Service Evaluation of the Calmbirth® Antenatal Pilot Programme at Auckland District Health Board (ADHB) 2020-21

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CENTRE FOR MIDWIFERY AND WOMEN'S HEALTH RESEARCH

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Executive summary

High childbirth intervention continues at Auckland District Health Board. High childbirth intervention rates impose unnecessary risk to women and their infants. Anxiety and fear of childbirth impacts on the experience of childbirth and evidence demonstrates that certain antenatal interventions can help mitigate this impact on childbirth experience. Furthermore, Māori and Pasifika wāhine and whānau have been shown to have poorer childbirth outcomes and underrepresentation in antenatal initiatives. Antenatal strategies to reduce childbirth interventions and improve childbirth experiences are required that are inclusive and engaging for all of the population using ADHB's services. Calmbirth® antenatal classes are one possible strategy.

This service evaluation focussed on a pilot programme of free Calmbirth® antenatal classes delivered at ADHB between September 2020 and June 2021 in which 438 women and 398 partners or support persons completed one of the 28 courses in this period. Attendance rates were higher in face-to-face classes (96%) than with online delivery (82.7%). A parallel ADHB in-house evaluation with 734 respondents was conducted which highlighted that only 14 Māori and 11 Pasifika attended.

The aim of the independent AUT commissioned evaluation was to establish what standard the Calmbirth® education classes achieved over the pilot period and to inform further planning and provide recommendations for ongoing related research and practice changes. The evaluation adopted a goal-free evaluation stance meaning evaluators endeavoured to perform the evaluation without rhetoric related to the programme goals. The evaluation comprised three phases 1) a scoping review, 2) online anonymous survey (qualitative and quantitative data collection), and 3) face-to face-individual and couple in-depth interviews. Ethics was granted by AUTEC (AUT Ethics Committee) and ADHB Research Governance Group Meeting of Women's and Neonatal Health. In

phase two 150 women completed the online Qualtrics survey. In phase three 13 interviews were conducted, 5 including partners, thus, 18 persons were interviewed.

Key findings/outcomes

Findings and outcomes from the scoping review, survey and interviews are reported. The scoping review identified multiple areas in this domain requiring further examination and highlighted four categories that informed the content of survey and interview questioning: Satisfaction and acceptability of classes; Labour and birth interventions; Labour characteristics; and changes in feelings, opinions, and beliefs towards pregnancy and birth. The survey collected demographics including 92.67% of women who participated in survey were primigravid. Most were aged 31-35 years. 32% were NZ European and this was the largest ethnic group. To note only 4% were Māori and 1% Pasifika and therefore these groups were underrepresented in the evaluation, however this was shaped by their underrepresentation in course enrolment. A variety of outcomes and childbirth intervention data were gathered and reported. Tentative comparisons are suggested to provide context with the strong recommendation that further scrutiny of comparative outcomes is needed with appropriate research designs. However, compared to the National Women's Health Annual Clinical Report 2020 annual report, and focusing on primigravida outcomes, there appears a marked decrease in overall caesarean section rate by over 7%, a reduction in episiotomy by over 25%, and a dramatic increase in water use in labour and birth. There was a more than 5% increase in spontaneous vaginal birth. There is also indication that induction of labour was less in the Calmbirth® participants. However, these comparisons are to be viewed with caution.

Calmbirth® classes have been, for the most part, welcomed by the participants in the pilot. The overarching impression is that Calmbirth® makes a difference for the majority of women impacting positively on their childbirth experience; particularly the building of confidence and self-advocacy

which may have repercussions on childbirth experiences. Increased partner engagement was acknowledged as a welcome contribution to their experience. In addition, it appears that several labour and birth physical outcomes and interventions have improved although causative impact on interventions and outcomes remains to be established. It is feasible that the positive Calmbirth® outcomes reported in this evaluation would influence several significant outcomes, including:

- Increased satisfaction with birth long-term and ongoing wellbeing
- Increased satisfaction with the ADHB childbirth experience
- Less PPH (postpartum haemorrhage)
- Increase in long term breastfeeding
- Improved relationships and family integrity
- Improve bonding and parenting long term
- An impact on ADHB resources (staff and/or facilities) due to reduction in interventions and complex ongoing hospital care

However, it is of note that a small percentage of Māori and Pasifika enrolled in the classes and/or participated in the evaluation. It is uncertain if the cultural alignment and content of the courses or problems with bespoke advertising contributed to this outcome. More work in this area is urgently required. The evaluation data analysis highlighted wider influences contribute to the impact and effectiveness of the Calmbirth® course, namely ADHB birthing and organisational cultures and an influence of societal birth discourses and culture. Consequently, the recommendations address these issues too.

Recommendations

Priority:

- Calmbirth® classes should be continued at ADHB and be free to local communities using ADHB maternity services to ensure accessibility to all.

- Explicit focus and mahi on improving accessibility and acceptability of the classes to Māori and Pasifika women/wāhine/whānau. This would involve robust consultation processes.

For consideration:

- Leadership, management, and fiscal constraints also need to address and facilitate the environment in which Calmbirth® practices can flourish in ADHB birthing spaces.
- Calmbirth® is one stratagem that can be used to support the necessary changes in culture, but this must be supported with a number of other interrelated initiatives:
    - Education for all midwives in the content of Calmbirth® to help address the fear in the midwifery workforce and help align them with Calmbirth® ethos.
    - Clinical pathways for childbirth care need to be re-examined to address risk culture so that Calmbirth® teachings and focus can be applied and fully realised in the birthing rooms.
    - Re-examination of the birth environment for all risk women that aligns with current evidence
    - An assessment of the role of private obstetricians at ADHB and how this potentially impacts on birth culture and practices aligned with Calmbirth®

Future research:

- A full evaluation is needed to measure the impact and acceptability of the Calmbirth® classes as compared to standard antenatal classes, with further comparisons made to the labour and birthing outcomes for those who do not undertake antenatal programmes, stratified against culture, parity, and risk with particular attention to the apparent differences in surgical births.

- Culturally aligned research on how Calmbirth® participation by Māori and Pasifika is required including purposive examination on cultural and ethnic responses to antenatal class components.
- Research to examine barriers and facilitators to implementing the teachings and ethos of Calmbirth® within the midwifery, medical practices, and birth culture at ADHB.
- Research which explores the impact of antenatal programmes comprising meditation and mindfulness and empirical work on how to influence changes of opinions and beliefs about childbirth is needed to influence a change in societal birthing culture.

Acknowledgments

We would like to express gratitude to the women/wāhine and whānau who contributed time and their experiences to this evaluation. Without their participation, the evaluation would not have been possible.

A thank you is also needed to our ADHB partners who provided the information we required in a timely way to execute this evaluation.

Introduction

High childbirth intervention continues at Auckland District Health Board (National Women's Health, 2020b). High childbirth intervention rates have shown to impose unnecessary risk to women and their infants (Anna E. Seijmonsbergen-Schermers et al., 2020) and have been shown to be highly variable across regions (A. E. Seijmonsbergen-Schermers et al., 2020), imposing additional costs both in staffing and budgetary terms from DHB maternity services. Moreover, there is growing global recognition that excessive and/or unneeded use of childbirth interventions can cause harm (Miller et al., 2016). The call to evidence-based approaches and respectful maternity care is vital to address this concern. There is emergent evidence that antenatal education may influence and/or impact on childbirth intervention rates (Crowther, Upcoming). It has been shown previously that anxiety and fear of childbirth impacts on the experience of childbirth and significant evidence is now demonstrating that certain antenatal interventions can help mitigate the emotional and psychological impact of anxiety and fear (O'Connell et al., 2021). Moreover, there is emerging evidence internationally that antenatal classes that focus on psychosocial and emotional preparation potentially lessen interventions rates (Akca et al., 2017; Cutajar & Cyna, 2018; Saxbe et al., 2018; Tabib & Crowther, 2018).

The high childbirth intervention rates at ADHB maternity services has motivated the directors of services to engage proactively in seeking solutions to mitigate rates recorded in intrapartum care (ADHB, 2020). As part of a larger strategy to address this concern, ADHB Pregnancy and Parenting programme piloted the delivery of Calmbirth® childbirth preparation classes. These classes were offered and fully funded for a 10-month period from September 2020 to June 2021 to a cohort of women planning to birth at Auckland City Hospital. ADHB anticipated being able to accommodate approximately 70-80 women and their partners per month, equating to approximately 700-800

women during the pilot period. ADHB commissioned AUT to conduct an independent service evaluation of the pilot programme, with both qualitative and quantitative aspects to the evaluation/research.

The aim of the evaluation was to establish what standard the Calmbirth® education classes met over the pilot period and to present an evaluation report to ADHB leaders that informs further planning on ongoing delivery of this service at ADHB (or not). The results of this evaluation study will aid understanding about the effects of the Calmbirth® programme on women's experiences of labour and birth who used ADHB maternity services. The outcome of this evaluation informs ADHB's future antenatal education planning, ongoing evaluation and audit of such services and provides recommendations for ongoing related research.

The Calmbirth® Course

According to data from Auckland DHB, 532 women registered for the free Calmbirth® pilot antenatal programme classes being held by the Pregnancy and Parenting Programme, and 438 women completed the course. This equated to 82.33% of women who registered across a total of 28 classes during the 10-month period from September 2020 to June 2021. A total of 398 partners or support people also attended the Calmbirth® programme, and therefore 90.86% of women who completed the course attended with a partner or support person. A total number of 836 people went through the Calmbirth® course therefore during the pilot period.

Attendance rates was higher in the face-to-face classes (96%) compared to the Zoom classes (82.7%) that were provided to navigate COVID-19 restrictions and offer flexibility of programme delivery. The total number of women who attended the course was lower than ADHB initially projected, however,

this would have been shaped by a number of factors, including COVID-19 lockdowns, awareness and uptake among ADHB LMCs, and the newness of the programme to ADHB as a free service.

Furthermore, it is unknown if the advertising of the free programme was sufficient and/or culturally tailored to the meet the diversity of cultures in the ADHB catchment area. Table 1 outlines the self-reported ethnicities of women who attended the course, and from this it is clear that New Zealand European course participation constituted by far the major ethnic grouping. ADHB serves a population of 493,990 people in 2021, however only 8.2% of people identify as Māori which is lower than the national average, which may shape the underrepresentation of Māori, though this underrepresentation is something that must be examined. ADHB serves a relatively large Pacific population (11%), which is not reflected in high uptake here (Ministry of Health, 2021b).

Table 1: Self-reported ethnic and cultural orientation of participants, from ADHB evaluation

Period	September	October-December	January-March	April-June	Totals
Māori	1	3	3	7	**14**
New Zealand European	2	12	40	47	**101**
Other European	1	15	29	33	**78**
Pasifika	0	3	2	6	**11**
Chinese	2	5	19	18	**44**
Indian	2	17	29	36	**84**
Other Asian	1	7	6	14	**28**
Other	0	0	1	1	**2**
African	0	2	0	0	**2**
Asian NFD	0	0	1	1	**2**
Euro NFD	0	2	3	7	**12**
Latin Am	0	3	6	9	**18**
Mid-East	0	3	2	5	**10**
Southeast Asian	3	7	7	13	**30**
Not stated	0	0	0	2	**2**
Total	**12**	**79**	**148**	**199**	**438**

Evaluation stance

The evaluation of the Calmbirth® education classes adopted a goal-free evaluation stance (Patton, 2014). This means the evaluators endeavoured to perform the evaluation without rhetoric related to the programme goals. Although the intention of the evaluation has been made explicit in the aims and questions, the trustworthiness and rigour of the evaluation is embedded from the start because the evaluators are not employed by ADHB, have no financial benefit from the outcomes, and can avoid narrowly studying ADHB stipulated outcomes alone and instead remain open to the unanticipated outcomes. Although it is not possible to remove all perceptual biases into an evaluation of this nature, the outcomes of the evaluation are balanced and reflect the real world of the participants using the service. This theoretical approach employed an inductive and naturalistic holistic lens enabling a robust and plausible evaluation to be conducted is responsive to the lived world experiences of participants whose voices remain at the centre of this evaluation (Kvale, 2008).

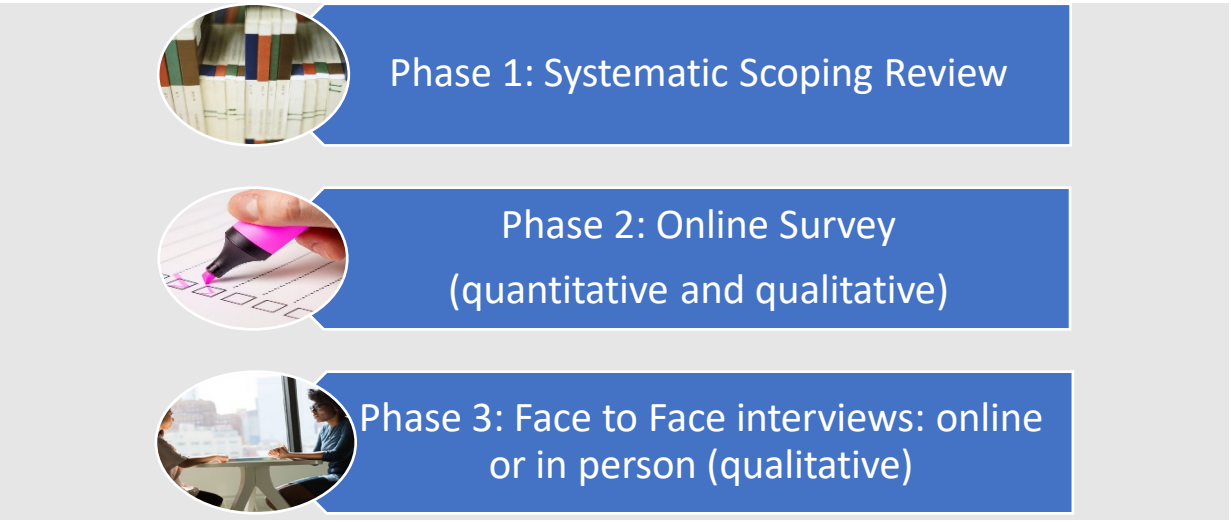
Service Evaluation Methods

The evaluation comprised three phases: 1) a scoping review of existing literature, 2) online anonymous survey data collection, and 3) face-to face-individual and couple in-depth interviews. Only participants who volunteered took part in phrases 2 and 3.

A parallel in-house evaluation was conducted by ADHB's Pregnancy and Parenting Programme, to gain an internal and interim understanding of class acceptability. The ADHB evaluation was conducted during the course and was completed by both the pregnant women and the partner, and therefore had high uptake with 734 respondents. It asked questions about the course promotion (how the course participants heard about the course), knowledge and acceptability (how well topics were covered and presented), an evaluation of the educator, and of the learning environment

(room). This evaluation will not be drawn upon within this independent evaluation other than when necessary to draw broader conclusions about the make-up of the evaluation participants and course participants.

Figure 1: Structure of the evaluation



Ethics approval

Ethics approval was obtained from the Auckland University of Technology Ethics Committee (AUTEC, # 20/323) and ADHB Research Governance Group Meeting of Women's and Neonatal Health (#9129). Participants had the right to remove their data up until all data was collected and analysis had started. Confidentiality of participants was maintained throughout, respecting, and maintaining anonymity. No names or any form of identity that may reveal participants or their positions will be used in this report or in any other materials produced from their data. No identifying information was intentionally collected at any point, or if it was unintentionally collected, it was removed prior to analysis.

Findings from this study have the potential to make a difference to funding for and access to Calmbirth® classes for women in New Zealand. The contribution of participants will be

acknowledged in all published papers and conference presentations arising from this study, although the identity of individual participants will be kept confidential. Researchers acted with honour and good faith throughout the evaluation. Participants involved in recorded interviews had the option to turn off the recorder at any point in the interview. Participants also had the option to withdraw at any stage.

While the research or outcomes are not targeted to any particular group, the researchers whose midwifery practice is underpinned and informed by Tūranga Kaupapa ensured these principles were upheld for all participants (Ngā Māia Trust, 2017). The research design focussed on the experiences of women and their partners. The principles of individual negotiation, equality, shared responsibility, empowerment and informed choice and consent were at the heart of this evaluation and the guiding principle of partnership influenced recruitment and participant engagement. Researchers involved in the project are very experienced in working in partnership, both individually and collectively, and are committed to research practice based upon these principles (See appendix 1 for ethics approvals from AUTEC and the ADHB research committee).

Survey recruitment

All pregnant people who were course participants were invited to complete an Online Qualtrics survey (phase 2) after attending their Calmbirth® course. A physical copy of the Participant Information Sheet about the survey was given to course participants who attended a physical course by the course educator, and online course participants were emailed the Information Sheet. One month after the estimated time that each women gave birth, course participants were emailed with the Information Sheet again, and a link to the survey, inviting them formally to participate. They were advised that completing the survey

was purely voluntary and not compulsory. Participants interested were invited to click the link to the survey. The first page of the survey had the Information Sheet again for them to review and a consent form for participants to anonymously sign their consent to participant. The whole survey process was anonymised and managed by AUT research team. No identifiable information was collected in the survey.

Survey design

The survey included open and closed questions, with the questions asked guided by the learning outcomes that ADHB sought to explore, the findings of the scoping review, and the questions used in a prior evaluation of the Calmbirth® programme in Australia (with permission given to adapt this survey to the New Zealand context). Demographics on participants were collected (e.g., age, ethnicity). We used ordinal and nominal data from the surveys and analysed these using simple descriptive statistics. Simple descriptive statistical analysis of ordinal data produced numbers and frequencies without examining intervals and ratios. The nominal data examined and highlighted categories whereas the ordinal data highlighted a meaningful order or rank between the options/findings for some categories (e.g., that some items were repeatedly mentioned, and some data indicated the best option out of a list).

Ethnicity coding

The Ethnicity Data Protocols describe the standard procedures for collecting, recording and using data on the ethnicity of people treated by or working in the New Zealand health and disability sector (Ministry of Health, 2021a). The prioritised ethnicity classification system allocates each person to a single ethnic group, based on the ethnic groups they identify with. Where people identified with more than one group, they are assigned in this order of priority:

Māori, Pacific Peoples, Asian, and European/Other. So, if a person identifies as being Māori and New Zealand European, the person was counted as Māori.

Interview recruitment

All course participants were also invited to take part in an interview. Their partners or a support person were also welcome. As with the survey recruitment strategy, a physical copy of the Participant Information Sheet about the interview was given to course participants who attended a physical course, and online course participants were emailed the Information Sheet. At the end of the online Qualtrics survey, participants were asked if they would like to take part in a face to face virtual or in person interview. If they were interested in being interviewed, participants were directed to another survey page to provide their contact details. This was a separate survey where their personal contact details needed to organise the interview could not be traced back to the survey (Phase 2) data – vis-à-vis., the two surveys were not linked. Alternatively, if participants did not wish to conduct the survey, they could also express interest in being interviewed only via a separate link emailed to course participants, or by notifying the researcher by email, phone call or text if they would like to participate in the study (These contact details were on the Participant Information Sheet).

Interview design

Interviews were conducted with 13 women across the 28 courses delivered[1]. Women's partners or a support person were also invited to join however this was not mandatory. Only 5 partners/support persons were recruited into phase 3 interviews, creating a total of 18 interview participants. Interviews occurred at around six-weeks following the birth. The interview was

[1] Women in the final courses may not have given birth prior to the end of the evaluation data collection and therefore were unable to participate in phase 3 interviews.

qualitative using in-depth conversational styled data collection using indicative questions formulated from the scoping review, insights from phase 2 survey data and ongoing interrogation of themes and areas of interest emerging in previous interviews. Open ended questions and probes yielded in-depth responses from participants about their experiences, perceptions, opinions, feelings, and knowledge about their own unique encounter with the Calmbirth® classes and their own subsequent labour and birth at ADHB.

Interviews were transcribed and all identifiable information was removed during transcription. Overall, the interviews sought to understand participant's feelings, experiences, opinions, and knowledge in relation to Calmbirth® and their birthing experience. The gathered stories from the interviews highlighted meaning rather than generated numbers or frequencies.

Analysis

Themes arising from these interviews were thematically analysed through template analysis. Template analysis is a style of thematic analysis which follows a set of procedures to guide the analysis of qualitative data (Brooks et al., 2015). For a copy of the template analysis, contact the corresponding author.

- First, the research team read the transcripts to familiarise themselves with the data.
- The Research Assistant carried out preliminary coding of a subset of the data (3 transcripts) to create an initial template with codes from this first subset.
- Additional a priori codes were included in the template to focus on and explore issues and outcomes that ADHB funders had requested findings on (See Box 1).

Box 1: Areas of focus required by ADHB
• What was helpful in the course • What was not helpful in the course • Impact of partner involvement • Cultural needs met • Use of tools and techniques between the classes and birth • Feelings/ expectations towards pregnancy and birth before classes • Feelings/ expectations towards pregnancy and birth after classes • Labour and birth experience • Use of analgesia/ anaesthesia • Labour and birth interventions • If applicable, feelings about interventions • Labour outcomes (length) • Women's birth outcomes e.g., vaginal birth, CS, Ventouse/forceps etc.

- An iterative process was then conducted to analyse data, with the research team reviewing the remaining 10 transcripts, and adding to or revising codes with new data (see Box 2).
- A second round of reviews was conducted to further refine, support and revise data. A third round was not required as consensus had been reached.
- A final template was used to aid overall interpretation of the data and conduct thematic analysis, with themes identified and discussed as a team.

Box 2: iterative processes

	First reviewer round	Second reviewer round (refine, support, revise)	Third reviewer (if consensus not reached)
A, B, C, D	BH (create initial template from this, done)	SC (done)	JMC (not required)
E, F, G,	SC (done)	CH (done)	BH (not required)
H, I, J,	CH (done)	HD (done)	SC (not required)
K, L, M	HD (done)	JMC (done)	BC (not required)

Data storage

Protection of participants is paramount, and all necessary conditions were applied to keep participants data safe. Data from the interviews and the survey was treated with the utmost respect and pseudonyms applied to the data to ensure anonymity.

Data from the phase 2 Qualtrics survey was stored in password protected SharePoint files on password protected computers in AUT while the project was active and for post-analysis retention. This data was only accessible by two members of the research team at AUT. All data was unidentifiable and in line with AUTEC's data management matrix.

Electronic recordings of the interviews were stored in password protected SharePoint 2013 files, only accessible by the research team while the project was active, and then digitally shredded. While this data is identifiable at this stage, there is a low probability of discrimination, harm or unwanted attention resulting from disclosure, therefore this is in line with AUTEC's data management matrix.

The interviews were transcribed by the Research Assistant or transcription software. The Research Assistant signed a confidentiality agreement and removed any identifiable data upon transcription. Solely the primary researcher (Professor Crowther) had access to the consent forms after the interview, which is the only piece of identifiable data. There is a low probability of discrimination, harm or unwanted attention resulting from disclosure. These consent forms were stored in locked filing cabinets in a locked office at AUT north campus whilst the project was active and have now been transferred to a secured removable storage location for post-analysis retention, in line with AUTEC's data management matrix. No data was shared with third parties. All data is held by AUT and is password protected and accessible only to the research team.

Pseudonyms

Participants within the interviews were given pseudonyms by the research team, with names chosen to align with the initial deidentified coding name they were given e.g., Participant A = Angel, Participant B = Belinda, Participant C = Carla. Survey participants were not given pseudonyms but are referred to throughout as 'A survey participant'. Pseudonyms are not intended to indicate the cultural or ethnic backgrounds of participants.

Findings/outcomes

Scoping review

A scoping review has been submitted to a journal. The review aimed to start by stating the problem: Antenatal classes are popular, however, not all classes incorporate mindfulness, relaxation, visualisation, breathing techniques and practice partner engagement. Minimal empirical research has been undertaken to understand and support the impact of such classes when all these components are delivered together.

The aim of the review was to identify the scope of current literature and types of evidence available on the use of relaxation, mindfulness, visualisation, breathing techniques and partner participation in antenatal classes and highlight what is known about their impact. The methods adopted for the review were a scoping review informed by Arksey and O'Malley's (2005) framework.

697 sources were identified through database searching, and a further 29 from hand searching. After full-text review, 39 sources were included (see appendix 2 for PRISMA chart). The review identified four categories for themes explored by the articles: Satisfaction and acceptability of classes; labour and birth interventions; labour characteristics (onset and duration), and changes in feelings, opinions, and beliefs towards pregnancy and birth. Of note, no study was identified that focussed on a single programme of antenatal education that incorporated all components of relaxation, mindfulness, visualisation, breathing techniques and partner participation – such as Calmbirth®.

The review concluded that several components in antenatal education programmes suggest some advantages, yet findings are not conclusive. The impact of teaching relaxation, mindfulness, visualisation, breathing techniques and focus on partner participation together in a singular programme remains unknown. A key message to emerge from the evidence synthesis of this scoping

review is that singular components or several components included in an antenatal education programme suggests some advantages, yet findings are not conclusive and remain mixed. Furthermore, no conflict-of-interest free research has examined a comprehensive programme of antenatal classes that contains all the components examined in the scoping review to ascertain influences and impacts on labour and birth outcomes, childbirth interventions and maternal satisfaction. The review clearly revealed a gap in the literature informing future research priorities:

- Further research is needed on how classes influence birth and maternal satisfaction and acceptability of classes with multiple components, such as in Calmbirth®.
- Although there is emergent evidence to support the influence on feelings, stress-related morbidity, fear reduction, and sense making about birth, there remains a paucity of evidence on impact on opinions and beliefs about childbirth overall, and this requires focussed study.
- The impact of partner involvement in these types of classes and maternal satisfaction and partner satisfaction also requires further research. In addition, this research would need to examine more closely the role of the partner in this genre of classes.
- Any comprehensive approach to antenatal education, such as Calmbirth®, which incorporates many components delivered together needs further investigation and evaluation.
- The review suggests that delivery of classes alone may not effect change and further work is needed to explore the effects of institutional maternity care culture and how this may be strongly influencing childbirth outcomes and maternal satisfaction.

- In addition, purposive examination on cultural and ethnic responses to antenatal class components requires further examination as does the acceptability to single parents and LGBTQIA+ communities.

For the purposes of this evaluation report four overarching categories were identified in the scoping review:

1. Satisfaction and acceptability of classes;
2. Labour and birth interventions;
3. Labour characteristics (onset and duration);
4. Changes in feelings, opinions, and beliefs towards pregnancy and birth.

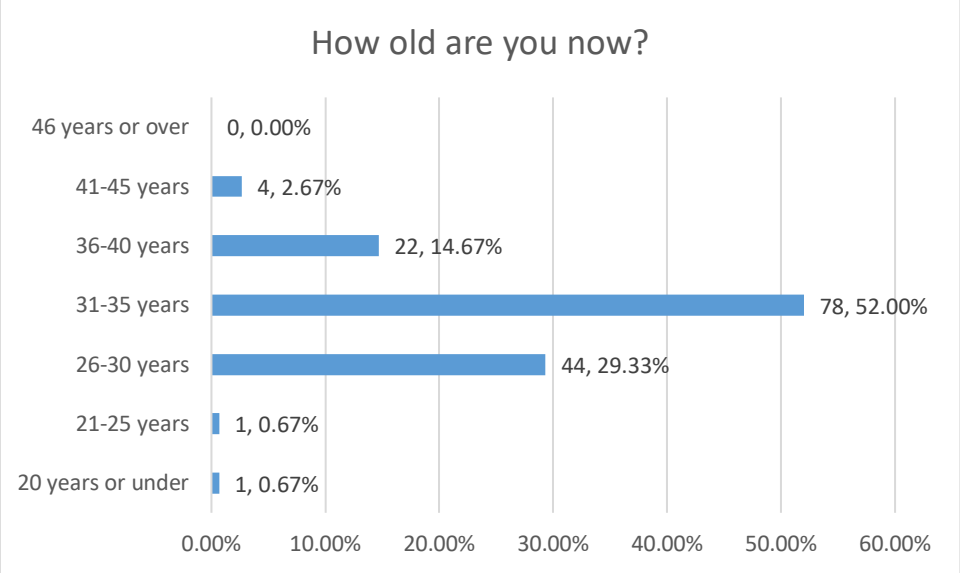
These four categories contributed and helped inform the indicative questions in the interviews (see Appendix 3) and were also integrated into the template analysis process. The review conclusion also informed the discussion of the evaluation outcomes.

Quantitative Survey Findings and Analysis

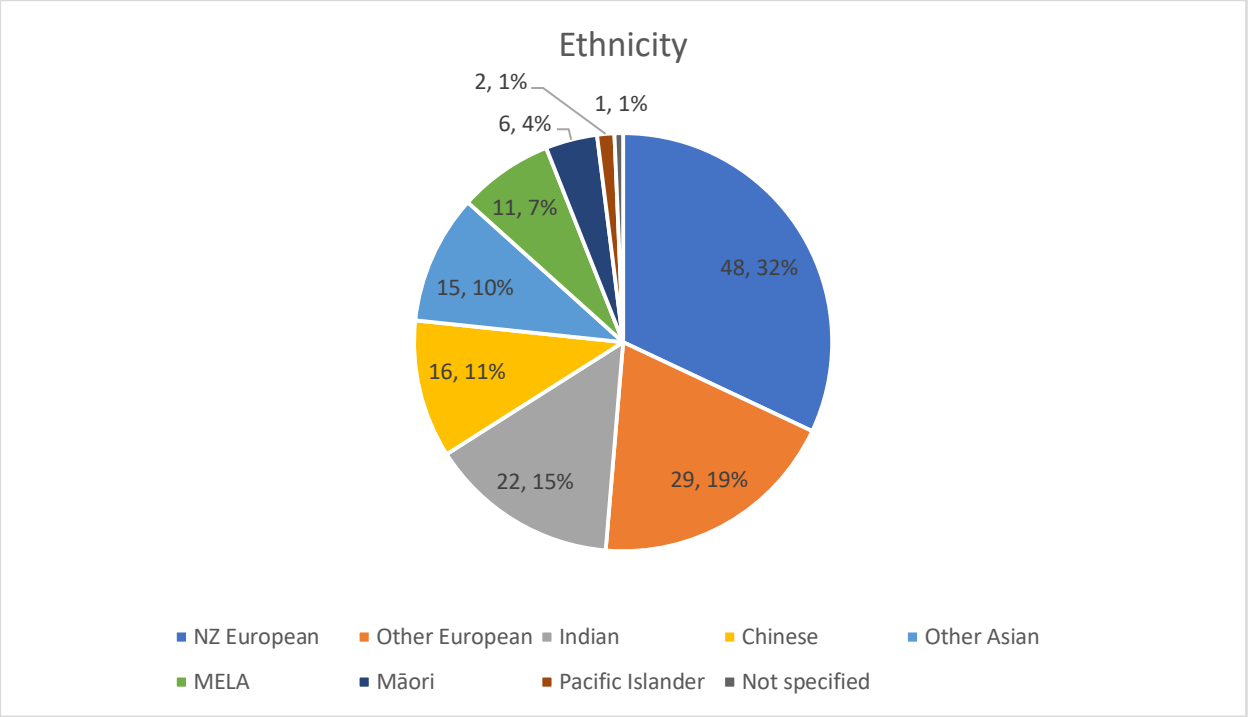
150 women completed the online Qualtrics survey (see Appendix 4 for Qualtrics questions). As 438 women completed the Calmbirth® pilot programme, the survey was completed by 34.24% of women who went through the programme.

Demographics

92.67% of women who participated in the survey were primigravida. Most women were aged between 31 and 35 (78/150, 52%). Few survey participants were below 25 or above 40.



Of the 150 women surveyed, 32% identified as NZ European, and 19% identified as Other European (UK, Irish, European, or North American).

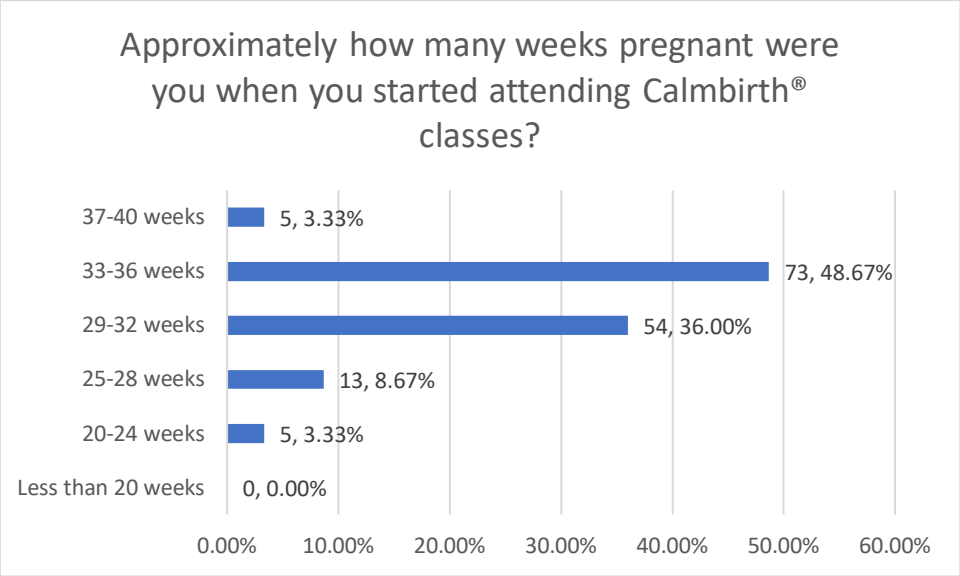


The next most dominant ethnicities were Indian at 15% and Chinese at 11%. 10% (15/15) identified as Other Asian, with 7 of these being Filipino, and Indonesia, Sri Lankan, Japanese and Vietnamese also being represented.

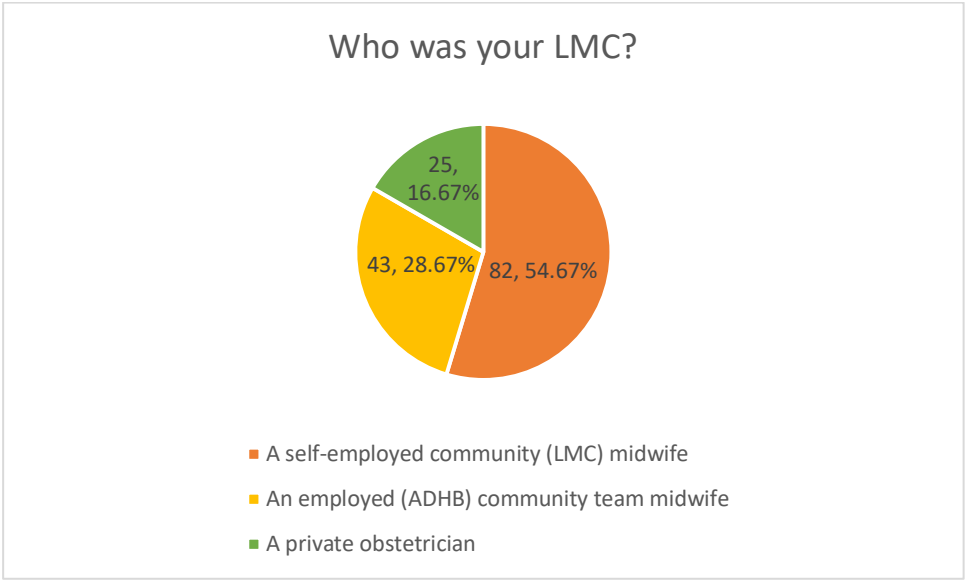
7% of participants were Middle Eastern or Latin American (MELA), with these including people who identified as Middle Eastern, Iranian, Latin American, South American, Brazilian, Columbian, Caribbean, and Latino.

Only 4% of participants were Māori, 1% Pasifika, and 1 person did not specify their ethnicity, however Māori and Pasifika participants were also underrepresented in the course, only making up 3% of women in the course.

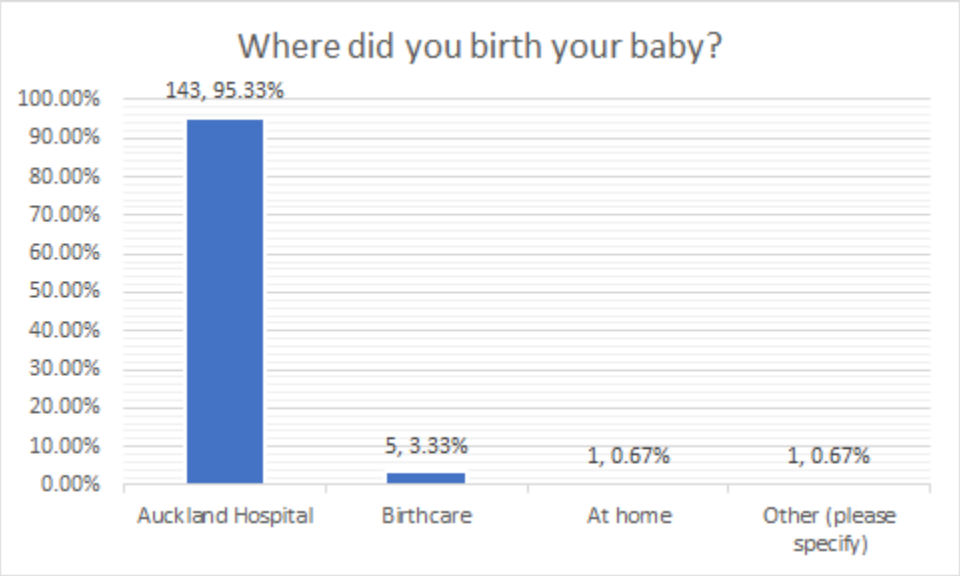
Most women (127/150, 84.67%) were between 29 and 36 weeks pregnant when they started attending the Calmbirth® classes, however some (5/150 each, 3.33%) were early in the pregnancy and late.



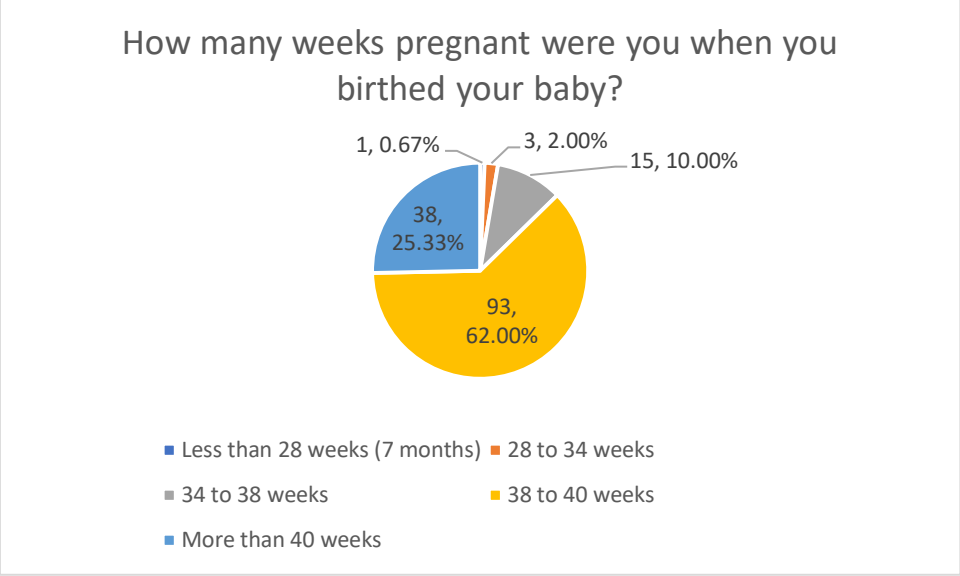
Most women (54.67%, 82, 150) had a LMC who was a self-employed community midwife.



Most women (143/150, 95.33%) birthed at Auckland Hospital, however as this was a requirement of attending the course, this would have influenced findings. One individual birthed at Whangārei Hospital.

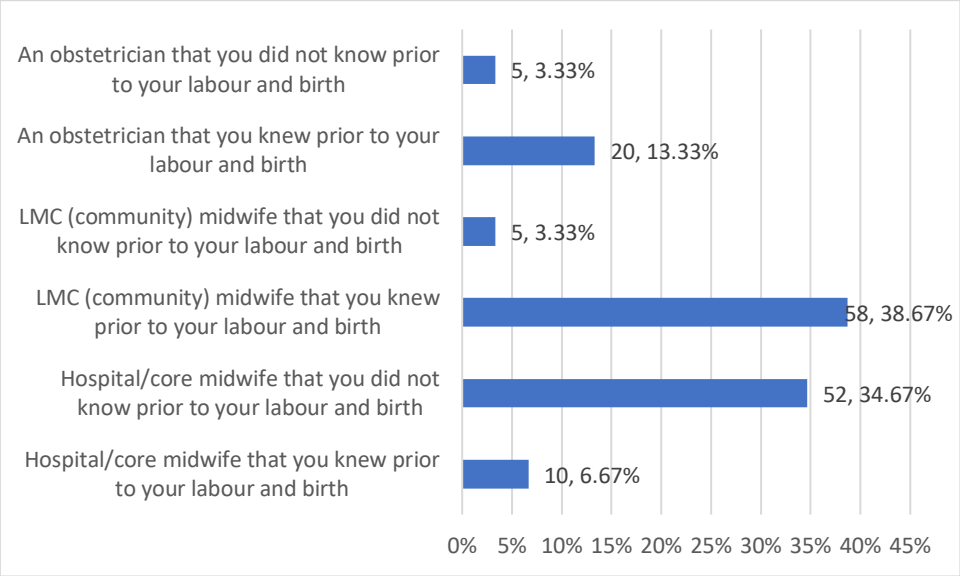


Most women surveyed (93/150, 62%) were over 38 weeks pregnant when they birthed their baby.



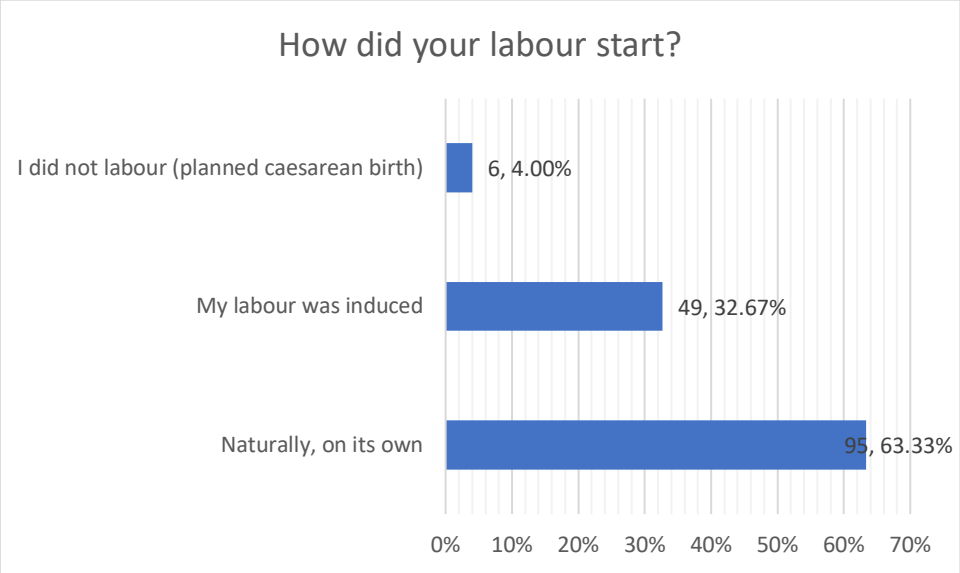
Who was the main person caring for you in your labour and birth?

Most women were cared for by a hospital/core midwife or their own LMC (community) midwife during their labour.



Labour and Birth

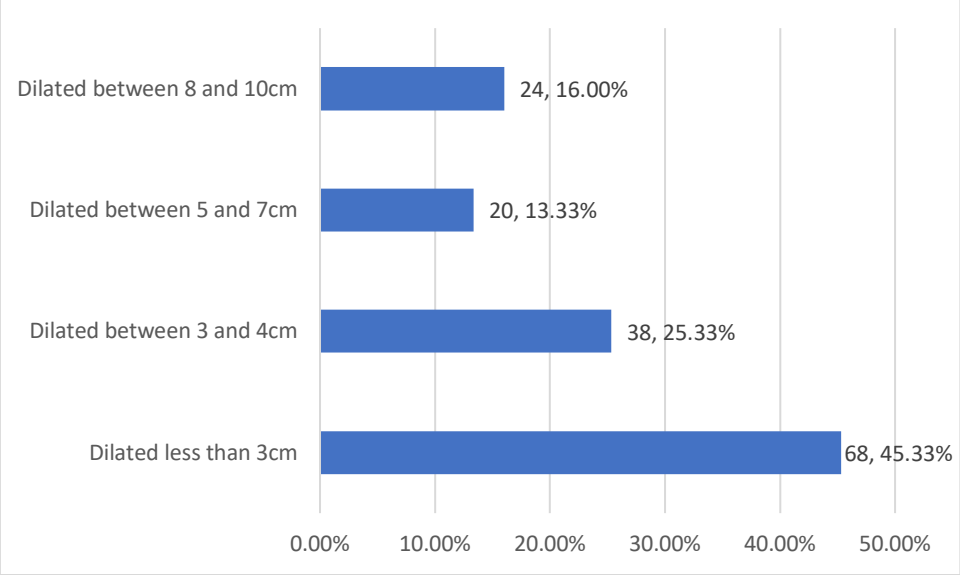
For most women, their labour started on their own.



Most women were less than 3cm dilated when they went to hospital. Part of the course programme focussed on preparation for, and understanding of, the importance of spending early labour at home to arrive at hospital in active labour, yet this finding suggests that some women still arrived at the hospital early. However, there could have been a number of factors influencing this outcome and it

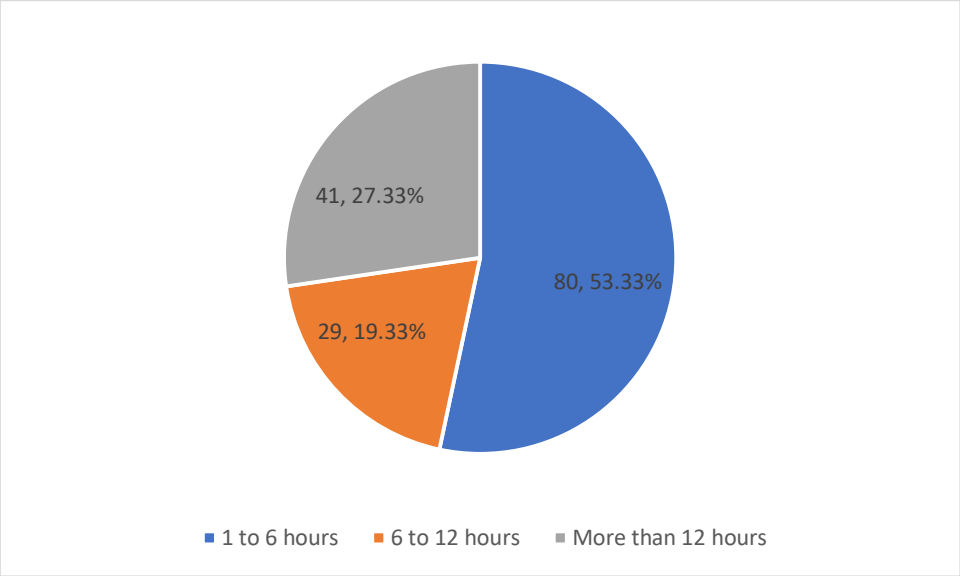
may be related to how many women had to be induced. It is not possible to break the numbers down by which women had spontaneous onset of labour and which had to be induced.

Women were told the dilatation of their cervix on admission to the hospital



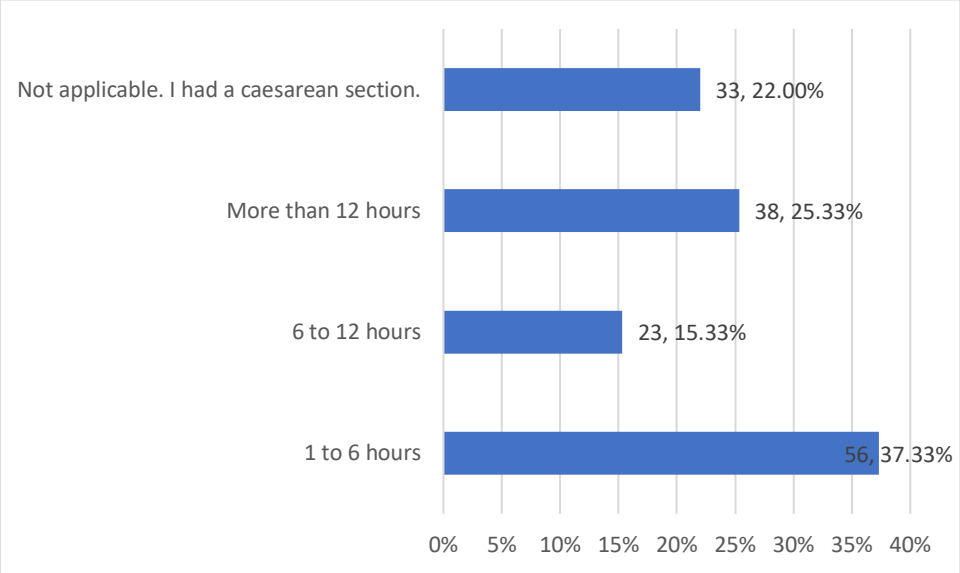
Time before arriving to the hospital

53.33% of women were in labour for 1 to 6 hours before going to hospital and 27.33% waited for more than 12 hours. It is noted that this was self-reported 'labour-onset' and may not indicate active labour.

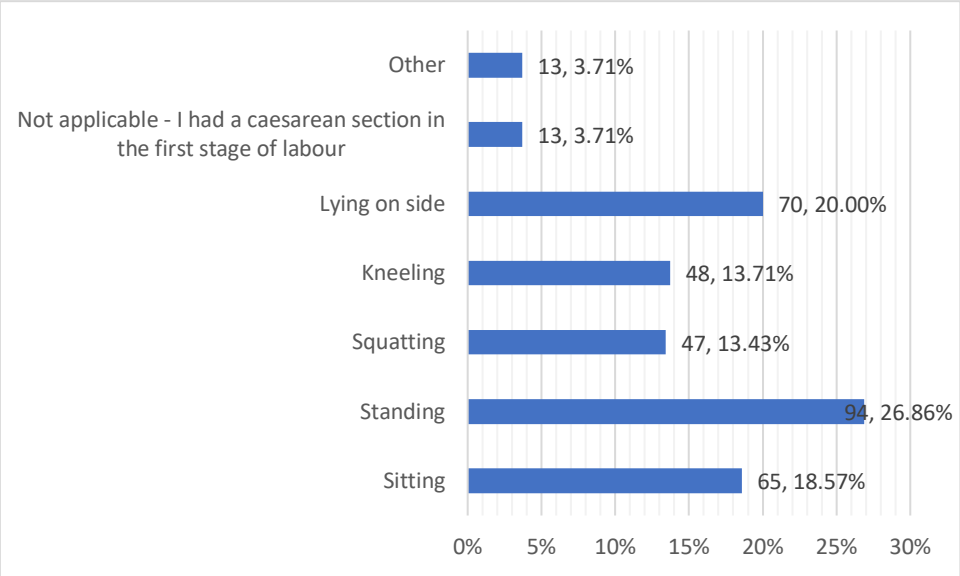


Length of time in hospital prior to second stage pushing

37.33% of women were in hospital 1 to 6 hours prior to second stage pushing.



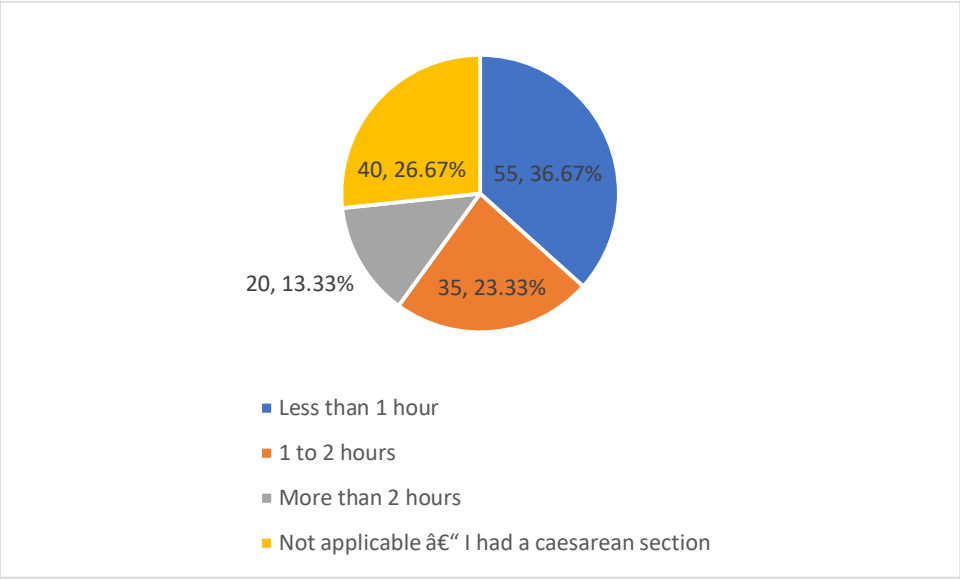
First stage positions



Other techniques reported by the women included using a Swiss ball, walking, and frog legs.

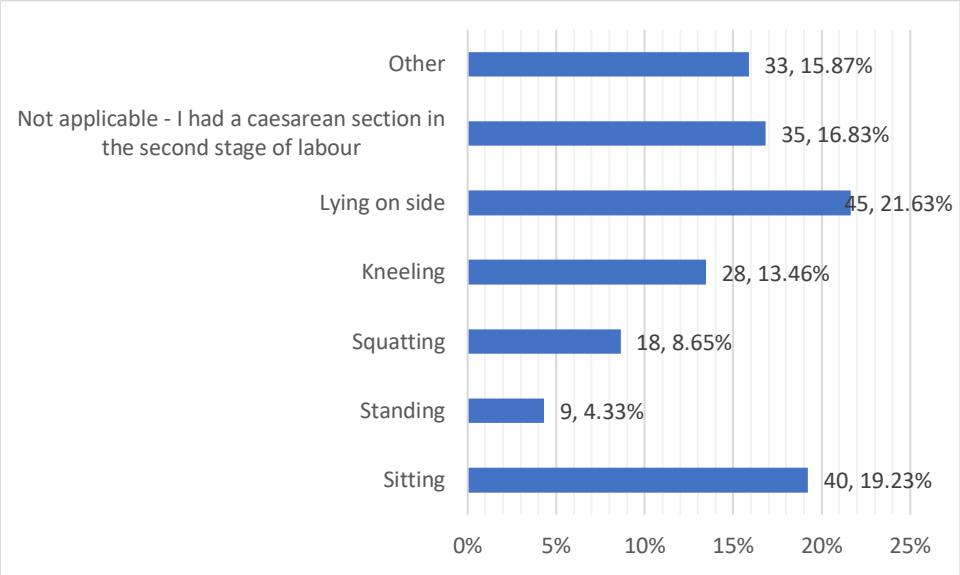
Length of time pushing until birth

Most women were pushing for either less than 1 hour or 1-2 hours until their baby was born.



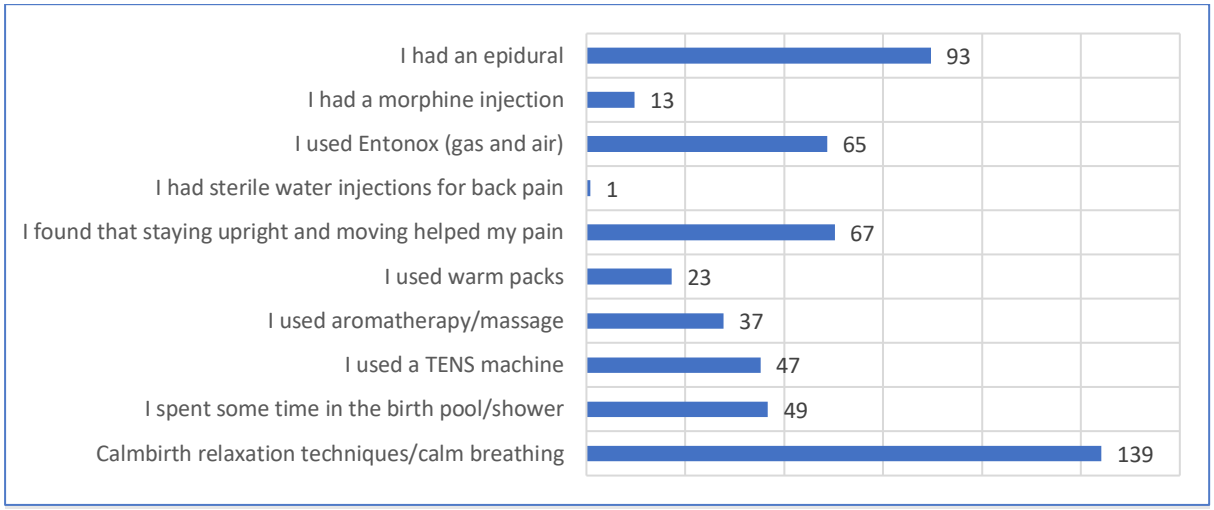
Position(s) adopted during pushing

Most women reported lying on their sides or sitting while pushing. Although they were able to select multiple options, it is unknown what initiated the adoption of these choices in positions during pushing and actually how many positions they adopted. The 'other' category includes 27 women lying on their back, some of whom were encouraged to adopt this position, whilst an epidural was being sited and/or use of stirrups for others. To note, women in the 'other' category were in a semi-reclined position which could also have included women who reported sitting.

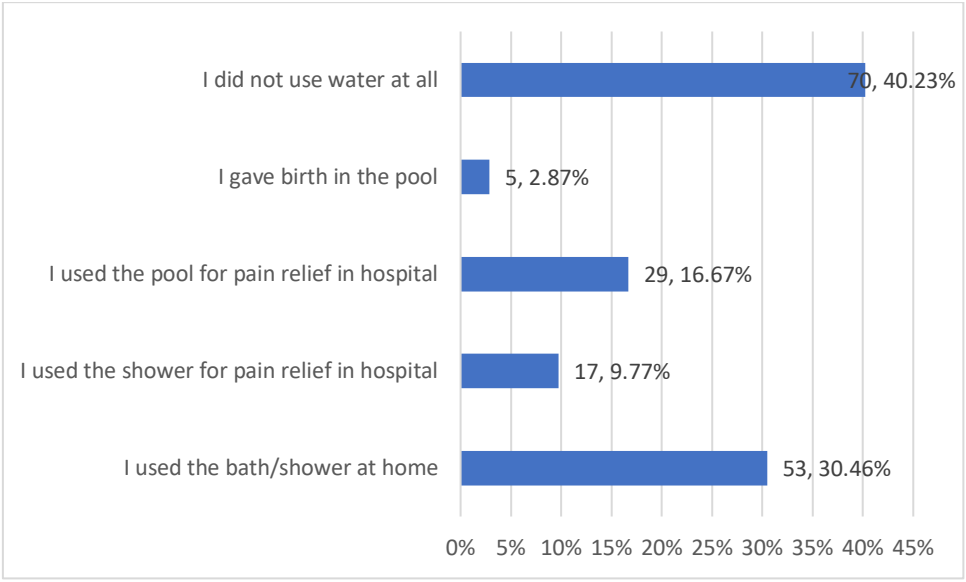


Tools and techniques during labour and birth

A range of tools, techniques and interventions were used to help women feel more comfortable during their labour and birth, however Calmbirth® relaxation/ breathing and epidurals were the most common. Women were able to mark all techniques they used.

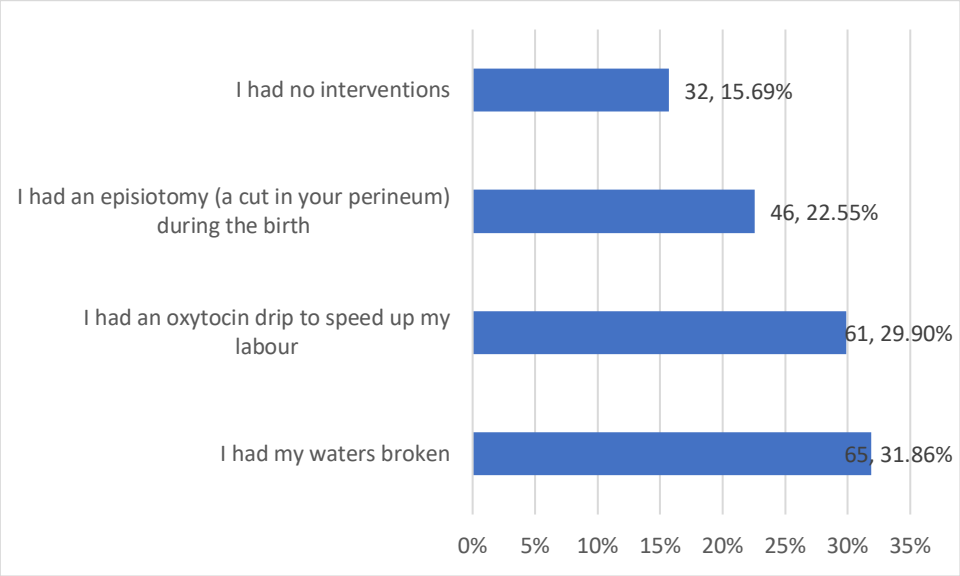


Most women did not use water at all during their labour and birth, however 30.46% reported using a bath or shower at home, and 16.67% reported using the pool at the hospital for pain relief.

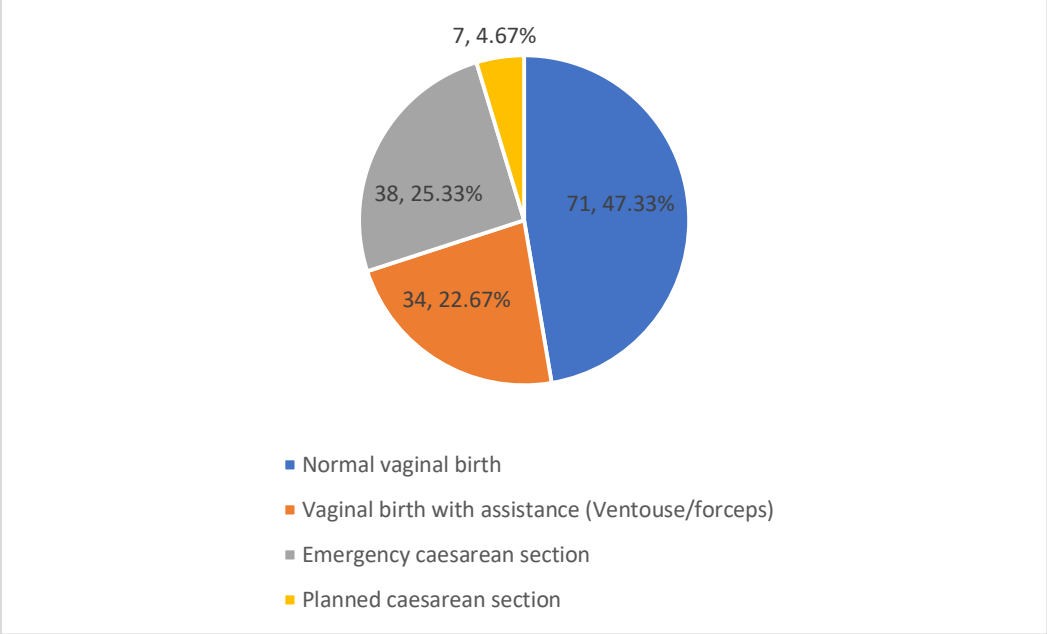


Childbirth Interventions

22% of women had an elective caesarean section and did not labour. Of those remaining 15.69% had no interventions during their labour and their labour occurred through spontaneous onset, however the remaining women reported one or more interventions during their labour.



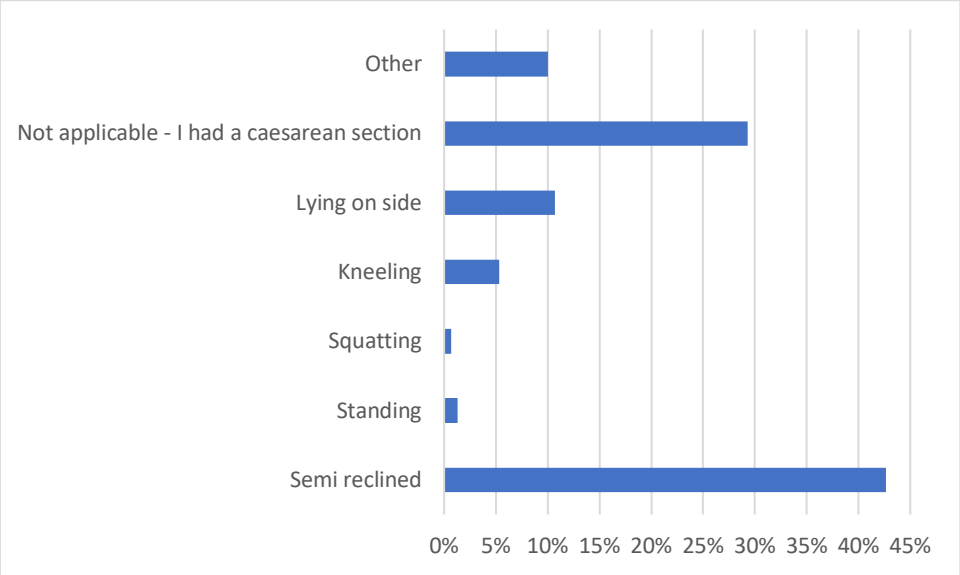
Nearly half of the women (47.33%) reported a normal vaginal birth, whilst others reported instrumental births or caesarean sections.



Birth

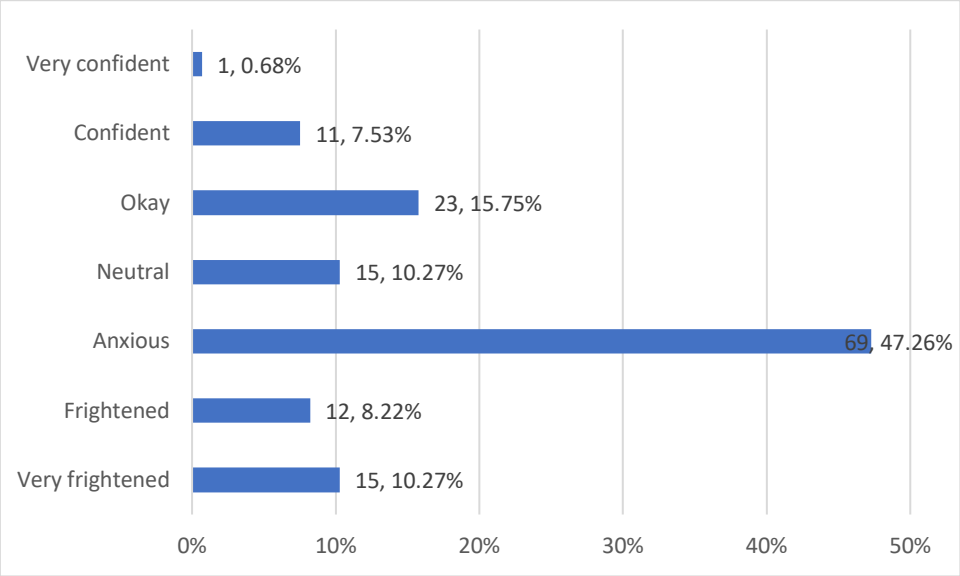
Position during birth

The majority of women were in a semi-reclined position when they birthed, however this high rate may represent the high rate of women who had an epidural and therefore were unable to be moving around and adopt other positions.

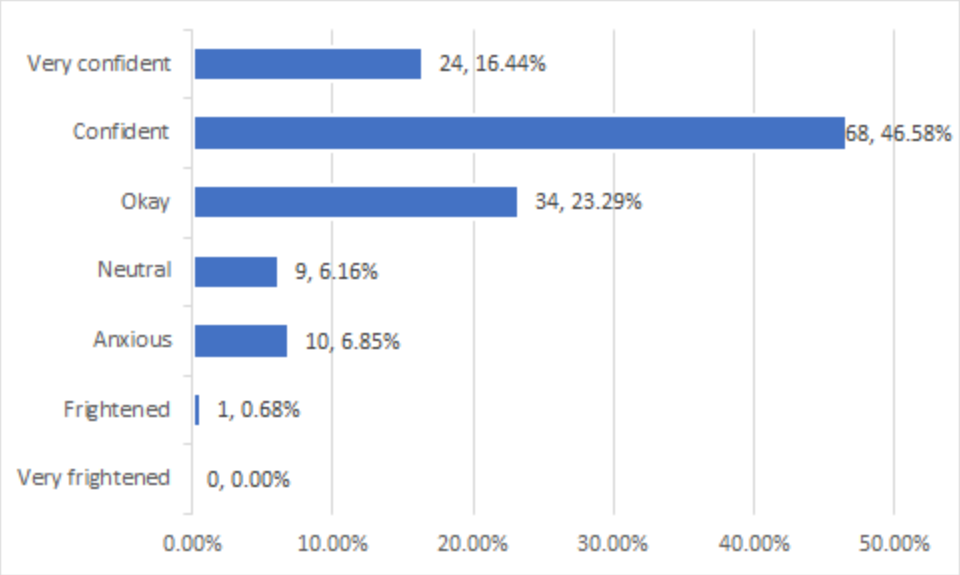


Reflections on Calmbirth® classes

Over 70% of women described themselves as feeling fearful in some way about the birth prior to the course. Nearly 16% reported feeling okay, just over 7% were confident and less than 1% were very confident about the birth prior to the course.



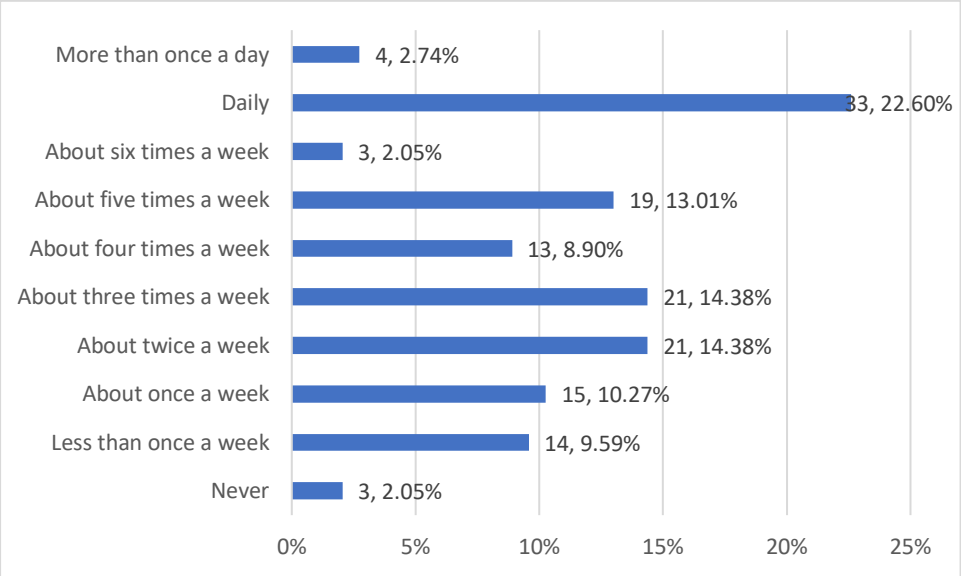
Following the course, the feelings towards birth shifted significantly: 23% of women reported feeling 'okay' whilst 47% of women described themselves as feeling confident and 16% were very confident about the birth.



Frequency of practising the Calmbirth® relaxations

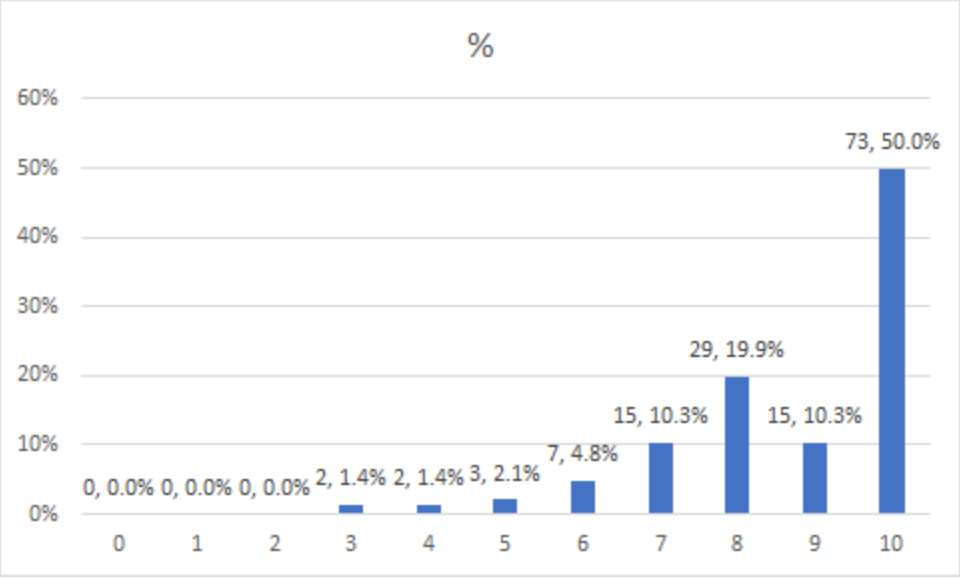
A large proportion of women practiced the tools they learnt in the Calmbirth® classes daily or multiple times a week, with only 9.59% and 2.05% practicing less than once a week and never

respectively. Practicing the tools and techniques is important as it greatly increases the chance that women will be able to draw from them during times of stress and the labour and birth process.

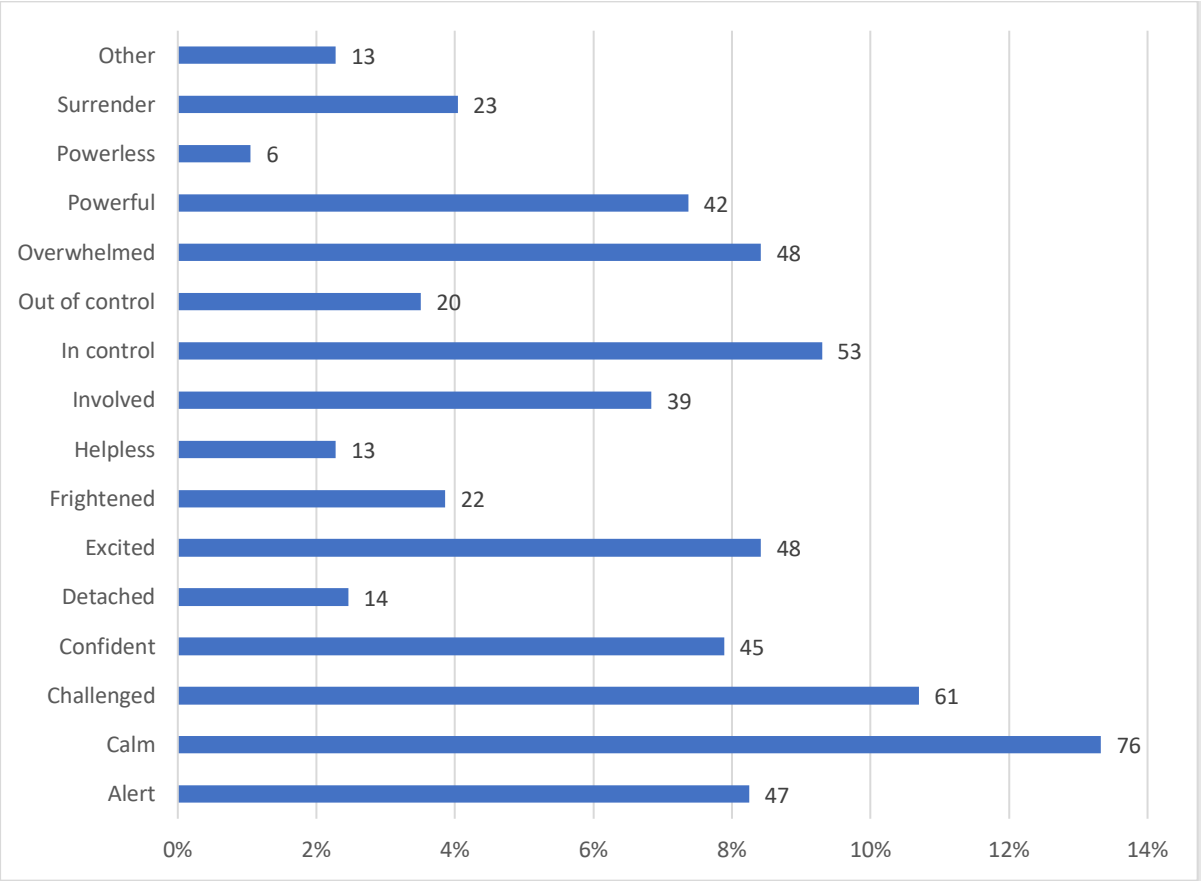


Overall level of satisfaction with the Calmbirth® programme out of 10

There was a high rate of acceptability of the classes, with 50% of women describing the course as 10/10, and only 4.9% of participants rated it 5/10 or below.

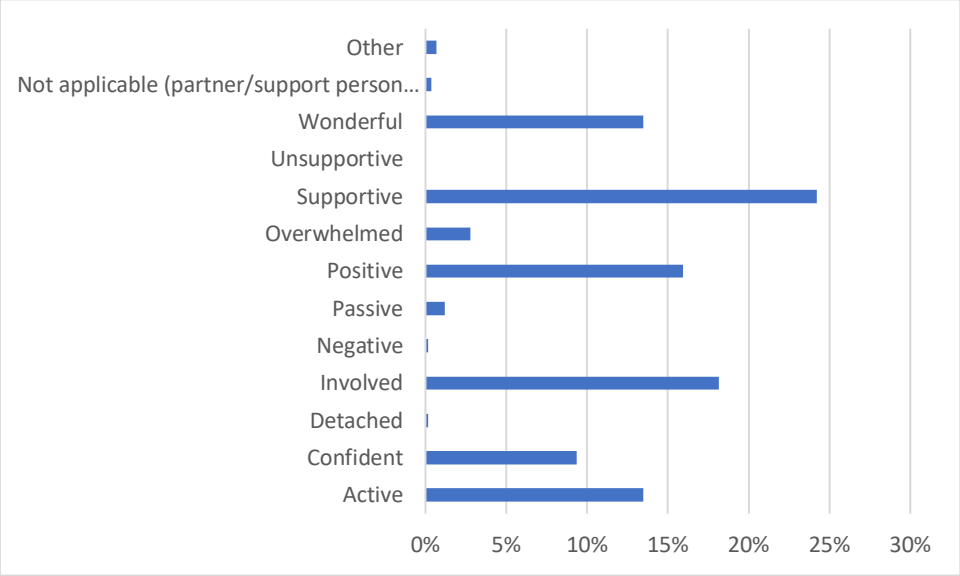


Women's emotional state during labour



Other words included focussed, frustrated, exhausted, nervous, responsible, and accepted, and well-informed.

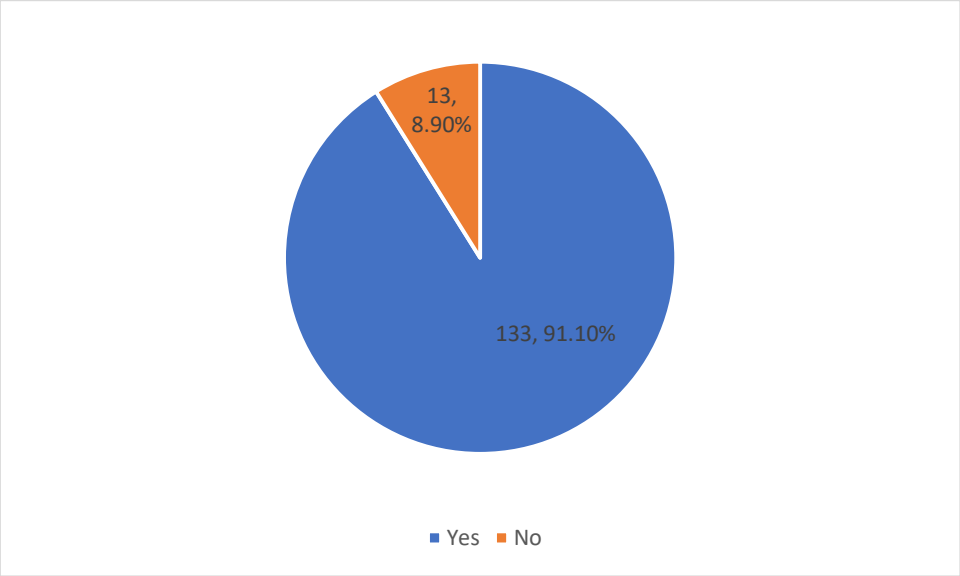
Describing partner/support person during labour



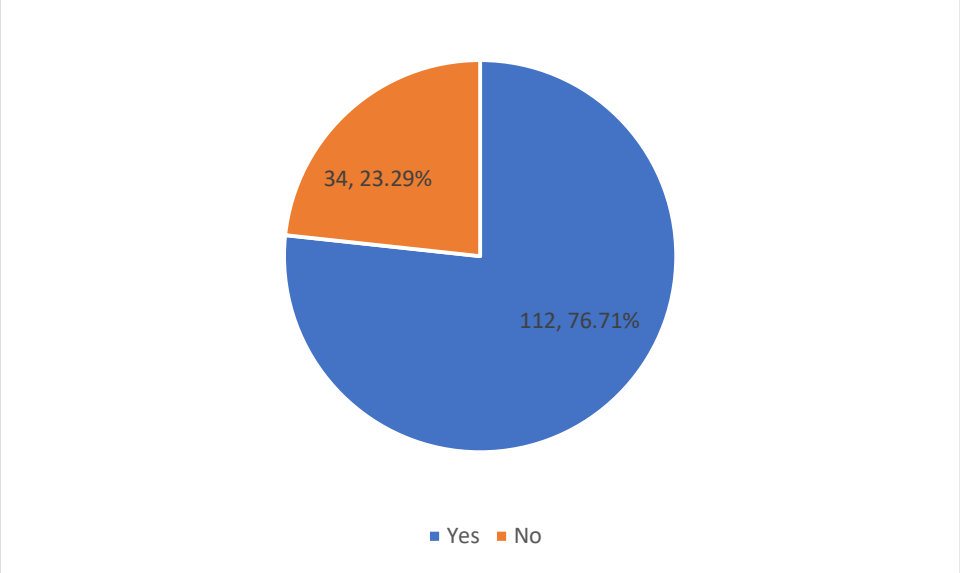
Post-birth

Skin-to-skin time within an hour of the birth

Some post-birth issues were covered within the Calmbirth® programme. For example, the benefits of having skin-to-skin time within an hour of the birth, and the proven benefits of skin to skin and breastfeeding soon after the birth. High rates of both were reported by the women who completed the survey, however, the ability to practice each of these may be related to factors outside of the women's control e.g., encouragement from midwife or hospital clinical staff, hospital culture etc. Moreover, this provision of post-birth care and advice needs to meet the expectation that ADHB maternity care provision meets Baby Friendly Hospital Initiative (BFHI) obligations. Participants in the classes were made aware that ADHB has a BFHI obligation to meet these requirements and that these obligations are to be met in the birthing environment by those providing care.



Breastfeeding within an hour of birth



Thematic analysis of qualitative findings

Data from interviews and open-ended survey questions

13 women were interviewed as part of the evaluation of the Calmbirth® pilot education programme. 5 partners were also interviewed (4 men and 1 woman), creating a total of 18 participants. All interviews were conducted over Zoom due to COVID-19 restrictions. 35 participants expressed interest in being interviewed, however due to time constraints not everyone could be interviewed, and the participants who were not interviewed were directed to the survey evaluation. Participants interviewed were selected purposively for diverse representation to ensure that they were drawn from a range of different course dates, course formats (online and in person), ethnicities, sexualities, and broader contexts.

During the interviews, participants were asked about their age and ethnicity, and whether this was their first child. All interview participants were first time parents and 92.6% of participants who completed the survey were first time parents; therefore, primiparous women's experiences of Calmbirth® were dominant throughout the study. 6 participants identified as New Zealand European, 5 as Chinese, 4 as British, 1 as Other European, and 2 did not specify their ethnicities. No Māori or Pacific Island participants expressed interest in being interviewed.

A list of indicative questions was produced to direct content of interviews (see Appendix 3). Participants were asked about the Calmbirth® class experience, who they attended with, which content and tools they found helpful (and unhelpful), and whether they used these between the course and the birth. They were asked about whether they had prior knowledge of experience with mindfulness and meditation, and whether they had any pre-existing beliefs or opinions that could

have shaped their experience. The partner's experience of the course was also explored, examining the impact on the women and the partner.

The beliefs and expectations about pregnancy and the birth were then explored, with the interviewers asking the participants how they felt about their pregnancy and birth prior to the class, what type of birth they were wanting, and how this changed after the class.

Participants were asked to share their birth story. From these specific questions, we examined the impact that participants felt they experienced during labour and birth as a consequence of attending the classes including any Calmbirth® tools or techniques they used to manage and cope with the childbirth experience. Questioning was also directed to whether they had had any interventions and reflect on how they felt about these interventions.

In addition to the qualitative interviews, the survey (whilst mostly quantitative) included three open-ended questions:

- What was the best thing about your birthing experience?
- What did you like most about Calmbirth®?
- Is there anything else you would like to share?

150 women completed the survey, and a thematic analysis of the qualitative responses to the above three question in the survey data occurred. The findings added further coding to the template used for the interview data. While most of the survey data supported the themes generated by the interviews, additional themes/sub-themes emerged from the survey analysis contributing to the final template, and these have been outlined below.

Key themes emerged from the interview and qualitative survey data that will be discussed in the next section. These related to three distinct areas: 1) the impact Calmbirth® courses had on

participants, 2) comments on the delivery and acceptability of Calmbirth® course, and 3) areas people felt were lacking in the Calmbirth® course in order to be more prepared for childbirth (see table 2).

Themes	Sub-themes
Empowerment	• Positively reframe the birth • Transforms childbirth experience • Challenging the cultural childbirth biomedical narrative • Confidence building
Strategies and tools	• Control and agency • Conscious breathing techniques • Visualisation and mindfulness • Not all material resonated or helpful for everyone
Partner participation	• Having a place/role throughout childbirth • Team working together
Inclusivity and engaging	• Honouring diverse worldviews • Significance of the educator • Experiential learning • Making Connections with others
Accessibility and flexibility	• Cost free • Format delivery • Time concerns • Informative and would recommend
Feeling unprepared	• Unprepared for post-birth • More information on possible interventions • Uncontrollable external factors

Table 2*: Themes and subthemes from template analysis*

Impact Calmbirth® course had on participants

Empowerment

The overarching theme that emerged from the template analysis of interview material and survey responses was one of empowerment, and the women and their partners experienced this in a multitude of ways. As we will explore here, it manifested itself through having increased confidence,

helpful tools, increased engagement from and with partners, and more inclusive and engaging experiences overall.

Positively reframe the birth

Calmbirth® classes helped the course participants positively reframe the birth, shifting their thinking to it being a positive experience that changed their expectations of the birth.

> *Maya: "It made me a lot more confident and excited. I think I remember leaving the class thinking 'I can't wait actually to go into labour and experience all these things and I really wanted to feel the contractions'."*
>
> *Hazel: "[The classes improved] both of our wellbeing going into that last trimester and increasing our knowledge of what was going to happen and how we felt about it as well. Yeah, and that was that was a real turning point for us in terms of taking away that fear. Of the actual birth itself being like this horrendous thing and it turned it into something really special that in our perception at least that it was going to be a really special moment."*
>
> *A survey participant: "It also prompted us to question our preconceived ideas of the birthing experience and reimagine it into a positive one."*

Transforms childbirth experience

The participants felt the course transformed the childbirth experience, from pregnancy and the antenatal period through to the birth and postnatal experience. These narratives revealed many partners had a sense of revelation through realising other potential and more positive perspectives and experiences that could be achieved.

Anna: "there's sort of some lifelong learnings that come out of the class that don't just finish with the birth."

Diana: "My opinion changed; you know it was different. It became more focussed on, I just want us to be safe, both me and the baby. And that I felt I had techniques to deal with whatever came at me."

Carla: "It was quite a cool experience. I was talking to the midwife the next day and I was like "that was nice[laughs]."

A survey participant: "Most women hold fearful narratives and associations about birth, that come from society - my favourite thing about Calmbirth® is how it removes that, replacing it with a feeling of excitement and calm about the birth process, and doing so in ways that make medical interventions a welcome part of some birth experiences."

Challenged the cultural biomedical childbirth narrative

There was also an element to these discussions that Calmbirth® challenged the cultural biomedical childbirth narrative, by making the experience less clinical.

Erin: "Calmbirth® made it so much less serious and less clinical…. I understood it's going to be like the most painful thing ever but you'll get through it and, like you'll forget it so best not to think about it – the Calmbirth® got me through it, made it made it seem more natural and a lot less technical than what was in my head, also showed me I have choices…it opened my eyes to what the body is capable of… Making sure we realise that everything's in our consent… [before the course] I wouldn't have said no to anything."

Confidence building

Participants also reported increased confidence to navigate the childbirth experience.

> *Anna: "I'm a lot more confident in what I had already planned in terms of yes, I can do it… Being a first-time mom, I felt the course really provided me assurance and confidence … I had a very positive experience going through the course and I felt a lot more prepared."*

> *Carla: "*It made me feel quietly confident, knowing everything from the course, and being able to meander through all the information. It started me researching a bit more, but not like a rabbit hole."

> *A survey participant: "Feeling ultimately very informed/empowered and able to participate in decisions/advocate for myself thanks to Calmbirth®."*

In particular, and in contrast to some of the survey findings, Calmbirth® gave women and their partners the confidence to stay at home for longer, rather than rushing to the hospital:

> *Frances: "Calmbirth® techniques helped us to stay at home longer and feel less anxious not being in hospital."*

> *A survey participant: "Calmbirth® took my fear away from giving birth. It allowed me to enjoy my pre-labour time at home (slept, watching a movie, had a bath). It gave me the confidence to not panic when I went into labour."*

Strategies and tools

Calmbirth® classes equipped the women and their partners with strategies and tools to navigate the pregnancy, labour, and birth, and that these tools helped the women and their partners.

Kamila: "I was much more focussed on my labour, and I felt like I had plans and strategies and ways to just keep mindful throughout the whole thing rather than going to these extreme concerns (anxiety and fear of birth). I did find that during the labour and even when we did go to the emergency care, I was just focussed on me and my baby and none of those other stories came to mind. I was just focusing on the strategies... "

A survey participant: "I had epidural but in general my birth is very nice experience; it was calm and happy journey. We applied acupuncture, meditation before birth, and partner support and breathing during."

Although Calmbirth® did not alleviate all anxiety associated with hospitals there was indication in the data that for some women the anxiety was mitigated by attending Calmbirth®:

A survey participant: "I'm not scared of hospitals, but I still felt out of control during the actual active labour, but I think my mental state would have been worse without Calmbirth®."

Control and agency

Couples reported feeling more prepared, having a sense of control and agency over their childbirth experience, and increased self-efficacy.

Kamila: "I felt much more confident, and I think I did feel reasonably calm. When I went into labour, I felt like I knew not necessarily what to expect, but like I had strategies and a plan in place in order to cope with it and I felt much calmer afterwards..."

A survey participant: "Having control of my thoughts, knowing I was capable."

A survey participant: "The confidence it gave me to make calm decisions that enhanced my experience and left me with no regrets."

Conscious breathing techniques

The most frequently cited tool was the use of conscious breathing techniques, with many women highlighting this as something they continued to use after the course, during the labour and birth, and in the postnatal period.

Brie: "What I ended up using… like the breathing was mainly what I used in the actual labour, which I don't think I would have really known how to do or kind of thought about it, if I hadn't done the course."

Hazel: "So during some of the really uncomfortable examinations, whether we're trying to break the waters and having to move the cervix it was really uncomfortable, so we're definitely doing the breathing then yeah that works."

A survey participant: "Although I ended up having to have an emergency C-Section, the calm breathing got me through all of the unforeseen turns that my labour took."

This suggests that breathing techniques were a tool that the women and partners felt were easy to learn and apply, and helped to navigate the whole experience, however, it may signal that further time should be spent becoming confident with them.

Visualisation and mindfulness

While conscious breathing emerged as a useful tool used by many in both the interviews and survey, there were a greater number of responses within the survey of participants using the visualisation tool and on the benefits of mindfulness more generally, with it having a positive impact on the

women's ability to shift their mindset, be in the moment, calm themselves, and picture a positive birth.

> *A survey participant: "I enjoyed learning relaxation techniques and mindfulness. I have used these techniques not just in labour but in other real-life stressful situations."*
>
> *A survey participant: "Ability to smile after each painful contraction while visualising my unborn baby in my arms."*
>
> *A survey participant: "Learning the calm breathing techniques and being able to go to my happy place and relax. Knowing how helpful it is to remain relaxed when birthing to help with a smooth birth."*
>
> *Carla: "Being in the busy lifestyle, we work, come home, do a bit of exercise, you don't think about meditating or taking some time out for yourself. Which is good cause it helped with her sleeping."*
>
> *Frances: "Mindfulness tapes were useful – had them on my mobile phone so I can easily play them and listen."*

However, for some women, it was only after being given an epidural that they felt they could draw on these techniques, though it was still reported to be useful in this time.

> *A survey participant: "In early labour I enjoyed staying home and practicing Calmbirth® techniques (breathing, music, aromatherapy, candles). Then once the contractions were intense, having an epidural- it made the whole experience calmer, relaxing and almost enjoyable. It wasn't until the epidural kicked in that I was actually able to use Calmbirth® techniques during active labour."*

A survey participant: "My epidural wore off when I needed to push, if I hadn't had Calmbirth® and hadn't learned about hitting the wall and the adrenaline etc. I think I would have found it harder."

Not all material resonated or helpful for everyone

However, not all material from the Calmbirth® course resonated with everyone. Some of the interview participants reported feeling discomfort with some of the techniques used, and there were mixed attitudes towards the use of media material.

Brie: "There was one video they played that made me quite anxious to watch, so you could kind of hear the pain, she was in… just that noise kind of frightened me a bit... The book given at end; I did not use. Too long. Was not accessible, lots of writing. A summary would have been better."

A survey participant: "The Calmbirth® course itself-felt a little outdated with old videos and photos used, it needs to be updated, more relevant videos and modernized slideshows."

A small number of participants also reported that some strategies and tools were unhelpful:

Hazel: "*That felt awkward, the massage bit, yeah cause that's not for everyone*."

This could have been linked with Calmbirth® content feeling outside of Hazel's personal worldview and cultural values. Moreover, childbirth can be unpredictable and challenging leading to feelings of negativity about Calmbirth® especially when women and/or partners do not resonate with the Calmbirth® ethos. For example, one woman in the survey disagreed with the content of the Calmbirth® course. She expressed how the content lacked congruence between her attitudes towards childbirth, her birthing experience, and the philosophy of the course:

The philosophy comes across as anti-intervention. I had a difficult birth and the lack of discussion of pain management other than breathing was infuriating. Also, the philosophy of "it's a natural process…just breathe" is overstated. Millions of women have died in childbirth and still do. Pretending that just breathing is going to help you manage the entire birth without educating people on alternatives is negligent.

Partner participation

Increased partner engagement and the benefits this brought to both the women and the partner also emerged as a key theme.

Having a place/role throughout childbirth

Participants reported that the Calmbirth® course equipped the partner with tools to navigate the birthing experience and helped them to feel they have a place or role in the childbirth.

Christopher (partner): "There was more reassurance of what I could do as a partner while she is going through the whole labour process. When you watch movies, the guy just stands there, does nothing, doesn't know what to do, but there's heaps of little things you can do to be supportive and to be there. Learning all the techniques and be there to support her helps. It didn't feel like I was in the way. It prepared us for that whole communication as well. I knew what was happening, so I didn't need to keep asking if she was alright, or how she was feeling. I knew what I should be doing, rather than be annoying…. It showed me my role. How I could be more supportive. I didn't feel useless. I was more involved with the pregnancy. Other guys were playing around with gas. But you can have a big say in what happens. Fend people off."

Jane: "He's just like 'okay, like just calm down, and let's do what we've been practicing' and he was able to bring me back to the moment and start like visualising all the things that we had planned earlier on at the class and afterwards..."

A survey participant: "The confidence and involvement it gave my partner. He was able to have a role and not be afraid going into it. It made me excited for my birth instead of fearful."

A survey participant: "…my husband was such a wonderful support. He was very confident after attending the class and believed in my abilities to give birth. He gave me the space when needed, was here to hold my hand when I asked and protected me from bad vibes and interruptions."

Team working together

The course also promoted increased engagement between the couples, with the partners and women interviewed reflecting an understanding that they were **a** team working together.

Hazel: "We started looking at it like that, that this was a moment (the birth) to behold, rather than to be afraid of, and I think made us a bit more proactive about really discussing what we wanted for the birth and how we wanted it to be and how we wanted it to feel."

Carla: "There were helpful added tools, and it changed our mindframe about the birth. Before, we thought we would rock up and just do It, but she showed there was a bit more to it. Working as a team. More of an emotional connection. We felt more informed."

A survey participant: "The support of my partner. Without him leading all the calm birthing techniques, I would have suffered emotionally and physically."

A survey participant: "The support and the promotion of love, I felt like every couple in the room had a much stronger bond upon leaving."

Acceptability of Calmbirth® course

Inclusivity and engaging

Another key theme that emerged from the interviews contributing towards the empowerment of the couples was a sense of inclusivity and increased engagement from the course, compared to standard antenatal classes.

Honouring diverse worldviews

Participants reported that the course honoured diverse worldviews, feeling enriched by the experience of engaging with different cultures in the course.

A survey participant: "It made me feel more prepared and less guilty about my birth plan, which was 'go with the flow' - I initially thought I would be judged for not having a detailed plan or for being open to any intervention."

A survey participant: "It was great to meet couples from across a range of ethnicities and backgrounds and connect about our shared experiences, hopes and worries."

Significance of the educator

The significance of the educator approach also had a clear impact of the interviewees and survey participants. Many referred to the educator, the facilitation of the course, and the environment created throughout the course contributed to the course being a positive experience.

Maya: "Really loved it really, really loved it. She [the Calmbirth® educator] makes us all connected in the class. I don't think I switched off once during the two days."

Experiential learning

The engaged learning style was also referred to by participants.

> *Leah: "Having that class, you know that classroom opportunity to have an open discussion, and there are a few other people with science backgrounds that could you know, bring forward ideas and everybody coming together to think of ways that they could use movement and visualisation and breathing. I think that that group format really helped as well."*

Making connections with others

There was also an appreciation that the course helped couples to make connections, with participants having a group that could relate to and experience the childbirth process with.

> *A survey participant: "It is empowering. I also like how the class brings the attendees close together as we were able to forge a good support network."*

Accessibility and flexibility

Participants mentioned that they found the accessibility and flexibility of the courses as helpful and something that enhanced their experience.

Free of cost

The free cost of the course was noted by a few participants as something they appreciated, saying they would have been unable to attend the course otherwise, and they hoped it meant more people would have access.

Leah: "I heard about Calmbirth® from a podcast, a couple of women had mentioned it, and so I researched it. I wouldn't have done it if it wasn't free. I like to try and find a cheaper way to do things so I probably would have just read books or listen to podcasts."

Format delivery

Participants also mentioned the benefits they derived from the different delivery formats of the course, having a choice between being able to do the course over the weekend or evenings, or online or in-person.

A survey participant: "It was a weekend focussed purely on labour so a great way to prepare with my partner and dedicate a good chunk of time to being prepared mentally and physically."

In particular, the online Zoom format of the course was noted as beneficial in that it allowed the women to visualise their labour and practice their techniques within their home environment where they felt comfortable, and where they would be managing their labour later on.

Carla: "The benefit of having the class on Zoom was that we were able to practice that stuff at home. You wouldn't have been able to do that. It might have felt weird. If we had done it at the venue, we might not have gone home and figured out where were good spots to do stuff. You were practicing where you would do it anyway."

Time concerns

However, some participants noted that they found the course to be too long with insufficient breaks, with the crossover of material with other antenatal classes noted as being able to be cut out.

Leah: "So for me, I feel like I could have achieved what I got from it in a shorter time frame."

Isabel: "He said, probably one day would have been just right."

Carla: "It would be handy to have some breaks during those two days as it was quite intense (Did 2-day weekend workshop over lockdown, Level 3)."

A survey participant: "Too many relaxation sessions, the course was verrrrry long. Got uncomfortable to be pregnant and spend so much time sitting for the two days. Could be shortened."

Others noted they thought they had undertaken the course too early or too late in their pregnancy.

Anna: "I gave birth nearly two months away. A little bit longer than eight weeks. And I lost a bit of that confidence and traction during this period."

Erin: "I was heavily pregnant – but it was okay."

Informative and would recommend to others

The open-ended text boxes within the survey provided the participants with an opportunity to share broadly about their experiences. Many used this space to highlight that they found the course more informative than other antenatal classes, and that they would recommend the Calmbirth® course to other couples, and ADHB's continued funding of the course.

A survey participant: "I think this course was actually amazing and should be an option for everyone."

A survey participant: "Even if nothing works out as planned; Calmbirth® is still a must to attend for everyone. It really helps and gives you confidence in yourself and your baby."

A survey participant: "I hope this programme becomes available to every pregnant woman for free as it is very valuable."

Areas felt to be lacking in the Calmbirth® course

Feeling unprepared

The final key theme that emerged from the interviews related to areas that participants felt could have been covered further within the course, which contributed to a sense of feeling unprepared.

Unprepared for post-birth

For some participants, there was a sense of feeling unprepared for the post-birth experience, and a feeling that this was not covered sufficiently by the course.

Anna: "Breastfeeding and post-birth care would have been helpful. The surprise element came after the birth, not in terms of the birthing experience when you're giving birth and you know… I was not focussed on the breastfeeding, and I was not prepared for the feeling that your body feels immediately after birth, you know that pressure on your pelvic floor."

More information on possible interventions

Some women also reported wanting more information on possible interventions, and a greater understanding of who may be involved.

Carla: "In the other antenatal class they showed you how the c section worked and how the room was laid out and that was quite impressive. Calmbirth® could add that. If that did happen, and there were 30 people in the room, you would want to know who was doing what and why."

Uncontrollable external factors

Other participants reported that during their labour and birth experience, there were times when they felt they did not have any control on external factors, feeling frightened and unable to draw on the techniques used in the class. Participants that they would like to see more of these situations explored in the Calmbirth® courses. For example, when labour and birth become complex, or when those caring for women in labour are not attuned to the ethos of Calmbirth®:

> *A survey participant: "I found it really difficult to use Calmbirth® techniques and feel in control once my labour progressed beyond 20hrs and I started to deviate away from my birthplan."*

> *A survey participant: "The hospital staff should take the course, so they understand the environment you are aiming for. It was all downhill once I got to hospital, a midwife was yelling at me like gym instructor. It was the opposite of what you are taught in antenatal, and childbirth and it ended up being a traumatic experience not a positive one."*

Discussion

The service evaluation for the 2020/21 Calmbirth® pilot programme classes at ADHB has highlighted how the classes have been, for the most part, welcomed by the participants who took the classes.

The overarching impression is that Calmbirth® made a difference for the majority of participants across different areas – emotional and psychological, alongside some tentative significant changes in labour interventions and birthing outcomes. For women and their partners, the evaluation has shown that many of their desired intended outcomes have been achieved – improved satisfaction with the childbirth process, empowerment and a greater sense of control, less anxiety and fear related to childbirth, and increased partner engagement. Moreover, the evaluation has clearly shown that the majority of women felt the Calmbirth® classes had in some way impacted positively on their childbirth experience; particularly in the building of confidence which may have repercussions on childbirth experiences.

Although the impact on the labour process and intervention remains to be established, participants reported feeling more confident to navigate the childbirth process across a variety of personal circumstances. For example, some women and partners stayed at home longer before travelling to the hospital in early labour and reported having a stronger voice in the childbirth process to advocate for their needs. Self-advocacy was particularly highlighted for women and partners when unexpected childbirth interventions occurred and when birth plans needed to adjust due to complications and/or need for regional analgesia.

Tentative comparisons

Tentative comparisons with the National Women's Annual 2020 report (National Women's Health, 2020a) are presented with the cautionary advice to scrutinise these knowing that the evaluation data are self-reported outcomes and not verified with ADHB records of these outcomes. The questions posed to the participants in the surveys and interviewers may not accurately reflect the true outcome percentages and neither do they claim to be generalisable to the population of birthing women using ADHB services in the same timeframe. Moreover, women attending the Calmbirth® classes were self-selected and predominately NZ European. Those agreeing to participate in the evaluation were also self-selected and a voluntary sample, and therefore it is possible this group may also prefer a normal vaginal birth that may not be consistent with the ADHB general birthing population. NZ European and other European women were also overrepresented in the evaluation, and therefore it is also difficult to generalise findings. The cohort of women who undertook the Calmbirth® pilot classes, and those who took part in the evaluation, were mainly primigravid. Furthermore, future studies must be tailored and focussed from the outset to examine acceptability and impact for Māori, as no Māori women or partners volunteered to be interviewed, we were limited to examining survey results for Māori to understand the impact.

Equally this evaluation of the service had no control group or stratification for risk, parity, and ethnicity. This would need to be done in follow up research adopting a quantitative research design including inferential statistics to compare the differences in multiple outcomes between those who attend Calmbirth® classes, those that attend standard antenatal classes and those not attending any classes. Such inferential statistical measures from each of the intervention groups and non-intervention group, using repeated measures, would allow for robust comparisons in order to make

generalisations about the larger population of birthing women at ADHB and help ensure more accurate quantifiable comparisons.

These issues and recommendations need to be considered when reading the following comparative table because there is risk in comparing one outcome to another, when they may not accurately be comparable due to the methods of data collection across the two sources and subsequent analysis differing. Therefore, the intention here is not to show one outcome as more desirable over another, nor to imply correlation or causation, or show definite proof of similarities and differences. The intended aim is simply to show areas for further investigation where there is suggestion of impact. Table 3 presents a comparison of the ADHB nulliparous population outcomes in percentages (National Women's Health, 2020a), with the Calmbirth® participant outcomes: to note Calmbirth® participants in the pilot were 92.6% primigravid.

Table 3: Tentative comparisons of birthing outcomes between evaluation participants and ADHB nulliparous outcomes

Outcome	National Women's Annual 2020 report	Calmbirth® evaluation
Induction of Labour	46.6%	32.67%
Augmentation of Labour	37.4%	29.9%
Spontaneous Vaginal Birth	41.5%	47.33%
Instrumental Birth	19.5%	22.67%
All LSCS	37.9%	30%
Elective LSCS	10.8%	4.67%
Episiotomy	48.5%	22.55%
Entonox	67.2%	43.33%
TENS	7.7%	31.33%
Water use	4.6%	33%

It is feasible, although this will need further examination over time and with a larger longitudinal cohort in a comparative study, that the positive Calmbirth® outcomes reported in this evaluation would influence:

- Increased satisfaction with birth long-term and ongoing wellbeing
- Increased satisfaction with the ADHB childbirth experience
- Less PPH (postpartum haemorrhage)
- Increase in long term breastfeeding
- Improved relationships and family integrity

- Improve bonding and parenting long term
- An impact on ADHB resources (staff and/or facilities) due to reduction in interventions and complex ongoing hospital care

Influence of ADHB culture

In the 2017 National Women's Annual report there was commentary next to the data about the rates of caesarean sections and vaginal births after caesarean sections stating that "the differences between women under different care models are unlikely to explain the differentials in intervention rates, and these differences are probably due to the variances in choices made by women and their LMCs" (National Women's Health, 2018, p. 99). This suggests that the rates of interventions are variable by modifiable factors and therefore potentially preventable events, and that overtreatments, complications, unnecessary services, and inappropriate care may also be occurring. These are all contributory factors that are modifiable, and if modified can lead to a better or different outcomes. It is evident that finding ways to reduce childbirth interventions at ADHB is a priority for the midwifery leadership who initiated this pilot and requested an independent review.

This evaluation of the Calmbirth® programme highlights one strategy that could modify childbirth interventions and outcomes and lead to a change in labour and birthing outcomes at ADHB, and perhaps a change of culture. The women who participated in the survey reported slightly better labour and birthing outcomes across many measures, and slightly lower intervention rates, when making tentative comparisons. However, it would be remiss to suggest that Calmbirth® in and of itself could significantly influence and impact a birthing culture and outcomes.

Many women within the survey and interviews mentioned that they struggled to draw from the techniques and tools that they learned in the classes on arriving at hospital, struggling to

communicate their needs to the hospital midwifery staff, or feeling unheard, or that things moved to being out of their control. This suggests that for some women, the learnings, and tools they gained through the course must also be understood by ADHB staff who support them through the childbirth process, or that there may be a clash of cultures between that of the Calmbirth® programme and that within ADHB more broadly. This correlates with published work focusing on attitudes, beliefs, and practices of maternity care providers and their influence on labour and birth care (Afshar et al., 2019; Maffi & Gouilhers, 2019) . Moreover, the powerful influence of maternity units and their culture and philosophy on childbirth has also been identified (Crowther et al., 2021; Dahlen et al., 2020).

Women within the study were reporting on their personal experiences of taking their learnings from the Calmbirth® programme into ADHB to navigate the labour and birth, and there seemed to be three divergent themes that explained these experiences. For some women, their labour and birth experience were improved. They reported good birthing outcomes, and they felt empowered, mindful, and in control during the childbirth process. For others, their main takeaway from the programme was increased flexibility of their birth plan and a desire to go with the flow. While many went into the programme wanting a natural birth, there seemed to be an increased confidence and trust in the process, alongside increased acceptance that interventions may be needed and that this was acceptable. There were also women who saw the programme's focus on relaxation to improve the labour and birth experience as anti-intervention and focussed too narrowly on trying to achieve a natural birth. Each of these themes show the diversity in values, pre-existing beliefs, and learnings among the course participants, and the impact that each of these has on women's ability to navigate the childbirth experience.

Influence of societal birth culture

The diversity of themes identified provide insights to broader societal cultural influences. Societal views, attitudes, risk perception, and fear culture surrounding and informing contemporary childbirth has been highlighted previously (Coxon, 2018; Einion, 2017; Haines, 2020)– furthermore, previous research has shown that women's choices are influenced by social context (McAra-Couper, 2010). It is evident that addressing the context both within ADHB and the wider community is necessary to effect the sustainable transformative changes sought. Although influencing the wider societal cultural discourses around childbirth is not the remit of this evaluation, these considerations do provide context to the broader concerns when addressing high childbirth intervention rates.

In conclusion, the evaluation establishes the significance of providing antenatal education that proactively re-imagines the possibilities of improving childbirth – Calmbirth® is one strategy that appears to be working effectively towards this.

The evaluation process: successes and challenges

Overall, the evaluation of the pilot antenatal programme ran smoothly, and the AUT research team was able to collate evidence across all the requested labour and birth outcomes, and data on class acceptability. The survey provided the project with the evidence needed to explore the labour and birth outcomes, and the interviews gained an understanding more broadly of couples' experiences navigating the programme and childbirth, gathering rich data on the impact that taking the course had on them. There was good engagement and communication between the AUT and ADHB teams, who were able to work together to raise awareness of the evaluation among course participants, disseminate information about the study, to disseminate the survey, and recruit interview participants, as evidenced in the high uptake of the evaluation.

However, the project took significantly longer than initially anticipated, facing delays due to complex approval processes for ethical clearance from both AUTEC and the ADHB Research Governance Group. ADHB's Auckland Research Governance Group for Women's Health and Neonatal recommended a specific focus of the evaluation on Māori and cultural acceptability, however the ability for the AUT research to examine these factors was limited by the low uptake by Māori of the Calmbirth® programme, and no Māori women or partners volunteered to be interviewed. We were limited therefore to survey findings where no significant data emerged. Future research is therefore needed to examine the impact of Calmbirth® classes for Māori and cultural relatability. The delays resulted in an extra phase of the study being dropped, which would have provided the ability to make more in-depth evidenced-based comparisons on the labour and birthing outcomes of the course participants who participated in the evaluation against women who birthed at ADHB more broadly, as well as comparisons with other DHBs. The delays were further exacerbated by COVID-19 lockdowns and a desire to not put undue pressure on couples navigating the childbirth process, and initially low uptake of the classes. These factors resulted in the AUT-ADHB contract needing to be extended by 3 months to the end of September 2021, to ensure there was significant time for data collection. An initial oversight in the contract and data collection planning also became evident, in that the pilot programme continued until the end of June 2021, and these couples would have given birth in September-October when data analysis and report dissemination is already occurring. These couples were not able to take part in the evaluation, and a potentially significant group were not included in the study.

Recommendations:

Priority

- Calmbirth® classes should be continued at ADHB and be free to local communities using ADHB maternity services to ensure accessibility to all. The evaluation has illustrated that on the whole they are well received and have positive effects on satisfaction and emotional wellbeing. In addition, a longer delivery of this service is required to produce data that would support or refute the outcomes suggested in this evaluation. The length of the pilot of the services was insufficient to provide the evidence base required, however, it has provided sufficient data to highlight more work in this area is required and that the service is welcomed by local women.
- Explicit focus and mahi on improving accessibility and acceptability of the classes to Māori and Pasifika women/wāhine/whānau. This would involve robust consultation processes.

For consideration

- Calmbirth® is one proven strategy that can reduce the high intervention rate at ADHB, and improve the childbirth experience for couples, however it cannot be done in a vacuum. Calmbirth® is one stratagem that can used to support the necessary changes in culture, but this must be supported with a number of other interrelated initiatives, for example:
    - Education for all midwives in the content of Calmbirth® to help address the fear in the midwifery workforce and help align them with Calmbirth® ethos. Those who have been through the programme should feel understood and supported to practice the tools and techniques and are not faced with barriers to implementing them on arrival at the hospital. Education on Calmbirth® content, techniques and

strategies is also needed among broader medical and hospital staff, and obstetricians.

- Clinical pathways for childbirth care need to be re-examined to address risk culture so that Calmbirth® teachings and focus can be applied and fully realised in the birthing rooms.
- Re-examination of the birth environment for all risk women that aligns with current evidence
- An assessment of the role of private obstetricians at ADHB and how this potentially impacts on birth culture and practices aligned with Calmbirth®

Future research

A full evaluation is needed to measure the impact and acceptability of the Calmbirth® classes as compared to standard antenatal classes, with further comparisons made to the labour and birthing outcomes for those who do not undertake antenatal programmes, stratified against culture, parity, and risk. Particular attention to the apparent differences in surgical births. This evaluation identified some initial marked differences; however, these need to be unpacked meticulously using rigorous processes and standard statistical analysis. The high rate of caesarean sections at ADHB suggest an audit of birthing outcomes is urgently required.

Culturally aligned research on how Calmbirth® participation by Māori and Pasifika is required including purposive examination on cultural and ethnic responses to antenatal class components. Further work is required to examine the drivers of low uptake of the Calmbirth® programme and antenatal programmes more broadly among Māori, to ensure classes are culturally aligned and accessible.

Research is needed to examine barriers and facilitators to implementing the teachings and ethos of Calmbirth® within the midwifery, medical practices, and birth culture at ADHB.

Research which explores the impact of antenatal programmes comprising meditation and mindfulness and empirical work on how to influence changes of opinions and beliefs about childbirth is needed to influence a change in societal birthing culture.

In future, evaluations of pilot programmes must allow sufficient time for all participants to pass through and complete the programme before analysis begins. All participants should be offered the opportunity to take part in the evaluation to ensure high uptake and measure the impact across a range of courses. Time is also needed for the results, learning and evidence on the programme to be analysed after the conclusion of the pilot programme to ensure these can be fed into decisions on its continued funding properly.

Overall, there is currently a significant gap in this type of research which explores the impact of antenatal programmes comprising meditation and mindfulness. This evaluation has supported some emergent evidence on the influence of these components on feelings, stress related morbidity, fear reduction and sense making about birth however there remains little reporting on changes of opinions and beliefs about childbirth overall; this area requires focussed ongoing series of studies. In addition, purposive examination on cultural and ethnic responses to antenatal class components requires further examination as does the acceptability to single parents and LGBTQIA+ communities.

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Appendix 1: Ethics Approval from AUT and ADHB

Auckland University of Technology Ethics Committee (AUTEC)

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1 December 2020

Susan Crowther
Faculty of Health and Environmental Sciences

Dear Susan

Ethics Application: **20/323 Evaluation of Calmbirth antenatal classes at Auckland District Health Board**

Thank you for submitting your application for ethical review. We are pleased to advise that the Auckland University of Technology Ethics Committee (AUTEC) approved your ethics application at their meeting on 23 November 2020, subject to the following conditions:

1. Provision of the survey in the format that participants will see, with the Information Sheet on Page 1. This should contain the following advice:
    a. An overview of the research and what it is you wish participants to do;
    b. An introduction to the research team and their institutional affiliations;
    c. The AUT logo;
    d. The section on concerns and the AUTEC approval details, wording for which can be found in the Information Sheet template on the Research Ethics website at http://aut.ac.nz/researchethics;
    e. Advice that consent is implicit in the completion of the survey. A Consent Form is not required;
    f. Inclusion of a statement noting that participants can withdraw from the survey at any point until their responses have been submitted but that once this has occurred their data cannot be identified or withdrawn;
    g. Disclosure of funding where appropriate;
2. Confirmation that only publicly available aggregate data will be used as there is some inconsistency in the application;
3. Revision of the escalation plan in the Researcher Safety Protocol;
4. Clarification of the length of interviews as there is some inconsistency in the application and public documents;
5. Clarification of the number of interviews. The memo states 10-20 while the Researcher Safety Protocol states 20-40;
6. Exclude from participation patients of the research team. Update the Information Sheet for interviewees as appropriate;
7. Clarification of how survey participants will receive feedback on the results of the research;
8. Amendment of the Information Sheet for interviewees as follows:

a. Update the instruction to participants to ask questions of the educator - questions about the research should be directed to the research team;

b. Update the name of the Executive Secretary to Dr Carina Meares;

c. Include advice about the funder of the research;

d. Update the 'how was I identified' section to accurately reflect this process;

e. In the 'what will happen to the information I provide' section include advice that 'ADHB will use the results to…'.

Please provide us with a response to the points raised in these conditions, indicating either how you have satisfied these points or proposing an alternative approach. AUTEC also requires copies of any altered documents, such as Information Sheets, surveys etc. You are not required to resubmit the application form again. Any changes to responses in the form required by the committee in their conditions may be included in a supporting memorandum.

Please note that the Committee is always willing to discuss with applicants the points that have been made. There may be information that has not been made available to the Committee, or aspects of the research may not have been fully understood.

Once your response is received and confirmed as satisfying the Committee's points, you will be notified of the full approval of your ethics application. Full approval is not effective until all the conditions have been met. Data collection may not commence until full approval has been confirmed. If these conditions are not met within six months, your application may be closed and a new application will be required if you wish to continue with this research.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

We look forward to hearing from you,

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: jmcaraco@aut.ac.nz; heather@maternitymatters.co.nz; Claire Hotchin; Brooke Hollingshead

Auckland DHB
Research Office
Level 14, Support Building
Auckland City Hospital
PB 92024, Grafton, Auckland
Phone: +64 9 307 4949 Extn. 23854
Email: mwoodnorth@adhb.govt.nz
http://www.adhb.health.nz/health-professionals/research/

Institutional Approval

18th March 2021

Christine Mellor
Associate Director of Midwifery
National Women's Hospital

Dear Christine,

Re: A+9129 (Ethics: AUTEC 20/323) Evaluation of Calmbirth antenatal classes and Auckland District Health Board.

The Auckland Research Governance Group: Women's Health and Neonatal (RGGWNH) would like to thank you for the opportunity to review your study and has given approval for Phase 1 and 2 of the above listed project. This is with the proviso that the evaluation includes:

- an assessment of Māori women's involvement in the classes
- an assessment of how culturally appropriate the classes were for Māori women

There is also a strong recommendation that a Focus Group for Māori women is done; preferably using Kaupapa Māori methodology.

Your Institutional approval is dependent on the Research Office having up-to-date information and documentation relating to your research and being kept informed of any changes to your study. It is your responsibility to ensure you have kept Ethics and the Research Office up to date and have the appropriate approvals.

ADHB approval may be withdrawn for your study if you do not keep the Research Office informed of the following:

- Any communication from Ethics Committees, including confirmation of annual ethics renewal
- Study completion, suspension or cancellation

More detailed information is included on the following page. If you have any questions please do not hesitate to contact the Research Office.

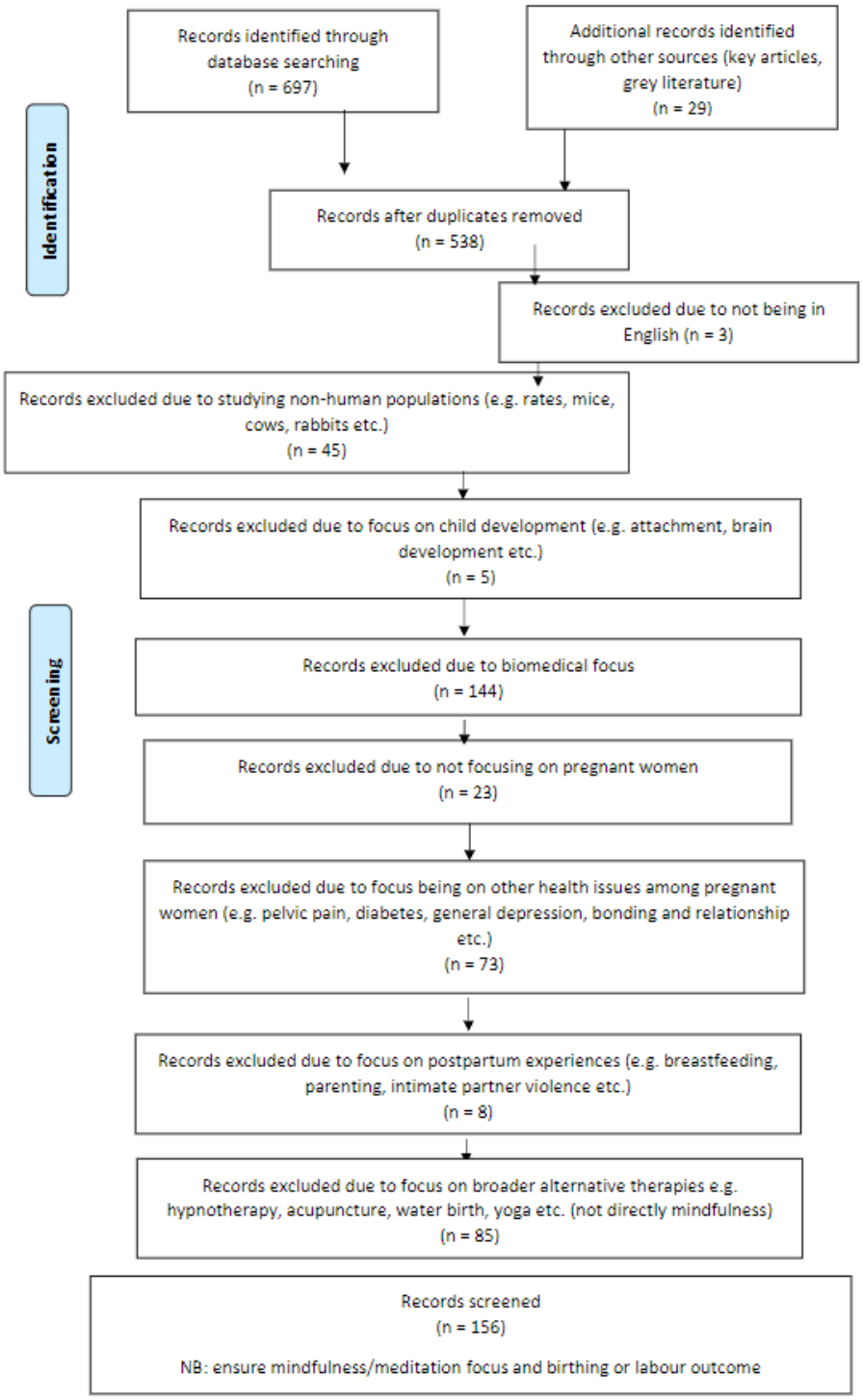
Yours sincerely,

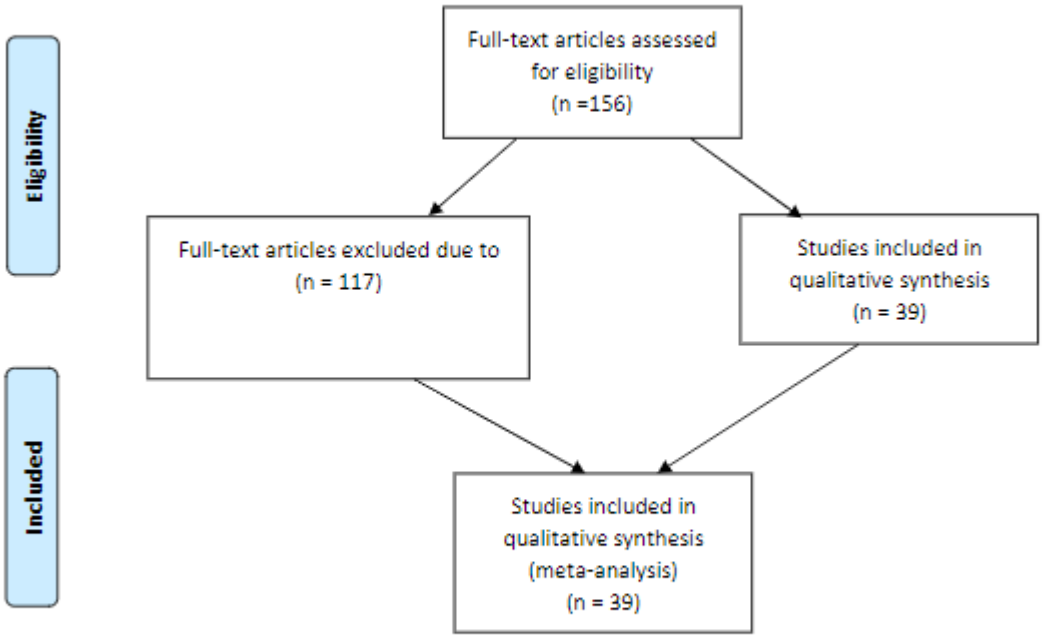
On behalf of the ADHB Research Review Committee Dr Mary-Anne Woodnorth
Manager, Research Office, ADHB.

c.c.

..../continued next page

Appendix 2: PRISMA Chart for Scoping Review




Eligibility
Included
Full-text articles assessed for eligibility (n =156)
Full-text articles excluded due to (n = 117)
Studies included in qualitative synthesis (n = 39)
Studies included in qualitative synthesis (meta-analysis) (n = 39)

Appendix 3: Interview Questions

CALMBIRTH® EVALUATION INDICATIVE QUESTIONS AND INTERVIEW SET UP PROTOCOLS

SET UP

Interviews to be conducted either in person or virtual by zoom link or telephone. This will be determined by participant preferences and COVID-19 lockdown status at the time of data collection, although there is a preference that interviews be conducted online.If you are meeting in person, the investigator safety protocol must be in place.

Prior to the start of the interview and recording, you must ensure:

- The participant has read the PIS that has been emailed to them by Brooke.
- Check whether they have any questions and concerns related to the content and ensure they are answered
- Prior to commencing the interview, the consent form must be signed.
    - If meeting in person, two copies must be signed (one copy kept by participant and one by the interviewer).
    - If the interview is being conducted online, the consent form must be sent to Brooke Hollingshead, Research Assistant, prior to the interview. Ensure they have done this.
- Check if the participant also filled in the survey. It would be great if the participant did this in addition to the interview. Send them the link again if necessary.
- For the purposes of the research, if we report any quotes as coming from this interview, do you (and partner) have a preferred pseudonym or name that you would like to go by?

Interview to last no more than 90 minutes, but ideally about 45 minutes. If the partner or support person is present, questions should be asked to both women and partner. If only one is replying and answering the questions, directly ask the partner or the woman the question.

Ensure participants are comfortable for the interview and recording to start. Tell them that they can ask for the recording to be paused or stopped at any time.

Ensure you press the function in Zoom to record and automatically transcribe.

INDICATIVE QUESTIONS AND PROBES

WARM UP TO OPEN THE INTERVIEW

Demographics

- How old are you? What's your ethnicity?
- Is this your first baby?
- Can I ask what type of birth did you have with this baby? Where did you birth? Who looked after you? What's your baby's name?

The classes

- When did you attend the Calmbirth® course?
- To the woman: Who attended the class with you? Did your partner or a family member attend?
- Tell me about your experience of attending the Calmbirth® antenatal classes?
    - What was helpful during the course?
    - What was not helpful?
- How did you find the content of the Calmbirth® classes and what was discussed, for example some of the tools given to you?
    - How much knowledge did you have of Calmbirth® before the course? Had you practiced mindfulness or meditation before?
    - **Did you have any pre-existing opinions or beliefs about what the classes would be like?**
- (If the partner attended) What impact did having your partner involved have on you?
- (To the partner) What impact did attending the course have on you and your involvement in the birthing experience?
- Did you find the classes to meet any needs you may have culturally? Were they relevant and did they respect the beliefs that you have grown up with?
    - NB: Question especially important to explore with Māori participants.
- Did you continue with the exercises you learnt whilst waiting for the birth of your baby(s)? What did you do?
- **Do the classes prepare you for the birth of your baby(s)? How so?**

Beliefs/expectations

- How did you feel about pregnancy and the birth prior to the classes? **What were your attitudes/beliefs about birth before the classes?**
- What type of birth did you want?
- Did this change after the classes?
- Did your expectations for the birth change in any way as a consequence of doing the classes? How did you negotiate this?

Impact

- Talking specifically about the birthing experience, what influence did the Calmbirth® classes on your birth?
- Did you have any interventions, and how do you feel about that? (e.g., induction, episiotomy, analgesia, epidural etc.)
- Did you get the type of birth that you wanted, or if not, how did you manage this?
- Did you labour for long, and how did you manage this?

- What positions were you in during labour, and how did this help?

FINAL:

- I am now going to turn off the recording and end the interview – before I do is there anything else you would like to share from your experiences doing Calmbirth® classes or/and about your birth? (To women and partner)

Close

Thank the participant for their time.

Stop the recording.

Put a copy of the recording onto Teams, or if the recording has been shared to the cloud, forward this to Brooke to give her access.

Check the transcription file for errors and accuracy, and send this to Brooke.

Thank participant for their time.

Appendix 4: Qualtrics Survey Questions

Calmbirth® Programme Evaluation by AUT

Start of Block: Participant Information Sheet

Q2 *We are Professor Susan Crowther, Professor Judith McAra-Couper, Brooke Hollingshead, Heather Donald, and Claire Hotchin, based at AUT. We would like to invite women who have undertaken the Calmbirth® programme via Auckland District Health Board to take part in a survey which will explore their experiences of doing Calmbirth® in relation to their labour and birth.*

What is the purpose of this research? *This research aims to explore the effects of attending a Calmbirth® programme on women's experience of labour and birth. The research is funded by ADHB, who have commissioned AUT to undertake this independent evaluation of the Calmbirth® programme.*

How was I identified and why am I being invited to participate in this research? *All participants are being approached and invited to participate following attendance on a Calmbirth® programme via Auckland District Health Board.*

How do I agree to participate in this research? *Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the survey at any time until your responses have been submitted by simply closing the survey, however after responses have been submitted data cannot be identified or*

withdrawn. Participants must provide consent to participate. Participants must tick the yes option below to give consent and be taken to the survey.

What will happen in this research? *If you decide to take part in this study, this will involve you completing an online evaluation survey. You will be asked questions about your age and ethnicity, whether this is your first baby, your experiences of Calmbirth®, and the impact you thought it had in relation to your labour and birth. You will also be invited through the survey to express interest to take part in an interview with the researcher which will explore these experiences in more depth. This invitation will be separate from your survey results and will not be linked. A few participants from each course delivered will be randomly selected to take part in an interview.*

What are the discomforts and risks? *We do not anticipate any risks to you from this survey.*

How will these discomforts and risks be alleviated? *AUT Health Counselling and Wellbeing can offer three free sessions of confidential counselling support for adult participants in an AUT research project. These sessions are only available for issues that have arisen directly as a result of participation in the research and are not for other general counselling needs. To access these services, you will need to: Drop into our centres at WB219 or AS104 or phone 921 9992 City Campus or 921 9998 North Shore campus to make an appointment. Appointments for South Campus can be made by calling 921 9992 Let the receptionist know that you are a research participant and provide the title of the research and the researcher's name and contact details as given in this Information Sheet You can find out more information about AUT counsellors and counselling on http://www.aut.ac.nz/being-a-student/current-postgraduates/your-health-and-wellbeing/counselling.*

What are the benefits?

The results of this study will aid understanding about the effects of the Calmbirth® programme on women's experiences of labour and birth, and for their labour and birth itself.

What will happen to the information I provide? *The results of this study and evaluation could result in publications and/or presentations. ADHB will use the results to inform decisions on the ongoing offering of the Calmbirth® programme and how it is structured and funded.* ***How will my privacy be protected?*** *You will not be asked your name or any identifying information within the survey, and therefore your participation will be anonymous. Only the AUT research team will have access to the survey results. If you do choose to take part in an interview, you will be taken to a separate survey to provide your contact details which will be separate to your survey results.*

What are the costs of participating in this research? *The only cost is your time. The survey is expected to take about 20 minutes.*

What opportunity do I have to consider this invitation? *You will be given information about this survey during the Calmbirth® course. You will be sent the link to the survey about one month after your birth with this information sheet again. We will send a reminder to all participants two weeks*

after this. If you have any other questions about participating in the study, you are welcome to contact the researcher below.

Will I receive feedback on the results of this research? *All participants will receive a summary of the results of the research on completion of the study.*

What do I do if I have concerns about this research? *Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Susan Crowther: susan.crowther@aut.ac.nz, 09) 921 9999 ext 7912 Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Dr Carina Meares, ethics@aut.ac.nz, 09) 921 9999 ext 6038.*

Whom do I contact for further information about this research? *You can contact the research team as follows: Researcher: Brooke Hollingshead, brooke.hollingshead@aut.ac.nz, ph. 0273050903 Project Supervisor: Professor Susan Crowther, susan.crowther@aut.ac.nz, ph. 0223101978* Approved by the Auckland University of Technology Ethics Committee on 1 December 2020, AUTEC Reference number 20/323 Approved by the ADHB Research Governance Group Meeting of Women's and Neonatal Health on Monday 8 March 2021.

Q3, **Do you consent to take part in the research?**

- ○ Yes
- ○ No

Skip To: Q6 If Do you consent to take part in the research? = Yes
Skip To: Q32 If Do you consent to take part in the research? = No

Page Break

Q32 You must give consent to participate in this survey. Please go back and tick yes if you wish to participate in the research or contact the researchers if you have any further questions.

Skip To: Q35 If You must give consent to participate in this survey. Please go back and tick yes if you wish to p... Is Displayed

Page Break

Q6 *To assess the effectiveness of the Calmbirth® programme and explore how the programme influenced your labour and birth experience, we are asking that you take time to fill out this anonymous survey. Please complete as many details as you are able or comfortable providing. Each survey is sent to the research team who are evaluating this programme at AUT, and data is stored centrally in a secure database.*

The survey results may also be shared with Calmbirth® educators and may be used publicly but will not identify you in any way. For example, statistics such as 70% of mothers who attended the Calmbirth® course were pregnant with their first baby. Thank you for sharing your observations and insights. Your experience and perspectives are very important to us and to this pilot study.

Q33 About you!

Q7

Is this your first baby?

- ○ Yes
- ○ No

Skip To: Q8 If Is this your first baby? = No
Skip To: Q44 If Is this your first baby? = Yes

Page Break

Q8 **What kind of birth did you have with your first baby?**

(Pick one)

- ○ Normal vaginal birth
- ○ Ventouse/forceps
- ○ Caesarean section

Q9 **What was your age when this baby was born?**

(Pick one)

- ○ 20 years or under
- ○ 21-25 years
- ○ 26-30 years
- ○ 31-35 years
- ○ 36-40 years
- ○ 41-45 years
- ○ 46 years or over

Page Break

Q44 **How old are you now?**

(Pick one)

- ○ 20 years or under
- ○ 21-25 years
- ○ 26-30 years
- ○ 31-35 years
- ○ 36-40 years
- ○ 41-45 years
- ○ 46 years or over

Q40 **Which ethnic group(s) do you belong to?** *(Pick the one or ones that apply to you)*

- ☐ NZ European
- ☐ Māori
- ☐ Samoan
- ☐ Cook Island Māori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other such as DUTCH, JAPANESE, TOKELAUAN. Please state: _____

Q11 **Approximately how many weeks pregnant were you when you started attending Calmbirth® classes?** *(Pick one)*

- ○ Less than 20 weeks
- ○ 20-24 weeks
- ○ 25-28 weeks
- ○ 29-32 weeks
- ○ 33-36 weeks
- ○ 37-40 weeks

Q12 **Who was your Lead Maternity Carer (LMC)?**

(Pick one)

- ○ A self-employed community (LMC) midwife
- ○ An employed (ADHB) community team midwife
- ○ A private obstetrician

Page Break

Q34 Your labour and birth!

Q13

Where did you birth your baby? *(Pick one)*

- ○ Auckland Hospital
- ○ Birthcare
- ○ At home
- ○ Other (please specify) _____

Q52 How many weeks pregnant were you when you birthed your baby?

(Pick one)

- ○ Less than 28 weeks (7 months)
- ○ 28 to 34 weeks
- ○ 34 to 38 weeks
- ○ 38 to 40 weeks
- ○ More than 40 weeks

Q14 **How did your labour start?**

(Pick one)

- ○ Naturally, on its own
- ○ My labour was induced
- ○ I did not labour (planned caesarean birth)

Q15 **How far advanced was your labour when you went to the hospital (on the occasion of your birth), or were transferred to the birthing unit?** *(Pick one)*

I was told that my cervix was:

- ○ Dilated less than 3cm
- ○ Dilated between 3 and 4cm
- ○ Dilated between 5 and 7cm
- ○ Dilated between 8 and 10cm

Q42 Who was the main person caring for you in your labour and birth?

(Pick one)

- ○ Hospital/core midwife that you knew prior to your labour and birth
- ○ Hospital/core midwife that you did not know prior to your labour and birth
- ○ LMC (community) midwife that you knew prior to your labour and birth
- ○ LMC (community) midwife that you did not know prior to your labour and birth
- ○ An obstetrician that you knew prior to your labour and birth
- ○ An obstetrician that you did not know prior to your labour and birth

Q16 **What did you do to help you feel more comfortable during labour and birth?**

(Mark as many as you used)

- ☐ Calmbirth® relaxation techniques/calm breathing
- ☐ I spent some time in the birth pool/shower
- ☐ I used a TENS machine
- ☐ I used aromatherapy/massage
- ☐ I used warm packs
- ☐ I found that staying upright and moving helped my pain
- ☐ I had sterile water injections for back pain
- ☐ I used Entonox (gas and air)
- ☐ I had a morphine injection
- ☐ I had an epidural

Q17 **Your use of water during your labour and birth**

(Mark as many as you used)

- ☐ I used the bath/shower at home
- ☐ I used the shower for pain relief in hospital
- ☐ I used the pool for pain relief in hospital
- ☐ I gave birth in the pool
- ☐ I did not use water at all

Q18 **Did you have any interventions during your labour?** *(Mark as many as you used)*

- ☐ I had my waters broken
- ☐ I had an oxytocin drip to speed up my labour
- ☐ I had an episiotomy (a cut in your perineum) during the birth
- ☐ I had no interventions

Q19 **How did you birth your baby?** *(Pick one)*

- ○ Normal vaginal birth
- ○ Vaginal birth with assistance (Ventouse/forceps)
- ○ Emergency caesarean section
- ○ Planned caesarean section

Q53 First stage:

Q46 **How long were you in labour before you went to the hospital?** *(Pick one)*

- ○ 1 to 6 hours
- ○ 6 to 12 hours
- ○ More than 12 hours

Q47 **How long were you in the hospital in labour until you started pushing?** *(Pick one)*

- ○ 1 to 6 hours
- ○ 6 to 12 hours
- ○ More than 12 hours
- ○ Not applicable – I had a caesarean section

Q48 **What position(s) did you use to support yourself in the first stage of labour?** *(Mark as many as you used)*

- ☐ Sitting
- ☐ Standing
- ☐ Squatting
- ☐ Kneeling
- ☐ Lying on side
- ☐ Not applicable – I had a caesarean section in the first stage of labour
- ☐ Other _____

Q54 Second stage:

Q49 **How long were you pushing until the baby was born?** *(Pick one)*

- ○ Less than 1 hour
- ○ 1 to 2 hours
- ○ More than 2 hours
- ○ Not applicable – I had a caesarean section

Q50 **What position(s) did you use to support yourself when you were pushing?**

(Mark as many as you used)

- ☐ Sitting
- ☐ Standing
- ☐ Squatting
- ☐ Kneeling
- ☐ Lying on side
- ☐ Not applicable – I had a caesarean section in the second stage of labour
- ☐ Other _____

Q51 **What position were you in when you gave birth?** *(Pick one)*

- ○ Semi reclined
- ○ Standing
- ○ Squatting
- ○ Kneeling
- ○ Lying on side
- ○ Not applicable – I had a caesarean section
- ○ Other _____

Page Break

Q20 **The Calmbirth® classes**

Q21 **Which one word would best describe your thoughts about birth before you did the Calmbirth® course?**

(Pick one)

- ○ Very frightened
- ○ Frightened
- ○ Anxious
- ○ Neutral
- ○ Okay
- ○ Confident
- ○ Very confident

Q22 **Which one word would best describe your thoughts about birth after you did the Calmbirth® course?**

(Pick one)

- ○ Very frightened
- ○ Frightened
- ○ Anxious
- ○ Neutral
- ○ Okay
- ○ Confident
- ○ Very confident

Q23 **On average, how many times per week did you practice the Calmbirth® relaxations?**

(Pick one)

- ○ Never
- ○ Less than once a week
- ○ About once a week
- ○ About twice a week
- ○ About three times a week
- ○ About four times a week
- ○ About five times a week
- ○ About six times a week
- ○ Daily
- ○ More than once a day

Q24 **What is your overall level of satisfaction with the Calmbirth® programme out of 10?**

(Move the gauge to rate your satisfaction from 1 to 10, with 10 being very satisfied)

0
1
2
3
4
5
6
7
8
9
10

Q25 **Which of the following words (if any) would you use to describe your emotional state during labour?** *(Check all that apply)*

- ☐ Alert
- ☐ Calm
- ☐ Challenged
- ☐ Confident
- ☐ Detached
- ☐ Excited
- ☐ Frightened
- ☐ Helpless
- ☐ Involved
- ☐ In control
- ☐ Out of control
- ☐ Overwhelmed
- ☐ Powerful
- ☐ Powerless
- ☐ Surrender
- ☐ Other … (please specify) _____

Q26 **Which of the following words (if any) would you use to describe your partner during labour?** If you had another support person instead of a partner, please select the words that you would use to describe them during labour. *(Check all that apply)*

- ☐ Active
- ☐ Confident
- ☐ Detached
- ☐ Involved
- ☐ Negative
- ☐ Passive
- ☐ Positive
- ☐ Overwhelmed
- ☐ Supportive
- ☐ Unsupportive
- ☐ Wonderful
- ☐ Not applicable (partner/support person was not at the labour)
- ☐ Other … _____

Q27 **What was the best thing about your birthing experience?**

_____

Q28 **Were you able to have skin-to-skin time with your baby within an hour of the birth?**

- ○ Yes
- ○ No

Q29 **Did your baby breastfeed within an hour of birth?**

- ○ Yes
- ○ No

Q30 **What did you like most about Calmbirth®?**

_____

Q31 **Is there anything else that you would like to add?**

_____

Page Break

Q35 This is the end of the survey. Thank you for participating.

End of Block: Participant Information Sheet