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Review

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Pregnant People's Perspectives On Cannabis Use During Pregnancy: A Systematic Review and Integrative Mixed-Methods Research Synthesis

Meredith Vanstone[1], PhD, Janelle Panday[1], MSc, Anuoluwa Popoola[1], Shipra Taneja[1], BSc, Devon Greyson[2,3], PhD, Sarah D. McDonald[4,5,6], MD, MSc, Rachael Pack[7], PhD, Morgan Black[1], MD, Beth Murray-Davis[4,8], PhD, RM, Elizabeth Darling[4,6,8], PhD, RM

Introduction: Rates of perinatal cannabis use are rising, despite clinical evidence about the potential for harm. Accordingly, pregnant and lactating people who perceive a benefit from cannabis use may have a difficult time making informed decisions about cannabis use.

Methods: We conducted a systematic review of mixed-methods research to synthesize existing knowledge on the perspectives of pregnant people and their partners about cannabis use in pregnancy. Six health and social science databases were searched up until May 30, 2021. There were no methodological, time, or geographic limits applied. We employed a convergent integrative approach to the inductive analysis of findings from all studies.

Results: We identified 26 studies describing views of 17,781 pregnant and postpartum people about cannabis use in pregnancy. No studies describing the views of partners were identified, and only one study specifically addressed the perspectives of lactating people. Comparative analysis revealed that whether cannabis was studied alone or grouped with other substances resulted in significant diversity in descriptions of participant decision-making priorities and perceptions of risks and benefits. Studies of cannabis alone demonstrated a complex decision-making process whereby perceived benefits are balanced against the available information about risk, which is often unclear and uncertain. Clear and helpful information was difficult to identify, and health care providers were not described as a helpful and trusted resource for decision-making.

Discussion: Decision-making about cannabis use is difficult for pregnant and lactating people who perceive a benefit from this use, although this decisional difficulty is seldom reflected in studies that examine cannabis as one of multiple substances that pregnant or lactating people may use. Our review suggests several approaches clinicians may take to encourage open and supportive conversations to facilitate informed decisions about cannabis use during the perinatal period.

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[1]Department of Family Medicine, McMaster University, Hamilton, Ontario, Canada
[2]School of Population and Public Health, University of British Columbia, Vancouver, British Columbia, Canada
[3]Department of Communication, University of Massachusetts Amherst, Amherst, Massachusetts
[4]Department of Obstetrics and Gynecology, McMaster University, Hamilton, Ontario, Canada
[5]Department of Radiology, McMaster University, Hamilton, Ontario, Canada
[6]Department of Health Research Methods, Evidence & Impact, McMaster University, Hamilton, Ontario, Canada
[7]Center for Education Research and Innovation, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada
[8]McMaster Midwifery Research Centre, McMaster University, Hamilton, Ontario, Canada

Correspondence
Meredith Vanstone
Email: Meredith.vanstone@mcmaster.ca

ORCID
Meredith Vanstone https://orcid.org/0000-0002-7347-6259
Devon Greyson https://orcid.org/0000-0003-4860-384X

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INTRODUCTION

Cannabis use in pregnancy and during lactation has been increasing over time.[1–3] This trend is driven by increasing use in the general population and reflects the likelihood of habitual cannabis use continuing in pregnancy.[4,5] It is difficult to establish a precise rate of cannabis use during pregnancy, with existing studies suggesting that 2% to 36% of pregnant people use cannabis[1–4,6,7] with variance related to the population studied, definition of use, and methodology. The prevalence of cannabis use during lactation is unknown.[7]

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Quick Points

- Pregnant people describe important perceived benefits of cannabis use related to the management of symptoms experienced before pregnancy and co-occurring with pregnancy.
- For many pregnant people, cannabis use is a deliberate choice resulting from a consideration of perceived benefits and the information available to them about the risk of cannabis use.
- There is little known about why people consume cannabis during lactation and what the perceived benefits and risks are. Similarly, there is little known about the influence of partners on the decision to use cannabis in the perinatal period.

Health Outcomes of Cannabis Use During Pregnancy

For the pregnant or lactating person, potential negative health effects remain the same within and outside of pregnancy,[8–10] although there is evidence associating anemia with cannabis use in pregnant people.[11]

Existing studies of the clinical outcomes associated with cannabis use in pregnancy are limited by self-reported data about gestational time of use, dose, and composition.[12,13] There is a lack of studies that control for polysubstance and tobacco use, which are known confounders.[12,14] Given the increased potency of tetrahydrocannabinol (THC) over time, older studies of cannabis may be examining the use of a different substance than is in current use.[15] However, with these caveats about the state of the evidence, there is indication that cannabis use during pregnancy can be associated with low birth weight and preterm birth, although this evidence is not unequivocal.[9,11,12,16,17] There are also inconsistent findings across studies as to whether prenatal cannabis use is associated with an increased risk for neonatal intensive care unit admission.[11,16,18] The evidence associating cannabis with neurodevelopmental outcomes in childhood is uncertain,[12,19] with some longitudinal studies suggesting there is an association between prenatal cannabis use and neurodevelopment as demonstrated through a variety of outcomes related to mental health, attention, hyperactivity, impulsivity in childhood,[20,21] whereas others have found no association.[22] Very few studies have analyzed the harms of cannabis exposure through lactation. A recent systematic review identified only 2 studies on the topic, both published more than 30 years ago.[23]

Why Might Pregnant People Wish to Use Cannabis?

Prior studies indicate that there are a variety of reasons pregnant and lactating people may choose to use cannabis, including to treat conditions that both preexist and are related to the perinatal period.[4–6,24–29] Pregnant people report using cannabis to alleviate pregnancy-related conditions such as nausea, vomiting, pain, and fatigue.[25,26,30] Others continue cannabis use for reasons that preexisted pregnancy such as pain or anxiety, to help sleep, to control seizures, or for skin and hair treatment.[4–6,24–27] For some pregnant people, cannabis use may be a method of harm reduction, to decrease the perceived negative impact of unmet physical or mental health needs, or as an aid to discontinue the use of other substances judged to be more harmful (eg, opioids).[31]

Pregnant and lactating people face challenging decisions regarding cannabis use in pregnancy, influenced by the rising rates and normalization of cannabis use, perceptions of therapeutic benefit, and the uncertain evidence of harms of use during pregnancy.[27,29] Health care providers may struggle to counsel on this topic in a way that does not generate stigma or impair the therapeutic alliance, acknowledges the uncertainty of evidence, and reduces maternal and fetal harm.[32] To help clinicians understand the decisional challenges about cannabis use faced by pregnant and lactating people, we conducted a systematic review to synthesize existing knowledge about how pregnant people's experiences, attitudes, and beliefs affect their decision-making about cannabis use in pregnancy and during lactation.

METHODS

We employed a convergent integrated approach to the synthesis of research using a variety of methods, following the Joanna Briggs Institute guidance.[33,34] In a convergent integrated approach, research using diverse methods is synthesized together, rather than using a subsequent or parallel style of analysis common to mixed-methods research. For this review, we sought primary, empirical studies to answer the following research question: "What are the experiences, beliefs, and opinions of pregnant people and their partners about cannabis use during pregnancy and lactation?" It is registered as PROSPERO review CRD42020180038.

Search and Screening

We sought English-language articles that used any method to gather and analyze primary, empirical data about the experiences, beliefs, or opinions of pregnant people or their partners about cannabis use in pregnancy and lactation. A search for published literature was performed by a medical librarian on April 1 to 2, 2020, and updated until May 30, 2021, using the following databases: MEDLINE, APA PsycINFO, CINAHL, Social Science Citation Index, Social Work Abstracts, and ProQuest Sociology Collection (including Sociological Abstracts). Grey literature searching was confined to theses, searched through the ProQuest Dissertation Abstracts database.

The search strategy (Supporting Information: Appendix S1) comprised both controlled vocabulary and keywords and was peer-reviewed according to the Peer Review of Electronic Search Strategies checklist. No limits to date or study design were applied. We also conducted a hand-search of 8 journals, selected based on a combination of relevance and recency of

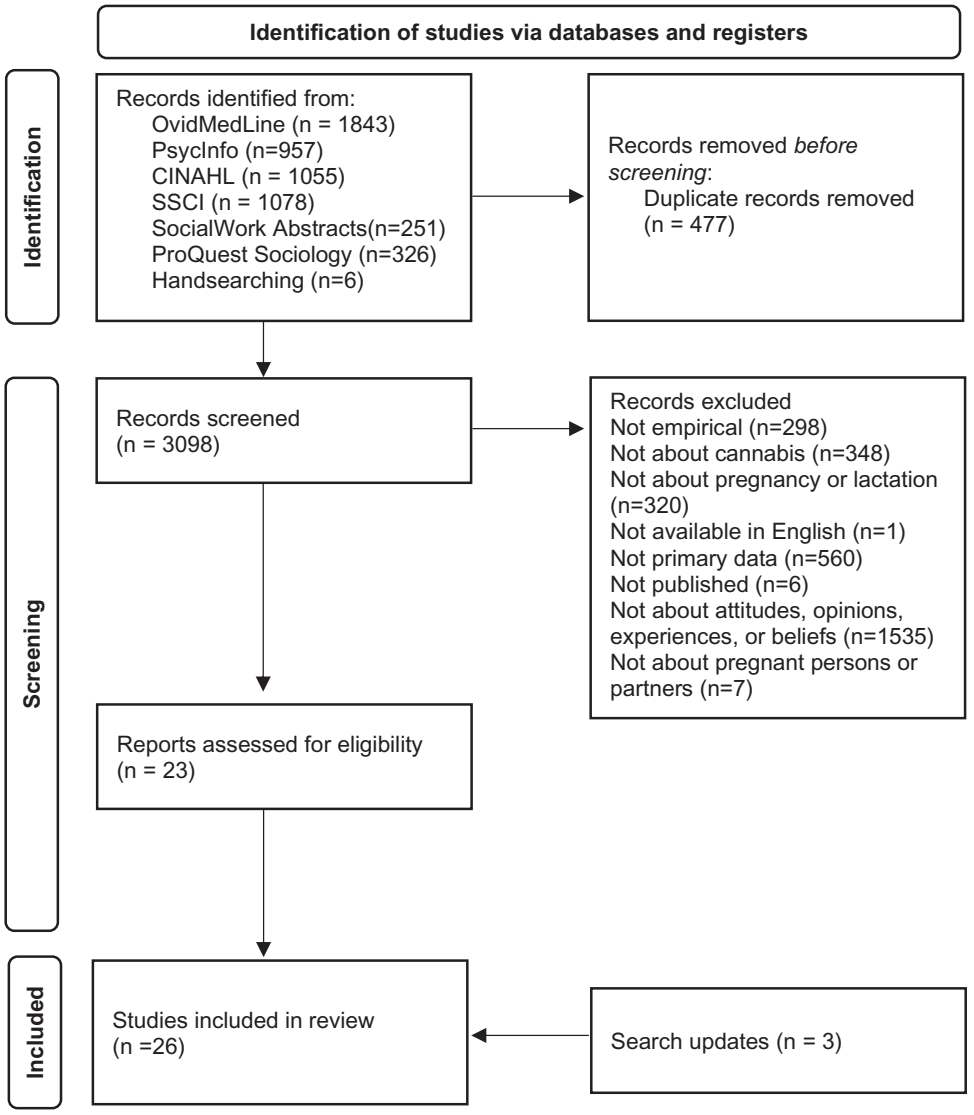

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Diagram of Article Selection Process.

Abbreviation: SSCI, Social Science Citation Index.

inclusion in indexed databases. These journals are described in Appendix S1.

Eligible articles were English language, peer-reviewed publications that included the perspectives of pregnant people and/or their partners on cannabis use during pregnancy or lactation. There were no limitations to the methodological approach, date of publication, or place the study was conducted. Studies were excluded if participants did not have personal or partnered experiences with pregnancy or lactation, if they did not include primary empirical data, or if they were published in languages other than English. We also excluded articles that described views on general cannabis use (not specifically during pregnancy or lactation), rates of cannabis use, or the biomedical or developmental outcomes of cannabis use during pregnancy or lactation.

Four reviewers (A.P., J.P., S.T., M.V.) screened the titles and abstracts of all citations based on the eligibility criteria. Full text articles were reviewed when more information was necessary to determine eligibility. Each article was screened independently by 2 reviewers, and discrepancies were resolved through discussion with a third reviewer until consensus was reached. After identifying eligible articles, we traced citations forwards and backwards to identify additional eligible articles. The Preferred Reporting Items for Systematic Reviews and Meta-analyses diagram depicting article selection process is in Figure 1.

In the process of article screening, we noted a cluster of articles that described pregnant and lactating people's experiences or perspectives with cannabis and other substances. Some of these articles examined cannabis alongside alcohol and tobacco, other illicit substances, and herbal medicines. All of these articles presented data specific to cannabis, as well as data that were generalized to all the substances under study. We decided to include the data from these articles that were specific to cannabis, which meant excluding data in which cannabis was not specifically and explicitly mentioned.

Critical Appraisal

We conducted critical appraisal using the Mixed Methods Appraisal Tool (MMAT), [35] selected as appropriate because it was designed to appraise studies with diverse designs and has been validated and reliability tested. Each study was appraised independently by 2 reviewers (2 of E.D., J.P., M.V. and a research assistant) who rated each aspect of the study as "yes," "no," or "can't tell" and conferred to reach consensus when they disagreed. The results of this critical appraisal are included as Supporting Information Appendix S2 to this article. Consistent with this review methodology and with the MMAT tool, all eligible studies were included, as long as they presented data in evidence of their conclusions.[36]

Data Extraction and Collation

We extracted 2 types of data from each included study: (1) study characteristics and (2) study results relevant to the research question. Descriptive data about the study and participant characteristics were extracted into a standardized electronic form. These data were used for comparative and contextualization purposes during analysis.

Strategies for data analysis of studies in an integrative review are one of the least developed aspects of the process, because analysis is a highly interpretive process where analysts must be attuned to the particular range of data available in each individual study.[37,38] We used Sandelowski's method of "qualitizing" data by identifying and extracting findings and then transforming each finding into a portable declarative statement that is understandable on its own.[34,38] These declarative statements are constructed to integrate findings with information about the study deemed most relevant to characterizing those findings (eg, population, jurisdiction). The declarative statements were composed by one reviewer and verified by another (A.P., J.P., S.T., M.V.) and recorded on a data extraction sheet for the individual study.

Data Analysis

Results from all studies were analyzed concurrently and combined together using data transformation techniques, following the convergent integrated approach in Hong's typology.[33] We treated the data in the qualitized declarative statements as qualitative data and used a staged constant comparative coding strategy adapted from grounded theory.[39] This is an inductive approach to analysis that starts with initial rounds of coding to describe and condense the findings of individual studies. The analysts then proceed to inductively generate categories from these descriptive codes, based on utility, prevalence, and authorial indication of meaningfulness. Analysis then moves to a constant comparative analysis, whereby findings from multiple studies are compared on multiple axes such as geography or participant type. During comparative analysis, we paid attention to factors such as the legal status of cannabis, comparator substances, funding source, year of publication, sampling strategy, and discipline of authors. Analysis was led by M.V. All analytic interpretations were negotiated during regular meetings with the whole research team. N-Vivo was used to manage the data.

RESULTS

After screening 3098 articles, we identified 26 eligible studies in this review, involving 12,564 pregnant people and 5,217 postpartum or unspecified people. These studies were conducted in jurisdictions where cannabis was legal, decriminalized, and illegal. Most studies were conducted in the United States, where states have varying cannabis laws, but cannabis remains federally illegal. All included studies are described in Table 1.

Concerning quality appraisal, the MMAT tool discourages the calculation of an overall score from the ratings of each category, but the quality of included papers was mostly acceptable.[35] As recommended, we present the rating for each criterion in the Appendix S2 for the purposes of evaluating the strength of the conclusions of this synthesis. Of the 26 included studies, 12 used qualitative approaches, 10 used quantitative approaches (9 surveys, 1 descriptive), and 4 used mixed-methods approaches. No partners were included in these studies, and only one article explicitly asked postpartum participants for their experience or perspectives on using cannabis while breastfeeding.[40]

Our initial analysis of the entire data set identified divergent findings across papers, and this divergence was not associated with critical appraisal results, year of study, or legal status in the jurisdiction where the study was conducted. As we engaged in comparative analysis, we identified that much of the divergence was accounted for by the other substances included in some studies. When cannabis was studied alone, grouped with alcohol or tobacco, or grouped with other drugs, the focus and hence the findings of each study shifted. In many of the articles in which cannabis was studied alongside other substances, the findings specific to cannabis were quite brief, and most data pertained to the group of substances generally. Accordingly, we have prioritized synthesis of the data from the 14 studies that examined cannabis only in this Results section, briefly contrasting these findings with those from the other 12 articles that examined cannabis in combination with other substances at the end of the section.

Cannabis Only

There were 13 studies that examined perspectives on cannabis use in pregnancy in isolation from any other substances.[5,30,41–51] One additional study specifically examined perspectives on the safety of cannabis use during lactation.[40] These studies were conducted in the United States, Canada, and Jamaica, in jurisdictions where recreational cannabis was legal or decriminalized[5,30,41] as well as jurisdictions where it was illegal.[42–47,50]

Decision-Making About Cannabis Use

Across these 14 studies, participants described making deliberate decisions about cannabis use. Participant decisions about whether, when, and how to consume cannabis were also influenced by their prepregnancy habits or reasons for use including improving mood, providing pleasure, managing stress, and making difficult circumstances more tolerable.[30,42-44] The financial implications of cannabis use

Table 1. Description of Studies Examining Pregnant and Lactating People's Perspectives on Cannabis Use

Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Cannabis-only studies							
Barbosa-Leiker et al[30]	2020 (N/A)	United States (Washington)	Recreational: legalMedical: legal	Qualitative	Pregnant and postpartum (0-3 mo) women (N = 19)	To identify women's perceptions of risks and benefits of cannabis use during pregnancy and postpartum as it relates to breastfeeding and parenting, in a state that has legalized recreational cannabis.Focus: cannabis only	5 themes are described, all of which contribute to the overarching theme of *Taking Care of Mom and Baby*, encompassing the woman's need and struggle to care for her own health and wellness as well as that of the fetus or future child.
Bartlett et al[41]	2020 (2019)	Canada (Ontario)	Recreational: legalMedical: legal	Quantitative	Pregnant women (N = 478)	The objectives of our study were to (1) estimate the prevalence of cannabis use among pregnant women in Hamilton Ontario; (2) evaluate pregnant women's beliefs about the transmission of cannabis in pregnancy and breastfeeding; and (3) examine if there is an association between receiving information from a health care provider and a woman's decision to discontinue using cannabis antenatally.Focus: cannabis only	The majority of participants (1) understood that cannabis can be transmitted to the fetus during pregnancy or infant during breastfeeding; (2) indicated that cannabis legalization did not influence their choice to use during pregnancy; and (3) those that continued to use were more likely to report getting information on cannabis from a health care provider, compared with those who discontinued use.
Chang et al[42]	2019 (Sep 2011-May 2015)	United States (Pennsylvania)	Recreational: illegalMedical: illegal	Qualitative	Pregnant women (N = 25)	To qualitatively describe the marijuana use experiences, beliefs, and attitudes of women who used marijuana during pregnancy.Focus: cannabis only	5 themes are described indicating that pregnant women who used marijuana during pregnancy had contradictory beliefs about use; that is, they tried to reduce use and were worried about potential risks, but also felt that marijuana was natural and safer than other substances, including prescribed medications.

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Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Coy et al[40]	2021 (2017)	United States	*[b]	Quantitative	Postpartum women with infants aged ≥12 wk (N = 4604)	(1) To describe characteristics of women who used marijuana postpartum; (2) to evaluate the relationship between postpartum marijuana use and breastfeeding behaviors; and (3) to assess, among women who used marijuana post- partum, how safety perceptions are associated with breastfeeding behaviors.Focus: cannabis only	Overall, 25.7% of participants indicated that they had been advised, by their prenatal care provider, against marijuana use while breastfeeding. Breastfeeding initiation or duration did not differ by postpartum marijuana use. Among participants with postpartum use, those who perceived marijuana was safe during breastfeeding were more likely to have breastfed and have a breastfeeding duration >12 wk compared with those who perceived it to be unsafe.
Curry[43]	2002 (N/A)	United States (California, Michigan)	Recreational: illegal (California); illegal (Michigan) Medical: legal (California); illegal (Michigan)	Qualitative	Pregnant women (N = 3)	To unveil the deep suffering endured by women undergoing HG from a folkloristic perspective and propose the use of medical cannabis as an effective natural remedy for the symptoms of HG.Focus: cannabis only	This study describes the experiences of women using medical cannabis as a remedy for HG, with the author noting a need for large clinical trials to explore this further.
Dreher[44]	1988 (N/A)	Jamaica	Recreational: illegalMedical: illegal	Qualitative	Pregnant women (N = 70)	To come out of the clinical setting and examine the practices and beliefs surrounding perinatal ganja smoking through interviews and direct observation in community-based field sites.Focus: cannabis only	Ganja was perceived by pregnant women to reduce the physiologic symptoms of pregnancy and the associated psychological stress, and these perceptions are described in relation to the sociocultural context of pregnancy in low-income rural communities.
Gray et al[45]	2017 (2015)	United States (Michigan)	Recreational illegalMedical: legal	Qualitative	Pregnant women (N = 10)	To evaluate, among pregnant women and prenatal care providers, the acceptability of an electronic brief intervention and text messaging plan for marijuana use in pregnancy.Focus: cannabis only	Patient-participants gave high ratings of satisfaction for the marijuana cessation intervention. They preferred the intervention program over working with their physician and most believed that the intervention would make them more likely to reduce their marijuana use.

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Table 1. Description of Studies Examining Pregnant and Lactating People's Perspectives on Cannabis Use

Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Holland et al[46]	2016 (2011-2014)	United States (Pennsylvania)	Recreational: IllegalMedical: Illegal	Mixed methods	Pregnant persons (N = 90)	To describe obstetric health care providers' responses and counselling approaches to patients' disclosures of marijuana use during first prenatal visits.Focus: cannabis only	Overall, 90 (19%) patient-participants disclosed marijuana use to health care providers, and of these 90 disclosures, half of the health care providers did not respond or offer counselling. When counselling was offered, information provided by health care providers included general statements, discussions about urine toxicology testing, and warnings about child services involvement.
Jarlenski et al[47]	2016 (Dec 2012-Feb 2015)	United States (Pennsylvania)	Recreational: illegalMedical: illegal	Qualitative	Pregnant women (N = 26)	To understand information-seeking patterns and perceptions of usefulness of available information about perinatal marijuana use among pregnant women who have used marijuana.Focus: cannabis only	Participants commonly searched for information about perinatal marijuana use via internet searching and anecdotal experiences or advice from family or friends. Few participants reported receiving helpful information from a health care provider or social worker. Participants recognized there was a lack of evidence on the harms of perinatal marijuana use and were dissatisfied with information quality. Most participants wanted information about the effects of perinatal marijuana use on infant health.
Mark et al[5]	2017 (2015-2016)	United States (Maryland)	Recreational: decriminalizedMedical: illegal	Quantitative	Pregnant women (N = 306)	To evaluate pregnant women's patterns of cannabis use, views toward legalization, knowledge of potential harm, and motivations for cessation during and after pregnancy.Focus: cannabis only	Most respondents (70%) believed that cannabis could be harmful to a pregnancy. Those who continued to use were less likely than those who quit to believe that cannabis use could be harmful during pregnancy. The most common motivation for quitting cannabis use in pregnancy was to avoid being a bad example. A physician's recommendation was only listed by 27% of respondents as a motivation to quit.

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Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Odom et al[48]	2020 (2015-2017)	United States	*[b]	Quantitative	Pregnant women; aged 14-44 (N = 2247)	The aim of this study was to estimate the prevalence and correlates of the perceived risk of weekly cannabis use, past 30-d cannabis use, and frequency of past 30-d cannabis use among US pregnant women.Focus: cannabis only	Almost 22% of participants did not perceive any risk associated with weekly cannabis use during pregnancy. Younger age, being below the poverty line and being in an early trimester of pregnancy, and co-use of tobacco and/or alcohol were associated with the increased odd of cannabis use.
Oh et al[49]	2017 (2005-2014)	United States	*[b]	Quantitative	Married (n = 3640) and unmarried (n = 3987) pregnant women (N = 7627)	To examine trends and mental health correlates of marijuana use among married and unmarried pregnant women including perceptions of risk of marijuana use during pregnancy.Focus: cannabis only	From 2005 to 2014, unmarried pregnant women increased marijuana use, as compared with married pregnant women, in whom use remained stable. This increase was associated with lower disapproval and risk perceptions of marijuana use among unmarried pregnant women.
Postonogova et al[50]	2019 (Jun 2018-Jul 2018)	Canada (Quebec)	Recreational: illegalMedical: legal	Quantitative	Women with vaginal births (N = 132)	To survey women who had recently given birth about their attitudes and experiences regarding the use of marijuana for the medical treatment of pain during laborFocus: cannabis only	34% of participants reported that they would consider the use of marijuana for labor pain. The greatest worry was the effect of marijuana on the fetus, with 26% being highly worried and 26% being extremely worried. 60% of women indicated a lack of knowledge of the side effects of marijuana in labor. 59% said they would feel comfortable discussing this topic with their obstetrician.
Young-Wolff et al[51]	2020 (Mar 2011-Jan 2017)	United States	*[b]	Mixed methods	Users of discussion forum (N = 204)	To analyze publicly posted questions on perinatal cannabis use on an online anonymous digital health platform and licensed US health care provider responses.Focus: cannabis only	The most frequent user questions concerned prenatal cannabis use detection (24.7%), effects on fertility (22.6%), harms of prenatal use to the fetus (21.3%), and risks of fetus exposure to cannabis through breast milk (14.4%). User "thanks" did not differ by provider responses regarding safety or dis/encouragement.

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Table 1. Description of Studies Examining Pregnant and Lactating People's Perspectives on Cannabis Use

Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Studies that consider cannabis alongside other substances							
Beatty et al[4]	2012 (N/A)	United States (Michigan)	Recreational: illegalMedical: legal	Quantitative	Low-income, primarily African American postpartum women (N = 150)	To examine the relative prevalence of marijuana and tobacco use among low-income postpartum women, using self report, urine, and hair testing data; and to further explore perceptions of the substances among postpartum women by evaluating perceived risk and monetary cost of prenatal marijuana vs tobacco use.Focus: cannabis, alcohol, tobacco	Self-reported prevalence of any tobacco or marijuana use in the past 3 mo was 17% and 11%, respectively. However, "objectively-defined" marijuana use (via urinalysis or hair analysis) was more prevalent than self-reported tobacco use. Participants were more likely to believe that there was a safe level of marijuana use during pregnancy, and nearly half believed that marijuana use during pregnancy was less expensive than smoking tobacco.
Hotham et al[52]	2016 (N/A)	Australia (Adelaide)	Recreational: illegalMedical: illegal (based on submission date)	Qualitative	Pregnant substance users (N = 104)	To use qualitative data from investigation of the screening tool ASSIST Version 3.0 with pregnant women to help determine its appropriateness for this cohort, thus informing potential innovations to enhance the questionnaire's utility.Focus: cannabis, alcohol, tobacco	Women reported that friends, family and care providers advocated cessation or curtailment of use; however, care provider advice was unpredictable. Some women shared suggestions about the appropriate level of provider advice. Pregnancy was a motivator for changing substance use behavior, but others reported continued attachment to use that was linked to dependence. Those who were less able to reduce/control use were more often skeptical of attributable harms and disinterested in change.

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Table 1. Description of Studies Examining Pregnant and Lactating People's Perspectives on Cannabis Use

Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Morrison et al[53]	1998	United States	*[b]	Quantitative	Young mothers (17 y or younger during pregnancy) (N = 255)	To investigate the beliefs about substance use among pregnant and parenting adolescents.Focus: cannabis, alcohol, tobacco	Use of cigarettes, alcohol, and marijuana were lowest during pregnancy, increased sharply at 6 mo postpartum, and remained level at 12 mo postpartum. Changes in intentions, attitudes, perceived social norms, outcome beliefs, and normative beliefs followed the same pattern.
Ng et al[54]	2020 (2019)	United States (New Jersey)	Recreational: illegalMedical: legal	Quantitative	Pregnant women (N = 843)	The objective of this study was to evaluate pregnant women's knowledge and opinions about marijuana use, potential risks, and legalization.Focus: cannabis, alcohol, tobacco	Overall, pregnant women had poor knowledge about the potential risks of marijuana use during pregnancy. Although a portion were opposed to legalization, 90% indicated they would be more likely to use marijuana in pregnancy if it were legalized. Associations of marijuana risks by prior tobacco use showed that nonsmokers had more awareness about risks. Similar trends were observed for participants who reported no prior marijuana use and for participants with more than high school education.
Higgins et al[55]	1995 (Dec 1991-May 1992)	United States (New Mexico)	Recreational: illegalMedical: illegal	Mixed methods	Pregnant substance users (N = 31)	To describe the types of drugs and alcohol used by pregnant multisubstance abusers enrolled in a substance abuse and treatment program and to describe the types of changes in their drug-taking behaviors. Focus: cannabis and other illicit substances	Generally, participants reported that they did change their drug-taking behaviors during pregnancy, and many women decreased their substance use. Most participants were in their twenties, Hispanic, single, and had some high school education.

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Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Klein and Zahnd[56]	1997 (N/A)	United States (California)	Recreational: illegalMedical: legal	Quantitative	Substance-involved pregnant women (N = 401)	To elicit information from pregnant, substance-using women on levels and consequences of their prenatal substance use, life situations, and service providers. Focus: cannabis and other illicit substances	Reported use of alcohol and other drugs diminished considerably during pregnancy.
Latuskie et al[57]	2018 (N/A)	Canada (Ontario)	Recreational: illegal (based on submission date)Medical: legal	Qualitative	Pregnant or parenting women with substance abuse issues (N = 11)	To understand women's experience using substances during pregnancy and the reasons that women continue and/or discontinue using substances. Focus: cannabis and other illicit substances	Women who continued substance use reported that various factors contributed to their use, including external and internal stressors, feelings of guilt and low self-efficacy, and a lack of understanding of the scientific and medical consequences of substance use. High self-efficacy and the quality of relationships when trying to make positive changes to their substance use during pregnancy were reported as important.
Roberts and Nuru-Jeter[58]	2010 (2006)	United States (California)	Recreational: illegalMedical: legal	Qualitative	Low-income pregnant and parenting women (N = 38)	To identify how the possibility of being identified as a pregnant alcohol and/or drug user through screening in prenatal care influence prenatal care attendance and engagement. Focus: cannabis and other illicit substances	Most women did not want to have drug use identified and were mistrustful of health care providers' often inconspicuous efforts to discover drug use. Women expected negative consequences, including feelings of maternal failure, judgment by providers, and reports to Child Protective Services. Women did not trust providers to protect them from these consequences and instead implemented strategies to protect themselves.

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Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Roberts and Pies[59]	2011 (2006)	United States (California)	Recreational: illegalMedical: legal	Qualitative	Low-income pregnant and parenting women (N = 38)	To identify women's perspectives on barriers to prenatal care and seeks to understand the processes through which drug use and factors associated with drug use during pregnancy become barriers. Focus: cannabis and other illicit substances	Women using drugs attend and avoid prenatal care for reasons not connected to their drug use: concern for the health of their fetus or future child, social support, and extrinsic barriers such as health insurance and transportation. Drug use itself is a barrier for a few women. Both the drug use and multiple simultaneous risk factors make resolving extrinsic barriers more difficult. Prenatal care use is also impacted by women's fear of the effects of drug use on the health of their pregnancy or future child and fear being reported to Child Protective Services.
Van Scoyoc et al[60]	2016 (N/A)	United States (Oregon)	Recreational: legalMedical: legal	Qualitative	Pregnant or postpartum women who used illicit substances during pregnancy (N = 15)	To examine women's beliefs about the impact of use on the developing fetus and to examine the protective behaviors that women with addictions engage in during the period of time between when they first find out they are pregnant and when they begin substance abuse treatment. Focus: cannabis and other illicit substances	Women were concerned about the impact of substance use on the developing fetus, including the physical and long-term developmental consequences of prenatal exposure. Women described trying to protect the fetus from harm on their own, outside of accessing traditional treatment services. They sought information anonymously, increased their engagement in health-promoting behaviors, and decreased their use of alcohol and other drugs.
Westfall[61]	2003 (N/A)	Canada (British Columbia)	Recreational: illegalMedical: legal	Qualitative	Pregnant women (N = 27)	To address several questions regarding the use of herbal medicine by pregnant women. What is the role of herbal medicine in pregnancy? How do pregnant women perceive herbal medicines in terms of safety? If they do use herbs, how do they make the choice to do so?Focus: cannabis and herbal medicines	Women considered herbs to be safer than pharmaceutical drugs. In choosing to self-medicate with herbs, women were guided by their prior knowledge, trusted sources of advice (books, friends, family members, maternity care providers, herbalists, herbal shops, and internet), and intuition.

(*Continued*)

Table 1. Description of Studies Examining Pregnant and Lactating People's Perspectives on Cannabis Use

Author	Date (Dates of Data Collection)	Country (Location)	Legal Status at Data Collection[a]	Methodology	Population	Main Research Question or Purpose and Substance(s) of Focus	Results
Westfall[62]	2004 (N/A)	Canada (British Columbia)	Recreational: illegalMedical: legal	Qualitative	Pregnant women (N = 27)	To identify which antiemetic herbs were used within a sample of women who participated in an interview-based study of prenatal and postnatal self-care, and discussing the herbs' historical uses, safety, and efficacy.Focus: cannabis and herbal medicines	20 participants experienced pregnancy-induced nausea with 10 using antiemetic herbal remedies, including ginger, peppermint, and cannabis.

Abbreviation: HG, hyperemesis gravidarum.
[a] Date of publication used if date of data collection not specified.
[b] Multiple jurisdictions: legal status unclear.

were mentioned as influencing both decisions to use and cease using.[5,45] Support or disapproval from friends, family, and health care professionals could also be influential.[5,45] However, most frequently, participants described a calculus of risk and benefit as the most influential factor for decisions about whether, how, and how much cannabis to use during pregnancy and lactation.

This calculus of risk and benefit was founded on a strong perception of personal benefit to cannabis use and a consistent but uncertain perception that it posed some form of risk to their pregnancy or child. Details about perception of risk and benefit will be discussed in the next sections. However, this was not always described as a binary decision of "use cannabis" or "cease use of cannabis." To minimize risk, many participants discussed changing the form of cannabis they used,[30,43,44] the frequency or amount,[5,30,42,44] or using cannabis at particular stages of pregnancy.[5,50]

Reasons for and Perceived Benefits of Using Cannabis

Seven studies described the benefits that participants perceived related to their cannabis use. Five studies did not describe any perceived benefits,[40,41,45,48,49] and 2 mentioned benefits only peripherally.[46,47]

Among the 9 studies describing benefits, many focused on perceptions that cannabis offers therapeutic or symptom management effects for managing conditions that preexisted pregnancy, including anxiety, depression, bipolar disorder, substance use disorders, posttraumatic stress disorder, insomnia, anemia, chronic pain, *Helicobacter pylori*, osteoarthritis, and fibromyalgia.[30,42,51] Benefits also included managing conditions related to pregnancy, including nausea and vomiting, weight gain, sleep, pain related to the physical toll of pregnancy or labor, and stress related to pregnancy and parenting.[5,30,42-44,50,51]

Some studies ascribed more general perceptions of benefits related to improving general health and mental, physical, and spiritual well-being.[44,51] This may be particularly important for pregnant people encountering difficult social, psychological, and physiologic circumstances.[44,51] For postpartum participants or those with older children, these effects meant they were better able to handle parenting stress and monotony.[30] Often these benefits were described in vague terms such as "calm down" or "tolerate a lot of things"[42] or "relaxing."[44] Participants were unlikely to describe their cannabis use in pregnancy or lactation as motivated by fun, recreation, or a desire to induce an altered state of consciousness, although sometimes this was present implicitly, such as when participants in a US study described cannabis use as improving their mood.[42] One exception to this was the Rastafarian women described in a 1989 ethnographic study conducted in Jamaica. This particular group of participants were described by the author as placing greater value on the immediate pleasure of recreational cannabis use than the health of their fetus or future child.[44]

Perceptions of Risk

Risk was a common topic of discussion in these studies. In one American study, a sizeable minority of pregnant women (~20%) perceived no risk associated with weekly cannabis use.[48] Pregnant women who were younger, living in poverty, white, and used tobacco were less likely to be concerned about the risk of cannabis use in pregnancy.[48] A longitudinal study showed that between 2005 and 2014, fewer American pregnant people believed that cannabis poses great risk or is harmful.[49] In both studies, perceiving that cannabis did not pose a great risk was associated with higher likelihood of cannabis use.

Perceptions of the risks of cannabis use in pregnancy most commonly focused on risks to the pregnancy or future child and were described only in very broad terms.[5,30,41,42,44,48,50,51] When specific harms were named, they included development and longer term health outcomes,[5,42] potentially related to oxygen restriction, respiratory problems, and brain development.[42]

Risks beyond the effects of prenatal exposure to cannabis on the fetus were described by participants in several studies. When describing the potential for risks to their pregnancy, newborn, or infant, participants also discussed risks related to the cessation or replacement of cannabis with a substance they deemed to be more harmful.[5,30,41,42,44,47,50] For example, participants in several studies evaluated cannabis as carrying less risk than over-the-counter or prescribed pharmaceuticals, particularly those prescribed to control nausea.[30,42,43,47] Participants also noted risk related to not consuming cannabis, describing that cannabis was essential to controlling their nausea and ceasing this use would pose a risk to the healthy development of their pregnancy because they would not be able to consume necessary nourishment.[30,43,44]

Some participants mentioned the potential for cannabis use to cause harm to themselves and their family. Most frequently mentioned here was the risk of involvement with criminal justice or child welfare services.[5,30,41-43,47,50,51] Personal risks also included unnamed side effects to themselves[50] or financial difficulty.[5]

Three studies included perceptions of cannabis safety during lactation, with most respondents indicating the perception that it was unsafe for breastfeeding people to use cannabis.[30,40,51]

Use of Information

Information sources were frequently discussed. Pregnant people sought or stated they would seek information from health care providers,[40,41,43,44,46,50] the internet or "literature,"[30,43,47,51] friends, family, and community members,[43,44,47] and, where cannabis was legal, from cannabis retailers.[30,41]

Health care providers were not a preferred source of information because of lack of clear information and fear of judgment or punitive responses.[30,42,43,45-47] The stigmatized nature of this topic encouraged online information searching, and the opportunity to ask questions anonymously through online or computerized programs was favorably received by participants in several studies.[45,51] Some, but not all, participants were comfortable seeking information from friends and family, and when received, this anecdotal information was powerful.[42,43,47]

Most common among studies that discussed information use was a preference for and a reliance upon information

found online, reflecting a dearth of information available from other sources and a desire for confidentiality when seeking information on cannabis use during pregnancy.[30,41,45,47,51] Few studies offered an evaluation of the quality of information received from different sources, with one remarking that pregnant people who received information online were more likely to believe that cannabis consumed in pregnancy would not pass to the fetus.[41]

Participants in several studies described the information they found or received as confusing, inconsistent, and incomplete.[30,42,43,45,47] Responding to this, pregnant people reported seeking information from multiple sources. For example, after seeking and failing to receive helpful information from their health care providers, participants in 3 studies turned to alternate sources such as friends, internet searches, or cannabis retailers for additional information.[30,43,47]

For those who received information from multiple sources, reconciling diverse and conflicting information was necessary. Participants described contradictions between what they heard from health care providers, read about online, and experienced personally or heard anecdotally from others.[30,47] Participants in 2 studies used the information available to them to determine that there is a debate among scientists and clinicians, and it is not clear whether cannabis use in pregnancy is truly harmful.[30,47]

Contrasts with Studies of Cannabis and Other Substances

We identified 12 studies that described perceptions of cannabis use in pregnancy alongside other substances. Four studies examined cannabis use in pregnancy alongside alcohol and/or tobacco.[4,52-54] Six studies discussed cannabis alongside other illicit substances[55-60] Two studies of a single group of participants grouped perceptions of cannabis with herbal medicines.[61,62]

In comparative analysis with the cannabis-only studies, it was remarkable that few of these studies addressed the perceived benefits of cannabis use. The herbal medicine studies were notable here in their discussion of the efficacy of cannabis for controlling nausea and vomiting.[61,62] In the other 10 studies, benefits were only mentioned incidentally, such as when quotes from individual participants mentioned using cannabis to treat depression and other health problems[52] or to manage stress and forget problems.[52,53] Instead, these 10 studies focused on describing perceptions of the harms of cannabis use in pregnancy and strategies to cease and reduce use.

When discussing risk, prenatal harm that would affect the life of their future child was a primary concern for most participants.[4,52,53,56-62] Participants mentioned a much wider array of potential harms, including harm to their own health, addiction, stress, withdrawal symptoms from quitting, drug-related arrests, and Child Protective Services involvement.[4,52,53,56-60] Some participants did not perceive that cannabis use during pregnancy posed a harm to their fetus.[54,60]

Information seeking and use was seldom discussed and, when present, was primarily related to identification of resources to support cessation and parenting.[57,59,60] Again, the herbal medicine studies were unique in describing the information used to support a decision-making process about whether and how to use cannabis. This decision process was supported by prior knowledge, trusted sources of advice (friends, family, health care providers, herbalists, the internet), and intuition/instinct.[61]

DISCUSSION

We identified 25 studies that describe the perspectives of pregnant and postpartum people about the reasons for, risks and benefits of, and available information about cannabis use during pregnancy and one study that focused on the perspectives of lactating people on the safety of cannabis use during lactation.[40] We did not identify any studies about the perspectives of partners on the use of cannabis during pregnancy or lactation. Included studies typically focused on smoked cannabis and seldom mentioned other increasingly popular forms of cannabis (eg, topical oils, ingestible formats, cannabidiol (CBD) products).

The studies synthesized in this review emphasize the variety of benefits that pregnant people perceive from cannabis use, related to managing the symptoms of conditions which preexisted pregnancy (eg, depression, anxiety), managing pregnancy-related symptoms (eg, nausea), and helping to cope with the unpleasant aspects of life and parenting.[5,30,42-44,50,51] This finding is congruent with several studies of prevalence of cannabis use during pregnancy, which demonstrate that people with depression or other mental health concerns[63,64] and those who experience nausea and vomiting in pregnancy[65] are more likely to use cannabis that pregnant people without these conditions.

Pregnant people across many of our included studies demonstrate a strong concern about whether cannabis use poses harm to their pregnancy or future child, with many perceiving that it is not safe and poses some form of risk, although only a few participants were able to articulate what specific risks they were worried about.[5,30,41,42,44,48,50,51] It was not a universally held belief that cannabis consumed during pregnancy poses a risk, and studies within and outside our review demonstrate that some pregnant people do not perceive that cannabis poses a health risk to their fetus.[6,48,49]

These notions of risk and benefit are in tension, leaving pregnant people engaged in a complex decision-making process whereby they try to balance their experience of the benefits of cannabis against uncertain and unclear information about the safety and risk of consuming this substance.[29,30] The challenge of making this decision is exacerbated by the difficulty finding clear, straightforward information about potential harms and strategies for mitigating these risks.[27]

A recent systematic review of clinicians' perspectives on counselling pregnant and lactating people about cannabis indicates a pervasive lack of confidence about how to respond to a disclosure of cannabis use, closely related to a lack of research evidence.[32] Clinicians who lack confidence in their knowledge about the effects of cannabis may hesitate to counsel about anything beyond the legal risks of cannabis use.[46] This may contribute to our finding that pregnant people are both reluctant to seek information from clinicians and

dissatisfied with the information they receive.[30,42,43,45-47] This finding is unique to decisions about cannabis; health care providers are typically the most valued source for information and counselling about other important health-related pregnancy decisions.[66]

These findings suggest several implications for researchers and clinicians. Researchers and research funders may wish to address the current gaps in knowledge about the clinical harms of cannabis use during pregnancy and lactation.[12,21] Although evidence is still emerging and more well-controlled studies are needed, there is indication showing potential for deleterious effects of cannabis use during pregnancy and lactation, particularly related to preterm birth and low birth weight.[9,11,12,16,17]

Second, clinicians should reflect upon their own assumptions about cannabis use in pregnancy. Ten studies in this review examined cannabis alongside other substances in which strong evidence of fetal harm exists (eg, alcohol, tobacco, methamphetamines, opioids).[67] The inclusion of cannabis in these comparator groups seemed to obviate the opportunity to consider that some pregnant people may perceive benefit to cannabis use and engage in a thoughtful and deliberate decision-making process; this was a prevalent theme in many of the cannabis-only studies but was not acknowledged in studies that grouped cannabis alongside substances known to be harmful in pregnancy.

Third, these findings suggest that counselling about cannabis should be undertaken separately from counselling about other substances. Asking patients to discuss the benefits they perceive from cannabis may prevent the appearance that the clinician is assuming the patient uses it because they do not know better, do not care about the health of their pregnancy, or are unable to stop using it.[32] Our review indicates that all 3 assumptions are likely to be false for many pregnant patients who are using cannabis. They are often very concerned with the potential for fetal harm and have spent significant time and energy searching out information to inform their decision.

Finally, we suggest that clinicians may wish to adopt a harm reduction approach when patients are hesitant to cease cannabis use, or substitute with a safer alternative. A harm reduction approach accepts the inevitability of drug use and works with people who use substances to minimize the associated harms.[68] This approach is particularly relevant in perinatal settings where the decision-maker is not the only person affected by choices about substance use. Given the documented perceptions of benefit, we encourage clinicians and researchers to inquire about *why* a person wishes to use cannabis and what benefits they receive from use. Discussions of risk and benefit should go beyond physiologic impact and include the availability of support, personal care, agency, and emotional health. A strong relationship between clinicians and their pregnant clients will be helpful in identifying appropriate strategies for harm reduction, which may include reducing or quitting use, substituting other drugs or treatments, making a lifestyle change, and seeking consistent prenatal care.[68] As research evidence continues to develop, evidence-based strategies for harm reduction based on, for example, the bioavailability of THC in different forms of cannabis may inform these strategies.[21]

Areas for Future Research

There is a significant gap in knowledge about the clinical outcomes of cannabis use during pregnancy and location. Decisional complexity faced by pregnant and lactating people and their clinicians is exacerbated by the lack of well-controlled studies about cannabis use during pregnancy and lactation. This research should seek to establish basic knowledge about the clinical outcomes associated with a variety of forms of cannabis with current THC compositions. Research on the clinical outcomes of cannabis exposure during lactation will be particularly important, as some studies have indicated that people are more likely to use cannabis during lactation than pregnancy.[29] This basic knowledge will be foundational in establishing clear guidance for clinicians and patients regarding cannabis use in the perinatal period. Our review identified no studies on the perspectives of the partners of pregnant people about cannabis use in pregnancy, although the influence of friends and family was noted as important by several studies. We also identified only one study that explicitly addressed the perspectives of lactating people or their partners about cannabis consumption. Given the findings of this study, it will be important for future research to study perspectives on cannabis in isolation from other substances used in pregnancy.

Strengths and Limitations

There are 2 existing systematic reviews on similar topics,[24,28] each with fewer than 6 included studies. Our search strategy, including extensive hand-searching and citation list searching is a strength, yielding 26 included studies, only 4 of which overlap with studies included in these previous reviews. This study has a few limitations. We searched only for articles published in English. We only included studies with participants who had personal experience of pregnancy or breastfeeding, potentially excluding the important perspectives of people who use cannabis and have yet to become pregnant.

CONCLUSION

This systematic review of 26 studies on pregnant and lactating people's perspectives about cannabis use documented a growing body of evidence about the perspectives of pregnant people on cannabis use in pregnancy but a lack of studies that include the perspectives of partners and of lactating people. This review demonstrated that the use of cannabis during pregnancy is often a deliberate choice founded on particular perceptions of benefit and related to uncertainty about the precise nature of the risk associated with prenatal cannabis consumption. Many studies do not acknowledge the deliberation demonstrated by many pregnant people or discuss the benefits they perceive to cannabis use. This gap was particularly notable in studies that addressed perspectives on cannabis alongside the use of other substances in pregnancy, and so may reflect the influence of the researcher's assumptions about cannabis use. As cannabis use rates rise in many jurisdictions following legalization, additional research on the ways and reasons that people use cannabis during the perinatal period is necessary to encourage informed decisions that reduce risk to pregnant people and their future children.

Clinicians can help facilitate this decision-making process by offering supportive counselling which explores the patient's perceived benefits and offers clear information about the risks and alternatives known to be safer.

CONFLICT OF INTEREST

From April to December 2019, J. Panday was employed as a research analyst at PureSinse Inc (a licensed cannabis producer). She does not currently hold any financial or personal connection to PureSinse, which is no longer in operation. Since May 2021, J. Panday has been employed as a freelance research coordinator by Avail Cannabis Clinics, a privately owned network of medical clinics, to prepare and submit ethics applications for research related to the use of cannabis to alleviate posttraumatic stress disorder symptoms in military populations. J. Panday is compensated hourly for this work and does not have any other financial interests related to Avail or their research.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1: Literature Search Methods

Appendix S2: Critical Appraisal Results: Quality Evaluation of Included Studies Using the Mixed Methods Appraisal Tool (2018 Version)

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