Factors influencing midwives' use of an evidenced based Normal Birth Guideline

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Abstract

Background: A Normal Birth Guideline was disseminated to hospitals in Queensland, Australia in 2012 to foster evidence based practice. The efficacy of the Guideline in supporting normal birth is unknown. Aim: To explore midwives' experiences, perceptions of barriers, and predictive factors for use of the Normal Birth Guideline. Method: A convenience sample of Queensland midwives were invited to complete an anonymous on-line survey. The survey included personal and professional questions, a scale called Best Uptake of Maternity Practice Survey, the adapted Evidenced Based Practice Beliefs Scale, and open-ended questions. Results: A response rate of 84% (n = 249 out of 279) was obtained. Over ninety percent of participants were aware of the Guideline and found it to be readily accessible, but 71% (n=177) reported that the Guideline routinely guided practice. Around half (52.6%) indicated organisational processes facilitated use of the Guideline. Midwives employed in private hospitals were less aware of the Guideline (p=.02) and more concerned about barriers to implementation (p=.02) than self-employed and public hospital employed midwives. Predictors of Guideline use were: being employed in a public hospital caseload model (OR 2.7, CI 1.02-7.14, p=.04,) and having a strong belief in evidenced based practice (OR 1.05, CI 1.03-1.113, p=.001). Conclusion: Use of the Normal Birth Guideline was influenced by model of care and strong beliefs in evidence-based practice. Promotion of the benefits of evidence-based practice in supporting normal birth requires greater attention. Priority needs to be given to woman-centred care rather than organisational and personal clinician preferences.

Keywords	Midwives; normal birth, clinical guideline; translational research; evidenced based practice
Taxonomy	Midwifery, Evidence-Based Practice, Continuity of Care in Organisation of Care
Manuscript category	Quantitative Research

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8 December 2016

Professor Kathleen Fahy

Editor, Women & Birth

Dear Professor Fahy

Please find attached a manuscript titled *Factors influencing midwives' use of an evidenced based Normal Birth Guideline* for consideration in Women & Birth. The manuscript presents original survey data on midwives' experiences, perceptions of barriers, and predictive factors pertaining to use of the Normal Birth Guideline published in Queensland in 2012. The impact of the Guideline has not been evaluated and we believe the findings will be pertinent not only to midwives' practice in promoting normal birth but to policy makers and expert groups undertaking the development of other evidence-based guidelines.

Conflict of Interest: On behalf of the authorship team, I wish to advise that we have no Conflict of Interest to declare.

Funding: The study was made possible through a small internal research grant offered by Griffith University.

Author Agreement

This article is the original work of the authors. This article has not received prior publication and is not under consideration for publication elsewhere. All authors have seen and approved the manuscript being submitted and abide by the copyright terms and conditions of Elsevier and the Australian College of Midwives.

Ethical Statement: Ethical approval was obtained in 2015 from Griffith University. Reference number of this approval is GU ref no. 2015/759.

Thankyou for your consideration of this manuscript and I look forward to hearing from you in due course.

Yours truly

Dr Jocelyn Toohill

Ethical Statement - Factors influencing midwives' use of an evidenced based Normal Birth Guideline

Ethics committee: Griffith University Human Research Ethics Committee

Approval number: GU Ref No: 2015/759

Date of approval: 26th October, 2015

STATEMENT OF SIGNIFICANCE

Problem	**What is Already Known**	**What this Paper Adds**
Rates of elective and unplanned caesarean section continue to increase in high income countries. Evidence-based clinical guidelines aim to promote and support normal birth but are rarely evaluated.	The Queensland Normal Birth Guideline was developed in consultation with stakeholders and disseminated to public and private hospitals and released in 2012. Impact of the Guideline on practice has not been investigated.	Although the majority of midwives (90%) were aware of the Guideline, only 71% reported that it routinely guided practice. Being employed in a public hospital caseload model, and having a strong belief in evidenced based practice predicted Guideline use.

INTRODUCTION

The World Health Organization recommends that women be supported to have a normal birth [1]. In comparison to surgical deliveries, spontaneous vaginal birth confers significant maternal physical and psychological health benefits [2, 3], supports the mother-baby relationship, and contributes to healthy child development [4, 5]. Spontaneous birth also benefits newborns by reducing the likelihood of respiratory problems, improving maturation of the immune system, and increasing early breastfeeding [6].

In many industrialised countries, such as the United Kingdom, United States, Italy, and Turkey, spontaneous birth rates are lower than recommended [7]. High rates of interventions such as induction or augmentation of labour, pharmacological pain relief, continuous fetal monitoring, assisted birth and surgical birth are common place [7-9]. Elective and unplanned caesarean section occurs for significant numbers of women globally without reasonable explanation and do not confer overall improvement in perinatal outcomes [7, 10]. Australia, as a high income country, reflects these trends and has recorded high childbirth intervention rates for several years [8]. In 2014, in the state of Queensland, where this study was conducted, low rates of spontaneous labour (54%) and spontaneous vaginal birth (56.2%) and a high caesarean section rate of 33.7% were recorded [11]. Furthermore, medical intervention rates are higher in private hospitals where almost half of the women experience a caesarean section [12].

In an effort to address falling spontaneous birth rates, countries such as the United Kingdom, Spain, and United States developed consensus statements or clinical guidelines to promote and support normal birth [13-17], as have some Australian states [16, 17]. In Queensland, an evidenced-based guideline was developed in consultation with a range of stakeholders (including consumers) and disseminated to public and private hospitals in 2012 [17]. The Queensland Normal Birth Guideline (the Guideline) aims to foster practices to improve normal birth rates while maintaining safety for the woman and her baby [17].

Evidence of the success and effectiveness of implementing normal birth guidelines remains limited. To date Spain is the only country to have published outcomes following implementation of a national normal birth guideline. Ruiz and Limonero [18] highlighted the divergent views of 94 staff (obstetricians,

midwives and assistants) working in one labour ward. While the midwives' philosophies aligned with the Guideline, it was at odds with obstetricians' views and this discrepancy hindered implementation [18]. More recently, a comparison of 32 Spanish public hospitals accredited to implement the normal birth guideline and 12 non-accredited public hospitals found that in the period 2007 to 2012 caesarean section rates were lower in accredited hospitals (18% - 21%) compared to non-accredited hospitals (18% - 34%) [19]. Reduction in caesarean section rates was most notable in smaller accredited centres with fewer births. However, in the same period caesarean section rates increased in private hospitals (32% to 39%) [19]. These results highlight the potential effectiveness of guideline use, but also the complexities of implementing a normal birth guideline across disciplines, health service sites, and different funding models [18, 19]. Barriers to the implementation and uptake of best evidence are well known [20, 21]. In particular, evidence suggests that stand alone implementation approaches are insufficient to foster practice change [22]. Sandall [23] argued that successful implementation strategies need to be informed by the perceptions and experiences of frontline staff.

Although there are many definitions of 'normal birth' [15], the interdisciplinary network of professionals and consumers who developed the Queensland Guideline defined normal birth as: spontaneous onset of labour, fetal progression and birth in the vertex position that may include amniotomy in established labour, non-pharmacologic pain management or nitrous oxide and intramuscular opioid pain relief, intermittent auscultation of the fetal heart rate; physiological, modified or active management of third stage, and immediate mother/ newborn skin-to-skin contact for the first hour following birth [17]. The Guideline excludes induction of labour, oxytocin infusion, episiotomy, assisted vaginal birth or caesarean section, epidural, spinal or general anaesthetic [17]. A number of contextual factors known to facilitate normal birth are also highlighted and include respectful inter-professional and woman-centred communication and continuity of midwifery care. Where appropriate, it is recommended that the Guideline also be applied to women who experience complications during pregnancy and/or labour.

Given the implementation of the Guideline in 2012 and the lack of evaluative data both locally and internationally on the impact of Normal Birth Guidelines, the current study aimed to explore midwives' perceptions and experiences of the Queensland Normal Birth Guideline. The specific objectives were to:

54 determine the extent to which the Guideline was used in practice; and identify midwives' perceptions of
55 usefulness, barriers, and predictors to applying the Guideline.

56 **METHODS**

57 A descriptive cross-sectional study design was used.

58 **Participants**

59 An email list of midwives who had indicated their interest in participating in continuing professional
60 midwifery education and research activities were invited to complete the survey. This convenience
61 sample of midwives (n = 297) practicing in Queensland, Australia were approached to participate. There
62 were no explicit inclusion or exclusion criteria. In order to achieve a 5% margin of error with a 95%
63 confidence level, a sample size of 168 needed to be recruited.

64 **Measures**

65 The survey consisted of four sections. The first section collected personal and professional demographic
66 information. Organisational variables included geographic location of the service where midwives were
67 employed (3 categories: rural/remote, regional, metropolitan), employment sector/funding (3 categories:
68 public hospital, private hospital, self-employed) and their midwifery practice area/s (5 categories: single
69 area of care, rotation across all areas, hospital-based caseload, self-employed midwife,
70 management/education/research). Service level capability (4 categories: no on-site birthing, birthing
71 without on-site theatre, low to moderate birthing complexity, complex birthing with NICU) was also
72 considered. Additional items sought to identify if midwives were aware of the Guideline, could access it,
73 and whether it routinely guided their practice in the workplace (yes/no).

74 Midwives also rated their level of agreement using a 5-point Likert scale (1 = strongly disagree to 5=
75 strongly agree) against four statements: (1) Women should be supported to achieve a normal birth, (2)
76 Women should be supported to achieve a positive emotional birth experience, (3) The Guideline
77 facilitates my practice for women to achieve normal birth, and (4) Our organisational processes facilitate
78 use of the Guideline for women to achieve normal birth.

In section two, the authors developed a new tool named Best Uptake of Maternity Practice Survey (BUMPS). The 17 item BUMPS reflected the eight areas known to be barriers to the uptake of evidenced based practice identified by the Cochrane Group [24] (Information management; Clinical uncertainty; Sense of competence; Perceptions of liability; Patient expectations; Standards of practice; Financial disincentives; and Administrative constraints) [24]. Additional questions pertaining to organisational culture, evidence-based knowledge, and uncertain birth outcomes were developed. A three-point response scale was used (1 = very concerned, 2 = somewhat concerned, 3 = not at all concerned) to produce a score range of 17-51. The draft scale was evaluated by an expert panel consisting of two clinical and two academic midwives. In the current survey, the BUMPS scale produced a Cronbach's Alpha correlation of 0.91, with inter-item correlations of .4 or above indicating good scale reliability [25].

Section 3 consisted of the Adapted Evidenced Based Practice Beliefs Scale (A-EBP-B) originally developed by Melynk et al [26] and revised by Abrahamson et al [27] who used five of 16 original questions. The scale measures beliefs and confidence for implementing evidence in practice. For the specific purposes of the current study, we used the five items developed by Abrahamson et al [27] and seven original items by Melynk et al. [26]. Responses were recorded on a 5-point Likert scale (1 = strongly disagree to 5= strongly agree) to produce a score range of 12-60. The wording was adapted for applicability to care of women and babies. Responses on the A-EBP-B scale in the current survey produced a Cronbach's alpha of 0.85 which is comparable to previous reports (0.86 - 0.90) [26, 27].

In the final section, participants could make any free text comments about the Guideline and its usefulness or otherwise in practice. The survey was pilot tested by six midwives. Typical feedback included; "took around 15 minutes to complete", "questions easy to understand", and "no further explanation required".

Procedure

Ethical approval was granted by the University (Ref No: 2015/759). An email containing a web link to a self-administered survey was forwarded to midwives on the email list. Return responses from the web link were anonymous. The online survey was open for six weeks from November to December 2015.

105 **Approach to data analysis**

106 Quantitative data were entered to SPSS 21. Descriptive statistics were conducted on all variables. Scales
107 were assessed for reliability with total scale scores calculated. Responses were compared for barriers to
108 use of the Guideline using chi square, and ANOVA for differences in BUMPS scores to determine beliefs
109 in evidenced based practice by professional circumstances. Variables associated with use of the Guideline
110 (geographical location, employment type, area of practice, clinical capability of service and total score for
111 A-EBP-B) were entered into a logistic regression analysis with the BUMPS score dichotomised (high and
112 low scores) as the dependent variable to predict factors that supported Guideline use. Thematic analysis
113 was used to analyse midwives' responses to the open-ended questions.

114 **RESULTS**

115 **Participant characteristics**

116 Of 297 midwives who opened the survey, 249 (84%) returned data (female n = 243, 97.6%; male n = 6,
117 2.4%). Most respondents were located in metropolitan areas (n = 115, 46.2%) with the remainder in
118 regional (n = 84, 33.7%) and rural and remote areas (n = 50, 20.1%). The majority were employed within
119 the public sector (n = 201, 80.7%) and of these, 46 (18.5%) worked in continuity (caseload) models.
120 Fewer midwives were employed in the private hospital sector (n = 32, 12.9%) or self-employed (n = 16,
121 6.4%). Sample characteristics are provided in Table 1. State-wide workforce data indicated similar
122 characteristics in respect of age and gender, however, there were more "midwife only" (as opposed to
123 midwife/nurse) registrants amongst participants (54%) than in the Queensland-wide workforce (11%)
124 [29].

125 Insert Table 1 about here

126 **Use of the Normal Birth Guideline**

127 The majority of participants (n = 239, 96%) were aware of the Normal Birth Guideline and found it to be
128 readily accessible (n = 229, 92%), however fewer indicated that the Guideline routinely guided practice
129 in their workplace (n = 177, 71%). The majority of respondents either agreed or strongly agreed that

women should be supported to achieve a normal birth (n = 238, 95.6%) and for birth to be a positive emotional experience (n = 238, 95.6%). Around two thirds (n=175, 70.3%) indicated the Guideline enabled them to support women to achieve a normal birth. However, only half (n = 131, 52.6%) agreed that organisational processes facilitated use of the Guideline.

Organisational characteristics and model of care in which midwives worked influenced Guideline use. Midwives' (1) awareness; (2) access; and (3) routine use of the Guideline were compared by employment type, geographic location and service level of capability. Self-employed midwives with visiting rights to a public hospital were more aware of the Guideline (n = 16, 100%, p = 0.02) than midwives employed in public hospitals (n = 195, 97%) or private hospitals (n = 28, 87.5%). Self-employed midwives could also access the Guideline more readily (n = 16, 100%, p = 0.03) than other midwives (public hospital employed, n = 187, 93%; private hospital employed n = 26, 81.3%). Midwives in rural sites (n = 45, 91.8%, p<0.001) were more likely to report that the Guideline informed organisational processes compared to regional (n = 62, 73.8%) and metropolitan sites (n = 70, 60.9%). See Table 2.

Insert Table 2 about here

Midwives who rotated across maternity areas (n = 77, 80.2%) indicated the Guideline was helpful to their practice compared to midwives working in single areas of practice (n = 32, 66.7%), hospital caseload models (n = 32, 71.1%) or were self-employed (n = 5, 33.3%) as outlined in Table 3. Midwives employed in public hospitals indicated the Guideline facilitated their practice (n = 148, 75.1%, p = .004) more than midwives employed in private hospitals (n = 21, 65.6%) and self-employed midwives (n = 6, 37.5%). Use of the Guideline was less frequent in hospitals where there was a reduced level of service capability (no onsite birthing: n = 5, 55.6%; low to moderate complexity: n = 70, 72.2%; and high complexity: n = 99, 73.9%, p = .04). (Refer to Table 3).

Midwives employed in public hospitals were more likely to consider their organisation facilitated use of the Guideline (n = 114, 57.9%, p = .01) compared to midwives in private hospitals (n = 13, 40.6%) or self-employed midwives (n = 4, 25%); with lower perceptions of organisational support for use of the

Guideline as services became larger and located in a city (rural: n = 36, 73.5%; regional: n = 48, 57.8%; metropolitan: n = 47, 41.6%, p =.001). Refer Table 3.

Insert Table 3 about here

Barriers to use of the Normal Birth Guideline

Almost all respondents (96%) completed the Best Uptake of Maternity Practice Survey (BUMPS) achieving a mean score of 36.16 (SD 7.82). Although more than two-thirds of midwives considered they had sufficient knowledge (67.1%), clinical skills (69%) and ability (64.5%) to use the Guideline in practice, more than 80% were concerned about barriers such as insufficient time (84.4%) and administrative processes (80.7%). A large proportion of midwives were also concerned about being prevented from using the Guideline (76.2%) as well as having insufficient collegial support (74.2%). Furthermore, a similar proportion of midwives were concerned that use of the Guideline might mean they would be blamed for an adverse outcome (76.9%); be involved in an investigation process (74%); lose their registration (62%); and or be sued (66.1%). Similarly, midwives were concerned about meeting women's expectations (74.6%) and possible poor maternal (72%) or neonatal (69.9%) outcomes. Barriers pertaining to financial constraints were of concern to 74.5% of midwives (refer Table 4). Midwives' responses on BUMPS did not differ based on geographical location of work; practice area; employment type; or service level capability.

Insert Table 4 about here

Confidence implementing evidence in practice.

The majority of respondents (89.6%) completed the adapted Evidenced Based Practice Beliefs Scale (A-EBP-B). The mean A-EBP-B score was 46.65 (SD 6.68) indicating midwives were more likely to believe in evidenced based practice than not. Over 90% of midwives believed that EBP; Guidelines; and their own ability to implement EBP, improved clinical care and outcomes for women and babies. However, fewer midwives were confident about their ability to find answers (68.7%), overcome barriers (51.6%) and implement EBP with confidence (59.8%) and in a timely fashion (54.3%) (refer to Table 5).

A-EBP-B scores were not associated with midwives' geographical location of work; employment type; or service level capability. However, staff who rotated across maternity areas (Mean 45.38, SD 6.29) or worked only within antenatal/labour/postnatal areas (Mean 45.86, SD 6.80) scored less compared to midwives working in continuity models (public hospital MGP Mean 47.63, SD 5.68; self-employed Mean 47.84, SD 5.45) or working in senior roles (management, education or research Mean 49.08, SD, 8.14, p = .03).

Insert Table 5 about here

Predictors of Guideline use

A logistic regression analysis determined factors predicting use of the Normal Birth Guideline. A dichotomous dependent variable for low (≤36) and high (≥37) BUMPS scores was calculated. Geographical location of work, practice area, employment type, service level capability and total A-EBP-B score (high/low) were independent variables. Major factors contributing to use of the Guideline were working in a public hospital caseload model (p = 0.04, OR 2.7, CI 1.02 – 7.14) and having a high belief in evidence- based practice (p =.001, OR 1.08, CI 1.03 – 1.13).

Usefulness of the Normal Birth Guideline in Practice

Sixty-four percent (n = 169) of participants wrote comments on usefulness of the Guideline. The majority considered the document to be a '*superb guideline'* that was '*helpful'*, '*useful',* '*clear'*, '*easy to follow*' and a '*great resource*'. Respondents appreciated the flow charts, evidence, and proposed timeframes (although time frames were also cited by others as a shortfall). Midwives commented that the Guideline '*improved practice*' was '*especially good for those grey areas'* and made '*decision-making better'*. Midwives used the Guideline to enact '*evidence based care'*, '*question interventions*' and ensure they and their medical colleagues were '*on the same page'*. For many, the Guideline '*armed*' them with evidence with one midwife stating '*Doctors especially can't ignore evidence in black and white*!' This was considered especially beneficial in contested spaces where midwives perceived organisational and/or colleagues' needs were given priority over the labouring woman. One midwife used the Guideline to not

only support, but defend her practice when '*accused of failing to recognise failed [labour] progression by a private obstetrician and a mechanical midwife'*.

Three midwives felt the Guideline was too '*prescriptive*' and had the potential to '*do more harm than good'*. Recommendations around vaginal examinations were particularly singled out. Despite the fact that the Guideline states "If there are concerns for labour progress", four hourly vaginal examinations are recommended, these midwives stated that clinicians often adopted a narrow or rigid approach around this timeframe. The result being that midwives were '*pressured*' into performing an examination potentially interfering with the woman's comfort and natural labour rhythms to no direct benefit; '*A VE is disturbing and not risk-free'*.

DISCUSSION

This is the first study to explore midwives' perceptions of working with a Normal Birth Guideline. Although the majority of midwives were knowledgeable and appreciative of the Guideline, a number of organisational and care model characteristics influenced use. Only half the midwives responding to the survey considered they worked in an organisation that was supportive and facilitated use of the Guideline. These midwives were more likely to be employed within a public hospital in a rural/remote service. Perceptions of higher organisational support for the Guideline in rural/remote areas may be because midwives have more autonomy in smaller settings and stronger relationships between team members [28]. In rural services in the state of Queensland, women experiencing complications or with significant risk factors are advised to transfer to a higher level service prior to the onset of labour [29]. Therefore medical interventions are less likely to occur in rural settings and normal birth is promoted for those women who give birth locally [30]. Furthermore, caring for predominantly low risk women may also account for the higher number of midwives in rural services who reported feeling confident with their clinical knowledge compared to some midwives in regional and metropolitan areas. This finding resonates with research undertaken with a cohort of German midwives that found a link between self-efficacy and support of normal birth [31]. In that study, the work setting was the most critical factor influencing midwives' attitudes in supporting normal birth [31].

231 Organisational culture and processes in tertiary services may challenge midwives' abilities/opportunities
232 to facilitate normal birth, particularly where the level of clinical complexity and access to interventions
233 increases. In a recent Australian study undertaken in a tertiary level maternity centre, participating
234 midwives reported that 'all' women were considered to be 'high risk' and reported being pressured to
235 adopt a risk minimisation pathway for women through early intervention [32].

236 Different factors were associated with Guideline use. Midwives employed in a public hospital, rotating
237 across maternity areas and working in a tertiary level service found the Guideline most helpful. Higher
238 acuity of women combined with increased use of technology may explain why midwives rotating across
239 areas (and possibly being less familiar with their work area) found the Guideline to be of more use.
240 Indeed, midwives who worked in fragmented models (single area or rotating) had lower mean evidenced
241 based scores and confidence. This lack of knowledge and confidence may have influenced them to refer
242 to the Guideline to develop their practice and support of normal birth. This possible explanation aligns
243 with recent Australian work where introduction of a water birth guideline supported midwives to
244 confidently facilitate women's access to water immersion and water birth [33]. Similarly, midwives
245 working in services of higher complexity in our study found the Guideline to be an effective tool. As our
246 qualitative data suggested, using the Guideline provided an opportunity to engage in conversations that
247 challenged non-evidenced based care by colleagues.

248 However, only public employed caseload midwives with strong beliefs in the benefits of evidenced based
249 care were more likely to use the Guideline. While self-employed midwives in private practice had high
250 levels of awareness, access, and use of the Guideline, they often considered it more difficult to follow
251 when supporting women in a hospital environment. Previous studies show that birth environments
252 characterised by relationship-based care and a belief in women's innate ability to birth, are predictive of
253 normal birth [34-36]. Normal birth is reliant on the confidence women perceive from their carers [13, 37-
254 39]. Continuity of midwifery care using a caseload model within a multidisciplinary framework produces
255 the best outcomes for women and their babies [40]. The Guideline acknowledges the importance and
256 benefits of continuity of midwifery care and recommends that all women, regardless of risk have access
257 to their own midwife.

Fewer private hospital employed midwives were aware of the Guideline compared to self-employed midwives in private practice or employed within public hospitals which indicates the Guideline is less visible and accessible to guide practice in private maternity hospitals. This could be due to a decision by management/senior clinician(s) to not introduce and/or promote use of the Guideline in some hospital environments. The difference in visibility and implementation of the Guideline between public and private sectors may be influenced by personal preferences of clinicians, advice from professional indemnity insurance companies, as well as hospital policies. These factors may contribute to notable differences in intervention rates and outcomes for women and their babies accessing different models of maternity care [19, 41-43]. Studies have shown that the practice setting (inclusive of organisational philosophy, leadership and culture) is critical to the support afforded to maintaining a focus on normal birth [3, 32, 44].

Despite midwives' beliefs in EBP and use of the Guideline, concerns were expressed about barriers such as insufficient time, administrative processes, and insufficient collegial support. In particular, participating midwives feared they would be blamed for an adverse outcome, investigated, lose their registration, or sued. Such concerns are consistent with other research [26, 27, 33] but do not reflect the low rates of case investigations involving midwives. Midwives concerns may, however, provide insights into the administrative, cultural, and legal pressures perceived to adversely influence their work. Although education and resources for implementation were provided when the Guideline was released and are still available today [45], strategies to promote professional advocacy and assertiveness are warranted. Perhaps in addition to resources that support normal birth [46, 47], multidisciplinary education, and guidance about how to implement continuity of midwifery care models are required, as well as opportunities for respectful interdisciplinary collegial dialogue around implementing best practice.

Recommendations

The findings of this study prompt several important recommendations for maternity policy and practice.

(1) There is clear evidence that governments and maternity service providers need to scale up and roll out caseload midwifery in line with compelling Cochrane systematic review evidence that "women who received midwife-led continuity models of care were less likely to experience intervention…" [36].

(2) There needs to be whole of organisation commitment to the introduction of strategies that support and promote normal birth which includes implementation of evidence based guidelines. Crucial to success is the need to create interdisciplinary "buy in" around a shared commitment to enable women to achieve a normal birth, reduce interventions, and improve organisational rates of normal birth. Recent work from the United Kingdom demonstrates that this requires a top down bottom up approach to develop an inclusive culture that promotes and drives 'buy in' at all levels of the organisation [44, 48].

(3) There is emerging evidence from the evaluation of programs and pathways introduced to promote normal birth in the United Kingdom that clinical leadership and coordination are key factors associated with successful implementation [44, 48]. Every maternity service could introduce a senior leadership role to drive use of Normal Birth Guidelines into practice. These individuals should be part of the leadership team who work to identify local strategies, coordinate, and "champion" the implementation of evidence into practice. These 'local champions' could be part of a professional network and form a state-wide Guideline implementation team, sharing strategies and initiatives found to be successful within each local context across the state. Such processes are highly relevant, because successful implementation strategies need to be informed by the perceptions and experiences of frontline staff [40].

(4) The practice environment contributed to differences in midwives' reported ability to access and implement the Guideline. In order to determine the impact of different maternity service delivery models on rates of normal birth, and accurately monitor and benchmark improvements in normal birth rates, public and private maternity services need to routinely collect standardised data on components of the model of maternity care alongside a universally agreed definition and data reporting system of maternal and newborn birth outcomes within the perinatal data set.

Despite high-level evidence in favour of caseload midwifery, there is a multitude of models implemented in Australia [49], with variations on the intent of 'relational continuity'. Service providers need to report/

capture caseload vs other models of care (and be explicit about the elements of such services) to enable accurate reporting and comparisons, as well as service improvements based on maternal and neonatal outcomes.

(4) Governments and accrediting authorities need to move to a system that requires all maternity service providers to benchmark their service against similar services with favourable normal birth rates, and undertake a regular program of review, audit and feedback within a quality improvement cycle to reduce unnecessary interventions whilst maintaining safety for mothers and babies. In order for this to occur there needs to be evidence of opportunities provided in each maternity unit for clinicians to access educational materials and engage in respectful interdisciplinary collegial discussion to identify and celebrate best practice and identify cases where the use of the Guideline facilitated normal birth.

(5) Data reporting could also include factors such as flexibility around indications for routine vaginal examinations or electronically monitoring contraction patterns where all other factors remain normal. Additionally, the culture at each level of the organisation should be analysed for factors that demonstrate supportive and innovative leadership of normal birth processes. Such indicators would provide identification of exemplars or areas requiring specific attention for education and research, and aid momentum for sustained improvements in normal birth care and outcomes.

(7) Any nuances applicable to improve legitimate safety for women and babies should be included in the Guideline to ensure consistency across services regardless of geographical site or funding model. Personal practitioners' preferences or funding requirements should not contribute to non-evidence based care, and medical intervention should only occur after full consideration of all appropriate factors (comprehensive physical and emotional assessment and shared decision making with the woman, and input from the unique insight of the primary carer).

Limitations

Although the recruited sample provided sufficient statistical power, the sample was a small proportion of the number of registered midwives in the State, introducing potential recruitment bias. Although respondents were employed in public and private hospitals, or self-employed, which allowed comparison

across a variety of models of care and employment types, representation in some categories was small and may have also contributed to possible bias. There was higher representation from 'midwife only' professionals compared to nurse/midwife registrants in Queensland. These respondents are likely to be direct-entry midwifery graduates, or professionals who have opted for midwifery registration only. They may differ in important ways from nurse/midwives, thereby limiting generalisation of findings across jurisdictions. Additionally, while midwives are the predominant professional group involved in the provision of women's maternity care and particularly during labour and birth, obstetricians play a major role in women's care and in clinical decisions. Therefore, future research should seek their perceptions on utility of the Guideline in practice. We developed the Best Uptake of Maternity Practice Survey (BUMPS) for this study to measure midwives' perceptions of barriers to the uptake of evidenced based practice. Although BUMPS demonstrated good face and content validity and reliability, the scale needs to be validated with other samples.

CONCLUSION

The Queensland Normal Birth Guideline is generally well-known to midwives who found it to be readily accessible and helpful, however only 71% indicated that the Guideline routinely guided practice. Organisational processes and a risk-adverse culture can hinder midwives' use of the Guideline. In particular, midwives employed in private hospitals were less aware of the Guideline and more concerned about barriers to implementation. Enhancing midwives' beliefs in evidenced based practice could positively influence use of the Guideline. There needs to be a full roll-out of relational caseload midwifery, provision of multidisciplinary education, and opportunities for respectful interdisciplinary collegial dialogue around implementing best practice to facilitate women's care and achieve optimal rates of normal birth.

ACKNOWLEDGEMENTS and DISCLOSURES

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493

494 **Tables**

495 Table 1: Demographic characteristics of participants

Variable	N (%)
Female	243 (97.6)
Male	6 (2.4%)
Age mean (SD range)	49 (9.5, 22-71)
Professional status:	
Midwifery student	7 (2.8)
Midwife only	135 (54.2)
Nurse and midwife	107 (43.0)
Employment category:	
Midwifery Student	7 (2.8)
Grade 5	79 (31.7)
Grade 6	76 (30.5)
Grade 7 or above	66 (26.5)
Self employed	14 (5.6)
Other	7 (2.8)
Years as a midwife Mean (SD, Range)	18.3 (11, 0-43 years)
Years in current role Mean (SD, Range)	6.3 (6.7, 0-35 years)
Main professional role:	
Clinical	200 (80.3)
Education	23 (9.2)
Administrator/ manager/researcher	23 (9.2)
Other	3 (1.2)
Highest qualification:	
Certificate	28 (11.2)
Bachelor degree	64 (25.7)
Postgraduate diploma	71 (28.5)
Masters degree	68 (27.3)
PhD	11 (4.4)
Other	7 (2.8)
Principal area of work:	
Antenatal and/ or postnatal	32 (12.9)
Labour and birth care	19 (7.6)
Hospital MGP Caseload model	46 (18.5)

Rotate all areas	96 (38.6)
Private Midwife with hospital visiting rights	15 (6.0)
Management, education, research	41 (16.5)
Geographical region for work:	
Remote	6 (2.4)
Rural	44 (17.7)
Regional	84 (33.7)
Metropolitan/urban	115 (46.2)
Service funding:	
Publicly funded	201 (80.7)
Privately funded	32 (12.9)
Self-employed	16 (6.4)
Facility level of service:	
Ante and postnatal care only – no birthing	10 (4.0)
Low complexity – no on-site theatre	5 (2.0)
Moderate complexity with on-site theatre	99 (39.8)
High complexity and NICU	135 (54.2)

496

497 **Table 2: Awareness of Guideline and Routine Workplace Use**

	Awareness of Guideline n (%)			Ready access to Guideline n (%)			Guideline routinely informs workplace practice n (%)		
	Yes	No	p	Yes	No	p	Yes	No	p
Service Location									
Rural / remote	50 (100)	0	.18	49 (98)	1 (2)	.06	45 (91.8)	4 (8.2)	<.001
Regional	81 (96.4)	3 (3.6)		79 (94)	5 (6)		62 (73.8)	22 (26.2)	
Metropolitan	108 (93.9)	7 (6.1)		101 (87.8)	14 (12.2)		70 (60.9)	45 (39.1)	
Employment Model									
Public hospital	195 (97.0)	6 (3.0)		187 (93.0)	14 (7.0)		148 (74)	52 (26)	.17
Private hospital	28 (87.5)	4 (12.5)	.02	26 (81.3)	6 (18.7)	.03	19 (59.4)	13 (40.6)	
Self -employed midwife	16 (100)	0		16 (100)	0		10 (62.5)	6 (37.5)	
Service Level Capability									
Ante / postnatal care only	9 (90)	1 (10)	.45	8 (80)	2 (20)	.47	7 (70)	3 (30)	.55
Birthing, no on-site theatre	5 (100)	0		5 (100)	0		5 (100)	0	
Birthing and on-site theatre	97 (98)	2 (2)		92 (92.9)	7 (7.1)		70 (71.4)	28 (28.6)	
Complex care with intensive care nursery	128 (94.8)	7 (5.2)		124 (91.9)	11 (8.1)		95 (70.4)	40 (29.6)	

498

499 **Table 3: Personal and Organisational factors associated with Guideline use**

Variables	Guideline facilitates my practice			Organisation facilitates Guideline use		
	Yes n (%)	No n (%)	P value	Yes n (%)	No n (%)	P value
Education						.535
<degree	69 (66.3)	35 (33.7)	.13	58 (55.8)	46 (44.2)	
≥degree	106 (75.2)	35 (24.8)		73 (51.8)	68 (48.2)	
Country of primary qualification						.188
Australia	143 (74.1)	50 (25.9)	.06	107 (55.4)	86 (44.6)	
Other	31 (60.8)	20 (39.2)		23 (45.1)	28 (54.9)	
Practice area						.20
Antenatal or postnatal or labour	32 (66.7)	16 (33.3)		23 (47.9)	25 (52.1)	
Rotate all hospital areas	77 (80.2)	19 (19.8)	.005	54 (56.3)	42 (43.8)	
Hospital MGP	32 (71.1)	13 (28.9)		26 (57.8)	19 (42.2)	
Private MGP	5 (33.3)	10 (66.7)		4 (26.7)	11 (73.3)	
Management, Education or Research	29 (70.7)	12 (29.3)		24 (58.5)	17 (41.5)	
Employment model						
Publicly funded hospital	148 (75.1)	49 (24.9)	.004	114 (57.9)	83 (42.1)	.012
Privately funded hospital	21 (65.6)	11 (34.4)		13 (40.6)	19 (59.4)	
Self-employed midwife in public hospital	6 (37.5)	10 (62.5)		4 (25.0)	12 (75.0)	
Service location						
Rural / remote	39 (79.6)	10 (20.4)	.136	36 (73.5)	13 (26.5)	.001
Regional	62 (74.7)	21 (25.3)		48 (57.8)	35 (42.2)	
Metropolitan	74 (65.5)	39 (34.5)		47 (41.6)	66 (58.4)	
Service level capability						
Antenatal/postnatal care	5 (55.6)	4 (44.4)		6 (66.7)	3 (33.3)	.263
Birthing, no on-site theatre	1 (20.0)	4 (80.0)		1 (20)	4 (80)	
Birthing and on-site theatre	70 (72.2)	27 (27.8)		56 (57.7)	41 (42.3)	
Complex care with intensive care nursery	99 (73.9)	35 (26.1)	.04	68 (50.7)	66 (49.3)	

500 **Table 4: Responses on Best Uptake of Maternity Practice Survey (BUMPS) and Item Factor**
501 **Loadings**

Survey Question: When preparing pregnant women for labour, or caring for women in labour, to what extent are you concerned about the following?	Concerned n (%)	Not concerned n (%)	Item factor loading
1. Insufficient clinical knowledge	79 (32.9)	161 (67.1)	.90
2. Insufficient clinical skills	74 (31.0)	165 (69.0)	.92
3. Unclear guidelines	109 (45.6)	130 (54.4)	.51
4. Insufficient collegial support	178 (74.2)	62 (25.8)	.74
5. Not sure how to put evidence into practice	85 (35.5)	154 (64.5)	.61
6. Being prevented from putting evidence into practice	182 (76.2)	57 (23.8)	.78
7. Meeting women's expectations	179 (74.6)	61 (25.4)	.70
8. A poor outcome for the mother	172 (72.0)	67 (28.0)	.95
9. A poor outcome for the baby	167 (69.9)	72 (30.1)	.91
10. Being blamed in some way for the outcome	184 (76.9)	55 (23.1)	.70
11. Being involved in an investigation process	177 (74.0)	62 (26.0)	.86
12. Losing my license to practice	148 (61.9)	91 (38.1)	.91
13. Being sued	158 (66.1)	81 (33.9)	.87
14. Budget constraints	178 (74.5)	61 (25.5)	.79
15. Administration processes	193 (80.7)	46 (19.3)	.81
16. Having insufficient time	202 (84.5)	37 (15.5)	.73
17. Accessing maternity records and recording care (paper or electronic)	143 (59.8)	96 (40.2)	.37

502

503 **Table 5. Responses on the Adapted Evidenced Based Practice Beliefs Scale - A-EBP-B**

Items	Disagree n (%)	Neither agree or disagree n (%)	Agree n (%)	Item Factor Loading
1. EBP results in best clinical care for women and babies	4 (1.8)	10 (4.5)	210 (93.7)	.92
2. Evidence-based guidelines can improve clinical care and outcomes for women and babies	4 (1.8)	10 (4.5)	210 (93.7)	.92
3. I can search for the best evidence to answer clinical questions in a time efficient way	26 (11.6)	44 (19.7)	153 (68.7)	.52
4. I can overcome barriers to implementing EBP	39 (17.4)	69 (30.9)	115 (51.6)	.75
5. I can implement EBP in a time efficient way	30 (13.4)	72 (32.3)	121 (54.3)	.73
6. Implementing EBP will improve the care I give to women.	5 (2.2)	17 (7.6)	201 (90.2)	.80
7. I am sure about how to measure the outcomes of clinical care.	25 (11.2)	71 (31.8)	127 (57.0)	.68
8. EBP takes too much time	164 (73.5)	42 (18.8)	17 (7.7)	.90
9. EBP is difficult	162 (72.7)	38 (17.0)	23 (10.3)	.85
10. I know how to implement EBP sufficiently to make practice changes	29 (13.0)	58 (26.0)	136 (61.0)	.80
11. I am confident about my ability to implement EBP where I work.	38 (17.0)	52 (23.2)	134 (59.8)	.88
12. My care is evidence-based.	4 (1.8)	25 (11.2)	195 (87.0)	.58

504

STROBE Statement—

	Item No	Recommendation
Title and abstract	1	(*a*) Study design with a commonly used term in the abstract
		(*b*) Provide din the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explained the scientific background and rationale for the investigation being reported
Objectives	3	Stated specific objectives for the survey
Methods		
Study design	4	Presented key elements of study design early in the paper
Setting	5	Described the setting, locations, and relevant dates, including periods of recruitment, exposure, and data collection
Participants	6	*Cross-sectional study*—Provided eligibility criteria, and the sources and methods of selection of participants
Variables	7	Clearly defined outcomes
Data sources/ measurement	8*	For each variable of interest, provided source of data and details of methods of assessment (measurement). Describe comparability of assessment methods i
Bias	9	Described any efforts to address potential sources of bias
Study size	10	Provided reference for how the study size was arrived at
Quantitative variables	11	Explained how quantitative variables were handled in the analyses.
Statistical methods	12	(*a*) Described all statistical methods, including those used to control for confounding
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study
Descriptive data	14*	(a) Gave characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate dnumber of participants with missing data for each variable of interest
		Cross-sectional study—Reported numbers of outcome events or summary measures
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included
Other analyses	17	N//A
Discussion		
Key results	18	Summarised key results with reference to study objectives
Limitations	19	Discussed limitations of the study, taking into account sources of potential bias or imprecision.
Interpretation	20	Gave a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discussed the generalisability (external validity) of the study results
Other information		
Funding	22	Gave the source of funding

Title Page

Title: Factors influencing midwives' use of an evidenced based Normal Birth Guideline

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