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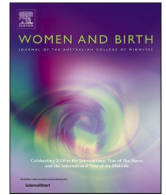

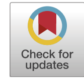

The impact of maternity care models on perinatal outcomes for women who gave birth and their babies: A national survey

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A R T I C L E I N F O

Keywords:
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A B S T R A C T

Background: There are several maternity care models in Australia providing varying levels of continuity of care in the private and public maternity system. These were disrupted to varying degrees during the pandemic.
Aim: To examine the impact of the five main maternity care models in Australia on perinatal outcomes for women who gave birth during the COVID-19 pandemic and their babies.
Design: A national survey, was conducted from March to December 2020, and again from August 2021 to March 2022.
Participants: A weighted sample of 3682 postnatal women provided information on birthing outcomes.
Analysis: Survey tabulations of prevalence and weighted logistic regressions examined associations between five models of maternity care and perinatal outcomes.
Results: Compared with standard care, continuity of care in both public (MWCOC) and private midwife (PPM) models was associated with higher odds of: spontaneous labour (MWCOC AOR 1.66; CI 1.35–2.04; PPM AOR 11.01; CI 0.6.29–19.28), spontaneous vaginal birth (MWCOC AOR 1.84; CI 1.49–2.28; PPM AOR 3.14; CI 2.08–4.73), postnatal midwife visits at home, feeling supported postnatally, feeling the care provider showed commitment, and feeling known by the care provider; as well as lower odds: of induction, elective and emergency caesarean section, augmentation with oxytocin, perceived traumatic birth (MWCOC AOR 0.57; CI 0.45–0.73; PPM AOR 0.49; CI 0.31–0.77), fetal distress, and infant admission to special/neonatal intensive care. Compared to standard care, private obstetric care was associated with lower rates of postpartum haemorrhage, perceived traumatic birth (AOR 0.56; CI 0.45–0.69), spontaneous labour (AOR 0.45; CI 0.37–0.54), spontaneous vaginal birth (AOR 0.54; CI 0.45–0.65), postnatal home visits from a midwife, and higher rates of elective caesarean section (AOR 2.65; CI 2.12–3.30).

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Conclusions: Continuity of midwifery care models are associated with lower intervention rates and birth trauma compared to standard care. However, for women who seek, or are not concerned about increased obstetric intervention, private obstetric care also leads to lower rates of birth trauma when compared to standard care. Continuity of care models should be prioritised in future disaster events.

Statement of significance

Problem	There is limited evidence regarding birth experiences and outcomes under different models of care and the potential protective effect of continuity of care during the recent COVID-19 pandemic.
What is already known	Continuity of care, particularly when provided by midwives in the context of a disaster, leads to positive birth outcomes and experiences for women, reduced postnatal maternal anxiety and depression and improved infant development.
What this paper adds	Overall, continuity of midwifery care by midwives, especially private midwives, demonstrated the most positive outcomes of all the models of care.

Background

Australia has a two-tiered health care system, comprising of a national publicly funded (Medicare) scheme that provides free, or limited out of pocket cost care in public hospitals, and a private system, where maternity service users pay through health insurance and out-of-pocket fees, to access care from preferred providers in private or public hospital settings [1]. Within the maternity care system, there are multiple models of care (MOC) with varying funding and care provision components, however the bulk of care is represented by five main categories. In two of the publicly funded maternity care models, standard care (SC) and GP shared care (GPSC), women encounter a range of different providers throughout their maternity episodes. For the other three models, midwifery continuity of care (MWCOC) in the public system; private obstetric (POb) care and privately practising midwifery (PPM) care in the private system, continuity of care (COC) is provided by one or a small number of midwives or obstetricians working together in a practice [2].

Women in the SC or GPSC shared models give birth in public hospitals, whereas those booked with PObs, mostly give birth in private hospitals, with a small number birthing in public hospitals. Those in MWCOC models mostly give birth in public hospitals and birth centres and those using PPMs can birth at home, in birth centres, or in public hospitals. Recent research demonstrates that women with private health insurance, who receive care in the private sector, tend to be older, better educated, of higher socioeconomic status, and less likely to smoke than women receiving publicly funded health services [3]. Continuity of maternity care however, continues to be regarded as the gold standard for maternity care, due to positive impacts on women's experiences, as well as labour, birth, postnatal and infant outcomes [4]. A meta synthesis of papers from 41 countries exploring healthcare providers', women's and lay community workers' perspectives regarding antenatal care, also reported that women wanted care that was individualised, culturally safe, and trustworthy. Health care workers additionally wished to provide this type of care; however, the provision of relationship-based care was often hampered by resourcing and staffing considerations [5].

During the COVID-19 pandemic, national health care systems attempted to strike a balance between public health needs, human rights and economic and social disarray [6]. Despite these efforts, there were significant disruptions, with policy often hastily implemented in an evidence vacuum [7–9]. Staffing levels were critically affected, particularly towards the end of the acute phase [10,11]. Many childbearing women and their families were negatively impacted through the increased use of telehealth; restrictions to childbirth education classes; personal protective equipment requirements; reduced access to networking with other mothers, and other forms of social support [12–15]. Labouring women consequently felt isolated and frightened during what should have been an exciting and socially meaningful life event [16]. Postnatal care was also impacted by the pandemic with a shift to shorter hospital stays. For example, in 2020 and 2021 It was estimated 21,840 more women stayed in Australian hospitals for one day or less [17], an increase from 21.7 % in 2019–25.9 % and 26.9 % in 2020 and 2021 respectively. Impacts upon women's mental health (MH) were significant, especially in cases of minimal support, substantial hardship, co-existing health concerns and past or present MH problems [18–21].

There is some evidence about pandemic related outcomes and experiences arising out of private or public health care provision, and between countries with different health and maternity care models [9,22]. Birth at home and MWCOC models were viewed positively by women and midwives during the pandemic [23,24], and may have had a positive impact on postpartum maternal anxiety [25]. Less is known about the impacts of continuity of care maternity models on perinatal outcomes.

This study aimed to examine the impact of the five main maternity MOC within Australia on perinatal outcomes, for women who gave birth during the COVID-19 pandemic, and their babies.

Methods

This study is part of a prospective longitudinal cohort study undertaken in Australia (details removed) examining the impact of the pandemic on maternal and infant health outcomes. Models of care were classified as either non-continuity SC or GPSC, where women saw a range of different practitioners and the birth attendant was likely to be unknown to them; or COC models, provided by a PPM, or POb; or a midwife employed in the public health system (MWCOC).

Recruitment and ethics approval

Ethical approval for this study was received from XXX (details removed). Women over the age of 18 years, with a good command of English, and who had birthed a baby during the COVID-19 pandemic were eligible to participate. Informed consent was embedded at survey entry, with the option to continue or opt out after reading the relevant information. All data were deidentified. As this survey dealt with sensitive questions, including about birth trauma, contact numbers for psychological support services were embedded at the start of the survey, where sensitive questions were asked and again at the end of the survey.

The national surveys were advertised through social media and on Australian parenting websites, and were open from March to December 2020 (details removed), and again from August 2021 to March 2022 (details removed) during the pandemic period. During this time there were four waves in Australia: Wave 1 (March – May 2020); Wave 2 (June – November 2020), Delta Wave (July-December 2021); Omicron Wave (January – September 2022) [26].

Fig. 1 shows the flowchart detailing the number of online de-identified data collection processes conducted in 2020 and 2021. During this period, a total of 6154 women completed both surveys. After excluding respondents who were pregnant at the time of the survey or had multiple births, the final unweighted sample consisted of 3725 postnatal women. Applying survey weights resulted in a weighted analytical sample of 3682 postnatal women. Percentages reported for both the weighted and unweighted samples were similar (see Supplementary Table A for details of the unweighted sample).

Outcome variables

We included 11 birth variables and six perinatal experiences and outcomes. The birth variables were: spontaneous onset of labour; induced labour; vaginal birth; vaginal birth with forceps or vacuum; caesarean during labour (emergency caesarean [EMC]); caesarean before labour (elective [ELC]); use of oxytocin drip to increase contractions; excessive blood loss; fetal distress during labour; and low birth weight (< 2500 g). The perinatal outcomes were: midwife home visits after birth; mother felt adequately supported with care received; baby sent to special care nursery (SCN) or Neonatal Intensive Care Unit (NICU); baby given formula when breastfeeding was chosen; baby needed extra care after birth; and recent birth perceived to be a traumatic experience. The outcomes were categorised as binary, coded as ‘1′ for having a birth or perinatal experience and as ‘0’ otherwise.

Main exposure factor and confounding variables

The main exposure factor examined was the intrapartum and postnatal MOC received. Potential confounding factors were based on previous studies [27,28] and included: year of survey, demographic factors (State or Territory; age in years; level of education; employment status; combined family income; country of birth; a language other than English spoken at home; marital status). Maternal factors included sex of the baby, parity, gestation and medical risk factors during pregnancy (e.g. hypertension, diabetes). Mental health status included MH concern, untreated MH concern and substance abuse.

Analysis

Sample weights were used to reduce bias. This included potential oversampling of certain maternal age groups. The sampling weight was calculated by dividing the proportion of women who gave birth by maternal age in Australia in 2019 [29], by the proportion of women by maternal age in our sample proportions. Further information on sample weighting can be found in our previous publication [28].

Descriptive statistics described the distributions of data by years of the online survey (2020/2021), and this was followed by the Survey tabulations ‘svy: tab’ command in STATA version 17.0 (Stata Corporation, College Station, TX, USA), which were used to examine the prevalence and their 95 % confidence intervals for birth and perinatal outcomes, exposure factor and confounding variables.

Univariable and multivariable logistic regression, adjusted for sampling weights, were performed. This included adjusting for the year of survey, MOC, demographic factors, obstetric factors and MH risk factors. The final model also included MOC as an additional covariate for each study outcome The adjusted odds ratios (AOR) and their 95 % confidence intervals (95 % CI) were used to measure the impact of the MOC received on maternal and neonatal outcomes. All analyses were conducted using “SVY” commands in STATA, to adjust for weights and calculate standard errors, and significance levels were set at $P < 0.05$.

Results

Over two thirds of women had undergraduate or postgraduate levels of education; approximately one-third had family incomes of less than A $100,000 a year; the majority lived in New South Wales (NSW) and Victoria (VIC) and 2 % were First Nations (Table 1). Over a third of women reported having MH concerns.

Table 2 presents the birth and postnatal outcomes and shows just over half of the women had a vaginal birth, a third had an induction and more than a third had a caesarean section. After birth, nearly a quarter of

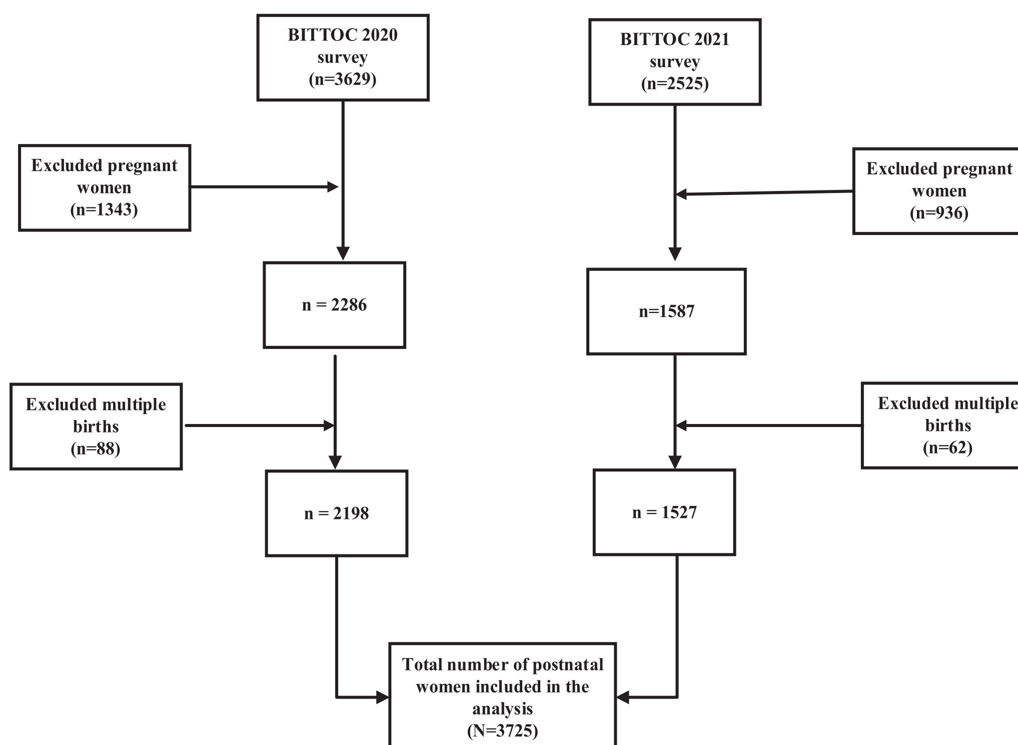

Fig. 1. Online data collection flowchart.

Table 1
Demographic, obstetric, and mental health factors 2020/2021.

Variables	2020 survey n = 2219 (%)*	2021 survey n = 1463 (%)*	Combined n = 3682 (%)*
Demographics			
Maternal age in categories			
< =24	123 (5.6)	154 (10.5)	277 (7.5)
25–29	424 (19.1)	348 (23.8)	772 (21.0)
30–34	804 (36.2)	566 (38.7)	1370 (37.2)
35 and over	868 (39.1)	394 (26.9)	1262 (34.3)
Country of birth			
Australia	1890 (85.2)	1282 (87.6)	3172 (86.2)
Other	329 (14.8)	181 (12.4)	510 (13.8)
Language spoken at home			
English	2045 (92.2)	1355 (92.6)	3400 (92.4)
Other	174 (7.8)	108 (7.4)	282 (7.6)
Indigenous status			
Non-Indigenous	2173 (97.9)	1415 (96.8)	3588 (97.4)
Indigenous	35 (1.6)	40 (2.8)	75 (2.0)
Combined family income			
< $100,000	622 (28.0)	382 (26.1)	1003 (27.3)
> =100,000	1469 (66.2)	1018 (69.6)	2487 (67.5)
Education level			
Less than Year 12	70 (3.1)	47 (3.2)	117 (3.2)
Year 12 or higher school certificate	174 (7.9)	134 (9.2)	309 (8.4)
TAFE or Diploma	442 (19.9)	290 (19.9)	732 (19.9)
University undergraduate or postgraduate	1533 (69.1)	991 (67.7)	2524 (68.5)
Jurisdiction resided in			
New South Wales	840 (37.8)	621 (42.5)	1461 (39.7)
Victoria	653 (29.4)	381 (26.1)	1034 (28.1)
Queensland	351 (15.8)	205 (14.0)	556 (15.1)
South Australia	109 (4.9)	74 (5.1)	183 (5.0)
Western Australia	140 (6.3)	87 (6.0)	227 (6.2)
Tasmania	54 (2.4)	30 (2.1)	84 (2.3)
Australian Capital Territory	48 (2.2)	48 (3.3)	96 (2.6)
Northern Territory	21 (1.0)	9 (0.6)	30 (0.8)
Marital status			
Currently partnered	2140 (96.4)	1405 (96.0)	3545 (96.3)
Not currently partnered	79 (3.6)	56 (4.0)	137 (3.7)
Maternal factors			
Parity			
Primigravida women	965 (43.5)	872 (59.6)	1837 (49.9)
Multigravida women	1254 (56.5)	590 (40.4)	1845 (50.1)
Sex of the baby			
Male	1145 (51.6)	735 (50.2)	1880 (51.1)
Female	1060 (47.7)	714 (48.8)	1774 (48.2)
Medical risk factors during pregnancy			
I believe I had no risk factor	1110 (50.0)	693 (47.4)	1803 (49.0)
I had a/some mild risk factor(s)	819 (36.9)	534 (36.5)	1353 (36.8)
I had a/some serious risk factor (s)	290 (13.1)	236 (16.1)	526 (14.3)
Gestation			
Pre-term (< 37 weeks)	122 (5.5)	101 (6.9)	223 (6.1)
Term (37–41.6 weeks)	2046 (92.2)	1320 (90.2)	3366 (91.4)
Post-term (42 weeks plus)	51 (2.3)	42 (2.9)	93 (2.5)
Mental health (MH) status and risk factors			
MH concerns			
No	1558 (70.2)	814 (55.7)	2372 (64.4)
Yes	661 (29.8)	648 (44.3)	1309 (35.6)
Untreated MH concerns			
No	1926 (86.8)	1355 (92.6)	3280 (89.1)
Yes	294 (13.2)	108 (7.4)	402 (10.9)
Substance abuse			
No	2202 (99.2)	1458 (99.7)	3660 (99.4)
Yes	17 (0.8)	5 (0.3)	22 (0.6)
Main study factor (exposure)			
Model of care			
SC	763 (34.4)	519 (35.5)	1282 (34.8)
GPSC	178 (8.0)	123 (8.4)	301 (8.2)
MWCOC	398 (17.9)	310 (21.2)	708 (19.2)
POb	751 (33.9)	440 (30.1)	1191 (32.4)
PPM	122 (5.5)	70 (4.8)	192 (5.2)

MOC: SC=shared care, GPSC=general practitioner care shared, MWCOC=midwifery continuity of care, POb=private obstetrician, PPM=privately practising midwife

* Weighted sample

women described their recent birth experience as traumatic (see, Table 2 for details).

Table 3 presents the prevalence of birthing outcomes by MOC and year of survey, with adjustment for the year of the survey, demographics, and maternal intrapartum-related and MH risk factors. Compared with SC, MWCOC and PPM care were associated with higher odds for the spontaneous onset of labour and vaginal births, respectively. MWCOC and PPM care had lower odds for induction of labour, ELC, EMC and instrumental birth. Private obstetric care was associated with higher odds of ELC.

Table 4 shows the unadjusted and adjusted odd ratios by year of survey and prevalence of, and influence of MOC on obstetric and birthing complications. MWCOC and PPM care was significantly associated with lower odds of oxytocin used to augment labour and POb and MWCOC were associated with less excessive blood loss. All COC models had lower fetal distress during labour (see Table 4).

Table 5 displays the unadjusted and adjusted odds ratios for the prevalence of, and influence of MOC on postnatal experiences and outcomes. MWCOC and PPM care were associated with women being more likely to feel adequately supported during the postnatal period, be visited by a midwife after birth and have fewer admissions of babies to a SCN or NICU. Fewer babies were diagnosed with jaundice or were given formula when the mother had chosen to breastfeed under PPM care. Women who had a baby under a COC model (MWCOC, POb, PPM) were less likely to report their birth as traumatic.

Discussion

To the best of our knowledge, this is the first study that provides data from a combined analysis of the different models of care during the pandemic over the first two years of the pandemic. This data includes the funding model (private vs public care providers); the lead provider type (GP, obstetrician, midwife); and the staffing arrangements (multiple providers versus continuity of care). Compared with standard care (SC), COC in both public and private midwife models was associated with higher odds of: spontaneous labour and vaginal birth, midwife postnatal home visits, feeling supported postnatally, as well as lower odds of induction, ELC and EMC, augmentation with oxytocin, perceived traumatic birth, fetal distress, and infant admission to SCN/NICU. Compared to SC, POb was associated with lower rates of postpartum haemorrhage, perceived traumatic birth, spontaneous labour and vaginal birth, postnatal midwife visits at home, and higher rates of ELC.

Although women who booked with PObs had higher rates of ELC (and, consequently, lower rates of spontaneous labour onset and vaginal birth) than those booked with the other care provider models, they also reported low rates of birth trauma, which could indicate a philosophical alignment between birth choices and care provider [30] and also the protective effect of relationship based care overall [31] regardless of the lead caregiver.

There was no significant difference in any outcomes between SC and GPSC. Women accessing these models may find it challenging to form effective relationships with the multiple care providers involved. In a recent paper examining Australian women's experiences with different models of care women expressed a strong desire for continuity of care across the continuum when under GPSC [31]. Under GPSC models women may get some continuity with their GP antenatally and again postnatally but they also see multiple hospital care providers antenatally, during the labour and birth and postnatally when in hospital. Embedding the GPSC model into a continuity of care model in the hospital could enhance outcomes and experiences for women.

The mechanism of effect for the positive outcomes seen in relationship-based models could be the building of trust and the consequent individual tailoring of care provision, that is enabled

Table 2
Prevalence (%) of birth and postnatal outcomes by year of survey and overall.

Variables	2020		2021		Overall	
	Prevalence	(95 % CI)	Prevalence	(95 % CI)	Prevalence	(95 % CI)
Birth outcomes						
Spontaneous labour	45.7	(43.5, 47.9)	51.0	(48.3, 53.7)	47.8	(46.1, 49.5)
Induced labour	34.2	(32.0, 36.3)	32.4	(29.9, 35.0)	33.5	(31.8, 35.1)
I did not labour	20.1	(18.3, 22.1)	16.6	(14.8, 18.6)	18.7	(17.4, 20.1)
Vaginal birth	52.5	(50.2, 54.7)	50.1	(47.4, 52.8)	51.5	(49.8, 53.3)
Vaginal birth with forceps or vacuum	10.8	(9.5, 12.2)	13.7	(12.0, 15.7)	12.0	(10.9, 13.1)
Caesarean during labour (EMC)	15.0	(13.4, 16.7)	18.5	(16.5, 20.7)	16.4	(15.1, 17.7)
Caesarean before labour (ELC)	21.7	(19.8, 23.7)	17.6	(15.8, 19.7)	20.1	(18.7, 21.6)
Use of oxytocin drip to increase contractions	21.7	(19.9, 23.6)	29.2	(26.8, 31.7)	24.7	(23.2, 26.2)
Excessive blood loss	9.1	(7.9, 10.4)	15.7	(13.9, 17.7)	11.7	(10.7, 12.8)
My baby was distressed during labour	17.0	(15.4, 18.8)	24.3	(22.0, 26.7)	19.9	(18.5, 21.3)
Low birth weight (< 2500 g)	2.6	(2.0, 3.5)	4.8	(3.7, 6.2)	3.5	(2.9, 4.2)
Postnatal outcomes						
Baby sent to SCN or NICU	13.2	(11.7, 14.8)	16.8	(14.9, 18.9)	14.6	(13.4, 15.9)
Baby had jaundice	23.3	(21.5, 25.3)	29.7	(27.3, 32.3)	25.9	(24.4, 27.4)
Baby given formula when breastfeeding was chosen	6.9	(5.8, 8.2)	10.4	(8.9, 12.2)	13.8	(12.7, 15.1)
Baby needed extra care after birth	11.9	(10.5, 13.5)	16.7	(14.8, 18.9)	8.3	(7.4, 9.3)
Midwife visited at home	52.7	(50.4, 54.9)	68.7	(66.2, 71.1)	59.1	(57.4, 60.7)
Feel adequately supported with care received	55.6	(53.4, 57.9)	69.0	(66.4, 71.5)	61.0	(59.3, 62.6)
Recent birth as a traumatic experience	21.1	(19.3, 23.0)	29.0	(26.6, 31.5)	24.2	(22.8, 25.7)

whether this is provided in a public or a private model [4,31]. In the context of a pandemic, where social support was denied to many people in hospitals, the potential to form trusting relationships in continuity models might have been beneficial for women. Research looking at the impact of MWCOC and MH during the pandemic has likewise shown a protective effect in the first 6-weeks following birth when women are cared for by PPMs, most likely because of relationship based care, but also due to postnatal care continuing for 6-weeks [32].

For the women in this study, the midwifery approach had an amplification effect on outcomes, above and beyond the impact of continuity, with this being particularly evident for those booked with PPMs. We would hypothesise that this might be due to two factors. The first is the midwifery philosophy of care, exemplified in the Lancet Series on Midwifery, and the resulting Quality Maternal and Newborn Care (QMNC) model [33]. In the context of the pandemic, this approach may have been particularly protective, both in terms of physical outcomes and social and psychological outcomes.

The second factor comes from evidence provided from the Queensland (QLD) Flood Study, that likewise showed a protective effect of MWCOC, in key areas that optimise maternal wellbeing and infant development [32]. Whilst higher rates of disaster related stress in pregnancy predicted worse maternal (depression and anxiety) [34] and infant neurodevelopment outcomes [35] in the QLD Flood Study, a buffering effect for women receiving MWCOC was noted. This extended to 6-weeks postnatally for women and 6-months for infants. When mothers received MWCOC, infants also performed better than those in SC with respect to fine motor and problem solving assessments at 6-months of age [35], even when controlling for the severity of flood related hardship.

Analysis of the qualitative data from the largest randomised trial of continuity of midwifery care for all risk women, found that the MWCOC model motivates and enables midwives to go 'above and beyond' in their provision of care, thereby positively impacting clinical and psychological outcomes [36]. This finding was predicated on an intimate and trusting midwife-woman relationship, such that women feel empowered, nurtured and safe. In our study, the home visits up to 6-weeks postnatally, were also observed to happen more frequently for women in the PPM model, and this may also have impacted transition to motherhood.

There were some interesting differences in women being visited at home postnatally in this study (52.7 % in 2020 and 69 % on 2021). Women reported feeling more supported by the care they received in 2021 compared to 2020 and this may have been in part to do with the increased home visits and some easing of the restrictions that were in place in 2020. Midwife home visits varied between models ranging from 22.3 % of women under POB care to 86.4 % under MWCOC. Women were also more likely to feel adequately supported by the care they received under continuity of midwifery care models. The increased number of home visits over an extended period of time (2–6 weeks) received in midwifery models of care is likely to be a factor here. While women in Australia have a longer in hospital stay following giving birth in the private sector, they have less in home postnatal follow up. However, we did not look at length of stay in this study. Around 59 % of Australian women in another national survey expressed concern about a lack of postnatal care during 2020 [37]. Where postnatal care in the home occurred, which is mostly in the public sector, midwives and family health nurses were limited during the pandemic in the time they could spend with mothers and babies [38]. In another national survey of Australian women, nearly 35 % of women received or anticipated receiving postnatal care once at home, but little detail is given about the models of care this occurred under [39].

In Australia in 2020 and 2021 the induction of labour rate was 35.5 % in 2020 and 34.2 % in 2021, which was similar to our findings (34.2 % in 2020; 32.4 % in 2021) [17]. Caesarean section rates were 36.7 % (2020) and 37.4 % (2021), similar to our study (36.7 % in 2020; 36.1 % in 2021) [17]. The spontaneous vaginal birth rate and instrumental birth rate were also similar to our study. However, babies born to women in our study were less likely to be low birth weight or go to SCN or NICU or be born preterm. We had more women over the age of 35 and born in Australia answering our survey than in the national population [17], indicating more socially advantaged respondents.

This paper makes a unique contribution by providing data on birth trauma following births in Australia, which are not routinely collected. With the exception of the public hospital MWCOC model, the fact that women had reduced birth trauma experiences if they received COC from private practitioners (PPMs and PoBs) as opposed to those in the public sector, suggests that there is an additional mechanism operating. We hypothesise that this is due to the level of autonomy offered by expert, regulated, practitioners that are working outside of the standard system, and beyond an employing organisation. This releases them from standardised, routinised systems-based care provision, and enables them to offer authentically tailored care that is specific to the physical, psychological, emotional, spiritual, and cultural needs of the individual woman [23]. When the benefits of continuity, midwifery, and

Table 3
Prevalence, unadjusted and adjusted odd ratios of onset of labour and mode of birth by year of survey and model of care.

Variable	Prevalence (95 % CI)	Unadjusted OR (95 % CI)	Adjusted OR (95 % CI)
Onset of labour			
Spontaneous onset of labour			
Year of survey			
2020	45.7 (43.5, 47.9)	1.00	1.00
2021	51.0 (48.3, 53.7)	1.12 (0.99, 1.28)	1.38 (1.18, 1.62)*
Model of care			
SC	45.5 (42.6, 48.4)	1.00	1.00
GPSC	54.3 (48.1, 60.3)	1.42 (1.11, 1.83)	1.18 (0.90, 1.56)
MWCOC	63.6 (59.7, 67.4)	2.17 (1.80, 2.62)	1.66 (1.35, 2.04)*
POb	32.0 (29.3, 34.9)	0.58 (0.49, 0.68)	0.45 (0.37, 0.54)*
PPM	91.2 (85.7, 94.7)	12.80 (7.70, 21.28)	11.01 (6.29, 19.28)*
Induced labour			
Year of survey			
2020	34.2 (32.0, 36.3)	1.00	1.00
2021	32.4 (29.9, 35.0)	0.91 (0.79, 1.04)	0.76 (0.65, 0.89)*
Model of care			
SC	38.8 (36.0, 41.7)	1.00	1.00
GPSC	33.6 (28.0, 39.7)	0.79 (0.60, 1.03)	0.83 (0.63, 1.11)
MWCOC	28.3 (24.8, 32.0)	0.60 (0.49, 0.74)	0.68 (0.54, 0.84)*
POb	35.2 (32.4, 38.2)	0.91 (0.78, 1.08)	1.05 (0.87, 1.27)
PPM	6.4 (3.4, 11.8)	0.10 (0.06, 1.17)	0.12 (0.06, 0.23)*
Mode of birth			
Vaginal birth			
Year of survey			
2020	52.5 (50.2, 54.7)	1.00	1.00
2021	50.1 (50.2, 54.7)	0.81 (0.71, 0.93)	0.98 (0.83, 1.15)
Model of care			
SC	49.9 (47.0, 52.8)	1.00	1.00
GPSC	49.9 (43.8, 56.0)	1.11 (0.86, 1.43)	1.07 (0.81, 1.42)
MWCOC	67.8 (64.0, 71.3)	2.13 (1.76, 2.57)	1.84 (1.49, 2.28)*
POb	39.0 (36.1, 42.0)	0.65 (0.56, 0.77)	0.54 (0.45, 0.65)*
PPM	81.1 (74.7, 86.3)	4.72 (3.24, 6.86)	3.14 (2.08, 4.73)*
Vaginal birth with forceps or vacuum (instrumental)			
Year of survey			
2020	10.8 (9.5, 12.2)	1.00	1.00
2021	13.7 (12.0, 15.7)	1.24 (1.02, 1.51)	1.03 (0.83, 1.28)
Model of care			
SC	12.8 (11.0, 14.8)	1.00	1.00
GPSC	16.9 (12.5, 22.4)	1.19 (0.83, 1.70)	1.01 (0.69, 1.49)
MWCOC	11.2 (9.1, 13.8)	0.89 (0.68, 1.17)	0.86 (0.63, 1.16)
POb	10.8 (9.2, 12.7)	0.90 (0.71, 1.15)	0.92 (0.70, 1.20)
PPM	9.2 (5.5, 14.8)	0.56 (0.33, 0.96)	0.79 (0.45, 1.40)
Caesarean during labour			
Year of survey			
2020	15 (13.4, 16.7)	1.00	1.00
2021	18.5 (16.5, 20.7)	1.33 (1.12, 1.59)	1.15 (0.94, 1.40)
Model of care			
SC	19.6 (17.4, 22.0)	1.00	1.00
GPSC	19.3 (14.8, 24.8)	0.93 (0.67, 1.28)	0.91 (0.65, 1.30)
MWCOC	12.4 (9.9, 15.3)	0.54 (0.42, 0.71)	0.55 (0.41, 0.74)*
POb	16.1 (14.0, 18.4)	0.81 (0.66, 0.99)	0.86 (0.68, 1.09)
PPM	7.8 (4.8, 12.4)	0.35 (0.21, 0.59)	0.48 (0.28, 0.84)*
Caesarean before labour (elective)			
Year of survey			
2020	21.7 (19.8, 23.7)	1.00	1.00
2021	17.6 (15.8, 19.7)	0.93 (0.79, 1.10)	0.89 (0.73, 1.08)
Model of care			
SC	17.7 (15.6, 20.1)	1.00	1.00
GPSC	13.9 (10.2, 18.7)	0.76 (0.53. 1.09)	0.97 (0.66, 1.41)
MWCOC	8.7 (6.7, 11.1)	0.44 (0.33, 0.59)	0.60 (0.44, 0.83)*
POb	34.1 (31.2, 37.1)	2.24 (1.86, 2.70)	2.65 (2.12, 3.30)*
PPM	1.9 (0.7, 5.2)	0.09 (0.03, 0.25)	0.10 (0.03, 0.31)*

Adjusted for year MOC, demographic factors, obstetric factors and Mental Health risk factors
*Indicates statistical significance.

Table 4
Prevalence, unadjusted and adjusted odd ratios of obstetric and birthing complications by model of care.

Variable	Prevalence (95 % CI)	Unadjusted OR (95 % CI)	Adjusted OR (95 % CI)
Other birth outcomes			
Oxytocin use to augment labour			
Year of survey			
2020	21.7 (19.9, 23.6)	1.00	1.00
2021	29.2 (26.8, 31.7)	1.45 (1.25, 1.68)	1.16 (0.98, 1.38)
Model of care			
SC	28.8 (26.2, 31.6)	1.00	1.00
GPSC	26.4 (21.4, 32.1)	0.93 (0.70, 1.23)	1.01 (0.74, 1.37)
MWCOC	22.6 (19.4, 26.1)	0.70 (0.56, 0.86)	0.73 (0.58, 0.93)*
POb	23.8 (21.3, 26.4)	0.82 (0.69, 0.98)	0.97 (0.79, 1.20)
PPM	8.9 (5.5, 14.2)	0.24 (0.15, 0.40)	0.34 (0.20, 0.57)*
Excessive blood loss			
Year of survey			
2020	9.1 (7.9, 10.4)	1.00	1.00
2021	15.7 (13.9, 17.7)	1.78 (1.46, 2.17)	1.48 (1.19, 1.84)*
Model of care			
SC	15.0 (13.1, 17.1)	1.00	1.00
GPSC	18.2 (14.0, 23.2)	1.24 (0.90, 1.72)	1.24 (0.87, 1.75)
MWCOC	11.1 (8.9, 13.8)	0.68 (0.52, 0.89)	0.65 (0.48, 0.87)*
POb	7.1 (5.8, 8.6)	0.45 (0.35, 0.58)	0.44 (0.33, 0.59)*
PPM	10.4 (6.6, 16.0)	0.61 (0.38, 0.98)	0.64 (0.38, 1.09)
My baby was distressed during labour			
Year of survey			
2020	17.0 (15.4, 18.8)	1.00	1.00
2021	24.3 (22.0, 26.7)	1.43 (1.22, 1.69)	1.16 (0.97, 1.40)
Model of care			
SC	26.2 (23.7, 28.9)	1.00	1.00
GPSC	24.4 (19.6, 30.0)	0.95 (0.71, 1.27)	0.93 (0.69, 1.32)
MWCOC	20.4 (17.3, 23.9)	0.67 (0.53, 0.83)	0.67 (0.52, 0.86)*
POb	13.6 (11.8, 15.8)	0.48 (0.39, 0.59)	0.54 (0.42, 0.68)*
PPM	8.4 (5.3, 13.0)	0.28 (0.17, 0.46)	0.41 (0.24, 0.70)*
Low birth weight			
Year of survey			
2020	3.1 (2.4, 4.2)	1.00	1.00
2021	4.8 (3.7, 6.2)	1.51 (1.06, 2.17)	1.02 (0.62, 1.70)
Model of care			
SC	5.6 (4.3, 7.3)	1.00	1.00
GPSC	2.6 (1.1, 6.4)	0.42 (0.18, 0.99)	0.37 (0.13, 1.05)
MWCOC	2.3 (1.3, 4.0)	0.41 (0.23, 0.73)	0.56 (0.26, 1.18)
POb	3.7 (2.7, 5.2)	0.70 (0.46, 1.04)	0.91 (0.52, 1.62)
PPM	0.5 (0.1, 3.7)	0.11 (0.01, 0.79)	0.64 (0.08, 4.99)

Adjusted for year, MOC, demographic factors obstetric factors and MH risk factors.
*Indicates statistical significance

automatous practice are combined, the outcomes appear to be optimal, unless individual women would prefer an ELC, in which case the POb model would be the best fit according to these findings. Beyond these data, there is evidence that where the woman and the care provider have aligned philosophies of pregnancy, labour and birth, maternal outcomes are improved [30]. Intervention rates however vary depending on the model of care, with women experiencing MWCOC and PPM care having less clinical intervention and those experiencing continuity of POb care experiencing higher rates of intervention [3]. The characteristics of women choosing different models also vary with older, more socially advantaged women giving birth under private models, with striking differences in outcomes between the obstetric and midwifery models.

It is critical to learn the lessons gained during the COVID-19 pandemic. Our findings suggest that current and future maternity services should be designed to optimise relationship-based care with autonomous practitioners, and, for the majority of women, that should be midwifery care. The implementation and sustainability of midwifery-led COC models in Australia, the United Kingdom, and New Zealand has been challenging [40–42], and the vulnerability of these models was further highlighted during COVID. In Australia and the UK, where public MWCOC models were modified, telehealth was increasingly used, and postnatal care was either abandoned, reduced or provided virtually. This all occurred at a time when many women were isolated and desperately needed relational care. Some services were even closed, with MWCOC midwives deployed to provide care in standard service models [43]. These changes must now be questioned with policy reflecting the evidence generated in ours, and other studies, ensuring that they are not

Table 5
Prevalence, unadjusted and adjusted odd ratios of postnatal experiences and outcomes by year of survey and model of care.

Variable	Prevalence (95 % CI)	Unadjusted OR (95 % CI)	Adjusted OR (95 % CI)
Postnatal outcomes			
Baby sent to SCN or NICU			
Year of survey			
2020	13.2 (11.7, 14.8)	1.00	1.00
2021	16.8 (14.9, 18.9)	1.38 (1.15, 1.65)	1.14 (0.91, 1.42)
Model of care			
SC	19.1 (16.9, 21.6)	1.00	1.00
GPSC	13.6 (10.0, 18.4)	0.69 (0.48, 0.99)	0.76 (0.50, 1.16)
MWCOC	9.4 (7.5, 11.9)	0.47 (0.36, 0.62)	0.56 (0.40, 0.78)*
POb	14.9 (12.9, 17.1)	0.79 (0.64, 0.97)	1.01 (0.78, 1.31)
PPM	4.3 (2.2, 8.2)	0.20 (0.10, 0.40)	0.45 (0.22, 0.90)*
My baby had jaundice			
Year of survey			
2020	23.3 (21.5,25.3)	1.00	1.00
2021	29.7 (27.3, 32.3)	1.35 (1.16, 1.56)	1.10 (0.93, 1.31)
Model of care			
SC	28.0 (25.5, 30.7)	1.00	1.00
GPSC	25.6 (20.6, 31.4)	0.84 (0.63, 1.12)	0.95 (0.69, 1.30)
MWCOC	25.0 (21.6, 28.8)	0.76 (0.62, 0.94)	0.93 (0.73, 1.17)
POb	26.6 (24.0, 29.4)	0.96 (0.80, 1.14)	1.17 (0.95, 1.43)
PPM	11.8 (7.9, 17.1)	0.33 (0.22, 0.52)	0.57 (0.36, 0.92)*
My baby needed extra care after birth			
Year of survey			
2020	11.9 (10.5, 13.5)	1.00	1.00
2021	16.7 (14.8, 18.9)	1.48 (1.22, 1.78)	1.32 (1.06, 1.63)*
Model of care			
SC	17.0 (14.9, 19.3)	1.00	1.00
GPSC	14.7 (10.8, 19.8)	0.80 (0.56, 1.14)	0.84 (0.56, 1.26)
MWCOC	12.2 (9.9, 14.9)	0.70 (0.54, 0.91)	0.81 (0.60, 1.09)
POb	11.9 (10.1, 14.0)	0.68 (0.54, 0.85)	0.83 (0.64, 1.09)
PPM	10.2 (6.4, 16.0)	0.47 (0.29, 0.78)	0.82 (0.48, 1.41)
My baby was given formula when I had chosen to breastfeed			
Year of survey			
2020	6.9 (5.8, 8.2)	1.00	1.00
2021	10.4 (8.9, 12.2)	1.64 (1.30, 2.08)	1.38 (1.06, 1.80)*
Model of care			
SC	9.9 (8.2, 11.8)	1.00	1.00
GPSC	8.6 (6.0, 12.2)	1.05 (0.69, 1.61)	1.11 (0.69, 1.79)
MWCOC	6.2 (4.5, 8.6)	0.61 (0.43, 0.88)	0.70 (0.47, 1.04)
POb	9.0 (7.4, 10.9)	0.99 (0.76, 1.31)	1.29 (0.94, 1.75)
PPM	1.0 (0.2, 3.8)	0.10 (0.02, 0.40)	0.19 (0.05, 0.80)*
Midwife visited at home			
Year of survey			
2020	52.7 (50.4, 54.9)	1.00	1.00
2021	68.7 (66.2, 71.1)	1.75 (1.53, 2.00)	1.16 (1.37, 2.01)*
Model of care			
SC	73.0 (70.3, 75.5)	1.00	1.00
GPSC	69.7 (63.8, 75.0)	0.83 (0.63, 1.10)	0.99 (0.71, 1.38)
MWCOC	86.4 (83.6, 88.7)	2.16 (1.70, 2.74)	2.66 (2.00, 3.53)*
POb	22.3 (19.9, 25.0)	0.11 (0.09, 0.13)	0.08 (0.06, 0.10)*
PPM	77.4 (70.9, 82.8)	1.28 (0.90, 1.82)	1.99 (1.29, 3.06)*
Felt adequately supported by the care received			
Year of survey			
2020	55.6 [53.4,57.9]	1.00	1.00
2021	69.0 [66.4,71.4]	1.82 (1.59, 2.09)	1.57 (1.34, 1.84)*
Model of care			
SC	59.0 [56.1,61.9]	1.00	1.00
GPSC	56.2 [50.1,62.2]	0.89 (0.69, 1.14)	0.95 (0.71, 1.27)
MWCOC	72.3 [68.7,75.6]	1.77 (1.46, 2.15)	1.80 (1.44, 2.26)*
POb	56.6 [53.6,59.6]	0.94 (0.80, 1.10)	0.90 (0.75, 1.09)
PPM	67.2 [60.1,73.6]	1.52 (1.11, 2.09)	1.83 (1.27, 2.65)*
My birth was traumatic			
Year of survey			
2020	21.1 (19.3, 23.0)	1.00	1.00
2021	29.0 (26.6, 31.5)	1.44 (1.24, 1.68)	1.32 (1.09, 1.58)
Model of care			
SC	32.5 (29.8, 35.3)	1.00	1.00
GPSC	31.9 (26.4, 37.8)	0.97 (0.74, 1.28)	1.03 (0.76, 1.40)
MWCOC	20.2 (17.1, 23.6)	0.51 (0.41, 0.64)	0.57 (0.45, 0.73)*
POb	17.5 (15.3, 19.8)	0.47 (0.39, 0.56)	0.56 (0.45, 0.69)*
PPM	14.2 (9.7, 20.3)	0.32 (0.21, 0.49)	0.49 (0.31, 0.77)*

Adjusted for year, MOC, demographic factors, obstetric factors, MH risk factors.
*Indicates statistical significance

repeated. However, these changes affected PPMs less as they continued in many cases to provide care as they did pre-pandemic [44]. Our findings provide even more evidence that denying women this MOC is likely to reduce the quality of maternity care and increase adverse clinical and psychosocial outcomes for women and babies.

Strengths and limitations

This survey was distributed via social media and online pregnancy and birth groups, so it may not have been accessible to women with limited computer/digital literacy or with restricted internet access. Respondents identified their own risk factors and care model, and thus there may be recall bias. Perinatal mortality is not examined as all the women responding to the survey had given birth to a live infant. Migrant communities may not be proportionally represented. Despite these limitations, the data provides a unique look at less commonly reported outcomes, including birth trauma, postnatal support, infant feeding and neonatal jaundice. Weighting the data also provided an added strength to the analysis.

Conclusion

This study showed that in a cohort of women responding to a national survey, COC by midwives, especially PPMs, demonstrated the most positive outcomes for women and babies in terms of birth intervention and birth trauma. However, for women who seek, or are not concerned about increased obstetric intervention, private obstetric care also leads to lower rates of birth trauma when compared to standard care. Continuity of care can provide a trusted guide and advocate in times of stress that may have ongoing implications for the physical and psychological wellbeing of mothers and their babies.

Declaration of Competing Interest

None.

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Ethical approval

Ethical approval was obtained from Western Sydney University (#H13825) and Charles Darwin University (#H21052).

AI use declaration

AI not used in the preparation of this work.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the

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References

[1] A. Government, in: D.o.H.a.A. Care (Ed.), The Australian Health System, Australian Government, Canberra, 2025.
[2] N.R. Donnolley, et al., A validation study of the Australian Maternity Care Classification System, Women Birth 32 (3) (2019) 204–212.
[3] H.G. Dahlen, et al., Rates of obstetric intervention and associated perinatal mortality and morbidity among low-risk women giving birth in private and public hospitals in NSW (2000-2008): a linked data population-based cohort study, BMJ Open 4 (5) (2014).
[4] J. Sandall, et al., Are midwife continuity of care models versus other models of care for childbearing women better for women and their babies?, **April 10th**, Cochrane Database Syst. Rev. (2024), https://doi.org/10.1002/14651858.CD004667.pub6).
[5] S. Downe, et al., Provision and uptake of routine antenatal services: a qualitative evidence synthesis, Cochrane Database Syst. Rev. (6) (2019).
[6] I. Kantrowitz-Gordon, Ethics of Midwifery care during the COVID-19 pandemic, J. Midwifery Women'S. Health Aff. 65 (6) (2020) 731–732.
[7] D.L. Hartz, et al., Midwives speaking out on COVID-19: the international confederation of midwives global survey, PLOS ONE 17 (11) (2022) e0276459, https://doi.org/10.1371/journal.pone.0276459.
[8] H.G. Dahlen, B. Kumar-Hazard, M. Chiarella, How COVID-19 highlights an ongoing pandemic of neglect and oppression when it comes to women's reproductive rights, J. law Med. 27 (4) (2020) 812–828.
[9] L. Benova, et al., IMAgiNE EURO: data for action on quality of maternal and newborn care in 20 European countries during the COVID-19 pandemic, Int. J. Gynecol. Obstet. (2022), https://doi.org/10.1002/ijgo.14500.
[10] Z. Bradfield, et al., Midwives' experiences of providing maternity care during the COVID-19 pandemic in Australia, Women Birth 35 (3) (2022) 262–271.
[11] S. Cordey, et al., There's only so much you can be pushed': Magnification of the maternity staffing crisis by the 2020/21 COVID-19 pandemic, BJOG 129 (8) (2022) 1408–1409.
[12] E.C. Collins, et al., Midwives' experiences with PPE during the COVID-19 pandemic: the Birth in the Time of COVID (BITTOC) study, Midwifery 134 (2024) 104016.
[13] E.C. Collins, E.S. Burns, H.G. Dahlen, It was horrible to watch, horrible to be a part of': Midwives' perspectives of obstetric violence, Women Birth 37 (4) (2024) 101631.
[14] E. Collins, et al., Telehealth use in maternity care during a pandemic: a lot of bad, some good and possibility, Women Birth 37 (2) (2024) 419–427.
[15] K.M. Levett, et al., Women's experiences of changes to childbirth and parenting education in Australia during the COVID-19 pandemic: the Birth in the Time of COVID-19 (BITTOC) study, Sexual & Reproductive Healthcare, 100904. https://doi.org/https://doi.org/10.1016/j.srhc.2023.100904, Sex. Reprod. Healthc. (2023) 100904, https://doi.org/10.1016/j.srhc.2023.100904. Sexual & Reproductive Healthcare, 100904. https://doi.org/https://doi.org/10.1016/j.srhc.2023.100904.
[16] H. Keedle, et al., Feeling anxious'- women's experiences of having a baby in Australia during the COVID-19 pandemic using the Voqual real time app, BMC Pregnancy Childbirth 23 (1) (2023) 670, https://doi.org/10.1186/s12884-023-05993-9.
[17] AIHW, Maternal and perinatal outcomes during the 2020 and 2021 COVID-19 pandemic. AustralianGovernment, AIHW, Canberra, 2024.
[18] B. Lequertier, et al., Perinatal depression in Australian women during the COVID-19 pandemic: the birth in the time of COVID-19 (BITTOC) study, Int. J. Environ. Res. Public Health 19 (9) (2022).
[19] A.L. Di Paolo, et al., Prenatal stress from the COVID-19 pandemic predicts maternal postpartum anxiety as moderated by psychological factors: The Australian BITTOC Study, J. Affect. Disord. 314 (2022) 68–77.
[20] J. Zhou, et al., Changes in social support of pregnant and postnatal mothers during the COVID-19 pandemic, Midwifery 103 (2021), 103162-103162.
[21] V. Fallon, et al., Psychosocial experiences of postnatal women during the COVID-19 pandemic. A UK-wide study of prevalence rates and risk factors for clinically relevant depression and anxiety, J. Psychiatr. Res. 136 (2021) 157–166.
[22] S. Crowther, et al., New Zealand maternity and midwifery services and the COVID-19 response: A systematic scoping review, Women Birth 35 (3) (2022) 213–222.
[23] D. Kluwgant, C. Homer, H. Dahlen, Never let a good crisis go to waste": Positives from disrupted maternity care in Australia during COVID-19, Midwifery 110 (2022).
[24] V. Stulz, et al., Midwives providing woman-centred care during the COVID-19 pandemic in Australia: A national qualitative study, Women Birth 35 (5) (2022) 475–483.
[25] B. Lequertier, et al., Pandemic-related prenatal maternal stress, model of maternity care and postpartum mental health: The Australian BITTOC study, Women Birth 37 (2024).
[26] Statistics, A.B.*.o. COVID-19 Mortality by wave*. 2022 16/11/2022 [cited 2025 25th July].
[27] L.L. Peters, et al., The effect of medical and operative birth interventions on child health outcomes in the first 28 days and up to 5 years of age: a linked data population-based cohort study, Birth 45 (4) (2018) 347–357.
[28] H.G. Dahlen, et al., Vaccine intention and hesitancy among Australian women who are currently pregnant or have recently given birth: the Birth in the Time of COVID-19 (BITTOC) national online survey, BMJ Open 13 (4) (2023) e063632, https://doi.org/10.1136/bmjopen-2022-063632.
[29] AIHW, Australia's Mothers and Babies 2019, AIHW, 2021.
[30] H.G. Dahlen, et al., An ethnographic study of the interaction between philosophy of childbirth and place of birth, Women Birth 34 (6) (2021) e557–e566.
[31] H. Pelak, H.G. Dahlen, H. Keedle, A content analysis of women's experiences of different models of maternity care: the Birth Experience Study (BESt), BMC Pregnancy Childbirth 23 (1) (2023) 864.
[32] B. Lequertier, et al., Pandemic-related prenatal maternal stress, model of maternity care and postpartum mental health: The Australian BITTOC study, Women Birth 37 (6) (2024) 101827.
[33] M.J. Renfrew, et al., The Lancet's Series on Midwifery Executive Summary, Lancet (2014) 1–8. **June 2014**.
[34] S. Kildea, et al., Continuity of midwifery carer moderates the effects of prenatal maternal stress on postnatal maternal wellbeing: the Queensland flood study, Arch. Women's. Ment. Health 21 (2) (2018) 203–214.
[35] G. Simcock, et al., Disaster in pregnancy: midwifery continuity positively impacts infant neurodevelopment, QF2011 study, BMC Pregnancy Childbirth 18 (1) (2018) 309.
[36] J. Allen, et al., The motivation and capacity to go 'above and beyond': Qualitative analysis of free-text survey responses in the M@NGO randomised controlled trial of caseload midwifery, Midwifery 50 (2017) 148–156.
[37] Australian College of Midwives, Women's experiences of maternity care at the height of COVID-19. ACM, ACT, 2020.
[38] Department of Health and Human Services, Coronavirus (COVID-19) - Update for Maternal and Child Health Services providers, Department of Health and Human Services, Melbourne, 2020.
[39] A., N. Wilson, et al., Australian women's experiences of receiving maternity care during the COVID-19 pandemic: A cross-sectional national survey, Birth 49 (1) (2021) 30–39.
[40] L. Hewitt, et al., Management and sustainability of midwifery group practice: thematic and lexical analyses of midwife interviews, Women birth J. Aust. Coll. Midwives 35 (2) (2022) 172–183.
[41] A. Hanley, D. Davis, E. Kurz, *Job satisfaction and sustainability of midwives working in caseload models of care: An integrative literature review.* Women and birth, J. Aust. Coll. Midwives (2021).
[42] S. Crowther, et al., Sustainability and resilience in midwifery: a discussion paper, Midwifery 40 (2016) 40–48.
[43] V.M. Stulz, et al., Midwives providing woman-centred care during the COVID-19 pandemic in Australia: a national qualitative study, Women birth J. Aust. Coll. Midwives 35 (5) (2022) 475–483.
[44] C.S.E. Homer, et al., The impact of planning for COVID-19 on private practising midwives in Australia, Women Birth 34 (1) (2021) e32–e37.