



New Zealand
College of Midwives

TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

JOURNAL

Pasifika women's choice of birthplace

Effects of cervical excisional procedures for cervical intraepithelial neoplasia on pregnancy and birth: A literature review

Health policy and its unintended consequences for midwife-woman partnerships: Is normal pregnancy at risk when the BMI measure is used?

Recognising and responding to acutely deteriorating women in New Zealand maternity wards: A literature and environmental scan

ISSUE 54
DECEMBER 2018

New Zealand College of Midwives Journal

The New Zealand College of Midwives Journal is a blind peer-reviewed journal and the official publication of the New Zealand College of Midwives. The Journal focuses on midwifery issues and women's health. It is provided as a benefit to all members of the College and has a wide readership, which includes New Zealand and overseas midwives, other health professionals, New Zealand women and others with an interest or involvement in pregnancy and childbearing.

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 scholarship and research
- To support the development and dissemination of New Zealand and international research into midwifery and maternal and child health

Publication

The Journal uses electronic article-based publishing. The editors build each issue as an "issue in progress" from papers that have been accepted for publication. Once accepted the paper is disseminated directly to College members electronically and is made publicly available on the College website <https://www.midwife.org.nz/midwives/publications/college-journal/>. A full journal issue is printed annually in December.

Submissions

The Journal welcomes original research, literature reviews, exemplars/practice stories/case studies, audits and research methodology articles that fit with the philosophy of the Journal.

It is important that articles submitted for review have not been published previously in any form and are not under consideration for publication elsewhere.

Articles should be submitted electronically to the Journal via email to co-editor, Lesley Dixon, at practice@nzcom.org.nz.

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

PRODUCTION

BNS Design & Print Ltd
76 Kingsley Street, Christchurch, 8023
Phone 0800 733 000, Fax 03 377 4931
Email astewart@bns.co.nz

ISSN.0114-7870

Koru photograph by Ted Scott

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EDITORIAL

Consumer representation on the editorial board

Lesley Dixon, Eva Neely & Ruth Martis

The Journal editorial board comprises of six members. Last year Susan Crowther resigned from her subeditor role due to overseas work commitments. We thank Susan for the enthusiasm, passion and commitment she brought to the role.

Susan's resignation provided a timely opportunity to reflect on the membership of the board and specifically to consider adding consumer representation.

Consumer membership and working in partnership with women are key principles of the College and the midwifery profession. Midwives work in partnership with the woman and her family in a relationship of trust, negotiation, shared decision making and responsibility, and shared understanding. Reflecting this, the College has consumer representation throughout its committees (National Committee, Midwifery Standards Review, Resolutions Committees) to ensure midwifery services remain woman centred. The exception to this to date has been the College's journal editorial board.

The board discussed the need of a consumer representative with the National Committee, who agreed that consumer representation would support the College's philosophy on partnership and women centredness, and that the appointed consumer would assume the role of a subeditor. This involves responsibility for:

- The quality of papers published
- Ensuring that content follows the Journal's philosophy
- Establishing the Journal's strategic direction and planning
- Ensuring efficient and rigorous publication processes
- Appointing and guiding Journal reviewers

It was agreed that the following attributes were needed for a consumer subeditor:

- Has an advocacy role or is a consumer organisation representative
- Has an academic background
- Has a publishing history
- Is not a health professional
- Is an affiliated College member
- Is elected by the National Committee

The National Committee and the editorial board are pleased to announce that Eva Neely has been appointed as consumer subeditor on the Journal's editorial board.

Eva is a mother, lecturer and advocate for mothers' health. She lectures in health promotion and has a particular interest in critical, strengths-based and empowerment-focused approaches to health and wellbeing. Her research interests include maternal health, youth health promotion, health-promoting settings, asset-based approaches for enhancing population health, and holistic concepts of health. She lives in Wellington with her husband and two young daughters, who were born at home. She is the Home Birth Aotearoa consumer representative on the College's National Committee, is active on the advocacy group Maternity Equity Action, and is a Trustee for Home Birth Aotearoa and for the Wellington Home Birth Association. She enjoys spending time tramping with her family, knitting, sewing, baking, and running.

Welcome Eva.

Thank you for your warm welcome, I have been reading the Journal for some years and am excited to be part of this wonderful editorial team. This issue has an interesting and eclectic mix of papers, reflecting the different ways midwifery is committed to generating woman centred research. The first paper reviews term breech presentation and



Eva Neely

how the interpretation of the evidence depends on the professional groups involved. The paper identifies the benefits and harms of a planned vaginal birth and a planned caesarean for breech presentation to support women's decision making. McAra-Couper and her colleagues in the next article explore birthplace choices of Pasifika women in Counties Manukau. While the community and midwife somewhat influence birthplace choice, the culture of, and familiarity with, the local hospital drives most women's choices. The paper reflects on the inherent tensions of de-contextualised values (birthing should happen in a primary unit or at home) and local birthing cultures. In the third article Rebecca Hay and Jean Patterson present a literature review exploring pregnancy and birth outcomes for women who have had cervical excisional procedures. They identify an important research gap and the need to extend knowledge about labour and birth care for women with a history of cervical procedures.

Knox and colleagues examine the impact of prescribed medical measures in midwifery, specifically how the use of body mass index as a monitoring device contradicts context-led and women-centred midwifery practice. The authors object to how such narrow tools fail to fully capture a woman's health and risk profile, and can enforce unethical practice. In the following article Nakamura and Horiuchi review the evidence behind hiesho (cold disorder) and whether it increases the risk for postpartum haemorrhage (PPH). Their findings indicate a possible indirect effect on PPH by increasing the occurrence of uterine inertia and prolonged labour. Incorporating antenatal lifestyle activities to improve circulation may reduce the risk for women with hiesho. In their article on Pasifika midwifery students' experiences, Beatson and colleagues unfold the importance of creating a "learning village". They explore how Pasifika students' collective identity needs acknowledging in education programmes, and present ways in which programmes can be more tailored to their needs. Dann and Hill's article explores the early detection and treatment of deteriorating inpatient pregnant women and the inconsistencies in protocols across New Zealand. The authors determine that most DHBs are developing and implementing early warning systems, but recommend the development of a national tool and early warning system to ensure consistency across the country. The final paper in this issue examines a newly graduated midwife's experiences of the Midwifery First Year of Practice programme. Chapman identifies the core components of the programme and highlights that the transition to becoming a confident midwife is an individual journey which is well supported by this programme.

We would like to take this opportunity to thank all authors, reviewers and the editorial team for their work in ensuring the publication of such high quality papers.

<https://doi.org/10.12784/nzcomjnl54.2018.0.4>

LITERATURE REVIEW

Singleton breech presentation at term: Review of the evidence and international guidelines for application to the New Zealand context

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ABSTRACT

Background: Over the last few decades the management of a breech baby at term has been immersed in controversy. It is important that New Zealand midwives and doctors have sufficient understanding of the evidence to be able to effectively counsel women to make an informed decision when a baby presents in a breech position at term.

Aims: To review the evidence and international guidance related to mode of birth for singleton breech presentation at term, identify the current evidence and gaps in knowledge and highlight how the evidence can be used to support women within the New Zealand context of maternity care.

Method: We searched Scopus, PubMed and the Cochrane Database of Systematic Reviews for peer reviewed publications about term breech presentation. The search terms used were "breech presentation" and "term". Limiters were set for the time period between 2000 and 2015, English language, human pregnancies, and peer reviewed journals.

Findings: We found 456 published papers covering breech presentation related to clinical outcomes, professional commentaries, professional guidelines and the woman's perspectives. We identified and retrieved 37 papers as relevant to our search criteria. We report specifically on the papers that provided professional commentary (detailed critique of the evidence), clinical studies, systematic reviews, meta-analyses and professional guidelines.

Following the publication of the Term Breech Trial there was a change in practice to that of recommending planned caesarean section for term breech presentation. Subsequent critiques and reviews have identified concerns with the study which undermine its reliability. Further retrospective/prospective studies, a systematic review and a meta-analysis have demonstrated equivocal results and suggest that perinatal mortality during vaginal breech births can be reduced when strict criteria are applied and an experienced clinician is involved. Many professional guidelines now advise that offering women the option of a vaginal breech birth is reasonable.

Conclusion: New Zealand midwives and doctors need to be in a position to inform women with breech presenting babies about factors that support the safety of vaginal breech birth, as well as about the benefits and potential harms of both caesarean section and vaginal breech birth, to support their decision making.

Keywords: breech, term, birth, evidence, guidelines

INTRODUCTION

It is estimated that breech presentation occurs in 3-4% of all births, with the proportion of breech presentations decreasing as gestational age increases, so that 1-3% of all pregnancies will be breech at term (Thorogood & Donaldson, 2015). A recent review of term breech presentation in New South Wales, Australia, identified an overall rate of 3.1% in a population of 914,147 singleton term births over the period from 2002 to 2012 (Bin, Roberts, Nicholl, Nassar, & Ford, 2016). Over these years the annual rate decreased from 3.6% in 2002 to 2.7% in 2012 due to the increasing use of external cephalic version (ECV).

Identifying the rate of breech presentation prior to birth for New Zealand is difficult, due to a lack of specific data. However, the

incidence of vaginal breech birth is reported annually by the Ministry of Health. The rate of vaginal breech births in New Zealand is low and has reduced from 0.26% to 0.20% (n=145 to n=132) between 2002 and 2014 (Ministry of Health, 2015), with the rate of singleton term vaginal breech births reducing from 0.14% to 0.10% (n=78 to n=63) between 2002 and 2014 (National Maternity Collection personal correspondence, 2016).

This is the first paper in a planned series of papers based on the Illuminate Forum: A Breech Experience, held in New Zealand in November, 2015. The Illuminate Forum was a joint venture between the New Zealand College of Midwives and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). The aim was to discuss term

breech presentation and birth for the New Zealand context. The presenters from the forum subsequently agreed to collaborate and share their knowledge and expertise related to breech birth through this series of papers, so that the information shared at the forum can be disseminated to a wider clinical audience. Other planned papers relate to the mechanisms of physiological vaginal breech birth, and to the barriers to, and enablers of, vaginal breech birth in the New Zealand context.

The aims of this paper are to review the evidence and international guidelines related to a singleton baby presenting breech at term, identify the current gaps in knowledge and highlight how the current evidence can be applied to support women in the New Zealand context of maternity care.

BACKGROUND

The management of term breech presentation has been the subject of debate since the 1980s and continues to cause controversy and polarisation of views (Kotaska, 2007, 2009; Lindqvist, Norden-Lindeberg, & Hanson, 1997). The question that has caused the controversy is: what is the optimum mode of birth for a singleton baby who is presenting in the breech position at term?

Hannah et al. (2000) sought to provide a resolution to the controversy by undertaking a randomised controlled trial (RCT) with the aim of determining whether planned caesarean section was better than planned vaginal breech birth when a baby presented breech at term. This research, which became known as the Term Breech Trial (TBT), involved 2088 women in 121 centres and 26 different countries. The women were randomised to having a planned caesarean section or planned vaginal breech birth. The inclusion criteria were: a singleton, live fetus; frank or complete breech; and more than 37 weeks gestation. There were 1041 women assigned to planned caesarean section with 941 (90.4%) having a caesarean section. A further 1042 women were assigned to a planned vaginal breech birth and 591 (56.7% of these) had a vaginal breech birth. In all, there were 16 perinatal related mortalities, three in the planned caesarean section group and 13 in the planned vaginal breech birth group. The authors reported that perinatal mortality, neonatal mortality or serious morbidity were significantly lower for the planned caesarean section group (1.6%) than for the planned vaginal breech birth group (5.0%), with a relative risk of 0.33% (95% CI 0.19 to 0.56). They found no difference in serious maternal morbidity or mortality.

RCTs and meta-analyses of RCTs are generally considered to be the gold standard of the evidence that results from scientific research (Keirse, 2012). The RCT can provide a way of testing for causal relationships and also controls for, and measures, pre-intervention differences (Shields & Watson, 2012). It is a valuable research methodology but has some limitations in clinical contexts, the main one being the need to ensure simple protocols for care are consistently followed within the randomised groupings. This is problematic in maternity care, where care pathways are often complex and may require alteration dependent on the clinical picture.

The Impact of the Term Breech Trial

The TBT changed obstetric clinical practice around the world to a degree rarely seen from other individual research studies (Daviss, Johnson, & Lalonde, 2010; Hogle et al., 2003; Rietberg, Elferink-Stinkens, & Visser, 2005). This change occurred rapidly and consistently and was supported by obstetric professional guidelines (American College of Obstetricians and Gynecologists [ACOG], 2006/2016; Royal College of Obstetricians and Gynaecologists

[RCOG], 2006) A review of 80 maternity centres in 23 countries found that the majority (92.5%) had changed practice to planned caesarean section for breech presentation at term as a result of the TBT (Hogle et al., 2003). In Canada, Daviss et al. (2010) surveyed 30 maternity centres (20 responded) and found that there was a marked increase in the number of caesarean sections for term breech presentation following the publication of the TBT. In the Netherlands, the caesarean section rate for singleton term breech presentation increased from 50% in 1998 to 80% in 2001 (Rietberg et al., 2005). Rietberg et al. found that the increase in caesarean section was associated with a significant decrease in the perinatal mortality (from 0.35% to 0.18%). Unfortunately, this change in practice was also associated with increased maternal mortality, with four maternal deaths reported in the Netherlands following elective caesarean section for breech presentation between 2000 and 2002, three of which were due to missed or incorrect prophylactic medications (Schutte et al., 2007). This association has not been found in other studies. Vlemmix et al. (2014) calculated that to avoid one perinatal death, 338 caesarean sections need to be performed.

In Australia and New Zealand, Phipps et al. (2003) surveyed 1284 members of RANZCOG to determine obstetric practice in the management of singleton breech pregnancies. Of the 956 respondents, 696 were practising obstetricians. Of these, 72% reported that they had routinely offered vaginal breech birth for uncomplicated singleton breech pregnancies prior to the TBT. This rate reduced to 20% after publication of the TBT.

The TBT has been heavily critiqued (Glezerman, 2006; Kotaska, 2004, 2007) and a number of other clinical studies have since been published. It is timely to explore the current evidence so that we can identify the gaps in knowledge and determine how the evidence relates to the New Zealand context of maternity care for women faced with a persistent singleton breech presentation at term.

METHOD

We designed this review to answer the questions: what is the current state of the evidence, and what are the professional guidelines around mode of birth for persistent breech presentation at term and how do these fit the New Zealand context? We searched Scopus, PubMed and the Cochrane Database of Systematic Reviews. The search terms used were “breech presentation” and “term”. We limited the time period to papers published after 2000 so that the TBT and subsequent papers could be included. Other limiters were: English language, peer reviewed journals, and studies on humans only. We were looking for publications related to term breech birth outcomes (maternal/neonatal), so excluded papers that discussed management of breech presentation through ECV and alternative therapies such as moxibustion, women’s experiences of breech pregnancies, and pre-term birth.

FINDINGS

A total of 456 articles were identified, of which 170 were related to breech birth and 37 papers were retrieved as being relevant for our search requirements. In order to answer the questions identified in our method, we report specifically on the papers that provided professional commentary (detailed critique of the evidence), clinical studies, systematic reviews, meta-analyses and professional guidelines.

Professional commentary on the TBT

The results of the TBT have been undermined by criticism related to violation of the inclusion/exclusion protocols, lack of informed consent to participate, variations in the standards of care provision, availability of clinicians with adequate expertise,

and availability of immediate resuscitation (Glezerman, 2006; Kotaska, 2007; Lawson, 2012). There was also criticism that some of the cases of perinatal mortality were not related to the mode of birth but to other causes (such as congenital abnormality), with at least two of the cases of mortality occurring at home after discharge from causes unrelated to the birth (Glezerman, 2006). A two-year follow-up of the children involved in the TBT found that planned caesarean section was not associated with a reduction in risk of death or neurodevelopmental delay in children at two years (Whyte et al., 2004).

In a secondary analysis of the TBT, Su et al. (2003) reviewed the timing of the caesarean section and outcomes compared to vaginal breech birth. Multiple regression analysis found that the risk of adverse perinatal outcome was lowest (odds ratio [OR] 0.13) for women who had a pre-labour caesarean section compared to a vaginal breech birth. Intrapartum factors that were significantly associated with adverse perinatal outcomes were: labour augmentation (OR 2.20, 95% CI 1.24 to 3.89), longer duration of active phase of the second stage ≥ 60 minutes (1-30 mins vs. ≥ 60 mins, OR 0.34, 95% CI 0.14 to 0.80) and low birthweight (< 2800 g vs. 2800g to 3500g, OR 2.56, 95% CI 1.38 to 4.73). Having an experienced clinician at the birth was associated with a reduction in adverse perinatal outcome (OR 0.30, 95% CI 0.13 to 0.68). Experienced clinicians were defined as those who considered themselves to be skilled and experienced at vaginal breech birth, confirmed by the Head of Department.

Clinical studies

Since the TBT there has been a number of observational studies reviewing outcomes for breech presentation at term and using either retrospective or prospective data collection (Table 1). The results of these studies are mixed, with some identifying increased risk of neonatal mortality or morbidity (Daskalakis et al., 2007; Golfier et al., 2001; Pradhan, Mohajer, & Deshpande, 2005), and others finding little difference and with safety attributed to strict adherence to criteria/protocols (Al-Inizi, Khayata, Ezimokhai, & Al-Safi, 2005; Alarab et al., 2004; Borbolla Foster, Bagust, Bisits, Holland, & Welsh, 2014; Goffinet et al., 2006; Uotila, Tuimal, & Kirkenen, 2005; Vistad, Cvancarove, Hustad, & Henriksen, 2013).

The majority of these studies were small, with the largest being from the PREsentation et MODE d'Accouchement (PREMODA) study group which described the outcomes for 8105 women according to the planned mode of birth for term breech presentation (Goffinet et al., 2006). This prospective observational study had an intention to treat analysis with data collected from 138 centres in France and 36 centres in Belgium. Caesarean section was planned for 5579 women (69.8%) and vaginal breech birth for 2526 (31.2%). Of the women who planned a vaginal breech birth, 1796 (71%) achieved a vaginal breech birth. The main outcome measure combined fetal and neonatal mortality and severe neonatal morbidity. The rate of the combined neonatal outcome was low, with no demonstrable difference between groups of women (1.59%, 95% CI 1.33 to 1.89 for the general population vs. 1.60%, 95% CI 1.14 to 2.17 for vaginal breech birth). The study had strict criteria for deciding mode of birth, with vaginal breech birth a widespread practice in the study centres. The authors concluded that, in places where planned vaginal breech birth is a common practice and when strict criteria are met (before and during labour), planned vaginal breech birth is a safe option.

One such country is Finland where almost half of all women (48%) with a term breech pregnancy planned to give birth vaginally ($n=4805$) over the decade from 2005-2014. Macharey et al., (2017) conducted a retrospective, population-based, case-control study

to investigate factors associated with adverse perinatal outcome when a woman laboured, planning a vaginal breech birth. Of these women, 3123 (65%) had a vaginal birth and 1682 (35%) had a caesarean section. The rate of composite adverse perinatal outcome was 1.5% ($n=73$), which is significantly lower than that reported in the TBT (5.1%). This study corroborates Su et al.'s (2003) findings of fetal growth restriction as a risk factor (aOR [adjusted odds ratio] 2.94, 95% CI 1.30 to 6.67). The additional risk factors identified were oligohydramnios (aOR 2.94, 95% CI 1.15 to 7.18), history of caesarean section (aOR 2.94, 95% CI 1.28 to 6.77), gestational diabetes (aOR 2.89, 95% CI 1.54 to 5.54), epidural anaesthesia (aOR 2.20, 95% CI 1.29 to 3.75) and nulliparity (aOR 1.84, 95% CI 1.10 to 3.08). The authors note that some of these factors are also linked with increased perinatal risks in the general population.

Systematic reviews and meta-analyses

A Cochrane systematic review of planned caesarean section for term breech birth identified three randomised trials involving 2396 women and babies (Hofmeyr, Hannah, & Lawrie, 2015). The largest contributor of data was the TBT, while the two other RCTs were from the USA in the 1980s (Collea, Chein, & Quilligan, 1980; Gimovsky, Wallace, Schiffrin, & Paul, 1983). Of the women allocated to a planned vaginal breech birth, 550 (45%) had a caesarean section while 1061 (91%) of the 1169 of women allocated to caesarean section underwent a caesarean section. There was significant heterogeneity between the studies and the quality of the evidence ranged from moderate to low, due to blinding not being possible, suboptimal allocation randomisation and study design limitations. Combined data from all three studies showed that planned caesarean section was associated with a modest increase in short term maternal morbidity (RR 1.29, 95% CI 1.03 to 1.61). One study of 1025 women, in which the evidence was graded moderate in quality, showed that perinatal or neonatal death (excluding fatal anomalies) was reduced for women with a planned caesarean section, in settings with a low national perinatal mortality rate (RR 0.07, 95% CI 0.02 to 0.29). One study showed that more infants born by planned caesarean section had medical problems at age two (RR 1.41, 95% CI 1.05 to 1.89); however, the numbers were too small for there to be certainty around the conclusions. The authors concluded that planned caesarean section compared with planned vaginal breech birth reduced perinatal or neonatal death and morbidity but at the expense of a modest increase in maternal morbidity. They conclude that the benefits of caesarean section need to be weighed up with the mother's preferences and with the risks to maternal and longer term child health.

Berhan and Haileamlak (2016) undertook a meta-analysis which included RCTs and observational studies to determine the absolute risk and relative risk of perinatal mortality and morbidity according to planned mode of birth. They examined 27 articles published between 1993 and 2014, with a total sample size of 258,953 women. The included studies were from Europe (20), Australia (2), Asia (2), multi-country (1), United States of America (1) and Trinidad (1). Of the 27 studies, 17 concluded that vaginal breech birth was an acceptable option if there were strict selection criteria. The other 10 studies concluded that routine elective caesarean section was a safer option. The meta-analysis found that the absolute risk of perinatal mortality was 0.3% or 1 in 333 babies for planned vaginal breech birth, compared to 0.05% or 1 in 2000 for planned caesarean section. Considering planned vaginal breech birth and planned caesarean section respectively, the risk of fetal neurological morbidity was 0.7% compared with 0.1%, birth

Table 1: Studies reviewing mode of birth and outcome for term breech presentation

Year	Authors	Title	Study type & population	Country	Findings	Conclusion
2001	Golfier, F., Vaudoyer, F., Ecochard, R., Champion, F., Audra, P., Raudrant, D.	Planned vaginal delivery versus elective caesarean section in singleton term breech presentation: A study of 1116 cases	Retrospective review of 1116 women with breech presentation from 1991-1995	France	702 (62.9%) C/S pre labour 414 (37.1%) planned vaginal birth 72 (6.5%) C/S 342 (30.6%) vaginal birth 2 perinatal deaths in vaginal group; 0 in C/S group.	Vaginal birth increases risk of mortality and morbidity.
2004	Alarab, M., Regan, C., O'Connell, M. P., Keane, D. P., O'Herlihy, C., Foley, M. E.	Singleton vaginal breech delivery at term: Still a safe option	Retrospective review of 641 women from 1997-2000	Ireland	343 (54%) C/S 298 (46%) trial of vaginal birth; 146 gave birth vaginally. No perinatal mortality or major morbidity. Strict criteria for vaginal birth.	Safe vaginal breech birth can be achieved with strict selection criteria, adherence to careful intrapartum protocol and with an experienced obstetrician in attendance.
2005	Al-Inizi, S. A., Khayata, G., Ezimokhai, M., Al-Safi, W.	Planned vaginal delivery of term breech remains an option – result of eight years experience at a single centre	Retrospective review of 299 women from 1996-2003	United Arab Emirates	96 (32.1%) vaginal birth 203 (67.9%) C/S Increased incidence in C/S in last 2 years of study. No difference in perinatal mortality	Planned vaginal delivery is associated with no significant adverse perinatal outcome and remains an option for selected women with term breech presentation
2005	Uofila, J., Tuimala, R., Kirkenen, P.	Good perinatal outcome in selective vaginal breech delivery at term	Retrospective review of 986 women from 1995-2002	Finland	396 elective C/S 590 planned vaginal births, of whom 455 had vaginal birth and 135 C/S No birth-related perinatal mortality and no significant difference in morbidity	Selective vaginal breech deliveries may be safely undertaken in units having a tradition of vaginal breech deliveries
2005	Pradhan, P., Mohajer, M., Deshpande, S.	Outcome of term breech births: 10-year experience at a district general hospital	Retrospective review of 1433 women from 1991-2000	England	881 (61.5%) vaginal birth 552 (38.5%) C/S pre labour 416 (29.1% vaginal birth and 465 (32.4%) C/S during labour 4 intrapartum deaths (1 lethal anomaly) Small increased risk of perinatal death and short-term morbidity for vaginal birth	Vaginal breech delivery or C/S in labour was associated with a small but unequivocal increase in the short-term mortality and morbidity. The long-term outcome was not influenced by the mode of delivery
2006	Goffinet, F., Carayol, M., Foidart, J.M., Alexander, S., Uzan, S., Subtil, D., Breart, G., for the PREMODA study group	Is planned vaginal delivery for breech presentation at term still an option? Results of an observational prospective survey in France and Belgium	Observational prospective with intent to treat analysis. 138 French and 36 Belgian maternity units involving 8105 women from 2001-2002	France & Belgium	5579 (68.8%) planned C/S; 2526 planned vaginal birth, of whom 1796 (71%) delivered vaginally. The rate of combined neonatal outcome (aggregate of adverse perinatal outcomes) measured 1.59% overall and 1.60% in the planned vaginal birth.	Planned vaginal birth is a safe option in places where it is a common practice, and strict criteria are met before and during labour and birth.
2007	Daskalakis, G., Anastasakis, E., Papantoniou, N., Mesogitis, S., Thomakos, N., Antsaklis, A.	Cesarean vs. vaginal birth for term breech presentation in 2 different study periods	Retrospective review of 1552 women from 1988-2000 and a further 502 women from 2001-2004	Greece	Significant difference in morbidity found in first study period, only a reduction in rate of admission to NICU found in second study period. Change in policy did not improve neonatal outcome	Planned C/S was found to be safer than planned vaginal delivery for breech presentation. The change in policy did not demonstrate improved neonatal outcome
2013	Vistad, I., Cvancarove, M., Hustad, B., Henriksen, T.	Vaginal breech delivery: Results of a prospective registration study	Prospective study of 568 women from 2001-2011	Norway	279 (49%) planned C/S 289 (51%) planned vaginal birth 104 (36.3%) C/S during labour No neonatal deaths, increased short-term morbidity but not long-term morbidity. Strict guidelines in place. Increased blood loss for women with C/S	Strict guidelines in place and followed in all cases. There were no neonatal deaths but two infants had serious neonatal morbidity in planned vaginal group without long-term sequelae.
2014	Borbolla Foster, A., Bagust, A., Bisits, A., Holland, M., Welsh, A.	Lessons to be learnt in managing the breech presentation at term: An 11-year single-centre retrospective study	Retrospective study. 243 women (31.7%) were eligible for planned vaginal breech birth, of whom 58% achieved a vaginal breech birth.	Australia	No perinatal or maternal mortality. Morbidity rates were low and compare favourably with similar studies. There was a non-significant trend towards higher rates of serious short-term neonatal and maternal morbidity in the planned vaginal birth group compared to planned C/S (1.6 vs. 0.4% and 8.2 vs. 4.8% respectively).	Attempted vaginal birth for breech presentation remains an option for carefully selected women under strict protocols.

trauma 0.7% compared with 0.17, 5 minute Apgar score of <7 was 2.4% versus 0.3% and neonatal asphyxia 3.3% versus 0.6%. The authors acknowledge that the relative risks are higher for vaginal birth than caesarean section for breech. However, they focus on the low absolute risks and argue that vaginal breech birth may have comparable safety to that of a vaginal cephalic birth when compared to statistics from a World Health Organization multi-centre study (Villar et al., 2007). They conclude that the evidence isn't strong enough to abandon vaginal breech birth completely and they advocate individualised decision making.

Professional guidelines

Professional guidelines related to breech birth from Australia/New Zealand, the United Kingdom, Canada and the USA were examined to identify similarities and differences in recommendations (Table 2). We did not find any midwifery professional guidelines on breech presentation at term. All of the guidelines examined state that there is an increase in perinatal mortality with vaginal breech birth compared with planned caesarean section. The differing tone and focus between the guidelines appear to be related to

interpretation of the evidence, tolerance of risk levels and whether other outcomes, such as the risks to the mother of caesarean section and risks to future pregnancies, are given importance when considering the same research evidence. This may be reflective of the culture of obstetric care within these countries. The guidelines are discussed from the most to the least recent.

The RCOG guideline "Management of Breech Presentation" considers both term and preterm breech presentations (Impey, Murphy, Griffiths, & Penna, on behalf of the RCOG, 2017). It accords weight to full discussion of both options for birth when a woman has a persistent breech presentation at term. This includes benefits and risks of both caesarean section and planned vaginal breech birth, stating:

Women should be informed that planned caesarean section leads to a small reduction in perinatal mortality compared with planned vaginal breech delivery. Any decision to perform a caesarean section needs to be balanced against the potential adverse consequences that may result from this. (RCOG, 2017, p.2)

Table 2: Recommendations from professional groups

Royal College of Obstetricians and Gynaecologists (Green-top Guideline No. 20b, 2017)

- Women should be informed of the benefits and risks, both for the current and for future pregnancies, of planned caesarean section versus planned vaginal birth for breech presentation at term.
- Women should be informed that planned caesarean section leads to a small reduction in perinatal mortality compared with planned vaginal birth for breech presentation. A decision for caesarean needs to be balanced against the potential adverse consequences that may result from this.
- Selection of appropriate pregnancies and skilled intrapartum care may allow planned vaginal breech birth to be nearly as safe as planned vaginal cephalic birth.
- Clinicians should counsel women in an unbiased way that ensures a proper understanding of the absolute as well as relative risks of their different options.
- Women should be advised that successful vaginal birth has the lowest rate of maternal complications; planned caesarean section for breech presentation carries a small increase in immediate maternal complications; emergency caesarean carries a higher risk of maternal complications than elective caesarean and that there is a 40% chance of caesarean section when vaginal birth is planned.
- Women should be advised that planned caesarean section for breech presentation does not carry any additional risk to long-term health outside pregnancy.
- Women should be advised that caesarean section has been associated with a small increase in the risk of stillbirth for subsequent babies although this may not be causal.

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2016)

- Where there is maternal preference for vaginal birth, the woman should be counselled about the risks and benefits of planned vaginal breech delivery in the intended location and clinical situation.
- Planned vaginal breech delivery must take place in a facility where appropriate experience and infrastructure are available:
 - Continuous fetal heart monitoring in labour.
 - Immediate availability of caesarean facilities.
 - Availability of a suitably experienced obstetrician to manage the delivery, with arrangements in place to manage shift changes and fatigue arrangements.

When breech presentation is first recognised in labour, the obstetrician should discuss the options of emergency caesarean section or proceeding with attempted vaginal breech birth with the woman, explaining the respective risks and benefits of each option according to her individual circumstances. Wherever practicable, point-of-care ultrasound should be performed when breech presentation is first diagnosed in labour.

American College of Obstetricians and Gynecologists' Committee on Obstetric Practice. (Number 340, 2006; reaffirmed 2016)

- The decision regarding the mode of delivery should depend on the experience of the health care provider. Caesarean delivery will be the preferred mode of delivery for most physicians because of the diminishing expertise in vaginal breech delivery.
- Obstetricians should offer and perform external cephalic version whenever possible.
- Planned vaginal delivery of a term singleton breech fetus may be reasonable under hospital-specific protocol guidelines for both eligibility and labor management.
- In those instances in which breech vaginal deliveries are pursued, great caution should be exercised, and detailed patient informed consent should be documented.

Before embarking on a plan for a vaginal breech delivery, women should be informed that the risk of perinatal or neonatal mortality or short-term serious neonatal morbidity may be higher than if a cesarean delivery is planned.

Society of Obstetricians and Gynaecologists of Canada (Clinical Practice Guideline, 2009)

Summary Statements:

- Vaginal breech birth can be associated with a higher risk of perinatal mortality and short-term neonatal morbidity than elective Caesarean section.
- Careful case selection and labour management in a modern obstetrical setting may achieve a level of safety similar to elective Caesarean section.
- Planned vaginal delivery is reasonable in selected women with a term singleton breech fetus.
- With careful case selection and labour management, perinatal mortality occurs in approximately 2 per 1000 births and serious short-term neonatal morbidity in approximately 2% of breech infants. Many recent retrospective and prospective reports of vaginal breech delivery that follow specific protocols have noted excellent neonatal outcomes.

Long-term neurological infant outcomes do not differ by planned mode of delivery even in the presence of serious short-term neonatal morbidity.

Throughout the literature, commentary is increasingly appearing about whether the appropriate comparison to make is between caesarean section and vaginal birth for breech presenting babies, or whether studies should be comparing outcomes for vaginally born breech babies compared to vaginally born cephalic babies. This is reflected in the RCOG guideline:

Women should be informed that when planning delivery for a breech baby, the risk of perinatal mortality is approximately 0.5/1000 with caesarean section after 39+0 weeks of gestation; and approximately 2.0/1000 with planned vaginal breech birth. This compares to approximately 1.0/1000 with planned cephalic birth. (RCOG, 2017, p.2)

The RCOG guideline states that "Selection of appropriate pregnancies and skilled intrapartum care may allow planned vaginal breech birth to be nearly as safe as planned vaginal cephalic birth" (p.2). It continues that women should be told of the benefits and risks for both the current pregnancy and further pregnancies of planned caesarean section and that there should be careful case selection and intrapartum management.

The RANZCOG guideline "Management of Breech Presentation at Term" identifies commentary from research papers and editorials that recommend caesarean section (RANZCOG, 2016). However, it also recognises the possibility that a woman may choose to have a vaginal breech birth and if this is the case she should be counselled about the risks and benefits of vaginal birth. The RANZCOG guideline does not state that a discussion about the risks and benefits of caesarean section should take place. Further recommendations are that vaginal breech birth must occur in a facility where there is infrastructure for caesarean section and that staff with appropriate experience are available throughout labour.

The ACOG Committee Opinion, "Mode of Term Singleton Breech Delivery", states that the decision on mode of birth depends on the experience of the healthcare provider and that many obstetricians may prefer caesarean section as they have diminishing expertise with vaginal breech birth (ACOG, 2006/2016). Having said this, ACOG also identifies that planned vaginal breech birth may be reasonable if attempted under a hospital specific protocol and advises careful case selection and protocols during the birth.

The Society of Obstetricians and Gynaecologists of Canada (SOGC) has entitled its guideline "Vaginal Delivery of Breech Presentation", with a particular focus on this mode of breech birth (SOGC, 2009). SOGC states that planned vaginal breech birth is a reasonable option to offer to carefully selected women, adding that, with this provision as well as labour management in a modern obstetric setting, there is the potential to achieve a level of safety similar to elective caesarean section.

The New Zealand Guidelines Group was a multidisciplinary group that produced a national guideline on the management of breech presentation at term in 2004 but this has since been withdrawn and not replaced, for unknown reasons.

Despite the differences in tone and focus there are some similarities in the recommendations made by each of these professional bodies. Each now reflects more overt support than earlier versions (although very cautious) for women who choose to have a vaginal breech birth and several recommend discussing the risks of caesarean section for the woman and the baby, both long and short term, as well as the risks of vaginal breech birth. All guidelines recommend selection criteria and labour protocols (Table 3) in an attempt to reduce the risks associated with vaginal breech birth.

Table 3: Factors commonly identified as important for a "safe" singleton vaginal breech birth at term

Prior to birth

Fetal size: Estimated fetal weight more than 2500g and less than 3800g-4000g
Flexed fetal head: absence of hyperextension of the fetal head
Flexed (complete) or extended (frank) breech
No signs of oligohydramnios or intrauterine growth restriction
No previous uterine scar and no other obstetric complications/contraindications
Maternal preference

During labour and birth

Experienced clinician
Spontaneous labour onset
Good labour progress
No ARM or augmentation

DISCUSSION

The aims of this paper were to review the research evidence and international professional guidelines about vaginal breech birth at term, identify the current evidence and gaps in knowledge and highlight how the evidence can be used to support women in New Zealand. Since the publication of the TBT there have been major changes in obstetric clinical practice globally, with caesarean section becoming the prevalent mode of birth for persistent breech presentation. Subsequent critiques have identified many issues within the TBT, making the evidence less reliable than initially thought. In addition, subsequent studies and systematic reviews have identified lower perinatal mortality and morbidity rates than those reported by the TBT. Many professional guidelines are now advising that women be fully informed of the risks as they relate to both vaginal breech birth and caesarean section.

The New Zealand context

In New Zealand maternity care providers are required by the Code of Health and Disability Services Consumers' Rights (the Code) to provide full and unbiased information about the health condition and the risks and benefits of all relevant treatment or management options (Health and Disability Commissioner, 1996). For women who have a diagnosed persistent breech presentation at term, this means providing information on the risks and benefits of both caesarean section and vaginal breech birth for both the woman and her baby. Women have the right to decline treatment, which, in this case, would be caesarean section.

Women need to have information presented in ways that support them to determine the optimal mode of birth for their circumstances. Sackett, Rosenberg, Gray, Haynes, and Richardson (1996) define evidence based practice as the integration of research evidence with the woman's preferences alongside the clinician's expertise – all of which can support the woman to determine the optimal course of action to meet her individual circumstances.

In New Zealand, most women receive antepartum, intrapartum and postpartum care from a lead maternity carer (LMC) who is nearly always a midwife. When a breech presentation is diagnosed, whether antenatally or in labour, the Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines) require the LMC midwife to recommend to the woman that a consultation with a specialist obstetrician is warranted (Ministry of Health, 2012). The duties to provide full and unbiased information set out in the Code apply to all clinicians who support a woman in her decision making.

Risk and safety

Women need to be informed of potential harms and benefits in specific terms, which they can relate to themselves, their context and their clinical situation, and in absolute risk terms rather than relative risk terms (Powell, Walker, & Barrett, 2015). In addition, women may perceive risk differently to that of the clinician, with a variety of other factors influencing women's decision making. When women are provided with options and supported in their decision making they report positive breech birth experiences, regardless of the type of breech birth (Toivonen, Palomaki, Huhtala, & Uotila, 2014).

Risk in healthcare is seen as simple and linear, yet healthcare provision is frequently unpredictable and messy (Nieuwenhuijze et al., 2015). There are often unintended consequences, which may not be limited to the physical but also involve the psychological, emotional and social, and which may have a long-term impact on the woman's quality of life. Risk-averse healthcare can depersonalise care provision and support a reliance on rule-based, protocol-driven care. Explaining risk is often difficult and likely to be influenced by the health professional's perceptions of risk and previous experiences, whilst the woman's decisions are more frequently based on her own personal fears and values (Healy, Humphreys, & Kennedy, 2016).

An alternative discourse to risk is that of safety, with the discussion focused not only on the chances of harm but on what can be done to support a safe outcome for the woman and her baby. This would include consideration of the physical, psychological and social benefits and harms for each course of action, individualised to the woman's health and that of her baby.

Benefits and harms of planned caesarean section

The main reason/benefit for offering an elective caesarean section for persistent breech presentation at term is the reduction in perinatal mortality. Reduction in mortality occurs for two reasons: the earlier gestation at which a caesarean section is performed and the reduced risk of hypoxia caused by potential complications during a vaginal birth (Pasupathy, Wood, Pell, Fleming, & Smith, 2009). Only the latter is specific to breech presenting babies. Other potential benefits that women may consider important are the ability to plan the date of birth (knowing that labour may spontaneously occur prior) and a reduced risk of perineal trauma, although these are not specific to breech presentations.

Women who are considering mode of birth for a breech presenting baby have the right to full information about not just the potential benefits but also the potential harms of the proposed treatment. Whilst maternal death following caesarean section is an extreme and rare event in developed countries, longer-term morbidity following caesarean section was found by Liu et al. (2007) to be higher following caesarean section births (27.3 per 1000) than vaginal births (9.0 per 1000 births). In order to assess the risks of caesarean compared to vaginal birth for an otherwise low-risk population, the researchers conducted a large, retrospective, population-based, cohort study of data from a 14-year period to compare the morbidity of 46,776 women who had a planned caesarean section, where breech presentation was the only indication, with 2,292,420 who were low risk (not breech presentation) and planned a vaginal birth. They identified increased risk of cardiac arrest, wound haematoma, hysterectomy, major puerperal infection, anaesthetic complications, venous thromboembolism, haemorrhage and a longer hospital stay for planned caesarean section. Having a caesarean section increases

the likelihood of caesarean sections for future births. Serious complications become more common with repeated caesarean sections (RCOG, 2015), including uterine rupture and placental implantation problems (MacDorman, Menacker, & Declercq, 2008). An analysis in the USA found rates of placenta accreta increase incrementally with every subsequent caesarean section, from 0.24% with a first caesarean section to 6.74% with a sixth or subsequent caesarean section (Silver et al., 2006).

For the neonate born breech there is an increased risk of admission to a neonatal intensive care unit (NICU) in the short term, following both caesarean section and vaginal breech birth (Blustein & Liu, 2015). Short-term complications following caesarean section include temporary breathing difficulties, and the baby may receive a cut (usually minor) during the operation (RCOG, 2015). The two-year follow-up of the TBT found that 20.8% of parents in the planned caesarean section group reported medical problems with their baby, compared to 14.8% of parents whose baby was born by vaginal breech birth (Whyte et al., 2004). Other studies exploring caesarean sections have reported more upper respiratory, gastrointestinal, ear, skin and allergy issues and there is some evidence indicating a latent risk of chronic disease such as type 1 diabetes, obesity and asthma (Blustein & Liu, 2015). Hyde, Mostyn, Modi, and Kemp (2012) suggest that the stress response that occurs during labour and a vaginal birth may be a key mechanism affecting the long-term health of the child. Stress would appear to modify the differentiation of a number of cell types during labour and birth and following the birth. This concept has led to the EPIgenetic Impact of Childbirth (EPIIC) hypothesis, which argues that interventions such as caesarean section during the intrapartum period may affect the "physiological remodelling processes through DNA methylation" and subsequent health of both mother and baby (Dahlen, Downe, Kennedy, & Foureur, 2014, p. 1150). A list of harms and benefits identified by the literature is provided in Table 4.

Several large, retrospective, cohort studies indicate that, irrespective of how a woman births in a subsequent pregnancy, after caesarean section her subsequent baby is at higher risk of stillbirth and neonatal death after adjusting for potential confounders (Huang et al., 2011; O'Neill et al., 2013; Salihu, Bowen, Wilson, & Marty, 2011). Prospective trials are needed to investigate this association. O'Neill et al.'s (2013) findings were disputed when multivariate analysis was used to investigate possible residual confounding variables (Walker, Scamell, & Parker, 2016; Wood, Ross, & Sauve, 2015).

Benefits and potential harms of planned vaginal breech birth

The benefits for the woman of planning a vaginal breech birth include shorter postnatal recovery and reduced incidence of serious maternal morbidity. Second and subsequent labours are shorter than a first labour and birth (Vahratian, Hoffman, Troendle, & Zhang, 2006) and are lower risk due to the absence of a uterine scar. Risks of planned vaginal birth for the woman are not specific to breech presentation and include emergency caesarean section in labour, perineal trauma and increased rates of pelvic floor dysfunction compared to caesarean section (Memon & Handa, 2012).

Finnish data suggests that risk factors for adverse perinatal outcome include fetal growth restriction, oligohydramnios, a history of caesarean section, gestational diabetes and nulliparity (Macharey et al., 2017). These are all factors which are known in advance of labour and could therefore be taken into account in prenatal counselling and decision making. In addition, avoiding

Table 4: Benefits and harms of vaginal and caesarean section as modes of birth

Planned vaginal birth	Maternal health	Baby's health
Benefits	Quicker recovery following the birth Future labours shorter and risks lower	Better longer-term health
Harms	May need emergency caesarean section Potential for perineal trauma	Risk of fetal death (2 per 1000 for planned vaginal breech birth compared to 1 per 1000 for planned cephalic birth (Impey et al., 2017) Birth trauma (e.g. brachial plexus injury) (0.7%) Low Apgar (<7 at 5 min) (2.4%) Admission to NICU (3%) Neonatal asphyxia (3.3%) Neurological morbidity (0.7%) No difference in longer-term health (Berhan & Haileamlak, 2016)
Planned caesarean section	Maternal health	Baby's health
Benefits	Ability to plan date/time of birth No risk of perineal trauma	Reduced risk, perinatal mortality 0.5 per 1000 births if caesarean section after 39th week
Harms	Increased risk of <ul style="list-style-type: none"> • Infections • Blood clots • Haemorrhage Need for further caesarean sections which then increases risk of: <ul style="list-style-type: none"> • Risk of uterine/scar rupture (0.5%) • Placental praevia • Morbid placental adherence (0.3% to 2.33% dependent on number of caesareans woman has) • Haemorrhage • Hysterectomy • Urinary tract injury • Maternal death Potential increased risk of <ul style="list-style-type: none"> • Future stillbirth (0.4%) 	Increased risk of: <ul style="list-style-type: none"> • Cut to the baby's skin during operation (1-2%) • Temporary breathing difficulties • Admission to NICU Potential for increased risk of chronic Immune disorders (e.g. asthma), obesity and diabetes

epidural anaesthesia (Macharey et al., 2017), labour augmentation and prolonged second stage, and having an experienced clinician at the birth (Su et al., 2003), are likely to minimise risks associated with vaginal breech birth.

Having a skilled practitioner attending vaginal breech births to minimise risk to the baby is a standard recommendation. Unfortunately, in many countries, including New Zealand, obstetricians and midwives have been unable to maintain experience or build the skills needed to support vaginal breech birth with confidence (Walker et al., 2016) due to its low prevalence (RANZCOG, 2016). Thus, the ability for a woman to access a practitioner experienced with vaginal breech birth has decreased. New Zealand midwives have been taught breech birthing skills in basic or undergraduate midwifery education since the registration of midwives, and the knowledge and skills have been a component of mandatory recertification since 2004 (Midwifery Council of New Zealand, 2014). This has ensured that, when a woman who is otherwise low risk and birthing outside a hospital setting has a surprise breech presentation in labour, midwives have the knowledge and skills to support that woman. However, in practice, this may not translate to experience when it comes to planning a labour and vaginal birth when the breech is diagnosed during pregnancy.

Another issue that requires consideration for women when planning a vaginal breech birth is the risk that they may still have a caesarean section (which would be classified as an emergency caesarean section) either before or during labour. Roman et al. (2008) explored the prenatal determinants that were predictive of caesarean section during labour and found that, if vaginal breech birth is planned, the risk of caesarean section during labour varied from 17% to 50%. These authors found that success of vaginal breech birth depends on the progress of labour, along with parity (nulliparity increases risk of caesarean section), the type of breech presentation, macrosomia, fetal biparietal diameter (increasing

diameter was positively correlated with a higher risk) and pre-labour rupture of membranes. Emergency caesarean sections are associated with higher rates of complications than pre-labour caesarean sections (Bergholt, Stenderup, Vedsted-Jakobsen, Helm, & Lenstrup, 2003; Su et al., 2003) and women labouring with breech babies have a higher chance of caesarean section in labour than those with cephalic babies.

For the baby, planned vaginal breech birth increases the risk of birth trauma (such as brachial plexus injury), a low Apgar score (<7) at 5 minutes, NICU admission, neonatal asphyxia and neurological morbidity (Berhan & Haileamlak, 2016). However, the TBT found that morbidity was short-term and there was no difference at the two-year follow-up between breech babies born vaginally or by caesarean section (Whyte et al., 2004). Other studies have found that the risk of fetal morbidity increased if the mother was older than 35 years (Pasupathy et al., 2009) or the baby was less than 39 weeks at birth, or had a birthweight under the 10th percentile (Azria et al., 2012).

Clearly, as Berhan and Haileamlak (2016) state, for women with a breech presentation at term, both vaginal breech birth and elective caesarean section carry some risk. Ultimately, the woman has the right to refuse a caesarean section and so it is important that New Zealand maternity service providers have the skills to support her in either option.

STRENGTHS AND WEAKNESSES

This is the first published review of the current knowledge and evidence related to breech presentation at term, as relevant to the New Zealand context. Specifically, given the patient-centred legal framework in New Zealand, the review takes a holistic approach to the evidence. New Zealand has more detailed requirements in the Code than other countries have in their common law. This arguably justifies providing women with a wider range of information and is the reason for the inclusion here of a broader range of sources

than just RCTs. However, there are minimal research data that are specific to New Zealand, so the majority of data in this paper have been sourced from other similar countries. Furthermore, the sources included here have not been graded for quality of evidence, although this has been undertaken in the RCOG (2017) and SOGC (2009) professional guidelines and the Cochrane Review (Hofmeyr, Hannah, & Lawrie, 2015) included in this paper. Finally, this paper does not address the growing literature about women's experiences of their maternity care in the later stages of breech pregnancies (Petrovska, Watts, Catling, Bisits, & Homer, 2017).

CONCLUSION

This paper has reviewed the evidence regarding the outcomes related to planned mode of birth for breech presentation at term. Following publication of the TBT there has been a major change in clinical practice and most women with a breech presentation at term are now advised to have a planned caesarean section. Subsequent critiques and reviews have identified concerns with the TBT which undermine the reliability of the trial's evidence. Further retrospective and prospective studies have demonstrated equivocal results and suggest that perinatal mortality can be reduced when strict criteria and an experienced clinician are involved. Professional guidelines now advise that offering women the option of a vaginal breech birth is reasonable. Women in New Zealand need to know the physical, psychological and social benefits and harms of both caesarean section and vaginal breech birth to support their decision making.

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Accepted for Publication January 2018

Dixon, L., Gray, E., MacDonald, C., Gullam, J., & Powell, R. (2018). Singleton breech presentation at term: Review of the evidence and international guidelines for application to the New Zealand context. *New Zealand College of Midwives Journal*, 54, 5-14.

<https://doi.org/10.12784/nzcomjnl54.2018.1.5-14>

NEW ZEALAND RESEARCH

Pasifika women's choice of birthplace

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ABSTRACT

Background: Birth is a socially constructed experience for Pasifika living in New Zealand that is shaped by their community and maternity provider's influences. Pasifika women in the Counties Manukau region predominantly choose to birth in a tertiary facility despite there being primary facilities available.

Aim: This study asked Pasifika women about their choices for place of birth within the Counties Manukau District Health Board region.

Method: Six healthy, low risk Pasifika women, who had given birth in the Counties Manukau District Health Board region, participated in this study. All women were interviewed individually and conversations were analysed using thematic analysis, followed by a hermeneutic interpretation.

Findings: The women shared a culture of "we birth at Middlemore [Hospital] and that is where you have babies". Their data surprised us as researchers. Those who had been transferred postnatally to primary units tended to still prefer Middlemore. We use the word "prejudice" in recognising that we thought (backed by research evidence) that they would be more likely to have a normal birth in a primary unit, and would prefer that experience. They told us that Middlemore Hospital was close to home; it was a place they knew; and it was where they preferred to give birth.

The Pasifika women's understanding of choice of birthplace was influenced by their community and, perhaps, by their midwife. While they seemed to have minimal understanding of why they would choose to birth at a primary birthing unit, there was a sense that even if they had this knowledge, they would not have changed their minds. They had a trust of, and familiarity with, Middlemore Hospital that held firm. They had their prejudice; we had ours. Recognising these different views offers a different space for conversation.

Conclusion: It is important that any new or re-designed birthing unit be planned in collaboration with Pasifika women if it is intended for their use. Further, it is important that midwives take the time to listen to Pasifika women, and those from other cultures, to understand their point of view.

Keywords: Pasifika women, maternity care system, New Zealand, Pasifika culture, place of birth

INTRODUCTION

The collective memory of the research team, of the time they have been working as midwives in South Auckland, dates back to the 1970s. We have long been struck by the paradox that the majority of Pasifika women chose to birth in a tertiary hospital (Ministry of Health, 2015). We have observed the natural ease with which so many Pasifika women give birth. It is likely that they have their own stories, or those of recent generations, of birthing in their home countries without ready access to technology. That they choose to birth at the tertiary hospital (Middlemore Hospital) in preference to a more homely primary unit appears incongruous. This research study provided the opportunity for six Pasifika women to talk about what influenced their choice to birth in Middlemore Hospital, the tertiary unit within their community. The research question was: why do low risk Pasifika women in the Counties Manukau District Health Board (CMDHB) region not birth at a midwifery-led primary birthing unit? By "low risk" we mean those women who would meet the criteria to book at a primary unit. This is a small qualitative study in which we bring a

hermeneutic lens to the data and in which questions are raised to provoke ongoing exploration.

Experiences of Pasifika women giving birth in New Zealand

Pasifika women have one of the highest birth rates in New Zealand, there being 92 births per 1,000 women of reproductive age compared to 54 births per 1,000 among Europeans (Ministry of Health, 2015). Pasifika are also the group with the highest fertility rate (Statistics New Zealand, 2013). Pasifika women giving birth are more likely to live in a socio-economically deprived area (Ministry of Health, 2015). Nationally, Pasifika (34.1%) and Māori women (42.9%) are more likely to have a physiological birth (requiring no medical intervention) when compared to Indian (19%), Asian (25.5%) or European and other ethnic groups (31.3%), exclusive of risk status (Ministry of Health, 2015). A retrospective study on a cohort of low risk women, who met guidelines to birth at primary birthing units in CMDHB in 2011-2012, found that only 10% of the study's Pasifika women started their labour at a

primary birthing unit (Farry, 2015). The CMDHB provides care for the country's most fecund population (Ministry of Health, 2015) and, in the past decade, 32% of babies in this population have been born to Pasifika mothers (Jackson, 2011; Paterson et al., 2012). The options of place of birth for women in the region include Middlemore Hospital (a tertiary unit) and three primary units: Botany Downs, Papakura and Pukekohe. There is strong evidence that, for low risk women, giving birth in a primary unit is as safe as in a large obstetric hospital (Farry, 2015).

The importance of making the choice of where to birth has been revealed in the overwhelming evidence concluding that, for women who do not have defined risk factors, birth outside of large, obstetric hospitals is safer (Birthplace in England Collaborative Group, 2011; Davis et al., 2011; Farry, 2015; Overgaard, Møller, Fenger-Grøn, Knudsen, & Sandall, 2011). Low risk women birthing in any one of CMDHB's three primary units had significantly lower odds of experiencing an emergency caesarean section, a postpartum haemorrhage, or an acute postpartum admission than those women giving birth in the tertiary unit (Farry, 2015). The babies in this study born to women at primary units had lower odds of a 5-minute APGAR score of less than 7 or an acute neonatal admission than babies born in the tertiary unit. With the existence of primary units, a woman-centred midwifery workforce providing continuity of care, and local, national and international data all concluding that a primary birthing experience has superior outcomes, why do low risk Pasifika women choose an obstetric hospital for their birthplace?

Exploring birthplace preferences requires researchers to identify the underlying assumptions influencing women. The plethora of qualitative research in this area has returned a wide range of results. Beliefs about childbirth, level of education, socio-economic background, the media discourse, women's partners, fear of intrapartum transfer, previous birth experiences, the midwife's philosophy, a woman's "sense of coherence", and her cultural norms all contribute to their place-for-birthing choices (Barber, Rogers, & Marsh, 2006; Bedwell, Houghton, Richens, & Lavender, 2011; Coxon, Sandall, & Fulop, 2015; Gottfredsdóttir, Magnúsdóttir, & Hálfhánsdóttir, 2015; Grigg, Tracy, Schmied, Monk, & Tracy, 2015; Hildingsson, 2017; Steel, Adams, Frawley, Broom, & Sibbritt, 2015). The socio-demographic background often determines which birth options are available to women (Liamputtong, 2004; Zadoroznyj, 1999).

To date, little is known about the reasons for Pasifika women's strong preference for hospital births or about their general experience of birth in New Zealand. The current study aims to explore the perspective about preferences for place of birth with a small number of women of Pasifika ethnicity within the CMDHB region.

Study design

A qualitative, descriptive approach was used for the data collection of this research. This approach was useful in facilitating the process of eliciting stories, providing insight into the views and needs of participants in relation to place of birth. However, as we began to work with the data, it became clear that a more interpretive level of analysis would draw forth a different kind of thinking. Thus, a hermeneutic hue (Sandelowski, 2000) was brought to the analysis phase of the research, in that we were now asking, "what is the meaning being revealed?" and "what are the questions that need ongoing thought?" (Smythe, Ironside, Sims, Swenson, & Spence, 2008). Gadamer, a philosopher in the field of hermeneutics, explains the way of hermeneutics:

Challenged by something not understood or not understandable, hermeneutics is brought onto the path of questioning and is required to understand. In this process one never has some advance lordship over all meaningfulness. Instead, one is answering an always self-renewing challenge (Gadamer, 2007, p.363).

On first reading, the data of this study are easily understood. On second and subsequent readings, one is called to wonder what one does not yet understand, which brings forth questions rather than answers. Such is the hermeneutic way (van Manen, 1990).

Recruitment

The researchers used their networks to identify potential participants and provide them directly with information about the study. When the women agreed to participate, they were contacted by one of the two Pasifika members of the research team to further discuss, gain verbal consent and set up a date and time for the interview. At the beginning of the interview, the researchers took time to explain again the purpose of the study and at that point the consent form was signed. There was an opportunity for the woman, after discussing the study with the researchers, to choose not to participate in the research. There was no funding for an interpreter, so, although the interviewers were able to communicate in other Pasifika languages, the expectation was that all interviews would be conducted in English. For participants to be included in the study, they needed to identify as Pasifika, to have had a baby in the past 12 months, and to mirror the criteria that qualified these women to have birthed in a primary birthing unit.

Data collection

Interviews were semi-structured and used open-ended questions, so that participants could share their views and tell their stories about why they chose to birth in a particular place. The questions began with: "Tell me where you had your baby. Why there?" The interviews took between 30-90 minutes and were audio-taped with the permission of the research participants. The interviews were transcribed verbatim.

Data analysis

The initial phase of the analysis was carried out as per Sandelowski (2010). The transcripts were first read and emerging ideas colour coded by one member of the team. These ideas and their colour coding were checked by another member. A coding tree was then created with the appropriate data linked to each code. This coding facilitated the emergence of patterns in the data leading to themes. It was when the data were presented in themes that we recognised it was just as important to highlight what was not being said, then to articulate the questions prompted by the data and, thus, to engage in a process of interpretive thinking (hermeneutics). The findings presented go beyond the original aim of the study which was focused on the woman's choice of place of birth. We came to realise we needed to situate their answers, as they did, against a broader background of understanding.

Ethics

Ethical approval for the study was granted by the Auckland University of Technology ethics committee (AUTEC) in 2015. Confidentiality was maintained by the use of pseudonyms. Women were free to withdraw from the study at any time, or to have their data removed, up to 14 days following the interview.

FINDINGS

Six women agreed to be interviewed, all were of Pasifika ethnicity. Four were born in New Zealand. Three participants were having a first baby, one a third and two a fourth.

Choice about place of birth for Pasifika women

The prompt for this research was a sense that Pasifika women have an understanding of birth that enables them to birth normally. This was affirmed by this participant who showed how she expected her births to be straightforward:

Well—with my first, I gave birth to him at Middlemore. I had natural birth; there were no problems. Everything was just—it went good, it was a fast delivery, and my midwife said he flew out when I gave birth. Second one, it took a little bit of time, only because I thought I was going to have [the] baby but it was only false contractions. So we were in hospital for probably almost six, seven hours, just to wait for the actual contractions to happen. In the end though nice natural birth for my second as well, no problems. And with my third it was a quick one as well, only two hours. And that was also a natural birth as well, no complications, everything went well. Yes for me I just always want the natural way. And I was just so used to it from my first experience, that's why I just did it with all—with my next two.

As shown in this story and in other conversations, both within this research and in our practice experience, the women who took part in our research, and their mothers, aunts, sisters, friends and community, trust their bodies to birth. We acknowledge that we bring our pre-understanding as researchers that these are the very women who “could/should” be birthing in the primary units. Our conversations with them were attuned to try to understand why that tended not to happen.

I didn't know

A common response in the interviews was “I didn't know [there was such an option]”:

Really? You can have babies at the maternity units? ... I didn't know that.

This participant, a mother of three, said:

Yes. Middlemore. It's a hospital, so that is where you give birth—yeah, you have to give birth at hospitals, don't you? With my next baby, if I have one, I would do something different like try a water birth. But I'd probably still have it at Middlemore, because it's the main place that I have given birth with my last three.

For this woman, Middlemore Hospital is where you give birth. She had already had three babies there. It is what she knew. It is where you go. She indicated that she was very open to trying something different, like a water birth, but it would still be at the same hospital. In describing it as the “main place” that she has given birth, perhaps there is an important desire for continuity. Maybe it matters that her children are all born in the same place.

Another woman told her story:

I went to Middlemore and had my baby and then went to Maternity Unit [primary unit] after that. I didn't know I could have my baby at Maternity Unit. My midwife told me to go to Middlemore; that is why I went there. For me, though, I think I would choose Middlemore, because this is the first baby I have had in this country. In fact if I have another baby I would still go to Middlemore.

It seems this woman's midwife “told her” to have her baby at Middlemore Hospital. Curiously, even after having been transferred to a primary unit for her postnatal care, this woman would still choose to give birth at the tertiary hospital next time. Has she come to feel comfortable/safe in this high tech environment? Is there something about the familiar that is reassuring in the time of labour?

Another participant also spoke about not being given a choice in relation to where she would give birth:

No one talked really about there being a choice about where to have baby. No. No choices were given.

Perhaps there was something reassuring for some woman in being told “this is where you will birth”. Maybe the certainty of that instruction gave them confidence in their midwife. As researchers (working within a hermeneutic framework) we wondered: does the midwife have the right to take away their choice?

This participant saw Middlemore Hospital as providing a degree of safety for her:

I didn't know about other places to go give birth but then probably wouldn't have chosen them, anyway, in case anything happened—because I didn't want to go to a birthing unit where, if anything happened, if things didn't go to plan, then would have to come to Middlemore. Really, all I knew was Middlemore, so that was my choice.

These participants, if they are representative of women in this community, appear to know Middlemore Hospital. Further, they know they would get transferred there from the primary unit at the first sign of a problem. This woman did not want that to happen. She preferred to be in Middlemore Hospital from the start. Is “knowing a place” akin to trusting, to feeling safe, to feeling a sense of belonging?

While, for the women in this study, there were all the usual concerns around birthing in a hospital or primary unit, such as “safety” or convenience, this does not take away from the fact that these women were not clear about what choices they could make. They did not recall having the evidence about primary unit safety explained to them. However, we wonder if such explanations would have changed the decision they made to choose Middlemore Hospital.

Maternity units are places you go after you give birth

I really thought those ones, like maternity unit [name removed], you just go there after birth, not for birth of baby.

To be honest, until you guys [the researchers] told me, I thought those units were there for you to go to and recover after having your baby.

Yeah, my family think you give birth at the hospital. That is what we would think - not at the after-care centres like a maternity unit.

It was clear that the women interviewed had no idea that they could birth safely at primary birthing units, as well as at Middlemore Hospital. Primary units were seen as somewhere only postnatal care is provided. Use of the term “after-care centre” assumes a level of care appropriate for after the birth. It is not surprising that, if most Pasifika women birth at Middlemore Hospital, then most of their friends and family will tell each other that is where you go. It seems there were few stories in their networks about birthing in primary units. However, some women in this study had experienced a primary unit and not found it to their liking.

Experience or thoughts about primary units

I would go to Middlemore. I didn't like the primary unit when I went after the baby was born. For me it was like a campground, how you couldn't eat in the room, and I wasn't in the mood to move around a lot. But I still ate

in the room even though I wasn't allowed. But, yeah, too many rules. So my third time round, Middlemore. I think it was way better.

It is apparent that, as researchers, our assumption that the primary unit is “better” was not necessarily the experience or impression of these six women. This participant remembered her sense of there being too many rules in the primary unit. It appears she did not feel comfortable eating with other women in the dining room. Maybe she was the only Pasifika woman in the unit at the time; maybe she felt she would not be welcomed by the other women. Maybe she simply wanted to stay in her room. The point was she was subject to rules which tried to dictate what she was and was not allowed to do. She broke the rules but chose not to go back there for her third birth. In her opinion Middlemore Hospital was “way better”. Maybe that is where she found herself in a community of other Pasifika women.

Another woman shared her discomfort with the primary unit:

Postnatally the amazing midwife at Middlemore she recommended I go to primary unit. She joked “there is scones there”. And then I was like “oh okay”. So I went and I had no idea what I was going into. The staff—I think we had a midwife take us to the room, set us up and told us about the facilities that were there, and if we needed anything just give them a call, they're there for anything and everything, and about lunch, breakfasts and dinners, about showers and toilets, and nappies and changing rooms and everything. And my first night I was by myself, because my partner couldn't stay and my mum couldn't stay, so I was really—I think I maybe pushed the bell or walked up to them maybe ten times in three hours or something because I was just nervous (laughs)—like what to do, what should I do, am I doing something wrong.

Perhaps for this woman going into a primary unit felt like going to stay in someone else's place. There were so many things she needed to know about what to do and where things were. She appears to have felt alone and vulnerable, seeking reassurance from the staff about what she should do; or maybe she just needed company. For this woman, she felt alone at a time when she needed people around her.

She seemed to miss the hustle and bustle of Middlemore Hospital, where chances are she would have been sharing a room with another new mother. Where was anybody to keep her company? She felt alone and nervous. The staff became her source of company. Paradoxically she seemed not to feel “at home” in this more homely place.

This participant also went to both Middlemore Hospital and a primary birthing unit:

The reason I chose... well, to be honest, I was put off with the first one. I was put off Middlemore because it was hot and I didn't really like it at all. With my second baby I felt like I was rushed out to primary unit to make room for someone new who needed my room. I had my baby and no room so they had to rush me and I knew they wanted me gone fast.

In this story it seems the woman almost became a “thing” to be moved to wherever there was space. It did not matter where she would have preferred to be. When Middlemore Hospital needed to make space, she was moved fast. Perhaps for the staff involved there was no opportunity for them to make this choice. When resources are limited, in a public health system, the woman has

little choice but to accept the decisions made on her behalf. It is not necessarily the place itself that makes the difference, but what is going on in that place on any given day.

What mattered most for participants was the staff:

But, yeah, Middlemore is amazing. Everyone. Like, I really didn't have any problems with their staff. Their staff were amazing and they just made me feel really looked after.

Supportive staff seemed to be more important than the actual place itself. When one feels “really looked after”, where one is, is hardly relevant. Perhaps it is in labour with one-on-one midwifery attention that the woman most keenly develops a sense of being “looked after”. Arriving at the primary unit postnatally may not draw women into the closeness of a relationship that they might have experienced had they arrived in labour.

Choice is determined by what is closest to home

For some of the participants, Middlemore Hospital was actually close to their home and this was the main reason for birthing there.

This participant was given choices but she knew she wanted to have her baby at the tertiary hospital:

Yes. The midwife gave me the choices of primary birthing units, or Middlemore. But I always knew that if I ever fell pregnant I wanted to have [the] baby in Middlemore, just because it's convenient because Middlemore is closest. And so my family or my mum could easily come and see me, and it was right there. So, yeah, that's probably the reason why I chose Middlemore.

This next participant echoes these sentiments:

The reason I go to Middlemore is because it is close to where we live. I have no problem to go anywhere else but, why, when this is the closest? Yes if a primary unit was closest to me, of course, I would go there as I have no worries about me or my baby.

There was no doubt that convenience and closeness to home were the main determining factors why these women went to the tertiary hospital. This raises questions about the location of services for low risk women who do not need to birth in a high risk obstetric hospital. It matters that it is located a short drive away for both the labouring woman and her family. It helps that it has a feeling of familiarity. Perhaps a birthing unit develops a sense of the culture of the community in which it is located. Certainly that could be said to be true for the three units currently within the CMDHB region. To go outside of one's locality is perhaps to move to a different cultural ambience.

Influence of friends and family

The influence of friends and family was significant as to where women birthed:

For me I always feel good when I talk to my other sister-in-law. They give birth here. She's from the Islands and then she comes back here to give birth. I always talk to her, and she said, “Oh it's really nice”, so I said “Oh, okay”. She would give birth at Middlemore and then go back to the Islands.

My friends also preferred they said it was better than Middlemore. I went to try it out the second time but, for me, Middlemore was better. I really enjoyed it.

My friend gave birth at Middlemore so I did.

My family, well, sister-in-law, gave birth at a birthing unit—that was in town near the domain. Yes, she went from Mangere to there, but everyone else in my family has given birth in a hospital and at Middlemore.

When other people amongst one's family and friends go to Middlemore Hospital and speak highly of their experiences, to do otherwise would be to go against the tide. It is as though Middlemore Hospital is a ready-made decision. Yet, that was not the experience for all participants:

Actually, all my friends were, like, "Don't go to Middlemore". They were all, "Go to Auckland, go to Auckland". I don't know if that's just because it's in South Auckland, the hospital, or what. Just because it is in South Auckland—but they all birthed at Auckland even though they live in South Auckland. For me, Middlemore was an awesome experience and I am normally skeptical about things. My husband always says I am high maintenance but I am not!

South Auckland comes with its own reputation. For some participants this is simply who they are: South Aucklanders. Others, it seems, try to escape beyond the bounds of South Auckland. Perhaps the friends of the participants above chose midwives who only had access agreements at Auckland Hospital or perhaps they deliberately sought to avoid Middlemore Hospital. Whatever their reasons, they tried hard to persuade their friend away from Middlemore Hospital. Yet she resisted their advice and had an "awesome experience".

The following woman differed from the other participants, preferring to go to the primary birthing unit:

I preferred to come to the maternity unit just because it's closer to home and my sister-in-law was discharged to there. She, too, gave birth to my niece at Middlemore but went to [the] maternity unit [name removed] afterwards and I just found the environment really good and closer to home.

While the choice is different, the influence of family and closeness to the facility reveal themselves again as critical. This woman, in contrast to others, found the environment of the primary unit "really good". It is a reminder that there is not "one" experience for all Pasifika women; rather, each have their own sense of what works for them.

DISCUSSION

The key finding of this study is that both midwife/researchers and the Pasifika participants brought their own prejudices to the decision of where these women were best to birth:

...history does not belong to us; we belong to it. ...the self-awareness of the individual is only a flickering in the closed circuits of historical life. That is why the prejudices of the individual far more than his judgments, constitute the historical reality of his being (Gadamer, 1989, pp.276-277).

Our hermeneutic approach to interpreting the data has revealed prejudices. Gadamer does not see prejudices as "good" or "bad"; they simply "are". He states: "...that all understanding inevitably involves some prejudice gives the hermeneutic problem its real thrust" (Gadamer, 2002, p.239). It was when we woke up to the thought that several of the participants in this study preferred Middlemore Hospital to a primary unit, that we realised we needed to engage in deeper thinking. It is not that our prejudices were shutting down our thinking; rather, they were showing us how our thinking as midwives was different from the opinions expressed by

the Pasifika women in the study. In everyday language we tend to think of the word "prejudice" as meaning a premature judgment or strong opinion that is ill-founded. Gadamer (2002) goes beyond this to say that we all have prejudices about everything. We have chosen to stay with his term for it "wakes-us-up". Who, me? Am I prejudiced? Once one accepts that the answer is always "yes", then one is free to begin to explore what lies behind one's taken-for-granted understandings. That is how fresh insights emerge.

The prejudices of our research team were born of a commitment to supporting normal birth wherever that is a safe option, a belief that women are more likely to labour without intervention in a primary maternity unit, and an appreciation of the more relaxed atmosphere of the primary units. Underpinning these beliefs is substantive research evidence (Birthplace in England Collaborative Group, 2011; Davis et al., 2011; Farry, 2015; Overgaard et al., 2011).

Each of the six Pasifika women in this study brought her own prejudices. For some it seemed that Middlemore was a better, safer, preferable option. Importantly, it was also closer to home. These things mattered to them. It piqued our interest that, when they did get to a primary unit, several of them gave us the impression that it was not a place where they could feel at home. Perhaps the different culture of a small homely primary unit exposed these women in a way that made them feel different and vulnerable. It raises even bigger challenges around how to offer informed choice in a manner in which midwife and woman come to a shared understanding of the reasons that lie behind that choice.

It was clear that, for our participants, midwives were one component in the decision of where to birth. Barber et al. (2006) found that midwives were the greatest source of information about the various choices for place of birth for expectant parents in Britain. However, it was also found that, in the United Kingdom, midwives did not appear to be promoting options other than hospital birth. This is despite the exhaustive evidence behind the recommendation that healthy pregnant women birth at home or in primary units (National Institute for Health and Clinical Excellence, 2014). It is not uncommon for birthplace options available to pregnant women to not be discussed (Houghton, Bedwell, Forsey, Baker, & Lavender, 2008; Lavender & Chapple, 2011). As a result, most women in the United Kingdom see hospital births as the norm and do not know to seek further information about alternatives from their maternity providers (Bedwell et al., 2011). The predominant choice of where women birth is not dissimilar in New Zealand, where, also despite a plethora of evidence that it is safest for healthy women to birth in primary settings, 87% of women birth in secondary or tertiary hospitals (Ministry of Health, 2015). How do midwives move beyond their own prejudices when opening a conversation about the choice of where a woman could birth? Houghton et al. (2008) found that some professionals had their own perception of which hospitals were the safest for birth and this bias was reflected in their consultations with women, which in turn influenced the women's decisions.

A "prejudice" we became aware of as researchers is that low risk Pasifika women have a right to know they are more likely to have a safe, normal birth in a primary unit. But perhaps these women have every confidence that they will birth without intervention, wherever they are. There are clearly differences in the experience of being in a primary unit to being in a tertiary hospital. Each has its mood (Freeman, 2014). While our prejudice is that primary units are more relaxed (Smythe, Payne, Wilson, & Wynyard, 2013), some of the Pasifika women in this study found them foreign. There seemed to be too many rules. They did not know what to do;

they felt vulnerable and alone. A place is never simply a building. It is always embedded in community with values and customs pervading its ways (Smythe, Payne, Wilson, & Wynyard, 2009). When people of the dominant culture impose their prejudices on another group, we run the risk of engaging in a subtle form of colonisation (Lampert, 1997).

It is now time for the maternity service providers to work with Pasifika women and their communities to understand their specific perspectives and needs. Some women have moved to New Zealand recently; others were born within the Pasifika communities established here. It is clear little is known about the reasons for Pasifika women's birth preferences or their experiences of birth in New Zealand. The current study has attempted to shed some light on these issues and address the challenges that are being laid before us in terms of accessible and appropriate services. We maintain our prejudice, supported by research evidence, that low risk Pasifika women need a primary unit option of care. What this research has suggested is that it needs to be close to where the family lives and it needs to be a place where Pasifika women can feel at home. It is interesting to note that there are plans to build a new primary unit close to Middlemore Hospital, in the Mangere area, a strongly Pasifika community (Wiggins, 2017). From the thinking that has arisen from this study we believe that this is an important initiative. It would likely give Pasifika women a place to birth for which they have some sense of affinity, while at the same time uphold a space for labour and birth to unfold, free from intervention.

STRENGTHS AND LIMITATIONS

This was a small study undertaken in one urban geographical area of New Zealand, thus the findings cannot be generalised to the larger total population of Pasifika women birthing there and in other areas of New Zealand or elsewhere. Despite this limitation, the women freely shared their experiences, shedding light on some of the issues that other Pasifika women might also experience in terms of what influences their choice around place of birth.

RECOMMENDATIONS

This is a small study. It is not our intention to generalise; nevertheless, the thinking that has emerged from the study leads us to recommend that, when primary birthing units are being designed or changed, consultation with Pasifika women may make the facility more fitted to their needs. Just as we have paused to consider our own prejudices, we encourage other midwives to take time to listen to the stories and opinions of the women they serve, particularly those from cultures other than their own.

CONCLUSION

Birth is never without prejudice, born of history, culture and personal experience. We began this research thinking that Pasifika women simply did not know they could birth in a primary unit. To some extent this was true of our small sample. However, we became aware that regardless of knowing or not knowing about the alternatives, some of these women preferred to birth in the tertiary hospital. Choice is much more complex than a rational weighing up of the research evidence. The way forward is to find ways of working with Pasifika communities that ensure the high rate of normal birth amongst their women is maintained and even improved, and that these women have a real choice of birthplace that includes a primary unit they perceive as culturally attuned to their needs.

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Accepted for Publication March 2018

McAra-Couper, J., Farry, A., Marsters, N., Otukolo, D., Clemons, J., & Smythe, L. (2018). Pasifika women's choice of birthplace. *New Zealand College of Midwives Journal*, *54*, 15-21.

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TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

LITERATURE REVIEW

Effects of cervical excisional procedures for cervical intraepithelial neoplasia on pregnancy and birth: A literature review

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ABSTRACT

Background: Anecdotal evidence suggests midwives recognise that pregnancy and birth may be affected by cervical scarring caused by excisional procedures in the treatment of cervical intraepithelial neoplasia (CIN2 and 3). Affected women seeking information about the effect on their pregnancy and labour must rely on the knowledge of maternity care providers or take guidance from consumer publications. A literature review was undertaken with the objective of exploring pregnancy and birth outcomes following cervical excisional procedures.

Method: CINAHL, ProQuest, Pubmed, Google Scholar and Cochrane databases were searched for full text, peer-reviewed articles discussing either original research or systematic reviews, published from 2001-2016. Inclusion criteria were applied and comparative analysis was used to identify and compare outcomes.

Findings: Seventeen articles were included for review. Fifteen articles discuss the relationship of cervical excisional procedures to an increased incidence of preterm birth. Other outcomes include the increased incidence of preterm, pre-labour rupture of membranes, or consideration of associated low birthweight related to the method or depth of excision. No articles were found which considered the provision of intrapartum care to women with a history of cervical excision procedures.

Conclusion: Current research regarding the effect of cervical excision procedure history on pregnancy and birth is largely limited to quantifying the incidence of preterm birth and preterm, pre-labour rupture of membranes, or in discussing the impact of the method and depth of excision. Research to identify, describe, or best clinically manage the experience of birthing at term with cervical scarring appears to be absent. Further research is needed to extend midwifery knowledge regarding the provision of care during pregnancy and labour to affected women at term.

Keywords: cervical intraepithelial neoplasia (CIN), large loop excision of the transformation zone (LLETZ), loop electrosurgical excision procedure (LEEP), cold knife cone biopsy or excision (CKC), labour, birth

INTRODUCTION

Cervical screening in New Zealand is offered to women aged 20-69. Women with low grade squamous intraepithelial lesions or atypical squamous cells of undetermined significance are recalled on a 12-month basis and, if recurrence is seen, may be offered colposcopy and biopsy. Women with identified high grade abnormal squamous cell changes (CIN2) or severe changes/carcinoma in situ (CIN3) are offered treatment by a cervical excision procedure.

Incidence and treatment of CIN2 and 3 peak at around 30 years of age (Arbyn et al., 2008), similar to the median age for women giving birth in New Zealand, and slightly higher than the median age of 28 for first births (Statistics New Zealand, 2012). Any potential threat, related to treatment of CIN2 or 3, which risks the prospect of a successful pregnancy and birth is highly relevant to women of reproductive age (Arbyn et al., 2008).

The most common cause of CIN2 and 3 is human papilloma virus (HPV; National Screening Unit, 2008), for which the New Zealand

Ministry of Health introduced immunisation in 2008 (The New Zealand HPV Project, 2016). In 2018 the earliest participants in the programme turn 30 years old (Ministry of Health, 2014); however, uptake of the vaccination programme in New Zealand is currently only 60% (Petousis-Harris, 2016), leaving many women of reproductive age unprotected from HPV virus and carrying an increased risk of developing subsequent CIN2 and 3. From 1 July, 2017, the treatment programme offered a broader vaccine, targeting nine strains of HPV, given in two doses to both females and males (PHARMAC, 2016). Further, the National Cervical Screening Programme included primary screening for the presence of HPV (National Screening Unit, 2016), with the aim of reducing the incidence of CIN2 and 3 over time. However, small numbers of affected women will remain, and it is important for midwives to understand how these surgeries may impact pregnancy and birth.

Cervical excision procedures for women with CIN2 or 3 lesions include ablative therapy (cauterisation of cervical tissue through heat, laser or chemicals), large loop excision of the transformation

zone (LLETZ), also known as loop electro-excisional procedure (LEEP), cold knife cone biopsy or excision (CKC), and sometimes hysterectomy if there are co-morbidities. Cryotherapy (extreme cold used to kill tumour cells) is not used in New Zealand but may be used in other countries (National Screening Unit, 2008).

CKC requires a general anaesthetic, and all ablative techniques destroy the tissue in situ and do not allow for histology. LLETZ has found favour since the early 1990s, as it enables the precise removal of affected tissue which can be sent for histology. It is usually an outpatient procedure, performed under local anaesthetic, and results in comparatively less post-procedural pain, bleeding and infection than other methods (Castanon et al., 2014; Kyrgiou et al., 2006; Sadler et al., 2004).

It has been proposed that removal of cervical tissue, which contains collagen and elastic fibres, leads to reduced mechanical integrity and support for the cervix (Sadler et al., 2004). An additional theory suggests that the removal of epithelial cells which secrete cervical mucus may reduce or alter local bacterial flora and thereby reduce immunological defences (Basama & Angala, 2010; Sasieni et al., 2016).

The New Zealand Referral Guidelines require lead maternity carers to recommend obstetric referral where a woman has a history of either preterm birth or “cervical surgery, including cone biopsy, laser excision or LLETZ of the transformation zone” (Ministry of Health, 2012, p.24), unless the current pregnancy is subsequent to a successful vaginal birth post-surgery, or the depth of cone excised by LLETZ is less than 16mm and histology is available (Ministry of Health, 2012).

The goal of this literature review was to locate available literature regarding pregnancy and birth outcomes following cervical excision procedures to treat CIN2 or 3, and to focus on the relationship of cervical excision procedures to the risk of preterm birth. In New Zealand, the total rate of preterm birth (prior to 37 weeks gestation) is currently 7.4% (Ministry of Health, 2015) and, internationally, it is estimated at 11.1% (Howson, Kinney,

& Lawn, 2012), which has consequences for affected women, babies and families, and significant ongoing costs for health service provision and funding (Sasieni et al., 2016).

This review, therefore, reports predominantly on the available obstetric and epidemiological research published relating to the methods and depth of excisions, and to the outcomes of preterm birth and preterm pre-labour rupture of membranes (pPROM). Consideration of the relationship between cervical excisions and outcomes, such as neonatal mortality, low birthweight, caesarean section and fertility, are discussed as well as risk factors such as presence of vaginal infections and lifestyle factors.

Objectives

This review aimed to examine literature currently available on the impact of all forms of cervical excision procedures on pregnancy and childbirth, with the goals of:

- contributing to the body of knowledge midwives have to draw on in clinical practice,
- increasing the ability of women to make informed decisions about their care, and
- identifying any gaps in research.

Search and selection criteria of literature

An in-depth literature search of databases CINAHL, ProQuest, Pubmed, Cochrane Collaboration and Google Scholar was undertaken for peer-reviewed articles published between 2001 and 2016, using the search terms: “cervical intraepithelial neoplasia”, “large loop excision of the transformation zone (LLETZ)” and “loop electrosurgical excision procedure (LEEP)”, paired with “labour” and “birth” and with a number of different word combinations and truncations (Figure1). Forty-eight articles were identified, of which 31 were excluded due to duplication, lack of relevance to the topic, unavailability of the full text, not original research or a systematic review, not in English, or older than dates searched (Figure 1). A total of 17 published studies

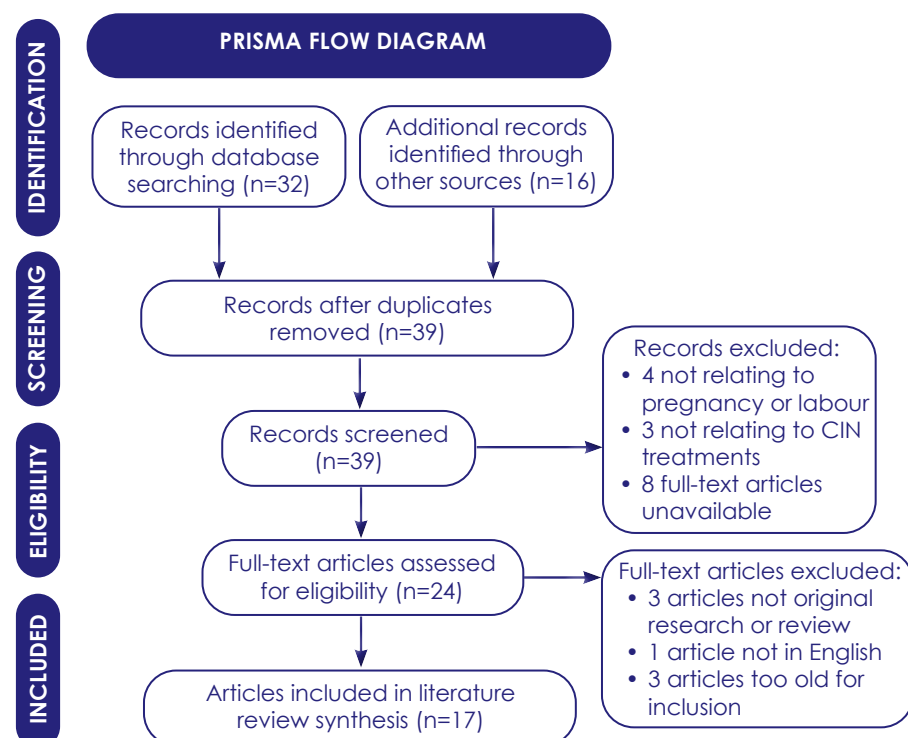


Figure 1. Literature search - PRISMA flow diagram

were considered (Tables 1-4). Eight studies were from the United Kingdom (UK), four studies from the United States of America and one study each from New Zealand (NZ), Norway, Australia, Belgium and South Korea. Authors' disciplines were dominated by obstetrics, but included epidemiology and women's health. Employers were hospitals and universities, the one exception being GlaxoSmithKline's North American Vaccine Development. Several English studies were funded by the UK-based National Institute for Health Research, with authors collectively known as the PaCT study group (preterm delivery after treatment of the cervical transformation zone).

RESULTS

Sixteen of the included articles were quantitative studies or systematic reviews (Table 1). Fifteen articles discussed the relationship of cervical excisional procedures to the incidence of preterm birth, while one considered the outcome of caesarean delivery and one considered subsequent fertility. Other outcomes in the included articles were incidence of preterm birth and pPROM with respect to the depth or method of excision; and consideration of low birthweight/small for gestational age (SGA).

Themes discussed less frequently included cervical length in second trimester, benefit of cerclage (a strong suture inserted into and around the cervix), presence of vaginal infections, subsequent births, incidence of caesarean section delivery, neonatal mortality, and subsequent fertility. Three studies collected delivery details but did not discuss them in their publications, and three others commented negatively on women's "risky" behaviour, stating this contributes to the incidence of CIN2 and 3 and resultant treatment. From a midwifery perspective it would have been desirable to include any literature that discusses intrapartum care at term; however, most of the available literature focuses on identifying risks for preterm birth.

Results from this literature review are discussed firstly as they relate to aspects of preterm birth, and secondly as their impact on wider practice considerations. Statistical methods and reporting styles vary; for example, some studies report using relative risk or odds ratios calculations, while others provide results as percentages (Tables 2 and 3). Other studies adjust risks for variables such as age, ethnicity, socio-economic and lifestyle factors (Table 1). Results potentially reflect variations in the background risk of preterm labour in each population, or changes in outcomes or treatment methods over time. For example, Norwegian research outcomes over 36 years reflected progressive changes in the practice of providing CKC treatment from 1967 to 1980, with likely mixed treatments from 1980 to 1985, laser treatment from 1985 to 1990, and currently LLETZ since 1990 (Albrechtsen, Rasmussen, Thoresen, Irgens, & Iversen, 2008).

DISCUSSION

Concern about premature birth

The major obstetric outcome of concern was increased risk of preterm birth following cervical excisional procedures, although risk differed between procedural methods used (Table 2) and depth of excisions (Table 3) and may be related to increased risk of pPROM (Table 4).

A New Zealand study of 1,078 women did not find any increased risk of preterm birth following cervical excision by any method (aRR 0.8, 95% CI, 0.8-1.5), except where excisions exceeded a depth of 17mm (Sadler et al., 2004). Simoens et al. (2012) found an increased incidence of preterm labour in 16.3% of 97 women with a history of undergoing the cervical excisional procedure, versus 8.1% of 194 unexposed women (OR 2.82, 95% CI, 1.32-6.00). Similarly, a large Norwegian population-based cohort study

of over 2 million births found preterm birth occurred in 17.2% of women birthing post excision, compared to 6.2% of women who had never had a cervical excisional treatment (Albrechtsen et al., 2008).

Initially, PaCT members Castanon et al. (2012) stated there was no significantly increased risk of preterm birth, either preceding or following cervical excisional procedures, due to quality improvements in treatments. However, in 2014 the PaCT group revised their position, stating that presence of CIN2 or 3, whether treated or untreated, increases the risk of preterm birth (8.8%) compared to unaffected women (6.7%; Castanon et al., 2014).

Studies differentiating outcomes between methods of cervical excision found wide disparities in outcome with regard to preterm birth. Most attention was given to the differences between LLETZ and CKC methods. In a systematic review and meta-analysis of 27 studies involving a total of 34,495 women, Kyrgiou et al. (2006) found LLETZ to be the safer option (RR 1.70, 95% CI, 1.24-2.35) as opposed to CKC (RR 2.59, 95% CI, 1.80-3.72) with regard to the risk of preterm birth. Australian systematic reviewers Bruinsma and Quinn (2011) supported this finding in their review of 30 studies, with LLETZ moderately increasing the risk of preterm birth (RR 1.85, 95% CI, 1.59-2.15) versus the significantly increased risk following CKC (RR 3.41, 95% CI, 2.38-4.88). Conner et al. (2014), published a review of 19 studies involving a total of over 1.4 million participants and found an increased incidence of preterm birth following LLETZ (RR 1.61, 95% CI, 1.35-1.92), which contrasted with Arbyn et al. (2008) who conducted a review of research published over a long time frame (1960-2007) and found no increased risk to pregnancy from any method (including LLETZ) except from CKC (RR 2.87, 95% CI, 1.72-4.51). It appears that, excepting the work of Arbyn et al., LLETZ is seen to moderately increase risk of preterm labour while CKC increases risk to significantly high levels.

The physical amount of cervical tissue excised was also a factor. Kyrgiou et al. (2006) found excision depth in excess of 10mm was sufficient to increase rate of preterm birth (RR 2.6, 95% CI, 1.3-5.3), and this finding was supported by Simoens et al. (2012), who found significantly increased risk of preterm birth with excision depth greater than 10mm (aOR 4.55, 95% CI, 1.32-15.65).

UK-based PaCT members made the clearest distinctions regarding depth of excision in their study of 11,471 women (Wuntakal, Castanon, Landy, & Sasieni, 2015). Cervical excisions under 10mm, including punch biopsies, were not considered to increase the risk of preterm birth. Large cervical excisions over 15mm (RR 2.04, 95% CI, 1.41-2.96) and very large excisions over 20mm (RR 2.40, 95% CI, 1.53-3.75) were found to bear a significant risk of preterm birth. As an example of the impact on women's and babies' health care services, the sole variable of a cervical excision greater than 10mm was implicated as adding 840 preterm births to the annual total in England. Risk was not increased by repeated treatment itself, but rather by progressive increase in the depth of tissue removed (Castanon et al., 2014).

The small study by Sadler et al. (2004) found pPROM was increased in women who had laser conisation (RR 2.7, 95% CI, 1.3-5.6) or LLETZ procedure (RR 1.9, 95% CI, 1.0-3.8; Table 3). This study included 652 cases versus 426 controls but, interestingly, also found that incidence of pPROM was over three times higher in women with excision greater than 17mm depth (RR 3.6, 95% CI, 1.8-7.5) compared to the control group. Conversely, in their meta-analysis of 27 studies, Kyrgiou et al. (2006) found no increased risk of pPROM for women following laser conisation (RR 2.18, 95% CI, 0.77-6.16) but did find that LLETZ increased risk of pPROM (RR 2.69, 95% CI, 1.62-4.46).

Table 1. Study design features and outcomes

Author(s)	Methodology and procedure	Medical procedures included	Number of participants	Primary outcomes considered
Albrechtsen et al., (2008) Norway	Population-based cohort study: Included all Norwegian births 1967-2003	Cold knife conisation until 1980, undocumented 1980-1985, laser treatments 1985-1990, LLETZ from 1990-1995	15,108 women with history of cervical conisation; 2,164,006 births to women with no history of conisation	Preterm birth, excision method, lifestyle factors
Arbyn et al., (2008) UK	Meta-analysis: 1960-2007 Pubmed-Medline and Embase data search	Excisional (cold knife conisation, LLETZ, and laser conisation); and ablative procedures (laser ablation, cryotherapy, and diathermy)	One prospective and 19 retrospective studies, included a total of 613,558 women	Preterm birth, excision method, birth weight, perinatal mortality, lifestyle factors, vaginal infections
Basama & Angala, (2010) UK	Postal survey of obstetric consultants based in England	Cold knife conisation, laser conisation, LLETZ	50 obstetric consultants	Preterm birth, pPROM, cerclage
Bruinsma & Quinn, (2011) Australia	Systematic review and meta-analysis of 30 randomised controlled trials and observational studies 1950-2009	Excisional: CKC, laser conisation and LLETZ. Ablative: cryotherapy, laser ablation (vaporisation)	Participant numbers not stated	Preterm birth, method of excision, pPROM
Castanon et al., (2012) UK	Retrospective-prospective cohort study of obstetric records 1998-2009	History of cervical histology compared to maternity event data	18,441 singleton births: 4,176 before cervical histology and 14,265 after cervical histology	Preterm birth
Castanon et al., (2014) UK	Case-control study nested in record linkage cohort study. 12 English hospitals, April 1998 to March 2011, matching histology records with obstetric records	Excisional: LLETZ, laser excision/ablation, cold knife cone biopsy	11,471 women with histology by colposcopy. Comparing within that cohort: 768 preterm births with 830 term births	Preterm birth, depth of excision
Castanon et al., (2015) UK	Nested case-control study	History of cervical colposcopy compared to maternity event data	2,798 births from 2,001 women with history of colposcopy procedures	Preterm birth, depth of excisions, 2nd and subsequent pregnancies
Conner et al., (2014) USA	Systematic review and meta-analysis of 19 observational studies of pregnancies following LLETZ procedures	LLETZ only	6,589 with history of LLETZ; 1,415,015 without history of LLETZ	Preterm birth, pPROM
Frey et al., (2013) USA	Secondary analysis of a multicentre retrospective analysis	LLETZ only, and only in relationship to caesarean section outcome	598 women with prior LLETZ, 588 with screening cytology (PAP smear) only, 552 with cervical (punch) biopsy	Caesarean section
Kyrgiou et al., (2006) UK	Systematic review and meta-analysis of 27 controlled observational studies taken from Medline and Embase data search 1960-2004	Cold knife conisation, laser conisation, LLETZ, laser ablation	34,495 women	Preterm birth, excision method, excision depth, pPROM, birthweight, perinatal mortality, labour duration, caesarean section, fertility
Naleway et al., (2015) USA	Retrospective matched cohort within a Kaiser Permanente hospital	Laser ablation, LLETZ, cold knife cone biopsy, cryotherapy	1,533 pregnancies in 13,767 women following diagnostic procedures; 570 pregnancies in 4,137 women following cervical treatment procedures; 7,436 pregnancies in 81,435 women with no history of procedures	Fertility, lifestyle factors
Nam et al., (2010) South Korea	Retrospective cohort study: review of medical records at Yonsei University Health System, Seoul.	LLETZ and cold knife conisation considered together	Reviews 65 cases of pregnancy following treatment over 13 years	Preterm birth, cervical length, cerclage
Sadler et al., (2004) NZ	Retrospective cohort study of women presenting to National Women's Hospital colposcopy clinic for the first time 1988-2000.	Laser conisation, laser ablation, LLETZ. Excluded cryotherapy and cold knife conisation due to low frequency in the NZ context	Treated women = 652; untreated women = 426	Preterm birth, excision method, depth of excision, pPROM, lifestyle factors
Sasieni et al., (2016) UK	Summary of symposium held in London. 50 attendees, including oncologists, colposcopists, obstetricians and epidemiologists			Preterm birth, excision depth, cerclage, progesterone pessaries, 2nd and subsequent pregnancies, fertility
Simoens et al., (2012) Belgium	Multicentre cohort study using a questionnaire and anonymised obstetric files	Excisional: LLETZ, laser, cold knife conisation. Ablative: laser, electrocoagulation, cryotherapy 12.5%	97 women with history of CIN treatment and 194 women with no history of CIN treatment	Preterm birth, excision depth, caesarean section, birth weight/SGA
Stout et al., (2015) USA	Secondary analysis of multicentre retrospective cohort study. Pregnancies with/without history of LLETZ, comparing presence or absence of vaginal infection	LLETZ only	1,727 women; 34.4% had LLETZ	Preterm labour, vaginal infection
Wuntakal et al., (2015) UK	Retrospective case-control study linking histology records with birthing records	LLETZ, laser excision, cone biopsy by any method.	10,711 women	Preterm birth, depth of excision

Table 2. Risk of preterm birth by excisional method

Author	Year	Excisional method with risk ratio of preterm birth, CI 95%						
		Any	Laser conisation	LLETZ/LEEP	Laser ablation	CKC	Cryotherapy	Punch biopsy
Arbyn et al.	2008		3.33 (0.73-16.77)	1.20 (0.50-2.89)	0.29 (0.15-0.58)	2.78 (1.72-4.51)	0.88 (0.49-1.56)	
Bruinsma & Quinn	2011		3.58 (1.93-6.61)	OR 1.85 (1.59-2.15)		RR 3.41 (2.38-4.88)		
Castanon et al.	2012	1.32 (1.13-1.53)						1.14 (0.77-1.66)
Castanon et al.	2014							0.97 (0.75-1.27)
Castanon et al.	2015							OR 0.9 (0.67-1.22)
Conner et al.	2014			1.61 (1.35-1.92)				
Kyrgiou et al.	2006			1.70 (1.24-2.35)		2.59 (1.80-3.72)		
Sadler et al.	2004	aRR 1.1 (0.8-1.5)	aRR 1.3 (0.8-2.2)	aRR 1.2 (0.8-1.8)	aRR 0.8 (0.5-1.2)			
Simoens et al.	2012	2.82 (1.32-6.00)	2.52 (0.62-10.25)	5.63 (1.85-17.15)				
Stout et al.	2015			1.4 (1.1-1.8)				

Table 3. Risk of preterm birth by depth of excision

Author	Year	Depth of excision			
		<10mm	10-14mm or >10mm	15-20mm	>20mm
Castanon et al.	2014	1 (Reference)	RR 1.28 (0.98-1.68)	RR 2.04 (1.14-2.96)	RR 2.40 (1.53-3.75)
Castanon et al.	2015	1 (Reference)	OR 1.08 (0.80-1.45)	OR 1.95 (1.28-2.97)	OR 2.30 (1.35-3.92)
Sadler et al.	2004	aRR 0.9 (0.5-1.6)	aRR 1.1 (0.6-1.9)*	aRR 1.7 (1.0-2.7)**	
Simoens et al.	2012	aRR 2.77 (0.28-27.59)	aRR 4.55 (1.32-15.65)		

* Sadler et al. used 10-16mm

** Sadler et al. used >17

Table 4. Risk of pPROM by excisional method

Author	Year	Excisional method with risk ratio of pPROM, CI 95%			
		Any	Laser conisation	LLETZ/LEEP	Excision >17mm
Bruinsma & Quinn	2011	3.40 (1.63-8.11)			
Conner et al.	2014			2.37 (1.64-3.44)	
Kyrgiou et al.	2006		2.18 (0.77-6.16)	2.69 (1.62-4.46)	
Sadler et al.	2004		2.7 (1.3-5.6)	1.9 (1.0-3.8)	3.6 (1.8-7.5)

A relationship between cervical excision and pPROM is supported, however, by two large systematic reviews and meta-analyses. Bruinsma and Quinn (2011) included studies employing all excisional techniques and found significantly increased risk (RR 3.40, 95% CI, 1.63-8.11). Conner et al. (2014) considered LLETZ procedures alone, but also found increased risk of pPROM (RR 2.37, 95% CI, 1.64-3.44). Of any excisional method, LLETZ procedures incurred the lowest risk of pPROM, and subsequent premature births, to women of reproductive age.

Aspects relevant to clinical practice

Other aspects discussed relevant to clinical practice include the effects of cervical surgery on subsequent pregnancies, the depth of excision and its relationship to cervical length, and other cervical

treatments such as cerclage. Studies included in this literature review typically didn't comment specifically about parity in their results; however, in a nested, case-control PaCT study of 2,001 women over their 2,798 first and subsequent births, Castanon et al. (2015) identified that women with deep cervical excisions retained an increased risk of preterm birth during all pregnancies subsequent to treatment.

A 2015 London symposium, which included 50 oncologists, colposcopists, obstetricians and epidemiologists, was in agreement that subsequent pregnancies remained at risk of preterm birth, and specifically so for women with cervical excisions greater than 15mm depth (Sasieni et al., 2016). The symposium group also viewed the cervical tissue remaining in situ following excision as important, and agreed that short cervical length (under 2.5cm long) is accepted as predictive of preterm labour. The symposium group also agreed cerclage and/or progesterone pessaries could be used from the second trimester; however, the evidence for either, in preventing premature labour, is mixed.

In a British postal survey of 50 obstetricians, 72% responded that they would assess cervical length for pregnant women who had a history of cervical excisional procedures by ultrasound. Routine cervical cerclage would be offered by 62% obstetricians, with 48% offering it pre-conception (Basama & Angala, 2010). One other study followed six participants over a 13-year time frame, three of whom experienced preterm labour and three of whom carried to term—a sample too small to achieve statistical significance (Nam, Kwon, Kim, & Park, 2010). The included studies cannot be seen to be conclusive as to whether cerclage or progesterone pessaries are of benefit, and dedicated searches on these topics were not undertaken for this study.

No studies discuss the duration of labour either at term or otherwise, even though the PaCT group state in three studies that they have collated delivery data (Castanon et al., 2012, 2014, 2015). This presents a lost opportunity to this literature review, although a retrospective analysis of the data could be possible. The closest statement about the duration of labour was by Kyrgiou et al., (2006), who found no link between LLETZ and precipitous birth (RR 1.26, 95% CI, 0.75-2.11), and did not comment on other methods of excision.

Other clinical implications

Some studies alluded to clinical outcomes, such as the incidence of caesarean section, birth weight and perinatal mortality. The incidence of caesarean section in women treated for CIN2 or 3 was considered by three studies. By method of excision, Kyrgiou et al. (2006) found a history of CKC increased the incidence of caesarean section (RR 3.17, 95% CI, 1.07-9.40), while LLETZ (RR 0.88, 95% CI, 0.71-1.09), laser conisation (RR 1.16, 95% CI, 0.64-2.09) and laser ablation (RR 0.79, 95% CI, 0.49-1.25) did not increase the risk of caesarean section. Simoens et al. (2012) found no significant difference between incidence of caesarean section in treated women (22.7%) compared to women not diagnosed or treated for CIN2 or 3 (23.2%). A secondary analysis of a previous multicentre, retrospective analysis, which focused solely on the incidence of caesarean section following LLETZ compared to women with no history of colposcopy, found no difference in incidence of caesarean section (RR 1.06, 95% CI, 0.79-1.41; Frey et al., 2013). In addition, labour arrest was not given as the reason for caesarean section delivery any more frequently following LLETZ than for controls, even in women with large excisions (32.7% vs 31.3%, $p=0.78$). In a study of 1,738 women, incidence of caesarean section did not vary based on time elapsed between LLETZ and birth: at 12 months post LLETZ, incidence of caesarean section was 29.8% vs 31.8%, ($p=0.78$), and at 24 months incidence of caesarean section was 31.1% vs 31.9%, ($p=0.84$; Frey et al., 2013). Therefore, a history of LLETZ procedure is not found to be a reason to offer elective caesarean section.

The included studies generally did not separate low birth weight or small for gestational age babies from the incidence of preterm birth. For example, a Norwegian population-based cohort study, which included all births ($n=2,164,006$) from 1967 to 2003, grouped all babies with birthweight under 2500g together with preterm births (Albrechtsen et al., 2008). Ultrasound was not used in Norway to estimate gestational age until 1998 and, until then, only the date of the last menstrual period was used, which could have increased dating errors. Definitions of low birth weight also varied between the included studies and ranged from <2000g to <2500g.

One meta-analysis found that women with a history of CKC delivered babies with low birthweight (under 2500g) two-and-a-half times more compared to controls (RR 2.53, 95% CI, 1.19-5.36) and, following LLETZ procedures, nearly twice as often as controls (RR 1.82, 95% CI, 1.09-3.06; Kyrgiou et al., 2006). In an analysis of a similar group of studies, Arbyn et al. (2008) likewise found CKC to be related to low birth weight, defined as under 2000g (RR 2.86, 95% CI, 1.37-5.97), and that LLETZ did not contribute significantly to any morbidity or adverse outcomes. It is not apparent from either of these findings whether there is any actual link between excisional history and fetal growth restriction. The only study to specifically measure risk of small for gestational age (under 10th centile for growth) found no relationship with

cervical excision (OR 0.74, 95% CI, 0.31-1.74; Simoens et al., 2012). This was a small study of 79 women and further research is needed.

Perinatal mortality was separated from preterm birth as an outcome in a systematic review and in a meta-analysis (Arbyn et al., 2008; Kyrgiou et al., 2006). Kyrgiou et al. (2006) found widely variable, inconclusive results by method: LLETZ (RR 3.40, 95% CI, 0.62-18.63); laser conisation, (RR 8.00, 95% CI, 0.91-70.14); laser ablation (RR 0.67, 95% CI, 0.11-3.96); and CKC (RR 1.89, 95% CI, 0.77-4.65). However, Arbyn et al. (2008) found LLETZ to be the safer option, with no additional perinatal mortality attributed (pooled RR 1.17, 95% CI, 0.74 to 1.87), while CKC led to significantly increased risk of perinatal mortality by nearly three times (RR 2.87, 95% CI, 1.42-5.81).

No method of cervical excisional procedure had a negative effect on fertility or time to conceive (Kyrgiou et al., 2006). In a large, retrospective, matched cohort study involving 17,904 participants and 81,435 controls, Naleway et al. (2015) found the rate of pregnancy was actually increased following cervical excisional procedures, compared to women with no history of CIN2 or 3 or related treatment (RR 1.42, 95% CI, 1.30-1.55).

Potential impact of lifestyle factors

It has been suggested that women treated for CIN2 or 3 are more sexually active than controls (Naleway et al., 2015). This view was supported by the New Zealand case-controlled study (Sadler et al., 2004), which included 1,078 women who had used the Auckland Hospital colposcopy clinic over a 12-year period, whether treated or not. The Sadler et al. study (2004) stated that, compared to the background population, all participants were predisposed to preterm labour due to certain “demographic, behavioural and sexual histories” ($p=0.2105$). Similarly, this association was also made by Arbyn et al. (2008), who commented that women treated for CIN2 or 3 lesions are “known to have demographic, behaviour and sexual characteristics that increase their risk of adverse obstetric outcomes” ($p=0.008$). The terms “sexual histories” and “sexual characteristics” were undefined by both sets of authors and appear to imply that women’s sexuality is problematic.

These broad and unqualified statements are discriminatory given that, without vaccination, 80% of the population is infected with one or more strain of HPV and therefore at risk of developing CIN2 or 3 (Ministry of Health, 2014). However, women who are smokers are at increased risk, so there may be correlations between some lifestyle behaviours and the incidence of precancerous cervical neoplasia (Albrechtsen et al., 2008). Likewise, vaginal infections are established as contributing to risk of preterm labour. Arbyn et al. (2008) cited research which found that bacterial vaginosis has a higher incidence in women with CIN2 or 3 and is linked to pPROM, which subsequently increases the risk of preterm labour. However, Stout et al. (2015) refuted this claim and, after controlling for confounding factors, did not find an adjusted increased risk of preterm labour in women with a history of LLETZ procedure, in combination with bacterial vaginosis (aOR 0.9, 95% CI, 0.7-1.2), chlamydia (aOR 0.9, 95% CI, 0.7-1.2), gonorrhoea (aOR 1.3, 95% CI, 0.9-1.9), trichomonas (aOR 1.1, 95% CI, 0.7-1.5), any vaginal infection (aOR 0.8, 95% CI, 0.6-1.1), multiple vaginal infections (aOR 1.0, 95% CI, 0.7-1.5) or pyelonephritis (aOR 0.9, 95% CI, 0.4-1.7). It is thought that excision affects the cervix mechanically and by reduction of immunological barriers via cervical mucus (Sasieni et al., 2016); therefore, presence of vaginal infections will likely continue to be perceived as causative until further research is available.

Relevance of the findings for midwifery care

This review provides a hopeful picture for the future of women who require treatment for CIN2 or 3, largely due to improvements in treatment method. Lead maternity carer midwives and core midwives are well placed to share the findings of this literature review with treated women. It is recommended, on the basis of the literature accessed for this review in combination with the Referral Guidelines (Ministry of Health, 2012), that, for each pregnancy subsequent to precancerous neoplasia treatments, the following practice approaches be considered:

- When taking a health history at booking, ascertain the depth of excision of any cervical excisional procedure and obtain histology records if available.
- Recommend obstetric referral in first or early second trimester, particularly if the excision had a depth of 15mm or more, or at any time a scan shows a shortened cervix.
- Include a request for cervical length measurement at the anatomy scan (18-20 weeks). Note: it is important to prepare women to anticipate that the scan method may use a transvaginal probe.
- Apprise women with a history of cervical excision procedure about the signs of labour initiation and pPROM and advise the need to seek urgent assessment if these signs present.
- Offer sexual health screening in early second trimester, when there are fewer contraindications to medications compared to the first trimester.

Limitations of this review

This literature review sought to include only original research or systematic analyses of original research. The exclusion of non-English language publications and grey literature, such as governmental publications or unpublished theses, may have prevented our identifying further articles for inclusion and could possibly have changed the results. We did not search any trial registers for trial protocols pertaining to effects of cervical excisional procedures for cervical intraepithelial neoplasia on pregnancy and birth which may have alerted the authors to possible protocol publications. While there would not have been any data available as yet, it could have alerted the authors and readers to future publications.

Research gaps

This systematic review identifies clear research gaps, including the lack of current literature which could contribute to the body of knowledge around the provision of intrapartum care at term to women with a history of cervical excisional procedures. Information regarding the pattern and duration of labour at term appears absent, as does literature considering the impact of common intrapartum interventions on affected women, such as induction of labour methods, for example, syntocinon infusion or artificial rupture of membranes, and the method of pain relief. Research into these aspects would benefit midwives in providing more appropriate intrapartum care for affected women.

Likewise, there appears to be no qualitative research, which could include consumer input to explore women's knowledge, understanding and experience of the impact of cervical excision procedures on their pregnancies and during labour, and any implications for the wellbeing of their babies. Midwives could contribute their experience and knowledge, for example, around how a scarred cervix may dilate during labour (particularly at term), findings on vaginal examination, beneficial actions and management in labour, information sharing with women, and antenatal and intrapartum decision points.

CONCLUSION

This literature review is consistent in revealing concerns about the relationship of cervical excisional procedure history to preterm birth. There is consensus that LLETZ procedures increase the risk of preterm labour to a moderate extent, while CKC is falling from favour in that it creates an unnecessary risk for women of reproductive age. Irrespective of method, when excisions are >15mm, the risk of preterm birth is significantly increased and this risk does not change with subsequent pregnancies.

While the risk of pPROM is significantly elevated by all methods of cervical excision, it is unclear whether the additional presence of vaginal infections exacerbates the risk of both pPROM and preterm birth.

Cervical excision procedures have not been found to affect fertility or fetal growth, and LLETZ is not found to increase risk of caesarean section or neonatal mortality.

This review provides a hopeful picture for the future of women who require treatment for CIN2 or 3, largely due to improvements in treatment method. Gaps in the literature exist around caring for treated women birthing at term, and the duration and pattern of labour. Likewise, there appears to be no qualitative research to reflect the clinical experiences of midwives, or those experiences of women birthing following cervical intraepithelial neoplasia treatment. Such research would be of considerable interest to women and provide balanced evidence for practice for midwives and all maternity care providers.

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

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Accepted for Publication April 2018

Hay, R., & Patterson, J. (2018). Effects of cervical excisional procedures for cervical intraepithelial neoplasia on pregnancy and birth: A literature review. *New Zealand College of Midwives Journal, 54*, 22-29.

<https://doi.org/10.12784/nzcomjnl54.2018.3.22-29>

COMPARATIVE CASE STUDY

Health policy and its unintended consequences for midwife-woman partnerships: Is normal pregnancy at risk when the BMI measure is used?

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ABSTRACT

Background: Little attention has been paid to understanding the unintended consequences of health policy for midwife-woman partnerships. The measure of Body Mass Index (BMI) is one such policy example which has become established in contemporary midwifery practice as a tool for assessing pregnancy risk. The universal acceptance of BMI creates an unsettling paradox for midwives concerned with promoting woman-centred practice. The increasing focus on BMI is challenging for midwives as they navigate ethical tensions when directed to undertake practices which have potential unwonted consequences for the midwife-woman partnership.

Aim: The aim of the study was to explore the use of an indicator, using BMI as an example, to provide an international perspective on obesity prevention policy and maternity care provision.

Method: A comparative case study approach was taken, using descriptive cross-national comparative analysis of obesity prevention policy, weight management guidelines and midwifery models of care in New Zealand and Scotland.

Discussion: Despite promoting healthy weight gain in pregnancy, New Zealand and Scottish health policies may be missing health promotion opportunities. Focusing on BMI in maternity, per se, should not prohibit other assessment of lifestyle issues or delivery of services based on individual needs, capacities, histories and sociological characteristics. Relying solely on pre-pregnancy BMI as a marker of health in all women has remained relatively unchallenged and, as such, constitutes a policy problem because it occludes the factoring in of other lifestyle issues that may significantly alter individual risk status. Further, such an assessment of risk status is ideally arrived at within a partnership model of maternity care, rather than reliance on an a priori medical test.

Conclusion: Decontextualised policies are challenging for midwives where medical and midwifery values are in conflict. Policy which fails to consider the multiple and complex contexts of women's lives is confronting for midwives as they attempt to re-articulate the meaning of woman-centred practice. Furthermore, BMI as a tool may be ineffectual. The current focus on BMI in policy and practice requires re-consideration.

Keywords: midwifery partnership, health policy, weight management guidelines, BMI, New Zealand, Scotland

INTRODUCTION

Little attention has been paid to understanding the unintended consequences of health policy for midwife-woman partnerships. Torloni, Betran, and Merialdi (2012) highlighted how maternal obesity is a real concern in pregnancy. Evidence shows that maternal obesity significantly increases the risk of adverse maternal and infant outcomes (Marchi, Berg, Dencker, Olander, & Begley, 2015) and of admissions for specialist care (Denison et al., 2014). The growing evidence has led to obesity-targeted policy recommendations in New Zealand and Scotland (Ministry of Health, 2015b; Scottish Government, 2010; Scottish Government, 2011), yet little is known about the potential impact of such policies on midwifery practice. The measure of Body Mass Index (BMI) is one such policy example which has become established in contemporary midwifery practice as a tool

for assessing pregnancy risk. One unintended consequence of such policy, and its associated gestational weight management guidelines, is an apparent preoccupation with weight surveillance. Such a focus on weight rather than pregnancy lifestyle care, in turn can pathologise the whole pregnancy for the woman.

BMI was originally intended as a tool used to monitor progress towards government targets on overweight and obesity (Hall & Cole, 2006). Subsequently, BMI has been widely adopted in policy and practice as a tool for individual assessment of overweight and obesity during pregnancy (Institute of Medicine, & National Research Council, 2009). BMI is therefore now used as the sole method of weight-based risk stratification in pregnancy. We are not disputing that BMI can be useful when used across populations but contest its use as the sole basis of risk stratification. We are concerned that the use of the BMI measurement alone may fail to

consider or recognise that some women are overweight and remain healthy. Their BMI is often the dominating focus of their care plan, when what matters most to women is a positive care experience based on compassion, choice and dignity (Morad, Parry-Smith, & McSherry, 2013). This appears to contradict the bespoke nature of care. Thus, the intrusive BMI is one such case that highlights a tension between individualised care to women juxtaposed to the routine nature of the dominant policy approaches to weight management. It is timely to expose a pathological paradox in which, if they have a BMI ≥ 25 kg/m², this is understood as always abnormal, covering up that some of these women are actually enjoying a healthy pregnancy. In other words, the BMI-related policy implication is that this places all women with a BMI over 25 as at risk, which leads to standardisation of care and may be moving us away from our focus on woman-centred, individualised care.

The aim of our paper is to explore the use of an indicator, using BMI as an example, to provide an international perspective on policy and maternity care provision. New Zealand and Scotland are used for comparison as they are two countries with high-income economies and are served by well-educated, regulated, registered, health care practitioners. Both countries have persisting disparities in socio-economic statuses and a rising obesity prevalence within low-income populations, which are growing causes for concern (Ministry of Health, 2015b; Scottish Government, 2010). See Table 1 for the comparison of prevalences between the two countries.

Table 1. Comparative demographics between adults in New Zealand and Scotland

Variable	New Zealand	Scotland
Overweight and obesity	Overweight (66%) Obese (31%)	Overweight (65%) Obese (28%)
Obesity by gender	Women (32%) Men (29%)	Women (29%) Men (26%)
Obesity by ethnicity	Pacific peoples (66%) Māori (47%) Asian peoples (12%)	Chinese (4%) Asian/Other (9%)
Obesity by deprivation	Most deprived areas (42%) Least deprived areas (22%)	Most deprived areas (37%) Least deprived areas (21%)

Sources: Ministry of Health (2015a) and Scottish Government (2015)

While the countries in terms of obesity prevalence are not vastly different, the issues related to health inequalities, maternity service provision and maternity policy approaches to address obesity are dissimilar. An ideographic approach was chosen to understand each country in its own terms (Kohn, 1989). Each nation was treated as an object of study, and the approach was selected to highlight the unique elements related to maternity service provision and maternity care policy to address obesity. Here, we explore how policy and maternity practice diverge and converge in the two regions. We are particularly concerned with uncovering the unintended consequences of adopting a population tool in woman-centred practice, the potential consequences of which have gone relatively unexplored. By examining two sets of policies across different regions, the salient aspects of the issue related to the routine measurement of BMI in pregnancy can be highlighted. Further, we discuss the tensions evident for midwives as they implement BMI-focused policy while engaging with women in partnership relationships.

This paper begins with a brief overview of relevant literature in relation to obesity and weight gain in pregnancy. We then describe policy measures in New Zealand and Scotland which aim to promote healthy gestational weight gain, before describing how the countries have sought to implement weight management guidelines in pregnancy. This is followed by analysis of each country's midwifery models of care to answer: "How far and in what ways are New Zealand and Scotland promoting woman-centred practice in pregnancy?" To conclude, we highlight the lessons drawn and reflect on the challenges of implementing policy in ways which ensure the well-woman focus.

Literature review

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health (World Health Organization, 2015b). The negative impacts associated with overweight and obesity in pregnancy for mothers and their infants are well documented. It is argued that excessive gestational weight gain is the most deleterious consequence of pregnancy (Gilmore, Klempel-Donchenko, & Redman, 2015). Maternal obesity leads to an increased risk of both gestational diabetes and hypertensive conditions for women and, for the infant, perinatal death, congenital anomalies, birth trauma and high birth weight (Adamo et al., 2013; Catalano & Ehrenberg, 2006; Dodd, Grivell, Nguyen, Chan, & Robinson, 2011; Furber et al., 2013; Galtier, Raingard, Renard, Boulot, & Bringer, 2008; Galtier-Dereure, Boegner, & Bringer, 2000; Lashen, Fear, & Sturdee, 2004; Leslie, Gibson, & Hankey, 2013; Ramachenderan, Bradford, & McLean, 2008; Ryan, 2007; Stotland, 2009). Low-income women were found to be more at risk than middle- and high-income women for excessive gestational weight gain, pointing to obesity-related disparities being a growing concern (Yeo & Logan, 2014). Furthermore, the predisposition to obesity is hereditary and is thought to impact the health of future generations (Mourtakos et al., 2015; Pirkola et al., 2010). Such evidence is fueling interest in pregnancy as a critical period to promote healthy weight gain (Huda, Brodie, & Sattar, 2010).

Despite pregnancy being an opportunity for health promotion, current obesity prevention initiatives have shown little evidence of success. Questions have been raised about the effectiveness of obesity-related policy approaches, with few of these approaches subject to rigorous evaluation and fewer still showing unequivocal evidence demonstrating efficacy in stabilising or reducing body weight (Essington & Hertelendy, 2016). It is unsurprising that the weight-focused approach to obesity management is being challenged (Bacon & Aphramor, 2011; Hafekost, Lawrence, Mitrou, O'Sullivan, & Zubrick, 2013).

In common with biomedical approaches to weight management, the emphasis on "one size fits all" (Hill et al., 2017) seeks standardised care pathways, neglecting the multiple contexts within which women exist (Keely, Cunningham-Burley, Elliott, Sandall, & Whittaker, 2017). The International Confederation of Midwives (ICM; 2017a) argues that the provision of maternity care that is service-centred rather than woman-centred can contribute to the medicalisation of pregnancy and childbirth. Inhorn (2006) describes medicalisation as the biomedical tendency to pathologise otherwise normal bodily states, leading to incumbent medical management. Pregnancy is a life event which has been medicalised with pregnant women's experiences epitomising the process of medicalisation (Zadoroznyj, 1999).

BMI appears to be part of the increasing medicalisation of pregnancy, with pregnant women increasingly being viewed through the lens of pathology. Pregnancy is a normal human

process which, like many processes, can vary from person to person. As such, biological approaches are narrow in focus and minimise opportunities for midwives to enable women to make sense of their health and well-being. Policy has paid little attention to the social context of maternal populations at risk of obesity (Heslehurst et al., 2011). Concurring, Sutherland, Brown and Yelland (2013) suggest that approaches which focus on behaviours that immediately lead to obesity, without considering the social circumstances that shape behaviours, are likely to have limited reach and impact on low-income groups. The rhetoric of personal choice, within which the obesity epidemic debate is framed, makes it difficult to see the structural barriers which encourage poor health or poor diet for women living in unhealthy environments (Cain, 2013). According to Greener, Douglas and van Teijlingen (2010), the prevailing biomedical interventions aim to enhance the health promoting capability of existing services to prevent or reduce obesity. Yet, without evidence from large-scale trials, it remains unclear whether adherence to suggested weight gain ranges improves maternal and infant health (National Institute Health and Clinical Excellence [NICE], 2010).

As sociologist C. Wright Mills (Mills, 1959) famously argued, we need to see personal problems (including and especially medical ones) as public issues and vice versa; it is inadvisable and misleading to see personal issues as separate from their complex historical and social contexts. Further, such approaches as those referred to above, serve to heighten anxiety and increase weight-based stigma (Lindhardt, Rubak, Mogensen, Lamont, & Joergensen, 2013; Mills, Schmied, & Dahlen, 2013). Emerging evidence supports the view that focusing on healthy lifestyles rather than on gestational weight is likely to be more effective (Keely et al., 2017; Smith et al., 2015). For example, in her study of women's lived experiences of co-existing BMI >30 and gestational diabetes mellitus, Jarvie (2017) found women sought less directive, more collaborative care. Similarly, findings from a feasibility study, and the degree of acceptability of a brief midwife-led intervention in that study, showed that women welcomed individualised discussion regarding diet and exercise (Warren, Rance, & Hunter, 2017). Arguably, a greater focus on promoting healthy lifestyles tailored to individual needs and preferences would be more acceptable and aligns more closely with the midwifery model of working in partnership with women.

Midwifery is based upon a partnership between women and midwives which aims to promote healthy outcomes (ICM, 2017b). The ICM Code of Ethics for Midwives (2008) urges midwives to develop a partnership with individual women, in which they actively share information and support women in their right to actively participate in decisions about their care. The midwife's role is to facilitate the safe passage of women and babies through the maternity care system (Koniak-Giffin, 1993), yet policy constraints potentially impact upon this primary midwifery focus, compromising the optimal ability of midwives to support women in achieving a normal pregnancy.

Design

Comparative analyses of policy and models of care in New Zealand and Scotland are presented. Descriptive cross-national comparisons can provide important new insights (Kan & Lau, 2013; Room et al., 2013; Shield et al., 2013). Similarly, Musingarimi (2009) conducted a descriptive comparative analysis of obesity-related policies within the devolved administrations in the United Kingdom (UK). We used descriptive methods to analyse related literature, policy and guidelines to explore how policy and practice diverge and converge in the two countries. A literature review

was conducted to identify stand-alone policy documents, dated 2010-2016, which propose public health frameworks for action and guidance for weight management during pregnancy in New Zealand and Scotland. We examined pre-conception, pregnancy and postpartum-related policies relating to weight on entering pregnancy and weight gain during pregnancy, paying particular attention to how BMI is used in maternity practice. Case studies outline the high-level policy response and the major lifestyles interventions in place to optimise gestational weight gain. It is not in the scope of this paper to explore how government arrangements affect policy; nor is it our intention to advance understanding of policy processes or identify the successes and failures of the current measures. We do not intend to critique policies for their impacts but rather we seek to understand current approaches and the extent to which policy and maternity guidance supports pregnant women to adopt healthy lifestyles. The following section describes the policy response and models of maternity care in each country as a basis for undertaking a comparative case study.

FINDINGS

New Zealand case study

The New Zealand Health Strategy's Roadmap of Actions (Ministry of Health, 2016) lays down a plan to tackle long term conditions and obesity. The recently launched Childhood Obesity Plan (Ministry of Health, 2015b) sets the direction for prevention of, and early intervention to address, obesity. A package of initiatives to prevent and manage obesity in children and young people is being implemented. The initiatives aim to take a life-course and progression of condition approach and include: targeted interventions for those who are obese; increased support for those at risk of becoming obese; and broad approaches to make healthier choices easier for all New Zealanders. The focus is on food, the environment and being active at each life stage, starting during pregnancy and early childhood. Development of the policy drew on national and international evidence outlined in the Interim Report on Ending Childhood Obesity (World Health Organization, 2015a).

The New Zealand maternity care model is unique in that women choose their lead maternity carer (LMC), usually a midwife, who provides continuity of care for women from early pregnancy, through the labour and birth and up to six weeks postpartum (Rowland, McLeod, & Forese-Burns, 2012). LMC midwives claim from the government for the services they provide, so that maternity services are free to eligible women, unless the woman chooses a private obstetrician, who can charge over and above government funding. This model means that the LMC midwife is able to build a close relationship with a woman and her family/whānau (extended family group) during her pregnancy, developing trust and preparing the woman for the labour, birth and becoming a parent. Thus, LMC midwives have an opportunity to tap into what is known as that "teachable moment" and potentially effect change to support healthy lifestyles and better outcomes for both the woman and her family (Pan, Dixon, Paterson, & Campbell, 2014).

Guidance for Healthy Weight Gain in Pregnancy was published to support a reduction in the incidence of "inappropriate" weight gain in pregnancy (Ministry of Health, 2014). This guidance updated the advice provided in the Food and Nutrition Guidelines for Healthy Pregnant and Breastfeeding Women (Ministry of Health, 2006). The advice is to encourage women to monitor their own weight at regular intervals during pregnancy and the postpartum period and discuss this with their LMC as part of their care plan.

BMI is normally calculated at booking/first visit, ideally before 10 weeks' gestation (Ministry of Health, 2014).

The healthy range for BMI is defined as 18.5 to 25 kg/m², with obesity being recognised as a BMI of 30 kg/m² or above (World Health Organization, 2015b). Maternal obesity is defined as pre-pregnancy BMI \geq 30 kg/m² (Chen, Feresu, Fernandez, & Rogan, 2009). In order to identify overweight and obese women, midwives measure women's BMIs which are calculated through height and weight measurements (kg/m²). Midwives and other providers of maternity care measure women's BMIs at the beginning of pregnancy to guide care and assess risk, given the significantly elevated risk associated with overweight and obesity in pregnancy for both mother and child, as signalled over the past two decades or so. It is expected that dietary and lifestyle advice is offered, or the woman is referred to a specialist, based on her BMI (Ministry of Health, 2012). It is a requirement, for example, to elevate care from low risk to higher risk categories in many hospitals across New Zealand.

Despite the availability of guidance since 2006, little is known about midwives' actual practice in relation to giving advice to women in relation to gestational weight gain. A nationwide cohort study involving 428 midwives described the practices of LMC midwives when discussing nutrition, activity and weight gain during pregnancy (Pan et al., 2014). Findings showed the majority of midwives provided information on nutrition and exercise during pregnancy and measured the height and weight of women in order to determine BMI. However, little is known in New Zealand about how such weight-focused advice leads to behaviour change, or not, in women with a high BMI within a continuity of carer model.

Scotland case study

Scotland has one of the worst obesity records among Organisation for Economic Cooperation and Development (OECD) countries (Scottish Government, 2010). A number of government policies and initiatives aimed at addressing obesity are in place there. Maternal obesity in isolation from contextual forces is not the focus. The focus is on improvements within the wider community of Scotland rather than in individuals, or individual groups in isolation (Scottish Government, 2011). In the Prevention of Obesity Route Map (Scottish Government, 2010), the government and the Convention of Scottish Local Authorities (COSLA) outline their long term commitment to tackle overweight and obesity. The goals are to have the majority of Scotland's adult population within a normal weight range and to have fewer overweight or obese children in Scotland. Thus, the majority of policy initiatives are focused on childhood obesity, the school environment and the workplace. The commitment to reducing prevalence of childhood obesity is reinforced by the inclusion of a national indicator to increase the proportion of healthy weight children (Scottish Government, 2011). Following analysis of the Route Map using the ANGELO (Analysis Grid for Environments Linked to Obesity) framework, Mooney, Jepson, Frank and Geddes (2015) found that, while all of the four domains of physical, economic, legislative and socio-cultural influences are represented, there is a disproportionate imbalance of policies in the attitude/behavioural arena compared to the built environment and at the expense of the legislative and economic domains. These authors further argue that, while the picture is unsurprising, it is at odds with the increasing body of international evidence about what works best.

Despite obesity being a UK-wide public health concern, there remains no evidence-based UK guidelines on recommended

weight gain ranges during pregnancy (NICE, 2010). The Scottish Government launched Improving Maternal and Infant Nutrition: A Framework for Action in 2011 (Scottish Government, 2011). While this policy recognises the importance of good nutrition before conception, during pregnancy and in the early years, it did not go so far as to publish guidance on what is considered a healthy gestational weight gain. Despite this paucity of evidence on recommended weight gain ranges, direction has been provided at the policy level, not in terms of clear guidelines but as continuous advice on lifestyle and activity levels throughout pregnancy across the UK maternity systems (NICE, 2010). NICE suggests offering supportive specific and practical information to elicit behavioural changes which includes: discussing eating habits and safe physical activity; providing practical and tailored information; dispelling myths about what and how much to eat during pregnancy; measuring weight and height; calculating BMI at the first contact; and being sensitive to any concerns mothers-to-be may have about their weight. The advice is to not weigh women repeatedly during pregnancy as a matter of routine but only if clinical management can be influenced or if diet and weight changes become problematic. Offering a referral to a dietitian or appropriately trained health professional is encouraged to support women to lose weight after pregnancy.

The Midwifery 2020 programme emphasises the public health role of the midwife across the UK and provides guidelines on care in relation to obesity and measuring height and weight on booking (Midwifery 2020, 2010). If the woman's BMI is more than 30 it is recommended that midwives discuss the risks and explore the woman's diet. Many Scottish regions emphasise continuity across antenatal care but often without continuity of carer; nor does this care, except in rare circumstances, traverse intrapartum and all postnatal care. The fragmented style of midwifery care for the majority of the Scottish population would seem at odds with providing individualised dietary advice. However, the health care culture and systems in Scotland are now evolving. A recent review of maternity and neonatal services (Scottish Government, 2017) recommended continuity of carer for all regions across Scotland within five years. Recommendation 1 out of 76 in the review states, "Every woman will have continuity of carer from a primary midwife who will provide the majority of their antenatal intrapartum and postnatal care..." (p.64). At the time of writing, early adopter sites have been identified that will work on implementing this priority recommendation across Scotland.

Policy convergence and divergence between New Zealand and Scotland

Policy responses converged in a number of areas. Maternal obesity remains a priority on the policy agendas of both New Zealand and Scotland. However, weight management interventions to address obesity in pregnancy are in their infancy in both countries. Written policy refers to obesity as a "societal problem" which goes beyond individual responsibility; the rationale being that obesity cannot be viewed simply as a health issue, nor will it be solved by reliance on individual behaviour change. Despite acknowledgement of the broader socio-environmental influences on health, New Zealand and Scottish policies continue to offer a narrow, medicalised, non-individualised approach to healthy weight management.

Four areas of policy divergence were found. First, the Scottish Government has selected national indicators to monitor progress of the Prevention of Obesity Route Map (Scottish Government, 2010). A key indicator for children is to "reduce the rate of increase in the proportion of children with their body mass index outwith a healthy range by 2018" (Scottish Government, 2010, p.2).

Subsequent to this, Scotland developed physical activity targets as an indicator for adults, aimed at increasing the proportion of adults reaching recommended levels of exercise (Musingarimi, 2009). In New Zealand, no similar targets have been identified for reducing child obesity or for increasing physical exertion.

Second, the New Zealand Childhood Obesity Plan (Ministry of Health, 2015b) directs midwives to use the national guidelines on healthy weight gain during pregnancy (Ministry of Health, 2014). No such guidelines have been published by the Scottish Government. In the UK, NICE (2010) failed to offer guidance with regard to what constitutes appropriate gestational weight gain, due to the uncertainty surrounding the recommendations available, particularly the widely used Institute of Medicine (IOM) guidelines (Poston, 2017; Scott et al., 2014). Consequently, while weighing women throughout pregnancy is not standard practice in Scotland, New Zealand practitioners are recommended to provide BMI specific advice to avoid excessive gestational weight gain.

Third, while New Zealand's obesity prevention policy is centred on a life-course approach for pregnant women, this is less evident in Scottish policy. In contrast, Scottish policy focuses less on early life interventions, leaning more toward environmental change.

Given the differences in ethnic group composition between New Zealand and Scotland, we might expect to see cross-national differences in policy making to support ethnic populations at high risk of obesity-related inequities. There is no such divergence. Despite the fact that Māori and Pacific peoples account for over 20% of the population in New Zealand and face a disproportionate health burden attributable to high rates of overweight and obesity (Theodore, McLean, & TeMorenga, 2015), New Zealand policy fails to provide increased support for minority populations. Instead, the New Zealand Childhood Obesity Plan proposes increasing access to sporting opportunities for young people in communities where participation rates are low and the risk of poor health is consequently higher.

Recent evidence points to the loss of funding for Māori-led initiatives. This is described by Theodore et al. (2015) as a lost opportunity to identify the most effective interventions for improving health and reducing health inequities. This in turn, they say, represents a substantial risk to optimal Māori health, despite the responsibility of the New Zealand Government under the Treaty of Waitangi (New Zealand's founding document) to ensure Māori have at least the same standard of health as non-Māori (Medical Council of New Zealand, 2008). Paradoxically, the Childhood Obesity Plan has failed to gain support among Māori and Pacific peoples. Scotland, on the other hand, a country unaffected by obesity-related ethnic inequities, acknowledges the consequences of obesity and cautions health professionals to avoid approaches which "reflect, perpetuate and potentially increase social inequalities in health in Scotland" (Scottish Government, 2010, p.2).

From comparative exploration of the two countries' policies, it is evident that two themes are worthy of further discussion: the impact of models of midwifery care that focus on relationships and continuity of care and the role of the midwife within these countries.

DISCUSSION

The UK's Centre for Maternal and Child Enquiries, the Royal College of Obstetricians and Gynaecologists (Modder & Fitzsimons, 2010) and NICE (2010) advise that all obese pregnant women be provided with accurate and accessible information about associated risks and how these may be minimised. They all recommend that obstetric care is prudent for women whose BMIs

are more than 30kg/m² rather than midwifery-led care. Yet caution needs to be taken not to pathologise the woman due to her weight alone. An individualised approach is called for that recognises the specific and complex contextual factors that impinge on the health status of all consumers, including pregnant women.

Both countries under review recognise the midwife as the key health professional; albeit the models of care are completely different otherwise in philosophy and practice arrangements. The one universal feature of both regimes is that, regardless of the model of care, all midwives promote woman-centred practice. Scottish midwifery services are currently fragmented compared to New Zealand's integrated services which are based on continuity of carer. In this context, fragmented care means that Scottish women receive care from community midwives who provide antenatal and postnatal care but rarely provide intrapartum care, other than the occasional primary birth either at home or, where available, at a stand-alone birth centre. Even when a primary/community birthing service is provided by community midwives, this is rarely by the named antenatal community midwife but whoever is on call at the time. In this way, fragmented care in Scotland refers to the fact that a named midwife does not follow the woman throughout her childbirth experience, as is the case for many New Zealand women who book with an LMC. The fragmented style of midwifery care for the majority of the Scottish population would seem at odds with providing individualised care. This fragmented experience has been highlighted in Cheyne et al.'s (2015) review of Scottish maternity experience, in which women frequently reported the dissatisfaction with having to repeat their story to different health care professionals throughout the childbirth experience. It is now rare that GPs and community midwives share pregnancy care in Scotland. Although many Scottish regions attempt midwifery continuity across antenatal care, they do not provide the degree of continuity across intrapartum and postnatal care as experienced by most New Zealand women. For the most part, in the Scottish context, community midwives provide a degree of continuity of care in pregnancy because antenatal clinics can be arranged around the off-duty entitlements of the community midwife. However, intrapartum care is unpredictable and postnatal care may fall over weekends when the rostered community midwife who provided the antenatal care is neither on call nor scheduled to work. In addition, the Scottish community midwife, unlike in New Zealand, does not follow the woman wherever her care is being provided. None of these community midwives, however, shares the same level of potential as the continuity of carer model in forging optimal midwife-woman relationships over time and, therefore, the facilitation of health promotion opportunities. As Scotland moves towards implementation of the Best Start recommendations for continuity of carer, it will be important to establish how evaluation of the continuity of carer service measures the standard that the service intends to achieve over time; e.g., "what does continuity of carer look like?" and "how will it be measured?" are very pertinent questions now needing to be answered as the implementation of the service rolls out across Scotland.

Treating each woman individually, that is, as a person with a unique combination of history, capacities, life-chances, opportunities and sociological characteristics based on gender, ethnicity, age, status, educational and religious affiliations, to mention just a few, not only better serves the woman herself, but also enables the LMC to offer specialised advice and support to facilitate optimal management and lifestyle changes, if necessary. It is an anathema to good health and a human rights agenda to simply label a woman as obese and treat her as personally irresponsible or incompetent just because this practice makes the UK nurse or midwife professionally

compliant (Nursing and Midwifery Council, 2008). Referring to the UK midwives, Swann and Davies (2012) agree that midwives have a major public health role in addressing obesity, yet argue for individualistic care to help promote normal birth for obese women. As they state:

The concept of the woman as expert in her own body, with the right to make informed decisions, is central to the midwifery model and should not be abandoned simply because risk factors are identified (p.11).

The above commentary reflects the by now standard midwifery philosophy to always focus on the normal; although, as Scamell (2016) points out, tensions can arise when divergent care objectives are in conflict. In practice, therefore, managing risk while promoting normality is a reality for the majority of midwives who must perpetually guard against “the midwifery rhetoric of normal birth...[being]...devitalised by the hegemonic prioritisation of risk management and sensitivity” (Scamell, 2016, p.19).

Swann and Davies (2012) contend that more evidence is required to identify how midwifery care with obese women can improve their health outcomes. Evidence-based decision-making necessitates that midwives scrutinise the evidence, listen to women and deliver critically informed, woman-centred care recommendations; although, in our opinion, this may not be politically popular nor supported by the dominant medical group in most maternity domains.

Practice should be in line with best available evidence, but whose evidence? Ménage (2016) affirms a broader definition of evidence is required, including evidence derived from the woman, the midwife and research, alongside the environmental factors. The decision-making model developed by Ménage (2016) can assist midwives in considering and analysing evidence for decision-making in partnership with women, ensuring that, “the weighting of one piece of evidence over another is something that is discussed and negotiated within the woman-midwife partnership” (p.140). While further evaluation of the model is needed, this framework holds promise for a more respectful and equitable approach to risk assessment that better reflects the complex lived realities of women on low incomes.

A salient feature to emerge from obesity-targeted policies is an explosion of weight-focused discourses leading to increasing surveillance and focus on risk in contemporary maternity care. McGlone and Davies (2012) maintain that the BMI calculation was never intended for individual diagnosis, yet the pre-pregnant BMI has emerged as the standard measure to label women with a high BMI as “at risk” (McGlone & Davies, 2012) and as a singular tool in “helping midwives to help obese pregnant women towards a healthier pregnancy” (Poston, 2017). The use of a standard BMI measurement fails to factor in women’s complex histories, capacities and sociological characteristics. Further, reliance on BMI alone compromises the midwifery model of partnership which does appreciate complexities and forges collaboration between midwife and woman. Our aim is to endorse the view that obesity in pregnancy represents a multifaceted and complex social process and, although it has serious medical implications, the extent of these involves more than just calculation of BMI. Instead, we aim to stimulate debate on the reliability and validity of a blanket approach of using pre-pregnancy BMI as a tool for all women in assessing risk in a normal pregnancy.

Further, we warn against an uncritical ingestion of a discourse underpinning much BMI messaging leading to standardised care pathways in favour of a little publicised, countervailing discourse

that gives a realistic appraisal of health at any size (Rowe & Fisher, 2015). Unfortunately, although midwives are charged with enabling woman-centred, family-centred and culturally sensitive care, generic, biomedical health policies continue to dominate. The effect is to create an unstable relational space which challenges the professional/consumer partnership that could potentially flourish; a partnership which is foundational to the salutogenesis lying at the heart of midwifery practice. Ideally, midwives adopt the role of critic and conscience of maternity care; the challenge for midwifery being to locate itself more explicitly in a public health care context to better enable critique of the research which may impact upon women’s experiences of care.

STRENGTHS AND LIMITATIONS

Our argument is made on the basis of a comparative analysis of health policy and models of care rather than on what women or midwives say about this, so caution needs to be taken in drawing conclusions. The paper contributes a description of the variations in policy contexts and maternity practice between New Zealand and Scotland and has highlighted important differences in the models of maternity care across these two countries. The opportunity to foreground divergent and convergent policy and practice across two different regions is a strength of this analysis because aspects worthy of further investigation (such as the voices of women and midwives) have been identified.

CONCLUSION

Midwifery philosophy has developed over time in contradistinction with medical philosophy to interpret pregnancy as a normal life event. The unintended consequences of health policies such as singular reliance on BMI to determine risk status have the potential to universally pathologise the individual, in this case to reinterpret pregnancy as a high risk life event. Hence, the use of BMI in maternity merits rigorous debate. The role of midwives extends beyond the provision of woman-centred care to the critique of emergent approaches and therefore promotes the autonomy of midwifery. We have shown that policies designed to regulate and diminish what has been called the obesity pandemic in Western countries have had the effect of directing midwives to undertake practices which are potentially detrimental to the midwifery partnership relationship based upon person-centredness and salutogenesis. The ongoing challenge for midwives is to drive improvements in health policies that are simultaneously congruent with the partnership model of midwifery practice. This may entail replacing a simplistic and singular medical indicator, such as BMI, with a composite indicator representing complex underlying factors unique to individual women. The value of this shift in policy would be an enhanced focus on outcomes that matter to individual women and better facilitate the management of overall health, including weight gain, before, during and after pregnancy. Congruence between health policy and midwifery practice is important if best practice and optimal outcomes are to be achieved.

Our paper is a small contribution to understanding the unintended consequences of health policy on midwifery practice. We point towards future possibilities for more effective approaches in maternity care. There are multiple influences that serve to shape government policy. We have highlighted how the BMI measure has become established in maternity care, yet its universal implementation and acceptance is unlikely to meet the needs of the majority of women. Policy which fails to consider the multiple and complex contexts of women’s lives challenges the very nature of woman-centred practice which lies at the heart of midwifery practice in New Zealand and Scotland.

ACKNOWLEDGEMENTS AND CONFLICT OF INTEREST DISCLOSURE

We thank Nicola Jackson, Registered Midwife in Wellington, who assisted in the review of this paper.

The authors declare that there are no conflicts of interest.

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Accepted for Publication June 2018

- Knox, S., Crowther, S., McAra-Couper, J., & Gilkison, A. (2018). Health policy and its unintended consequences for midwife-woman partnerships: Is normal pregnancy at risk when the BMI measure is used? *New Zealand College of Midwives Journal*, 54, 30-37.
<https://doi.org/10.12784/nzcomjnl54.2018.4.30-37>

INTERNATIONAL RESEARCH

Is hiesho in pregnant women a risk factor for postpartum haemorrhage?

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ABSTRACT

Background: In Japanese culture, a cold sensation known as “hie” is an important symptom in traditional medicine. Hiesho is a condition whereby the sympathetic nervous system becomes dominant, causing peripheral blood vessels to contract, impairing circulation and leading to low skin temperatures in the extremities. A link between hiesho and prolonged labour and uterine inertia, both of which are risk factors for postpartum haemorrhage (PPH), has previously been identified.

Aim: The aim of this study was to analyse whether hiesho has a direct impact on PPH by comparing the outcomes for women who experienced hiesho in their pregnancies with those who did not.

Methods: The study design was a retrospective cohort study conducted over 12 months, between 19th October, 2009, and 8th October, 2010, involving 2,427 women who had given birth in six hospitals in Japan. Women were excluded if they had had a caesarean section. Data were extracted from medical records and a paper questionnaire. Analysis was conducted using multiple logistic regression analysis and the Mantel-Haenszel test.

Findings: Of the women, 613 experienced PPH (25.3% of the entire sample), of whom 343 (56.0%) had experienced hiesho. In the analysis of covariance, the regression coefficient for hiesho was 0.2, $p=0.07$, the odds ratio (OR) was 1.22, and the 95% confidence interval (CI) was 0.98-1.50. In a stratified analysis, the regression coefficient was 0.25, $p=0.02$, the common OR was 1.29, and 95% CI was 1.04-1.59. Thus, there was no significant link found between a woman experiencing hiesho during pregnancy and having a PPH.

Conclusion: Although the findings indicate that uterine inertia and prolonged labour are direct causes of PPH, hiesho may potentially have an indirect effect. Therefore, since hiesho potentially affects the occurrence of uterine inertia and prolonged labour, preventing hiesho may help avoid uterine inertia and prolonged labour and consequently PPH. For women who experience hiesho in pregnancy, lifestyle activities known to improve peripheral circulation should be promoted antenatally.

Keywords: pregnant woman, postpartum haemorrhage (PPH), risk factor, hiesho (sensitivity to cold)

INTRODUCTION

In Japanese culture, a cold sensation known as “hie” is an important symptom in traditional medicine. Hiesho is considered to be a condition in which the sympathetic nervous system becomes dominant, resulting in poor circulation in the extremities due to contraction of the peripheral blood vessels. In Nakamura, Ichisato, Horiuchi, Mori, and Momoi's (2011) analysis of the concept of hiesho, it is defined as a condition in which “there is a difference between core temperature and peripheral temperature and a delay in the rise of the peripheral temperature even when the individual is in a warm environment, resulting in a ‘chilly feeling’ in many cases” (p.2).

In Western medicine, hiesho is an unfamiliar concept but, in Oriental medicine, it is recognised as an important symptom of potential health problems. According to Yoshino et al. (2013), hiesho is a common phenomenon in Japanese and traditional Chinese medicine; it is recognised as a condition that requires diagnosis and treatment. Hiesho is commonly experienced by

Japanese pregnant women, with one study reporting 67% of pregnant women experienced hiesho (Nakamura, 2008). Pregnant women with hiesho have cold hands and feet all day, which is not only uncomfortable but is also a condition that exacerbates minor problems during pregnancy, such as early uterine contractions, headache or lower back pain.

Although the concept of hiesho does not exist in Western medicine, research conducted among pregnant Brazilian women living in Brazil revealed that 57% of the women in that study experienced hiesho (Nakamura et al., 2011). Pregnant women in the Philippines were also studied and, although those participants were not aware of experiencing hiesho as such, they had experienced cold hands and feet (Takeuchi & Nakamura, 2018). In other words, the issue is that awareness of hiesho, as a stand-alone symptom, is weak and we suggest that hiesho possibly exists in countries other than Japan.

Nakamura and Horiuchi (2013) found a relationship between hiesho, a physical state in pregnant women, and prolonged

labour and uterine inertia. Both of these conditions are known risk factors for postpartum haemorrhage (PPH). In their study among pregnant women aged 35 to 39, with and without hiesho, the probability of uterine inertia was 2.9 times (OR 2.94), and of prolonged labour 2.6 times (OR 2.56), higher in the group with hiesho. Among pregnant women aged 40 and over, the probability of uterine inertia was 7 times (OR 7.02), and of prolonged labour 7 times (OR 7.19), higher among those with hiesho. From this, we deduced that uterine inertia and prolonged labour may occur more often in pregnant women with hiesho.

Simple lifestyle modifications and complementary therapies can reduce the prevalence of hiesho. In one study, a group of pregnant women with hiesho in the latter half of pregnancy, who followed a four-week programme involving wearing leg warmers, performing exercises and pressing acupressure points, experienced a statistically significant rise in temperature in their extremities compared to the control group (Nakamura & Horiuchi, 2017).

PPH can be a serious complication following labour, in some instances putting the woman's life in danger. Therefore, it is urgent that efforts are made to identify predictor factors for this condition. Uterine inertia and prolonged labour are both risk factors for PPH. Other risk factors include multiple births and induced labour (Cunningham, Leveno, & Bloom, 2014).

Active management in placental delivery is advocated by the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) to prevent PPH (ICM & FIGO, 2006). The New Zealand College of Midwives (NZCOM) also recommends that, when there is a risk of PPH, active management is the first choice in dealing with the third stage of labour, requiring administration of an oxytocic drug following the birth of the baby (NZCOM, 2013). According to the National Institute for Health and Care Excellence (NICE) delivery guidelines (2014), active management compared to physiological management can help reduce a PPH of over 1,000ml. However, the use of oxytocic drugs has been reported to have side effects, such as higher diastolic blood pressure, vomiting after delivery and afterpains.

Given these findings, we began this study to determine if hiesho in pregnancy was also associated with PPH. Thus, our aim was to analyse the direct impact of hiesho on PPH by comparing blood loss outcomes of pregnant women with and without hiesho in pregnancy.

Operational definition of terms

An objective indicator of hiesho is a large difference between core body and peripheral temperatures. In previous studies, the forehead temperature of pregnant women with hiesho was 36.2°C, compared to 36.4°C among pregnant women without hiesho, which was not a significant difference. However, the sole temperature was 31.2°C in women with hiesho and 33.9°C in those without, showing a significant difference between the two groups. Furthermore, the combined difference in temperature was significant (5.5°C vs. 2.4°C) between those with and those without hiesho (Nakamura, 2008). A similar result was obtained for skin temperature. Participants' body temperatures were measured using Core Temp R CTM-205, with proven reliability and validity. Core and skin temperatures were measured simultaneously, and the results had strong reliability and validity.

As the results of prior studies show that being conscious of cold reflects a statistically significant difference in forehead and sole temperatures, women in the latter half of pregnancy who had cold hands and feet in daily life were deemed to have hiesho (Nakamura, 2008).

METHOD

The research design was a case-control study. Data were collected over a 12-month period during 2009 and 2010, with research being conducted in six general hospitals in Japan. A uniform practice among the hospitals in measuring blood loss during birth, including blood loss up to two hours after birth, was to not only measure clots but also estimate blood on gauze or sheets (except amniotic fluid). No significant differences in measurement values were found between institutions.

Study participants

The participants in the present study were Japanese women in hospitals who had given birth within the previous four days. Women who had had a caesarean section or who were experiencing unstable physical or mental health conditions were excluded from the study.

Data collection

In this study, data were extracted from medical records and a questionnaire was circulated to participants. The questionnaire included a question as to whether the participant had developed hiesho in the latter half of pregnancy, along with other questions relating to demographic data, which included the woman's age, labour and birth history, smoking history, and any complications and abnormalities during pregnancy. Information on participants' condition at birth (number of weeks of pregnancy, length of time from the initiation of labour to birth, uterine inertia, prolonged labour, condition of newborn, etc.) and whether PPH had developed was extracted from the medical records (Table 1).

Anxiety during the latter part of pregnancy increases stress, and stress heightens the action of the sympathetic nervous system. Anxiety and stress, which are confounding factors for hiesho, were measured using the Stress Response Scale-18 (SRS-18) for psychological stress reactions. The related questionnaire asked participants after the birth to recall how they had felt during the latter stage of their pregnancies (Suzuki, Shimada, Sakano, Fukui, & Hasegawa, 2007). The questionnaire consisted of 18 questions, with answers ranging from 1 (*completely disagree*) to 4 (*completely agree*) on a 4-point Likert scale. Total scores obtained were converted into four stages by using a score conversion table. The discriminant validity of the concepts was tested, and Cronbach's alphas were obtained for the stress scale (0.91) and anxiety scale (0.84), demonstrating no issues with internal consistency and confirming the high reliability of the questionnaire.

Methodology

Participants were recruited by having staff in the maternity wards of six general hospitals in Japan identify women who met the inclusion criteria. Prior to the researchers gaining access to participants, hospital staff confirmed that they were willing to participate, after which the researchers also asked participants if they wished to be included in the research. After they had confirmed their intent to participate, the researchers explained to participants, both verbally and in writing, that participation in this study was voluntary, that submitting the completed questionnaire was deemed to imply written consent to participate, and that all data collected would be used only for the purposes of this study. The study was approved by the Ethics Committee of the University (24th September, 2009: 09-057) and by the ethics committees of the six institutions where the study was conducted (approval no. 1003).

The research study was described to the prospective participants and they were handed the questionnaire. The women were asked

to place completed questionnaires in a retrieval box provided for that purpose. The researchers collected the completed questionnaires and extracted data about labour and birth from the medical records of the women who had chosen to participate. To establish matching between the questionnaire and medical records, participants were asked to enter the date and time of birth (delivery number) and the birthweight of the newborn; these were matched with the details in the medical records. When the data were extracted, only the information required for the study was recorded and the women's names were not included.

Table 1. Baseline characteristics of participants

Characteristic	mean±SD/N	
	No.	%
Age	32.5±4.6	
Parity	Primipara	1,294 53.3
	Multipara	1,133 46.7
Smoking (during pregnancy)	82 3.4	
Sensitivity to cold (hiesho)	1,019 42.0	
Complications (perinatal period-related primary disease)	905 37.3	
Complications prior to this pregnancy	Infertility	237 9.8
	Uterine fibroids	205 8.4
	Ovarian cysts	104 4.3
Abnormalities during pregnancy (disorder developing during pregnancy)	1,587	65.4
	Anaemia	923 38.0
	Breech presentation	417 17.2
	Number of weeks of pregnancy (mean±SD)	39.4±1.2
Mode of birth	Normal birth	2,310 95.2
	Forceps/vacuum delivery	117 4.8
Length of time for labour and birth (h) (mean±SD)	9.0±7.2	
Blood loss at birth (ml) (mean±SD)	417.7±285.0	
Weak labour pains - labour inertia	272 11.2	
Prolonged labour (when the baby is not born 30 hours after onset of labour for a primipara or 15 hours for a multipara)	146 6.0	
Atonic postpartum haemorrhage	613 25.3	
Number of births (mean±SD)	1.0±0.0	
Apgar score at 1 minute (mean±SD)	8.6±0.7	
Apgar score at 5 minutes (mean±SD)	9.4±0.6	
Birthweight (g)	3,054.4±358.6	

n=2,427

Data Analysis

Statistical analysis was conducted using the SPSS Statistics software versions 17.0 and 19.0. Data from the two groups, pregnant women with hiesho and those without hiesho, were analysed to determine any relationship between hiesho and PPH.

Considering the connection between independent and dependent variables, the influence of confounding factors must be excluded when studying whether there is any relationship between factors and results. Therefore, in this study, propensity scores were used to adjust for confounding factors, other than PPH, in both the hiesho and non-hiesho groups (Hoshino & Okada, 2006; Rosenbaum & Rubin, 1983). Thus, in observational studies, propensity

scores enable the aggregation of multiple confounding factors into one variable—similar to the process of “pseudo-analysis” of observational study data, such as that in randomised controlled trials (Cepeda, Boston, Farrar, & Strom, 2003; Drake, 1993).

In this study, we selected confounding factors for hiesho and PPH to calculate propensity scores. For PPH, we selected factors from domestic and overseas medical literature believed to affect PPH and used a panel of experts to study their internal validity. From all factors extracted from the medical notes, we selected those showing a statistically significant difference for presence or absence of PPH. Regarding hiesho, out of all the factors extracted, we selected those showing a statistically significant difference for presence or absence of hiesho. We ultimately selected 16 confounding factors (Table 2), making hiesho a dependent variable (response variable), and applied multiple logistic regression analysis to a selected covariance as independent variables (explanatory variables) to calculate propensity scores. Results showed that eight of the factors included in the model equation—smoking during pregnancy, the presence of ovarian cysts, strategies for relieving hiesho during labour and birth, fatigue during labour and birth, stress during the latter half of pregnancy, uterine inertia, prolonged labour, and abnormalities during labour and birth—were involved, and the propensity scores calculated averaged 0.42 (standard deviation [SD] 0.15; Table 3).

Table 2. Factors identified as a covariance

Factor
Maternity history (number of births, including this one)
Smoking during pregnancy
Complications of ovarian cystoma
Chorioamnionitis
Use of tocolytics during pregnancy
Fatigue during labour and birth
Care for relieving hiesho during labour and birth
Stress during latter half of pregnancy
Use of uterotonics/oxytocin (1st and 2nd stages of labour)
Length of time of labour and birth
Perineal laceration
Use of oxytocics (3rd stage of labour)
Interventions during labour and birth
Uterine dystocia
Prolonged labour
Macrosomia

Next, we applied a multiple logistic regression analysis to calculate propensity scores and later used a logistic regression analysis to analyse the effect of propensity scores before adjustment for hiesho. By using the propensity scores thus calculated, we gave weight to background factors other than PPH (confounding factors) in the hiesho and non-hiesho groups, so that they would be identical in both groups through analysis of covariance and stratified analysis, and we calculated the effect of hiesho on PPH after adjustment for propensity scores.

In the stratified analysis, participants were evenly divided into five subgroups, according to the propensity score values calculated. Next, a chi square test for the two variables of hiesho and PPH was conducted for each subgroup, and the results were combined, yielding a regression coefficient of common OR and a 95% CI. A stratified analysis was conducted according to the Mantel-Haenszel method. In the stratified analysis, it is desirable to have at least five subgroups (Rubin, 1997); therefore, the minimum and maximum

Table 3. Factors used to estimate propensity scores as covariances of hiesho and atonic postpartum haemorrhage

Covariance	Regression coefficient (B)	Standard error (SE)	Wald statistics	Degree of freedom	Significance probability (p)	Odds ratio (OR)	95% confidence interval (CI)
Smoking during pregnancy	0.53	0.24	4.90	1	0.03	1.69	1.06-2.70
Ovarian cystoma	0.42	0.21	3.94	1	0.05	1.52	1.01-2.30
Care for relieving hiesho during labour and birth	0.38	0.08	21.80	1	<0.001	1.46	1.25-1.71
Fatigue during labour and birth	-0.13	0.05	5.36	1	0.02	0.88	0.79-0.98
Stress during latter half of pregnancy	0.02	0.01	16.08	1	<0.001	1.02	1.01-1.03
Uterine inertia	0.43	0.15	8.15	1	0.004	1.54	1.14-2.06
Prolonged labour	0.51	0.20	6.63	1	0.01	1.66	1.13-2.44
Interventions during labour and birth	0.82	0.09	76.06	1	<0.001	2.27	1.89-2.73

Goodness of fit of the model: chi square test $p < 0.001$, Nagelkerke R^2 .13, Hosmer-Lemeshow test $p = 0.90$, Accuracy of discrimination 64.4%, $n = 2,427$

values obtained for each propensity score were distributed evenly across the five subgroups (Rosenbaum & Rubin, 1984).

FINDINGS

A total of 2,821 women were recruited. Of these, 11 individuals were excluded: three because they were non-Japanese and eight because they declined to give permission for access to their medical records. An additional 383 women who had delivered via caesarean section were also excluded, giving a final total of 2,427 participants (63.4% retrieval rate, 86% valid response rate).

Participant characteristics

Participants ranged in age from 16 to 45, with an average age of 32.5 (SD 4.6; Table 1). Of the total cohort, 1,408 (58%) reported experiencing hiesho during pregnancy, while 1,019 (42%) had not. From the total sample, 613 respondents (25.3%) had experienced PPH.

Regarding smoking during pregnancy, 82 women (3.4%) had smoked during pregnancy, while 2,345 women (96.6%) had not. Complications occurred in 905 women (37.3%) and included infertility ($n = 237$, 9.8%), uterine fibroids ($n = 205$, 8.4%) and ovarian cysts ($n = 104$, 4.3%). Complications during pregnancy included breech presentation ($n = 417$, 17.2%) and anaemia ($n = 923$, 38%), and complications during labour included uterine inertia ($n = 272$, 11.2%) and prolonged labour ($n = 146$, 6%).

Relationship between presence/absence of hiesho and PPH

Of the 613 respondents (25.3%) who had experienced PPH, 343 (56%) reported experiencing hiesho and 270 (44%) reported not experiencing hiesho.

Choice of confounding factors and calculation of propensity scores

To calculate propensity scores, confounding factors for hiesho and PPH were selected. Results showed that the eight factors included in the model equation were involved, and propensity scores calculated averaged 0.42 (SD 0.15; Table 3). These eight factors were thus found to be confounding factors that affected the relationship between hiesho and PPH. The propensity score of 0.42 demonstrates identical weighting of the group of women with hiesho and the group of those without hiesho.

Impact of hiesho on PPH

The results obtained for the impact of hiesho on PPH, before adjustment using propensity scores, were a regression coefficient of 0.76 and $p < 0.001$ (OR 2.13; 95% CI, 1.77-2.57; Table 4), indicating that the probability of PPH was 2.13 times higher among pregnant women with hiesho than those without hiesho, a statistically significant difference.

However, when the impact of hiesho on PPH was adjusted using the propensity scores, the regression coefficient was 0.2 and $p = 0.07$ (OR 1.22; 95% CI, 0.98-1.50). Using propensity scores to adjust for the impact of confounding factors, the probability of PPH was 1.22 times higher among the women who experienced hiesho in the latter half of their pregnancy. This is not a statistically significant difference. The evaluation of the model, using the chi square value omnibus tests of model coefficients was 444.62, $p < 0.001$, indicating that the goodness of fit of the model was high. The accuracy of discrimination was 72.9%, giving the model sufficient predictability.

For the stratified analysis, respondents were evenly divided into five subgroups, according to the propensity score values calculated,

Table 4. Probability of atonic postpartum haemorrhage due to hiesho

		Regression coefficient (B)	Standard error (SE)	Wald statistics	Degree of freedom	Significance probability (p)	Odds ratio (OR)/ common odds ratio	95% confidence interval (CI)
Before adjustment with propensity scores*	Hiesho	0.76	0.10	63.98	1	<0.001	2.13	1.77-2.57
After adjustment with propensity scores	Analysis of covariance**	0.20	0.11	3.29	1	0.07	1.22	0.98-1.50
	Mantel-Haenszel	0.25	0.11	5.12	1	0.02	1.29	1.04-1.59

Goodness of fit of the model: $n = 2,427$

*chi square test $p < 0.001$, Nagelkerke R^2 .04, accuracy of discrimination 74.7%

**chi square test $p < 0.001$, Nagelkerke R^2 .25, Hosmer-Lemeshow test $p < 0.001$, accuracy of discrimination 72.9%

and a chi square test for the two variables of hiesho and PPH was conducted for each subgroup. The results were combined, yielding a regression coefficient of a common OR and 95% CI. Stratified analysis was conducted according to the Mantel-Haenszel method. The results were a regression coefficient of 0.25 and $p=0.02$ (common OR 1.29; 95% CI, 1.04-1.59, managing not to cross 1). Using propensity scores to adjust the impact of confounding factors, the probability of PPH was 1.29 times higher among the women who experienced hiesho in the latter half of pregnancy. While this was a significant difference, the value was very close to that obtained in the analysis of covariance.

Essentially, if the impact of confounding factors is not taken into account, the probability of PPH among women with hiesho is 2.13 times greater, a statistically significant difference; however, when propensity scores are used to exclude the impact of confounding factors, the difference is not statistically significant.

DISCUSSION

Relationship between hiesho in pregnancy and PPH

The aim of this study was to determine whether hiesho is a risk factor for PPH. We found that, although PPH occurred 1.2 to 1.3 times more frequently in pregnant women with hiesho in the latter half of pregnancy than in those without hiesho, a considerable covariant overlap was observed, indicating that hiesho had little impact on the overall risk of PPH.

We used propensity scores to adjust for important confounding factors. Prior to making this adjustment, we found that pregnant women with hiesho were 2.1 times more likely to experience PPH than those without hiesho ($p<0.001$; OR 2.13; 95% CI, 1.77-2.57). This demonstrates that confounding factors have an impact on the relationship between hiesho and PPH and that factors other than hiesho were likely the major causes of PPH.

Normally, after the birth of the baby and delivery of the placenta, the cavity of the uterus empties and uterine contractions reduce blood loss by the biological ligation provided by the uterine muscle. When this function is impaired, PPH can occur (Cunningham et al., 2014). Thus, the presence of ovarian cysts or uterine fibroids can interfere with this normal physiological process (Cunningham et al., 2014). In this study, 8.4% of the respondents had uterine fibroids and 4.3% had ovarian cysts, both of which were considered as predisposing factors for PPH.

Smoking during pregnancy was also a confounding factor (Cunningham et al., 2014). It is known that one of the physical effects of the nicotine contained in cigarettes is to constrict peripheral blood vessels. Thus, smoking may aggravate hiesho.

Labour is the contraction of the smooth muscle of the uterus, and insufficient contraction can contribute to uterine inertia and prolonged labour (Cunningham et al., 2014). The relationship between hiesho, uterine inertia and prolonged labour found by Nakamura and Horiuchi (2013) suggests that the presence of hiesho is a risk. Our hypothesis was that because hiesho is a condition where the sympathetic nervous system becomes dominant and one of the effects of the sympathetic nervous system is to cause the smooth muscle to relax, this may lead to increased risk of PPH. However, this is not supported by our data.

Although we have found that uterine inertia and prolonged labour are direct causes of PPH, hiesho may potentially have an indirect effect. Therefore, as hiesho potentially affects the occurrence of uterine inertia and prolonged labour, preventing hiesho may help avoid uterine inertia and prolonged labour and consequently PPH.

Hiesho can be mediated through complementary therapies, such as wearing leg warmers, performing exercises and pressing acupressure points (Nakamura & Horiuchi, 2017). It is possible that introducing these interventions may help prevent uterine inertia and prolonged labour, potentially contributing to a reduction in the incidence of PPH.

STRENGTHS AND LIMITATIONS

This study is the first of its kind to systematically examine hiesho and its relationship to PPH. As such, it contributes to the field of research related to hiesho.

The limitation of this study is that it targeted only Japanese women living in Japan and the findings may not be applicable to women in other countries. In clinical midwifery practice in Japan, midwives evaluate hiesho by palpation and recommend that pregnant women keep warm and take walks regularly (Gepshtein, Horiuchi, & Eto, 2007). Today, many Asian women live and give birth all over the world and New Zealand has a growing Asian community. We believe it is important to disseminate information from Japan concerning the concept and potential implications of hiesho on childbirth for these women in particular.

CONCLUSION

Hiesho is an important facet of Japanese culture that can influence health. Hiesho during pregnancy is linked to uterine inertia and prolonged labour. Both of these conditions can lead to PPH. This retrospective cohort study analysed the impact of hiesho on PPH for 613 pregnant women experiencing or not experiencing hiesho. Findings indicate that hiesho has no direct impact on PPH. However, there may be a secondary influence increasing the likelihood of uterine inertia and prolonged labour. Therefore, it is suggested that managing hiesho may help avoid uterine inertia and prolonged labour and, potentially, reduce the incidence of PPH in susceptible women. In clinical practice, we encourage midwives to diagnose hiesho by palpating pregnant women's hands and feet and provide care by recommending that pregnant women keep warm, exercise and stimulate circulation in their hands and feet.

ACKNOWLEDGEMENTS & CONFLICTS OF INTEREST DISCLOSURE

The authors express their gratitude to the respondents and to the staff of the cooperating institutions who participated in this study.

This research was undertaken with the help of Grant-in-Aid for Scientific Research No. 22592525 from the Japan Society for the Promotion of Science (JSPS) and presented before the Kanagawa Society of Maternal Health, Japan.

The authors declare that they have no conflicts of interest with respect to this research manuscript.

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Accepted for Publication July 2018

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NEW ZEALAND RESEARCH

Pasifika student experience in a Bachelor of Midwifery programme

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ABSTRACT

Background: In New Zealand the Pasifika population comprises 6.9%. Rapid growth in the Pasifika population is anticipated and, with only 2.2% of registered midwives identifying as Pasifika, most Pasifika women are currently, and could increasingly be, unable to access a midwife from their culture. To help address this need Otago Polytechnic has identified Pasifika midwifery student success as a priority area.

Aim: The objective of the research was to hear how Pasifika students experience studying midwifery, and to seek their contribution to the ongoing development of the learning environment and School processes, with the aim of increasing their enjoyment, success and retention rate in the programme.

Method: Possible methodologies were considered, with the aim of developing a culturally appropriate relationship between the researcher and the participant. The Talanoa and the Kakala research approaches informed how the students were approached and the interviews conducted. To help frame the research, a flexible participatory model, “Spacifichology”, was chosen which recognises four categories of Pasifika learners. Following ethical approval, individual interviews were undertaken by the Pasifika researcher with the participants. The recordings were transcribed and analysed for themes.

Findings: Two broad areas were uncovered. Firstly, “the experience of being Pasifika” with subthemes: trying to fit in; it’s not easy to ask for help; determination to succeed; and the desire to work with Pasifika women. And, secondly, “the student experience in the programme” with subthemes: the value of ākongā (local tutorial groups); the costs of the programme; assignment writing; preferring face-to-face; making connections: a place to belong; and collectivism (it is about us).

Conclusion: Pasifika students are challenged by competing demands from family, social responsibilities, financial issues and unfamiliarity in the tertiary education environment. Fostering a “learning village” will help students to feel like they fit in. As educators, it is crucial for us to understand that it is always about “us” for Pasifika students; not about them as individuals. Finally, these Pasifika students are determined to succeed.

Keywords: Pacific, Pasifika, undergraduate midwifery education, midwifery student

INTRODUCTION

The word “Pasifika” refers to learners and communities or populations of peoples living in Aotearoa New Zealand (NZ) who have genetic and cultural links to Pacific Island nations. More than 15 Pacific nations fall under the umbrella of Pasifika and each culture is unique. In 2010 the Pasifika population comprised 6.9% of the NZ population (Statistics New Zealand & Ministry of Pacific Island Affairs, 2010). The number of Pacific people in NZ is growing rapidly, with Samoans the largest Pasifika ethnic group and Tongans the most rapidly growing group (Statistics New Zealand & Ministry of Pacific Island Affairs, 2010), influencing the demographic and cultural profile of NZ.

Currently, the majority of Pasifika people resident in NZ have been born here. This is a change from a previously mainly migrant group (Statistics New Zealand & Ministry of Pacific Island Affairs, 2010). Further, the Pasifika population is considerably younger, with a median age of 21 years, compared with 36 years for the total population of NZ (Statistics New Zealand & Ministry of Pacific Island Affairs, 2010).

Chu, Samala Abella and Paurini (2013) acknowledge that Pasifika are over-represented in low-decile schools and may not have been provided with the same learning opportunities as other students. As a consequence, Pasifika are under-represented in professional roles, prompting Alkema (2014) to suggest that tertiary institutions need to be cognisant of this and have strategies to support Pasifika students to succeed.

When we began this current study, midwives in NZ identifying as Pasifika represented only 2.2% of registered midwives (Midwifery Council of New Zealand [MCNZ], 2014). Therefore, most Pasifika women will be unable to access a midwife from their culture.

BACKGROUND

In the Bachelor of Midwifery programme at Otago Polytechnic we have a small number of students who identify as Pasifika. Some of these students are challenged by the academic expectations and the workload required in the programme. At the time of this study we had an 81% retention rate for Pasifika students, with the course completion rate averaging 73% between 2012 and 2014. The success of these students is a priority for our School of Midwifery,

and Otago Polytechnic has clearly identified Pasifika student success as a priority area for all schools, with the intention of building a tertiary system where Pasifika students are encouraged and supported to succeed (External Pacific Advisory Committee, 2014). This project is viewed as a starting place to understand more clearly the issues for Pasifika students within a particular School and where resources can be directed.

In 2014 a study was designed with the aim of hearing the voices of Pasifika midwifery students to inform how we could support them in the programme. This followed a participatory research project undertaken in 2013 with Māori students in the School using a kaupapa Māori process and methodology (Patterson, Newman, Kerkin, & Wilson, 2013), from which the School made changes to the teaching practices and processes in response to the student recommendations. Our research question for the Pasifika study was similarly aimed at discovering the experiences of Pasifika students and, where possible, making changes to increase their enjoyment, success and retention in the programme.

Three lecturers and a Student Advisor in the School of Midwifery, in collaboration with the Otago Polytechnic Pasifika Student Advisor, undertook the study.

Bachelor of Midwifery programme

The current Otago Polytechnic Bachelor of Midwifery programme was jointly designed and developed by Otago Polytechnic and Christchurch Polytechnic Institute of Technology (now Ara Institute of Canterbury) and commenced in 2009. The curriculum uses a blended delivery model to meet the MCNZ standards (MCNZ, 2015) and improve access and local midwifery practice opportunities for students. The degree is a three-year programme (equivalent to four years' full-time study) delivered over 45 programmed weeks in each year (MCNZ, 2015).

The blended model allows us to support students to undertake the majority of their study in their home areas and includes:

- a range of online learning resources
- distance synchronous online tutorials using the Adobe Connect™ platform
- ākonga (local tutorial groups) where a local midwifery kaiako (lecturer) supports a small group of up to seven students
- face-to-face learning blocks (known as “intensives”) at the Dunedin and Kāpiti campuses
- midwifery practice experiences in rural and provincial areas, as well as in main centres

There are satellite groups in Whanganui, Palmerston North and the Wellington area in the North Island, and in Central Otago, Southland and Dunedin in the South Island. Ākonga groups meet weekly for three or four hours in years one and two, providing opportunities for debriefing, learning and practising midwifery skills, and the provision of pastoral support.

Literature review

While it is acknowledged that there is minimal research in the area of Pasifika tertiary education, Ako Aotearoa (National Centre for Tertiary Teaching Excellence) has led the way with research examining Pasifika student success. Alkema (2014) reported to Ako Aotearoa, identifying key findings from 11 projects between 2008 and 2013. These findings support the enhancement of educational outcomes for Pasifika learners in tertiary education. They conclude that organisations need to take a holistic approach with Pasifika learners, providing a “learning village”, supporting students academically and pastorally in an environment where they

feel comfortable. The recommendations were that ongoing work in the area of supporting Pasifika student success should focus on the links between interventions and retention, quantifying what makes a difference to learner outcomes, rather than focussing on literature reviews (Alkema, 2014).

Since this report, there has been a mixed methods study exploring Pasifika learner voices to identify and build on strategies that support learner success within Canterbury (Luafutu-Simpson et al., 2015). A Pasifika methodology, the Fausiga O Le Fale Tele Model, was used with focus groups and the findings demonstrated that Pasifika students' perception of what success means to them is tightly linked to their families and communities. For success, transformative changes in the academic interface, organisation practices and engaging spaces were recommended. The visibility of Pasifika culture within course content and curriculum design was seen as important, and both the learning contexts and teaching approaches need to enable Pasifika collectivist values. Further, organisational practices with targeted Pasifika learner support, and opportunities to meet with the wider Pasifika communities, were advocated to increase community connectedness. Finally, the provision of informal meeting spaces with visual imagery and artwork which reflect Pasifika culture was recommended (Luafutu-Simpson et al., 2015).

In relation to midwifery education, a set of specifications to guide good practice, quality improvement and aspirational goal setting was developed, based on the Future Workforce (2009) report. The recommendations followed a survey of tertiary institutions and District Health Boards (DHBs) of the undergraduate education and clinical placement experiences of Māori and Pacific nursing and midwifery students. The specifications targeted at the Schools of Midwifery and the Schools of Nursing included providing early counselling options when students consider leaving, requiring all students to attend an exit interview, and providing students with scholarship information and sources of advice on financial matters (Future Workforce, 2009).

Findings included that Pacific students may take longer to complete undergraduate degrees and have higher attrition rates than other nursing and midwifery students (Future Workforce, 2009). Interestingly, it was suggested that Schools with small numbers of Māori and Pacific students appear to have better retention rates and students are more satisfied with their support services. At Otago Polytechnic we have small numbers of Pasifika students enrolling in the midwifery programme. The Future Workforce survey did not gather data directly from students but rather gathered demographic and anecdotal data from the schools and DHBs. Our study addresses this gap by seeking to hear the students' voices.

This brief review of the literature highlights that there has been some exploration of the factors that encourage/hinder Pasifika student success but it is an area that needs further research. This study builds on the findings in the above literature by adding the particular experiences of the participating midwifery students who represent a minority group in the Bachelor of Midwifery programme at Otago Polytechnic.

METHOD

To guide this research, we explored possible Pasifika research approaches. The aim was to foster a culturally appropriate relationship between the researcher and this small number of participants. Two models were chosen: Talanoa and Kakala.

Talanoa is a Tongan perspective which captures traditional ways of communicating concepts and values in common with many

other Pacific nations (Vaiotei, 2006). One example is the mo’oni or “pure, real and authentic” (Vaiotei, 2006, p.1) approach, where the participants tell their story and aspirations in a very personal way, similar to a grounded theory approach. This can help balance the power dynamic between the researcher and the participants. Thus, Talanoa weaves culture, or the cultural experience of participants, into their narratives (Vaiotei, 2006). Also appraised was the Tongan Kakala process (Chu et al., 2013). This is similar to an appreciative inquiry approach (Cooperrider & Whitney, 2005), where the historical and cultural wealth of the participants is the beginning point for the research. For this study these approaches, using traditional ways of communicating and valuing the cultural wealth of the participants, informed how the Pasifika researcher approached and negotiated the interview processes with the students.

However, Pasifika students come from at least 15 diverse nations, all with particular cultural and linguistic differences. These identities become even more complex when they move to NZ. Seiuli (2013) captures this complexity, which she termed “Spacifichology”, which recognises four categories of Pasifika learners:

- learners born and raised in the Islands with Pasifika parents
- learners born in the Islands but raised in NZ with Pasifika parents;
- learners born and raised in NZ with Pasifika parents
- learners born and raised in NZ with one non-Pasifika parent

The model is created from three core aspects of Seiuli’s work. It is “specifically” for “Pasifika” and takes a “psychological” view of Pasifika students as they function in NZ and reflects the only common factor that all Pasifika peoples share—their or their family’s migration and now residency in NZ. By incorporating this model, there is potential to frame the student experiences and perhaps glean a deeper understanding of the challenges and potential of the students in the specific categories.

Overall, Seiuli’s objective was to create a safe arena for the research team to learn and analyse each narrative without fear of offending Pacific cultures. The inclusion of Talanoa practices enabled the Pasifika researcher to focus on students’ holistic journeys from their (or their family’s) arrival into NZ to the present moment, and on the aspects of this experience that enabled or hindered their success in their midwifery programme (Seiuli, 2013).

Informed by these approaches, the goal was to record informal conversations with each of the participants on the key aims of the research. The process undertaken is outlined below.

Ethics approval for the research was sought and obtained from the Otago Polytechnic Research Ethics Committee (OPREC #605).

Participants

Three students who identified as Pasifika, who were enrolled in the midwifery programme at that time, were approached by the Pasifika researcher and agreed to participate. This captured the total population of Pasifika students at the time; however, it is acknowledged that the small number of participants is a limitation of this study. Two students who had left the programme were approached but decided not to participate. The preliminary meeting was held in the local area of the participant/s. A koha (gift) of food and petrol vouchers, to acknowledge any travel costs, was offered as a traditional way of engagement. The research project was explained by the Pasifika researcher which included the return of the consolidated data to the participants for their approval before being presented to the School research team.

The individual interviews were undertaken at a second visit, later in the year, which allowed time for the students to consider whether or not they would participate. Each participant agreed to sign a consent form and koha was again provided. Participants were asked about their experience in the programme, what they saw as their learning needs, and what ideas they had for how learning resources and School processes could be adapted to improve their learning experiences. The Pasifika researcher digitally captured their comments, concerns and recommendations.

Understanding the individual participant’s background helped guide the Talanoa (conversations). Using the Spacifichology model, our participants sat under categories 2 and 4 of the tool:

- Student #1 & Student #2: Pasifika learners born and raised in NZ with Pasifika parents. Learners in this category often live by or are influenced by NZ values and beliefs. They often describe frustration at being stereotyped or experiencing assumptions from others that English is their second language (Seiuli, 2013).
- Student #3: Pasifika learner born and raised in NZ with one non-Pasifika parent. Learners in this category might not be struggling with transitioning within the education system but they may be struggling with finding their identity within the continuum from Traditional to Postmodern culture, Pasifika values and beliefs. Learners may refer to themselves as “plastic”; that they are not real Pacific Islanders (Seiuli, 2013).

Analysis

A research assistant, who had signed a confidentiality agreement and was not associated with the School teaching team, transcribed the recordings. Identifying details were removed from the transcripts which were disseminated to the research team for analysis.

To analyse the data, the Pasifika researcher colour coded participants’ transcripts and identified broad themes. The wider research team then met to review the data and the themes were refined.

A draft report was completed and forwarded to the participants to review, to correct any inaccuracies, and to provide any further feedback on the recommendations and conclusions.

Two broad areas emerged: firstly, the experience of being Pasifika and, secondly, the student experience in the programme (Table 1).

Table 1: Themes	
Experience of being Pasifika	Student experience in the programme
Trying to fit in	The value of ākongā
It’s not easy to ask for help	The costs of the programme
Determination to succeed	Assignment writing
Desire to work with Pasifika women	Preferring the face-to-face
	Making connections
	Place to belong
	Collectivism

The experience of being Pasifika was about trying to fit in with the more dominant cultural groups, not wanting to stand out by asking for help, and having a strong personal and family-driven desire to succeed and to contribute their skills to their Pasifika communities. Whereas, the student experience in the programme largely embraced the challenges of the mix of learning modes and social connection aspects, in relation to their fellow students.

FINDINGS

Experience of being Pasifika – what the students bring to the programme

Each student comes from a different background, which has influenced how each engages with the programme. One student stated:

I'm quite involved with the church. I don't have a family of my own; I don't have kids of my own, which frees me up quite a lot. But then I do help with my sister's kids quite a lot and extended family kids quite a bit; nieces and nephews. I suppose that's all part and parcel of being an Islander. (#1)

Another student mentioned that “Probably a major part of [doing midwifery] is following what God wants me to do” (#3).

This same student was asked if she was struggling to blend her knowledge as a Pacific person into what she was learning through the School. She responded:

Yup. I'm always looking for ways that I can get it in there. I just struggle that there's not that component. Well, it's almost like it's a cursory acknowledgment that they've just kind of thrown in. Very much a box ticking exercise. For me it would be great if there was more of a component there. (#3)

Another student alerted us to her difficulty with the way things are introduced and presented to students:

For me it felt harder because my understanding of how things are put out is a little bit upside down....It's really structured in a way that, sure, I went to school here and I understand that, but I still lived a Pacific life. I may have grown up in the school system, but I grew up in a Samoan house with the same Samoan ways of life, I suppose. (#2)

This comment indicated that she had to work hard to decipher what the lecturers were meaning and requesting.

Trying to fit in

The students discussed the struggle with being Pasifika and trying to fit in. One student talked about heading to Dunedin for the initial orientation week:

Thinking back I can say it was really difficult, but at the same time I wasn't in a space to... I don't think I was that open myself. I was very closed, very suspicious, wary of these people and who they are and what are they actually going to do for us? (#2)

It was identified that linking up with other students was helpful: “I think it was a relief to see other Māori and Pacific students when I got there. It's funny because you just get drawn together. We all just sort of came together and hung out” (#2).

She also recognised her unfamiliarity with the tertiary environment: “I've done life but I haven't done academic stuff to this extent” (#2).

There were some surprising findings relating to fitting in, with the same student saying:

Yup, and to fit in. The other issue I have is, I'm quite big. I'm not a small person, so I can't just slink into the corner and, “Don't see me, don't see me!” I'm quite a large... you know? (#2)

It's not easy to ask for help

While comprehensive student support systems are in place, it appears that Pasifika students may not see them as appropriate for their needs. All three participants identified difficulties with seeking help, demonstrated by the following:

It's not easy to ask for help, but that's just because we don't. We don't ask for help. We just kind of muddle on and do it. I know where to go if I need help. We've got the Student Success Team or whatever it is... (#3)

Determination to succeed

The theme of determination to succeed was strongly seen in all three participants' comments. One student described the challenges of applying for the programme:

I think it put me off to start with, because I read it and read what I had to do, and I was like, “I can't do that.” So I just didn't for a while and thought about it and then I was like, “Actually, I can do this.” It's serious. They want good people and people that are going to succeed and if you can't do that then you can't do the programme. So I got it done. It was alright, it was just very full on. (#3)

The notion of doing this to make the family proud and to be a role model for their children was important for all:

I have to have something to show for it at the end. So I have to keep pushing myself to succeed. It's going to be good for my son as well because he's going to see me succeeding. Whereas me and my brothers, we never really got that... (#3)

Another student contemplated withdrawing from the programme and identified the potential reaction of her children as a motivating factor: “It was either I was going to drop out or continue. Dropping out wasn't an option because then my kids would be thinking, ‘Um, excuse me’...” (#2).

This student described a desire to do further study, including wanting to work in midwifery education: “Now that I have a very definite goal, and goals beyond my degree goal, I'm very committed to my studies and how I succeed. So probably the determination that I've got through my studies as well has been huge” (#3).

Another student describes what has motivated her to succeed:

Probably my age. I'm a bit old to be mucking around with study now. And I actually really want to do this. Before I was kind of... it was priority. I didn't prioritise study. Which was obviously related to not really wanting to achieve. But with this I have set goals and I want to achieve those goals. I'm excited for what a career in midwifery can lead to. (#1)

Desire to work with Pasifika women

All three students wanted to work with Pasifika women, with one saying:

The more I've learnt this year about how indigenous people respond better healthwise to providers that are the same ethnicity as them, their health stats improve so much and I've seen it with Māori, and I thought, “Why do we not have this for Pacific Islanders as well, because would they not reap the same benefits if they had Pacific Island health providers?” (#3)

Student experience in the programme

The next broad area that emerged was the student experience in the programme.

The value of ākongā

Students clearly identified that ākongā are valuable. One student said:

I loved ākongā group because that's where we built relationships, connected with each other, and learnt about what was happening in their lives. And it wasn't all

just talk about midwifery, it was talk about life; what's happening in our lives. It was a really important group I think for me. (#2)

The costs of the programme

This student described the costs associated with the programme as:

Massive. I don't actually know how I'm going to do third year, and I don't know how I'm going to juggle that with Mum either. Mum's the main carer for my child, when I have to go away to intensives and things, so third year is going to be a huge toll on the family... (#3)

Assignment writing

There was plenty of feedback about assignment writing, with a student saying: "It's just that I don't like essay writing. I think why it's really annoyed me is that a majority of assessments we've done this year have been essays or writing in the form of an essay" (#1).

She expanded: "I reflect a lot, I always reflect, but I don't like writing my reflections. It's almost like reflecting on your reflection and I struggle to put it into writing" (#1).

Another student identified that she has struggled with the assignment questions, saying:

For me personally, some of the wording of assignment questions are just quite bizarre to me and I really struggle to get my head around it. I don't know whether that's just a general thing across the board or whether that's specifically because of my Pacific Island background, I have no idea. (#3)

Preferring the face-to-face

When discussing modes of learning in the blended programme one student stated that she found the online tutorials the least useful. She went on to say: "I suppose it's a part of distance learning that you can't really have the whole interaction that you would face-to-face" (#1). When she was questioned further about whether she preferred classroom or this way of learning, she replied:

Not classroom every day, definitely not. This blended learning works perfectly, because I still get to catch up with my ākonga every week. Then catch up with everyone else at intensives and stuff. There's still some face-to-face, but then I'm kind of left to do it myself, which kind of works in with the way that I like learning as well. (#1)

Making connections

A student articulated the importance of making a connection with the School early. She said: "I think having a connection with you straight off for those who identify as Pacific is really important" (#2). This student also found it important to make connections with her fellow students:

It's really important that I'm doing it with someone else; that we're on the road together rather than individual. And doing work together I like to share; sit at a table and share stuff together with another person, which is what me and my mate did a lot. (#2)

This student described the grief of losing one of her midwifery colleagues who withdrew from the programme:

I think my biggest issue in the beginning was making sure I'm taking someone with me; always doing it with someone, not being on my own. It's a very lonely programme. So if you don't make connections with the other students you're basically on your own. I think I struggled with that part the most, especially when my friend dropped out. I just thought, "I don't want to do this now; I don't want to do this by myself". (#2)

Place to belong

This student spoke about finding a place to belong. She had failed a course and then successfully completed the course the following year. She said:

It's also about becoming familiar with the space that you're in. I was more familiar now with the programme and how things start to get together and I was able to bring in my own life experiences that I didn't know how to bring in before. (#2)

She expanded on the transition she made:

It was all new and I think even though I wanted to do it, I was still afraid. After that first year (which I think was the hardest in getting my head around everything as well as myself, getting over myself) it started to get better. (#2)

Collectivism

When asked "What could the School do better to support you?" one student clearly outlined her collectivist outlook when she responded:

I don't know if there's anything. I'm sure there is. It's been such a long time. I just think having a better understanding of how we work. How Pacific work, function as a whole, is that everything is about us, our family, our community. It's not about individuals. It's not about me being me, sort of thing. It's about "us" always. So I'm down in Dunedin (at orientation), but I'm there with my whole family. When you're doing stuff, it's like there's a guy that spoke the other day and he said, "This is the problem with Pacific women: they come over here, they live in their homes as a family; as a unit. Everything is about the benefit of that family, it's not about the betterment of one individual. Then they go to school, and at school it's all about the individual". (#2)

DISCUSSION

As we review the literature and compare this with our findings, the importance of finding a place to belong, the students' drive to succeed, the factors underpinning this drive and challenges faced, will be explored. The Spacichology model will also be revisited for how it has contributed to an understanding of the students' experiences. Finally, a brief overview of how the School plans to address the findings will be provided.

Fitting in and belonging as a Pasifika student

Alkema (2014) highlighted the need for a "learning village", supporting students academically and pastorally in an environment where they felt comfortable. This aligns with the theme we uncovered of finding a place to belong.

The importance of belonging has been highlighted in other studies and has been shown as a way to build confidence and develop a positive identity (Furrer & Skinner, 2003; Luafutu-Simpson et al., 2015; Mila-Schaaf & Robinson, 2010; Osterman, 2000). Luafutu-Simpson and colleagues also stressed the importance of connections as the basis of relationships, and Tomoana (2012) recognised that relationships are of utmost importance as the foundation for learning.

A study exploring Pacific Island students' experiences at Massey University found that the students' social networks consisted primarily of other Pacific Islanders (Tofi, Flett, & Timutimu-Thorpe, 1996) and Chu et al. (2013) found that Pasifika students had a preference for sticking together during the hard times. Likewise, the midwifery students in our study predominately formed alliances with other Pasifika and Māori students.

The value of working together in educational institutions, where there was a privileging of Western cultural capital over other

cultural world views, was recognised by the students in Luafutu-Simpson et al.'s (2015) study. The students highlighted the value of working collectively, as opposed to the expectations of institutions that they become independent solitary learners (Luafutu-Simpson et al., 2015).

In the current study, the ākongas were identified as enabling students to work together. These groups provide a space for listening to students in a face-to-face environment, offering pastoral support as well as learning support. Further, they allow space for kaiako to get to know the students, and to create an environment where students feel they belong. These concepts have been acknowledged by Tomoana (2012) as helping students to succeed. Belonging to an ākonga also assists with creating a team environment so students feel comfortable to ask a class member or their kaiako for help. It also provides a place for students to give feedback, and for kaiako to check comprehension, and use a variety of formats to demonstrate practice skills. Tomoana (2012) acknowledges that making time in the teaching plan to listen to students creates gains in other areas and can be used as a strategy to build relationships and enhance learning.

Determination to succeed and the primacy of the family (us)

NZ culture is often classified as individualist and its mode of education as dialogic with an emphasis on independent, self-directed and critical thinking (Ho, Holmes, & Cooper, 2004). However, it is recognised that there is diversity in NZ's educational values and practices, some of which have been influenced by Māori and Pasifika communities, who have a more collectivist approach to learning (Ho, Holmes, & Cooper, 2004). In collectivist cultures, people promote respect for authority and group consensus compared to individualist cultures, where self-expression and individual thinking is emphasised (Ho, Holmes, & Cooper, 2004). One of our students acknowledged her collectivist outlook when she stated "*It's not about individuals...It's about 'us' always*" (#2).

Pasifika students have identified that their obligation to their family was seen as more important than study, which may negatively impact study or mean that the student would have to cease studying (Benseman, Coxon, Anderson, & Anae, 2006). There were also expectations placed on them by their parents to attend church and family activities as well as study (Benseman et al., 2006; Future Workforce, 2009). Likewise, the learners in our study have discussed competing demands. Conversely, families that provide a meaningful level of support (such as through praise, giving students time to study, and encouraging higher education) assisted students to academic success (Chu et al., 2013).

Pasifika families often have few family members who have tertiary education experience, the consequence being there is less knowledge from which students can draw to help them build academic habits and receive guidance (Benseman et al., 2006).

Success was viewed by the students in Luafutu-Simpson et al.'s (2015) research as completion of a qualification, which was often followed by an explanation of how their achievement would positively impact family and the next generation. They were aware that being successful comes with great responsibility, including being good role models for younger siblings, their own children or future generations. They showed awareness of family sacrifice, and a reciprocal sense of service and responsibility that comes with success (Luafutu-Simpson et al., 2015). Similarly, the themes of role modelling and "giving back" were expressed by our learners.

However, the decision to commence tertiary education for Pasifika may be a mature decision after applicants realise the value

of education following completion of secondary school (Benseman et al., 2006). The three participants in our study are all mature students with one stating "*I've done life but I haven't done academic stuff to this extent*" (#2).

A challenge for some students, however, is knowing how to work the system and this mindset was identified as one of the major barriers to Pasifika students succeeding at tertiary level (Benseman et al., 2006). Students report that Pasifika students' cultural knowledge can be validated once the system is mastered (Benseman et al., 2006). This challenge resonates with a response from a student in our current study where she describes becoming familiar with the system:

It was all new and I think even though I wanted to do it, I was still afraid. After that first year (which I think was the hardest in getting my head around everything as well as myself; getting over myself) it started to get better. (#2)

Challenges in their programme and what could improve their experience

Financial support has been recognised as a major issue for Pasifika students (Benseman et al., 2006; Chu et al., 2013; Luafutu-Simpson et al., 2015). Students who had access to scholarships were less affected by monetary worries (Luafutu-Simpson, 2015) but limitations on student loans for older students may impact on the accessibility of education for Pasifika students. Placements are intensive and the associated costs are high for midwifery students, due to travel and accommodation requirements (Future Workforce, 2009). For midwifery students, the intensity and length of the programme affects students' ability to work during their study, potentially further compromising their ability to provide financially for themselves and their family. Further, there are low numbers of Pasifika academics to provide role modelling, mentorship and support (Benseman et al., 2006). This was recognised in our study, with one student suggesting that this gave her a goal to strive for (#3).

What the School is doing to improve their experience

A common theme in supporting success for Pasifika students are programmes that demonstrate commitment to high achievement standards and the expectation that all students can achieve (Benseman et al., 2006). The expectation that all students can achieve is at the forefront of planning and in our relationships with students.

The School has made a commitment to more visibly include Pasifika culture and visual images in the programme material. We acknowledge that we do not have any Pasifika staff within our School and, therefore, it is of utmost importance to introduce the polytechnic's Student Advisor-Pasifika proactively and face-to-face at the beginning of each year.

Tomoana (2012) suggests incorporating team building practices to encourage relationships amongst students. There is scope to increase cross-year shared time to enhance these relationships. Enhancement of the institutional interface with Pasifika students and Pasifika communities (Benseman et al., 2006) is an area for us to address as a School.

Students have identified that they struggle with the number of essays and reflections expected throughout the programme. In a recent redevelopment, the School has made significant reductions in the number of essays, with a focus on aligning practice courses with collaborative practical assessments. Our ongoing challenge is to ensure that essay questions, and expectations for what is required in reflections, are succinct, clear and explicit. Collaboration and group work are acknowledged as benefiting Pasifika learners

(Luafutu-Simpson et al., 2015), and we continue to strategically incorporate these.

STRENGTHS AND LIMITATIONS

We acknowledge that this is a small study with just three participants. However, it did capture all the enrolled Pasifika students at the time. It is possible that a larger number of participants would have raised different issues and sentiments. However, many of the experiences resonate with those in other larger studies accessed in the discussion, such as the obligation to family and the desire to succeed. Further, it is possible that Pasifika students in other midwifery schools in NZ, or elsewhere, will recognise shared experiences in this study.

The Pasifika researcher brought value to the project and allowed the students to share candidly of their experiences. By using traditional communication strategies and acknowledging the cultural worth each student brought to the interview, the scene was set for exploring their views in an environment of trust.

The application of the Spacifichology model facilitated discussion of the unique aspects of each student's Pasifika connections with their families and their home nations, enabling them to share their individual connection to their cultural roots. While this model gave us a demographic profile of the students' cultural connection, the small number of participants did not allow deeper analysis of the student experience in relation to the categories in the Spacifichology model. In a larger study it would be expected that themes may emerge which pertain to the demographic categories in the Spacifichology model.

Importantly, the responses provide guidance for the School in the development of future curriculum and environmental design ideas that may resonate with other midwifery schools in relation to Pasifika students.

CONCLUSION

Pasifika students are challenged by competing demands from family and social responsibilities, financial issues and, for some, unfamiliarity with the tertiary education environment. Fostering a "learning village" will help students to feel that they fit in. The small ākongā groups in each satellite in the programme provide a place for the students to belong. As educators, we need to understand that it is always about "us" for Pasifika students; not about them as individuals. These findings provide insights for how midwifery programmes could be adapted to better support Pasifika learners.

Finally, these Pasifika students are determined to succeed, to represent their family, to be role models for younger Pasifika people, to benefit the Pasifika community and because they have a passion for midwifery.

ACKNOWLEDGEMENTS AND CONFLICT OF INTEREST DISCLOSURE

We would like to acknowledge Otago Polytechnic for funding our Pasifika researcher, Anna Seiuli, and to acknowledge Anna for her work with the students, the gift of the Spacifichology framework, and her collaboration with the research team which enabled the research team to facilitate the project. Thank you to Katie Baddock who transcribed the interviews for us. Our most special thanks to the students for the willing gift of their time and wisdom to the research project.

The authors declare that there are no conflicts of interest.

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Accepted for Publication August 2018

Beatson, D., Seiuli, A., Patterson, J., Griffiths C., & Wilson, K. (2018). Pasifika student experience in a Bachelor of Midwifery programme. *New Zealand College of Midwives Journal*, 54, 44-50.

<https://doi.org/10.12784/nzcomjnl54.2018.6.44-50>

LITERATURE REVIEW AND ENVIRONMENTAL SCAN

Recognising and responding to acutely deteriorating women in New Zealand maternity wards: A literature and environmental scan

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ABSTRACT

Background: A significant body of evidence now demonstrates that early warning, recognition and response systems can help to prevent harm associated with in-hospital clinical deterioration. Systems for early recognition of, and response to, pregnant or recently pregnant (<42 days) women whose conditions are acutely deteriorating in hospital maternity settings have been recommended in other countries as a useful way of supporting rapid intervention and treatment, but it was not known what systems were in place in New Zealand (NZ) hospitals. The Maternal Morbidity Working Group (MMWG), within the Perinatal and Maternal Mortality Review Committee, has recommended the development of a national approach to detecting and responding to acute deterioration in inpatient pregnant women to align with the national patient deterioration programme currently in implementation.

Aim: The aim of this project was to investigate current practice nationally and internationally, by identifying the evidence related to early warning systems and tools, and investigating current models in place at NZ district health boards (DHBs) that support the early identification and treatment of an inpatient pregnant woman's deteriorating condition.

Method: We performed a literature search and environmental scan. The search strategy incorporated both academic and grey literature databases using the same search terms. The environmental scan involved contact with all NZ DHB midwifery leaders to request information on early warning systems and tools currently in use.

Findings: Sixteen papers met the inclusion criteria for the literature scan. The majority of evidence about the role of maternal early warning systems in preventing morbidity comes from retrospective case reviews, retrospective cohort studies, cross-sectional surveys, and validation studies, with some prospective evidence where early warning systems were evaluated after implementation. There were some indications that early warning systems can contribute to earlier identification of deterioration and cost-effectively reduce harm, although there is wide variation in the parameters used. The environmental scan found that 15 of the 17 DHB maternity services who responded (from 20 total services) have introduced, or are in the process of introducing, modified obstetric early warning systems. There is wide variation in the designs, parameters and thresholds of these scores, as well as the recognition and response systems in use.

Conclusion: A substantial proportion of DHBs are developing and implementing tools and early warning systems for maternity care. There is significant variation in the tools and approaches in current use. The MMWG and the Health Quality & Safety Commission have recommended development of a nationally standardised recognition and response system for use in NZ hospitals for pregnant or recently pregnant (<42 days) women to align with the national patient deterioration programme.

Keywords: maternity, early warning, track and trigger tools, recognition and response, score, system, physiological deterioration

INTRODUCTION

Most women are healthy throughout their pregnancies but, for a small number, pregnancy will be complicated by a significant morbidity experience. It is estimated that approximately 1% of all births in England are severely complicated (Waterstone, Bewley, & Wolfe, 2001), although that is thought likely to underestimate the current United Kingdom (UK) situation (Knight et al., 2016). Maternal morbidity review is a quality improvement initiative that

seeks to identify ways to improve systems and processes so that fewer women become seriously unwell during pregnancy or within 42 days of birth.

Systems for early recognition of, and response to, women whose conditions are acutely deteriorating in hospital have been identified as a useful way of supporting rapid intervention and treatment. Earlier recognition and appropriate response has the potential to reduce the physical and psychological severity of episodes of acute

deterioration experienced by women, thereby enhancing their recovery from childbirth and transition to motherhood.

It is now well established that in-hospital serious adverse events such as unexpected death and cardiac arrest are often preceded by observable physiological and clinical abnormalities (Buist, Bernard, Nguyen, Moore, & Anderson, 2004; McQuillan et al., 1998; Schein, Hazday, Pena, Ruben, & Sprung, 1990). Failures to recognise and respond to such abnormalities are preventable errors that can have devastating consequences for patients, families, whānau, and clinicians. A significant body of evidence now demonstrates that recognition and response systems can help to prevent harm associated with in-hospital clinical deterioration and have demonstrated improved outcomes in general adult populations internationally (Andersen et al., 2016; Ludikhuijze et al., 2015; National Institute for Health and Care Excellence, 2007; Pain et al., 2016; Schein et al., 1990; Winters et al., 2013). The Health Quality & Safety Commission (the Commission) is currently implementing a national patient deterioration programme for non-pregnant adult patients.

Anecdotal evidence from clinicians has suggested that early warning systems in maternity settings are currently being developed and used in some District Health Boards (DHBs), with significant variation in the tools and approaches in use and equivocal evidence of benefit. It is proposed that work to standardise maternity early warning systems in New Zealand (NZ) is aligned with the adult programme to ensure a sustainable and cohesive approach to implementation of systems to recognise and respond to acute deterioration in hospital. There was uncertainty over which, and to what level, early warning systems had been introduced into maternity settings in NZ and therefore there was a need to identify current practice.

AIM

The aim of this project was twofold: firstly, to identify and summarise the evidence related to early warning systems and tools that may support early identification of, and response to, episodes of acute deterioration experienced by pregnant or recently pregnant women within inpatient settings. Secondly, the aim was to identify if and how any of these tools have been incorporated into practice within the maternity hospital setting in NZ.

METHODS

A literature search was undertaken to summarise available evidence about existing early warning systems from both academic and grey literature databases. An environmental scan was conducted to understand the current NZ context.

Search strategy

Ministry of Health librarians assisted with a literature search strategy using terms agreed by the authors. The search strategy (Table 1) incorporated both academic and grey literature databases using the same search terms (although the search strategy was modified to accommodate the limitations of grey literature search engines, the keywords used were the same).

Environmental scan

There are 20 DHBs in NZ and midwifery leaders for each of these DHBs were contacted by email (by LD) with a request to provide the authors with information on what early warning systems and tools were currently in use in their maternity service. These leaders were also asked to forward a copy of any relevant DHB maternity policy or guideline and vital sign charts being used in their service.

Table 1. Search strategy

Academic database search engines	Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations Ovid MEDLINE(R) Daily Ovid MEDLINE and Versions(R) Ovid Nursing Database <1946 to June Week 3 2017> CINAHL PubMed Scopus
Grey literature search	Australia Policy Online Canadian Electronic Library Google (with a focus on non-governmental organisations, government, and academic websites) Greynet Health Foundation Archives King's Fund Library NICE evidence Search Opengrey TRIP (Turning Research into Practice) database, GreyLit
Inclusion criteria	Full text In English First world (Europe, UK, Ireland, Canada, Australia, NZ, USA) Peer reviewed academic journals Policy and other grey literature
Exclusion criteria	Editorials Commentary Conference proceedings Posters

Search terms	
1	(matern* or perinatal or pregnan* or obstetric*).mp
2	(fatality or mortality or morbidity or (deteriorat* adj3 patient*) or "acute deterioration" or "clinical deterioration" or "physiological deterioration" or "preventable death").mp.
3	1 and 2 (79276)
4	((("early warning" or "patient safety" or "early detection" or "vital sign*" or "observations" or "emergency response" or "rapid response") adj5 (system* or score* or criteria or tool*)),mp.
5	("track and trigger" or "recogni* AND respon*").mp. [mp=ti, ab, ot, nm, hw, kf, px, rx, ui, sy, dw]
6	3 and (4 or 5)
7	limit 6 to English language
8	limit 7 to yr="2012-Current"
9	remove duplicates from 8
10	limit 9 to (comment or editorial or letter)
11	9 not 10

Supplemental search based on keyword review	
1	((matern* or perinatal or pregnan* or obstetric*) adj5 ("early warning" or "patient safety" or "early detection" or "vital sign*" or "observations" or "emergency response" or "rapid response" or "track and trigger" or "recogni* and respon*") adj5 (system* or score* or criteria or tool*)),mp. [mp=ti, ab, ot, nm, hw, kf, px, rx, ui, sy, dw]
2	remove duplicates from 1
3	limit 2 to English language
4	limit 3 to yr="2012-Current"

A note on terminology

One of the difficulties of interpreting the findings of the literature on maternity early warning systems is a lack of clarity and consistency around the use of terms to describe the tools and processes that are reported. Of particular note is the interchangeable use of the acronym “EWS” to describe, variously, early warning scores and early warning systems.

In the non-pregnant adult literature, the term “early warning score” specifically refers to aggregate weighted early warning scores derived from vital sign data. These rely on the calculation of scores that are assigned to individual vital sign abnormalities, with the aggregated total score triggering action. Other trigger tools require action to be taken when single vital sign parameter thresholds that indicate abnormality are breached. The New Zealand Early Warning Score (NZEWS) for non-pregnant adults is a combination system that includes an aggregate weighted score, and single parameter triggers for high levels of abnormality (Health Quality & Safety Commission, 2017).

In the non-pregnant adult literature, early warning systems specifically refer to the use of a track and trigger tool (such as an early warning score or single parameter trigger tool), the accompanying escalation pathway and response processes, and the organisational structures and supports required to ensure the system is sustainable and effective. These commonly include structures and processes for ongoing clinical governance, monitoring and improvement, communication and team work, and education and training.

Further confusion is added when various acronyms (for example MEWT, MEOWS, MEWS) are used to refer to either aggregate early warning scores or single parameter trigger tools with little differentiation. This requires particular attention when attempting to interpret available evidence and weigh up the potential risks and benefits of using one method to support recognition of deterioration over another.

FINDINGS

Literature scan

As illustrated in Figure 1, a total of 175 abstracts were retrieved from the academic database searches, with an additional 11 items retrieved from grey literature sources. After abstract review, 133 items were excluded, and the full text for the remaining 46 papers and 4 grey literature items was reviewed. A further 26 items did not meet the inclusion criteria that studies dealt specifically with maternity settings, early warning, and track and trigger systems. Twenty papers and grey literature items met the search criteria and were reviewed. A further four were then excluded; three that were expert opinions and one that discussed early warning systems in a third world country.

The available evidence about the role of maternal early warning systems in preventing morbidity is generally not robust. Pragmatically, randomised controlled trials are not available, and the majority of evidence comes from retrospective case reviews, retrospective cohort studies, cross-sectional surveys, and validation studies, with some prospective evidence where early warning systems were evaluated after implementation. See Table 2 for study designs, methods, settings and findings.

Despite some indications that early warning systems can contribute to earlier identification of deterioration (Carle, Alexander, Columb, & Johal, 2013; Shields, Wiesner, Klein, Pelletreau, & Hedriana, 2016), the majority of available studies have attempted to validate the use of maternity early warning tools, scores and triggers only in specific populations of women (Edwards et al.,



Figure 1. Academic and grey literature search findings

2015; Maguire et al., 2016). This limits our understanding of how effective such tools are in a general population of hospitalised women in the maternity context. However, there are indications that implementing a maternity early warning system can cost-effectively reduce harm from maternal morbidity in hospitalised women (Hedriana, Wiesner, Downs, Pelletreau, & Shields, 2016; Hess, Hoffmann, Shields, & Caughey, 2017). It is clear that there is wide variation in the parameters used as part of an early warning tool (for example, respiratory rate, heart rate, proteinuria or lochia), and in the specific trigger thresholds within each parameter; for example, a respiratory rate of 25 may indicate abnormality in one tool but be considered normal in another (Bick et al., 2014; Smith et al., 2017). Such variation highlights the potential difficulty of reaching agreement on the most sensitive and specific parameters, thresholds and tools to detect deterioration, and also highlights the potential for confusion and delays in recognising deterioration.

Further confusion about the effectiveness of early warning systems in maternity settings is incurred when considering the varying practices around the timing and application of early warning tool use. For example, in some cases they are used only when a woman has already been identified as “at risk”; in others they are meant to be used for all pregnant women, and in yet others for all women more than 20 weeks pregnant.

Despite equivocal evidence about the validity and impact of introducing maternity early warning systems, a number of jurisdictions have made recommendations for their implementation. For example, in the UK, the Centre for Maternal and Child Enquiries (2011) recommends that all maternity services implement a maternity early warning tool. In Ireland, the National Clinical Effectiveness Committee (2014) recommends the standardised Irish Maternity Early Warning System (IMEWS) and has developed guidance about its implementation. Similarly, in California, the Council on Patient Safety in Women's Health Care developed maternal early warning criteria and provides guidance around the development of escalation pathways (Council on Patient Safety in Women's Health Care, 2017). The Australian National Safety and Quality Health Service Standards also require health services to have recognition and response systems in place, including in maternity services (Australian Commission on Safety and Quality in Health Care, 2012).

However, implementation of maternity early warning systems may not be straightforward. A grounded theory study in the UK identified perceived barriers to the use of early warning systems among midwives and obstetricians (Mackintosh, Watson, Rance, & Sandall, 2014). There was a view that using early warning systems with every woman created additional workload without clear benefit. There was also a view among the interviewed midwives that early warning systems threatened their ability to apply clinical judgment in the care of women experiencing episodes of acute deterioration. The authors further identified the significance to implementation and change management of "cultures, boundaries and hierarchies within midwifery teams, between obstetricians and physicians and between midwives and physicians" (p.32).

Environmental scan

An environmental scan of 20 DHB maternity services in NZ was undertaken, with 17 of the current 20 DHBs responding to a request for information about current use of maternity early warning systems. Fifteen of the DHBs who responded have introduced, or are in the process of introducing, modified obstetric early warning scores. Of the 17, two have recently developed policies and charts that are currently under trial, while another is in the process of modifying an Australian version of a maternity early warning chart and escalation process. The remaining 14 have a tool that is used, although not all have an associated policy or guideline.

There is wide variation in the designs of the maternity early warning systems in place. Despite some synergies on parameters used, tools are commonly complex in design, with variations in regard to the thresholds, triggers and escalation pathways used to support early recognition and response to acute maternal deterioration. It appears that none of the current systems has undergone robust evaluation of its effectiveness or impact on outcomes for women who deteriorate while in hospital. This variation in the recognition and response systems in use could provide the potential for confusion among clinicians working in maternity settings, particularly for lead maternity carers (LMCs) and locum clinicians who work across multiple DHBs.

DISCUSSION

The aim of this literature and environmental scan was to summarise the evidence that supports the use of early warning systems within the maternity sector and, secondly, to identify if the NZ maternity inpatient services had introduced early warning systems.

We found equivocal evidence as to the benefit of early warning systems due to a lack of robust, high level evidence and wide

variation in the tools, parameters and thresholds used to detect deterioration. Despite this, many countries have developed and implemented early warning systems as quality improvement initiatives. NZ has a unique model of maternity care because of the role of the LMC in delivering continuity of care. Other countries where early warning maternity systems have been implemented may have different models of care that could impact on the applicability of the international literature in the NZ setting.

The majority (14 out of the 17 we heard from) of the DHBs within NZ have already developed and implemented early warning systems as a means of identifying women experiencing an episode of acute deterioration within maternity wards. A further three are in the process of developing, testing or implementing early warning systems. This means that despite a lack of robust evidence, there has been a pragmatic approach to implementing systems in each DHB to support the recognition of, and response to, pregnant and postnatal women whose conditions are acutely deteriorating. However, the pragmatic approach has led to wide variation in the parameters, thresholds, escalation and documentation processes used across NZ maternity services.

Such variation creates risk in a small country such as NZ, where LMCs may work in multiple DHBs, and locum maternity clinicians are common. A nationally standardised early warning system would reduce the potential for confusion about the early warning system in use; provide opportunities to streamline training and education, including at the undergraduate level; and potentially smooth referral processes for women whose conditions are deteriorating and require transfer between services. An additional benefit is the opportunity to also instigate a change in culture, developing escalation processes that reflect respectful interdisciplinary discourse and facilitate appropriate and timely assessment of affected women by a clinician with the necessary skills.

The Commission and the Maternal Morbidity Working Group (MMWG) have identified the need to ensure that there is a consistent and agreed approach to support appropriate recognition of deterioration and timely escalation of care. The group has identified a need to develop a national early warning system that can be used across DHBs, and that reduces ambiguity and aligns the national deteriorating patient early warning and recognition and response system with that for pregnant or recently pregnant women accessing inpatient maternity services.

The Ministry of Health also has a vested interest in furthering the development of a standardised maternity early warning tool through the continued implementation of a national maternity record. A national early warning tool and localised escalation pathways that reflect the context of maternity care in NZ are required for this national record.

The development of a maternity early warning system must be cognisant of the roles of all clinicians involved in maternity care, who have a professional responsibility to advocate for women's decisions within the complexity of the maternity service environment. Although the intent is that early warning systems are used in hospital contexts, the crucial role of the LMC in detecting deterioration must be recognised. Indeed, the Midwifery Council of New Zealand's Scope of Practice (2010) states: "The midwife understands, promotes and facilitates the physiological processes of pregnancy and childbirth, identifies complications that may arise in mother and baby, accesses appropriate medical assistance, and implements emergency measures as necessary." Furthermore, Standard Six of the New Zealand College of Midwives' Standards of Practice (2015, p.23) states: "Midwifery actions are prioritised

and implemented appropriately with no midwifery action or omission placing the woman at risk.” All clinicians working in maternity services provide care in environments that are complex, unpredictable and uncertain and they share the same intentions of achieving the best possible outcome for women and their babies.

Any national maternity early warning system should complement the autonomy and critical thinking of clinicians; it should not remove or replace the importance of professional care or clinical judgement. Rather, it should provide a safety net so that when a woman becomes unwell, her deterioration is recognised, and care promptly escalated to an appropriately skilled responding clinician and service.

Many existing tools, both nationally and internationally, are extremely complicated and visually busy. Considerations of ease of usability to minimise complexity and additional workload, also known as “human factors design” (Patel & Kannampallil, 2014) should inform continued development of a national tool. The scope of the work should be to develop a maternity early warning tool strongly focussed on the detection of deterioration, rather than a general observation chart that factors in all potential antepartum and postpartum monitoring and assessment requirements. It is furthermore critical that appropriate governance, measurement and supporting frameworks are in place to support implementation and improvement to ensure the best possible outcomes for women and their babies.

This work will require continued input from key stakeholder representatives. In the absence of a clear evidence base, consensus about the parameters and thresholds indicating deterioration is essential. Testing of a proposed tool in appropriate maternity settings for usability continues and it will be refined as necessary. Appropriate subsequent audit and evaluation of performance will also be vital to ensure an early warning system that is fit for purpose within the NZ model of maternity care.

Our literature and environmental scan found a substantial proportion of DHBs are developing and implementing tools and early warning systems for maternity care. There is significant variation in the tools and approaches in current use and equivocal evidence of benefit. The MMWG and the Commission have recommended development of a nationally standardised recognition and response system for use in NZ hospital-based maternity services to align with the national patient deterioration programme.

Developing a nationally consistent approach to maternity early warning systems will support consistency for clinicians, regardless of which DHB they work within, and will assist DHBs to reduce the harm caused by delayed recognition of, and response to, morbidity among women who are pregnant or recently pregnant. A nationally standardised maternity early warning system would reduce the potential for confusion while providing opportunities to streamline training and education, and potentially smooth referral processes for women who require transfer between services. An additional benefit is the opportunity to foster a clinical culture of respectful interdisciplinary discourse that facilitates appropriate and timely assessment of women whose conditions are deteriorating by a clinician with the necessary skills.

CONFLICT OF INTEREST DISCLOSURE

The authors declare that there are no conflicts of interest.

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Accepted for Publication August 2018

Dann, L., & Hill, J. (2018). Recognising and responding to acutely deteriorating women in New Zealand maternity wards: A literature and environmental scan. *New Zealand College of Midwives Journal*, 54, 51-57.
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Table 2. Summary of the findings of the literature search

Authors, Year	Research design	Aim	Method	Limitations	Key findings
Austin et al. (2014) NZ	Retrospective case review	To determine whether EWS may have improved detection of severe maternal morbidity or lessened severity of illness	Multidisciplinary team determined through group consensus whether EWS might have improved care	64 charts Non-modified adult EWS	Adult EWS may have reduced severe maternal morbidity in 5 (7.6%) cases. No patient had a complete set of core vital signs recorded
Behling & Renaud (2015) USA	Pre- and post-implementation retrospective case review of women with postpartum haemorrhage	To assess impact of introducing obstetric vital sign alert in electronic health record and corresponding escalation pathway	Multi-site pre- and post-implementation case review assessing clinical variables, response time, length of stay	94 charts Only included postpartum haemorrhage	Response time and time to intervention significantly improved in post-implementation cohort. Total estimated blood loss was significantly reduced.
Bick et al. (2014) UK	Cross-sectional survey	To identify variation in the use of maternity EWS	Survey electronically distributed to heads of midwifery at NHS maternity care facilities (n=157); 68% response rate	Subjective reporting of organisational use of maternity EWS.	All but one facility had introduced EWS; wide variation in tools, parameters, thresholds, escalation procedures. Little evidence of benefit.
Carle et al. (2013) UK	Retrospective validation study	To validate statistically based aggregate weighted EWS (obstetric)	Retrospective data from 4,440 patients admitted to critical care units	Score validated using data set from critical care patients.	The obstetric EWS performed well in discriminating survivors from non-survivors
Edwards et al. (2015) USA	Retrospective cohort study using prospectively collected clinical observations	To compare diagnostic performance of six EWS for women with severe sepsis due to chorioamnionitis. Three EWS used single-parameter triggers, three used aggregate scores	364 cases with complete data from a single tertiary unit reviewed. Retrospectively applied all six EWS to determine sensitivity, specificity, positive predictive value	Focused specifically on sepsis due to chorioamnionitis	Positive predictive value low for all six scores (<2-15%). Single parameter systems more sensitive; aggregate scoring systems more specific
Hedriana et al. (2016) USA	Retrospective case control study	To compare triggers for six vital sign parameters to predict pregnancy morbidity	Retrospective chart review of ICU obstetric patients looking at frequency and intervals of vital sign triggers in comparison to control group of normal obstetric patients	Obstetric patients in ICU (n=50), control obstetric patients with uncomplicated deliveries (n=50)	At least one persistent vital sign trigger (lasting ≥30 mins) present in almost three quarters of women transferred to ICU, compared to <5% of uncomplicated obstetric patients.
Hess et al. (2017) USA	Electronic modelling comparing outcomes & costs before & after implementation of maternity EWS	To assess cost-effectiveness of maternity EWS in reduction of severe maternal morbidity (SMM)	Developed decision-analytic model and applied it to theoretical cohort of 4 million women assessing clinical outcomes and cost effectiveness based on factors derived from the literature	Theoretical modelling	Maternity EWS appears to be cost-effective strategy to reduce SMM during maternity hospitalisations

Isaacs et al. (2014) UK	Survey	To explore early warning systems used in maternity units in UK	Electronic questionnaire sent to 205 lead obstetric anaesthetists; 63% response rate	Subjective reporting of organisational use of maternity EWS	91% agreed obstetric EWS helped prevent morbidity. Despite variation in tools & parameters used, general agreement that most important in EWS are respiratory rate, heart rate, temperature, systolic/ diastolic blood pressure, O ₂ saturation.
Mackintosh et al. (2014) UK	Ethnographic study	To explore implementation of an obstetric EWS	Observations, semi structured interviews and document review in two maternity services. Data thematically analysed	Generalisability may be problematic outside of UK settings	EWS enabled communication, helped shape shared understanding of maternal complications. However midwives and obstetricians questioned perceived increase in workload associated with using chart, given low incidence of maternal complications.
Maguire et al. (2015) Ireland	Mixed retrospective and prospective single centre study	To assess whether Irish maternity EWS vital signs improved the recording for women with bacteraemia	IMEWS retrospectively applied to records of vital signs over six-year period. The prospective over a 12-month period.	Small numbers in prospective cases	Introduction of IMEWS for women with bacteraemia associated with improved recordings of vital signs, particularly respiratory rate.
Maguire et al. (2016) Ireland	Observational study of women admitted to the HDU after implementation of Irish national obstetric EWS	To explore whether the Irish maternity EWS contributed to earlier identification of women with severe maternal morbidity	Case review of 167 women admitted to HDU in one tertiary hospital	Of cases reviewed <50% of women had IMEWS charts completed	80 cases had IMEWS chart completed prior to HDU admission. Of those, 73.9% were triggered by IMEWS and 26.3% by clinical judgement
Martin (2015) UK	Grounded theory	To understand midwives' experiences of using a modified EWS	Six semi-structured interviews with midwives working on labour ward of a single tertiary teaching centre	Generalisability in smaller maternity facilities and outside of the UK	Frequent changes in practice, lack of training, duplication of documentation perceived as barriers. Tool seen as threat to autonomy, undermining clinical judgement.
Ryan et al. (2017) Canada	Retrospective observation case control validation investigating physiological predictors of ICU admission	To evaluate performance of modified early obstetric warning system to predict ICU admission	Comparing physiological predictors 24 hours prior to ICU admission for 46 women against 138 randomly selected control maternity patients in two maternity settings. 13 single parameter triggers	Small numbers	Trigger had high sensitivity but low specificity for ICU admission. If more than one extreme trigger present, system maintained sensitivity and improved specificity
Shields et al. (2016) USA	Before and after study	Early assessment and treatment of patients with suspected deterioration. To address four most common causes of maternal morbidity	Prospective data collection over 13-month period after implementation of Maternal Early Warning Trigger (MEWT) tool, compared to 24 months pre-implementation baseline. Single-parameter system requires triggers to be sustained for >20mins. Included 36,832 women at pilot sites: 24,221 pre- and 12,611 post-implementation. MEWT included key components of clinical pathways for the 4 conditions	Tool is complex to navigate although impact of this was not addressed by the research	Use of MEWT tool resulted in significant reduction in maternal morbidity and composite morbidity but ICU admissions were unchanged
Singh et al. (2012) UK	Prospective review	To evaluate modified early obstetric warning system (MEOWS) as tool for predicting maternal morbidity, measuring sensitivity, specificity and predictive value	676 admissions audited for completion of MEOWS charts for triggers and evidence of morbidity. Single-parameter trigger system	No admissions to ICU during study period	200 triggered, with 86 having morbidity according to criteria. MEOWS 89% sensitive and 79% specific, positive predictor value 39%, negative predictor value 98%
Smith et al. (2017) UK and Channel Islands	Comparison of early warning charts and escalation protocols	To analyse early warning charts in consultant-led maternity units to establish vital sign values and presence of explicit escalation	120 obstetric early warning charts and escalation protocols obtained	Charts only available from consultant-led maternity units	Considerable variation in escalation charts and protocols, e.g. 75 discrete combinations of vital sign ranges

CASE STUDY

Developing confidence in competence: My experience of the Midwifery First Year of Practice programme

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ABSTRACT

Background: Confidence and competence do not always co-exist in the context of a new graduate midwife. Being competent does not always mean being confident and vice versa. In New Zealand, the Midwifery First Year of Practice (MFYP) programme supports new graduate midwives through their first year of practice.

Aim: This paper examines the concepts of competence and confidence in the context of my experiences as a new graduate midwife in New Zealand, participating in the MFYP programme. The four aspects of the MYFP programme are identified as they relate to my experience. These are: clinical practice, one-to-one mentoring, funded education/professional development and quality assurance, with the focus being on the mentoring aspect of the programme.

Discussion: Using published research about transition programmes alongside my experience of the MFYP programme, I identify my individual challenges during my transition year and how the individualised support available to me through the MFYP programme helped me to meet those challenges.

Conclusion: Whilst there is no clear demarcation point between being a graduate and becoming a confident midwife, my experience suggests that building confidence in the first year of practice is a very individual journey. I believe the MFYP programme successfully supports a graduate's transition from a competent to a confident midwife.

Keywords: competence, confidence, Midwifery First Year of Practice, mentoring, graduate, midwifery practice

INTRODUCTION

Competence comes in various forms and is identified as a core component of professional clinicians (Hodges & Lingard, 2012), with maintaining competence identified as a vital characteristic of the professional midwife (Calvert, Smythe, & McKenzie-Green, 2017). The Midwifery Council of New Zealand (2005) defines competence as, “the ongoing capacity to integrate knowledge, skills, understanding, attitudes, and values within the professional framework of the Midwifery Scope of Practice” (p.6). Within midwifery there is an expectation that midwives can work competently in all areas at all times (Edwards et al., 2016); however, the need and motivation to maintain overall competence depends on the midwife (Calvert et al., 2017).

Confidence is often related to competence; however, they do not always co-exist. Confidence is defined as a feeling of self-assurance arising from an appreciation of a person's own abilities or qualities (Oxford Dictionary of English, 2010). The concept of confidence is an essential part of the transition from undergraduate student to midwife, through gaining confidence in their demonstrated competence. Factors such as the influence of colleagues, perceived autonomy and a sense of familiarity can contribute to enhancing confidence (Bedwell, McGowan, & Lavender, 2015).

Bradshaw, Noonan, Barry and Atkinson (2013), in their descriptive qualitative study of post-registration Irish student

midwives' experiences of the competency assessment process, describe competence and confidence in midwifery practice as:

... involving continual interaction between skills, abilities, and knowledge in a wide variety of maternity settings which attempts to capture concepts of capability, performance, elements of critical thinking and personal attitudes in which a midwife practices. (p.521)

These findings are congruent with much of the international literature focusing on clinical competency models. The New Zealand College of Midwives (2016) describes a confident midwife as a midwife who is working in partnership with women across the Midwifery Scope of Practice; promoting and facilitating the physiological processes of pregnancy and childbirth; identifying complications in mother or baby and working in collaboration with other health professionals to ensure appropriate care; managing emergency situations; informing and preparing women and their families for pregnancy, birth, breastfeeding and parenthood; facilitating the interface between primary and secondary/tertiary maternity services when necessary; and working autonomously and remaining responsible and accountable for the care provided in all settings. The graduate is expected to be confident and meet the confident midwife profile by the completion of their first year of practice (p.19).

This aim of the article is to examine the concepts of competence and confidence in the context of my experiences as a new graduate midwife in New Zealand who has participated in the Midwifery First Year of Practice (MFYP) programme. I focus predominantly on developing confidence during the first year of practice and the role of the MFYP programme.

Developing midwifery competence to enter the register

The New Zealand midwifery education model prepares students to achieve the four competencies for registration as a midwife that are set out by the Midwifery Council of New Zealand. These competencies encompass the core elements of how “a registered midwife is expected to practise and what she is expected to be capable of doing” (Midwifery Council of New Zealand, 2007, p.1). Gilkison, Pairman, McAra-Couper, Kensington and James (2016), in their review of the New Zealand midwifery education model, believe the model produces “competent, confident midwives able to work across the scope of practice on their own responsibility” (p.33). However, the concepts of competence and confidence are not mutually assured and may vary at the point of graduate registration (Davis, Foureur, Clements, Brodie, & Herbison, 2012).

Graduates must be deemed competent to be entered into the Midwifery Council’s Register of Midwives; however, they may not feel confident at that time. While research confirms that the current midwifery education model appears to produce competent midwives, graduates need to gain or increase their confidence in their practice over time (Lennox, Jutel, & Foureur, 2012). Skirton et al. (2012) in their prospective, longitudinal, qualitative study of 35 midwifery graduates in the United Kingdom (UK) discovered there was a perceived lack of confidence in the graduates’ abilities to make decisions based on clinical assessment. Whereas, in a survey of New Zealand midwifery graduates, Kensington et al. (2016) found a similar lack of confidence but that it “more frequently stems from a lack of experience rather than a lack of competence or knowledge” (p.20). Clark and Holmes (2007) in a qualitative exploratory study of UK nursing students suggest that competence is linked to confidence in clinical skills and argue that situations which build the graduates’ confidence will impact positively on their competence.

I graduated from the new model of midwifery education that Gilkison et al. (2016) discuss and felt I had achieved the competencies needed to be entered into the Register of Midwives; however, my confidence was low when transitioning to a graduate. This was predominately related to clinical skills and autonomous decision making. I felt confident working in partnership with women and knew that I was a competent midwife but lacked the confidence that comes with experience.

Transition to practice programmes

A well-designed transition support programme can play a significant role in assisting graduates to confidently take up their position as registered practitioners (Banks et al., 2011; Clements, Fenwick, & Davis, 2012). Evidence shows that such programmes decrease work stress and anxiety regarding the realities of being a midwife (Chen, Duh, Feng, & Huang, 2011), and improve graduates confidence in their competence due to being supported throughout the first year of practice (Bratt & Felzer, 2011; Kitson-Reynolds, Ferns, & Trenerry, 2015; Park & Jones, 2010). Avis, Mallik and Fraser (2012) researched the transition experiences of UK graduates as recorded by their diary writing and found the “the growth of confidence is linked to support and feedback on

acquiring and improving clinical skills, helping them settle into their role” (p.1068). A graduate’s ability to successfully transition from undergraduate student to midwife is important from both a personal and professional perspective (Clements et al., 2012).

The challenge for the New Zealand midwifery profession was to develop and provide a transition programme that met the individual needs of graduates within New Zealand’s context of maternity care (Kensington et al., 2016). New Zealand’s maternity system is designed to provide women-centred continuity of care, regardless of place of birth (Pairman et al., 2016). Graduates may be a hospital- or community-based midwife, choosing the one which best suits them and their lifestyle. Movement between these two roles is fluid, with some midwives working in both roles simultaneously (Grigg & Tracy, 2013).

In many countries hospitals employing graduates, regardless of profession, provide a graduate programme. However, such a hospital-based programme would not work with the self-employed model of community midwifery care that New Zealand’s maternity system works on. New Zealand required a transition programme that would work regardless of whether the graduate’s choice of workplace was a hospital or the community.

The New Zealand Midwifery First Year of Practice programme

The MFYP programme commenced in 2007 as a fully funded national scheme, aimed at providing a structured yet individualised programme of support to meet the needs of the graduate, wherever they chose to work. Although participation was encouraged, it was not made compulsory until 2015 (Dixon et al., 2015).

The programme has four main components of support. These are: support during clinical practice, ongoing education, formal mentoring, and reflection and review through the Midwifery Standards Review (MSR) process. Essentially, it provides the opportunity for graduates (self-employed or employed) to access funded education, activities and professional development opportunities to consolidate their knowledge, skills and clinical competencies acquired during the undergraduate midwifery education programme, together with a supportive environment through one-to-one mentoring. It concludes with preparation for, and participation in, a MSR at the completion of their first year of practice.

Element one: consolidating midwifery clinical practice

Consolidation of skills and knowledge forms an integral part of the transitional journey for graduates during their first year of practice. The transition from being an undergraduate student to a confident midwife can be challenging. Adapting to new environments, changing dynamics in existing professional relationships and differing expectations within their role can cause insecurity, fear and stress (Dixon et al., 2015; Wain, 2017). Choosing the work setting that suits graduates’ individual circumstances is an important part of consolidating and developing midwifery practice (Pairman et al., 2016).

My experience

For me, working in the hospital suited my personal circumstances, and the small rural secondary unit where I was employed, which was midwifery led, aligned with my midwifery philosophy. However, this was in a region new to me. I had no history and no existing professional relationships there.

Starting as a graduate in a new environment meant that I had to adapt, whilst simultaneously establishing professional relationships with both midwifery and medical colleagues, understanding the dynamics of the unit, its unfamiliar policies and guidelines, and

the culture of a rural secondary unit. During this time, I also had to prove my knowledge and skills to my colleagues to build their confidence in my abilities, whilst also consolidating my practice skills and identifying opportunities for further skill development.

In many ways this felt like an initiation rite which I had to pass before being accepted by my more experienced midwifery and medical colleagues. This process took approximately six months and within those six months I took every opportunity available to understand the culture of the unit and forge professional relationships. This included attending social events, professional events, journal clubs and in-service education. I often volunteered to be the second midwife at births, which provided the community-based midwives with the opportunity to get to know me and my practice and build professional trust. Despite the challenges involved in this “initiation period”, I still felt supported by the midwifery and maternity community. My manager and educator gave me opportunities to attend meetings and workshops to further develop knowledge and skills alongside other clinicians such as obstetricians, paediatricians, anaesthetists, lactation consultants, pharmacists and social workers; all of who helped me to develop inter-professional communication and collaboration skills and enabled opportunities for referral and multi-disciplinary care experience.

Towards the end of my first year of practice, I was given the opportunity by my manager to do shifts in a nearby tertiary hospital’s birthing suite. The aim was to consolidate my secondary and tertiary knowledge and skills. This clinical experience was a major influence on my practice because it helped me to realise that I preferred to work in a lower level care environment. It also helped me to understand that I had increased my confidence in my existing skills and developed a stronger midwifery philosophy. This meant that, in practice, I looked for opportunities to support the woman’s physiology and work in ways that support the woman to birth normally where possible.

Element two: Funded education & professional development

Continuing professional development is vital to maintain competence and confidence (Hundley et al., 2007). However, rural midwifery brings with it its own challenges to accessing education. Crowther (2016), in a qualitative study exploring rural and remote rural midwifery in New Zealand, found these to be or include “geographic location, on-call demands, travel, accommodation, course costs, poor local resources (libraries, broadband access) and lack of provision of locum cover for mandatory and elective educational days” (p.30).

Within the MFYP programme all graduate midwives are required to undertake elective and compulsory education. The focus of the education component is on consolidation of the knowledge, skills and experience acquired in the midwife’s undergraduate programme, with up to 80 hours of funded education. All graduates are required to have a written professional development plan that includes well-defined goals and specific education outcomes.

My experience

I identified the need to increase my knowledge and skills related to various practical skills such as IV cannulation, suturing, labour and birth, and complicated postnatal care. I dutifully made my way to workshops and study days, completing requirements and reaching the goals that I had set.

The MFYP funding for elective and compulsory education was important because often the workshops and courses that I needed to attend were held in cities or towns outside of the region. The funding allowed me to access these courses when I would not have been able to financially afford to attend otherwise. Attending

the elective and compulsory courses increased my confidence in my clinical skills and decision-making, especially regarding physiological labour and birth, emergency management, suturing, IV cannulation, prescribing and documentation. This in turn increased my confidence to take future opportunities to continue developing these skills.

Element Three: One-to-one mentoring

A formal mentoring structure is one of the crucial characteristics of a successful transition support programme identified by Ulrich et al. (2010) in their 10-year longitudinal study of nursing graduates in a resident programme in the United States. Within midwifery the concept of mentoring has been well established for centuries through the historic apprentice-style training (Stojanovic, 2008). The MFYP mentoring is a partnership established with an end purpose and is defined by the New Zealand College of Midwives (2000) as “one of negotiated partnership between two registered midwives. Its purpose is to enable and develop professional confidence” (p.1). Both parties are engaged in the process which resonates with the partnership model of midwifery care in New Zealand. Pairman et al. (2016) and Dixon et al. (2015), in their evaluations of the MFYP programme, both concluded that finding the right mentor was vital to a successful mentoring relationship and supportive of a positive transition.

My experience

I found this important element of the programme initially problematic because I had moved into a new area and therefore did not know any of the available mentors. Usually, students can identify who they would like as their mentors during their undergraduate programme. I was unable to do this so had to put my trust in a mentor that I did not know. However, once I got to know her philosophy and teaching style, it was soon apparent that she was an experienced mentor with a lot to offer and the ability to provide the support and encouragement that I needed.

Mentors have a responsibility to listen, challenge, support and critique graduates to empower and encourage them to research, explore and reflect on their own practice (New Zealand College of Midwives, 2000). The mentoring relationship lasts 12 months and is focused on planned goals and expectations that are defined by graduates based on their unique learning needs (Kensington, 2006). Mentors also play a significant role in assisting the graduate in setting goals, debriefing and identifying areas for further learning.

The importance and value of the mentor became clear for me at the six-month mark when I hit a confidence roadblock and a make-or-break point professionally. I had, up to this point, had very limited exposure to labour and birth post registration, whereas my confidence in antenatal and postnatal care was high. It was then that my mentor became my biggest advocate and a plan was put in place to help me move past this roadblock. A great deal of time was spent discussing ways and means of how to get involved in care and not just feel like the ward cleaner or the postnatal midwife caring for the new mother and baby on the ward. I needed to put myself out there, work on relationships with the community-based midwives, gain their trust in my abilities and feel worthy of my role and connected to my scope of practice in the midwifery world.

With the support of my manager, my mentor approached a lead maternity carer (LMC) midwife, and encouraged her to invite me to gain experience from the consenting woman, by helping her midwife. After this, invitations came from other community midwives to help them care for women having inductions or to cover for short spells with women who required secondary care, if

these women had given consent for my involvement. Having this experience increased my confidence and was the turning point I needed. This was thanks to the support of not just the mentor, but also my midwifery colleagues, and it opened more opportunities for me to continue to develop my clinical practice.

Having a mentor who was there no matter what, someone who encouraged, supported, challenged and advised me during this first year as a midwife was invaluable. Being able to challenge her back (the mentor), as well as be challenged, gave me confidence in my knowledge, decision making and professional interactions.

In 2015 Midwifery Practice Support was introduced to provide all graduates with the opportunity for clinical support whether or not the mentor is available when needed ((New Zealand College of Midwives, 2016). This had not been available during my MFYP year.

Element Four: Midwifery Standards Review

New Zealand College of Midwives (2016) describes a Midwifery Standards Review (MSR) as:

A process of reflection, assessment and education . . . and reflects the midwifery profession's partnership with women as well as the requirement for the midwife to be professionally accountable to herself, the women for whom she cares, the profession and the wider community (p.37).

All graduates are given the opportunity to self-reflect and explore their midwifery practice, identify their strengths and weaknesses, and advance their professional development plan to help achieve their goals. Takase, Yamamoto, Sato, Niitani and Uemura (2015) found, in their cross-sectional survey of the relationship between workplace learning and self-reported competence of nurses and midwives in Japan, that confidence may impact on midwives' self-evaluation of their competence and that learning from reflection may be useful through acknowledging a positive view of one's own competence. The MSR attended during the first year of practice is funded as part of the MFYP programme. The mentor assists in preparing the graduate for her review and attends in support of the graduate.

My experience

The MSR process enabled me to reflect on my year as a graduate and see the progress in my knowledge, skills, confidence and experience. It empowered me to reflect on the difference in confidence at the beginning of the MFYP programme and then at its completion. The opportunity to look in hindsight at the challenges, successes, support and collaboration that shaped my first year of practice was invaluable.

The feedback provided by both midwifery colleagues and consumers was positive and further bolstered my confidence. I went into my MSR with the confidence and knowledge that, having completed the MFYP transitional journey, I was now a competent and confident midwife.

DISCUSSION

The realities of everyday practice can often be challenging for graduates as they work to develop confidence in their practice. Confidence has been found to be the key to successful adaptation into their new role as an autonomous midwife (Kensington et al., 2016; Skirton et al., 2012). Davis et al. (2012) believe that the responsibility to support graduates to become confident is not just laid at the feet of other midwives but belongs equally to all healthcare professionals they encounter who contribute to the graduates' consolidation of skills and continuation of their learning.

Fenwick et al. (2012) suggest a "theory-practice gap" exists where graduates doubt their skills and decision-making ability following registration, due to their limited clinical experience. The theory-practice gap links the concept of confidence and competence, with research revealing a conflict between the taught midwifery practice and the reality of day-to-day practice in contemporary maternity wards (Reynolds, Cluett, & Le-May, 2014; Wain, 2017). It is essential to provide learning opportunities to link theory and practice, and role modelling, and to encourage occupational socialisation in order to develop confidence in graduates (Licqurish, Seibold, & McInerney, 2013).

When measuring confidence in UK graduates, Donovan (2008) emphasised the vital role that mentorship played in developing midwives, identifying that their experience of mentorship impacted on their confidence as a midwife. This is supported by Hughes and Fraser's (2011) qualitative, longitudinal cohort UK study and Cummins, Denney-Wilson and Homer's (2017) qualitative, descriptive study of Australian graduates. The presence of a mentoring relationship has a significant effect on how graduates work, and on their confidence in their skills.

The MFYP programme provides all-encompassing support to graduates and is critical to the development of their confidence. It provides links between theory and practice through all four elements and individualised assistance for graduates to consolidate knowledge and skills through gaining practical experience in their chosen workplace. It also enables gaps in knowledge to be identified and filled through funded education and professional development exercises and creates self-reflective opportunities on the progress of their year's practice through MSR. Kensington et al. (2016) in their thematic analysis of the MFYP programme found each element contributed to building graduates' confidence, with an emphasis on the importance of support from their mentor and the wider midwifery community. This is supported by Pairman et al. (2016) who identified the most important elements of building confidence were "financial support for education", "support from a mentor", and "clinical practice support from colleagues".

In my experience, I found that each of the four elements of the programme was essential and contributed to my confidence; each element complementing and often overlapping the others. I transitioned from being competent at the point of registration to being a confident midwife, according to the Confident Midwife Profile, at the end of the MFYP programme. This achievement was echoed through the MSR process.

CONCLUSION

There is no clear demarcation point at which graduates become confident midwives (Lennox et al., 2012). Graduates are considered competent to provide safe midwifery care at the point of registration but often lack confidence at the beginning of their first year of practice. Graduates' transition journeys require time and support to build confidence (Avis et al., 2012).

My experience attests that building confidence in the first year of practice is a very individual journey and supports the fact that competence and confidence do not always co-exist. I believe the MFYP programme successfully supports a graduate's transition to a competent midwife with a confidence that continues to grow. This not only benefits the graduate, but also the profession as a whole.

ACKNOWLEDGEMENTS AND CONFLICT OF INTEREST DISCLOSURE

The author declares that there are no conflicts of interest.

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Accepted for Publication November 2018

Chapman, A. (2018). Developing confidence in competence: My experience of the Midwifery First Year of Practice programme. *New Zealand College of Midwives Journal*, 54, 58-62.

<https://doi.org/10.12784/nzcomjnl54.2018.8.58-62>

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