Midwifery 115 (2022) 103499

Contents lists available at ScienceDirect

Midwifery

journal homepage: www.elsevier.com/locate/midw

Gaining insight from future mothers: A survey of attitudes and perspectives of childbirth

Janine H. Clemons[a,*], Deborah Payne[a,b], Nick Garrett[c], Judith McAra-Couper[a], Annabel Farry[a], Emma Marie Swift[d], Kathrin Stoll[e]

[a] Department of Midwifery, Centre for Midwifery and Women's Health Research, Auckland University of Technology (AUT), Private Bag 92006, Auckland 1142, New Zealand
[b] Centre for Midwifery and Women's Health Research, Diversity and Gender Cluster, PCRC, School of Clinical Sciences, Auckland University of Technology, Private Bag 92006, Auckland 1142, New Zealand
[c] Biostatistics and Epidemiology Department, Auckland University of Technology, Private Bag 92006, Auckland 1142, New Zealand
[d] Department of Midwifery, Faculty of Nursing, University of Iceland, Eirberg vid Eiriksgotu, Reykjavik 101, Iceland
[e] Department of Family Practice, Faculty of Medicine, University of British Columbia, Suite 320 – 5950 University Blvd, Vancouver, BC, Canada

ARTICLE INFO

Article history:
Received 25 March 2021
Revised 2 July 2022
Accepted 25 September 2022

Keywords:
Fear of birth
University students
Mental health
Maternity system

ABSTRACT

Objective: To determine whether participant characteristics and/or birth preferences of future mothers are associated with a fear of birth.
Design: A cross-sectional survey was used to determine if fear of birth could be profiled in specific participant characteristics and birth choices.
Setting: Urban New Zealand university.
Participants: A convenience sample of women (final $n = 339$) who were < 40 years old, attending university, not pregnant nor had been pregnant but wished for at least one child in the future.
Findings: Multivariable analysis identified a subset of four variables that were independently associated with the instrument Childbirth Fear Prior to Pregnancy (CFPP) measuring fear of birth (mean CFPP=38.0, SE=10.1). Preferences of birth by caesarean section (n=32, mean CFPP=44.3, SE=1.8, $p < 0.0001$), use of epidural analgesia (n=255, mean CFPP=45.0, SE=1.1, $p < 0.0001$), participants born outside of New Zealand (n=123, mean CFPP=42.9, SE=1.4, $p < 0.0001$), and participants who scored > 20 ('severe') for depression on DASS-21 scale (n=11, mean CFPP=44.8, SE=1.7, $p < 0.0001$) were all positively associated with CFPP. Post-hoc analyses revealed that mean CFPP was higher for those that perceived birth technologies as easier, safer, necessary, and required.
Conclusions: Women born outside of New Zealand and/or suffering 'severe' depression were more likely to have a fear of birth. Fear of birth was associated with the participants choices towards medicalised childbirth. Familiarising women with the provision of maternity care in New Zealand and identifying mental health status early could reduce fear of birth and possibly support the vaginal birth intentions of future parents.

Introduction

Gaining insight on the pressures and influences surrounding childbirth of this generation of young women will guide community reproductive health strategies for our future mothers. How the media's portrayal of pregnancy and childbirth affects women's attitudes and perspectives is complex and contextual. The responsibility of preserving physiological labour and birth within the climate of advanced, lifesaving, biomedical birth technologies is key for the health and wellbeing for future generations. Young women with high fear of birth may interpret birth as painful and frightening and look to medical interventions as a supportive strategy to cope with (Thomson et al., 2017) childbirth (Stoll and Hall, 2013b). Therefore, fear of birth can induce women to avoid normal childbirth processes which lead to unintended adverse outcomes (Stoll et al., 2018b).

Childbirth is a contested space and pregnancy, and birth are culturally embedded and socially constructed (Davis-Floyd, 1994).

* Corresponding author.
E-mail address: janine.clemons@aut.ac.nz (J.H. Clemons).

https://doi.org/10.1016/j.midw.2022.103499

Box 1: New Zealand's model of maternity care:

Lead Maternity Carers (LMC) are publicly funded to provide maternity care to all NZ residents and citizens. An LMC provides a woman/baby(ies) with continuity of care from conception through to 6 weeks after birth.

An LMC is a midwife, an obstetrician, or a general practitioner and provides care for 94.5%, 5.3% and 0.2% of women, respectively. Only LMC obstetricians can charge women a fee for this service.

NZ residents are entitled to choose to birth at an obstetric-

Society's underlying beliefs about birth are manifested in the practices and structures that surround it, which in turn shape peoples' beliefs about what kind of birth they consider desirable and normal (Davis-Floyd, 1994). A fearful mindset can easily become a self-fulfilling prophecy as expectations of what birth will be like affect not only the selection of birthplace and caregiver but also labour and birth processes (Stoll et al., 2017; Stoll et al., 2016b; Wiklund et al., 2007). Both prior to (Stoll et al., 2016a) and within-pregnancy (Fenwick et al., 2010; Hall et al., 2009; Molgora et al., 2018; Nerum et al., 2006; Romero et al., 2012; Sheen and Slade, 2018) fear of birth significantly predisposes women to choose caesarean section delivery. Although the majority of women still choose vaginal birth, fear of the birth sways healthy or 'low risk' women to choose epidural pain relief and obstetric settings for birth (Stoll et al., 2017). The risk-based approach that drives the discourse of pregnancy and childbirth in both the developed and developing world (Chadwick and Foster, 2014) may cause expectant mothers to conceive of birth as a frightening event that requires medical support and pain relief (Fisher et al., 2006; McAra-Couper et al., 2012; Renfrew et al., 2014). Both systematic reviews by Stoll et al. (2018c) and Dencker et al. (2019) summarise how a fearful attitude towards birth has been linked to interventions that complicate the labour and birthing processes, such as increased pain perception, more requests for epidural anaesthesia, longer labours, and a higher likelihood of caesarean birth.

Among this backdrop of childbirth fear, concerns about safety, and appropriateness of technocratic intervention, it is well-established that midwifery care has an essential contribution to make to high-quality maternal and newborn services (Renfrew et al., 2014). In New Zealand (NZ), Lead Maternity Care (LMC) midwifery service (see Box 1) is delivered as a 'package of care', the optimal maternity service provision configuration described by Renfrew et al. (2014). If a woman or baby need additional healthcare prior to, during, and/or after labour, for example by a specialist (e.g. physiotherapist, obstetrician, neonatologist, psychiatrist), a named midwife as the woman's primary carer, recognises and facilitates the appropriate referral while maintaining continuity of care through the specialised service. Pregnant individuals self-select maternity carers through a fraught process that enables maternal choice but poses significant barriers to access and suffers inequitable health outcomes (Dawson et al. 2022). This model of maternity care is unique to NZ and was the maternity context within which this research surveyed childbirth attitudes and fear for pre-pregnant university students.

Understanding young adult's perceptions of childbirth may offer the opportunity to avert or reduce the degree of fear prior to becoming pregnant. Research on the attitudes and perceptions of young people from different cultures with access to different maternity services, serves to add depth to this issue. A variety of international studies using the Childbirth Fear Prior to Pregnancy (CFPP) scale have been carried out describing the attitudes towards birth of men and women who plan to have children (Hauck et al., 2016; Stoll et al., 2009; Stoll et al., 2014; Stoll et al., 2016a; Stoll et al., 2017; Stoll et al., 2016b; Swift et al., 2017; Thomson et al., 2017; Weeks et al., 2020; Zigic Antic et al., 2019). In this paper we report the detailed analyses of the NZ findings within this international collaboration (Stoll et al., 2017), with our focus on whether fear of birth is associated with participant's characteristics, childbirth choices (birth mode, caregiver, and birthplace), perspectives towards medical interventions, and finally, childbirth information sources.

Methods

Study setting and participant recruitment

This study represents the NZ contribution to an international project exploring perceptions towards birth among university students in eight participant countries (Stoll et al., 2017). The NZ participants were recruited from a large urban university where the anonymous, online survey ran for 5 months over during the summer semester (October 2015–February 2016). In 2015 an advertisement about the study inviting participants was posted on the university's online pages, on the electronic noticeboards located on the three main campuses, and on the student organisation's website. This advertisement included participant information about the study and outlined that the process of consent in the study was implied in their participation.

Participants

The initial dataset was 558 responses. This was reduced to $n = 449$ when the following inclusion criteria were applied: participants needed to be currently enrolled university students, less than forty years old, not pregnant at the time of the survey, and did not have any children but specified that they wished to have at least one child in the future. Participants were further excluded from analysis if they did not complete the fear of birth scale ($n = 66$) or identified as male ($n = 44$, childbirth fear scores showed a different response pattern to females). This final cohort of participants was $n = 339$ and, after all exclusion criteria was applied, did not include any missing data or outliers. There were 13,027 female students enrolled in the university for 2015 (AUT University, 2016), therefore a very conversative estimate of the response rate was 2.5% as recruitment took place during the summer semester (a low enrolment time).

The survey designed for university-aged students prior to their first pregnancy was adapted from (Stoll et al., 2016a) for use in NZ. The survey included five sections. Section 1 asked eight questions around socio-demographic information, university enrolment details and the participant's plans for children. The ethnic identity question in Section 1 was changed to add in NZ-specific ethnic identities (see below). Section 2 asked six birth choice questions which included NZ-specific maternity system choices such as available places of birth and maternity care providers (see below). Section 3 included five Likert-scale questions that established participant's attitudes towards pregnancy, labour, birth, and the postpartum period. Section 4 included four multiple-response questions that determined influential information sources (written text, visual, stories from friends or family, and/or school-based)

that shaped attitudes and identified childbirth learning needs and knowledge gaps. The final section, Section 5 included a psychological profile inclusive of two validated instruments. The first was a 10-item childbirth-fear-prior-to-pregnancy (CFPP) scale validated in this form by Stoll et al. (2016a) and described in detail by Weeks et al. (2020). The second was a 21-item depression, anxiety, and stress (DASS-21) scale established by Lovibond and Lovibond (1996).

The survey was adapted to the NZ context in Sections 1 and 2. In Section 1, where ethnic identity was asked, multiple response options included cultural identities unique to NZ including Māori and Pacific Island peoples (Niuean, Tongan, Samoan, Cook Island Māori). In Section 2, where participant maternity care preferences were addressed, the question asking: 'Assuming that you have (your partner has) no health problems and will not experience any complications during pregnancy, which care provider would you want to provide care during pregnancy and birth?' the possible answers were given as (a) midwife, (b) obstetrician, (c) I don't know and (d) 'other'. Similarly, when asked 'Where do you imagine the birth to take place?', the options were (a) at the hospital, with a midwife, (b) at the hospital, with a doctor, (c) at home, with a midwife, (d) at a birthing centre (an out-of-hospital facility staffed by midwives; a more home-like environment than a hospital labour ward) or (e) 'other'. These two latter questions reflected options freely available and easily accessible to NZ residents and citizens within the public maternity service.

Fear of birth was quantified using the CFPP scale previously validated across Australia, Canada, England, Germany, Iceland, and the United States by Stoll et al. (2016a) . The 10-item scale has six-point responses ranging from strongly disagree (1 point) to strongly agree (6 points). The points are added together and the CFPP scale results in a range from 10 to 60 and assesses three general dimensions of fear: fear of labour pain, fear of complications, and fear of physical changes following pregnancy and birth. The reliability estimate (Cronbach alpha coefficient) for the CFPP scale in this study was 0.89 consistent with previous work by Stoll et al. (2016a) where reliability estimates for women's responses to the CFPP survey in six countries ranged from 0.85 to 0.89.

Anxiety, depression, and stress; factors commonly shown to be associated with fear and intervention preferences; were assessed with the DASS-21 questionnaire. Internal consistency reliabilities of the three psychometric subscales were good: 0.86 for depression, anxiety 0.84, and 0.81 for stress, while the overall DASS-21 scale was 0.89. For the purposes of this study, the three emotional states were dichotomised to 'severe' depression (>20 points), 'severe' anxiety (score >14 points), and 'severe' stress (>25 points) as per Lovibond and Lovibond (1996).

Data analysis

The variables for participant characteristics (age, ethnocultural identity, birth origin, relationship status, experience of birth, educational level, field of study and psychological profile) were categorised for ease of analyses. Birth choice variables were recoded into new variable as described here. Maternity care provider choices were either *midwife, obstetrician* or *undecided*. Place of birth option was dichotomised to either *hospital* or *midwifery-led setting*. The three choices provided for use of epidural pain relief were 'Yes', 'Maybe' and 'No'. These were dichotomised as *Yes/Maybe* or *No*. An a priori decision was made to collapse *Yes/Maybe* as likely to be comparable; this was confirmed. Where there were Likert-scales measures (e.g. perceptions of birth), these scores were dichotomised as either *agreement* (strongly agree, agree, somewhat agree) or *disagreement* (strongly disagree, disagree, somewhat disagree).

Prior to the primary analysis, the assumption of normality for the raw CFPP scores was tested via Kolmogorov-Smirnov in SAS (v9.4). Mean (standard error = SE) CFPP scores were calculated for participant characteristics and birth related choices (SPSS v 25). Individual variables were tested in a generalised linear model (GLM, SAS v9.4) for their association with CFPP scores, and variables with bivariate associations of $p < 0.2$ were considered for inclusion in the multivariate model building process. The stepwise process was then used to identify the best subset of variables to explain the influence of CFPP (multiple variable analyses). Level of significance was set at $\alpha = 0.05$ for inclusion in the final model. Least square means and confidence limits are provided for the relevant variables in the final multiple variable model.

Post hoc tests were also undertaken to further examine the data. To test whether participants that chose specific perceptions of birth (e.g. 'All childbirth requires medical intervention', Agree/Disagree) held significantly different mean CFPP scores, Student *t-tests* (SPSS v25) were performed. Level of significance was set at $\alpha = 0.05$ for these tests.

Ethics

Ethics approval was granted from the Auckland University of Technology Ethics Committee (AUTEC-15/319) which required participants to be given full information about the study prior. Ethics was, in part, granted based on this information being made explicit and that completion of the questionnaire indicated their consent.

Results

Mean CFPP score for participants was 38.0 (SD = 9.0, range: 10–60) and met the assumption of normality. In this study, the CFPP scale showed an acceptable internal reliability (Cronbach's *alpha* = 0.89) consistent with Stoll et al. (2016a).

Participant characteristics

The mean age of the participants was 21.7 years (SE = 3.4, range: 18–40). Most participants wished for two (35%) or more (47%) children, and the majority were enrolled in their first university degree in non-health related study and were currently single or casually dating (Table 1). Participants born outside of NZ made up 36% of the cohort and when asked to self-identify ethnicity, 7% of the participants chose Māori, 5% as being from one of four Pacific Islands, 64% NZ European, 8% Chinese, 8% Indian and 17% from countries 'other' than those listed,

No significant associations with CFPP were observed with participant's age, relationship status, or education level. Yet, CFPP was associated with participant's born outside of NZ ($n = 123$, mean CFPP = 40.5, SE = 0.9, $p = 0.005$), studying in a non-health field ($n = 211$, mean CFPP = 39.1, SE = 0.7, $p = 0.02$), having had no previous experience of birth ($n = 271$, mean CFPP = 39.1, SE = 0.6, $p < 0.001$), and 'severe' scores in the DASS-21 for depression ($n = 373$, mean CFPP =44.8, SE = 1.6, $p < 0.001$), anxiety ($n = 67$, mean CFPP =41.8, SE = 1.2, $p = 0.001$) and stress ($n = 39$, mean CFPP = 42.1, SE = 1.6, $p = 0.007$). The highest CFPP mean scores (range: 41.8–44.8) were observed for the participants scoring in the 'severe' category of depression, anxiety and/or stress.

When participants were asked if they had 'been present for a real (human) birth?', most had not (80%) but having had some birth experience was negatively associated with CFPP (Table 1). When given choices about their experience(s) witnessing a birth, the most common descriptions were 'amazing' (68%) and 'intense' (79%), where 'frightening' was chosen by 31% and 'beautiful', by 10%. Whether the participants had witnessed birth or not, 68% of participants wanted 'to learn more about reproductive health

Table 1
Bivariate associations between CFPP scores and their individual participant characteristics and childbirth choices ($n = 339$).

Participant Characteristics	*n* (%)	Mean CFPP*	Standard Error	Confidence Limits	*p*-level
Age					
<22	201 (59)	38.3	0.7	36.9–39.7	0.54
≥22	138 (41)	37.6	0.9	35.9–39.3	
Birth Origin					
Born Outside of NZ	123 (36)	40.5	0.9	38.8–42.3	0.005
NZ-Born	216 (64)	36.5	0.7	35.2–37.9	
Relationship status					
Not in relationship	189 (56)	38.6	0.7	37.1–40.0	0.24
In relationship	150 (44)	37.3	0.8	35.7–38.0	
Educational Level					
Holds a university degree	125 (37)	38.0	0.9	36.2–39.8	0.98
Enrolled in first university degree	214 (63)	38.0	0.7	36.6–39.4	
Field of Study					
Non-Health Sciences	211 (62)	39.1	0.7	37.7–40.4	0.02
Health Sciences	129 (38)	36.3	0.9	34.6–38.0	
Experience of Birth					
Has not attended a birth	271 (80)	39.1	0.6	37.9–40.3	<0.001
Attended a birth	68 (20)	33.6	1.2	31.2–35.9	
Psychological Profile (DASS-21)					
Depression Score >20	37 (11)	44.8	1.6	41.7–48.0	<0.001
≤20	302 (89)	37.1	0.6	36.1–38.3	
Anxiety Score >14	67 (20)	41.8	1.2	39.4–44.2	0.001
≤14	272 (80)	37.1	0.6	35.0–38.3	
Stress Score >25	39 (12)	42.1	1.6	39.0–45.2	0.007
≤25	300 (88)	37.5	0.6	36.3–38.6	

* Estimated least square means.

Table 2
Associations between mean CFPP scores and childbirth preferences ($n = 339$).

Participant Childbirth preferences	n (%)	Mean CFPP*	Standard Error	Confidence Limits	*p*-level
Birth Mode					
Caesarean Section	32 (9)	44.0	1.8	40.6–47.4	0.0004
Vaginal Birth	307 (91)	37.4	0.6	36.2–38.5	
Care Provider					
Obstetrician	79 (23)	40.0	1.1	37.8–42.2	0.02
Midwife	203 (60)	36.7	0.7	35.4–38.1	
Undecided	57 (17)	39.8	1.3	37.2–42.4	
Birthplace					
Hospital	232 (70)	39.2	0.7	37.9–40.5	0.001
Midwife-led setting	100 (30)	35.3	1.0	33.5–37.2	
Epidural Analgesia					
Yes & Maybe	255 (75)	40.1	0.6	39.0–41.3	<0.001
No	84 (25)	31.5	1.0	29.5–33.5	

* Estimated least square means

and childbirth options'. For all participants, when asked what sources of information shaped their attitudes towards pregnancy and childbirth, the multiple response data revealed their main sources as 'experiences/stories of family members', 'visual media (TV, Youtube™, movies etc)', and 'experiences/stories of friends' at 85, 73, and 70%, respectively. Sources that were somewhat less influential were school based health/sex education (45%) and written media (47%).

Birth Mode choice

With the assumption of a healthy, low risk pregnancy, vaginal birth was the preferred mode of birth for participants (91%, Table 2). The three most reported reasons for choosing vaginal birth, were that vaginal birth: is a 'natural/normal/traditional way to give birth' (72%), afforded 'faster recovery time/less postpartum pain' (63%), and avoided 'surgery/scarring associated with Caesarean birth/fear of surgery' (61%). Safety and health considerations for mum and baby ('fewer complications/risks') was chosen by 31–49%.

Choice of Caesarean section (CS) for birth mode was associated with a high CFPP score ($p = 0.0004$) when compared to choosing to birth vaginally (Table 2). When participants who chose caesarean section ($n = 32$; 9%) were given eight options for why participants preferred this birth mode, the two most chosen were 'fear of labour pain' (78%) and 'to avoid damage to my body/to maintain vaginal integrity' (66%). Of the remaining six choices the next two common selections included the 'ability to plan' and the 'convenience of a scheduled birth' (47 and 38%, respectively) while 'family history of CS' (9%), safety/health of mother and baby (6 and 5%, respectively), and the perspective that she would be too small to birth vaginally (9%) were only minor reasons for choosing CS.

In further analysis on attitudes on birth procedures (such as Caesarean birth), the multiple response data revealed that CFPP mean scores were significantly higher for those that viewed caesarean section should be available as a choice for all women ($n = 254$, CFPP 38.9, SD, 10.0, $F = 8.3$, $p = 004$) and be available to avoid the pain of labour ($n = 56$, mean CFPP = 45.5, SD 7.9, $F = 41.4$, $p < 0.0001$). Those with a higher mean CFPP were concerned about vaginal trauma ($n = 200$, mean CFPP = 41.9, SD=8.6, $F = 91.2$, $p < 0.001$), felt that caesarean section was a less embar-

Table 3
Independent, multiple variable associations of CFPP score and participant characteristics or birth preferences as determined by the GLM model.

Preferences	*n* (%)	Mean CFPP*	Standard Error	Confidence Limits	*p*-level
Birth Origin					
Birth Origin Born Outside of NZ	123 (36)	42.9	1.4	40.2–35.7	<0.0001
NZ-born	216 (64)	40.0	1.2	37.8–42.3	
Psychological Profile (DASS-21)					
Depression Score >20	37 (11)	44.8	1.7	41.3–48.3	<0.0001
≤20	302 (89)	38.2	1.0	36.2–40.1	
Birth Mode					
Caesarean Section	32 (9)	44.3	1.8	40.7–47.9	<0.0001
Vaginal	307 (91)	38.7	0.9	37.0–40.4	
Epidural Analgesia					
Yes & Maybe	255 (75)	45.0	1.1	42.9–47.0	<0.0001
No	84 (25)	38.0	1.5	35.0–41.0	

* Adjusted least square means.

rassing way to have a baby (n = 58, mean CFPP = 44.1, SD 8.2, F = 27.5, p < 0.0001) and that vaginal birth was outdated (n = 16, mean CFPP = 48.4, SD = 9.1, F = 19.0, p < 0.0001).

Maternity care provider choice

Choice of obstetrician as care provider was positively associated with CFPP score (n = 79, mean CFPP = 40.0, SE=1.1, p = 0.02) when compared to preferring a midwife (Table 2). When participants were asked which care provider, they would choose assuming they had no health problems before or during pregnancy, participants chose midwives (60%) over obstetricians (23%) with some yet undecided (17%).

Birthplace choice

Birth at an obstetric hospital was chosen by 70% of participants and associated with a higher CFPP score when compared to midwifery-led birth setting (Table 2). The number of participants who chose 'at the hospital birth, with a midwife' (31%) was similar to those who chose 'at the hospital, with a doctor' (37%). The mean CFPP levels for those who preferred birth 'at home, with a midwife' were markedly lower at 27.9 (SE = 2.6, n = 15) than those 'at a birthing centre' a midwifery-led birthing centre at 36.2 (SE = 1.1, n = 85) and 'at hospital, with a doctor' at 39.2 (SE = 0.9, n = 126) or 'at hospital, with a midwife' at 39.2 (SE = 0.9, n = 106).

Epidural analgesia choice

A preference towards using epidural analgesia for the pain of labour and birth was associated with a high CFPP (n = 255, mean CFPP = 40.1, SE = 0.6, p < 0.001) and chosen by most participants (Table 2). Most participants who would or might have epidural analgesia (94%) gave 'to help me manage labour pain' as their main reason.

In further analysis of how birth technologies (such as epidural analgesia), multiple response data revealed that CFPP mean scores were significantly higher for those that viewed birth technologies as making birth easier (n = 300, mean CFPP = 38.9, SD = 9.8, F = 23.9, p < 0.0001), safer for baby (n = 273, mean CFPP = 39.2, SD = 9.6, F = 20.5, p < 0.0001), and necessary (n = 118, mean CFPP = 41.5, SD = 9.5, F = 23.8, p < 0.0001) and required for birth (n = 131, mean CFPP = 42.0, SD = 9.0, F = 37.2, p < 0.001).

Multivariable model

When the significant participant characteristics and birth choices were combined in the general linear model, four variables revealed independent associations (Table 3). Two participant characteristics that were independently associated with CFPP included (1) being born outside of NZ (n = 123, mean CFPP = 42.9, SE = 1.4, p < 0.0001) and (2) 'severe' depression scores on the DASS-21 scale (n = 37, mean CFPP = 44.8, SE = 1.7, p < 0.0001). Two birth choices that were independently associated with CFPP were (1) preferring epidural analgesia for labour and birth (n = 255, mean CFPP = 45.0, SE = 1.1, p < 0.0001) and (2) preferring caesarean section for birth (n = 32, mean CFPP = 44.3, SE = 1.8, p < 0.0001).

Discussion

Fear of birth was measured by CFPP in this study of pre-pregnant women, a scale that differentiates itself from other fear of birth instruments used during pregnancy or in the postpartum period (Jomeen et al., 2021). The NZ seminal findings from this internationally validated survey reveals results that align well with other developed countries (Hauck et al., 2016; Stoll et al., 2014; Stoll et al., 2016a; Stoll et al., 2017; Stoll et al., 2020; Swift et al., 2017; Weeks et al., 2020). Ninety-one percent of young women (n = 307) preferred vaginal birth in this population of young women. They reasoned that this was the most 'normal' way to give birth, avoided surgery, and provided a faster recovery. The remaining 9% (n = 32) of these women felt that elective caesarean section was the preferred mode; fear of pain and the loss of vaginal integrity were the predominant reasons. The health and safety of mother and/or baby were not common reasons for either birth mode choice.

The assumption in this study was that each participant would envision a pregnancy with 'no health problems' or complications. This premise aligns to the NZ definition of a 'standard primipara' defined as 'women aged 20–34 years old at the time of giving birth, who are giving birth for the first time, at term, where the outcome of the birth is a singleton baby, the presentation is cephalic and there have been no recorded obstetric complications that are indications for specific obstetric interventions' (Ministry of Health, 2012). The NZ spontaneous vaginal birth rate for primiparous women is 64.1% (Ministry of Health, 2022), a statistic that has declined from 70% over the past decade with concomitant rises in instrumental (14.9 to 17.5%) and caesarean section (14.5 to 18.5%) rates. Identifying specific strategies to support future 'standard primipara' to achieve their vaginal birth intentions is a focus for the NZ maternity system and the National Maternity Monitoring Group (Ministry of Health 2019).

The average fear of birth among participants was within the realm of those reported in a cross-cultural mixed gender study where average CFPP ranged between 29.8 (Germany) and 38.5 (United Kingdom) (Birthplace in England Collaborative Group, 2011). If this study included the data from its male par-

ticipants, the mean CFPP would slightly decrease to 37.4 but still be comparatively high. Swift et al. (2017) reported CFPP scores for the all-female Icelandic university cohort at 35.8. The homogeneity of cultural identity analysed was 98% Icelandic and born in Iceland whereas the diversity in this study differed where 36% of the participants were born outside of NZ and 24% identified as 'other' ethnicities than the more common cultures represented by NZ-European, Māori, Pasifika, Chinese, or Indian peoples.

Being born outside of NZ was independently associated with a fear of birth for the young women in this study. This agrees with work done by Ternström et al. (2015) where being foreign-born and primiparous increased women's fear of birth in pregnancy three times above those born in Sweden. Ternström et al. (2015) surmised this could be due to a fear of the unknown, a lack of knowledge of their adopted country and a lack of familiarity of their rights and expectations within the health system. New Zealand's unique maternity care system serves some of its population well but the process of accessing and navigating the service has erected many barriers especially for marginalised populations (Dawson et al, 2022). Childbirth preferences and its related fear vary significantly depending on a woman's cultural values and influences as seen by Preis et al. (2018) when they compared an Israeli cohort with a Norwegian cohort. Israeli women's preferences were influenced by their medicalised view of birth, where the risk to the baby predominated. This contrasted with the natural birth expectation and decision-making autonomy Norwegian women had around their birth experience.

The psychological states of depression, anxiety, and stress for the young women in this study were associated with fear of birth and were highly correlated with each other (Spearman Correlation 0.6 to 0.7). However, multivariate model building selected 'severe' depression over 'severe' anxiety and 'severe' stress in the final model. The systematic review by Dencker et al. (2019) identified that these three emotive states as well a lack of social support were associated with a 'fear of pregnancy'. Using the Edinburgh Postnatal Depression Scale in a postpartum population, Molgora et al. (2018) observed that fear of birth was related a 'severe' depression score. However, as noted by Jomeen et al. (2021), comparing risk factors for screening for fear of birth varies depending on the instruments and the study's inclusion and exclusion criteria.

To reduce risk factors of a fearful childbirth perspective, this research supports public health initiatives aimed at addressing mental health needs for NZ youth (Hetrick et al., 2017). Entering pregnancy with the appropriate support of mental health services will enable better birth outcomes for mothers and babies. While provision of maternal mental health services in pregnancy is necessary and lifesaving (Dennis and Dowswell, 2013), addressing depression, anxiety and stress before pregnancy may reduce fears at a time when women already feel vulnerable (MacLellan, 2020).

A choice to avoid experiencing labour through caesarean section or labour pain through epidural analgesia were independently associated with a fear of birth in our multivariable analysis. For participants with a high fear of birth, these labour and birth options were correlated to their choice of birthplace (hospital) and caregiver (obstetrician); these options are only available in an obstetric hospital. That fear of birth is associated with elective caesarean section is well established in the research both in pregnancy (reviewed in Jomeen et al. (2021) and for those not yet pregnant (Stoll et al., 2018b; Stoll et al., 2014; Stoll et al., 2017). Additionally, we know that in countries where a range of accessible and safe maternity options are available, place of birth choice for future parents is overwhelmingly 'hospital' (Stoll et al., 2016b; Stoll et al., 2020).

Hospital birth is the social norm in NZ where birth occurs for 87% of 'standard primpara' (Ministry of Health, 2022). Local and international evidence agrees that births for healthy, 'low risk' women initiating their labour in a birthing unit/midwifery-led birth setting are more likely to result in normal vaginal births (Bailey, 2017; Birthplace in England Collaborative Group, 2011; Davis et al., 2011; Dixon et al., 2014; Farry et al., 2019). Yet, for 75% of these student participants, access to an epidural would be a powerful influencer for birthplace choice. There was some confusion for these participants about birthplace choice and pain relief options. Some participants chose both an epidural and birthing unit/midwifery-led only setting for birth, however, this form of analgesia is only available in an obstetric hospital. Birthing units/midwifery-led units are available for low-risk women yet used by a small portion (10%) of the total birthing population (Ministry of Health 2021) which might explain why young women in this study were confused about the services offered within these units. In contrast, there was no confusion about homebirth; none of these participants concomitantly chose epidural analgesia.

Predominant perspectives of and attitudes to childbirth aligned well to other studies using the CFPP survey, despite the differences in maternity systems for women in each country. However, when Stoll et al. (2018a) analysed this survey's results from eight countries, NZ was the least supportive in their attitude towards accepting birth technologies where the United States was the most. The difference in importance of birth technologies was not posited to be as much due to social influence as to differences in each country's maternity system structure.

We have learned that written and school-based information is the least used by, or perhaps available to these participants, whereas visual imagery was a popular source regarding pregnancy and birth. In an analysis of the birth attitudes of 2676 young women from Canada, Stoll and Hall (2013a) found that those whose attitudes towards birth were primarily shaped by visual media had 1.5 increased odds of reporting high childbirth fear, compared to participants who learned about birth via other sources (such as family and friends). It is noteworthy this study and in a study of Canadian women who had witnessed a birth first-hand and those who learned about pregnancy and birth through friends had significantly reduced fear of birth (Stoll and Hall, 2013a).

The insight we gain from this is that the way information is received powerfully affects expectations of young women. Midwives reduce fear through optimistic, accurate messaging of birth information and effective psycho-education for pregnant women within the continuity of care model (Aune et al., 2015; Fenwick et al., 2015; Fenwick et al., 2018; Stoll et al., 2018c; Toohill et al., 2014). However, young people in NZ have few opportunities to learn about pregnancy and birth and this survey highlights a need to develop programming that educates young people about childbirth in a way that is not frightening but affirms pregnancy as a normal life event. In Germany, midwifery-led childbirth education programs for students in grades 3-6 have been successful in increasing knowledge about pregnancy and birth and reducing fear. Midwives use age-appropriate teaching aids and interactive games, to deliver the curriculum, and work closely with parents and teachers (Pflanz, 2014).

Strengths and limitations

An explicit limitation of this study is that the one-time convenience sampling of female students enrolled in a large urban university is not representative of all NZ women prior to pregnancy. Although our 2.5%, low response rate could have been a result of our summer semester sampling time; we are reassured that the study's findings were broadly consistent with the larger international study in other universities. Although the ethno-cultural identity of our participants is representative to that of the wider university where over a third of the student body were classi-

fied as international at the time of data collection (AUT University, 2016), this can be interpreted as a limitation of generalisability as well. Although the survey instrument included several factors known to be associated with childbirth fear (e.g. depression & anxiety) socio-demographics and experiences that were not measured in this study might be related to childbirth fear (e.g. history of sexual trauma). This self-reported data may be limited by the participant's challenge in expressing a perspective or attitude about a future event for which they have limited knowledge. However, a strength of the study is that results are part of a larger study where key findings were replicated across countries, and where fear of birth consistently correlates with choices and perspectives expressed here.

Conclusions

Young women approaching pregnancy in NZ represent a diversity of cultural influences which can contribute to their perspective and fear of birth. Accurate, unbiased messaging about the importance of place of birth and labour interventions in their birth outcomes will benefit these future parents before they enter their maternity system. Tackling mental health service inequities for NZ youth may also concomitantly address the prevalence of fear of birth. Further research defining appropriate, engaging, meaningful lines of reproductive health communication targeting young people may increase informed choice at the onset of pregnancy, normalise expectations, and help midwives provide individualised care.

Ethical Approval

Granted from the Auckland University of Technology Ethics Committee (AUTEC-15/319).

Declaration of Competing Interest

Not applicable.

CRediT authorship contribution statement

Janine H. Clemons: Methodology, Formal analysis. **Deborah Payne:** Conceptualization, Methodology, Writing – review & editing. **Nick Garrett:** Formal analysis, Writing – review & editing. **Judith McAra-Couper:** Conceptualization, Methodology, Writing – review & editing. **Annabel Farry:** Methodology, Writing – review & editing. **Emma Marie Swift:** Writing – review & editing. **Kathrin Stoll:** Conceptualization, Methodology, Writing – review & editing.

Acknowledgement

We thank Dr. Caroline Stretton (AUT University, School of Public Health & Interdisciplinary Studies) and Dr. Jean Rankin (University of the West of Scotland, School of Health and Life Sciences) for their contribution to this article in its early inception.

Funding Sources

Not applicable.

References

Aune, I., Marit Torvik, H., Selboe, S.T., Skogås, A.K., Persen, J., Dahlberg, U., 2015. Promoting a normal birth and a positive birth experience — Norwegian women's perspectives. Midwifery 31, 721–727. doi:10.1016/j.midw.2015.03.016.

AUT University, 2016. Annual Report. AUT University, Auckland, p. 116 University, A..

Bailey, D.J., 2017. Birth outcomes for women using free-standing birth centers in South Auckland, New Zealand. Birth 44 (3), 246–251. doi:10.1111/birt.12287.

Birthplace in England Collaborative Group, 2011. Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the birthplace in England national prospective cohort study. BMJ 343, d7400. doi:10.1136/bmj.d7400, Clinical research ed..

Chadwick, R.J., Foster, D., 2014. Negotiating risky bodies: childbirth and constructions of risk. Health Risk Soc. 16 (1), 68–83. doi:10.1080/13698575.2013.863852.

Davis-Floyd, R.E., 1994. The technocratic body: American childbirth as cultural expression. Soc. Sci. Med. 38 (8), 1125–1140.

Davis, D., Baddock, S., Pairman, S., Hunter, M., Benn, C., Wilson, D., Dixon, L., Herbison, P., 2011. Planned place of birth in New Zealand: does it affect mode of birth and intervention rates among low-risk women? Birth 38 (2), 111–119. doi:10.1111/j.1523-536X.2010.00458.x.

Dawson, P., Auvray, B., Jaye, C., Gauld, R., Hay-Smith, J., 2022. Social determinants and inequitable maternal and perinatal outcomes in Aotearoa New Zealand. Women's Health 18, 1–14. doi:10.1177/17455065221075913.

Dencker, A., Nilsson, C., Begley, C., Jangsten, E., Mollberg, M., Patel, H., Wigert, H., Hessman, E., Sjöblom, H., Sparud-Lundin, C., 2019. Causes and outcomes in studies of fear of childbirth: a systematic review. Women Birth 32 (2), 12. doi:10.1016/j.wombi.2018.07.004.

Dennis, C.L., Dowswell, T., 2013. Psychosocial and psychological interventions for preventing postpartum depression. Cochrane Database Syst. Rev. doi:10.1002/14651858.CD001134.pub3, 10.1002/14651858.CD001134.pub3.(2).

Dixon, L., Prileszky, G., Guilliland, K., Miller, S., Anderson, J., 2014. Place of birth and outcomes for a cohort of low risk women in New Zealand: a comparison with birthplace England. N. Z. Coll. Midwives J. 50, 11–18.

Farry, A., McAra-Couper, J., Wheldon, M., Clemons, J., 2019. Comparing perinatal outcomes for healthy pregnant women presenting at primary and tertiary settings in South Auckland: a retrospective cohort study. N. Z. Coll. Midwives J. 55, 5–13.

Fenwick, J., Staff, L., Gamble, J., Creedy, D.K., Bayes, S., 2010. Why do women request caesarean section in a normal, healthy first pregnancy? Midwifery 26, 394–400. doi:10.1016/j.midw.2008.10.011.

Fenwick, J., Toohill, J., Jenny Gamble, J., Creedy, D.K., Buist, A., Turkstra, E., Sneddon, A., Scuffham, P.A., Ryding, E.L., 2015. Effects of a midwife psycho-education intervention to reduce childbirth fear on women's birth outcomes and postpartum psychological wellbeing. BMC Pregnancy Childbirth 15, 284–292. doi:10.1186/s12884-015-0721-y.

Fenwick, J., Toohill, J., Slavin, V., Creedy, D.K., Gamble, J., 2018. Quantitative: improving psychoeducation for women fearful of childbirth: evaluation of a research translation project. Women Birth 31, 1–9. doi:10.1016/j.wombi.2017.06.004.

Fisher, C., Hauck, Y., Fenwick, J., 2006. How social context impacts on women's fears of childbirth: a Western Australian example. Soc. Sci. Med. 63, 64–75. doi:10.1016/j.socscimed.2005.11.065.

Hall, W.A., Hauck, Y.L., Carty, E.M., Hutton, E.K., Fenwick, J., Stoll, K., 2009. Research: childbirth fear, anxiety, fatigue, and sleep deprivation in pregnant women. J. Obstet. Gynecol. Neonatal Nurs. 38, 567–576. doi:10.1111/j.1552-6909.2009.01054.x.

Hauck, Y.L., Stoll, K.H., Hall, W.A., Downie, J., 2016. Association between childbirth attitudes and fear on birth preferences of a future generation of Australian parents. Women Birth 29 (6), 511–517. doi:10.1016/j.wombi.2016.05.001.

Hetrick, S.E., Bailey, A.P., Smith, K.E., Malla, A., Mathias, S., Singh, S.P., O'Reilly, A., Verma, S.K., Benoit, L., Fleming, T.M., Moro, M.R., Rickwood, D.J., Duffy, J., Eriksen, T., Illback, R., Fisher, C.A., McGorry, P.D., 2017. Integrated (one-stop shop) youth health care: best available evidence and future directions. Med. J. Aust. 207 (S10), S5–S18. doi:10.5694/mja17.00694.

Jomeen, J., Martin, C.R., Jones, C., Marshall, C., Ayers, S., Burt, K., Frodsham, L., Horsch, A., Midwinter, D., O'Connell, M., Shakespeare, J., Sheen, K., Thomson, G., 2021. Tokophobia and fear of birth: a workshop consensus statement on current issues and recommendations for future research. J. Reprod. Infant Psychol. 39 (1), 2–15. doi:10.1080/02646838.2020.1843908.

Lovibond, P.F., Lovibond, S.H., 1996. Manual for the Depression Anxiety Stress Scales. Psychology Foundation of Australia.

MacLellan, J., 2020. Vulnerability in birth: a negative capability. J. Clin. Nurs. 29 (17-18), 3565–3574. doi:10.1111/jocn.15205.

McAra-Couper, J., Jones, M., Smythe, L., 2012. Caesarean-section, my body, my choice: the construction of 'informed choice' in relation to intervention in childbirth. Fem. Psychol. 22 (1), 81–97. doi:10.1177/0959353511424369.

Ministry of Health, 2012. New Zealand Maternity Clinical Indicators 2009: Revised June 2012. Ministry of Health.

Ministry of Health, 2022. New Zealand Maternity Clinical Indicators 2019. Ministry of Health.

Ministry of Health, 2019. National Maternity Monitoring Group: 2019 Work Programme. Ministry of Health, p. 9.

Ministry of Health, 2021. Report on Maternity 2019. Ministry of Health.

Molgora, S., Fenaroli, V., Saita, E., Prino, L.E., Rollè, L., Brustia, P., Sechi, C., Vismara, L., Lucarelli, L., Trovato, A., Volpi, B., Tambelli, R., 2018. Fear of childbirth in primiparous Italian pregnant women: the role of anxiety, depression, and couple adjustment. Women Birth 31 (2), 117–123. doi:10.1016/j.wombi.2017.06.022.

Nerum, H., Halvorsen, L., Sørlie, T., Øian, P., 2006. Maternal request for cesarean section due to fear of birth: can It be changed through crisis-oriented counseling? Birth 33 (3), 221–228. doi:10.1111/j.1523-536X.2006.00107.x.

Pflanz, M., 2014. Warum Babys im Fruchtwasser Nicht Ertrinken Können. Evaluation des Modelprojektes " Hebammen in der Schule". (Fach Hochschule Fulda/ Fulda University of Applied Science, p. 67 translation: Why Babies don't drown in the womb: Evaluation of the pilot project "Midwives at School"), Diskussionspapiere aus dem Fachbereich Pflege und Gesundheit /Discussion papers from the Department of Nursing and Health.

Preis, H., Benyamini, Y., Eberhard-Gran, M., Garthus-Niegel, S., 2018. Childbirth preferences and related fears - comparison between Norway and Israel. BMC Pregnancy Childbirth 18, 9. doi:10.1186/s12884-018-1997-5.

Renfrew, M.J., McFadden, A., Bastos, M.H., Campbell, J., Channon, A.A., Cheung, N.F., Silva, D.R.A.D., Downe, S., Kennedy, H.P., Malata, A., McCormick, F., Wick, L., Declercq, E., 2014. Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. Lancet 384 (9948), 1129–1145. doi:10.1016/S0140-6736(14)60789-3.

Romero, S., Coulson, C., Galvin, S., 2012. Cesarean delivery on maternal request: a western North Carolina perspective. Matern. Child Health J. 16 (3), 725–734. doi:10.1007/s10995-011-0769-x.

Sheen, K., Slade, P., 2018. Examining the content and moderators of women's fears for giving birth: a meta-synthesis. J. Clin. Nurs. 27 (13-14), 2523–2535. doi:10.1111/jocn.14219.

Stoll, K., Edmonds, J., Sadler, M., Thomson, G., McAra-Couper, J., Swift, E.M., Malott, A., Streffing, J., Gross, M.M., Downe, S., 2018a. A cross-country survey of attitudes toward childbirth technologies and interventions among university students. Women Birth doi:10.1016/j.wombi.2018.07.025.

Stoll, K., Fairbrother, N., Carty, E., Jordan, N., Miceli, C., Vostrcil, Y., Willihnganz, L., 2009. It's all the rage these days': University students' attitudes toward vaginal and cesarean birth. Birth Issues Perinat. Care 36 (2), 133–140. doi:10.1111/j.1523-536X.2009.00310.x.

Stoll, K., Fairbrother, N., Thordarson, D., 2018b. Childbirth fear: relation to birth and care provider preferences. J. Midwifery Womens Health 63 (1), 58–67. doi:10.1111/jmwh.12675.

Stoll, K., Hall, W., 2013a. Vicarious birth experiences and childbirth fear: does it matter how young Canadian women learn about birth? J. Perinat. Educ. 22 (4), 7. doi:10.1891/1058-1243.22.4.226.

Stoll, K., Hall, W., Janssen, P., Carty, E., 2014. Why are young Canadians afraid of birth? A survey study of childbirth fear and birth preferences among Canadian University students. Midwifery 30, 220–226. doi:10.1016/j.midw.2013.07.017.

Stoll, K., Hall, W.A., 2013b. Attitudes and preferences of young women with low and high fear of childbirth. Qual. Health Res. 23 (11), 1495–1505. doi:10.1177/1049732313507501.

Stoll, K., Hauck, Y., Downe, S., Edmonds, J., Gross, M., Malott, A., McNiven, P., Swift, E., Thomson, G., Hall, W., 2016a. Cross-cultural development and psychometric evaluation of a measure to assess fear of childbirth prior to pregnancy. Sex. Reprod. Healthc. 8, 49–54. doi:10.1016/j.srhc.2016.02.004.

Stoll, K., Hauck, Y., Downe, S., Payne, D., Hall, W., 2017. Preference for cesarean section in young nulligravid women in eight OECD countries and implications for reproductive health education. Reprod. Health 14 (1), 116. doi:10.1186/s12978-017-0354-x.

Stoll, K., Hauck, Y., Hall, W., 2016b. Home or hospital? Midwife or physician? Preferences for maternity care provider and place of birth among Western Australian students. Women Birth 29 (1), e33–e38. doi:10.1016/j.wombi.2015.07.187.

Stoll, K., Swift, E., Fairbrother, N., Nethery, E., Janssen, P., 2018c. A systematic review of nonpharmacological prenatal interventions for pregnancy-specific anxiety and fear of childbirth. Birth 45 (1), 7–18. doi:10.1111/birt.12316.

Stoll, K.H., Downe, S., Edmonds, J., Gross, M.M., Malott, A., McAra-Couper, J., Sadler, M., Thomson, G., Hauck, Y., Streffing, J., Swift, E., McNiven, P., Payne, D., Hall, W.The ICAPP Study Team, 2020. A survey of university students' preferences for midwifery care and community birth options in 8 high-income countries. J. Midwifery Womens Health 65, 131–141. doi:10.1111/jmwh.13069.

Swift, E.M., Gottfredsdottir, H., Zoega, H., Gross, M.M., Stoll, K., 2017. Opting for natural birth: a survey of birth intentions among young Icelandic women. Sex. Reprod. Healthc. 11, 41–46. doi:10.1016/j.srhc.2016.09.006.

Ternström, E., Hildingsson, I., Haines, H., Rubertsson, C., 2015. Higher prevalence of childbirth related fear in foreign born pregnant women – Findings from a community sample in Sweden. Midwifery 31 (4), 445–450. doi:10.1016/j.midw.2014.11.011.

Thomson, G., Stoll, K., Downe, S., Hall, W.A., 2017. Negative impressions of childbirth in a North-West England student population. J. Psychosom. Obstet. Gynaecol. 38 (1), 37–44. doi:10.1080/0167482X.2016.1216960.

Toohill, J., Fenwick, J., Gamble, J., Creedy, D.K., Buist, A., Turkstra, E., Ryding, E.L., 2014. A randomized controlled trial of a psycho-education lintervention by midwives in reducing childbirth fear in pregnant women. Birth 41 (4), 384–394. doi:10.1111/birt.12136.

Weeks, F.H., Sadler, M., Stoll, K., 2020. Preference for caesarean attitudes toward birth in a Chilean sample of young adults. Women Birth 33 (2), e159–e165. doi:10.1016/j.wombi.2019.03.012.

Wiklund, I., Edman, G., Andolf, E., 2007. Cesarean section on maternal request: reasons for the request, self-estimated health, expectations, experience of birth and signs of depression among first-time mothers. Acta Obstet. Gynecol. Scand. 86 (4), 451–456. doi:10.1080/00016340701217913.

Zigic Antic, L., Nakic Rados, S., Jokic-Begic, N., 2019. Are non-pregnant women afraid of childbirth? Prevalence and predictors of fear of childbirth in students. J. Psychosom. Obstet. Gynaecol. 40 (3), 226–231. doi:10.1080/0167482X.2018.1470162.