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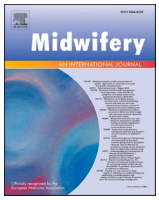

Changes to provision of childbirth education during COVID-19 and its implications for ongoing service delivery – An Australian Survey

Kate M. Levett [a,b,c,d,*], Jack McLean [a], Kerry L. Sutcliffe [a], Hazel Keedle [e]

[a] The University of Notre Dame, School of Medicine, Australia
[b] Collective for Midwifery, Child and Family Health, University of Technology Sydney, Australia
[c] NICM Health Research Institute, and THRI, Western Sydney University, Australia
[d] Translational Health Research Institute, Western Sydney University, Australia
[e] Western Sydney University, School of Nursing and Midwifery, Australia

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ABSTRACT

Background: Childbirth and parenting education (CBPE) programs provide participants with information about pregnancy and labour and have a multitude of positive health impacts. During COVID-19, many CBPE classes ceased or transitioned to an online format, significantly impacting pregnant women across Australia. Little is known about the provision and delivery of CBPE in Australia during the COVID-19 pandemic from the perspective of CBPE educators and hospital managers, regarding its impact on staff and implications for ongoing service delivery.

Methods: The PACS study was an online survey distributed through CBPE networks across Australia, including via Childbirth and Parenting Educators of Australia (CAPEA) and the NSW Parenting, Birth and Early Parenting Education Coordinators Network.

Results: From the 67 responses received, there was a substantial shift toward online delivery, however, there was an overall decrease in the number of classes provided. Respondents reported that CBPE was not prioritised by management during the pandemic, citing increased workloads, and a lack of access to equipment, infrastructure and support. Educators adapted over time, however, the loss of social connection and participant engagement was the main barrier to service delivery and raises concerns regarding ongoing services.

Conclusion: Health systems should ensure there is adequate technological infrastructure, equipment, consultation and support for CBPE to make a positive transition to online and hybrid services and for future proofing delivery. It is essential that greater prioritisation and investment in educator staffing, consultation and training is provided, as well as further research into improving the quality of classes for continued delivery of high-quality education.

Introduction

Problem or Issue	Little research has examined the changes to childbirth and parenting education that occurred during Covid-19 and the implications of ongoing online services. This paper examines these changes from the perspective of educators and service providers.
What is already known	Childbirth and parenting education has demonstrated effectiveness for women's and partners' preparation for birth and early parenting. Changes to online education are becoming widespread, with unknown implications for ongoing services.
What this paper adds	This paper, reporting on the PACS study, explored the changes that occurred in Covid-19 related service shutdowns, from the perspective of educators and service providers, with implications for ongoing online service. Requirements for delivery of high-quality care and the impact of online classes is examined in the light of the birth trauma inquiry findings.

Childbirth and parenting education (CBPE) is an important public health intervention, well embedded into the Australian maternity care system. Australian Government Department of Health guidelines advise

Abbreviations: CBPE, Childbirth and parenting education; CAPEA, Childbirth and Parenting Educators of Australia.

* Corresponding author.
E-mail address: kate.levett@nd.edu.au (K.M. Levett).

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that CBPE programs are effective in providing information about pregnancy, childbirth and early parenting, and recommend clinicians to assist women in selecting appropriate antenatal programs that suit them (Department of Health 2019). However, recent evidence suggests that there is little consistency in recommendations made across Australian guidelines (Ferri et al., 2024), and a recent New South Wales (NSW) Parliamentary Inquiry into birth trauma highlighted the need for comprehensive and standardised CBPE for all prospective parents and support people, due to concerns about availability of evidence-based information, consent for procedures and support for mental health (NSW Parliament 2024).

The provision of CBPE has been found to have positive health impacts on childbearing women, such as increased smoking cessation, healthy nutrition, reduced interventions in childbirth, and improved breastfeeding outcomes (Department of Health 2019; AIHW 2023; Hong et al., 2021). Systematic review evidence suggests that CBPE reduces medical interventions in labour, and that educating pregnant women on the risks of elective induction of labour can increase the rates of normal births (Hong et al., 2021; Simpson et al., 2010). In addition, when antenatal care incorporates psychological preparation, it has been shown to reduce the rate of postnatal depression (Kozinszky et al., 2012; Yasuma et al., 2020). CBPE also provides women with social support, through meeting other parents, and plays a role in connecting families via increasing partner engagement (Spiby et al., 2022; Fabian-Danielewska, 2019; Fabian and Rådestad, 2005).

Evidence suggests that most women access information about labour management, pain relief options, and information about common procedures and interventions via CBPE classes, enabling informed decision making (Nolan, 2021; Henry and Nand, 2004; Declercq et al., 2014). During the COVID-19 pandemic, access to maternity services was severely interrupted, with many forms of healthcare, including CBPE, temporarily ceased or transitioned to online delivery. Findings by the Australian Institute of Health and Welfare, showed there was up to a 20 % decrease in antenatal care services when COVID restrictions were put in place (Australian Institute of Health and Welfare 2021). In total, there were approximately 130,000 fewer antenatal care visits in 2020 when compared with 2019 (AIHW, 2021). Importantly, in an Australia-wide survey, women's access to CBPE was shown to be substantially reduced during the COVID-19 pandemic, which had a large impact on their sense of preparation, isolation and perceived support in during birth (Levett et al., 2023).

Pregnant women were significantly impacted by these restrictions to services, despite some CBPE programs being delivered via an online format. Studies show that during the COVID-19 pandemic, pregnant women wanted greater access to formal supports to provide reassurance during the antenatal period (Meaney et al., 2022). Similarly, a study in Turkey found that the incidence of postpartum depression increased during COVID-19 (Oskovi-Kaplan et al., 2021). However, while there has been some Australian research investigating CBPE during COVID-19 from the perspective of pregnant women (Levett et al., 2023), there is little research from the perspectives of educators, and the implications of this for ongoing service delivery. As antenatal education services in Australia are unregulated, and classes are becoming more diverse in their offerings, (Levett et al., 2023; Levett et al., 2020; Levett et al., 2024), educators may not have resources available to them to easily transition to different formats or content. Educators from the UK have described the impact of a rapid transition to online education as potentially limiting the capacities of the educator to meaningfully engage with parents, and potentially not meeting their educational needs (Nolan, 2021). In Australia, the response from healthcare systems regarding prioritisation and provision of services for women, and the impact on service providers, both inside the health system and as independent providers, is less well understood. This remains an important consideration for health services that are considering retaining an online component to CBPE.

Therefore, it is important to explore how the provision of CBPE in Australia during COVID-19, particularly the transition to online programs, was managed by educators, hospitals and health services. Understanding the barriers and facilitators of service provision and the impact on staff, will help improve the provision of CBPE and to future proof ongoing services, including the meaningful integration of telehealth. This led to the initiation of the *Provision of Antenatal education during Covid-19 Study* (PACS).

Aims

The PACS research study aimed to understand how the COVID-19 pandemic impacted the service provision of childbirth and parenting education across Australia and examined the implications for ongoing service delivery.

Objectives

This research had three objectives:

1. To identify what changes occurred to childbirth and parenting education programs during the COVID-19 pandemic.
2. To identify barriers and facilitators to the provision of online childbirth and parenting education classes.
3. To understand the experience of staff in providing this education, in terms of comprehensiveness and quality of interactions with participants.

Methods

Study design

This retrospective study used a cross sectional online survey to collect data from childbirth and parenting education providers across Australia.

Participants

The survey was sent through CBE networks (as below), with an online link to the Qualtrics site (UNDA). Inclusion criteria to complete the survey included: Maternity Unit Managers, Midwifery Educators and CBPE Educators practising in public or private settings within Australia.

Survey development

The survey questions were designed by the research team in collaboration with members of the Childbirth and Parenting Educators of Australia (CAPEA), who have expertise in research design, midwifery, and childbirth and parenting education. The survey was piloted by 10 educators from the CAPEA network and amendments were made accordingly. These consisted of changes which were typographical, wording and flow of questions. Consent was provided by respondents selecting an online confirmation button after reading the participant information contained in the survey. The survey consisted of 10 sections collecting quantitative and qualitative responses, which included – consent, demographics, work setting, class content pre and post COVID, perceptions of classes, resources required, barriers and enablers and future plans. Response options included limited response (discrete choice), Likert scales and free text responses (qualitative).

Inclusion criteria

Inclusion criteria was any adult within Australia who as part of their usual role provided, coordinated or managed childbirth and parenting education classes, sessions or programs.

Survey distribution

The online survey was distributed Australia-wide via email to CBPE networks, such as the CAPEA membership and NSW Parenting, Birth and Early Parenting Education Coordinators Network (NSWPBEPCNP), via QR code through online social media platforms and researchers' professional networks.

Data collection

Anonymous data was obtained from responses to the online survey via Qualtrics® and stored on the University of Notre Dame Australia's platforms. No identifiable information was requested in the surveys. A total of 67 antenatal educators completed the survey between June and November 2022.

Data analysis

This study used a mixed methods analysis using integrated qualitative responses and quantitative demographic and CBPE related response data from the survey items.

Quantitative and qualitative data integration occurred at the study design, analysis and results stages of the study using a convergent design. This allowed for data to be interpreted in the context of each other (Elo and Kyngäs, 2008; Fetters et al., 2013).

Quantitative data was downloaded from Qualtrics® and entered onto an excel spreadsheet and analysed using Excel and SPSS software. We assessed responses regarding 'content of programs', 'barriers and facilitators' and 'future plans for CBPE classes' using frequencies and percentages. The respondent's perception of online method of delivery of classes was assessed by selection of survey options and free text responses. Qualitative data recorded as free text responses was analysed using the three phases of inductive qualitative content analysis (Elo and Kyngäs, 2008; Hsieh and Shannon, 2005; Mayring, 2015). The three-phase qualitative content analysis method by Elo & Kyngas was adopted; (i) preparation, (ii) organisation, and (iii) reporting (Elo and Kyngäs, 2008; Hsieh and Shannon, 2005; Mayring, 2015). In the preparation phase, open coding was conducted by KL & KS to identify key words, phrases and themes. In the organisation phase, KL & KS refined codes and grouped them according to categories, using NVivo (Nvivo (released in March 2020) [Internet] 2020) for iterative comparison and accuracy with other authors (HK & JM). All open text responses (n = 651) were included in the analysis. Regular meetings supported consensus and ensured data integrity through repeated interpretation checks. In the reporting phase, findings were consolidated, and participant quotes are reported to illustrate findings.

Findings

Participants

Of the 67 antenatal educators who completed the survey, most respondents worked in public hospitals (69 %) with between 1500 and 3000 births per annum (31 %). The majority worked in NSW (70 %) and were mostly working in major cities (67 %), with around a quarter working in a rural setting. There were no respondents from Tasmania or the Northern Territory. Respondents' work characteristics are summarised in Table 1.

The respondents were mainly practicing midwifery CBPE educators and CBPE coordinators. They were mostly in the 50–59 years age group (61 %), of Australian nationality (80 %), with graduate diplomas (37 %).

Changes to CBPE classes

When comparing classes provided before and during the pandemic, we found that face-to-face classes decreased by 30 %, and online classes increased by 46 %. All other classes decreased in availability, except for 'other' (see Fig. 1), which included classes such as post-natal care and next birth after caesarean (NBAC) classes. The occurrence of pre-recorded classes emerged during the pandemic as an offering from hospital providers, and live online classes via social media such as Facebook and Instagram were also offered by independent providers.

Table 1
Respondent Characteristics.

	Characteristic	Frequency (n) (%)
Type of Facility*	Public Hospital	46 (68.7)
	Private Hospital	14 (20.9)
	Community	10 (14.9)
	Independent	5 (7.5)
	Other	3 (4.5)
	Private Midwife	2 (3.0)
Location	Major city	45 (67.2)
	Regional	18 (26.9)
	Rural	6 (9.0)
	Remote	1 (1.5)
Births per annum of facility*	<500	4 (6.0)
	500–1500	7 (10.4)
	1500–3000	21 (31.3)
	3000–5000	16 (23.9)
	>5000	7 (10.4)
	Do not know	3 (4.5)
	N/A	3 (4.5)
Role(s)*	Midwife CBPE	40 (59.7)
	Coord/Manager CBPE	15 (22.4)
	Lactation Consultant	11 (16.4)
	Independent Educator	10 (14.9)
	Physio CBPE	8 (11.9)
	Child & Family Nurse	4 (6.0)
	MUM	2 (3.0)
	Doula	1 (1.5)
	Other	7 (10.4)
State or Territory	NSW	47 (70.1)
	VIC	6 (9.0)
	SA	4 (6.0)
	Not Stated	4 (6.0)
	QLD	3 (4.5)
	ACT	2 (3.0)
	WA	1 (1.5)
	TAS	0 (0.0)
	NT	0 (0.0)

* Some respondents selected multiple responses, so number is greater than respondents.

Barriers and facilitators – technology and support

Barriers to the provision of online CBPE were identified by the respondents, as shown in Fig. 2. The most frequent barrier to *setting up* classes was poor internet connectivity, usually within the health service, which was encountered by 70 % of respondents. Lack of technological experience of educators (49 %), inadequate technological support from health service (35 %) and lack of technological equipment provided (33 %) were also identified as major barriers to setting up online classes.

Barriers to *running* the online program – after setup – were also identified. Lack of technological experience of both educators and class attendees, was reported as the greatest barrier to running the programs (42 %). Other significant barriers included poor internet connectivity (37 %) and inadequate technological support (33 %).

Overall, when combining responses, poor internet connectivity (54 %), lack of technological experience (46 %) and inadequate technological support (34 %) were the most common barriers to setting up and running online CBPE classes.

This study also examined the additional activities and time requirements of antenatal educators. Regarding unpaid extra time required, 58 % of educators agreed that it took more time to fulfill their role, with 51 % of educators indicating that delivery of online classes required 'a lot more' time. When educators were asked about the

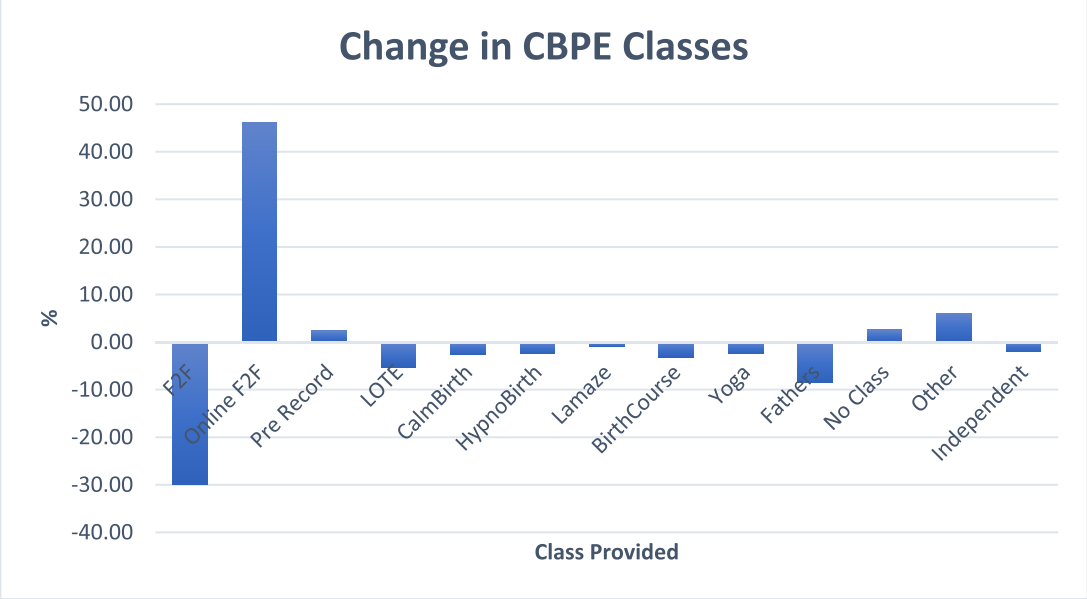

Fig. 1. Changes to classes during Covid-19 pandemic.

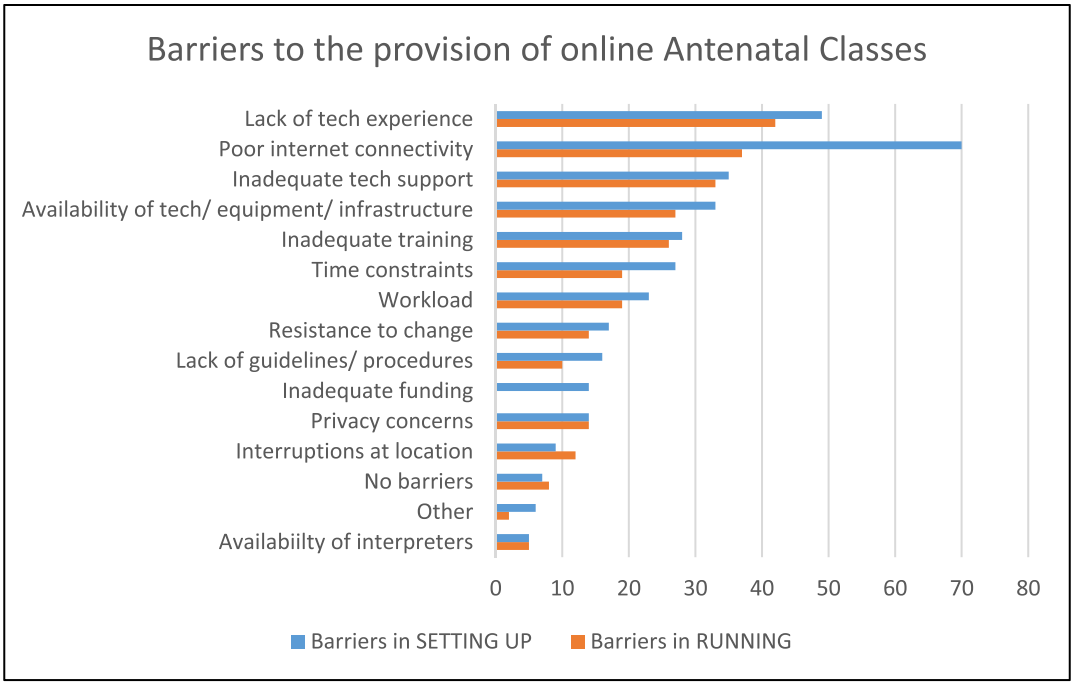

Fig. 2. Barriers to the provision of online Antenatal Classes during COVID-19.

additional activities they undertook in setting up online programs during COVID-19, they reported that; checking technology (73 %), assisting participants with technology (69 %), setting up power point slides (61 %) and finding new resources (58 %) were the most frequently reported additional activities (Fig. 3).

Qualitative content analysis – main categories and subcategories

There were five main categories that described the 651 participant responses to open text questions about what CBPE options were provided during Covid in response to the needs of women and partners, including adaption to policy changes, support from managers and executive, and the barriers and facilitators to delivery of classes. The respondents described how difficult it was initially when the Covid restrictions started.

> *It was a very difficult time for the women, their supports, and staff. I felt terrible when we were unable to provide any education support. I heard distressing stories of women feeling unprepared, unsupported, and having to make decisions they didn't feel equipped to make; or having to make choices or take actions they didn't want to because there was no alternative, or no professional support available to them (R32).*

During the analysis it was clear the responses followed a chronological pattern from the initial changes through to what occurred, how it was managed, the realities of the changes and future planning, as everyone adapted to the new requirements. The results will be discussed

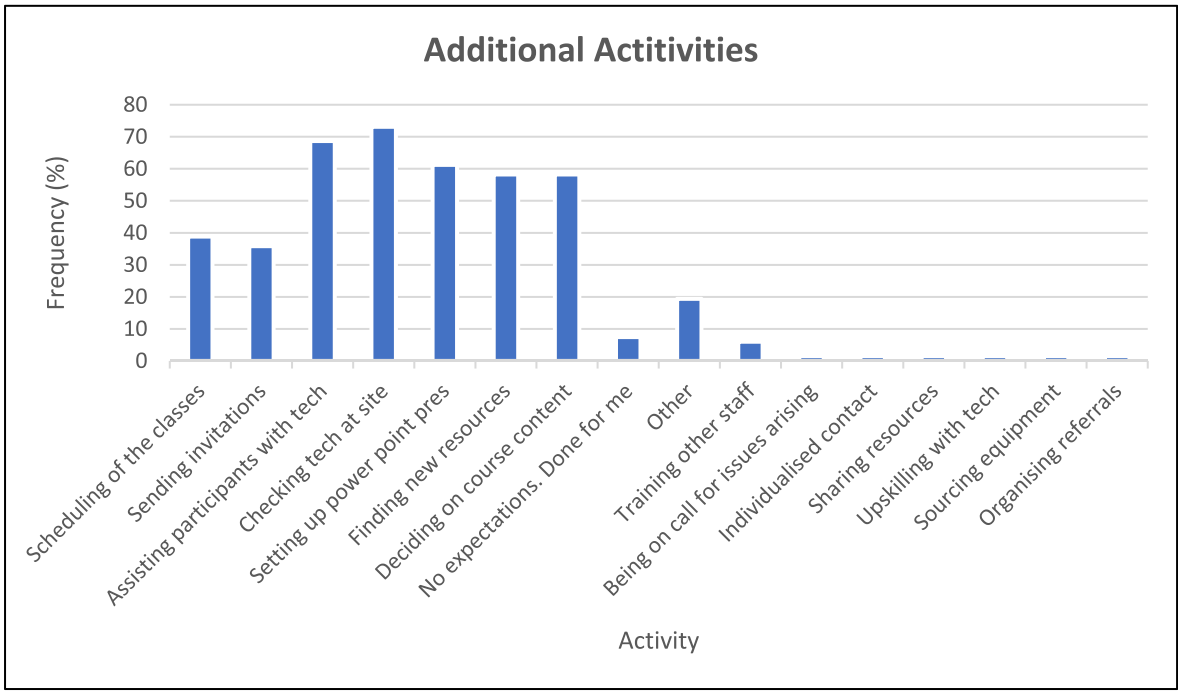

Fig. 3. Additional activities undertaken to set up online CBPE during COVID-19.

under the main categories with descriptions of the subcategories and illustrative comments from the data and Table 2 lists the categories, items of coding and percentage distribution of comments.

What we needed

There were 74 (11 %) of overall comments, included in this category 'what we needed', where CBPE educators described what was required to be able to provide classes during the pandemic. This included having 'I.T. support', and 'time to develop resources'. These sub-categories described educators need for time, support, access to resources and the skill development to make the pivot to online delivery to ensure classes were maintained during Covid.

Designing, developing and training staff in providing online programs. Adapting existing literature and resources to accompany the online programs. Troubleshooting tech issues and logon issues to programs for clients. Designing and developing systems and processes to support client bookings, emailing invitations (R57)

The subcategory 'I.T. support' ($n = 32$, 43 % of the category), broadly describes universal requirements for I.T. support, the concepts of 'access to IT equipment' and having to 'develop IT skills' describes the unique challenges in this environment. Staff who deliver CBPE, as indicated in Table 1, are generally clinicians who conduct education classes face-to-face, and did not generally require IT equipment or skills. The two concepts 'access to equipment' ($n = 9$), to be able begin to develop the resources, and then more commonly reported, was that they need to

Table 2
Content analysis categories framework.

Main Category	No. Quotes $N = 651$	Sub Category	No. quotes	Concept	No. quotes
What we needed	74 (11.3 %)	IT support	32 (43 %)	Access to IT equipment	9
				Develop IT skills	23
		Time to develop resources	42 (57 %)		
What we got	124 (19.1 %)	CBE undervalued	49 (39 %)	Other things took priority	19
				Support systems not in place	30
		Collaboration	32 (26 %)	We did our best	13
				We had to pitch in together	19
		Different audience	22 (18 %)	New audiences	15
				Didn't suit everyone	7
		Someone took ownership	21 (17 %)		
How we managed it	108 (16.6 %)	Reworked content	88 (81 %)	Content was adapted	72
				Made online friendly	16
		Impact on staffing	20 (19 %)	A learning curve	6
				Demanded more	14
The realities of delivering CBE	299 (45.9 %)	Reduced participation	202 (68 %)	Lack of personalisation	40
				Less engaged	67
				Limited scope	62
				Reduced social aspect	33
		Challenging	62 (21 %)	IT issues	22
				Staff under pressure	40
		Convenience	20 (7 %)		
		Little change	15 (5 %)		
Onward plans	46 (7.1 %)	Variety is important	29 (63 %)		
		I saw the benefits it brought us	17 (37 %)		

develop IT skills to be able to produce what was needed. This was reported to be a significant challenge for many of the respondents who listed what barriers were predominantly faced within their hospital.

Prior to COVID all classes were delivered in person. After March 2020 many, many classes had to be delivered online. The content needed to be translated to an online format & the tech had to be navigated along with training all the educators (R31)

'Time to develop resources' ($n = 42$, 57 %), was also reported as a barrier to timely delivery. Given the previous sub-category highlighted issues to do with accessing resources and developing skills, the issue of time became essential. Educators were cognisant that women and partners were waiting on classes being available, and being able to attend the full program, with adequate support, prior to the birth of their baby. Educators stressed that time sequestered from their clinical load was essential to create online programs in a timely fashion, particularly when they were having to develop new I.T. skills to do so.

The content was designed for face to face delivery. It is therefore reasonable to assume that the format needed an overhaul for online delivery. Time/resources did not allow us to do this as well as we would have like (R30)

What we got

In this category 'what we got' ($n = 124$, 19 %), educators described what changed in response to the Covid-related shutdowns, and what they had to do to manage the development and delivery of online classes. They reflected that they felt CBPE was 'undervalued' ($n = 49$, 39 %), which was demonstrated by a lack of equipment and resources being provided by hospital management, specifying in the concepts, that 'other things took priority' ($n = 19$), and that the necessary 'support systems [were] not in place' ($n = 30$).

I think the hospital was too busy with other Covid programs, we felt that we were not a priority (R20).

However, educators and managers noted significant 'collaboration' (32, 26 %) with colleagues and networks to ensure the development and delivery of classes. Educators and managers reported in the concepts, that 'we did our best' ($n = 13$) in developing programs and resources and getting the online delivery going despite the challenges they faced with technology and resources. They described an overall ethos of knowing 'we had to pitch in together' ($n = 19$) if they were going to be able to provide education to women and partners as quickly as needed. The sub-category 'someone took ownership' ($n = 21$, 17 %), described the reality of the situation, as the classes just had to be set up.

NSW parenting and childbirth educators network and CAPEA were both supportive networks providing discussion, some guidance and sharing of resources (R6).

Having a 'different audience' (22, 18 %) meant having to navigate these 'new audiences' ($n = 15$), in facilitating what is essentially a hands-on program, and make it completely online, recognising that while there were pros and cons, it certainly 'didn't suit everyone' ($n = 7$).

There was less connection with the clients and hence lower engagement - we had to work harder to keep them interested and it didn't meet the educational needs for learners with different learning styles (R34).

However, more broadly, respondents also commented on equity of access depending on geographical location, and state government investment in rural/regional health services, as one respondent highlighted;

This period of time has been extremely difficult & challenging. It has highlighted the enormous discrepancy in access to quality care & education that people in regional/rural & remote areas have to essential health services. This is a huge failing of NSW health over many decades & consecutive governments inaction (R39).

How we managed it

In this sub-category, 108 (17 %) respondents described how they managed the transition to online classes. The concepts described the need for 'reworked content' (88, 81 %) for online delivery, which meant that content was adapted ($n = 72$) and 'made online friendly' ($n = 16$). They described how managing the classes had an 'impact on staffing' (20, 19 %), with staff ratios and role definitions changing, impacting those coming from very different baseline positions of skill and confidence, which required 'a learning curve' ($n = 6$) for some, and where educators stated it 'demanded more' ($n = 14$) of them in their role.

Everyone was affected by the pandemic, and antenatal education was part of that. Adjusting to a new way of life as well as online learning was difficult, but people embraced it as they had no other choice. Although the way we delivered the content changed, we were able to provide people with the information they required. (R28)

The realities of delivering CBPE

This category had the most responses (299, 46 %), and described the realities of delivering the classes, once content and systems were sufficiently created and available. Educators continued to find the delivery 'challenging' (62, 21 %), due to ongoing 'IT issues' ($n = 22$) and having 'staff under pressure' ($n = 40$), with the added organisation and administration of classes. However, it was the 'reduced participation' of the women and partners during the CBPE (202, 68 %) which was the main barrier that respondents reported. This continued to hamper the delivery, and the educators identified the main issues contributing to reduced participation, as participants being 'less engaged' ($n = 67$), and having 'limited scope' ($n = 62$) for what they could show or demonstrate or engage with in the classes in the online format. The 'lack of personalisation' ($n = 40$) with participants also made it harder to get to know them and interact. These factors also meant that there was a 'reduced social aspect' ($n = 33$) of the classes.

There was less participation by partners. Some couples stated that it was definitely better then nothing but they felt it was hard to absorb information and were frustrated by technology issues (R33)

Some of the respondents reported that there was 'little change' (15, 5 %) to the delivery of classes, and that the 'convenience' (20, 7 %) aspect was very positive, giving access to people who may previously struggled to attend.

The participants could still learn during COVID lockdowns etc. They did not have to leave their home so it was convenient for them (R5)

Onward plans

As people got used to online arrangements, and many found benefits, the educators were cognisant of how this could be adapted in 'onward plans' (46, 7 %). Some were hesitant about the possibility of online becoming the main delivery in the future and perceived it as merely a cost cutting measure from unsupportive management;

Discouraged, unsupported, frustrated, devalued. Wondering if things will ever go back face to face as it's too convenient for the LHD to run only virtual classes as it's much cheaper staff wise (R29).

However, mostly they thought that having 'variety is important' (29, 63 %) and that they could 'see the benefits it brought us' (17, 37 %);

Yes, I can see that the online option is convenient for some women and partners and I would like to see it continue as an option alongside face to face groups. I would like to survey clients to see which they would prefer. We have over the course of the online journey been very motivated to learn new skills to engage clients and make a safe effective learning

environment and the technology we are using is slightly better so we can now use Zoom and show videos for example (R6)

Discussion

The PACS study aimed to explore changes to CBPE during the COVID-19 pandemic, including the barriers and facilitators to new delivery methods, and to understand the experiences of the staff responsible for providing CBPE. These findings will help to inform the development of improved CBPE education programs for future delivery and ongoing integration of telehealth services. Additionally, in light of the Select Committee's recent findings from the NSW Birth Trauma Inquiry (NSW Parliament 2024), which recommended the need for comprehensive antenatal education, this study provides insights from the perspective of educators, managers and service providers in Australia for the reasonable provision of ongoing CBPE in an online format.

Classes

Currently, there is no prior research that investigated the type and delivery of CBPE classes that were provided during COVID-19 in Australia. However, the Birth Trauma's Inquiry found that in general antenatal education is inadequate in its current content and availability, and one of its main recommendations is for increased access and minimum standards for content (NSW Parliament 2024). The Australian Institute of Health and Welfare's report on Antenatal care during COVID-19, which is not inclusive of CBPE, found that there was a reduction in Medicare benefit claims for antenatal care, with 136,000 fewer antenatal care visits in 2020 compared with 2019 (Australian Institute of Health and Welfare 2021). Reduction of antenatal care services resulted in fewer opportunities for education within routine antenatal care, as well as reduced CBPE class provision, compounding the impact for women. In fact, a survey on Australian women's maternity care experiences during COVID-19 (Wilson et al., 2022) found that while 77 % of women were able to access antenatal care services, only one-third-of women accessed CBPE classes during COVID-19, suggesting that CBPE may have been more severely impacted. Indeed, our data supported this notion as it showed a similar decrease in the overall number of classes provided during COVID-19 when compared to pre-pandemic. Previous Australian research investigated changes to CBPE in Australia during Covid, from women's perspectives. The findings indicate that the majority of women experienced changes or cessation of classes, which left them feeling isolated and unprepared for birth, as well as having an impact on their experience of birth and parenting (Levett et al., 2023).

This study also found a change in the types of classes provided during COVID-19. Unsurprisingly, results showed a shift from face-to-face programs towards online delivery. Research also indicates that the long delay in getting classes on an online platform meant that many women missed out altogether (Meaney et al., 2022; Wilson et al., 2022). Despite this trend toward loss or reduction of services, previous data illustrating how this change in format occurred was not available, and until now remained largely anecdotal (Pascuzzi, 2020) (Wilson et al., 2022; Stulz et al., 2022; Atmuri et al., 2022). The significant changes that occurred with CBPE classes resulted from strict requirements from state issued social distancing and isolation rules that were introduced during the pandemic, as well as the inclusion of pregnant women in the high-risk category, which would have made face-to-face antenatal classes virtually impossible (NSW Ministry of Health 2022).

Except for online classes, our data showed a decrease in all types of classes provided, including a substantial decrease in 'other' classes such as those in languages other than English and father's classes, highlighting the potential for these group to be at a further disadvantage. This may be due to the incompatibility of certain aspects of these classes to adapt to an online format, which has been expressed as a difficulty encountered by some educators in previous research (Nolan, 2021).

It is important to consider the likelihood that online classes will play a more prominent role in CBPE in the future (Nolan, 2021), evidenced by the Australian Government Department of Health and Aged Care $106 million investment to ensure the continuation of telehealth services beyond the COVID-19 pandemic (Australian Government Department of Health and Aged Care 2021). There is a need to ensure that funding extends to supporting CBPE across Australia, for women from all language groups, geographical regions and access capacities, to ensure that health inequities are not further compounded by a lack of funding for childbirth and parenting education.

Barriers and facilitators

The most reported barriers in this study highlighted issues with technology, mainly relating to hospital services and the lack of prioritisation of resources. These included poor internet connectivity, inadequate technology, a lack of technological experience, and the increased, and sometimes unpaid, time to develop the programs. Additionally, more than one-third-of respondents listed equipment such as computers, meeting software, cameras, microphones and a quiet room as required resources that were lacking. There is no overarching guide as to the minimum requirements for setting up a telehealth system in Australia, let alone one specific for CBPE classes. The NSW Health Telehealth Framework and Implementation Strategy (NSW Ministry of Health 2022) states that it is the responsibility of eHealth NSW and local health districts to fund the development, operation and maintenance of telehealth. There is no prior research that has investigated the infrastructure barriers experienced in setting up online antenatal classes, however, access to affordable technology is described as a barrier to care for on telehealth across Australian primary health care (Jonnagaddala et al., 2021). Additionally, we found there were different technology barriers to setting up classes, as opposed to running the classes. The majority of respondents (77 %) experienced poor internet connectivity as a barrier to setting up the classes, while only about a third (37 %) found it a barrier after set-up. This may suggest inadequate hospital infrastructure, with usage that initially outpaced capacity, and a reluctance from administration services to remedy connectivity issues. This could be from WiFi access, ethernet ports or other internet services that were potentially unable to cope with internet use from staff using voice and video streaming (Kluwgant et al., 2022). All other barriers showed a $<$10 % difference when comparing setting up and during the delivery of online antenatal education classes.

A lack of evidence-based guidelines was also reported as barriers, which has also been found in other Australian research (Bradfield et al., 2021). However, in our study a lack of guidelines was only reported as a barrier by small number of educators (16 %). In a review of Australian antenatal guidelines, there is a distinct lack of consistent and comprehensive recommendations for CBPE in guidelines across all states and territories (Ferri et al., 2024). It is also possible that requirements for rapid changes to guidelines and procedures were more pressing and time consuming in the hospital maternity wards and clinics, rather than in CBPE classes, or perhaps that the antenatal educator working environment normally lends itself to more autonomy.

In terms of facilitators, most educators reported that having access to technology was a facilitator to program delivery. This finding is not surprising, given that a lack of technology was found to be such a major barrier. Other facilitators such as written procedures and sharing of resources have also been reported in our study as well by midwives in an Indonesian study on maternity care during COVID-19 (Hazfiarini et al., 2022).

Engagement and experiences of class delivery

Navigation of practical aspects of classes was also reported as

problematic including the difficulty of demonstrating and practicing hands on techniques. Other research has also highlighted educators' difficulty with physical skills and positioning (Nolan, 2021). In addition, Australian midwives have reported that lack of touching and the ability to be hands-on caused challenges with antenatal care (Stulz et al., 2022). However, the main challenge reported by educators lay in the difficulty of engagement of participants, with some finding the class structure to be discouraging. Nolan and colleagues (2021) also report that educators found online antenatal education to be difficult in creating a connection with participants. These researchers conducted interviews with antenatal educators in the United Kingdom, who reported difficulty in "creating relationships" with women during classes. Equally, Stulz et al., (2022) explored the experiences of midwives during COVID-19 and found midwives reported "they had lost an important connection with women" (Stulz et al., 2022).

Evidently, most educators in our study found online programs to be less interactive, and for ongoing delivery of online services, this will have impacts on women and their partners into the future. Educators reported an adaption over time and substantial collaboration and skill development, with some positive aspects to online classes such as increased convenience in attendance from home and access for geographically isolated women. However, more barriers were identified with decreased attendance, lack of social connections, and a lack of ability to demonstrate essential physical skills. However, the lack of engagement of participants was the main issue reported overall, which has implications for women's and educators' sense of support and satisfaction, potentially leading to poorer outcomes overall. Australian research investigating women's experiences of CBPE during COVID-19 found that while women reported some benefits to online classes, such as convenience and a broader choice, mostly they found the online provision to be unsatisfactory, and would at best support hybrid classes (Levett et al., 2023). There is a temptation to continue to provide online learning past the acute need during the pandemic, due to the cost and time benefit for hospital management. However, the importance of retaining at least some portion of in-person classes for skill development, support and participant engagement, which is underscored by the experiences of women and educators, cannot be overstated.

Limitations

There were some limitations surrounding study design that may have impacted the results of this study. The survey may reflect the majority views of NSW participants, or the more frequent older respondents, and those from predominantly from the public service. Additionally, the lack of responses from Tasmania and the Northern Territory may have resulted in missing essential information about services from those states or territories. Without a widely accepted tool available for use as the questionnaire, survey questions were designed using researcher knowledge and expertise as well as stakeholder engagement. This may have resulted in a few discrepancies in the questions, making interpretation more difficult. The lack of younger respondents may have skewed the results towards reporting issues with technology, however, this may also be reflective of the current workforce demographic. Therefore, the use of a convenience sample may limit the generalisability of the research.

Conclusion

Significant changes occurred to the provision of CBPE during the pandemic in Australia, with the majority of classes going to an online format. Many of these changes have persisted beyond the initial crisis, however, the lack of prioritisation of CBPE by hospital management has meant significant challenges associated not only with returning to face-to-face, but with ongoing access to technology, digital infrastructure and skill development, which have implications for work requirements. The recent findings from the NSW Inquiry into Birth Trauma recommends access to comprehensive CBPE for all women and support people, to mitigate concerns around lack of information, consent practices and medical interventions in the perinatal period. This study highlights the loss of social connections and engagement of participants as the main consideration of educators with concerns over the long-term reduction in attendance, and the impact for women as well as staff by continuing with an online format. Considering that online classes are likely to continue in some hybrid format, regardless of the pandemic, it is imperative that CBPE programs be improved. Cost effectiveness alone, should not be the driver of pivoting to online education. Quality online classes should be developed in consultation with researchers, educators, consumers and policy makers, to prevent a reduction in the quality of CBPE in the future.

Statement

The article is the authors' own original work.

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Ethics declaration

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CRediT authorship contribution statement

Kate M. Levett: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Jack McLean:** Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Formal analysis, Data curation. **Kerry L. Sutcliffe:** Writing – review & editing, Visualization, Validation, Supervision, Software, Resources, Methodology, Data curation, Conceptualization. **Hazel Keedle:** Writing – review & editing, Validation, Supervision, Project administration, Investigation, Formal analysis, Data curation.

Declaration of competing interest

All authors declare that they have no conflicts of interest to disclose.

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