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'. . . you can't work singular when you're working with families': co-creating strategies for fetal alcohol spectrum disorder prevention and support with an Aboriginal and Torres Strait Islander primary healthcare service: a baseline mixed methods study

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ABSTRACT

Background. Community controlled Aboriginal Medical Services (AMS) lead the way in addressing the health needs of Aboriginal and Torres Strait Islander peoples. If appropriately resourced, AMSs are inherently well-placed to address prenatal alcohol exposure (PAE) and fetal alcohol spectrum disorder (FASD). The Strong Start, Bright Future project and a regional AMS co-created culturally-informed approaches to address PAE and FASD. This study reports baseline findings and proposed strategies for the implementation phase of the project. **Methods.** Using Indigenous and Western mixed methods, this study centred staff and Aboriginal and Torres Strait Islander community voices, knowledges and priorities through yarning. Questionnaires and a chart audit sought broad insights into staff knowledge, attitudes and practices. Yarns were analysed using Dadirri and narrative analysis, and questionnaire and chart audit results were summarised numerically (descriptive statistics). All findings were integrated to produce proposed service-specific implementation strategies. **Results.** Findings revealed the strengths of Aboriginal and Torres Strait Islander relational and trust-building approaches, particularly within AMS community outreach services that foster connections with Aboriginal and Torres Strait Islander women in the community, facilitating access to PAE and FASD-related knowledge and services. However, clinical staff knowledge gaps, misconceptions, inconsistent practices and unclear diagnostic referral pathways were barriers to service access. Guided by Aboriginal and Torres Strait Islander community and staff knowledge and priorities, proposed strategies were multifaceted, including whole-of-service training, community learning opportunities, family-centred care and culturally safe messaging. **Conclusions.** The Aboriginal and Torres Strait Islander community and outreach staff knowledge featured in this research highlights the strengths of Aboriginal and Torres Strait Islander approaches for addressing PAE and FASD, and provides essential guidance informing safe and culturally responsive PAE and FASD services for Aboriginal and Torres Strait Islander peoples.

Keywords: Aboriginal Medical Services, community-led, cultural safety, fetal alcohol spectrum disorder, indigenous approaches, prenatal alcohol exposure, prevention, strengths-based.

Introduction

Aboriginal Medical Services (AMS) were the first Aboriginal Community Controlled Health Organisations, established in 1971 to address the health needs of Aboriginal and Torres Strait Islander peoples through integrated, holistic and culturally centred care (Khoury 2015). AMSs play a fundamental role in decolonising health care by offering responsive services to meet the unique social, cultural, and environmental contexts of local Aboriginal and Torres Strait Islander (hereafter respectfully referred to as Indigenous) communities.

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Using culturally-centred and strengths-based approaches, AMSs are inherently well-positioned to address the complexities of alcohol consumption during pregnancy, and raise awareness that prenatal alcohol exposure (PAE) of the fetus *in utero* can cause fetal alcohol spectrum disorder (FASD; Williams *et al.* 2024).

FASD is a diagnostic term for the lifelong effects of PAE on the fetal brain and body (Reid 2018). The effects of PAE on the brain can impact learning, memory, attention, communication, emotional regulation and social interactions, and can co-occur with other neurodevelopmental disorders, including autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD; Clark *et al.* 2024). However, there is accumulating evidence that PAE can impact multiple organ systems with higher rates of cardio-renal, immune, reproductive and metabolic dysfunction among individuals diagnosed with FASD compared with the general population (Vanderpeet *et al.* 2025). This highlights the importance of accurate diagnosis of FASD to facilitate appropriate ongoing assessments, treatments and support, including access to the National Disability Insurance Scheme (NDIS; Stubbs *et al.* 2024).

Globally, FASD is estimated to affect 7.7 out of 1000 children and young people, and it is 10 to 40 times higher in specific populations, such as children in out-of-home care, correctional services and special education settings (Lange *et al.* 2017). Although the actual prevalence of FASD in Australia is unknown, studies show high rates of PAE, with 48% of people reporting alcohol use at any time during pregnancy (Young *et al.* 2022). Alcohol use during pregnancy, and at any time in the life cycle, can have broad detrimental effects and is a significant public health concern across Australia (NHMRC 2020).

Despite the prevalence of FASD, prevention, diagnostic, and support approaches are under-resourced and inconsistently available, and there continues to be misinformation among health and social service professionals (Reid 2018; Lyall *et al.* 2021). Additionally, there are complex and intersecting social and structural factors that contribute to high PAE rates, including trauma, domestic violence, and systemic inequities in housing, employment, health service access and income (Reid *et al.* 2021; Holland *et al.* 2023). For Indigenous peoples, the ongoing impacts of colonisation, including intergenerational trauma, violence and dispossession, are central to understanding alcohol use during pregnancy among Indigenous women today (Hewlett *et al.* 2023). Nevertheless, alcohol use in pregnancy is often framed as a matter of individual responsibility (Lyall *et al.* 2021), a narrative that undermines access to antenatal care, and adversely affects maternal and child health outcomes (Hewlett *et al.* 2023).

Indigenous culturally-centred health approaches are inherently strengths-based, incorporating the critical importance of an individual's connection with family, friends, community and culture in promoting health (Verbunt *et al.* 2021; Biles *et al.* 2024). Utilising these strengths inherent in the AMS setting, the Strong Start, Bright Futures project was formed in partnership with a regional AMS to co-create culturally informed, and service-wide approaches to PAE and FASD prevention and support. Here, we report on the first phase of the project, which aimed to identify a suite of PAE and FASD prevention and support strategies informed by the priorities, knowledge, experiences, and strengths of the health service and local community.

Methods

Setting

This research project was led by the Carbal Outreach Team and co-created with staff across Carbal Medical Services, an AMS providing services to Indigenous peoples in the Darling Downs, Southern Downs and Goondiwindi regions of southern Queensland, Australia. Carbal's team includes GPs, Aboriginal Health Workers (AHWs), nurses, allied health professionals, visiting specialists and addiction support services. Carbal also provide NDIS access and support, chronic disease management, and community outreach services. Carbal serves nearly 6000 patients annually, including approximately 100 births (Carbal Medical Services 2025).

Indigenous community governance, ethics and researcher reflexivity

The traditional Western framework for defining qualitative rigour is not applicable to Indigenous research, which must be led by Indigenous research methodologies that centre Indigenous ways of knowing, being and doing (Kennedy *et al.* 2022). Therefore, as Indigenous and non-Indigenous authors committed to decolonising research, Carbal AMS control over each research stage was prioritised. Following community endorsement by the Carbal AMS Board of Directors, a Research Governance Committee consisting of senior Carbal leadership from across the AMS was formed to oversee the project (Carbal Advisory Group [CAG]), and was regularly consulted. Carbal research officer, KS, played an integral role supporting the researchers to establish relationships with Carbal staff and community members. An academic guidance group consisting of Indigenous and non-Indigenous experts from across Australia and Canada supported the project. Carbal leadership and research team members (including authors CR, JC, KS) and a non-Carbal Indigenous author (NH) provided cultural guidance, which was crucial, given that the non-Indigenous researchers (VL, DA, LW, VS, KL, PA, KL and NR) do not have living experiences of local Indigenous community life, culture and impacts of colonisation, including systemic racism. Carbal AMS is referred to as AMS hereafter. The study was approved by the University of Queensland Human Research Ethics Committee (2021/HE001203).

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Research approach and design

A baseline mixed methods study collects qualitative and quantitative data at the beginning of a project to understand conditions before implementing an intervention. This mixed methods research used a strengths-based, trauma- and equity-informed, relational approach, grounded in respect to promote wellbeing and self-determination (Wolfson *et al.* 2019). The use of both Indigenous and Western quantitative and qualitative methods enabled the study to capture broad perspectives. The quantitative component included a staff questionnaire and audit of electronic medical records of AMS clients who had been pregnant in the past 2 years. The qualitative component used yarning and narrative analysis to explore PAE/FASD-related knowledge and priorities in a culturally safe manner (Hewlett *et al.* 2023). Yarning is an Australian Indigenous cultural practice underpinned by an exchange of knowledge and stories (Atkinson *et al.* 2021). When approached with openness, honesty, two-way sharing, cultural humility, and deep listening and critical reflexivity, yarning can foster relationships trust, and knowledge sharing. Importantly, yarning can decolonise research by sharing power (Atkinson *et al.* 2021). To guide a practice of deep listening during the yarns, guidance was sought from the practice of *Dadirri* – a gift from the Ngan'gikurunggurr and Ngen'giwumirri languages of the Aboriginal peoples of the Daly River region (Northern Territory, Australia) (West *et al.* 2012). Dadirri involves listening from a quiet place of still awareness. Narrative research constructs meaningful and accurate descriptions of people's stories and life events (Bengtsson and Anderson 2020). The quantitative and qualitative components of the study were then integrated to produce the recommended prevention and support strategies.

Quantitative component

Staff questionnaire

The staff questionnaire comprised 34 questions to assess respondents' PAE/FASD knowledge, attitudes, awareness, exposure and current work practices (see Supplementary File S1). The questionnaire was adapted from a previous instrument used to assess outcomes of an Indigenous community FASD workshop (Reid *et al.* 2021). The questionnaire was reviewed and endorsed by the CAG before data collection. Hardcopies were distributed to all AMS staff in June 2021, and completed questionnaires were returned anonymously in a sealed envelope for analysis. To maintain confidentiality, demographic data collection was limited to staff roles and employment duration. An open-ended question invited participants to identify their FASD-related learning needs.

Electronic medical record audit

Carbal AMS collects and stores electronic health and medical data for a range of purposes, including research, with the consent of the client. The electronic medical record audit aimed to assess antenatal care at the AMS. Adapted from the One21seventy Maternal Health Clinical Audit (Menzies School of Health Research 2014), the main items included brief interventions, advice on health-related behaviours and social risk factors, and screening and follow up for emotional and social wellbeing (see Supplementary File S2).

In March 2022, records of $n = 44$ women who received antenatal care at the AMS and had infants aged 2–14 months were randomly selected from a total of $n = 88$ charts using computer-generated numbers. VL conducted the audits with AMS staff. A clinical service was considered 'delivered' if recorded in the electronic medical record according to antenatal/postnatal care guidelines.

Data analysis

Data were entered into an Excel spreadsheet and imported into Stata (StataCorp 2023) for analysis. Categorical variables were reported as frequencies and percentages, and continuous variables reported as medians and interquartile ranges.

Qualitative component

Participants and recruitment

AMS research assistant KS applied a 'critical case sampling' approach (Patton 2014), leveraging her local relationships and community knowledge to identify and invite participants. We aimed to include a diverse group of Indigenous and non-Indigenous AMS staff, as well as community members of various ages, genders and professions. KS selected individuals whose experiences could provide valuable insights into the enablers and barriers to healthy, substance-free pregnancies. In total, KS invited 13 AMS staff members (6 Indigenous) and seven Indigenous community members who live locally, with all consenting to participate.

Data collection

To build trust and rapport, the yarns, involving KS and VL, began with social conversations about each other's lives and community connections. KS played a crucial role in supporting connectedness and safety for the yarns to proceed. The discussions naturally progressed to the research topic, focusing on healthy, substance-free pregnancies. VL and KS occasionally asked prompting questions to support the yarns.

Yarns lasted between 40 and 75 min (average 60 min). All but one yarn were conducted face-to-face at an AMS facility, participants' homes or a local café. One session occurred via Zoom due to COVID-19 restrictions. With participants' consent, yarns were audio recorded and transcribed verbatim. VL de-identified transcripts to protect participants' privacy and confidentiality before sharing with the research team. Participants received a A$30 gift voucher.

Data analysis

Data were analysed using narrative thematic analysis, and an inductive approach was used to create codes representing

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meaningful features within each yarn to privilege participants' voices. Codes were then grouped to identify overarching story themes (Bengtsson and Anderson 2020; Ahmed *et al.* 2025). Researchers critically reflected on their interpretations, considering power imbalances, and cultural, social and historical contexts (West *et al.* 2012; Wilson 2014). This process was supported by using the practice of Dadirri to deeply listen to what was being shared and not shared within the yarns, along with personal inner responses to the stories shared (West *et al.* 2012).

Using NVivo 14 (QSR International Pty Ltd 2023), VL identified story themes, which were reviewed and revised by DA until agreement was reached. VL then presented the draft themes to KS for feedback and to the CAG for approval. Before finalisation, the CAG reviewed and approved the findings.

Results

Quantitative component

Staff questionnaire

Questionnaires were completed by 35 of the 78 AMS staff members (45% response rate). Respondents had a median employment duration of 2 years, ranging from <1 year to >10 years. Employee roles were defined broadly to ensure participant anonymity, and included administrative and support coordination (35%, $n = 12$), and clinical (39%, $n = 14$) and community outreach (15%, $n = 5$).

In response to questions on FASD knowledge and awareness, 89% ($n = 31$) of participants had heard of FASD, although self-rated knowledge was limited, with 23% ($n = 8$) reporting none/very little knowledge, and 69% ($n = 24$) reporting some to medium knowledge. Fig. 1 provides information on the remaining knowledge and awareness questions that were reported as true, false or unsure. The majority of participants either believed people with FASD had sentinel facial features (43%; $n = 15$) or were unsure about this (37%; $n = 13$). Although 79% ($n = 27$) knew prenatal alcohol exposure could impact brain development, over one-third of participants 36% ($n = 12$) were not aware FASD can affect educational and employment outcomes.

Table 1 presents the beliefs and practices regarding FASD diagnosis and support. Most staff (71%, $n = 25$) believed a FASD diagnosis was helpful, 44% ($n = 15$) felt somewhat competent to provide services to affected children and families, 40% ($n = 14$) had worked with a child diagnosed with FASD, and 40% ($n = 14$) were unsure about referral options for assessment and FASD diagnosis.

Fig. 2 presents responses on alcohol use in pregnancy. Nearly all participants (94%, $n = 31$) believed FASD was preventable, but one-fifth 20% ($n = 7$) did not know that women should avoid alcohol at all stages of pregnancy. Additionally, one-quarter of staff (25%, $n = 8$) were unsure of men's roles in FASD prevention.

Fig. 3 presents FASD prevention practices currently implemented by staff. Just over half of staff (51.4%, $n = 18$) routinely asked women of reproductive age about alcohol use

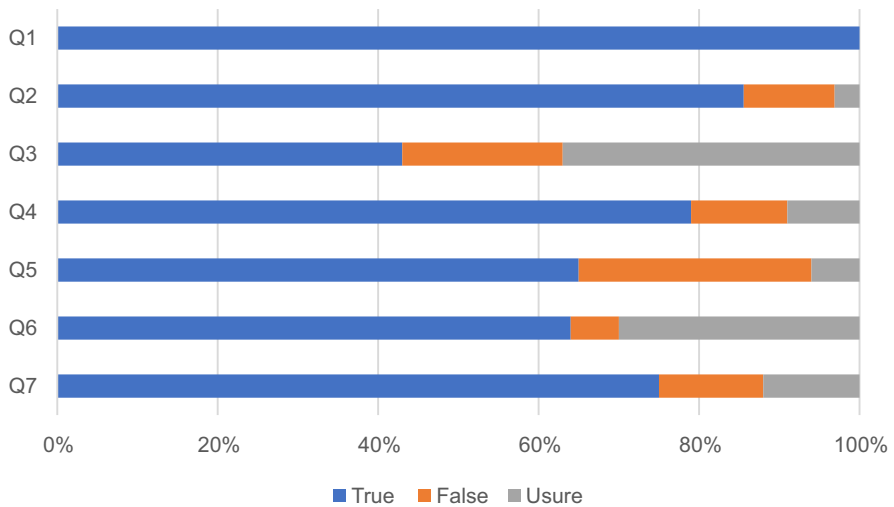

Fig. 1. Staff knowledge and awareness of FASD. Q1 – FASD is caused by being exposed to alcohol during pregnancy ($n = 35$), correct = true. Q2 – FASD is a permanent, life-long condition ($n = 35$), correct = true. Q3 – All people with FASD have the characteristic facial features ($n = 35$), correct = false. Q4 – Exposure to alcohol before birth causes brain damage ($n = 34$), correct = true. Q5 – A FASD diagnosis relies on knowledge of alcohol consumption by the birth mother during pregnancy ($n = 34$), correct = true. Q6 – People with FASD typically have lower educational and employment outcomes as people without FASD ($n = 33$), correct = true. Q7 – Early diagnosis of FASD reduces the risk of comorbidities ($n = 32$), correct = true.

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Table 1. Beliefs and current practices regarding FASD diagnosis and support.

Variable	*n*	Frequency (%)
Belief about the helpfulness of diagnosing someone with FASD	35	
Helpful		25 (71.4%)
Unhelpful		9 (25.7%)
Not sure		1 (2.8%)
Self-rated competence in providing services to children and families affected by FASD	34	
Competent		15 (44.1%)
Incompetent		12 (35.2%)
Not applicable		7 (20.6%)
Experience in working with a child who has been diagnosed with FASD	35	
Yes		14 (40.0%)
No		5 (14.3%)
Not sure		11 (31.4%)
Not applicable		5 (14.3%)
Experience in referring a child for a FASD assessment and/or diagnosis	35	
Yes		2 (5.7%)
No		26 (74.3%)
Not applicable		7 (20.0%)
Experience in working with children who may have FASD, but were unsure of what to do or referral options	35	
Yes		14 (40.0%)
No		14 (40.0%)
Not applicable		7 (20.0%)

and almost one-third (31.4%, $n = 11$) provided information about associated risks. However, only 14.3% ($n = 5$) of staff always provided men with information about alcohol risks. Similarly, just under half of staff (45.7%, $n = 16$) always provided contraception information to women, but only 17.6% ($n = 6$) did so for men.

Chart audit

The audit of 44 randomly selected charts showed a median maternal age of 27 years (range 17–40 years), with 59% of women aged in their 20s (see Table 2). Most women (86%, $n = 38$) attended their first antenatal visit in the first trimester, and the median gestational age at birth was 38 weeks (range 30–40 weeks). During first trimester visits, discussions about alcohol use were documented for 90% of women ($n = 34$), and of these, 68% ($n = 26$) documented having informed the woman of potential risks of alcohol during pregnancy. AUDIT C is a validated tool to screen for alcohol use in pregnancy, which is incorporated into the pregnancy health record (red book). Screening was used with nearly three-quarters of cases (74%, $n = 28$) in the first trimester, 7% ($n = 3$) in the second and none in the third trimester.

Qualitative component

Research yarns were completed with 20 individuals: 13 local Indigenous community members (including six AMS staff members: four AHWs, a NDIS coordinator and a receptionist) and seven non-Indigenous staff members (GPs, midwives, allied health and community outreach staff).

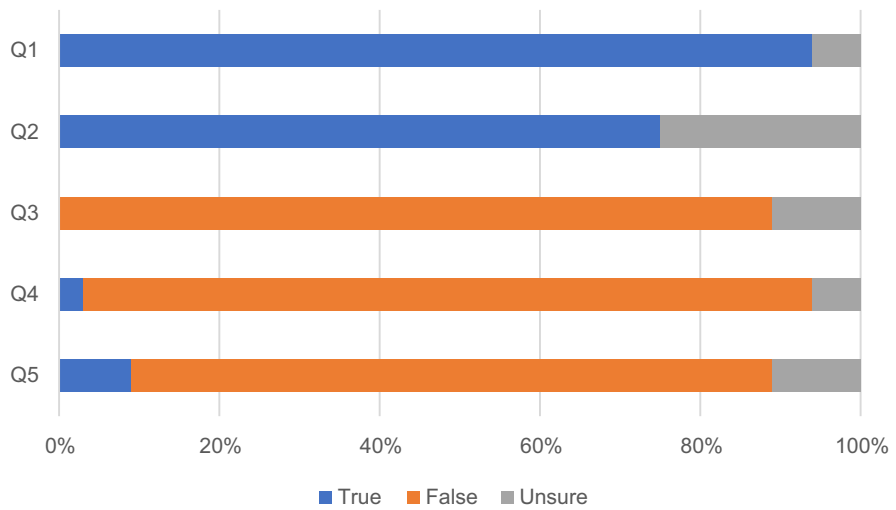

Fig. 2. Knowledge and beliefs about FASD prevention. Q1 – FASD is preventable ($n = 33$), correct = true. Q2 – Men have a role in FASD prevention ($n = 32$), correct = true. Q3 – Beer or wine are less harmful to an unborn child than spirits ($n = 35$), correct = false. Q4 – The placenta protects the unborn baby from alcohol exposure ($n = 35$), correct = false. Q5 – Pregnant woman can drink a little alcohol at any time during their pregnancy ($n = 35$), correct = false.

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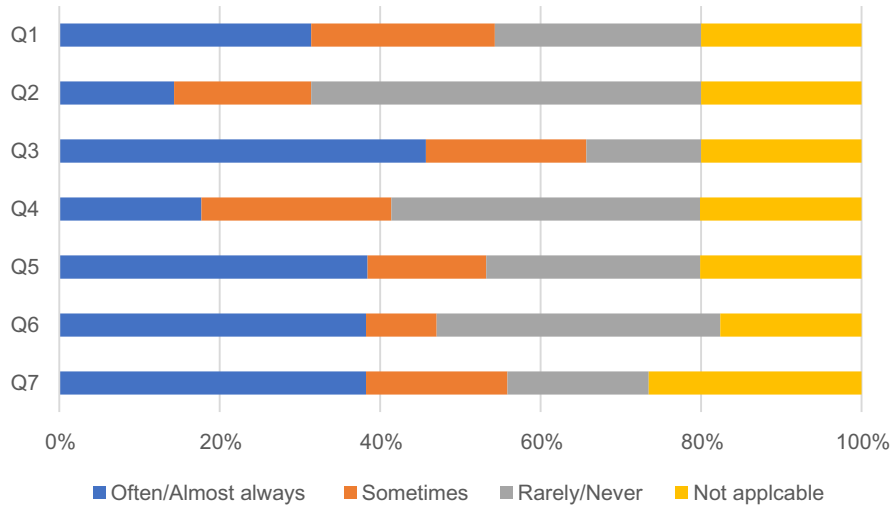

Fig. 3. Current practices regarding FASD prevention. Q1 – Provide women of reproductive age with information about risks (including FASD) that may be associated with alcohol use? ($n = 35$). Q2 – Provide men with information about risks (including FASD) that may be associated with alcohol use? ($n = 35$). Q3 – Provide women of reproductive age with information about effective contraception use? ($n = 35$). Q4 – Provide men with information about effective contraception use? ($n = 34$). Q5 – Assist women to stop or reduce alcohol use if they are pregnant or planning pregnancy? ($n = 34$). Q6 – Encourage partners, family or friends to support a woman to stop or reduce alcohol use if they are pregnant or planning pregnancy? ($n = 34$). Q7 – Arrange further support for woman who are wanting to stop or reduce their alcohol use? ($n = 34$).

Table 2. Results from the chart audit.

	1st Trimester ($n = 38$)		2nd Trimester ($n = 43$)		3rd Trimester ($n = 44$)	
	n	(%)	*n*	(%)	*n*	(%)
Alcohol consumption during pregnancy was discussed	34	(89.5)	12	(27.9)	15	(34.1)
Risk of alcohol consumption during pregnancy were discussed	26	(68.4)	3	(7.0)	1	(2.3)
Alcohol consumption assessed using a validated tool	28	(73.7)	3	(7.0)	0	(0)
Assessment of alcohol consumption						
No alcohol use	25	(65.8)	11	(25.6)	14	(31.8)
Any alcohol use	8	(21.1)	1	(2.3)	1	(2.3)
Alcohol use not assessed	5	(13.2)	31	(72.1)	29	(65.9)

Five themes were developed from the yarns: (1) complex factors influencing substance use during pregnancy; (2) community and staff awareness of PAE risks and FASD; (3) factors affecting holistic health care during pregnancy and parenting; (4) access and barriers to reproductive healthcare use; and (5) strategies for PAE and FASD prevention and support.

Complex factors influencing substance use during pregnancy

Community members shared that some women continued to use alcohol after pregnancy as a way to cope with intersecting stressors, including intergenerational trauma from the Stolen Generations, current trauma, racism, discrimination, financial and housing insecurity, and health outcome disparities. These stressors negatively impacted mental health and increased domestic violence. Participants noted that pregnancy, especially if unplanned, often exacerbated women's stressors, intensifying the need for coping mechanisms, such as alcohol, particularly if this had been modelled by family members.

> Yeah. Pregnancy. Hormones. Yeah, I think it makes it worse for 'em. And if they're already addicted to the grog it's going to be that much more difficult to not use that same coping mechanism they use every day . . . I think you gotta address the trauma. Before you look at the, you know, symptoms . . . Whatever coping mechanism drugs, alcohol, whatever the person's chosen intensifies. Especially in

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pregnancy and having children ... The alcohol literally is just one of the symptoms of the trauma. (Indigenous community member, #5)

Because like I said, it really comes down to what they have been through. Um, now if they've been through a lot ... their only way of dealing with it is drinking. Because that's what they're seeing, or you're seeing, they might have seen their mother do. (Indigenous community member, #3)

Community and staff awareness of PAE risks and FASD

Further compounding alcohol use during pregnancy, community and staff members perceived that the local community had limited knowledge and understanding about PAE risks and FASD.

Um, in community, probably none of them really ... limited, very limited [knowledge of FASD]. (Non-Indigenous AMS outreach worker, #19)

I think – I think everyone's got that idea of you can have a glass or you can have a glass or two ... It's not going to hurt bub. A glass or two is fine. (AMS AHW, #13)

However, community members expressed a clear desire to understand PAE risks and FASD. Alternatively, one staff member described how occasionally community members already understood these risks and therefore stopped using alcohol upon pregnancy recognition.

... occasionally you'll get girls that will say, 'Oh, I had a few drinks at a party before I knew I was pregnant.' ... but they stop, like they know that it's risky during pregnancy. (Non-Indigenous AMS midwife, #12)

Overall, staff knowledge of PAE risks and FASD as a disability aligned with quantitative findings, highlighting varied knowledge levels. This influenced how staff provided care, as one GP shared, FASD had not been on their radar when referring children for cognitive assessments.

[GPs are] more compliant with or complacent with the diagnosis of ADHD, or ASD. And then we stop, and then we don't find any other reason why they have the ADHD. (Non-Indigenous AMS GP, #18)

Factors affecting holistic health care during pregnancy and parenting

Nearly all Indigenous community members and outreach staff agreed that the greatest barrier to Indigenous women accessing support services during pregnancy and parenting years, and sharing their stories, was a profound fear of child protection involvement and child removal.

Nobody wants to do that [share what they are going through with health professionals]. But – and for them to what? Turn around and say, oh, well you shouldn't have been drinking in the first place. So stay here while I call Child Safety and probably the coppers too. (Indigenous community member, #5)

In response, participants cautioned against asking women about alcohol use during pregnancy outside of a trusted relationship, especially if they were experiencing adversity. They also highlighted the limitations of time-pressured clinical spaces for sensitive conversations, and emphasised the importance of AMS outreach services in overcoming these barriers through relationship-based care that builds trust and works at the women's pace.

And I suppose some of the pregnant ones that have come in, just don't ask them. I don't know if they'd tell you the truth anyway ... if I knew them, yeah, I'd probably ask. (AMS AHW, #20)

I think that girls would probably open up more to [the female outreach staff member]. Because with the [clinic] screenings we've only got so many minutes to get it done. (AMS AHW, #20)

Participants stressed the importance of AMS outreach providing family-centred care, which was central to building trust and effectiveness of supports emphasising that it is not just what health professionals communicate, but also how they communicate that is important.

... you can't work singular when you're working with families. And especially with Aboriginal families, you're working together ... and then we build that trust. (Non-Indigenous AMS outreach worker, #19)

If you put it down in a real casual conversation, it doesn't feel so [clinical] ... these standard questions, somebody else makes them. Like, this isn't us. (Community member, #5)

Access and barriers to reproductive health care

Although only 46% of staff indicated that they provided contraception information to women in the questionnaires, and only 18% did so for men, all yarn participants agreed on the importance of addressing contraception with young people to prevent unplanned and/or alcohol-exposed pregnancies. However, participants identified three reasons for low contraception use among young people. First, considering the possibility of pregnancy is not always a priority for young people, especially if intoxicated. Second, young men often prefer not to use condoms. Finally, young women may feel embarrassed or unsafe when accessing contraception or asking partners to use condoms.

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> Yeah. If it's the bar in the arm [contraception implant], or something like that [is more effective for young people]. But when [they] are drunk, nobody knows where a condom is. Let's be realistic here. (Indigenous community member, #5)

> I said [to her], 'Do you need any?' She's like, 'No, [staff member name], embarrassing. I said, 'No, it's not embarrassing If you need any, you just come and see me or let me know, I'll grab you some. I'd rather you be safe than sorry (AMS AHW, #13)

These findings highlight the importance of supporting young women through including men in contraception health care.

Approaches to PAE and FASD prevention, and support strategies

Creating safety for the community to access PAE/FASD-related information and supports was considered essential. Building trust and rapport through informal and Indigenous approaches, such as yarning, was considered important for helping women feel respected and safe.

> And bring the topic up sort of organically. Let the conversation [grow] ... Yeah... It's just that relationship, you know? We're not going to go to a stranger – pour all your dirty laundry about your family, you know? Nobody wants to do that. (Indigenous community member, #5)

When considering PAE and FASD learning resources and opportunities, the importance of ensuring safe messaging was stressed through avoiding confrontational language that could shame women. Instead, participants felt efforts should be holistic and target all age groups, incorporating learning opportunities in schools, community events, and outreach support groups for men, women, Elders and youth.

> Oh, oh, that'd be the education work, you know, the 12, 13-year-olds before they start having sex and drinking. But, yeah [it's] a good thing, sexual health course include that in the FASD but, again, not just high schools, it needs to be, um, down to the Year 6, Year 5s, Year 6s yeah, because the earlier I suppose they get that information and then I suppose their – their understanding of it the – the better. (AMS AHW, #16)

> ...it can – it's [about] becoming everyone's business. So whether it's, um, aunties, uncles, cousins. Um, kind of reaching that handout to be like I can see you're struggling or, um, if you ever needed help, like I'm always here. Um, everyone being there for each other. Um, and I think definitely education to the partners, definitely. (Indigenous NDIS worker, #14)

To foster accessibility, participants advised that learning resources should accommodate those with low literacy by using visual messages.

> ...try to make something really visual, less words as possible okay, less terminology as possible. (Non-Indigenous outreach mental health worker, #15)

Integration of qualitative and quantitative findings to address PAE and FASD: participant recommendations and practical implementation strategies

Quantitative and qualitative findings highlighted key guidance and opportunities for supporting community health and wellbeing through expanding PAE and FASD prevention and support strategies at the AMS. In response to varied knowledge, practices and attitudes held by AMS staff, prioritising whole-of-service training was considered essential for fostering competency and consistent approaches. Additionally, recognising the diverse needs of different sections of the community, and the role that all ages can play in FASD prevention and support, strategies sought to target the entire community with diverse, culturally-tailored and safe openings to access information and services. As part of this, ensuring culturally appropriate PAE and FASD resources was critical for increasing accessibility of knowledge both of staff and community learning. The implementation phase coincided with the launch of the National Aboriginal Community Controlled Health Organisation's Strong Born campaign (Williams *et al.* 2024), which promoted culturally tailored FASD-related resources for healthcare workers and Indigenous communities. These resources were integrated into the strategies, and the AMS received support from the National Aboriginal Community Controlled Health Organisation to create FASD training resources (Table 3).

To facilitate implementation, strategies were categorised into: (1) low-cost strategies for immediate implementation; (2) short-term strategies requiring some resources; and (3) long-term strategies requiring more planning. These strategies were presented to the CAG for the project's implementation phase.

Discussion

This study offers critical insights into the factors influencing, and opportunities for strengthening, the prevention and support of PAE and FASD in a regional AMS. The findings highlight the importance of local cultural knowledge and practices, which were particularly exemplified within community outreach services, where culturally grounded approaches to building confidential and trusted relationships outside of clinical time-pressured environments helped address the complexity of stressors that predispose Indigenous women to alcohol use during pregnancy. However, barriers, such as knowledge gaps among clinical staff, inconsistent prevention practices and unclear diagnostic referral pathways, limited service effectiveness. In response, the study proposed culturally responsive strategies informed by staff and

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Table 3. Suggested strategies to support whole-of-service approaches to FASD prevention and support.

Low-cost strategies that could be immediately implemented
• Increase staff awareness of the risks associated with alcohol use during pregnancy.
• Increase community and staff awareness of FASD through Carbal FASD t-shirts
• Provide staff education and training workshops covering FASD prevention, brief interventions, and how to support individuals and families affected by FASD.
• Discuss and provide information about contraceptive options for all women and men of reproductive age.
• Adapt annual Indigenous Health assessments to facilitate routine enquiry about alcohol and contraception use.
• Increase access to FASD diagnostic services: establish referral pathway to UQ's Neurodevelopmental Clinic.
• Audit existing patient education materials to ensure accurate and current information.
• Collate culturally appropriate and non-stigmatising FASD resources for staff, emphasising *Strong Born* resources: https://www.naccho.org.au/fasd/strong-born/.
Strategies to be implemented in the short term with minimal planning or costs
• Enable routine use of Brief Intervention and the AUDIT-C with pregnant women, partners, and key supports.
• Encourage partners/support people to reduce or abstain from alcohol-use to support their partner/family member during pregnancy.
• Incorporate conversations around alcohol-use risks during pregnancy, FASD, and contraception options within Outreach support groups for women, men, youth, and Elders.
• Celebrate International FASD awareness day.
• Create and launch a Carbal FASD story book.
• Hold staff and community FASD yarning circles with Aunty/Dr Lorian Hayes.
• Collate referral options for pregnant women requiring substance use support.
• Develop a resource directory for clients with FASD and their caregivers.
• Provide brief intervention training for non-clinical staff.
• Compile FASD-informed support resources.
Strategies to be implemented in the longer term, requiring investment of time and other resources
• Develop a women's group (soft-entry health promotion/social and cultural connections).
• Develop a young women's cultural support program (equivalent to Marlu https://carbal.com.au/outreach-services/marlu-youth-program/).
• Create Carbal FASD awareness podcast and learning modules for health professionals. (Supported through Strong Born: https://carbal.com.au/education-resources/training/deadly-fasd/).
• Create an intensive program to support women's alcohol use reduction and abstinence during pregnancy. Recommended: adapted CHOICES Program: (https://sites.utexas.edu/hbrt/research/choices/).

community expertise. Strategies integrated whole-of-staff professional development, whole-of-community education, family-centred care, culturally safe messaging and routine, evidence-based practices. In what follows, we explore key strengths, challenges, and opportunities for progressing PAE and FASD prevention and support, and the implications for other health services.

Participants highlighted two key issues that should be addressed for effective prevention of PAE: (1) Indigenous women's distrust of health services, and (2) the need for broader and more inclusive discussions of contraception options. The distrust of health services was reported to stem from justified fears of child protection involvement, which deter alcohol use discussions and service access. This aligns with other qualitative research identifying similar barriers during pregnancy and parenting (Gonzales *et al.* 2021; Hewlett *et al.* 2023). Indeed, Indigenous children are staggeringly overrepresented in all aspects of Australia's child protection system, which many view as a continuation of the Stolen Generations (Payne 2024; SNAICC 2024). To improve service safety and access, community members stressed the importance of health practitioners building trust through culturally safe settings, such as community outreach services, which have greater scope to tailor care holistically. This approach reflects the principles of the Australian FASD Indigenous Framework and the Australian Indigenous alcohol treatment guidelines, which both emphasise trusted relationships and cultural safety to counter healthcare system distrust and intergenerational trauma contributing to prenatal alcohol use (Assan *et al.* 2021; Hewlett *et al.* 2023).

On the second issue of contraception, quantitative findings highlighted opportunities for the greater inclusion of men in contraception advice, and PAE and FASD information sharing, which was lacking at the time of the research. As it is well established, women's contraception and alcohol use are significantly influenced by their partners, family and peers, and therefore, men play a critical role in PAE prevention, by enhancing support for women, reducing unplanned pregnancies and improving pregnancy health outcomes (Lyall *et al.* 2021). Importantly, family and community approaches hold

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deep resonance with Indigenous cultural traditions, that recognise that individual health and wellbeing are inextricably linked to family and community health and wellbeing (Verbunt *et al.* 2021).

Participants considered family-centred approaches and efforts to inform the entire community as key strategies for PAE prevention and FASD support. They particularly valued the family-centred approach used by AMS community outreach services for creating supportive environments through working with women's partners and key supports. These approaches are also important for mitigating the shame and stigma often experienced with Western medical individualistic behavioural approaches, which typically target women as solely responsible for making any change, without consideration of their social contexts (Lyall *et al.* 2021). From these understandings, family-centred approaches and whole-of-community awareness raising have informed other Indigenous PAE and FASD prevention and support initiatives, such as the Strong Born campaign (Williams *et al.* 2024).

The proposed implementation strategies leveraged the expertise of staff and Indigenous community members, adopting holistic, culturally grounded approaches. Key components included service-wide training, community-based learning, family-centred care, culturally safe communication, and consistent prevention and support practices – aligning with emerging best practices in FASD prevention and support for Indigenous communities (Gonzales *et al.* 2021; Hewlett *et al.* 2023; Williams *et al.* 2024). Initial efforts focused on whole-of-service FASD training to foster FASD-informed services, promoting consistent messaging and culturally appropriate practices. To ensure safe access to PAE and FASD knowledge, multiple culturally safe entry points were embedded in routine clinical and community outreach services. This approach aimed to normalise conversations around contraception, alcohol use and FASD, addressing misinformation and intergenerational knowledge gaps within women's support networks.

Strengths, limitations and future directions

This research highlights the pivotal role of culturally-centred and community-based approaches in overcoming significant healthcare access barriers faced by Indigenous women and their families. By prioritising healing-informed and strengths-based approaches, the study contributes to a growing body of evidence that supports more respectful, responsive and effective ways of addressing PAE and FASD. The recommended implementation strategies aim to enhance the cultural safety of healthcare environments, counter harmful colonial narratives, and disrupt deficit-based assumptions that perpetuate shame and stigma within health systems.

A key strength of this research lies in its grounding in community priorities and Indigenous ways of knowing, being and doing. The participatory and relational approach aimed to foster trust, and enabled the co-production of knowledge that is both contextually relevant and action-oriented.

However, several limitations must be taken into consideration. The staff questionnaire response rates were low, which may limit the representativeness of the findings and reduce the generalisability of staff perspectives across the AMS. Additionally, the qualitative component of the study did not include Torres Strait Islander participants, meaning the findings reflect the views of Aboriginal peoples living in Toowoomba and may not be transferable to other diverse Aboriginal populations. Future research should aim to engage a broader and more diverse sample of both staff and community members. Expanding the geographic and demographic scope of the research could provide a more comprehensive understanding of community needs and service gaps. It will also be important for future research to evaluate the effectiveness and sustainability of the implemented strategies. This includes assessing whether these approaches lead to increased awareness of PAE and FASD, improved access to culturally safe services, and measurable reductions in stigma and shame. In addition, these approaches may also increase opportunities to engage in broader discussions with men and women about the importance of preconception care and pregnancy planning for improving pregnancy outcomes (Dorney and Black 2018; O'Brien *et al.* 2018). Such evidence will be vital for informing policy, scaling successful models, and ensuring that Indigenous-led solutions continue to shape the future of maternal and child health care.

To address the significant barriers Indigenous women and families face in accessing health care during childbearing, pregnancy, and parenting years, the implementation strategies proposed in this research support interprofessional, comprehensive, harm-reduction, and family-centred models of care. The success of these approaches, however, depends on the commitment of health practitioners to build genuine, trusting, and culturally safe relationships with Indigenous women and their families. This requires a compassionate and nuanced understanding of the systemic and personal barriers that Indigenous women face – particularly those related to child protection system fears and the complex stressors that influence alcohol use during pregnancy.

Conclusion

This research highlights the essential role of a regional AMS, particularly their community outreach team, in delivering culturally-safe, community-led, and contextually relevant responses to addressing PAE and FASD. Primary healthcare services are well-positioned to expand PAE and FASD-related approaches, with many of the proposed implementation strategies requiring minimal additional investment. However, sustained and appropriate resourcing is critical to enable

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primary healthcare services to embed consistent, collaborative, and culturally responsive approaches across their services.

Supplementary material

Supplementary material can be accessed from the article page online.

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Data availability. The deidentified data that support the findings of this study are not publicly available yet and are available from the University of Queensland via correspondence with the author, provided appropriate ethical and community approvals are obtained.

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