the re-introduction of a separate midwifery education which commenced in Auckland and Dunedin
- Rt. Hon. Helen Clark, then the Minister of Health, successfully passed the first reading of the Nurses Amendment Bill Section 54 of the Nurses Act which would allow midwives to practise independently of medical supervision
- Joan Donley was awarded an OBE for her services to midwifery as she opened the door to ensure there was an effective midwifery service for future generations
- The launch of the New Zealand College of Midwives Journal in September 1989. The first issue was co-edited with Judy Hedwig, who was pure inspiration; we were all very grateful for her vision and input.

The Journal now gave the College a voice, which was soon heard. The first issue had an immediate response from the medical profession, with a notable obstetrician challenging statements made (with help from the legal profession).

Publishing has been revolutionised during the past 30 years, mainly due to technological advances – it seems hard to believe now how we struggled with chunky computers and no internet! Everything was typed, checked and rechecked. It was a slow process. All the graphics and Journal covers were hand drawn (no electronic illustrator then) and continual pleas were put out to advertisers to buy space to help cover the printing costs.

So many excellent original articles were printed, with some of the regular contributors being Karen Guilliland, Sally Pairman, Joan Donley, Bronwen Pelvin, Cheryl Benn, Alison Stewart, Sarah Stewart and many more. Often photographs were submitted by Glenda Stimpson. So many amazing, talented midwives.

The next process was to await the printer’s call, instructing us to collect the “galley prints” which were edited, rearranged, checked – again rearranged – and with no internet this meant a few trips to the printers to get it right. We went through three printers in my time as we wore out all of them!

Once in print the Journals were loaded into the car and the two-day job of unloading, packing, sealing, labelling and delivering at NZ Post commenced. Help was commandeered from anywhere and everywhere. In the later stages (with the promise of wine and nibbles) it became a debating ground for the local midwives. While the packing, labelling and boxing was underway, heated debates would erupt and childbirth and midwifery issues were opened out and solutions debated. Good friendships were sealed over these events.

One article, *Six Myths that can Lead Us Astray* by Professor Emeritus Murray Enkin (Issue 11) is as true today as it was in 1994, as he tried to raise our collective consciousness about common but invalid assumptions that can lead us astray:

- Association means causation
- If everyone believes it, it must be true
- Prevention is always better than cure
- The myth of the magic bullet
- The myth of authority
- Experience is the best teacher

There has never been so much evidence-based credible research covering women’s health and childbirth being completed in the world as there is today and, thanks to professional Journals like this, there is widespread dissemination of the results for us all to use. We remain indebted to you all.

Here’s to the next action packed 30 years!

Helen was the Journal’s editor for the first 21 issues, 1989-1999.

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NEW ZEALAND RESEARCH

Comparing perinatal outcomes for healthy pregnant women presenting at primary and tertiary settings in South Auckland: A retrospective cohort study

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ABSTRACT

Background: Strong evidence supports the premise that many low-risk women and babies experience perinatal outcomes, in a free-standing, midwifery-led, primary level maternity unit (PMU) similar to, or better than, those of an obstetric-led tertiary level maternity hospital (TMH).

Aim: The aim of this study was to identify whether place of birth affected measurable maternal and neonatal outcomes in a low-risk cohort within one New Zealand District Health Board.

Method: We gathered the birth records of a retrospective cohort of low-risk women (n=4,207), who had birthed within two distinct environments, including one TMH and three PMUs. Comparison was made of three maternal outcomes: emergency caesarean section, acute postpartum admission to theatre/high dependency unit/intensive care unit (<12hr post birth) and postpartum haemorrhage (PPH; >500ml). Neonatal outcomes analysed were 5-min Apgar score <7 and acute neonatal admission to neonatal intensive care unit (NICU; <12hr post birth).

Findings: Logistic regression of data revealed statistically significant associations between place of birth and the five perinatal outcomes. Low-risk women giving birth in one of the three PMUs had fewer emergency caesarean sections (OR 0.25, 95% CI, 0.157-0.339), PPHs (OR 0.692, 95% CI, 0.534-0.898), and acute postpartum admissions to theatre (OR 0.201, 95% CI, 0.102-0.398) than women giving birth in the TMH. Babies born to women at a PMU were less likely to experience a 5-min Apgar <7 (OR 0.313, 95% CI, 0.124-0.791) or acute neonatal admission to NICU (OR 0.492, 95% CI, 0.324-0.747) compared to babies of women of similar risk status, born in the TMH.

Conclusion: Low-risk women birthing in PMUs in South Auckland, New Zealand, experienced a significant reduction in morbidity for themselves and their babies.

Keywords: place of birth, primary birthing unit, tertiary maternity hospital, caesarean section, neonatal morbidity, maternal morbidity, transfer rates

INTRODUCTION

In Aotearoa New Zealand (NZ) there are currently 54 freestanding primary level midwife-led maternity units (PMUs) either owned by a District Health Board (DHB) or by non-government organisations (Ministry of Health, 2017). These PMUs offer birthing and postnatal facilities. There are also 18 secondary-level and six tertiary-level obstetric-led maternity hospitals (TMHs) that have specialist obstetric, midwifery, anaesthetic and paediatric services on site (Ministry of Health, 2017). Women in NZ can choose where to give birth. Low-risk women have the options of giving birth in their own home, or in a primary, secondary or tertiary maternity facility. However, access is often an issue as most PMUs are rurally located and many towns and cities with secondary level hospitals have no PMU option. All PMUs, whether private or public, receive government funding for maternity service provision. Self-employed, government funded, Lead Maternity Carer (LMC) midwives provide continuity

of care to women irrespective of planned or actual birthplace (Ministry of Health, 2007). This includes intrapartum care in the woman's chosen place of birth, with rostered midwives providing midwifery services in the facilities or in the hospital. It is possible for a private obstetrician to provide primary maternity care as an LMC (at an additional cost to the woman) but if women choose a private obstetrician, a PMU is no longer a birthplace option. At the time of data collection, midwives were the LMC for 93.6% of women nationally (Ministry of Health, 2015) and for all of the participants in this study. Private obstetric care for low-risk women is rare in this low-decile region (accounting for only 0.6% of the low-risk births) and is therefore not included in the analysis. The midwives in this study continued as the primary caregiver whether the woman remained in the PMU or was transferred to the TMH for specialist consultation. Accordingly, differences in outcomes presented relate to birthplace independently of model of care.

BACKGROUND

Despite the number of primary units available in NZ, the proportion of women choosing to birth in a primary unit has been reducing from 15.6% in 2007 (Ministry of Health, 2015) to 9.9% in 2015 (Ministry of Health, 2017). “Safety” is the principle consideration in women’s birthplace decision-making, but the way safety is understood differs according to birthplace choice (Grigg, Tracy, Daellenbach, Kensington, & Schmied, 2014). Women choosing the tertiary hospital setting consider access to specialist services/facilities (if needed) was the most important factor, whereas women planning a primary setting identified “closeness to home”, “ease of access”, the “atmosphere” of the unit and “avoidance of unnecessary intervention” as important (Grigg et al., 2014). The decreasing utilisation of PMUs may be related to the increase in the number of women experiencing intervention (such as induction of labour, labour augmentation, instrumental assisted birth and emergency caesarean section) across the country (Ministry of Health, 2017).

Undertaking a randomised controlled trial for place of birth is problematic due to the inability to blind participants and clinicians and the need to ensure the woman has informed choice. Hollowell et al. (2011) published a prospective cohort study of women (n=64,538) who gave birth between 2008 and 2010 in England. No significant differences were found in the adjusted odds ratios (AORs) of primary outcome (a composite of perinatal mortality and intrapartum related morbidities) for low-risk women who gave birth in a PMU compared with a TMH (AOR 1.22, 95% CI, 0.76-1.96). The researchers concluded that choice of birth place had no effect on perinatal outcomes. However, in the TMH, low-risk women experienced increased rates of intrapartum caesarean section (AOR 0.32, 95% CI, 0.24-0.42) and birth interventions such as augmentation (AOR 0.26, 95% CI, 0.20-0.33), epidural (AOR 0.25, 95% CI, 0.2-0.31), episiotomy (AOR 0.33, 95% CI, 0.28-0.39), transfusion (AOR 0.48, 95% CI, 0.32-0.73), admission to higher level care (AOR 0.32, 95% CI, 0.13-0.84), and third or fourth degree perineal trauma (AOR 0.78, 95% CI, 0.58-1.05). Another component of this research involved a cost analysis which showed that the use of community-based birthing options is less expensive than hospital-based services (Schroeder et al., 2012).

Further prospective, retrospective and population based studies from Denmark (Overgaard, Møller, Fenger-Grøn, Knudsen, & Sandall, 2011), the Netherlands (Wiegerinck et al., 2015), Australia (Homer et al., 2014; Laws, Tracy, & Sullivan, 2010; Monk, Tracy, Foureur, Grigg, & Tracy, 2014), United States of America (Stapleton, Osborne, & Illuzzi, 2013) and NZ (Bailey, 2017; Davis et al., 2011; Grigg et al., 2017) reported significantly fewer obstetric interventions (such as instrumental birth, emergency caesarean section, labour augmentation, episiotomy) for mothers and no difference in neonatal mortality and morbidity for babies, when choosing midwifery-led settings (home and PMU) over obstetric-led hospitals. In contrast, population-based studies from the USA report higher neonatal mortality for babies born at home (Grünebaum et al., 2014; Wax et al., 2010) and a higher prevalence of Apgars of 0 at 5-min and neurological dysfunction in babies born at home or at a PMU (Grünebaum et al., 2014) compared to births at a TMH. Arguably, the lack of an infrastructure supportive of midwifery and midwife-led, free-standing maternity units in America may explain these findings.

The study region, Counties Manukau (CM), forms one of the largest providers of birthing services within Australasia; 14% of all births in NZ are to women residing in this DHB (Jackson,

2011). It has one of the fastest growing populations in NZ with an annual growth rate of 1-2% (Counties Manukau Health, 2016). CM has the second highest number of Māori (after Waikato), the highest number of Pasifika, and the second highest number of Asian people (after Auckland DHB) with a comparatively high birth rate (Winnard, Lee, & Macleod, 2015). Of the approximate 8,500 babies born per year in the region, over 50% are born to Māori or Pasifika mothers (24% and 32% respectively in 2007-2009; Statistics New Zealand, 2018) and more than half of the birthing population for this region resides in the lowest two (9, 10) socio-economic deciles (Counties Manukau Health, 2016).

Counties Manukau District Health Board (CMH) operates a tertiary (full neonatal service) hospital as well as three PMUs. About one-third of all the low-risk women that give birth in this region use one of the three PMUs (Farry, 2015), each of which is located within a 12-40km radius of the TMH. The remaining low-risk births occur at the TMH. Midwives take primary professional responsibility for women with low-risk pregnancies during labour and birth in both the PMU and TMH unit types (Rowe, 2011; Table 1). At the time of data collection, this DHB had lower rates of LMC (community-based or self-employed) midwifery care than other regions, with the DHB providing midwifery primary maternity services (employed or core midwives) for one third of the women (Farry, 2015). To access specialist obstetric or neonatal care from a PMU, the woman or woman and baby transfer (usually via an ambulance) to the TMH with their midwife. All maternity care is fully funded for NZ residents.

Our study’s hypotheses

After controlling for age, ethnicity, body mass index (BMI), parity, smoking status, and socio-economic decile, low-risk women giving birth at a PMU will have similar rates of caesarean section, blood loss and maternal postpartum admission to theatre compared with low-risk women giving birth in the TMH. Babies of low-risk women giving birth in a PMU will have similar Apgar scores at 5-minutes and a similar number of acute neonatal admissions to intensive care when compared with babies of low-risk women giving birth in the TMH.

The maternal and neonatal outcome measures in this study are: emergency caesarean section, postpartum haemorrhage (PPH; >500ml), acute maternal postpartum admissions to theatre/high dependency unit (HDU)/intensive care (ICU; within 12 hours of birth), low Apgar (5-min Apgar <7), and acute neonatal admissions to neonatal intensive care (NICU; within 12 hours of birth).

METHODS

This retrospective cohort study compares accurately captured clinical outcomes for well (“low-risk”) women giving birth in a TMH with those for women giving birth in PMUs in South Auckland, over a 12-month period. Approval was gained from local DHB and National Health Ethics Committees (expedited review number NTX/12/EXP/078). Data extraction was provided by the region’s DHB data managers.

The combined birthing facilities (one TMH and three PMUs) reported 8,063 babies born during the study period. To be defined as low-risk, the woman’s pregnancy was at term (37-42 weeks gestation); it was a singleton pregnancy and a cephalic presentation. Exclusion criteria were: women who had had multiple births, had been admitted to hospital during pregnancy or in labour with one or more secondary diagnostic code/s (Table 2), were induced, were >44 years old at time of birth or ≥40 years and nulliparous at time of birth, had a BMI >40kg/m² at the time of booking, or who had booked ≤13 days before birth (Figure 1).

Table 1. Place of birth definitions adapted from Rowe (2011)

Term	Definition	Birthplace terms used internationally
Freestanding primary level midwife-led maternity unit (PMU)	A clinical location offering care to women with straightforward pregnancies during labour and birth, with midwives taking primary professional responsibility for care. General practitioners may also be involved in care. During labour and birth, diagnostic and treatment medical services (obstetric, neonatal and anaesthetic) are not immediately available but are located on a separate site if required. Transfer will normally involve a car or ambulance.	Primary unit (NZ) Metropolitan stand-alone primary childbirth unit (Australia) Birth centre (USA)
Tertiary- level obstetric-led maternity hospital (TMH)	Care is provided by a team with obstetricians taking primary responsibility for women at high risk of complications during labour and birth. Midwives offer care to all women (high and low risk) in a TMH and take primary responsibility for women with straightforward pregnancies during labour and birth. Diagnostic and treatment medical services (obstetric, neonatal and anaesthetic) are available on site 24 hours a day.	Tertiary hospital (NZ) Conventional delivery ward (Norway) Hospital labour ward (Australia) Standard care unit (China) Standard delivery ward (Sweden)

Table 2. Diagnostic codes indicating secondary care in pregnancy

Diagnostic code*	n
Maternal care due to uterine scar from previous surgery	639
Premature rupture of membranes, onset of labour between 1-7 days later	369
Preterm spontaneous labour with preterm delivery	340
Duration of pregnancy 34-36 completed weeks	339
Maternal care for poor fetal growth	337
Vaginal delivery following previous caesarean section	297
Other specified diseases and conditions complicating pregnancy, childbirth and the puerperium	246
Supervision of pregnancy with other poor reproductive or obstetric history	218
Pre-eclampsia, unspecified	190
Maternal care for excessive fetal growth	189
Oligohydramnios	161
Preterm delivery without spontaneous labour	159
Antepartum haemorrhage, unspecified	139
Diabetes mellitus arising during pregnancy, insulin treated	132
Maternal care for breech presentation	125
Duration of pregnancy 26-33 completed weeks	124
Diabetes mellitus arising during pregnancy, oral hypoglycaemic therapy	122
Gestational (pregnancy-induced) hypertension without significant proteinuria	110
Maternal care for other specified fetal problems	101
Diabetes mellitus arising during pregnancy, other	92
Endocrine, nutritional and metabolic diseases complicating pregnancy, childbirth and the puerperium	82
Diseases of the digestive system complicating pregnancy, childbirth and the puerperium	70
Anaemia complicating childbirth and the puerperium	69
Prophylactic immunotherapy	62
Polyhydramnios	53
Mental disorders & diseases of the nervous system complicating pregnancy, childbirth and the puerperium	44
Other diagnostic codes e.g. rhesus isoimmunisation, thrombocytopenia, cervicalgia	398
Total number of secondary diagnoses	5,207
Total number of women excluded	3,403

* Diagnostic codes are not mutually exclusive, a total of 3,403 women were excluded for one or more of the above 5,207 secondary diagnoses

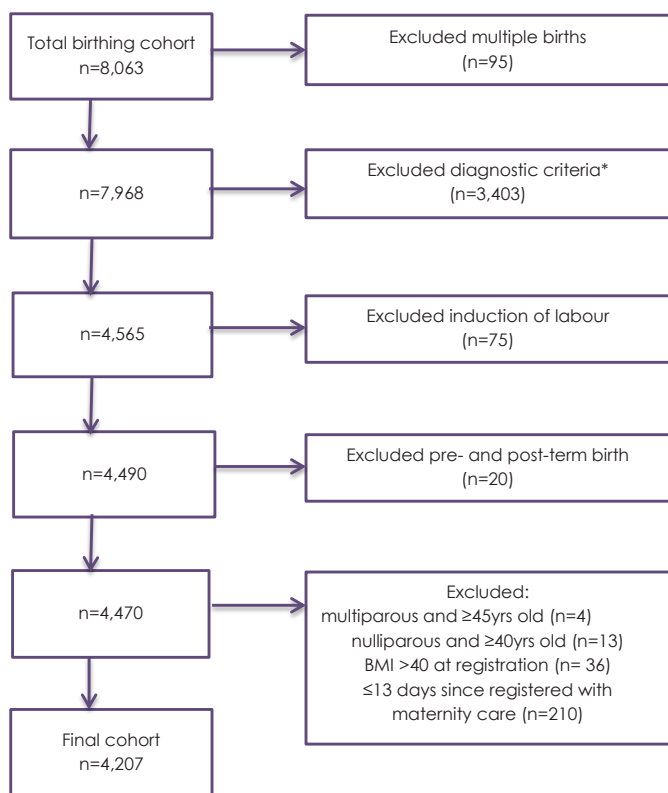
Women's risk status can change at any stage and their risk status on admission in labour is unknown. This fact is acknowledged as a limitation in this study.

Data Extraction

Data were collated from two DHB databases. The first was a local DHB clinical dataset entered in retrospect by non-clinical staff from contemporaneous handwritten records made by clinical staff. The second was a national patient management database updated digitally by non-clinical staff in real time and primarily used for resource allocation.

The integrity and reliability of the data were checked through comparison of the codes applied to each woman's clinical records and actual records by a clinician for a subgroup of 250 women.

The accuracy of each field was measured using the proportion of records for which the database entry matched the clinical notes. Agresti-Coull confidence intervals (CI) of 95% (Agresti & Coull, 1998; Brown, Cai, & DasGupta, 2001) were used. The study was powered to produce a 95 % CI of width no more than 10% under the assumption that the proportion of correct records was 80%. Fields were deemed sufficiently accurate for use if the lower limit of the CI for the proportion of records correct was at 85). If



* See Table 2

Figure 1. Flow chart inclusion/exclusion criteria to identify low risk women

this accuracy was not met, the required information was obtained from the second data source – the national patient management database. Accuracy of this database is likely to be high because it informs contemporaneous availability of beds and is a record of DHB acuity for resource management.

Of the 24 fields captured (Figure 2), five were excluded as the lower limit of the CI for the proportion of records correct was less than 85% (Table 3). Unfortunately, “Intended Place of Birth” could not be determined as women’s intentions were not accurately recorded in the local database. This could have offered some insight into women’s planned, compared with actual, place of birth. “Birth Site”, however, was accurate and used to determine “Place of Birth”. “Booking Gestation” was made accurate by subtracting the “Date of Booking” from the “EDB” (Expected Date of Birth) both 90% accurate data fields in the local database. In this way women who were booked into the Healthware database with <13 days left in their pregnancy could be excluded from the cohort as they no longer satisfied the low-risk criteria. This may have erroneously excluded women who were, in fact, “booked” with an LMC in a timely manner and therefore receiving antenatal care, but not booked into the Healthware database by their LMC midwife until their labour was imminent. “Location Changed” and “Changed Reason” were both inaccurate and were replaced by “Transfer Time” and “Transfer Destination” from the patient management database. This information along with “DOB Including Time” allowed intrapartum transfers to be differentiated from postpartum transfers. The data “Acute Maternal Postpartum Admission” and “Neonatal Admission” were also sourced from the national patient management database. Unfortunately, “Third Stage Procedures” did not reach the accuracy criterion and this information was not captured elsewhere, precluding this study from any deeper analysis of differences in third stage management between the sites.

Table 3: Percentage accuracy including 95% CI for 24 variables in national database

National data field	% Accuracy (95% CI)	Accurate, or inaccurate*
Patient details		
Maternal age	97 (0.95, 0.99)	accurate
Ethnicity	93 (0.89, 0.96)	accurate
Suburb	94 (0.92, 0.97)	accurate
Pregnancy details		
LMP date	97 (0.95, 0.99)	accurate
EDB best	98 (0.96, 0.99)	accurate
Gravida	97 (0.95, 0.99)	accurate
Parity	91 (0.88, 0.95)	accurate
Antenatal booking		
Smoking status	91 (0.88, 0.95)	accurate
Booking date	89 (0.86, 0.93)	accurate
Intended place of birth	28 (0.23, 0.34)	inaccurate
Booking gestation	1 (0, 0.02)	inaccurate
Maternal height	97 (0.95, 0.99)	accurate
Maternal weight	95 (0.93, 0.98)	accurate
Labour and birth (mother)		
Birth date	99 (0.98, 1)	accurate
Birth method	97 (0.95, 0.99)	accurate
Location changed	13 (0.09, 0.17)	inaccurate
Changed reason	22 (0.17, 0.27)	inaccurate
Labour and birth (baby)		
DOB (including time)	99 (0.98, 1)	accurate
Birth place	98 (0.96, 0.99)	accurate
Birth outcome	99 (0.98, 1)	accurate
Labour and birth 3rd stage		
Estimated blood loss	98 (0.96, 0.99)	accurate
Third stage procedures	87 (0.83, 0.91)	inaccurate
Baby birth examination		
Apgar 1 min	96 (0.94, 0.98)	accurate
Apgar 5 min	97 (0.95, 0.99)	accurate

* Accurate (lower limit of CI above 85%); inaccurate (upper limit of CI below 85%)

Data Analysis

The inferential statistical analysis was conducted using IBM SPSS version 22.0 using the protocols described by Field (2013) and Pallant (2013). Frequencies were used to describe the characteristics of all eligible healthy women with low-risk pregnancies (n=4,207). Proportions and Pearson’s chi-squared tests were used to explore the associations at p<0.05 between cross-tabulated variables. Six covariates (parity, smoking status, ethnicity, BMI, socio-economic decile, age) were identified a priori based on their suspected influence on the maternal and neonatal dependent variables (emergency caesarean section, PPH, admission to HDU/ICU/theatre, low Apgar, admission to NICU). These dependent variables were prepared for binary logistic regression by coding all data to dichotomous as per Bagley, White and Golomb (2001). ORs with 95% CIs were calculated for the five perinatal outcomes and shown as unadjusted and adjusted for confounders.

RESULTS

Demographics

Fifty-two percent (n=4,207) of total births in the region during the study period (n=8,063) met the inclusion criteria. Of the 4,207

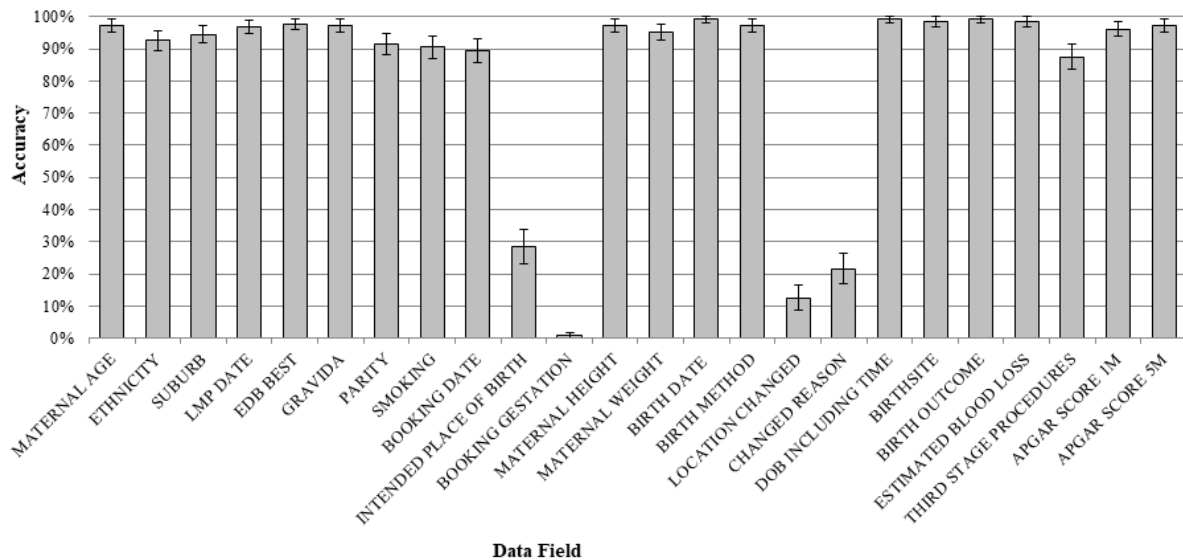


Figure 2. Accuracy assessment of the data fields

women who met the inclusion criteria, 26.5% (n=1,114) gave birth at a PMU and 73.5% (n=3,093) at the TMH. Thirty-nine percent (n=1,206) of those birthing at the TMH were nulliparous, compared to 29% (n=323) of those birthing at a PMU.

The transfer rate from the three PMUs to the TMH was 6.7% for intrapartum (n=75) and 2.6% for immediate (<12h) postpartum women (n=29), making a total transfer rate of 9.3%. There was a statistically significant difference $\chi^2(3, n=75) = 65.55, p<.001$ between the intrapartum transfer rate of nulliparous women 18% (n=52) compared to multiparous women 3% (n=23). Postpartum transfers were similar between the two groups.

The maternal age, smoking status and parity profile of the PMU and TMH populations was similar. Women giving birth in the PMU were predominantly NZ European (n=421) and Māori (the indigenous people of NZ; n=359), 70% combined; in contrast to the TMH which had a higher proportion of women identifying as Pacific (n=1,348) and Asian (n=509), 60% combined. Women giving birth at one of the PMUs were less likely to have a BMI >35 or be economically deprived. The frequency distributions of the cohort characteristics by Place of Birth are listed in Table 4.

Statistically significant interactions were identified between Place of Birth and the covariates: parity, smoking status, ethnicity, BMI, socio-economic decile, and maternal age. These confounders were adjusted for in the subsequent logistic regression analyses.

Place of Birth

The three maternal (emergency caesarean section, PPH, and acute maternal postpartum admissions) and two neonatal (Apgar and acute neonatal admission) outcomes held statistically significant associations with Place of Birth. The unadjusted and adjusted Odds Ratios (ORs) are shown in Table 5. Low-risk women giving birth at a PMU have one quarter the odds of an emergency caesarean section (aOR 0.224, 95% CI, 0.157-0.339), half the odds of experiencing a PPH (aOR 0.536, 95% CI, 0.424-0.676), and one fifth the odds of being acutely admitted after birth (aOR 0.201, 95% CI, 0.102-0.398) when compared to women birthing in the TMH. Babies of low-risk women giving birth in a PMU have one third the odds of receiving a low Apgar (aOR 0.354, 95% CI, 0.135-0.926) and, correspondingly, have half the odds of being admitted to NICU (aOR 0.571, 95% CI, 0.362-0.902), when compared to babies of low-risk women giving birth in the TMH.

Table 4. Frequency distributions of the cohort covariates for place of birth

Covariate ^a	Place of Birth	PMU		TMH		Pearson's Chi-Square
		n	%	n	%	
Parity ^b	Multiparous	753	67.6	1,883	60.9	n=4,207, 15.783 p<0.001
	Nulliparous	361	32.4	1,210	39.1	
	Total	1,114	100.0	3,093	100.0	
Smoking ^b	Yes	207	18.6	486	15.7	n=4,207, 4.899 p=0.027
	No	907	81.4	2,607	84.3	
	Total	1,114	100.0	3,093	100.0	
Ethnicity ^b	Māori	359	32.3	640	20.8	n=4,191, 502.423 p<0.001
	NZ European	421	38.0	457	14.8	
	Pacific	144	13.0	1,348	43.7	
	Asian	113	10.2	509	16.5	
	Other	72	6.5	128	4.1	
	Total	1,109	100.0	3,082	100.0	
BMI ^b	<18	18	1.8	32	1.1	n=3,875, 50.116 p<0.001
	18-24	406	39.8	999	35.0	
	25-29	328	32.1	787	27.6	
	30-34	188	18.4	596	20.9	
	35-40	79	7.8	442	15.4	
	Total	1,019	100.0	2,856	100.0	
Socio-economic decile ^{b,c}	1-5	368	35.7	487	16.5	n=3,970, 223.550 p<0.001
	6-10	664	64.3	2,451	83.4	
	Total	1,032	100.0	2,938	100.0	
Age ^b	15-24	364	32.6	1,277	41.2	n=4,207, 20.328 p<0.001
	25-34	600	53.9	1,477	47.7	
	35-44 ^d	150	13.5	339	11.0	
	Total	1,114	100.0	3,093	100.0	
Model of Care	DHB	397	35.7	1,172	38.0	n=4,198, 1.810 p=0.179
	LMC	715	64.3	1,914	62.0	
	Total	1,112	100.0	3,086	100.0	

^a n differs for some confounders due to missing data in the original data set

^b Confounding covariates adjusted for in the logistic regressions presented in Table 5

^c The higher the decile, the greater the socio-economic deprivation

^d Only multiparous women were included >40 years of age

Table 5. Effect of place of birth on maternal and neonatal outcomes. Descriptive statistics are listed as n (%) and OR (unadjusted and adjusted) are provided.

Outcome	Occurrence	Place of birth n (%)		Unadjusted ^{a,b} OR (95% CI)	Adjusted ^b OR (95% CI)
		PMU	TMH		
Maternal					
Emergency caesarean section	No ^c	1,092 (98.2)	2,856 (92.5)	0.224 (0.141-0.356)	0.250 (0.157-0.339)
	Yes	20 (1.8)	233 (7.5)		
Postpartum haemorrhage	No	1,007 (92.2%)	2,481 (87.0%)	0.489 (0.389-0.615)	0.536 (0.424-0.676)
	Yes	85 (7.8%)	371 (13.0%)		
Acute postpartum admission to HDU/ICU/theatre	No	1,105 (99.2%)	2,967 (95.9%)	0.192 (0.097-0.378)	0.201 (0.102-0.398)
	Yes	85 (7.8%)	371 (13.0%)		
Neonatal					
Low Apgar <7 at 5 min	No	1,106 (99.5%)	3,032 (98.5%)	0.298 (0.118-0.752)	0.354 (0.135-0.926)
	Yes	5 (0.5%)	46 (1.5%)		
Neonatal admission to NICU	No	1,087 (97.6%)	2,940 (95.1%)	0.477 (0.315-0.723)	0.571 (0.362-0.902)
	Yes	27 (2.4%)	150 (4.9%)		

^a All results were statistically significant at $p < 0.001$

^b Adjusted for parity, smoking status, ethnicity, BMI, socio-economic decile, and age, as per Table 4

^c This outcome describes vaginal birth inclusive of instrumental birth

When the number of women who required a caesarean section ($n=253$) was removed from the cohort, the proportion of women experiencing a PPH in the TMH was still statistically significantly higher than the proportion of those who had a PPH and whose Place of Birth was a PMU (OR 0.692, 95% CI, 0.534-0.898). In addition, the non-caesarean section babies born in the TMH remained more likely to be admitted to NICU (OR 0.168, 95% CI, 0.082-0.345).

There were no incidences of maternal or neonatal mortality reported in either cohort.

DISCUSSION

This study found that women giving birth in a freestanding PMU had more favourable clinical outcomes when compared with women giving birth in a TMH. The findings identify statistically significant differences in outcomes dependent on the place of birth, with women giving birth in a freestanding PMU having lower odds of emergency caesarean section, PPH, and acute maternal postpartum admissions to theatre/HDU/ICU, and their babies having lower odds of an Apgar <7 at 5 minutes and of acute neonatal admission to NICU. The associations remained significant after adjustment for known confounding factors (age, ethnicity, decile, BMI, smoking status and parity). For low-risk women giving birth at the TMH, the odds of an emergency caesarean section were four times the odds of women birthing at the PMUs, and the odds of acute maternal postpartum admission to theatre/HDU/ICU were five times the odds of women birthing at the PMUs. This latter finding may reflect the morbidity associated with caesarean (Gregory, Jackson, Korst, & Fridman, 2012) and the increase in prevalence of epidural, episiotomy, and forceps, leading to a higher rate of third and fourth degree tears (Fitzgerald et al., 2007) in the TMH.

The number of women experiencing a PPH was found to be significantly less for PMU births compared with TMH births. This differs from the results in a study undertaken by Davis et al. (2011) which compared outcomes for place of birth. In their study the place of birth was not found to have a significant effect on maternal blood loss. However, their study defined women

experiencing a PPH as having a blood loss >1,000ml which they argued to be a clearer indication of morbidity. In our study, a blood loss of more than 500ml was the measure identified to determine PPH. This was because Conner et al. (2015) found that the thresholds most predictive of a clinically significant estimated blood loss were confirmed to be 500ml in a vaginal birth and 1,000ml in a caesarean section, with the median recorded blood loss resulting from a caesarean section being 500ml. To determine if PPH was an interaction of the increased number of emergency caesarean sections observed, we undertook a subgroup analysis in which women whose labours resulted in an emergency caesarean section were removed. We found that the incidence of PPH remained significantly lower when women gave birth at a PMU. Oxytocin augmentation during labour has been shown to increase the risk of PPH (Belghiti et al., 2011; Combs, Murphy, & Laros, 1991; Grotegut, Paglia, Johnson, Thames, & James, 2011; Sheiner, Sarid, Levy, Seidman, & Hallak, 2005; Waterstone, Bewley, & Wolfe, 2001), perhaps by desensitising receptors (Phaneuf et al., 1998; Robinson, Schumann, Zhang, & Young, 2003), thereby impairing oxytocin's post-delivery effects on uterine contractility and increasing the risk of atonic PPH (Magalhaes et al., 2009). Oxytocin augmentation does not occur at PMUs and this may explain the difference in blood loss between the two sites.

The higher rate of neonatal admission of babies of women birthing in the TMH in this study was in agreement with the large Birthplace in England study (Hollowell et al., 2011), two Australian studies (Laws et al., 2010; Monk et al., 2014) and two previous NZ studies (Bailey, 2017; Davis et al., 2011). These findings indicate that routine hospital birth is not safer for babies of low-risk mothers. The higher number of NICU admissions, in the cohort excluding caesarean section, remained significant for women birthing vaginally at the TMH. This agrees with Laws et al. (2010) and Davis et al. (2011), where increased rate of admission to NICU was associated with labour interventions and assisted modes of birth in the TMH settings they studied.

There is no equivalent low-risk national dataset with which to compare and identify the generalisability of our study sample. The demographic findings demonstrate that our sample held

similarities to national maternity data (Ministry of Health, 2017). Age, nulliparity, smoking status, and ethnicity (NZ Māori, Asian and Other) were all within 1-2% of the national/regional maternity data. The proportion of women identifying themselves as NZ European was higher in the national maternity data (48%), than in the current study cohort (20.9%). The proportion of women identifying themselves as Pacific was lower in the National Maternity data (11.2%) than the current study cohort (35.5%). Socio-economic decile is comparable between this study's use of "deprivation decile" and the nationally gathered data reported as "deprivation quintile" according to Atkinson, Salmond and Crampton (2014). The National Report on Maternity (2015) states that 29.8% of NZ birthing women reside in quintile 5 (the lowest quintile in NZ). This study reports 54.2% of the cohort reside in decile 9, 10 (the lowest two deciles). It is possible to conclude that this cohort is more deprived than the national average. The most recent annual report to the National Maternity Quality and Safety Programme also revealed that more than half of the entire Counties Manukau birthing population for this region resides in the lowest two (9, 10) socio-economic deciles (Counties Manukau Health, 2016).

Rates of transfer

The intrapartum and immediate postpartum (within 12 hours of birth) transfer rate was 9.3% (n=104), lower than the 19% (n=6002), 21.9% (n=2,468) and 17.3% (n=70) reported by Bailey (2017), Hollowell et al. (2011) and Grigg et al. (2017), respectively. However, these studies either included maternal and neonatal transfers up to 48 hours (Grigg et al., 2017) or did not define the timeframe (Bailey, 2017; Hollowell et al., 2011). Sixty-nine percent of the transfers were primigravid women. This rate sits between that found by the other two NZ studies which reported a transfer rate of primigravid women of 96.3% (Grigg, Tracy, Tracy, Schmied, & Monk, 2015) and 39% (Bailey, 2017). The latter study may be more relevant as the data are from the same region. However, it may be that the accuracy of manual calculation of data sourced through the national patient management database reveals a more accurate picture of intrapartum transfer. The source of transfer data is not reported by Bailey (2017). The accuracy assessment carried out in this study would suggest that if Healthware data were used they would provide inaccurate figures. Our study adds to the body of evidence demonstrating that when women give birth in a PMU they have less intervention than when they birth in a TMH. Despite these findings the majority of women continue to choose to birth in a TMH. The notion of informed choice is one of the guiding principles of the midwife-woman partnership in NZ (New Zealand College of Midwives, 2015). Informed choice means that through discussion, education and the sharing of evidence, a woman is able to decide what best serves her needs. To reduce (or at least stabilise) the continually rising rate of caesarean sections, this research suggests that the option of giving birth in a PMU needs to be actively discussed, disseminated and promoted to low-risk women and their support people.

A recent study which surveyed women's wishes around place of birth in Christchurch, NZ, found that perceived risk strongly influenced the woman's decision to birth in a TMH, while a combination of proximity, comfort and avoidance of intervention strongly influenced the woman's decision to birth in a PMU (Grigg et al., 2014). Further research is needed to explore the perception of safety and place of birth as barriers to women choosing a PMU. In addition to ensuring information is shared with women, there is a need to consider the role of the clinician in decision making. Davis and Homer (2016) recently explored why some midwives

use different birthing environments and found "that the culture of the birthplace rather than the physicality is the highest priority" (p.414). It has been suggested that TMHs are structured and function in ways that make childbearing women and midwives change their behaviour. This behaviour difference, termed submissiveness by Fahy and Parratt (2006), is theorised to weaken autonomy for both childbearing women and midwives. Previous NZ research has shown the influence of organisational context on practice (Davis & Walker, 2010; Miller & Skinner, 2012). This is an important issue to consider when looking to support midwives to work in PMUs. Midwives have concerns related to their own professional safety and support needs. The United Kingdom has incorporated changes in their intrapartum care guidelines (National Institute for Health and Clinical Excellence (NICE), 2014) advising health practitioners to offer birth at midwifery-led units to low-risk women. This formal requirement provides implied support for the practitioner to practise in PMUs; however, for midwives who have mostly practised in TMHs, moving to a PMU could be considered challenging. Women, and perhaps midwives, make their choices based on their personal perception of safety and therefore changing these perceptions may be difficult. More research is needed to identify what support structures are needed both for women to utilise, and midwives to facilitate birth in, PMUs.

It may not be advisable to extrapolate these findings to other regions. The freestanding PMUs in this study were relatively busy, with on site midwives present at all times and located within 45 minutes by road from the TMH. Some NZ PMUs are several hours from the hospital and not all have midwives present at all times. Most pregnant women in NZ are under the care of self-employed midwives who have continuous access to obstetric services, facilitating safe and timely consultation and transfer. This requires a strong midwifery infrastructure that may be lacking in other countries.

Strengths and limitations

This study was undertaken in an area of high deprivation, which is associated with poorer outcomes, yet the findings support PMUs as being safer than the TMH for this population. This study involved a rigorous accuracy assessment process which helped to identify and determine the most robust data fields for analysis. In addition, the comprehensive inclusion/exclusion criteria identified a sample of low-risk women. However, only risk factors requiring hospitalisation were captured by the diagnostic codes and therefore there may have been some higher risk women (being managed as outpatients) who were included, leading to potential sample bias. Apart from women's antenatal risk, women's risk status on admission in labour cannot be identified, and this absence of information constitutes another potential source of sample bias. Women with meconium liquor, Group B Strep, fetal heart rate abnormality on home assessment, maternal fever, or long latent phase needing analgesia have all been found to be reasons for a change of plan prior to admission in labour (Grigg, Tracy, Schmied, Monk, & Tracy, 2015). These women would all be admitted to the TMH and their higher risk status would not be identified by the exclusion criteria we used. Another limitation is that the size of the cohort was insufficient to detect rare and severe outcomes in either setting (as there were none). In addition, women's choice is paramount in our model of maternity care and this may have led to differences in philosophy, values and beliefs which also could have had an effect on where women chose to give birth. It is difficult to identify this construct or determine its effect.

CONCLUSIONS

This research found evidence for increased risk of adverse outcomes for low-risk births at an obstetric-led tertiary level maternity hospital (TMH) compared to freestanding primary level midwife-led maternity units (PMUs) in South Auckland, NZ. This research adds to the growing body of international research on freestanding PMUs, confirming them as physically safe places for well women to give birth when midwifery is properly integrated into the maternity system, allowing for the provision of continuity of care across sites and timely referral. The task now is to protect the unique relationship between the TMH and the PMUs of South Auckland and to promote similar models across the country and around the world. This can be achieved by healthcare policy makers and maternity care providers publicly acknowledging the benefits PMUs provide childbearing women and their families. Dissemination and advocacy of the findings from this research, along with similar national and international primary maternity unit birthplace literature, are highly recommended.

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NEW ZEALAND RESEARCH

Low-cost, self-paced, educational programmes increase birth satisfaction in first-time mothers

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ABSTRACT

Introduction: Birth satisfaction is an important aspect of giving birth. It is a subjective way to quantify how the experience went for new mothers.

Aim: This research aimed to assess whether either of two self-directed educational programmes could improve birth satisfaction in New Zealand first-time mothers.

Method: One hundred and eighty-two women were recruited and randomly assigned to a skills preparation group, a birth stories booklet group, or a treatment as usual (TAU) group.

Findings: One hundred and thirty-seven women completed the three questionnaires relevant for this report (a 75% retention rate). Birth satisfaction was measured soon after birth. It was found that women who received either of the birth preparation programmes (skills or birth stories booklet) had significantly higher birth satisfaction scores. A post-hoc analysis found that, irrespective of programme, having either an induction or a caesarean birth had a negative effect on birth satisfaction, while having birth expectations met had a positive impact on birth satisfaction.

Conclusions: Increased preparation for childbirth may be important for birth satisfaction; both induction and caesarean section reduce satisfaction; and expectations around birth might be managed to improve satisfaction. This study found evidence that simple low-cost programmes can improve birth satisfaction.

Keywords: childbirth, childbirth preparation, birth stories, labour, satisfaction

INTRODUCTION

Birth satisfaction is a subjective evaluation made by women who have given birth. It encompasses many aspects of their experiences. Women may be evaluating their own coping, the care received and a general reconstruction of the experience. This may be accurate or less accurate, but it does reflect their perceptions of their experiences at the time (Proctor, Hollins Martin, Larkin, & Martin, 2017). Women have hopes and expectations of what their birthing experiences will be like, and these expectations affect how they anticipate and approach the births of their children (Ayers & Pickering, 2005; Gibbins & Thomson, 2001). Satisfaction with birth has long-term influences on the future health of the woman and her family (Maimburg, Væth, & Dahlen, 2016).

Various phenomena have been found to contribute towards experiencing a sense of birth satisfaction. Howarth, Swain and Treharne (2011a, 2011b, 2013) reported the following themes as linked to positive birth satisfaction in mothers: taking personal responsibility (Howarth et al., 2011a); important relationships during pregnancy and birth (Howarth et al., 2011b); and the availability of a safety net (Howarth et al., 2013). Another group of women who all had positive birth experiences also endorsed a sense of safety, personal control and trusting relationships (Karlström, Nystedt, & Hildingsson, 2015). Similarly, Aune et al. (2015) concluded that the two most important things leading to increased birth satisfaction were a safe environment and emotional strength.

In a qualitative study using grounded theory methodology, Koehn (2008) reported that women were aware that childbirth is unpredictable and that childbirth education helped them to prepare and be ready. Preparing for childbirth is important. Another study of childbirth preparation randomly assigned 170 women to either a 10-session education course or treatment as usual. They found a dramatic lowering of interventions, including caesareans, among those who had been assigned educational sessions (Karimi, Kazemi, Masoumi, Shobeiri, & Roshanaei, 2016). Childbirth classes have been shown to reduce fear and increase the chance of normal vaginal birth (Najafi, Abouzari-Gazafroodi, Jafarzadeh-Kenarsari, Rahnama, & Gholami Chaboki, 2016). The resulting childbirth self-efficacy, the belief that women have all the skills needed to manage the childbirth process, has been found to enhance birth satisfaction (Berentson-Shaw, Scott, & Jose, 2009).

Women reported that childbirth experiences were better when there were fewer medical interventions; this included both home births and hospital births (Handelzalts, Zacks, & Levy, 2016). Risk factors identified by Waldenström, Hildingsson, Rubertsson and Rådestad (2004) for poor birth satisfaction included unexpected medical problems and interventions such as induction and emergency caesarean section. Inductions were also seen as a risk factor for decreased birth satisfaction by Martin and Fleming (2011) and Svärdb, Nordström and Sellström (2007).

Unexpected and emergency caesarean births may decrease childbirth satisfaction and may increase the risk of negative psychosocial

outcomes for women. One of the reasons found for these poor outcomes was that a caesarean violated birth expectations (Lobel & DeLuca, 2007). One study suggested that women who had a planned caesarean had greater childbirth satisfaction than those who planned a vaginal delivery but experienced an emergency caesarean (Blomquist, Quiroz, MacMillan, McCullough, & Handa, 2011). The explanation given for differences was that the lower satisfaction came from the fact these caesareans were unplanned. Consequently, Carquillat, Boulvain and Guittier (2016) caution that type of birth may not be the important factor and that a more nuanced view of the psychological and emotional factors needs to be considered.

Women may be dissatisfied with medical procedures for which they felt ill prepared. As well as dissatisfaction, some women may also experience post-traumatic stress disorder after a difficult childbirth experience (Ayers, Wright, & Wells, 2007; Soderquist, Wijma, & Wijma, 2002). In a large longitudinal cohort study involving 2,541 Swedish women, Waldenström et al. (2004) examined satisfaction with experiences of labour and birth. They reported that seven percent of women indicated that they had had a negative birth experience.

Unmet childbirth outcome expectations, especially if combined with a difficult postpartum recovery, also created potential risk factors for decreased birth satisfaction which may impact on the development of maternal identity (Nelson, 2003). Because she may be left confused as to why her birth experience went wrong, a new mother may feel she was at fault in some way, that she failed, and that she may continue to fail in her role as mother (Miller, 2007). However, when the outcome matches a woman's expectations of childbirth, her satisfaction with her birth experience is heightened (Goodman, Mackey, & Tavakoli 2004). At the time of our trial, most pregnant women can access free childbirth education courses, which are offered in the third trimester, are a minimum of 12 hours total duration, and cover access to maternity services, pregnancy care, labour and birth care, and care following birth (Dwyer, 2009). It was reported by Dwyer (2009) that 80 percent of New Zealand first-time pregnant women attended a childbirth education course and that they said the course prepared them for birth. More recently, the latest New Zealand Maternity Consumer Survey from 2014 states "Two-thirds of first-time mothers (64 percent) went to antenatal classes" (Ministry of Health, 2015, p.28).

This study aimed to test the hypothesis that birth satisfaction can be enhanced through the use of educational material supplied to the mother. In this case we used either a skills-based preparation package, or a birth stories booklet. Both these programmes are low-cost, self-paced, independent and not taught as a part of the standard antenatal education programme.

METHOD

Design

This study was a randomised controlled trial (RCT) that compared two educational programmes for childbirth preparation (The Pink Kit Method for Birthing Better®, or birth stories) with standard care for first-time New Zealand mothers.

The RCT examined the two programmes' effectiveness for a number of different outcomes, one of which was birth satisfaction. Other outcomes examined include birth self-efficacy (Howarth & Swain, 2019) and labour pain as well as midwife stress and fathers' birth experiences (Howarth, Scott, & Swain, 2017a, 2017b). This report is concerned with the impact of childbirth skills preparation, a birth stories booklet, and other factors thought to

impact on birth satisfaction for first-time mothers.

A number of variables were measured as part of the larger study. The following measures were considered as confounders of the effect of the two programmes on childbirth satisfaction: depression before birth as measured by the Edinburgh Postnatal Depression Score (EPDS), family life satisfaction before birth, childbirth self-efficacy, pregnancy anxiety, medical interventions, and expectations of labour and birth.

This project was reviewed and approved by the Lower South Regional Ethics Committee (Reference Number: LRS/10/11/052). It is registered as a clinical trial: ACTRN12616001545459.

Eligibility of participants

The study inclusion parameters were: first-time pregnant women, residing in New Zealand, aged 18 years or over and 42 years or less at the time of enrolment (these age limits were applied because younger and older women often have specialised healthcare and specific psychological and social needs that were beyond the scope of this research project), English speaking, living in a relationship with the father, and less than 24 weeks pregnant. Women who met these criteria were invited to participate. Being married or in a civil union was not a requirement, but living with the father was needed for analysis in a related study of fathers' experiences.

Recruitment

Women were recruited through advertisements, using both traditional (e.g., posters, flyers, magazine and newspaper advertisements - local and national) and online (dedicated website, Facebook postings and advertisements, posting details on relevant sites with permission from the owners) methods during May, 2011 to April, 2013. Posters and flyers were posted to midwifery practices, libraries, hospitals, and universities throughout New Zealand.

Procedure

Once recruited, women were asked to complete a baseline questionnaire and could choose either paper documentation or online documentation using Google Docs. Online documents were accessed by participants through the website (enrolment documents including information sheet, consent form and demographics) and through links emailed to participants at the appropriate times by the primary researcher (questionnaires). Paper documents were posted on request to participants (enrolment documents including information sheet, consent form and demographics). Other documents, including questionnaires, were posted to participants at the appropriate times. The women completed demographics information on enrolment in the study prior to 22 weeks' gestation.

After completing the baseline questionnaire at 24 weeks' gestation, participants were randomly assigned into one of three groups: the Skills Group; the Birth Stories Group; and the Treatment As Usual (TAU) Group. The randomisation process was conducted using online randomisation software, and undertaken by a colleague not involved in the study in any other way.

Participants in the Skills Group were issued with the anonymised version of The Pink Kit Method for Birthing Better®, and were to work through the programme between 24 and 36 weeks' gestation. Participants in the Birth Stories Group were issued with the birth stories booklet at 24 weeks' gestation and asked to read through it any time before birth. The TAU Group received no additional material.

A second questionnaire was completed at 36 weeks' gestation and a third as soon after birth as the woman felt able.

Skills Group

The programme was an anonymised version of The Pink Kit Method for Birthing Better®, a commercially available, self-paced, multi-media, skills-based, childbirth preparation programme available on the internet (Common Knowledge Trust, 2001). Permission was requested and granted by the developers of the programme to remove all identifying material. The information and structure of the programme were not altered.

The version of the programme used (2010) contained four books, two audio CDs and one video DVD. The four books had the following content: breath, language and touch skills; teamwork for managing skills; rationalisation for basic skills applicable for every birth; and extra skills for specific situations. The DVD demonstrated specific practical skills to manage the birth process and keep the birth canal relaxed and open. Examples of exercises included directed breathing, mapping the pelvis, teamwork, deep touch relaxation, cervical relaxation and hip lift. The two CDs focussed on how to prepare the birth passage and skills for each phase of a contraction.

The course contained around 40 hours of content. It was recommended that study commence at 24 weeks’ gestation, and it was suggested that 5-15 minutes learning about and practising these skills every day or two would provide women with the skills required. As the programme used a self-teach methodology, the women were responsible for their own time commitment and learning. Women indicated that on average they completed at least 50 percent of the programme.

Birth Stories Booklet Group

A 58-page birth stories book was compiled by the primary researcher (AH) to include examples of births that participants may experience. It included personal stories divided into chapters. The chapters were: home births, water births at home and hospital, natural births in hospital, hospital births with induction and/or pain management, premature and multiple births, pregnancy and birth complications, forceps and ventouse births in hospital, and unexpected caesarean births in hospital.

Birth stories were chosen as a programme because women in a previous study had indicated a desire to read more birth stories during their pregnancies (contact authors for a copy of the birth stories booklet).

Treatment As Usual Group

Participants in this group were asked to proceed as usual.

All groups

All groups were asked to continue with whatever activities they had previously planned and to participate in any education or preparation for birth that they wanted to. Post birth, all groups were asked if they had used the Pink Kit Method for Birthing Better®, as it is commercially available. Those participants who answered in the affirmative and who were not in the Skills Group were excluded from the analysis. Those issued the birth stories booklet were asked not to share it for the duration of the trial.

Measures

Birth satisfaction was measured using the Mackey Childbirth Satisfaction Rating Scale (Goodman et al., 2004) New Zealand Adaptation. The 34-item scale contains questions related to the behaviours of self, partner, baby, nurse (midwife) and physicians. A further six questions relate to expectations. Items 1 to 34 are scored on a five-point Likert scale (1 = *very dissatisfied*; 5 = *very satisfied*). The six items measuring expectations are scored on a four-point Likert scale. Scores can range from 38 to 186; the higher the score, the greater the birth satisfaction.

Differing systems (American/New Zealand) created issues when using Mackey Childbirth Satisfaction Rating Scale (Goodman et al., 2004). For example, many women do not require the services of a physician/obstetrician, so a sixth scoring column entitled N/A was added. Additionally, because the scale was developed for women giving birth in the American maternity system, consideration was also given to differing terminology; for example, the term “nurse” was altered to “midwife” (Figure 1). Permission was requested from, and given by, Mackey to use this scale and make these adaptations. Overall reliability was excellent ($\alpha=0.93$; Goodman et al., 2004). In the current study Cronbach’s alpha was $\alpha=0.90$.

For each of the following items listed below, indicate how satisfied or dissatisfied you are with that aspect of your childbirth experience. Tick one response for each item. If a statement is not relevant for you, please tick the N/A column.

	1	2	3	4	5	6
Your overall labour experience						
Your overall delivery experience						
Your level of participation in decision making during labour						
Your ability to manage your labour contractions						
Your partner's help and support during labour						
The amount of time your midwife spent with you during labour						
The amount of time the doctors spent with you during labour						
Your baby's physical condition at birth						
The amount of time which passed before you first held your baby						

1 - Very dissatisfied; 2 - Dissatisfied; 3 - Neither satisfied nor dissatisfied; 4 - Satisfied; 5 - Very satisfied; 6 - N/A

Figure 1. Examples of questions from the Mackey Childbirth Satisfaction Rating Scale (Goodman et al., 2004) New Zealand Adaptation

Data analysis

The trial examined the hypothesis that additional childbirth education would result in greater birth satisfaction for women. A one-way ANOVA examined for differences between the three groups using a per protocol sample of 137 women. A post-hoc analysis was then conducted on the full set of data combined. Two-step hierarchical multiple regression (sequential regression) was used to identify models of predictive variables for birth satisfaction. Model 1 corrected for the programme used in the trial.

FINDINGS

Of the 199 women assessed for eligibility, 182 women were enrolled. One hundred and thirty-seven women completed the three questionnaires (at 24 and 36 weeks’ gestation and post birth) relevant for this report, a 75% retention rate.

At the time of recruitment the mean age of the women was 29.2 years, with a range of 19 to 41 years. Table 1 demonstrates that there were no significant differences in age between groups ($F [2,134] = 0.022, p = 0.978$).

Table 1. Mean age and range of ages of participants by group (n=137)

Group	Women's age		
	Mean	Minimum	Maximum
Skills Group	29.2	19	41
Birth Stories Group	29.0	19	38
TAU Group	29.2	20	38

Women were predominantly well-educated career women of NZ European ethnicity who were working full-time at the time of recruitment. The majority of participants were married, owned their own homes, and earned in the higher income bracket. There were significant differences between groups for work status, with fewer women in the Skills Group working full-time. However, regression analysis indicated this did not impact on the outcome birth satisfaction (Table 2).

Table 2. Demographic information for women shown in percentages by group (n=137)

	Demographic	Skills	Birth Stories	TAU
Marital status	Married	60.5	70.8	58.8
	De facto ¹	39.5	29.2	41.2
Home ownership	Own home	60.5	54.3	62.7
	Does not own home	39.5	45.7	37.3
Tertiary education	None	18.4	18.8	10.0
	Tertiary cert./dipl.	13.2	25.0	26.0
	Bachelor's degree	39.5	27.1	38.0
	Post-grad cert./dipl.	13.2	12.5	16.0
	Master's or PhD degree	15.8	16.7	10.0
Work status	Working full-time	52.6	70.8	78.4*
	Working part-time	13.2	8.3	11.8
	Student	18.4	6.3	9.8
	At home	15.8	14.6	0.0
Family income	Up to \$25,000	5.3	0.0	3.9
	\$25,001-\$50,000	21.1	6.3	7.8
	Over \$50,001	71.1	89.6	86.3
	Don't know	2.6	4.2	2.0
Ethnicity ²	Māori	7.9	8.3	3.9
	NZ European	97.4	93.8	98.0
	Asian	2.6	2.1	2.0
	Pacific peoples	2.6	2.1	0.0
	MELAA ³	2.6	4.2	0.0

*p<.05

¹ Living together in a relationship but not married

² People may identify with more than one ethnicity

³ Middle Eastern/Latin American/African

A one-way ANOVA found that group differences in birth satisfaction were statistically significant (Table 3).

The Tukey Honest Significance post-hoc test was used to determine if the statistically significant ANOVA findings for birth satisfaction for mothers indicated higher scores for any particular group (Table 4).

Table 3. ANOVA results for birth satisfaction by group (n=137)

	n	Mean	Std. deviation	F value	Significance
Skills	38	159.35	20.685	6.457	.002**
Birth Stories	48	160.46	17.326		
TAU	51	146.53	24.616		

**p<.01

Table 4. Multiple comparisons of means for birth satisfaction (n=137)

Measure	Mean difference	Std. error	Significance
Birth satisfaction			
Skills-Stories	-1.106	4.604	.969
Skills-TAU	12.819	4.544	.015*
Stories-TAU	13.925	4.264	.004**

*p<0.05, **p<0.01

The Tukey post-hoc test revealed that there was no significant difference between the Skills Group and the Birth Stories Group for birth satisfaction for participants. However, women in both the Skills Group and the Birth Stories Group experienced significantly higher satisfaction with their birth experience than the women in the TAU Group.

An exploratory post-hoc analysis was conducted of birth satisfaction (Table 5). Two-step, hierarchical, multiple regression analysis was used. Step 1 accounted for the group assigned in the trial.

Table 5. Summary of hierarchical, multiple regression analysis for variables predicting birth satisfaction (n=137)

Predictor	B	Std. error	Beta	t	Sig.	Adjusted R ²
						.285
Depression (before birth) (EPDS)	-.246	.434	-.051	-.566	.573	
Family life satisfaction (before birth)	-.142	.147	-.091	-.969	.335	
Childbirth self-efficacy	.017	.042	.034	.407	.684	
Pregnancy anxiety	-.532	.368	-.119	-1.444	.151	
Medical intervention	8.177	4.380	.165	1.867	.064	
Induction of labour	-10.302	4.010	-.219	-2.569	.011*	
Caesarean birth	-13.232	3.994	-.276	-3.313	.001**	
Labour expectations met	4.173	4.073	.088	1.025	.307	
Birth expectations met	8.808	4.212	.184	2.091	.039*	

Significance *p<0.05, **p=0.001. Controlled for group allocation.

Introducing the covariates, induction and caesarean, was associated with lower birth satisfaction and birth expectations (positive expectation met was associated with higher birth satisfaction), increased our understanding of what contributes towards higher birth satisfaction by a moderate statistically significant amount. Medical intervention experienced had a modest negative effect approaching statistical significance.

DISCUSSION

This study aimed to identify whether birth satisfaction can be enhanced through the use of educational material supplied to the woman. We found that the provision of either one of two childbirth preparation programmes (a skills-based, multimedia, childbirth preparation course or a compilation of birth stories) increased birth satisfaction. This finding may relate to an improved understanding of how the woman can manage her labour and birth. It may also relate to improved coping skills which may enhance the possibility for women having their first baby to increase birth satisfaction. It could be that either programme helped women form more realistic expectations of labour and birth. Additionally, using a post-hoc test of birth factors, while controlling for group, found the greatest influences on childbirth satisfaction were inductions, caesareans and childbirth expectations.

The mechanism by which a skills programme or reading birth stories increases birth satisfaction remains unknown. We speculate an increase in childbirth skills may have had a direct effect on childbirth satisfaction, while perhaps the birth stories booklet provided role models for the first-time mother. In another study it was found that reading these birth stories had not resulted in an increase in childbirth self-efficacy for mothers (Howarth & Swain, 2019); it may be that women had absorbed information that related to expectations. Previous research suggests expectations are one of the important pathways to childbirth satisfaction (Goodman et al., 2004). In New Zealand most first-time pregnant women attend antenatal classes (Dwyer, 2009). Although these classes are both important and helpful, it would appear that more can be done to prepare women for a satisfying childbirth experience. Increasing this satisfaction can have long-term health and wellbeing benefits, for both a woman and her family (Maimburg et al., 2016).

Despite the fact that medical interventions may save lives, unexpected medical procedures can be challenging experiences for women and can result in them perceiving their birthing experiences more negatively (Martin & Fleming, 2011; Svärdbby et al., 2007; Waldenström et al., 2004). Post-hoc analysis suggested that inductions and caesareans decreased birth satisfaction for participants, which is supported by other studies (Lobel & DeLuca, 2007; Martin & Fleming, 2011; Svärdbby et al., 2007; Waldenström et al., 2004). This may be important information for women and for providers to consider when making decisions about interventions. Goodman et al. (2004) found that when the experience of childbirth is better than expected, birth satisfaction is enhanced. This suggests that it may not be the caesarean or intervention per se that causes lower satisfaction but other factors associated with the caesarean (Carquillat et al., 2016).

LIMITATIONS AND STRENGTHS

The demographics of the women taking part in this project were not nationally representative. It happened that participants were principally recruited from well-educated, professional people who were NZ European, employed and in the higher income bracket. Few first-time mothers from the lower socio-economic sectors of New Zealand society engaged with the study. Because of this, generalisability of results to the whole New Zealand population of first-time mothers cannot be assured.

The strengths of the study include randomisation of the participants. By randomly assigning participants to one of three groups, the trial minimised allocation bias in treatment assignment by keeping other unknown variables constant. Testing confirmed that groups were similar in terms of demographic characteristics.

Baseline testing also reinforced that randomisation had been successful. This added to the confidence that differences between experimental groups at outcome would reflect the impact of the programme.

CONCLUSION

Birth satisfaction is an important evaluation for women. Both skills-based childbirth preparation and a birth stories package appear to have had a positive effect on birth satisfaction. This is in the context where pregnant women can also access formal childbirth education. Teaching women skills for, in conjunction with giving them information about, labour and birth would appear to have the potential to significantly enhance a woman's childbirth satisfaction. As well, given the simplicity of providing a book of birth stories, this could be a viable option for increasing birth satisfaction for women. The impact of expectations could be seen in this research and this is perhaps the moderator for birth preparations to increase birth satisfaction. Regardless of the nature and degree of preparation, some birth interventions, such as caesarean section and induction of labour, may have a negative effect on birth satisfaction. This study provides evidence that simple low-cost programmes can improve first-time pregnant women's birth satisfaction. These findings should be replicated with further research using examples of self-paced education to establish whether the two programmes in the present research were contributing, or a variety of educational approaches are helpful. The implication for practice is that midwives could provide or recommend at home self-guided birth preparation material, such as birth stories, to increase first-time mothers' birth satisfaction.

Key messages

- A first-time mother and her family benefit if she feels positive and satisfied about her birth experience.
- Researchers tested if two specific birth preparation programmes would help improve a woman's birth satisfaction. Both were self-paced and low cost.
- Women who used either programme were more positive before the birth and more satisfied with their birth experience afterwards.

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TE KĀRETI O NGA KAIWHAKAHANAU KI AOTEAROA

NEW ZEALAND RESEARCH

Rethinking engagement: Exploring women's technology use during the perinatal period through a Kaupapa Māori consistent approach

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ABSTRACT

Background: Barriers to accessing perinatal health services in New Zealand remain a significant problem, especially for Māori and rural populations. Information technologies and telehealth can facilitate the distribution of health-related information and promote provider engagement during the perinatal period.

Aim: This study explored the perceptions and use of technologies by women and their partners who were pregnant or new mothers/caregivers and who utilised Kaupapa Māori perinatal health services.

Method: A Kaupapa Māori consistent methodology was applied. An equal explanatory sampling approach was used for recruitment. Conversational interviews were conducted with a total of nine Northland-residing participants of an antenatal programme. Data were analysed thematically.

Findings: Four overarching themes emerged from the interview narratives: communication, information, facilitators and barriers. Participants used a range of online tools to access diverse health-related topics and executed autonomous control over the information gained. The credibility and reputability of sources as well as knowledge sharing were valued. Similar technologies were used to communicate with perinatal healthcare providers, including lead maternity carers, and to make in-person appointments. Barriers were related to the technology itself or the experience of using it, whilst ease of access and emotional elements facilitated engagement. Participants were generally satisfied with the technologies.

Conclusion: Technology can play an important role in health literacy and minimising barriers to perinatal healthcare, by facilitating the distribution of information and promoting provider engagement. As the research indicated that online tools and services available in Northland are generally adequate for the population served, perinatal healthcare providers should leverage these to further promote engagement with service users. It is crucial that Māori health values such as whānau (extended family structures) and kanohi ki te kanohi (face-to-face interactions) are incorporated for successful perinatal healthcare delivery via telehealth.

Keywords: Māori, perinatal, telehealth, pregnancy, women, Kaupapa Māori

INTRODUCTION

The growth of internet connectivity and mobile phone use in New Zealand has led to an increase in social media and mobile application (app) use. A recent report identified that the smartphone is the nation's most popular device, with an increase of ownership from 48% in 2013 to 70% in 2015 (Research New Zealand, 2015). Additionally, 91% of smartphone owners reported using their mobile device daily and half report using it more than they did the year before, most of whom (86%) use it to connect to the internet. Furthermore, 87% of those aged 18-34 years, 75% of those aged 34-54 years and 58% of those aged 55 years or older use social media apps (Research New Zealand, 2015). These rates are predicted to continue to rise with increasing access to the internet. For example, an additional 134,115 people who identified as Māori gained access to the internet between 2006 and 2013 (Statistics New Zealand, 2013). However, the ability to

access information online is accompanied by a greater likelihood of being exposed to misleading information. For health-related advice, such as during the perinatal period, this can be harmful for both woman and baby.

Within healthcare, the use of information and communication technologies for education, research, administration and treatment purposes is known as "telehealth" (Wootton & Bonnardot, 2015). Telehealth encompasses a range of digital information technologies, including social media, video-conferencing, blogging and the use of mobile phones and other devices. Benefits of technology use in perinatal healthcare could include convenience, minimised geographical barriers, improved health literacy, cost-effectiveness for providers and service users and increased confidence through emotional and practical support, and timely aid (Entsieh, Emmelin, & Pettersson, 2015; Friesen, Hormuth, Petersen, & Babbitt, 2015; Hod & Kerner, 2003; Jareethum et al.,

2008; Lindberg, Axelsson, & Öhring, 2009; Lund et al., 2014). Technology use can provide opportunities for increased access to perinatal healthcare.

Access to quality healthcare during the perinatal period is important and can affect both the mother's and the baby's health outcomes (World Health Organization, 2017). The perinatal period starts at 154 days of gestation and continues until seven days after birth; so related healthcare is provided throughout pregnancy, birth and postpartum (World Health Organization, 2017). Although this care is publicly funded nationally and therefore at no cost to the consumer at the point of care, many Māori women experience other access barriers. For example, Corbett, Chelimo and Okesene-Gafa (2014) identified that the odds of late booking for antenatal care are six times more likely amongst Māori women compared to New Zealand European and other ethnic groups. Makowharemahihi et al. (2014) reported that the young Māori women who participated in their research found that a lack of adequate information on navigating perinatal pathways to discover their choices for primary care providers and nominating a lead maternity carer (LMC) delayed their access to antenatal care. Such barriers can result in unequal health outcomes between those who can easily navigate the pathways and those who struggle to.

Health inequities are also exacerbated by Eurocentric health systems that often fail to incorporate Māori values, practices and concepts of health (Reid & Robson, 2007). Valued concepts of health for many Māori include whānau (extended family structures) and holistic and traditional practices such as herbal remedies and massage (Cram, Smith, & Johnstone, 2003; Jones, 2000). The collectivist whānau ora (healthy families) approach includes immediate family, extended family structures and the wider community, whose interconnectedness facilitates wellbeing longevity through future generations and also provides reciprocal support and access to resources (Cram et al., 2003; Durie, 2006; Jones, 2000). Wellbeing is understood to exceed physical health and incorporates a harmonious unity of physical, spiritual and mental health (Cram et al., 2003; Durie, 2006; Jones, 2000). Including these concepts of health in perinatal healthcare practice is important in reducing inequitable health outcomes for Māori.

Inequities are also evident, with Māori being over-represented in the group that suffers stillbirth, neonatal and maternal mortalities, and with Māori women being almost three times as likely as non-Māori to die from suicide (Perinatal and Maternal Mortality Review Committee, 2017). Likewise, more Māori women, when compared with non-Māori women, report barriers to breastfeeding, including a lack of professional support, culturally irrelevant information, feeling pressured by health providers, conflicting advice, and cultural insensitivity (Glover, Manaena-Biddle, & Waldon, 2007; Glover, Waldon, Manaena-Biddle, Holdaway, & Cunningham, 2009). Respect for the woman's culture, values, beliefs and background was also found to influence her choice of LMC (Ministry of Health, 2015). These disparities and experiences demonstrate the need for partnership with Māori communities and advocacy of Māori-led research within health contexts to identify interventions that address barriers to perinatal care and promote the longevity of tāngata whenua. One such area is the use of technologies, to deliver appropriate health-related information and to facilitate provider engagement during the perinatal period.

The aim of our study was therefore to explore the perceptions and use of technologies by women who were pregnant or new mothers/caregivers, and their partners, who utilised Kaupapa Māori perinatal health services (services based on Māori philosophies, values and practices of pregnancy and birthing).

METHODS

The study applied a qualitative Kaupapa Māori consistent and interpretive approach. The University of Auckland Human Participants Ethics Committee approved the study in 2017 (Reference 019135), which included the participating district health board's (DHB's) locality approval (Reference 2017-11).

Kaupapa Māori consistent research

Kaupapa Māori research (KMR) provides a critical analysis of power relationships, centralises Māori paradigms and aims to improve the wellbeing of Māori through collaborative research with Māori communities (Malpas et al., 2017; Mane, 2009; Pipi et al., 2004). A Kaupapa Māori consistent methodology was employed, as two of the three researchers were non-Māori (Malpas et al., 2017). Although this research approach aligns with the principles of pure KMR by centralising Māori paradigms, language and values, negotiations must be undertaken to ensure that ownership and benefits are maintained for Māori (Malpas et al., 2017; Smith, 1992). Consultation was undertaken with Māori researchers and the DHB to collaboratively design the research. The project was also reviewed and supported by the Tōmaiora Māori research unit at The University of Auckland, and followed their policies for culturally safe research practices (Tōmaiora, 2015).

Data collection

Conversational interviews were conducted with a total of nine participants in a small, rural Northland town. These were undertaken in groups of two or three participants. Conversational interviews in pairs and a triad allowed for the interviews to resemble an informal kōrero (conversation) that reduced ambiguity and increased opportunities for clarification (Eggleton, Kearns, & Neuwelt, 2017). The inclusion criteria for participants were: (1) being pregnant, identifying as new mothers/caregivers, or their partners, (2) residing in Northland and (3) engaging with Kaupapa Māori perinatal services. An equal explanatory sampling model was applied, meaning that at least half of the participants self-identified as Māori (Te Rōpū Rangahau Hauora a Eru Pōmare, 2015). This aligns with KMR by ensuring that the research captures Māori perspectives, voices and experiences, targets inequities experienced by Māori and is as effective at promoting health outcomes for Māori as it is for non-Māori (Te Rōpū Rangahau Hauora a Eru Pōmare, 2015).

Interviews were conducted during a two-day Kaupapa Māori antenatal programme that was free to attend. Transport was also organised from the wider area. The programme offered a holistic alternative to western biomedical practices by teaching attendees how to incorporate Māori philosophies and practices relating to perinatal health throughout this period. Sessions focused on pregnancy, birth, labour, breastfeeding and car-seat safety, but also included dental health, nutrition and maternal wellbeing.

A kaimahi (Māori health worker) who had established relationships within the community helped to organise the interviews by liaising between the researcher and the attendees and assisted with maintaining Māori authority and guidance of the research (Pipi et al., 2004). The kaimahi outlined the project, introduced the researcher, invited participants to be interviewed and ensured there was a private and quiet room in which to conduct the interviews. Interested participants approached the researcher who set up a time for the interview. Information sheets were provided to all participants and signed consent forms were gathered before the interviews commenced. The interviews were semi-structured, audio-recorded and lasted around 30 minutes. Interactions with

participants respected manaakitanga (hospitality/respect) through koha (gifts/acknowledgements), food and prayer (Jones, Crengle, & McCreanor, 2006; Mead, 2003). To protect the confidentiality and anonymity of the participants, the name and location of the antenatal programme have been removed from this report and all participants were assigned pseudonyms.

The interview questions were written on paper and given to participants to ask one another (Table 1). This practice helped shift the power dynamic from the researcher to the participants, thus shifting control to the community, as consistent with KMR practices (Mead, 2003).

Table 1. Interview questions

Question 1	What technologies did/do you use to educate yourself on your or your baby's health?
Question 2	What technologies do you use to communicate with health providers?
Question 3	What did you like/not like about the technologies and how would you improve them?

Data analysis

The audio-recorded data were transcribed verbatim. The transcriptions were transferred to a coding sheet in Excel (14.7.1), where sentences were clustered to form codes and codes were clustered to form themes (Braun & Clarke, 2006). An inductive thematic analysis was conducted by the authors (Māori and non-Māori researchers) to maintain the participant's mana (authority) and minimise the possibility of misinterpretation. This was achieved through continuous re-reading of the codes to identify, summarise and organise recurring themes, and for links between the research objectives and themes to be made (Braun & Clarke, 2006; Thomas, 2006).

FINDINGS

There were nine participants in this study (Table 2), seven women and two men. The age range of the participants was 18 to 46 years. The gestation time for the pregnant women ranged from 29 to 35 weeks.

Table 2. Participant demographics

Pseudonym	Ethnicity*	Age	Age of baby/weeks pregnant
Hana	NZ European	23	35 weeks pregnant
Aroha	Māori	21	29 weeks pregnant
Larissa	ns**	23	33 weeks pregnant
Nico	Argentinian	28	Larissa's partner
Kamaia	Māori	18	16 month old baby
Arehana	Māori	18	33 weeks pregnant
Miranda	NZ European	29	32 weeks pregnant
Thomas	NZ European	29	Miranda's partner
Atarangi	Māori	46	Pregnant with 4th child, weeks ns

* ethnicity was self-identified, ** not specified

Four overarching themes emerged: information, communication, barriers, and facilitators, which are explained with their associated sub-themes. As there were no obvious differences between Māori and non-Māori narratives, all data were aggregated. Participants used technologies to access health-related information and to communicate with their healthcare providers during the perinatal period. Various barriers and facilitators influenced their ability to access this information or to communicate.

Information

Range of tools and rangatiratanga (self-governance)

A range of online tools and services was used to gain health-related information and these enabled autonomous decision-making by participants. Women texted or called their LMC and used smartphones and computers to access information through Google searches and webpages. Participants were members of private and public mothering groups on Facebook, used pregnancy mobile apps, called the Ministry of Health (2017) helpline "Healthline" and watched a Vlogger (video blogger). These resources and services supplemented books, breastfeeding workshops, routine antenatal care appointments and advice from family and friends. Participants used tools simultaneously to compare information or conduct "research", which exemplified rangatiratanga in autonomous decision-making. Hana and Aroha demonstrate using a range of tools.

Hana: Doctor Google.

Aroha: Yeah, Google and actually some mum pages on Facebook.

Hana: My one is the Ministry of Health, New Zealand website... Or my main one is that I'll ring Healthline, cos then they have the nurse and they run you through the symptoms.

Aroha: I've got a pregnancy app!

Hana: Yeah, I've got the same pregnancy app.

Diversity of information

Participants accessed a range of health-related information, including subjects such as physical health, mental wellbeing, nutrition and parenting. Participants appreciated the weekly updates on their pregnancy journey apps and on some websites, regarding changes occurring during the pregnancy, such as their baby's growth. Atarangi used the weekly updates to "remind" herself of what developmental stages she and her baby were experiencing:

... and also about every week, what week stage you're at - just to remind me... it just has a week-by-week pregnancy update for what stage you're at, what stage your baby's at...

Credibility and reputability

Most participants were able to discern credible and reputable tools and acknowledged that incorrect information is often shared online. Participants defined credibility as the trustworthiness of the information, whereas reputability referred to the extent to which the source was recognised as an esteemed health-related organisation.

The Ministry of Health and its services were regarded as reputable and were believed to distribute credible information. Credibility was questioned when there was a lack of references provided, when information was out-dated or irrelevant to the New Zealand healthcare system, and in advice shared among Facebook group members. Aroha and Hana exemplified this by recalling that some women sought diagnoses on Facebook, rather than seeing a doctor.

Hana: There's always a lot of mums that are like, 'here's a picture of this rash... what is it?' And there's like 20 people that are like 'yeah, it's measles'.

Aroha: Like asking other mums, as if they're doctors!

Hana: It's like - 'just go to the doctor!'

Knowledge sharing

Participants valued sharing advice and experience-based information with their families, partners or wider virtual communities, such as Facebook groups. The tuakana-teina relationship (older expert teaching the younger and less knowledgeable) was evident in Kamaia and Arehana. Both young women asked their older sister, their tuakana, who already had a baby of her own, for pregnancy advice. The information that was shared among other families, couples and wider networks related to abnormalities, pregnancy complications, skills, such as measuring the baby during pregnancy, and experiences with treatments. However, half of the participants were ambivalent toward receiving medical advice from complete strangers. Aroha and Hana stressed the difference between seeking medical diagnoses and seeking experience-related advice online:

Hana: ...say things like your kid's got eczema and you know, this cream you've got isn't working, like 'What do you guys use?' And then people can be like, 'Oh, I had this great experience with this and this was terrible and like that kind of thing is really good.' But when it comes down to an actual medical diagnosis or something that people are actually relying on Facebook to diagnose, actual medical conditions and it's, like, 'noooo!'

Aroha: That's the difference, aye!

Communication

Seven participants reported using mainstream modes of communication to make in-person appointments or request advice from their LMC, namely through calling or texting on mobile and landline phones. One couple did not use any technologies, as appointments were pre-booked. Only Aroha reported using a patient portal for convenience, as her health provider was a 20-minute drive from where she resided. A patient portal is a type of personal health record managed by the patient (Tang, Ash, Bates, Overhage, & Sands, 2006). These often allow patients to view aspects of their medical records, book appointments, access health information, message their provider and request repeat prescriptions.

Kanohi ki te kanohi (face-to-face)

All participants valued the routine kanohi ki te kanohi communication with their LMCs, due to feeling connected and comfortable. Communicating in person was reported to be more familiar and easier than learning to use a new technology. Participants preferred in-person contact due to the natural flow of energy, which created a real, physical, nurturing and comfortable interaction.

Larissa: I wouldn't like to have a[n] antenatal or midwife's appointment over the phone or online... the energy just doesn't flow as naturally... I guess when you're kind of in a room with someone you can kind of pick up on people's energies and.... You feel more comfortable as well when you're with someone in person and it is more of a nurturing environment.

Nico: When you get to the room, you give them a hug first and then you start talking...

Larissa: Yeah, more personable interaction I guess, that's what I like a lot better than that.

Barriers

Barriers were related to the technologies or the experience of using them. Participants reported technology-related barriers such as

complexity, lagging (slow responses by the device) and a need for up-to-date devices and data. Hana emphasised the complexity of setting up a patient portal system.

I've just found it's a real pain in the ass to set it up, so I never really followed through with it! They gave me this huge pamphlet, you know, and I just can't be bothered with it!

Obstacles pertinent to the experience of engaging with tools were related to whakamā (being shy/embarrassed) and privacy concerns. Aroha and Hana reported that whakamā was aggravated when talking on the phone as they primarily communicated by text messaging.

Aroha: I get nervous talking to anybody on the phone! ... Making appointments for anything, it's not my thing. I don't like doing it.

Hana: It makes us sound like the most pathetic people... but actually, like everything you do now is just typing on your phone.

Nico and Larissa emphasised privacy concerns whereby they encountered personalised advertising on Google and Facebook that was based on previous searches done on the device. This was particularly alarming to Larissa who had not released pregnancy-related information on Facebook but found expectant “mothers-to-be” advertisements appearing on her Facebook when she used it:

I'll tell you something that sort of freaked me out... I am on Facebook but I'm not the type of person to announce on Facebook that I'm having a baby... so the Facebook world technically doesn't know that I'm having a baby, but um on my timeline it always comes up with ads promoting mother things, like expectant-mothers-to-be, and this never happened before. But it is now because I'm researching this stuff on my phone.

Improvements

Some recommendations from participants were made for what they perceived to be improvements for the technologies they used. Aroha and Hana suggested that being able to text LMCs, rather than only talking on the telephone, would improve accessibility as women may feel less whakamā. Kamaia reported being dependent on internet data to access perinatal health-related information online, thus suggested access to “more data”. Lastly, Larissa suggested more use of visual content in video blogs (Vlogs):

I think people are more attracted to visual things and stuff, than just seeing someone sit there and talking, which can be boring.

Facilitators

Access

Regarding the various technologies, participants liked the convenience, cost-effectiveness, ease-of-use, and the ability to obtain information instantly. Technologies, such as texting that allowed for quick access to LMCs, assisted communication and engagement with health services. Personal convenience and physical access were emphasised, as the ability to seek information online traversed geographical barriers and overcame the need to travel or wait for clinic opening hours. Participants also acknowledged that technologies allowed midwives to communicate when it was most convenient for them, as they often have busy schedules. Aroha reinforced how these aspects influence accessing health care:

I understand that a lot of mums probably don't have cars, don't travel, don't drive, which would make it harder, you

know, if you've got more than one child, but that's where social media comes in.

Emotional

Emotional facilitators were explained through the promotion of hinengaro (mental wellbeing) and whakamana (confidence). This was evident by relief and confidence replacing worry, as the ability to quickly talk to a provider through technologies was reassuring. Participants called Healthline or texted their midwife about their concerns, especially during their first pregnancy as they knew they could gain an “end result” quickly. Reassurance was reported regardless of whether the situation was an emergency, and participants were generally informed that everything was fine, as Miranda explained:

Having my first baby, some of the pains or discomforts I'm feeling and I don't know if they're normal or abnormal, whether to worry about them or not, so I text questions through. Usually it's just a text back saying it's normal.

DISCUSSION

Technology use during the perinatal period by Kaupapa Māori health service users was explored in the context of Māori values and philosophies. The study identified a range of online tools and services that were being used to gain health-related information during the perinatal period. It also identified which technologies were being used to communicate with midwife LMCs and to book appointments. The tools and services were synergised with existing care and the knowledge of each user's midwife LMC, so were valued by participants.

As women increasingly gain internet access and use mobile devices, it is useful for midwives to be aware of the range of tools and services being used, and how they may be used to complement the care and information they provide. LMC midwives may be one of the few professional groups who use text messaging for contact and support, due to the demographic needs of their clients.

A Māori-centred approach was important in this study to identify barriers to healthcare and ensure that services are responsive to Māori (Reid et al., 2017). This was evident in the sub-themes of kanohi ki te kanohi and knowledge sharing amongst whānau, which are influential determinants of health for indigenous populations (Cram et al., 2003; Durie, 2006). Indigenous health scholars reinforce the importance of friendly interactions and the inclusion of cultural values such as kanohi ki te kanohi in promoting rapport and creating meaningful relationships and safe spaces for communication (Cram et al., 2003; Mead, 2003; van Herk, Smith, & Tedford Gold, 2012). Participants highly valued the different connection they felt meeting with their LMC in person and reflected this by speaking about being able to “hug” their provider and the “natural flow of energy” that they felt when communicating personally. Encounters as such have been described as “high tech, high touch” or achieving the balance between humanness and technology (Ho, 2010). Finding a balance when employing technologies is important, to ensure that some processes in healthcare delivery are simplified whilst the relevance of in-person providers is not lost (Ho, 2010). Maternity care requires regular assessment of both maternal and neonatal health so will always require physical assessment through face-to-face appointments. This study has identified that information technologies can be used to supplement, but should not be used to replace, face-to-face appointments.

Conversely, appointments limited to a physical space may invite barriers as some healthcare professionals struggle to create respectful environments (Eggleton et al., 2017), although participants reported that their midwife was able to establish nurturing

environments. Previous research shows that successful engagement with health professionals is jeopardised by poor communication, conflicting advice and provider behaviour that is insensitive to cultural differences (Glover et al., 2007; Makowharemahihi et al., 2014). This can result in women distrusting health professionals and create barriers to engagement with healthcare professionals and the support and care they provide (Glover et al., 2007).

Identifying issues such as lagging and complexity as barriers to using technologies was consistent with previous research by Rojjanasrirat, Nelson and Wambach (2012) and Seguranyes et al. (2014). However, other findings were novel. The concept of whakamā, is rarely applied to telehealth. Younger participants described feeling anxious about talking on the phone and felt more confident texting or messaging their midwife LMC. Eggleton et al. (2017) also identified aversion to talking on the phone as a barrier to accessing healthcare and discussed how visual methodologies may offer less chance of misunderstanding compared to oral communication. This finding provides insight into the popularity of text use amongst younger generations and the changing culture of telephone use.

Challenges are also associated with texting for midwives, including delayed transmission of messages due to loss of connection, security breaches and exposure to private medical information by someone unauthorised who reads the messages, misinterpretation and less depth of the information being relayed, compared to phone calls (Midwifery Council of New Zealand [MCNZ], 2016). The Midwifery Council offers guidance on safely incorporating text messaging services into standard care, suggesting that women call in emergencies, that midwives communicate in normal English, rather than “text-speak” to avoid miscommunication, ensure that mobile devices are password-protected and do not perform clinical assessments via text (MCNZ, 2016). Regardless, the Midwifery Council emphasises that midwives should not avoid text messaging, as many households do not use landlines and it is easier to connect with women in hard-to-reach communities and can improve relationships and care through the ability to send supportive texts and promptly communicate reassuring test results. Consequently, despite some challenges for the midwifery profession, texting may increase women's confidence in navigating the health system due to greater opportunities to exchange questions and answers, clarify understanding, and receive reassurance.

Unexpectedly, participants did not comment on the affordability of technologies. This may suggest that participants were already connected to the internet or were a relatively privileged cohort. Given that Northland is a fairly deprived area and Māori, as with many other indigenous peoples, experience greater levels of deprivation than their non-indigenous counterparts, affordability could be considered for future interventions and research (National Health Committee, 2010).

Facilitators for telehealth use during the perinatal period, such as convenience, cost, ease-of-use, instant information, reassurance and confidence were also consistent with previous studies (Entsieh et al., 2015; Friesen et al., 2015; Gund et al., 2013; Hod & Kerner, 2003; Jareethum et al., 2008; Lindberg et al., 2009). Our study revealed that technology might benefit providers too, as participants assumed that communicating through technologies was more convenient for their midwife. Prolonged interactions can be explained through an asynchronous communication model, whereby information exchange is not actively simultaneous, such as email rather than talking on the phone (Venes, Fenton, & Patwell, 2017). This form of communication is becoming more popular within the health sector, due to an increased use of telehealth, patient demand and preference, a changing health market and

easily facilitated consultations (Wilson, 2003). Advantages of asynchronous communication in health systems tend to focus on user benefit, thus it was interesting that participants also considered their midwife's convenience. This finding suggests that users may be aware of their provider's workload, therefore addressing the fear of many providers regarding increased workload due to more easily accessible communication (Bardsley, Steventon, & Doll, 2013; Taylor, Coates, Wessels, Mountain, & Hawley, 2015). This reinforces the need both for perinatal health providers to up-skill and embrace information technologies and for the inclusion of both providers and service users in future research on telehealth use.

Participants had selected their own electronic information resources and appeared to be satisfied with the quality of their selection. Most were able to discern credible and reputable tools but acknowledged that incorrect information is often shared online, especially in Facebook groups. This raises the question of midwife LMCs being able to support their clients' selection and use of these technologies. Technologies emerge, change and disappear rapidly, making it challenging to keep up to date with relevant apps, websites, Vlogs and other services. It is possible for midwife LMCs to assist their clients in selecting resources by using the Mobile App Rating Scale created by Stoyanov et al. (2015) or inviting staff at healthnavigator.org.nz to rate selected apps, or to check that websites are approved by Health on the Net Foundation (2018). While it is useful for midwife LMCs to prescribe apps and websites, it is not necessary to do so. Knowing how to identify apps and websites selected by their clients as trustworthy and of high quality may be more useful than prescribing.

STRENGTHS AND LIMITATIONS

This study provided Māori and non-Māori perspectives to telehealth, illustrating that health services should be responsive to Māori. It helped to inform the participating DHB on a group of their service users' engagement with telehealth and can be used to improve perinatal services and contribute towards interventions to reduce inequities in maternal and infant mortality.

As an exploratory study with a small sample size of nine participants that was limited to Northland, findings are neither entirely transferable nor generalisable. Despite this, the study centralised Māori values and was conducted collaboratively so that it is meaningful to Māori (Smith, 1992). This study may encourage more non-Māori researchers to apply Kaupapa Māori consistent research in partnership with Māori.

CONCLUSION

The study has demonstrated that information technologies play an important role in minimising barriers to perinatal healthcare by facilitating the distribution of health-related information and promoting provider engagement. It also identified barriers and facilitators that prevented or enabled engagement with these technologies and, ultimately, access to information and effective communication. The findings suggest that the available online tools and services are generally adequate, from the standpoint of our sample, and that Māori health values such as whānau and kanohi ki te kanohi are important for successful perinatal healthcare delivery via telehealth. More research is needed to explore how widely technologies influence pregnant women and their health care.

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Key messages

- There are often barriers for Māori and rural populations to accessing care during or following pregnancy. Technology can help reduce these barriers by making health information more accessible.
- Researchers explored the use of technology with nine participants using Kaupapa Māori methodology.
- Health technology is effective and responsive to Māori; however, values such as whānau (extended family structures) and kanohi ki te kanohi (face-to-face interactions) need to be incorporated and respected.

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NEW ZEALAND RESEARCH

Midwives' perspectives of maternal mental health assessment and screening for risk during pregnancy

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ABSTRACT

Background: Increased maternal mental health needs are associated with an increased risk of maternal morbidity and mortality and occur more frequently during pregnancy than during the postnatal period. The implications of this antenatally for the mother, baby and family is increasingly becoming recognised and recommendations are being made for routine antenatal screening.

Aim: This qualitative descriptive research study explored midwives' perceptions of maternal mental health antenatally, including screening.

Method: Twenty-seven Lead Maternity Carer (LMC) midwives participated in five focus group interviews. These were analysed using thematic analysis to identify the key ways in which midwives perceived and assessed maternal mental health during the antenatal period.

Findings: The study identified that these midwives routinely assessed women's mental health during antenatal care in informal and not necessarily explicit ways. Caring for women who were highly anxious was not an infrequent experience and led to the midwives feeling responsible for the woman's mental health needs without a safety-net. Midwives were concerned about the introduction of routine universal antenatal screening without the availability of appropriate maternal mental health services for women who had identified as having mild to moderate mental health issues, such as anxiety.

Conclusion: The mental health services that the midwives needed to refer pregnant women experiencing mental health issues to, particularly those women with mild to moderate issues, are lacking. We suggest that the introduction of routine antenatal mental health screening would need to be well supported with accessible and appropriate mental health services to meet the needs of all women, not just those experiencing serious mental ill health.

Keywords: maternal mental health, antenatal assessment and screening, antenatal anxiety and depression, midwives' perspectives

INTRODUCTION

A degree of anxiety and stress is often considered normal in the perinatal period but for some women anxiety can become a serious problem and affect their health and wellbeing (Stadtlander, 2017). Anxiety and depression during pregnancy often coexist (O'Hara, Wisner, & Asher, 2014; Schmeid et al., 2013) and are associated with postnatal depression (Koutra et al., 2014; Obgo et al., 2018). Antenatal stress, anxiety and depression represent key risk factors in the aetiology of preterm birth (Eastwood, Obgo, Hendry, Noble, & Page, 2017; Rose, Pana, & Premji, 2016; Staneva, Bogossian, Pritchard, & Wittkowski, 2015). An association has also been identified between antenatal stress, anxiety and depression and low birthweight infants (Khashan et al., 2014; Saeed, Rashid, Ahmed, Naqvi, & Tabassum, 2016).

Maternal mental health morbidity can continue well beyond the perinatal period with antenatal stress, anxiety or depression also associated with a negative effect on the cognitive development, behaviour, and emotional health of the child (Glover, 2015; Leis,

Heron, Stuart, & Mendelson, 2014; Slykerman et al., 2015). High levels of antenatal stress, anxiety or depression have been found to be associated with behavioural problems and depression in the offspring at age 21 years (Betts, Williams, Najman, & Alati, 2015).

The Growing Up in New Zealand study (n=5664) is a longitudinal study which found that 11.9% of participants had symptoms of antenatal depression/anxiety (Waldie et al., 2015). In a more recent phase of the study (n=5301) Underwood, Waldie, D'Souza, Peterson and Morton (2017) found that 16.5% of this cohort reported significant symptoms of depression either at booking or at nine months postpartum, with more women meeting the criteria for depression antenatally. Almost 26% of women in this cohort who experienced antenatal depression also had postpartum depression.

Suicide is a leading indirect cause of perinatal maternal death in New Zealand. The Perinatal and Maternal Mortality Review Committee (PMMRC, 2016) in its review of the 22 maternal

deaths from suicide (2006-2013) found that many of these women had risk factors for major depression that were not recognised. Thirty-two percent of these deaths were considered to have been potentially avoidable.

There is a growing body of evidence indicating the importance of maternal mental health assessment and screening antenatally, as well as during the postnatal period, and the provision of appropriate services to meet women's needs. However, maternal mental health needs are not always recognised (Bayrampour, 2018; Burgess & Shakespeare, 2016).

According to the United Kingdom (UK) Centre for Mental Health, the costs incurred as a result of perinatal mental health problems in the UK equate to five times the cost of improving the services. An estimated 28 percent of these costs relate to the mother, and 72 percent to the child. Child outcomes calculated included pre-term birth, emotional problems, conduct problems, special education needs, and chronic abdominal pain. Related maternal costs included lost income, bills for health and social care, and economic effects related to suicide. It was also recognised, although not included in the cost calculation, that the potential impact of untreated perinatal mental health needs ripples out more extensively, influencing, for example, partners, employment and children being taken into care (Centre for Mental Health, 2014).

Early identification of increased perinatal mental health needs and referral to appropriate services benefit both the mother's mental health and wellbeing and also the health and development of the infant (Eastwood et al., 2017). Maternal mental health screening should be a routine part of antenatal care (New Zealand Guidelines Group, 2008; PMMRC, 2018). The National Institute for Health and Care Excellence (NICE) guidelines (2014) recommend that all women are routinely screened for maternal mental health problems at their first antenatal appointment and again early in the postnatal period, and that the woman's mental and emotional wellbeing is assessed at each encounter.

There is no formal perinatal maternal mental health assessment/screening programme in New Zealand (Ministry of Health, 2018). The National Maternity Monitoring Group (2017) has recommended that all District Health Boards (DHBs) throughout New Zealand develop maternal mental health referral pathways to guide assessment and screening throughout the perinatal period and to aid referral to appropriate services.

BACKGROUND

Midwives are integral to the success of maternal mental health assessment and screening during pregnancy due to their pivotal role in antenatal care.

There are no New Zealand studies examining how midwives perceive their role in maternal mental health or their antenatal assessment and screening practices. However, studies from Australia and the UK identify midwives' perception of their knowledge of maternal mental health, attitudes towards caring for women with maternal mental health needs, their preparedness for their role in identifying risk, and their perinatal (rather than just antenatal) assessment and screening practices. In a systematic review exploring the barriers and enablers for women with symptoms of depression seeking help postnatally, the authors found that when health professionals were supportive and sensitive, and validated the woman's concerns about her mental health, this enabled her to share her feelings and accept referral to services more readily (Newman, Hirst, & Darwin, 2019). Hauck et al. (2015) explored 238 Australian midwives' attitudes towards perinatal mental health, finding generally positive attitudes,

although a small cluster analysis indicated that there was some negative stereotyping of women with mental health needs by some of the midwives.

An integrative review of 20 studies (predominantly from the UK and Australia) by Bayrampour (2018) found that midwives' attitudes towards maternal mental health could be a significant barrier to midwives' screening. Although midwives generally perceived that their attitudes towards women with mental health needs were compassionate, empathetic and respectful, some negative attitudes, reflecting the impact this had for the midwives' workload, were reported. The findings of this review also highlighted that time pressure to prioritise physical over mental health care was a significant barrier to midwives' screening, and that managing subsequent referrals and care of women with mental health needs may cause stress for some midwives.

Whilst generally midwives acknowledge their integral role in caring for women with mental health needs, this is compromised by feelings of lacking the skills to deal with maternal mental health problems, and a lack of adequate educational and organisational support and referral options (Hauck et al., 2015; McGlone, Hollins Martin, & Furber, 2016; Noonan, Doody, Jomeen, & Galvin, 2017). In their integrative review of 22 publications (17 of the 22 from Australia and the UK) Noonan et al. (2017) explored midwives' perceptions of their role in supporting women with perinatal mental health needs. The review found that the midwives' perceived lack of confidence and competence in this area, along with a lack of practical support systems, were fundamental to their readiness to support women with their mental health needs. Central to the midwives' confidence and practice was the availability of appropriate and accessible mental health services.

A scoping review of 26 publications from Australia, the United States and Europe (21 of the 26 from Australia and the UK) exploring midwives' and women's perceptions of barriers to accessing mental health services found that many of the midwives lacked confidence around when and how to talk about mental health needs, resulting in inconsistent screening practices (Viveiros & Darling, 2019).

Findings from recent studies of midwives in Ireland also highlight inconsistent screening practices. Noonan, Jomeen, Galvin and Doody (2018) found that 77% of midwives in their study (n=157) did not use a screening tool to screen for maternal mental health needs. Carroll et al. (2018; n=438) also found variation in screening practices, with midwives only screening women who they considered may be at risk, potentially resulting in a lack of identification of mental health needs. They also identified challenges to midwives' screening which included heavy workload, time constraints, and a lack of care pathways and maternal mental health services. Similarly, Higgins et al., (2018) in their study (n=837; 438 were midwives) found heavy workload, lack of time with each woman, and lack of clear mental health pathways were key barriers to midwives discussing mental health with women.

As the New Zealand model of midwifery differs from that of many other countries, it is important that research captures the practices and perceptions of New Zealand midwives. Given the evidence and recommendations for routine antenatal maternal mental health screening, and midwives' place in the provision of antenatal care, it seemed timely to explore local midwives' views on maternal mental health and its antenatal assessment. This study had a particular focus around needs that are considered to be mild or moderate in nature which do not meet the criteria for referral to the Maternal Mental Health (MMH) service.

METHODS

Thorne’s (2008) interpretive description methodology was used for this study. It was designed for use in the applied health sciences, and is grounded in these professional epistemological foundations (Thorne, Kirkham, & MacDonald-Emes, 1997). Interpretive description facilitates the generation of knowledge by the discovery of themes and patterns within the research data which can then be used to assist in clinical reasoning, and to guide and inform clinical practice (Hunt, 2009; Sandelowski, 2000; Thorne, 2008). Researchers using this methodology are concerned with both descriptive validity in accurately describing the events, and interpretive validity, which comes with accurate accounting of participants’ meanings that are evident within the event (Sandelowski, 2000). This methodology is particularly useful when researchers strive to know the "who", "what", "where", and "how" of a phenomenon (Sandelowski, 2000).

Ethical considerations

Ethical approval for the study was obtained through the Auckland University of Technology Ethics Committee in 2014 (Approval number 14/86). Participant Information forms were emailed to midwifery practices to invite potential participants. Interested midwives then contacted the first author and, following confirmation of their interest, a time and place for a focus group interview was arranged.

At the commencement of each focus group interview, the study was again outlined and then written consent sought from each participant. Before each interview began ground rules were established to ensure that participants felt safe to share their perspectives and experiences with their peers. These included agreeing to the identity of group members and information provided remaining confidential to the focus group members and the first two authors. Confidentiality was further maintained by assigning each participant an identification number and the removal of any identifying information from the transcripts.

Participants

A purposeful sample of 27 Lead Maternity Care (LMC) midwives was recruited and each midwife took part in one of five focus groups. The participants worked in a variety of settings in the Auckland region. Our rationale for recruiting such LMCs was to capture the issues related to maternal mental health across the continuum from pregnancy, labour and birth through to the postnatal period. This ensured that the midwives studied were making clinical decisions about antenatal maternal mental health assessment and screening and would have experience of caring for women with maternal mental health needs. This cohort included midwives who regularly cared for Māori, Pacific and Asian women, those who did homebirths, and those from both urban and rural practices. Our aim was to maximise insight into the perceptions and practices of these midwives with regard to maternal mental health (Table 1).

Data Collection

Our use of focus groups aimed to capitalise on the interactions amongst the members of each group. The ensuing discussion revealed both the similarities and differences amongst the LMCs regarding their perceptions of maternal mental health and their individual antenatal assessment and screening practices. The number in each group ranged from two to seven. CM facilitated and DP took notes to assist transcription and ensure that the aspects of LMC practice were addressed. The focus groups were digitally audiotaped and later transcribed by CM.

At the beginning the LMCs were asked to share their views of what constituted a state of mental health and wellbeing. Then, they were asked to talk about their practice in relation to maternal mental health: how they assessed a woman’s mental health during pregnancy, and what they did when their assessments indicated that a woman’s mental health and wellbeing required support.

Table 1. Participants' demographic information

Focus group 1	7 LMC midwives	Supported women giving birth in primary settings	Rural practice
Focus group 2	6 LMC midwives	Supported women giving birth in primary and secondary settings	Urban/semi-rural practice
Focus group 3	6 LMC midwives	Supported women giving birth in secondary settings	Urban practice
Focus group 4	2 LMC midwives	Supported women giving birth in primary and secondary settings	Semi-rural practice
Focus group 5	6 LMC midwives	Supported women giving birth in primary settings	Rural practice

Data analysis

The four-stage cognitive process for qualitative data analysis by Morse and Field (1995) was used to drive the data analysis for this research (Table 2). Transcripts were analysed by CM using a stepped process of first making sense of the data and asking, “What is going on?” (Thorne, 2008). Next the data were systematically sorted and synthesised looking for categories or explanations. These notes became more definite and polished as the analysis developed and the underlying meaning became more evident. From there the patterns, then the categories and themes, were identified.

Table 2. Four-stage cognitive process for qualitative data analysis and its application to this research study

Stage of data analysis	Meaning	Application of data analysis stages to this research study
Comprehension	Making sense of the data and asking, "What is going on?"	Repeatedly listening to narratives Immersion in the data Reflection on own pre-suppositions Searching for insights Notes to capture non-verbal communication within data Primary researcher transcribed focus group interviews
Synthesising	Systematically sorting the data and beginning to look for significant patterns	Transcripts analysed in detail Memo notes remained broad Potential meaning teased out
Theorising	Reflective process constantly challenging the interpretive angle until patterns in the data and ideas become more refined and themes are identified	Notes became more polished Areas identified that were salient for development of clinical reasoning Memo notes that had begun to form categories collated and placed on left side of series of Word documents On right side of documents associated meaning further teased out Contradictory notions carefully examined, compared and contrasted
Re-contextualising	Reflection on themes and overarching statement	Holistic reflection on themes considering clinical application and reasoning

Rigour

Guba and Lincoln’s (1981) framework for achieving trustworthiness was observed throughout the study (Table 3). Anonymised transcripts of the focus groups’ discussions were initially shared with DP, and beginning codes cross checked. Later codes, themes and interpretation were crosschecked with the research team.

Table 3. Framework for trustworthiness in qualitative research and its application to this research study*		
Criterion	Meaning	Application to this research study
Credibility	Confidence in the 'truth' of the research findings	Study originated from gaps identified in the literature review Purposive sampling of 'key informants' Prolonged engagement with data Accurately capturing and describing the participants' perspectives
Confirmability	Neutrality and accuracy of the data Certainty that findings have been determined by the subjects and context of the research	Ongoing reflexivity (researcher) Member validation during focus group interviews for clarification of meaning Ongoing discussion throughout analysis with supervisors
Dependability	Would the findings be repeated if the research was replicated with the same (or similar) subjects in the same or similar context?	Keeping a decision trail throughout research study including rationale for decisions & analytical process Clearly articulated and transparent research process Ongoing self-reflection (researcher)
Transferability	Application of the findings to other context or with other groups	Rich description of findings capturing underlying meaning in a way that readers can recognise and relate to their own practice

* Lincoln & Guba (1985)

FINDINGS

The overarching theme "the disparity between needs and service provision" was underpinned by three sub-themes: "not meeting needs", "the anxious woman needing extra support", and "safeguarding women’s wellbeing and welfare", thus providing an overarching statement of "holding the problem: plugging the gap between women and the service". The midwives found that appropriate services were not always available to meet the needs of women who had symptoms such as anxiety and mild/moderate depression, which did not meet the criteria for referral to the MMH service. As a consequence, there was a gap between the needs of the women and services available to them, which left the midwives carrying the weight of attending to these women’s mental health needs.

Not meeting needs

Carrying the weight of the woman’s maternal mental health needs appeared to impact on the continuum of care from mental health assessment/screening to accessing services. The participating midwives felt that the current service was not meeting the needs of all women, and consequently neither was it meeting the needs of midwives; these being that, following a concerning assessment, they are able to refer to services and gain appropriate care for women.

Identifying the maternal mental health needs

The midwives acknowledged their pivotal role in the assessment of maternal mental health in the antenatal period. Whilst the

antenatal assessment and screening practices across the range of midwives were not cohesive, there were commonalities. All of the midwives incorporated some form of ongoing enquiry as part of their antenatal care, continually assessing women’s mental health throughout the pregnancy (all names are pseudonyms to protect the privacy of participants):

It might seem like you’re just sitting down having a chat, but actually you’re taking in all the little facial nuances, you’ve taken in the home situation without looking like that’s what you’ve done, you’ve taken in what does the relationship seem like, you take in so much more than what you actually let on. (Isabelle)

Yes, I do a bit of both [maternal mental health assessment and screening at booking and later in pregnancy]. There are definitely screening questions that you do at the beginning, often at booking, and then maybe as you are getting a bit of an inkling something’s not right, or just a couple of times in the pregnancy if you’re not quite sure. (Grace)

Although it is not explicitly stated, Isabelle’s assessment of a woman’s mental health was constant and integral to her midwifery care. She subtly assessed the woman’s state of mental health, looking for signs that might indicate a mental health need. In the example above, Grace mentioned that when she got "an inkling" that something was not right, this was a catalyst for further assessment or screening. This highlighted that she was drawing on different cues and subtly assessing the woman’s mental health. The midwives’ assessment was often not formal in nature but was a thread that was woven into midwifery care, reflecting a holistic approach.

The midwives spoke about how the routine questions about the woman’s and her family’s mental health, required as part of the midwives’ health assessments, represented a catalyst for further enquiry, providing a space for conversation about mental health. Beyond this, formal antenatal MMH screening was not routine. The majority of the participant midwives used the Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1987) selectively, as a vehicle for validating their existing concerns, and to validate referral to the MMH service. Many of the participants challenged the efficacy of a routine antenatal screening programme without having the support of appropriate services. They identified that there was a threshold where they felt the responsibility for the woman’s mental health needs should be met by appropriate mental health services. However, these services were often not easy to access.

Difficulties accessing services

Although the referral guidelines for midwives (Ministry of Health, 2012) provide guidance for maternal mental health referral, this was not always effective in ensuring that all women’s needs were met, particularly when their symptoms did not meet the criteria for referral to the MMH service. The midwives felt dissatisfied and frustrated by the current referral process:

I had one (woman) that had a previous pregnancy loss and she was incredibly anxious with her subsequent pregnancy. I referred her to MMH service, and they didn’t pick up the ball at all. I think they gave her one phone call...and I was seeing her weekly from the beginning of the pregnancy, and my scheduled appointments never ended up the time I booked for her. It was counselling for the whole pregnancy. (Emily)

I’ve had a couple where they’re just 'No, she doesn’t need it', or 'She doesn’t qualify, you need to ring this person, you need to ring this person', you get a bit of a runaround. Who am I supposed to be calling about this lady? (Lisa)

Once a woman's symptoms and behaviours related to mental health needs became apparent to them, it was not uncommon for the midwives to experience difficulties in locating services that could support her. Sometimes they felt that the woman needed care from the local DHB mental health service who, while they followed up the referral, only accepted women who met their admission criteria. Central to the midwives' discussions were women who were anxious and required additional support and reassurance; this became a further sub-theme.

The anxious woman needing extra support

Whilst acknowledging that some degree of anxiety was to be expected during pregnancy, participants all commented on the prevalence of heightened anxiety symptoms evident amongst women in their care. They considered that this state of anxiety was often consequently normalised due to its pervasiveness. They noted that it was them who provided the additional psychological support and reassurance that these women needed to allay their anxiety, which subsequently resulted in a greater workload and pressure for the midwives:

I've got a couple of women at the moment who have been texting me a lot, and one of them, I think I counted 18 texts in a three-week period . . . they're just 'I did this and it made me worried' and 'Did I hurt the baby' and 'Do you think if I did this and did that, and ate this and it wasn't hot enough then', you know? (Jenny)

The midwives were carrying the weight of the women's anxiety in the absence of appropriate services. This was seen as having a significant impact on their workload, both in and outside of "normal hours". Reducing women's anxiety also became a variable for midwifery decision-making:

And I find that getting the balance right, of doing testing just to reassure them, then often the testing (of fetal wellbeing) itself brings up more anxiety. Its (fetal growth) on the tenth percentile but everything's fine, but they are, you know? One of them, the baby was meant to be 2.8 kg and it came out at 3.2kg . . . Did I cause more anxiety by doing that scanning, which I didn't really need or want to do? But I did it thinking that I would set her mind at rest, and it didn't. Those kind of things, juggling that discretionary part of it too . . . You think you're reassuring them, and then it backfires on you, and suddenly they're more anxious. (Charlotte)

Sometimes the midwives offered additional assessment/screening purely to satisfy the woman's need for reassurance about her pregnancy. This had the potential to create additional work and uncertainty for the midwives without always effectively reducing the woman's anxiety.

Safeguarding women's wellbeing and welfare

The midwives had some key concerns regarding safeguarding women's wellbeing and welfare whilst carrying the weight of women's mental health needs. Plugging the gap between the woman's needs and service provision had implications for the midwives.

Trusting relationship and feeling responsible without a safety-net

The midwives felt an additional responsibility, and frequently the absence of a safety-net, as they filled in the service provision gap in order to safeguard the woman's wellbeing. This was influenced by the relationship between the midwife and the woman,

which appeared to facilitate women's reliance on the midwives for support:

I wasn't meant to be going to see her but how could I not have gone to see her? She didn't have anyone else that she talked to (. . .). I really do feel that the system let her down. When she was out in the community it didn't seem that there was regular contact, kind of like, 'We've fixed you, here's your tablets, on your way'. She should have had a wrap-around service, which leaves you carrying a really big burden when you feel someone's been lost because there weren't proper safety-nets. (Rosie)

I'm a midwife (. . .) I'm not a counsellor. I think it's really hard because people want you to be their social worker, their aunty and friend, as well as a midwife, and I think that's such a burden to carry. (Frances)

When the midwives were left carrying the weight of the woman's mental health needs they felt responsible beyond their midwifery obligations and without a safety-net. They felt that women's expectations of their support were intensified by the trusting relationship they shared, but also reflecting the lack of services to meet these needs.

Feeling ill-prepared

When having to plug the gap between women's maternal mental health needs and available services, many of the midwives felt ill-prepared to provide appropriate care:

Yes, I find it difficult sometimes. We have a postnatal woman at the moment (who has maternal mental health problems); we didn't get a lot of help with her. So, I feel tricky because I don't know enough about it and I don't know when and how to ask. If something crops up it's very difficult to say, well what do you say to somebody who you think is not coping, apart from, 'You're not coping? Do you need to see these people?' And she's refusing everybody. Maternal Mental Health spoke to her on the phone, and she was fine, so yes, it's a bit like that. (Caroline)

Yes, I think we need some more training (maternal mental health) that would prepare midwives for what it's like (in clinical practice). And around managing those really difficult women who are really anxious, that's very hard to deal with. (Nina)

Being left carrying the weight of maternal mental health needs, and feeling frustrated and unsupported by services, strongly influenced the midwives' perspective of feeling ill-prepared for their current practice reality. There was an underlying concern that midwives were unable to provide the additional support needed by the woman. This, they believed, needed to be provided by mental health workers, not midwives.

DISCUSSION

Themes from this research show that the disparity between women's needs and maternal mental health service provision was central to the midwives' frustrations around carrying the weight of women's mental health needs. Feeling responsible for the care of these women, who although struggling did not meet the criteria for referral to the MMH service, impacted on the midwives.

The evidence from this research suggests that one effect of the gap between women's needs and the services available to them was that the process of referral was not always seen as a reliable one, in that it did not always result in a woman receiving the support that she required. Identifying and referring a woman who "only" had

a mild or moderate mental health issue was problematic in that, because of the lack of appropriate services, the obligation or onus of ensuring the woman's wellbeing then fell on the midwife. Hence, having an available service that met the mental health needs of all women, and not solely for those with more serious mental health issues, would not only validate the purpose and meaning of the assessment and screening but also make it worthwhile.

Although universal routine antenatal mental health screening and psychosocial assessment have been recommended (New Zealand Guidelines Group, 2008; National Institute for Health and Care Excellence, 2014; Perinatal and Maternal Mortality Review Committee, 2018), universal screening alone may not represent a complete solution. Laios, Rio and Judd (2013) emphasise the importance of mental health being integral to maternity care, and its assessment being ongoing rather than relying on a transient screening tool. It is important, also, that screening tools are not purely a "tick box exercise", a potential barrier to the woman engaging with her midwife, but instead are used as a vehicle to facilitate deeper discussions with women about their mental health and wellbeing (Viveiros & Darling, 2019).

Findings from this research show that our participant midwives did perform ongoing assessment of women's mental health, which would complement a universal routine screening programme. The findings show that, although for the majority of the midwives antenatal screening using a tool such as the Edinburgh Postnatal Depression Scale (Cox et al., 1987) was not routine, the required questions about the woman's past and present mental health, along with her family history, effectively lead to an initial assessment. If routine screening, such as is recommended, is implemented then more services will need to be available.

Maternal mental health should not be regarded as a separate entity but, instead, its evaluation should be normalised and embedded into routine maternity care (Atif, Lovell, & Rahman, 2015). Assessing a woman's physical and psychological symptoms simultaneously would help with this normalisation. To facilitate greater integration, the MMH services need to work in partnership with midwives, addressing the woman's symptoms of anxiety and depression and lifting the weight from midwives.

Findings from this research suggest that the trusting relationship between midwives and women could be both "friend and foe". The trusting relationship central to the continuity of care model has been acknowledged as being critical to identifying maternal mental health needs (Viveiros & Darling, 2019). However, this research suggests that the relationship sometimes created additional workload and pressure for the midwives. The participant midwives cared deeply for the women in their care, and this motivated them to "plug the gap" between the women's needs and the service deficit.

This research highlighted the significant impact, that frequently caring for women who were anxious during pregnancy, had for the midwives' workload and practice. Midwifery is acknowledged as emotionally challenging, and increasingly midwives care for women who are distressed by anxiety, fear and trauma symptoms, which may contribute to burnout and trauma experienced by midwives (Creedy, Sidebotham, Gamble, Pallent, & Fenwick, 2017). In their large cross-sectional survey of Australian midwives (n=1037) Creedy et al. found that 43.8 percent of participants reported work-related burnout, and 10.4 percent reported client-related burnout. Caring for a greater number of women experiencing multiple psychosocial needs can contribute to midwives' emotional stress and burnout (Mollart, Skinner, Newing, & Foureur, 2013).

Furthermore, a New Zealand study of midwife burnout by Young (2011) highlighted the difficulties inherent in ensuring that professional boundaries in LMC practice are not breached when endeavouring to meet women's needs and expectations. Young identified maintaining professional boundaries as necessary to sustainability in LMC midwifery practice.

Studies in Australia and the UK have suggested that many midwives do not feel equipped with the required knowledge and skills for maternal mental health assessment and care (see, for example, Hauck et al., 2015). Some additional postgraduate education, equipping midwives with practical skills for dealing with the symptoms and behaviours that they commonly see in practice, would be of benefit.

The referral guidelines (Ministry of Health, 2012) clearly define the midwifery scope of practice as identifying the maternal mental health needs and referring to the appropriate service. As suggested in this study, there appears to be inadequate services catering for pregnant women who are experiencing mild to moderate mental health issues such as anxiety. Given that anxiety can contribute to ill-health in the perinatal period and beyond, the provision of such services is vital. The dearth of services to meet the requirements of women with mild or moderate mental health needs is therefore the precursor to midwives feeling unprepared for their current position rather than a lack of educational preparation. Women need access to appropriate maternal mental health services both antenatally and postnatally, particularly in primary care. For some women these services are crucial for their safety and wellbeing and that of their baby (National Maternity Monitoring Group, 2017). The New Zealand government has recognised the underfunding of mental health services, inequalities in outcomes, and high suicide rates in New Zealand, and has reinstated an independent Mental Health Commission. A Mental Health and Addiction Inquiry (New Zealand Government, 2018) has been done to assess the efficacy of current mental health service provision.

STRENGTHS AND WEAKNESSES

This study was conducted in a region of New Zealand, so reflects the New Zealand partnership model of midwifery care. The participants were recruited from a range of geographical areas across the Auckland region. Urban, rural, and semi-rural practices were involved. Practices offering care in hospital, in primary birth units, and homebirths were included in the study in an attempt to explore possible diversities in the midwives' perceptions or assessment practices. Existing midwifery practice members formed the focus groups, which proved to be a strength; their connectedness and shared experiences assisted with conversations and collective sense-making.

As this study was conducted with a small sample size in one region of New Zealand, the findings cannot be generalised.

CONCLUSION

Untreated antenatal anxiety and depression is a strong predictor of postnatal mental health issues and can cause significant morbidity and distress antenatally, postnatally and beyond. This study has shown that the participant midwives did assess women's mental health during pregnancy; however, there were not always mental health services they could readily refer these women to, should there be a concern. Should routine antenatal screening be introduced and required universally, then this would need to be well supported with accessible and appropriate mental health services to meet the needs of all women.

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We extend our sincere thanks to the midwives who took part in this study, giving their time and insights.

The authors declare that there are no conflicts of interest.

Key messages

- Midwives assess women's mental health throughout pregnancy but can only refer those with serious needs to the maternal mental health service.
- Midwives feel responsibility beyond midwifery care for women with mild to moderate needs, such as anxiety.
- If formal routine screening is introduced, it needs to be well supported by referral into services that all women can access.

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NEW ZEALAND RESEARCH

Using critical discourse analysis and the concept of food security to understand pregnant women's nutrition in Aotearoa/New Zealand

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ABSTRACT

Background: Increasingly, pregnant women in Aotearoa/New Zealand (Aotearoa) are unable to achieve the dietary intakes recommended by the Ministry of Health (MOH). While health professionals express frustration at “being the ambulance at the bottom of the cliff”, the continued government response to this public health concern is to “educate women”, as per the current mantra of personal responsibility and choice-based rhetoric.

Aim: Using critical discourse analysis (CDA), this study examined the discourses regarding nutrition in pregnant women in Aotearoa. Pregnant women's nutrition is further considered within the contexts of food security and empowerment.

Method: In July 2017, using 30 documents from three different platforms – media, government and academia – with a focus on Aotearoa, the first author undertook a CDA.

Findings: Three key messages were identified: firstly, pregnant women, in not being viewed holistically or relationally, are isolated as being solely responsible for nutrition; secondly, women are positioned as naïve recipients, and achieving a healthy pregnancy requires women to be educated and to adhere to complex food guidelines; and lastly, there is an authoritarian use of fear and monitoring to motivate adherence to guidelines. Thus, women are personally responsible for achieving complex, unrealistic and often unaffordable nutritional targets.

Conclusion: The most dominant discourse is one whereby malnutrition is seen as deficit behaviour and thinking by women, and one of self-responsibility, regardless of context. This is very much in keeping with the modus operandi of public health and neo-liberal discourse. We argue, however, this renders silent the fact that malnutrition for some women results more from food insecurity and disempowerment. Midwives need to make audible other less dominant narratives, alongside advocating for woman-centred, policy-based approaches towards nutrition, whereby the underlying drivers of poverty are actively addressed.

Keywords: Aotearoa/New Zealand, critical discourse analysis (CDA), empowerment, feminist, food security, malnutrition, pregnant women

INTRODUCTION

While Aotearoa/New Zealand (Aotearoa) is widely recognised as a wealthy developed nation, with a growing economy and a high level of food exports, food insecurity is a rising concern (Graham, Stolte, Hodgetts, & Chamberlain, 2016; Pollard & Booth, 2019; Schlichting, Hashemi & Grant, 2019). Most recent available data highlight that 7.3% of Aotearoa households experience food insecurity (Graham & Jackson, 2017). Food security data in Aotearoa are similar to international data, with more women food insecure compared to men (Broussard, 2019; de Schutter, 2016). The National Council of Women of New Zealand (2019) has identified poverty as the major economic issue facing many women in Aotearoa, with women consistently earning less than men. Hence women living in poverty who are pregnant face greater concerns and can become more vulnerable economically, socially and physically.

The importance of nutrition during pregnancy is well recognised, with pregnancy being a time when health inequities can be exacerbated if malnutrition is transmitted to the next generation (Wall et al., 2016). The health and wellbeing of the woman and her baby can be affected by poor nutrition, specifically micro-nutrient deficiencies such as that of iron (Greig, Patterson, Collins, & Chalmers, 2013). Problematically, “most pregnant women ...do not adhere to nutritional guidelines in pregnancy, with only 3% meeting the recommendations for all four food groups” (Morton et al., 2014, p.1).

Previous government responses have sought to address the issue by targeting perceived educational or individual deficits through the mantra of personal responsibility and choice-based rhetoric. Yet this is failing to improve outcomes (Davies et al., 2016; Growing Up in New Zealand, 2014; Wall et al., 2016). While health professionals express frustration at “being the ambulance at the

bottom of the cliff”, the continued response to this public health concern, in line with deficit thinking, is to “educate women”. To view pregnant women’s poor nutrition as an individual deficit and/or lack of knowledge is too simplistic. If these issues are to be truly addressed then a more nuanced understanding of reasons for women’s malnutrition during pregnancy is required. We argue the concepts of food security and empowerment render visible some of the nuances.

Using a critical discourse analysis (CDA), this study examined the discourses regarding nutrition in pregnant women in Aotearoa, within the contexts of food security and empowerment. In this study, a discourse is defined as “the social process in which texts are embedded” (Locke, 2004, p.14). An example of this in healthcare is the construction of dominant health messages, hospital policies and health practices which make up a discourse within powerful institutions such as hospitals and professional colleges, and which directly affect health outcomes for women and families, such as immunisation. Some authors argue that fear-based messages linking “unhealthy” food choices with laziness, obesity and chronic ill health are used to motivate people into making “healthy” food choices (Dodds & Chamberlain, 2017). The application of CDA therefore looks to expose power relationships, assumptions and bias (O’Leary, 2009).

This paper firstly explains what the concept of food security entails; secondly, it discusses in more detail malnutrition, specifically the concept of hidden hunger, and considers this in relation to women and pregnant women; thirdly, it explores what is meant by empowerment; fourthly, it explains the CDA process before presenting our findings; and finally, it draws some broad conclusions and explains how these relate to midwifery.

Conceptualising food security

The term “food security” was first used at the 1974 World Food Conference. The Food and Agriculture Organization of the United Nations (FAO) defines this as:

...food security at the individual, household, national, regional and global scale is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996, p.1).

This definition is the most useful and frequently cited. It specifies that food must be of a quality and quantity that allows everyone to meet their dietary needs and food preferences. A lack of food security leads to hunger, hidden or obvious (FAO, 1996; 2008). Further to meeting the definition of food security, a food secure context must also align with the four pillars of food security (Figure 1; FAO, 2008; Tiffin, 2014).

Therefore, a context which is food secure is one where there is sufficient availability of food, there is sufficient access to sufficient quantity and quality of foods, food is appropriately and safely used, and lastly, these pillars are stable over time and seasons. This framework provides a way of analysing a given context, and can reveal underlying cultural, political and economic factors which influence the four pillars of food security. This analysis can further reflect the distribution of access to power; for example, purchasing power, political status, and capacity. Food insecurity within a food secure population such as Aotearoa is likely to be caused by inequity of access to sufficient and appropriate foods for vulnerable groups. Uncorrected food insecurity manifests initially as malnutrition for pockets of the population.

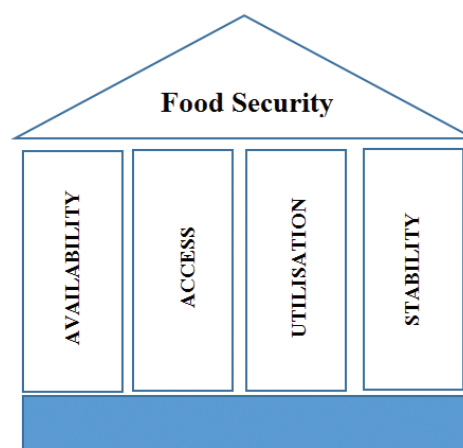


Figure 1. Food security framework - four pillars of food security

Disempowering discourses: Malnutrition, hidden hunger and women

Malnutrition and hidden hunger

Malnutrition can be understood as either over or under nutrition and is caused by insufficient foods as well as diets based on the wrong type or quantities of food (Shetty, 2008). Therefore, both stuntedness and obesity are forms of malnutrition. A more specific form of malnutrition is hidden hunger (James & Rigby, 2012; World Health Organization [WHO], 2006). Named because of its high impact but lack of visibility, hidden hunger refers to a form of malnutrition connected to a calorie rich diet but with deficiencies of micro-nutrients such as iodine, iron and vitamin A (James & Rigby, 2012; Kimura, 2013). Hidden hunger hence reflects low quality, high energy diets.

Hidden hunger is thought to impact up to 2 billion people (Wendelbo, 2018; WHO, 2006), with implications for mortality and morbidity (Shetty, 2008); yet, it remains under considered due to the continued focus on conspicuous hunger, calorie consumption and quantity of foods. Individuals experiencing hidden hunger are usually food insecure due to poor access (Tiffin, 2014). An example of this was during the world food crisis in 2007 when prices for basic foodstuffs rose drastically, directly affecting those living in poverty. Studies of this food crisis provide evidence of a form of malnutrition in which calorie consumption remained constant but as poverty grew, dietary diversity was reduced and child malnutrition increased (Headey, Oliver, & Trinh Tan, 2014). The consumption of fresh fruit and vegetables, for example, which is directly related to socio-economic status, is likely to decrease in food insecure contexts (Parnell, 2012).

At the global level, patterns of food production, supply and access have had a widespread impact on how people value, consume and conceptualise food (Tiffin, 2014). One example of this is “the nutrition transition”. The nutrition transition describes a global shift where increased prosperity and urbanisation have led to a transition from traditional foods and physically demanding lifestyles to low-cost foods and sedentary lifestyles (Jha, Gaiha, & Deolalikar, 2014; Tiffin, 2014). The rise of non-communicable diseases (NCDs), such as diabetes and cardiovascular disease, is linked to the nutrition transition, with increased levels of malnutrition caused by the overconsumption of energy dense foods (Tiffin, 2014). Now the majority of deaths globally are caused by

NCDs, with a sub-optimal diet as a key risk factor (Smith & Signal, 2009). However, not all individuals grappling with the drivers of the nutrition transition are experiencing malnourishment. Individuals who can retain a high level of purchasing power and who are empowered within their community and home environments can withstand fluctuations in global food prices to achieve adequate nutrition access.

One of the most common forms of malnutrition faced by pregnant women is “hidden hunger”, for example, iron deficiency anaemia (IDA). IDA in Aotearoa is considered to be mild, affecting 5-19% of pregnant women (WHO, 2008). While seen as mild, it is of significance when compared to global figures (Ferguson et al., 2001; Ministry of Health, MOH, 2008a). The Aotearoa national nutrition surveys have also found a disturbing trend, with ferritin (iron stores) deficiency prevalence among girls and women over 15 years of age more than doubling from 3% in 1997 to 7% in 2008/2009. FAO, International Fund for Agricultural Development, United Nations Children's Fund and WHO (2017) further highlight the worldwide prevalence of anaemia among women of reproductive age, 15-49 years, which was 11.6% in 2016. This is problematic as even a mild level of iron deficiency impacts on women's cognitive function, quality of life and most importantly, pregnancy and birth (Ferguson et al., 2001; Gibson, Heath, & Ferguson, 2002; MOH, 2008a).

The response to micro-nutrient deficiencies in Aotearoa has been to resort to dietary supplementation; however, this “nutritionist approach” is unlikely to improve overall wellbeing, nor does it empower women to gain access to an appropriate and adequate diet (Davies et al., 2016). Supplementation does little to address the complex causes of malnutrition such as food insecurity (Gibson et al., 2002).

Obesity, another form of malnutrition, is strongly linked to an obesogenic environment, where culture, employment opportunities, the local housing market, and access to transport and healthy food impact on food accessibility and choices (Pearce, Richardson, Mitchell, & Short, 2011). Obesity in Aotearoa women is on the rise, from 20% of the population in 1997 to 27% in 2008 (MOH, 2008a), and 30.5% in 2014 (FAO et al., 2017). In South Auckland local obstetric guidelines have had to amend the application of the national referral guidelines due to the pressure on secondary care services. High numbers of obese and morbidly obese pregnant women are now considered the “new normal”, and are regularly cared for within primary care services (Counties Manukau District Health Board, 2013).

Women and hidden hunger

Women are normally able to maintain adequate calorific intake but when in crisis their ability to retain a high quality and nutritious diet, which is especially important in pregnancy, reduces (Gibson et al., 2002). As levels of crises are heightened, due to globalisation, for example, there is increased pressure for women to participate within productive and formal roles to generate income. But as women generally are paid less, they cannot buy as much as men. This exposes female workers to a greater risk of food insecurity and to the poverty nexus, with women who experience malnutrition being even less able to generate income due to reduced cognitive ability, productivity and capacity caused by micro-nutrient deficiencies (Horton & Ross, 2003).

Women, food and the household/family unit

Women are at risk in times of crisis, both by social and cultural norms which discriminate against them and by their own actions, as women may allocate more nutritious foods to children and, in

times of stress, will act as “shock absorbers”, restricting their own dietary intake (Brody, 2015; Martin & Lippert, 2012). There is some evidence to suggest women are shielding men from the effects of food insecurity in Aotearoa by prioritising nutrient rich and more expensive foods for men and children, and at times even going without (Graham et al., 2016; Martin & Lippert, 2012).

Figure 2 outlines the consequences of household food insecurity and conceptualises how malnutrition affects women. An increased consumption of high energy foods, such as bread or simple carbohydrates, results in reduced nutrient intake and increased levels of obesity for women in households which are food insecure (Martin & Lippert, 2012; Papan & Clow, 2015). This partially explains dietary intake data from developed countries with respect to pregnant women, which revealed they did not reach recommended levels for folate, iron, or vitamin D, despite increased energy intakes reported (Blumfield, Hure, Macdonald-Wicks, Smith, & Collins, 2013). This interestingly also supports the claim that women in both developed and developing nations are more vulnerable to food insecurity and, increasingly in both realms, more women are obese than men.

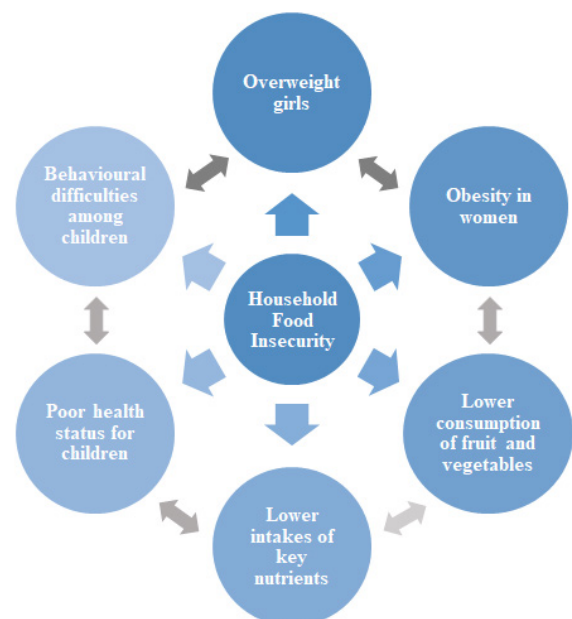


Figure 2. Emerging evidence of consequences of household food insecurity

Theoretical underpinnings: Empowerment and the food security nexus

Empowerment involves three elements: (1) the power within – that is, changes in how women view themselves; (2) the power to impose change more broadly within society; and (3) the power to join with other women and men to reinforce the momentum for change (Kabeer, 2010). Table 1 conceptualises the food security framework discussed earlier with women's empowerment. Applying the concept of food security places the focus on self-empowerment as the key to gender equity, where women articulate their own needs rather than having them predicted and met on their behalf. It investigates divergence, diversity and complexity, “to pull apart” women's positioning in relation to food security.

The food security literature has developed over time to conceptualise food security as reflecting social, political, economic

and cultural factors. Countries like Aotearoa face challenges with responding to food insecurity because it is often poorly monitored and remains, until recently, largely unacknowledged. There are numerous threats to the global food production systems, requiring improved analysis and investigation in order to provide warnings about growing food crises in both developed and developing countries (Headey et al., 2014). Moreover, global factors, such as the nutrition transition described prior, have had different impacts on individuals within the same household based on gender and age (Jha et al., 2014). This indicates that power inequalities can increase food insecurity at the household level. Through the investigating of “hidden pathways” which disempower women from attaining food security, the prevalence of “hidden hunger” becomes more evident. A focus on power analysis is hence likely to be the more effective pathway to understanding food and nutrition security for pregnant women.

Table 1. An empowerment framework related to food security

	Power within:	Power to:	Power with:
Availability	Women recognise their right to sufficient quality and quantity of food.	Women can meet their food needs for sufficient quality and quantity of food.	Women can make change with others to improve the availability of food within their communities nationally and globally.
Access	Women understand how their wellbeing is connected to adequate access to food.	Women can negotiate adequate food access within their families and communities.	Women can make change with others to respond to factors which affect their access to food.
Utility	Women are confident and able to utilise food to meet their needs.	Women have resources to develop their knowledge around food utility.	Women can work with others to improve food utility in their communities.
Stability	Women possess self-confidence and adequate self-esteem to recognise and voice concerns.	Women can counter threats to food security in the short, medium and long term.	Women can work with others to respond to the food stability threats in their community.

METHODOLOGY: A CRITICAL DISCOURSE ANALYSIS

CDA explores the relationship between discourse and power to reveal abuses of power and systemic inequalities in operation across society (Weiss & Wodak, 2002). It assumes that certain groups are privileged over others and, if not sufficiently critical, CDA itself may be implicated in the reproduction of forms of oppression (Locke, 2004). CDA theorists therefore aim to disseminate a critical awareness of language as a factor in domination (Fairclough, 1995). Particularly in health settings, discourse and narratives have powerful impacts. As noted by Pollard and Booth (2019), how we define and frame issues shapes the response. Problematically, this can stigmatise, stereotype and reinforce disadvantage. The dualist nature of modern health systems is a prime example of this – the problem is often the patient or the disease, with the solution being the doctor or medicine. This discourse operates in a reciprocal relationship with social institutions and structures, which replicate the framing of the discourse throughout society. This impacts on all of us but inequitably impacts on “othered” groups, especially indigenous people and people living in poverty – those positioned

at the margins. Weiss and Wodak further simplify this explanation by labelling discourse used in speech and text as a “social practice” which has a “dialectical relationship” with institutions and social structures (Weiss & Wodak, 2002, p.13).

The social practice within text can be analysed to reveal assumptions and bias by:

1. Clarifying the theoretical assumptions within a text;
2. Identifying conceptual tools such as linguistics to reveal connections with discourse and social structures or outcomes;
3. Defining categories or “analytical concepts” which explain specific phenomena (Weiss & Wodak, 2002, p.13).

Data collection

For this paper, a CDA process was developed drawing on works of various significant authors (Fairclough, 1995, 2003; Janks, 1997; Locke, 2004; O’Leary, 2009; Weiss & Wodak, 2002). To practically apply the goals of CDA, four key questions of the texts were asked:

1. How is the text positioned?
2. Whose interests are served by this positioning?
3. Whose interests are negated?
4. What are the consequences of this positioning? (Janks, 1997).

Thirty articles were selected for analysis, consisting of 10 media, 10 government and 10 academic articles (Table 2).

Table 2. Document selection process

Academic articles

Search terms through Massey Discover platform: “Ti (New Zealand or Otago or Auckland) AND Ti (Pregnant or pregnancy) AND SU (nutrition or food or food security or malnutrition or nutrients or deficiency diet or eating)”

- Limited to: First 10 articles (order of relevance)
- ‘Folate knowledge and consumer behaviour among pregnant New Zealand women prior to the potential introduction of mandatory fortification’ – unable to find in English
- Limit to academic articles
- Limit to 2007-2017

Media articles

Search terms through google.co.nz news platform: “nutrition OR diet OR malnutrition OR food OR security OR nutrients OR supplementation OR eating” + “pregnancy”

- Limited to: Most relevant – celebrity, personal stories omitted
- First 10 articles
- Within New Zealand region only, under advance search settings

Government articles

Search terms through google.co.nz - site: govt.nz: “pregnancy” + “nutrition OR diet OR malnutrition OR food OR security OR nutrients OR supplementation OR eating”

- Limited to: First 10 articles
- Omitting repeats
- Omitted anything older than 2007

Analysis required a two-step approach: firstly, a detailed analysis of sentence structures and words (specifically nouns and verbs), followed by a wider approach looking at themes (Fairclough, 1995). The goal of this analysis was to reveal the assumptions that formed the ideological basis within the text, specifically:

1. Existential assumptions about what exists;
2. Propositional assumptions about what is, can, or will be; and
3. Value assumptions about what is good or desirable (Fairclough, 2003, p.55).

Secondly, to reveal the ideological basis of the articles analysed, Janks's questions were reframed to work within the limitations of this project:

1. What is the central theme in positioning the text? What is the "problem" framed as?
2. Who is the text directed to? Who is assigned responsibility for the "problem"? (Janks, 1997).

To answer these questions, analysis further looked at the use of pronouns, commonly repeated words and phrases, as well as concepts and words omitted. Specific text analysis tools revealed patterns and themes in the text. These key questions were built on to develop a table summarising Fairclough's, Janks's and Locke's textual analysis tools (Table 3).

Table 3. Text analysis process

Step 1	Identification of patterns, key words repeated which set up a complex web of interconnectedness across the discourse (Janks, 1997; Locke, 2004).
Step 2	Identify how the social identity and relationships have been constructed (Locke, 2004).
Step 3	Analyse pronouns which stitch together the text and its meaning. This can identify who the "problem" is directed to (Locke, 2004).
Step 4	Assess the force of the text and its nature, as evidence of social and power relations (Locke, 2004).
Step 5	Identify the marginalised or hidden view through both the use of the words as well as the suppression of their opposites (O'Leary, 2009).
Step 6	Identify which voices are included and which voices are significantly excluded? How are voices textured in relation to the authoritative voice? (Fairclough, 2003).
Step 7	Identify ideological assumptions; what do authors commit themselves to in terms of truth? What is an irrational assumption within the text? (Fairclough, 2003)

Using the above process, and noting both consistencies and inconsistencies across the text, the first author reviewed each document. Sentences, which summarised a key message or the key findings of the document, as well as key words, which identified who the writing was directed at and how this group had been conceptualised, were marked. Distinct words and concepts were repeated often throughout the body of work. This repetition of common themes and words exposed a discourse which is surprisingly similar across the realms, namely, "pregnant women are singularly responsible for ensuring adequate nutrition". This analysis was further developed by using the quantitative MAXQDA software programme to generate word clouds based on the frequency of word usage (Figure 3).

A further analysis of the texts looked at the most common word combinations of three words which had three or more letters. Across all 30 documents, "nutrition guidelines for" was the most highly ranked and reflects the dominance of adherence to the nutritional guidelines as a key phrase within the text.

In the 10 media documents "pregnancy" and "pregnant" again feature strongly. However, words such as "risk", "avoid" and "should" feature more prominently in the media texts. This also concurs with the most common word combination in these documents which is "the risk of"; this reinforces the use of fear to motivate women to adhere to nutritional guidelines.



Figure 3. Word cloud: all documents

In contrast, "pregnancy" is the dominant word for the academic texts, with "women" used far less often. As well as this, "dietary", "intake", "mg" and "g" also feature strongly. "The Ministry of" is the most frequent word combination followed by "College of Midwives", demonstrating the dominance of these institutions as authorities within the academic texts.

The government documents closely reflect the analysis of the full body of documents with "women" again being dominant as well as "food". The most frequent word combination is "nutrition guidelines for", again reflecting the broader body of texts.

Finally, because this was a study of text and discourses, ethics review and approval were not required. Regardless, ethics and research integrity remain important in terms of ensuring the research is considered trustworthy due to the soundness of the methods and the honesty and accuracy in terms of presenting the findings (O'Leary, 2009). Input from internal academics, as well as consideration of the early findings by an academic outside the project, further contributed to the rigour and trustworthiness of the study.

FINDINGS

Reoccurring across the documents were three key messages:

- Pregnant women are singularly responsible for ensuring adequate nutrition.
- A healthy pregnancy requires women to be educated to adhere to complex food guidelines.
- Fear and monitoring of women are used to motivate adherence.

A fourth message can also be found, that is the problem of access to quality foods for pregnant women (Boland & Gibbons, 2009; MOH, 2008b; Yin, Dixon, Paterson, & Campbell, 2014), and, while it is still concluded that women require further education to achieve compliance with food guidelines, there is some recognition about lack of finances and other resources as barriers (Yin et al., 2014). This presents a tension in that while health professionals recognise that women may be unable to achieve adherence, there remains an expectation that women will try to comply.

In terms of separating out results, the media articles consistently sensationalise and often use inflammatory and fear provoking language such as "diet overkill", "can harm a growing baby" and "putting... their babies at risk" to engender an audience (Australian Associated Press, 2011; Tasker, 2017). In three of the media articles, women themselves are quoted discussing both

their desires and difficulties during the pregnancy, advising other women as to how they should manage expectations, admitting “overindulging in foods” and “being consumed with worry and anxiety” (Essentialbaby.com.au, 2015; Hartley, 2017). There is also contradictory information which generates uncertainty and drama, creating a “confusing maze of dietary restrictions” which the media builds on to generate cheaply produced material (Corderoy, 2017). This increases the stress on women navigating a dramatised discourse.

The government material falls into two fields. In the first field a clear health promotion agenda is directed at pregnant women, to clarify and detail a complex set of nutritional guidelines. The second field is to inform policy and health agendas by detailing key research which emphasises the importance of appropriate nutrition for the wellbeing of the pregnancy and the infant. This literature argues the need to educate pregnant women to adhere to guidelines with the government positioned as the key authority about a complex and technical “problem”. Addressing pregnant women as isolated and autonomous individuals, these guidelines are complex, only focus on pregnant women, and are designed to promote adherence.

The academic texts are the most diverse. Drawing from a range of academic and professional disciplines from midwifery to nutrition, the academic sources look at malnutrition in pregnancy from a variety of perspectives. While each research article has an agenda and a perspective on “the problem”, they still ascribe to the three key messages identified above. The academic nature of the work attributes importance to high quality data, yet only one included the voices of pregnant women in the text, with one further text investigating women’s knowledge and beliefs about nutrition through a questionnaire (Paterson, Hay-Smith, & Treharne, 2016). This lack of engagement with pregnant women’s voices indicates that the authority to describe “the problem” rests with researchers (Okesene-Gafa, Chelimo, Chua, Henning, & McCowan, 2016).

Throughout the literature, there is a limited discussion of food security despite the evidence showing concerns for women in Aotearoa over the last ten years (MOH, 2012). Malnutrition in pregnancy is consistently problematised as the responsibility of individual pregnant women rather than a national public health concern. This framing persists despite a uniform agreement across the texts that malnutrition in pregnancy is rising to a concerning level, with the impacts on infants extensively detailed. There is also a consensus that the current response is failing to improve women’s wellbeing. These messages are arranged now as themes for the purpose of a more detailed discussion.

DISCUSSION

Theme one: Framing identities of women who are pregnant

Most of the articles refer to women as “pregnant women” with the pregnancy itself denoting their status. Other subjects in the texts are described as “mums to be” or “pregnant Kiwis”, indicating that women are waiting to gain status as mothers and with the pregnancy itself the key identity in women’s lives (Nakhle, 2015; Tasker, 2017). In contrast to this, several academic articles describe the subject as women who are pregnant or just women, indicating that womanhood is the primary identity of the subjects, with the pregnancy existing alongside this identity (Boland & Gibbons, 2009; Okesene-Gafa et al., 2016; Wall et al., 2016; Yin et al., 2014). In three of the titles of the academic texts, the subjects are maternal diet or the pregnancy, thereby excluding women altogether as subjects (Boland & Gibbons, 2009; Morton et al., 2014; Wall et al., 2016). In the media and government texts only

four reference pregnant women as the subject in the title, with the 16 other texts deferring to the pregnancy itself as the subject of the article (Corderoy, 2017; MOH, 2008b, 2017).

This dominant focus on the pregnancy as the key subject rather than women or pregnant women is also signalled by the images which accompany the texts. Out of 10 articles which include photographs of pregnant women, 80% have an image which is cropped to focus only on the pregnant uterus. Again this indicates that the subject of the text is the pregnancy itself as independent from women as whole citizens functioning within society. In contrast to this, two resources from the MOH show “whole women” pursuing activities with other women indicating they perceive women as functional within a society (MOH, 2008b, 2017). This suggests that the current discourse frames the primary identity of pregnant women in reference to the pregnancy rather than as fully participating and active women in society.

Theme two: A healthy pregnancy requires adherence to guidelines

Theme two has been identified in answer to the CDA text analysis question: What is the central theme in positioning the text? What is the “problem” framed as? Many of the texts prescribe the nutritional and food safety requirements women need to adhere to, to ensure a healthy pregnancy. These prescriptions include specific instructions for women who must “limit” or “avoid” unhealthy or unsafe foods (Food Standards Australia and New Zealand, 2016). The government and media texts discuss the many complex and varied requirements to achieve health. This advice is technical and specific down to the consumption of grams of micro and macro nutrients per day. Food is divided into foods to avoid, and foods which are best or healthier. This breakdown of food into grams, and good food versus bad food creates a rule book which abstracts the concept of health and nutrition into a calculation requiring management. Women’s enjoyment of meals, the taste of food and any spiritual or cultural meaning of foods are not emphasised as contributing to health and wellbeing.

The MOH nutritional guidelines are detailed in an 8-page booklet and include many specific instructions: for example, women should “eat ... at least four servings of vegetables and two servings of fruit. If you do choose juice or dried fruit have no more than one serving per day” (MOH, 2017, p.1). Examples of what make up a serving of vegetables and fruit are detailed further. Perhaps the most confusing message is around eating fish. Women are advised variously of the health benefits of seafood consumption, of the risk of high levels of mercury, to limit consumption of fish with potentially high levels of mercury, to have a very limited consumption of other fish and that the recommendations may change over time (MOH, 2017). These instructions require a high level of literacy, comprehension, and education to follow and incorporate into everyday life.

Pregnant women as passive recipients of nutritional messages

As previously discussed, pregnant women’s identity as women and their voices within the texts are limited. The focus is instead on the “voices of experts”. In the media articles, the authority is often dieticians who justify their expert status by describing the complexities of eating the right foods during pregnancy. In the academic texts, researchers analyse pregnant women’s food frequency questionnaires and blood tests rather than discussing with women their knowledge and concerns around food and nutrition. These experts then describe the “problem”, as well as solutions based on these measures. This said, since completing this study, along with work by Yin et al. (2014), publications have

emerged where women's voices are included, for example, Pullon et al. (2019).

Several texts describe women as ignoring the guidelines, suggesting that they should be listening and compliant, rather than seeking active participation (Corderoy, 2017). Many of the texts recognise the failure of these nutritional messages and, in response, they call for "women to be weighed more often", or suggest "women need to be given more information" and specific groups of women need to be targeted more effectively (Tasker, 2017; Wall et al., 2016, p.1). Several texts hold women to account for "being mistaken over healthy diet" and for erroneous beliefs around "eating for two" (Corderoy, 2017; Hartley, 2017). This framing posits that the authority is the researcher or the health professional who educates women as to what they should/should not eat, with women failing to follow the guidelines. These are examples of how the discourse dictates acceptable behaviour to women rather than supporting them to improve diets during pregnancy.

Failure to adhere to guidelines leads to poor outcomes

Most of the documents conclude that pregnant women's failure to adhere to these guidelines is leading to poor outcomes. Thus, they define women's behaviour as "the problem". On the other hand some academic texts posit that "the problem" is in meeting the extra nutritional demands of the pregnancy with adherence to the nutritional guidelines thus a necessity (Davies et al., 2016; Growing up in New Zealand, 2014). It seems that women are targeted as both the cause of the problem as well as the solution to the problem. If a failure to adhere to nutritional guidelines is the problem, then the solution is to work harder to get pregnant women to follow the guidelines. The literature positions pregnant women as requiring specific education around nutrition (MOH, 2008b, 2017). Conversely, many of the documents position education as the solution but also recognise its failure to create lifestyle change (Davies et al., 2016).

Theme three: Fear and monitoring to motivate adherence

The repetition of the word "safe" across most of the media documents suggests an action is required to ensure safety is maintained. The recommended action is always adherence to the guidelines. Specific instructions to women are focussed predominantly on the risk of harm to the baby and on being "on the safe side" (Auckland District Health Board National Women's Health, 2017; Essentialbaby.com.au, 2015; Hartley, 2017; Nakhle, 2015). There is no comment on the joy of motherhood or pregnancy or of the amazing achievement of women who can conceive, grow, and nurture healthy babies. There is no positive story where women achieve success in their pregnancies – even though most pregnancies have positive outcomes for women and their babies. Two articles have women specifically discussing their fears and their concerns in an emotional and dramatic discussion. One woman states "but more than anything I worried about the food I was putting into my mouth"; this emphasises a risk and fear based approach to healthy eating and overly dramatises the risks of food safety and nutrition (Essentialbaby.com.au, 2015; Hartley, 2017). In this discourse, the pregnancy is an abnormal life event which needs to be managed and becomes an issue of self-control and discipline. Women can no longer enjoy certain foods and should instead adhere, monitor and avoid or limit their eating (Australian Associated Press, 2011). The shifting and confusing narratives across the texts about what is permissible are emphasised and generate more fear with women doing something they are not really meant to (Nakhle, 2015).

There is also a theme of monitoring the ability of women to adhere to guidelines. Pregnant women described feeling watched and having their decisions judged by people in society with comments like: "urgh look at her", "you'd get away with it" and an example of being told off by a midwife for being "naughty" (Paterson et al., 2016, p.8). In one article a spokeswoman for the Dietitians Association of Australia admits that women "need to be very, very organised, and well-planned or have a strict diet" to meet the guidelines; she admits nobody in Australia is really meeting these guidelines but retains a high level of expectation that pregnant women will be able to conform to them (Corderoy, 2017). The academic texts focus on monitoring women's nutritional status but only two explore with women their thoughts and beliefs around nutrition, indicating the importance of monitoring, but not talking with, women (Okesene-Gafa et al., 2016; Paterson et al., 2016).

Overarching phrase: "Walking the tightrope"

A discourse is "the social process in which texts are embedded"; thus discourse is both establishing and creating meaning in the world (Locke, 2004, p.14). CDA deepens this analysis by also revealing power structures which are being constructed and replicated (Fairclough, 1995). The phrase, "walking the tightrope" describes a precarious situation that demands careful and considered behaviour regardless of socio-economic circumstances. This grand theme brings together the three main messages found in the texts and reveals the power structures which position pregnant women in a vulnerable space of both being the target of an impossible expectation as well as not having a clear role or voice in responding to this situation. The issue is primarily framed as one of personal responsibility and adherence to guidelines. Yet this response fails to acknowledge the lack of access to appropriate resources for many families to live healthy lives (Graham et al., 2016). It also remains in keeping with a middle-class "nutritionist approach" which judges those living with food insecurity to be making poor food choices due to a lack of nutritional knowledge (Graham et al., 2016). Feeding a family with limited resources is time consuming, stressful and difficult (Graham et al., 2016; Katz, Crean, Cerulli, & Poleshuck, 2018).

Thus, these discourses disempower women from providing responses to the very problems that researchers are seeking to answer. Research is increasingly dominant in health and healthcare practices but, if the research and the wider discourses which surround its use are developed without reference to women's lived realities, it can silence women and give an inaccurate portrayal of the context.

When we reflect further on this analysis, we detect an expectation that women will be compliant and will follow instructions and directives. Women's identity is subsumed by the pregnancy in the discourse. In contrast to the language of food security and empowerment, the analysis presents many points of conflict but is also a chance to reframe how health professionals and the general public view nutrition in pregnancy. There is much potential for non-government organisations, health professionals and academics to reframe this discourse, thus working to empower women and make their voices heard by focusing on the importance of food security for women and their families.

As health professionals, midwives can reframe the discussion around nutrition in pregnancy and advocate for a policy-based approach to effectively respond to the chronic and widespread concern of malnutrition in pregnancy. Midwives have a role to play in making heard less dominant narratives, alongside advocating

for woman-centred, policy-based approaches towards nutrition, whereby the underlying drivers of poverty are actively addressed.

CONCLUSION

This paper argues that the current discourse around nutrition in pregnancy is not working to resolve a chronic public health concern. Pregnant women as citizens require effective government action in the form of accurate monitoring, political and social policy provision which responds to problems of food security, and empowerment to create transformative change. This approach views women as functioning citizens deserving of rights and of contributing to solutions, rather than as having the narrow identity of women as seen in the discourse who are expected to conform and to “walk the tightrope”. As has been aptly put by these authors: “Nutrition public policy must be linked to broader strategies that respect and empower non-discriminatory and economically secure livelihoods for all women and girls, and all men and boys... nutrition policy must support and facilitate women’s own plans – whether aligned to or separate from market-based nutrition products – for their own, their families’, and their communities’ nutritional health” (Bellows & de Lara, 2016, p.65).

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The first author undertook a CDA that contributed to the degree of Master in International Development (Raven, 2018). The project was examined externally and awarded a first class pass.

The authors declare that there are no conflicts of interest.

Key messages

- A prevailing discourse surrounding pregnant women’s poor nutrition is one of individual deficit and/or lack of knowledge.
- Food security and empowerment analysis provides a chance to reframe how health professionals and the general public view nutrition in pregnancy.
- Midwives can reframe malnutrition in pregnancy discussions, advocating for woman-centred, policy-based approaches, whereby the underlying drivers of poverty are actively addressed.

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