

Multidimensional influences on prenatal cannabis use: A reflexive thematic analysis of low-income birthing people

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Kristine Alaniz¹ , Emmanuel M Ngu², Linnea Laestadius²,
Peninnah M Kako² , Musa Yahaya² and Tessa Vance³

Abstract

Objective: Prenatal cannabis use has more than doubled in recent years, disproportionately affecting birthing people with lower incomes and mental health conditions. Despite this trend, research remains fragmented, and the voices of birthing people who use cannabis are largely absent. This study aimed to explore multidimensional influences on prenatal cannabis use, centering the lived experiences of those directly affected.

Methods: Researchers conducted a reflexive thematic analysis of secondary qualitative data from a community-based program in Wisconsin, where cannabis remains illegal. Nineteen pregnant cannabis users participated in interviews; most were Medicaid recipients, and nearly half reported household incomes below \$10,000. Lifecourse theory guided study design and analysis. Synthesized Member Checking was used to enhance credibility.

Results: Five central themes emerged: pregnancy as a turning point in cannabis use; cannabis as emotional regulation; complex ties between cannabis and mental health; relational influences on use; and contextual barriers to informed and supported decision-making. Emotional regulation and mental health were the most cited drivers of cannabis use.

Discussion: Findings highlight the urgent need for holistic prenatal care that addresses both substance use and mental health, and for public health messaging that is unbiased and evidence-based. Addressing prenatal cannabis use requires community-engaged, cross-sector strategies and structural policy reform. Without tackling systemic barriers—such as racial bias in screening and care—efforts to support birthing people who use cannabis will remain insufficient.

Keywords

pregnancy, cannabis, marijuana, reflexive thematic analysis, member check

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Introduction

Prenatal cannabis use (PCU) rates have more than doubled in recent years, with an estimated 8% of birthing people reporting cannabis use during pregnancy in 2022.^{1–3} Pregnant people who are younger, unmarried, have mental health conditions, and have lower socioeconomic status are significantly more likely to use cannabis during pregnancy.^{4,5} PCU has been associated with a range of adverse birth outcomes such as preterm birth, small for gestational age, lower birth weight, lower Apgar scores, neonatal intensive care unit (NICU) admissions, and perinatal mortality.^{6–8} Evidence of a dose-response relationship between PCU and adverse birth outcomes has been observed.^{9,10}

Neuroimaging studies have further demonstrated a wide range of long-term physiological, neurodevelopmental, and psychopathological effects on children who were exposed to cannabis prenatally.^{11,12} PCU is associated with increased risks of adverse maternal health outcomes, including gestational hypertension, preeclampsia, both

¹University of Wisconsin, Madison, USA

²University of Wisconsin, Milwaukee, USA

³Wisconsin Women's Health Foundation, Madison, USA

Corresponding author:

Kristine Alaniz, University of Wisconsin, Madison, WI 53715, USA.

Email: kalaniz@wisc.edu



insufficient and excessive gestational weight gain, and placental abruption.¹³

Major public health and healthcare institutions such as the American College of Obstetricians and Gynecologists, the American Society of Addiction Medicine, and the U.S. Surgeon General advise pregnant people to abstain from cannabis.^{14–16} However, there are currently no evidence-based strategies to prevent PCU,¹⁷ nor are there evidence-based interventions to reduce cannabis use during pregnancy.¹⁸ A myriad of issues affect prenatal care providers' ability to address PCU, including reluctance to discuss cannabis use with patients,¹⁹ challenges in prioritizing care, and documented racial bias.²⁰ A complex combination of historical, political, and social factors has further limited efforts to address PCU. Although recent legalization, rescheduling, and decriminalization measures have significantly changed the landscape, there has been little progress in protecting pregnant individuals. In 25 states, prenatal substance use is considered child abuse under civil child-welfare statutes, and in five states, it is grounds for civil commitment.²¹

Qualitative research can be used to design effective PCU prevention, interventions, and policies. However, the few published studies tend to be limited in their scope, focusing on negative experiences with prenatal care providers, risk perception, and knowledge about PCU.^{22–25} Few studies specifically examine the experiences of birthing people living in states where cannabis use remains illegal, particularly those from low-income backgrounds. Further, very few qualitative studies articulate theoretical frameworks or use community-engaged research approaches.

Purpose and research question

This study aimed to explore multidimensional influences on PCU in a state where cannabis use remains illicit, centering the experiences and perspectives of birthing people. This study aims to answer the research question, "How do birthing people describe the behavioral, psychological, social, and contextual influences on prenatal cannabis use?" In this study, "contextual" is defined to encompass the physical/retail environment and the policy landscape surrounding prenatal cannabis use.

Design

This study used reflective thematic analysis (RTA), emphasizing theoretical flexibility, pattern identification, and researcher reflexivity.²⁶ RTA was deemed the best approach to handle the (1) exploration of multiple domains of influence, (2) diverse perspectives and experiences of birthing people, and (3) the need to situate the findings within the context of birthing people's lives. This study's reporting adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines to ensure

transparency, rigor, and completeness in the presentation of methods and findings.²⁷

Theoretical framework

Lifecourse theory (LCT) guided study conceptualization, the research question, and the interview guide. LCT is both a theory and an approach that describes the interplay of accumulating factors that shape people's lives.²⁸ Glen Elder originally described the five fundamental principles of life course theory as (1) time and place, (2) lifespan development, (3) timing, (4) agency, and (5) linked lives.²⁹ Time and place describe how individuals are situated in historical, social, and cultural contexts. Life-span development refers to the lifelong process of human development. Timing refers to the behavioral patterns, life transitions, and trajectories (long-term patterns) of people's lives. Agency describes the choices and actions individuals engage in within the constraints and opportunities of individuals' circumstances. Linked lives refer to the inextricable links between individuals and others through relationships and society. A critical realist framework was used during the analytic process, staying close to participants' accounts of their experiences situated within historical, local, and policy contexts.³⁰

Methods

Setting

This study utilized de-identified secondary data from First Breath, a free, community-based perinatal substance use program in Wisconsin. First Breath collaborates with various prenatal care sites across the state, including OB/GYN clinics, federally qualified health centers, tribal health clinics, Women, Infants, and Children (WIC) programs, and local health departments. Providers at these sites are trained to screen and refer pregnant individuals who use substances to the First Breath program, where they are matched with a local First Breath Health Educator (HE). HEs, who hold Substance Use Pregnancy Certificates, deliver individualized education and support from pregnancy through 6 months postpartum. HEs obtained verbal consent to participate in the program as part of standard program enrollment process. A copy of the consent was emailed to each participant. All data were collected as part of standard program operations prior to study initiation. The study was reviewed by the University of Wisconsin IRB and deemed exempt due to the use of de-identified secondary data.

Sampling, recruitment, and data collection

The First Breath program recently expanded its scope from focusing solely on tobacco to addressing all prenatal substance use and observed low participant engagement

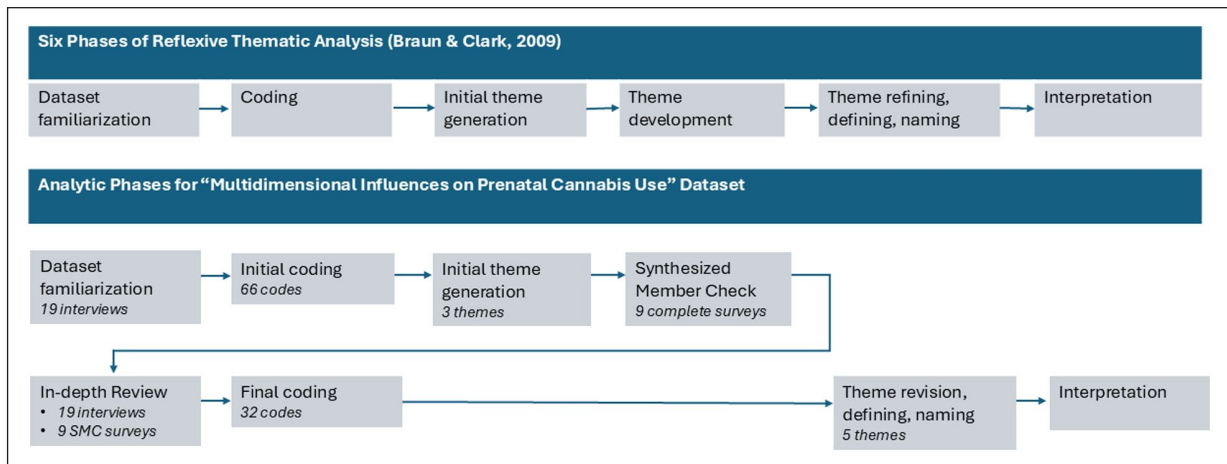


Figure 1. Reflexive thematic analysis phases.

with its cannabis education and risk reduction counseling efforts. Recognizing a need to better understand and address PCU, interviews were conducted to identify the most salient factors and influences, to inform improved care for pregnant individuals. Interviews were conducted as part of First Breath’s 2023 Participant Advisory Group (PAG), an annual forum where program participants share their experiences and provide feedback related to perinatal substance use.

Purposive sampling was employed to identify First Breath participants who had been pregnant within the past year and reported cannabis use during pregnancy.³¹ Program participants were phone screened by their assigned HE to ensure they met these criteria. The maximum variation sampling technique was applied to ensure geographic diversity among participants.³¹

HEs conducted individual interviews (average length 24 min) using a semi-structured interview guide. Pilot tested interview questions explored participants’ history with cannabis, including initiation, use/cessation during pregnancy, social influences, mental health and stress connections, experiences of stigma, the impact of cannabis marketing and laws, and overall factors affecting their use. All interviews were conducted virtually using Microsoft Teams, with the record and transcription functions enabled. Transcripts were downloaded as Word documents, and recordings were saved on a secure, Health Insurance Portability and Accountability Act (HIPAA) compliant network. Transcripts were checked against the recordings for accuracy and automatically deleted after 120 days. Fifty-dollar Walmart gift cards were sent to participants as a thank you. Between June and August 2023, nineteen birthing people participated in an interview. This number was deemed suitable based on (1) previous PAG participation, (2) alignment with similar qualitative studies,³² and (3) the typical number of interviews needed to achieve saturation.³³

Analysis

Figure 1 shows the analytic process used, which closely matched the six-phase RTA process recommended by Braun and Clark³⁴ with slight variations. KA thoroughly reviewed the transcripts, initially reading them in full and then rereading them while performing hand-coding. A hybrid deductive-inductive approach was employed, guided by LCT and the research question. The coding process was iterative, with codes refined and updated inductively based on emerging patterns in the data.

This process generated 66 initial codes clustered into 3 initial themes, using key constructs from LCT as an initial guide. A draft summary report was crafted with the initial themes, proposed definitions, and selected extracts to help illustrate the themes. The summary report was checked for readability using the Flesch–Kincaid Grade Level score. The First Breath team reviewed the summary and provided minor edits and adjustments.

A member check process was conducted using the Synthesized Member Checking (SMC) methodology.³⁵ Member checking, also known as respondent validation, is a technique for establishing credibility and trustworthiness in qualitative research.³⁵ An online survey was created using the summary report described above. In the survey, each initial theme was presented, along with the definition and selected text. For each of the three candidate themes, participants were asked (1) how well the theme matched their own experience, (2) what they would change, and (3) what they would add. Two HEs field-tested the survey to ensure readability and functionality. The HEs contacted participants who agreed to take part in the member check. They reminded them of the goal and allowed them to opt out if their interest or circumstances changed. If they were still interested and able to complete the member check, the HE sent the SMC survey link, which could be completed

on any device, including participants' smartphones. Nine participants completed the SMC survey.

KA conducted a second in-depth review and coding of all data, including original interviews and SMC survey responses. SMC survey findings shaped the remainder of the analysis, resulting in 32 final codes and 5 themes. Of the three initial themes, one was broken into two distinct themes, two were revised, and one new theme was added. This final set of five themes was checked for coherence and relevance to the research question, codes, and data extracts. Throughout the analytic process, a reflexivity practice involving journaling, notetaking, and group meetings was used to critically examine the ongoing decisions and how the research teams' values, experiences, and training impacted them.

Results

Nineteen birthing people completed a semi-structured interview. Table 1 shows that most participants were low-income, with 95% insured by Medicaid, nearly half reporting annual household incomes less than \$10,000, and almost 60% unemployed. Fifty-three percent identified as White, and 42% identified as Black. More than two-thirds (63%) reported having a diagnosed mental health condition. The sample included participants from four of the five public health regions in Wisconsin, reflecting broad regional representation.

Theme 1. "When I found out I was pregnant": Pregnancy as a turning point in cannabis use

Many participants described pregnancy as a turning point that led them to evaluate their relationship with cannabis. For some, like Participant 5, stopping cannabis use during pregnancy was a relatively straightforward decision. "When I found out [I was pregnant], I stopped. I haven't picked that back up, and [my baby]'s almost going to be a year." A few participants made changes to minimize the risk to their babies even though they were unclear about the effects of cannabis use during pregnancy. Participant 8 explained, "I cut back a little to be on the safe side, but there is no actual evidence that it is harmful while pregnant." On the other extreme, some participants felt quitting cannabis would be harmful to their baby, such as Participant 14, who shared, "When I first found out I was pregnant, I was just trying to wean myself off because they tell you, 'You can't quit cold turkey. You can put your baby into withdrawal, and it could cause miscarriage.'" For a handful of participants, quitting cannabis was not even considered, like Participant 1, who said, "I didn't really try to stop—I just didn't think it was that bad."

Several participants described the interplay between cannabis and pregnancy-related conditions, like nausea, vomiting, loss of appetite, and chronic pain. For some, like

Table 1. Participant characteristics (n = 19).

Characteristic	n	%
Insurance		
Medicaid	18	95%
Private	1	5%
Race		
Black	8	42%
White	10	53%
Missing	1	5%
Annual household income		
Less than \$10,000	9	47%
\$10,000–\$49,000	6	32%
\$50,000 or more	1	5%
Missing	3	16%
Employed		
Yes	8	42%
No	11	58%
Relationship status		
Married or committed	10	53%
Single	9	47%
Mental health condition		
Yes	12	63%
No	7	37%
Region		
Southeast	7	37%
Southern	8	42%
Northern	2	11%
Northeast	2	11%

Participant 11, cannabis offered relief, "I attempted to stop, but I was always throwing up. So, it helped with nausea and for me to eat." For others, like Participant 14, cannabis made their symptoms worse. "When the pregnancy sickness hit, people were like, 'Oh, this will make you feel better'. Well, for me, that was a lie and made me feel worse. I stopped pretty much cold turkey."

Theme 2. "It helps me not feel everything all at once": Cannabis as an emotional regulator

Nearly all participants described using cannabis as a tool to help navigate significant stressful life events occurring before and during pregnancy, such as childhood trauma, interpersonal violence, moving, job changes, relationship changes, unintended or mistimed pregnancy, and housing insecurity. For many, this pattern started well before pregnancy, such as Participant 14, who said, "I just remember I had a really messed up childhood, so the first couple times I used it, it gave me that place to go where, you know, I could just not be there."

During pregnancy, some described antecedent-focused emotional regulation, where cannabis was used to manage future events. For example, Participant 12 said, "Cannabis can help make stressful situations seem not so stressful. So instead of making mountains out of molehills, I can just go

with the flow, and I know this will work out.” More commonly, though, cannabis was used as a down-regulation method. Participant 14 said, “When I was down or frustrated or having a hard day, I would smoke, and it would make me feel better. I wouldn’t forget about being mad, but it just didn’t seem as bad when I was high.” Participant 8 said, “It definitely doesn’t, like, fix my stress, but it definitely helps to be able to not feel all of it at once.”

Theme 3. “You have to dig deeper”: The complicated link between mental health and cannabis

More than 60% of interview participants had a diagnosed mental health condition, and many described using cannabis to manage their conditions. For many, this pattern was established before pregnancy. As Participant 12 described, “I was really depressed as a teenager. I was extremely suicidal, and it really helped with that.”

The use of cannabis to relieve symptoms of mental health conditions persisted into pregnancy, with depression, anxiety, and attention deficit hyperactivity disorder (ADHD) most often noted. Participant 6 explained, “With my ADHD, my mind will go a mile a minute and start all the bad things at once go rushing through your brain non-stop, and they keep pestering you, pestering you. So, for me, it gives that, hey, stop. Calm down. Breathe. You’re fine. You know you can work through this.”

A few mentioned using cannabis to manage serious mental health symptoms. Participant 12 explained, “It definitely impacts [my mental health] as a positive because without it, the voices can get really loud and mean. With it, I can actually go out and do stuff with my kids without fearing that the voices would come back.”

For some participants, using cannabis went deeper than symptom relief. One participant said, “You can’t really ever cure depression, but I’d say this is about as close as I’ll ever get to a cure.” Several participants preferred cannabis to more commonly prescribed pharmaceuticals, often citing fewer side effects. Participant 6 explained, “It felt a lot more relaxing than a lot of the ADHD or depression medications I was taking at the time.”

Others went on to say that cannabis does not address underlying issues, such as Participant 5, who said, “You have to kind of dig deeper in what’s really causing your stress.” Several described a fine line between using cannabis as a coping mechanism and dependency. Participant 4 said, “Back when I was really depressed, it would bring me out of my depression. But at the same time, I was dependent on it, and that wasn’t a good thing. I needed to figure out how to keep myself out of that depression on my own without substances. It’s not something you should be using every single day just to feel right.”

Other participants were adamant that cannabis should not be used in place of more formal mental health care, such as Participant 1, who said, “If it’s [cannabis use] for

mental health, just go to a therapist or a psychologist and actually get mental help because weed isn’t gonna help you. If you actually are having psychological issues, you should see a doctor or professional.”

Theme 4. “It changed our dynamics”: For better or worse, relationships influence PCU

While emotional regulation and mental health were by far the most influential factors on participants’ cannabis use, many also described the role people in their lives had on their cannabis use. Social influences began well before pregnancy, with many participants describing how their peers, parents, and siblings impacted their use of cannabis early on. During pregnancy, participants were influenced more by their partners and the baby’s fathers. For some, like Participant 10, this led to more cannabis use. “My ex was a big time weed smoker. So, when he was around, I would smoke. I mean, we *smoked*.” For others, like Participant 1, people in their lives influenced them to use less. “My boyfriend stopped smoking, and we decided to stop together.” Participant 17, along with a few others, felt changes to their cannabis use impacted their relationship. “I think there was a little resentment when I stopped smoking cannabis products. That was something that we had done as a bonding experience. It changed our dynamics.”

All participants felt that cannabis was socially acceptable in both their social circles and communities. Participant 14 said, “I would say 95% of people I know smoke,” and Participant 6 said, “It’s very common, pretty much any city you’re in here in Wisconsin.” A few mentioned places where cannabis was not socially acceptable, like Participant 6, who explained, “If you go into hospitals that are run by churches and they know you’re using cannabis, they tend to just write you off as a pothead.”

Theme 5. “They assume you’re gonna look into the details yourself”: Contextual barriers to informed and supported decision-making

Many participants noted contextual barriers to informed and supported decision-making around PCU. Participants expressed a rapidly changing retail environment that promotes use, noting frustrations with product placement. Referring to psychoactive cannabinoid hemp products, Participant 17 explained, “I’ve watched them purposely remodel their stores so they can add the clear display cases in the front with cannabis products. The other day, I saw a new candy. I picked up the package right by the register, and it said this contains this amount of THC. I was like, ‘Oh my God, some kid is gonna see this and think it’s actual candy’.” Participant 17, commenting on the lack of cannabis warnings, went on to say, “They just assume you’re gonna look into the details yourself. Or, for some reason, the legislation believes that all of us are potheads already, and we don’t care about the warning.”

While several local municipalities in Wisconsin have passed ordinances loosening restrictions, cannabis in Wisconsin remains illicit. Several participants described Wisconsin's policies as restrictive and punitive, leading to uneasiness. Participant 5 said, "You have to be discreet, and you know you could get in trouble at any point. I guess there's always this nervousness."

Another contextual barrier noted by several participants was the lack of public education about cannabis, and a desire for accessible information was evident. Participant 17 said, "I am very adamant that this [information about PCU] should be more public knowledge. [I wanted] more knowledge and awareness of the effect of marijuana and how the long-term use would affect me in the future."

Discussion

This study explored the behavioral, psychological, social, and contextual influences on cannabis use from the perspective of birthing people. While all domains influenced birthing people's use, psychosocial factors, particularly emotional regulation and mental health, were the most influential and important, aligning closely with key constructs of Lifecourse Theory. The PCU literature consistently shows that pregnant people with mental health conditions use cannabis at significantly higher rates than those without³⁶ yet little is known why. Some researchers suggest that cannabis is used to "self-treat" mental health symptoms during pregnancy.³⁷ While some participants in this study described using cannabis in this way, far more expressed complex motivations, citing multiple types of emotional regulation, grounding, relief from mental health symptoms, and avoidance of side effects associated with more commonly used prescription drugs. Several described internal struggles and a process of questioning or re-evaluating their own beliefs and choices around cannabis use to manage mental health. These findings align with a qualitative study in which participants reported using cannabis postpartum to manage mental health, though their decision-making was often nuanced.³⁸

In this study, social influences emerged as a major factor shaping prenatal cannabis use. Prior research among adolescents and young adults has demonstrated that peer norms, social acceptance, and perceived social benefits significantly contribute to cannabis initiation and continued use.³⁹ The social influences on prenatal cannabis use are just beginning to be understood,⁴⁰ highlighting a critical need for further research to explore how social dynamics uniquely impact pregnant individuals' cannabis use.

Increasing rates of PCU are often attributed to changes in policy and retail landscapes as well as changing social norms.⁴¹ While participants discussed the influences of cannabis policies and industry on their use, the prominent role of mental health suggests that the ongoing mental health crisis could also be a contributing factor. This is in line with other research indicating an association between

substance use and unmet mental health needs.⁴² System failures in the mental health system are evident, and for many pregnant people, mental health care is not accessible, culturally appropriate, or affordable.⁴³ Over 60% of pregnant and postpartum people with mental health conditions do not receive mental health services.⁴⁴

These findings must be understood within the broader context of participants' lives, as nearly all described experiencing significant stressors before and during pregnancy, including childhood trauma, interpersonal violence, job or relationship changes, unintended or mistimed pregnancies, and housing instability. Participants' cannabis use behaviors were shaped not in isolation, but by intersecting challenges they experienced before and during pregnancy. Grounded in a life course perspective, this study recognizes how early adversity, systemic inequities, and cumulative disadvantage over time influenced substance use patterns. These insights underscore the need to approach prenatal substance use through an equity lens that prioritizes structural context alongside individual behavior.

Need for evidence-based interventions and policies

Investments in holistic, innovative, integrated prenatal care services are needed. Substance use and mental health treatment are currently siloed, resulting in fragmented care.⁴⁵ Thus, efforts to integrate care require complex, system-level changes. Promising approaches have been noted; for example, one study found that a referral to a perinatal mental health specialist in the first trimester was associated with increased cannabis cessation.⁴⁶

Participants' emphasis on pregnancy as a key decision point about cannabis use further supports the idea that the first trimester may be a critical window of time for such interventions. Further research is needed about the specific nature of these interventions, however. A systematic review of integrated substance use and mental health interventions pointed to a wide range of approaches, including psychoeducation and psychological interventions.⁴⁵ However, few of these approaches were rigorously evaluated for their efficacy.

Beyond the integration of substance use and mental health, this study has several other implications for public health practice and policy. Public health agencies should take responsibility for assuring access to unbiased and scientifically accurate information to allow birthing people to make informed decisions about their cannabis use. Previous research has shown that the most common place for pregnant people to gain information about PCU is in the digital environment, where the risk of misinformation and predatory marketing is high.^{23,24} However, a content analysis of public health websites found that only about 20% of federal and state agencies had published information about perinatal cannabis use on their websites.⁴⁷

According to the U.S. Substance Abuse and Mental Health Services Administration, there is currently “no evidence on individual programs for the prevention of marijuana use among pregnant and postpartum women.”¹⁷ While the use of evidence-based tools such as Screening, Brief Intervention, and Referral to Treatment (SBIRT) has shown promise in clinical settings (Latiolais et al., 2022),⁴⁸ more research is needed in prenatal populations who use cannabis. Efforts are needed to develop, implement, and evaluate person-centered, harm-reduction, and scientifically based interventions.

Community-engaged practices and partnerships with clinical, community, and retail partners will be critical to successful implementation. However, these efforts will not be without challenges. Racial bias has been well-documented in PCU screening, reporting, and counseling.^{49,50} Research has shown that up to two-thirds of pregnant people did not disclose cannabis use with their provider, citing judgment and fear of being reported to child protective services.^{24,25} Those who did disclose use describe inconsistent, punitive, and generally unhelpful information.^{22,23} Thus, efforts must focus on health equity and working with healthcare providers to dismantle bias.

None of the approaches described here will result in the critically needed change and support for birthing people if significant policy changes do not occur. While not explored in this study, punitive policies around prenatal substance use lead to a range of adverse birth and child health outcomes⁵¹ and contribute to the environment of fear, distrust, and confusion that participants described as limiting their access to information and support.⁵² Thus, civil child welfare statutes and reporting requirements should be updated to (1) remove substance use as grounds for child abuse and/or civil commitment and (2) remove reporting requirements for substance use in state statutes. Additional actions called for by the American Public Health Association include (1) providing protection to vulnerable populations through product, advertising, and labeling regulations, (2) minimizing harm through prevention education, clean indoor air, and adoption of health equity policies, and (3) monitoring patterns of use.⁵³

Strengths and limitations

This study had several key strengths. RTA allowed for a systemic and flexible approach to a unique dataset and protected population. Lifecourse theory guided the exploration of critical cumulative stressors and contextual influences on PCU. SMC allowed participants to engage with the research process and strengthened the critical realist approach. Social desirability bias has been noted as a limitation in previous PCU literature, but was minimized in this study through rapport building, careful interview design, and word choice. Finally, this study used data from an existing community-based program, resulting in high ecological validity. However, care must be taken not to use

these findings to make broader assumptions about PCU. The local setting and socio-political context were essential factors in interpreting the results.

This study had some limitations. This study used secondary data from pregnant people who participated in a voluntary program, potentially introducing selection bias. These participants potentially had access to more cannabis-related information, support, and resources than pregnant people who did not participate. At the time of this study, adult recreational use of cannabis was prohibited in Wisconsin. While this study used only secondary, de-identified data collected within the safety of an established relationship, it is possible that participants withheld information as a self-protection measure.

Conclusion

This study provides a holistic picture of PCU, exploring individual, psychological, social, and contextual influences using a life course perspective. The use of cannabis to (1) regulate emotions and (2) manage mental health conditions during pregnancy were the most important findings. Social influences, especially partners, also played a role in influencing PCU among birthing individuals, with this influence occurring in both directions. This study highlights the importance of addressing mental health and substance use before and during the perinatal period. Multi-disciplinary, community-engaged, equity-informed approaches are needed to address PCU and protect the health of pregnant people and their families.

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ORCID iDs

Kristine Alaniz  <https://orcid.org/0009-0004-0805-3892>

Peninnah M Kako  <https://orcid.org/0000-0002-1071-5785>

Ethical considerations

The University of Wisconsin—Milwaukee IRB reviewed this study in February 2024 and deemed it exempt due to its exclusive use of de-identified secondary data (24.154-UWM).

Author contributions

Kristine Alaniz: Conceptualization, methodology, analysis, writing – original draft. Emmanuel Ngui: Methodology, writing – review and editing, supervision. Linnea Laestadius: Methodology, writing – review and editing. Peninnah Kako: Methodology, writing – review and editing. Musa Yahaya: Writing – review and editing. Tessa Vance: Writing – review and editing.

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Declaration of conflicting interests

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