# Pregnant people's perspectives on cannabis use during pregnancy: A systematic review and integrative mixed-methods research synthesis

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#### Abstract

Background: Cannabis use during the perinatal period is rising. Objectives: To synthesize existing knowledge on the perspectives of pregnant people and their partners about cannabis use in pregnancy and lactation. Search strategy: We searched MEDLINE, APA PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Social Science Citation Index, Social Work Abstracts, ProQuest Sociology Collection up until April 1, 2020. Selection criteria: Eligible studies were those of any methodology which included the perspectives and experiences of pregnant or lactating people and their partners on cannabis use during pregnancy or lactation, with no time or geographical limit. Data collection and analysis: We employed a convergent integrative approach to the analysis of findings from all studies, using Sandelowski's technique of "qualitizing statements" to extract and summarize relevant findings from inductive analysis. Main results: We identified 23 studies of pregnant people's views about cannabis use in pregnancy. 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 combining cannabis with other substance seldom addressed perceived benefits or reasons for using cannabis. Conclusions: The way cannabis is grouped with other substances influences the design and results of research. A comparative analysis emphasizes the importance of understanding why a pregnant person might choose to use cannabis in order to foster dialogue about perceptions of benefit and strategies for risk mitigation.

# Pregnant people's perspectives on cannabis use during pregnancy: A systematic review and integrative mixed-methods research synthesis

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# Running title: Perspectives of cannabis use in pregnancy

Abstract (242/250 words)

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Search strategy: We searched MEDLINE, APA PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Social Science Citation Index, Social Work Abstracts, ProQuest Sociology Collection up until April 1, 2020.

Selection criteria: Eligible studies were those of any methodology which included the perspectives and experiences of pregnant or lactating people and their partners on cannabis use during pregnancy or lactation, with no time or geographical limit.

**Data collection and analysis:** We employed a convergent integrative approach to the analysis of findings from all studies, using Sandelowski's technique of "qualitizing statements" to extract and summarize relevant findings from inductive analysis.

Main results: We identified 23 studies describing the views of 9474 pregnant people and 613 postpartum about cannabis use in pregnancy. 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 combining cannabis with other substance seldom addressed perceived benefits or reasons for using cannabis.

**Conclusions:** The way cannabis is grouped with other substances influences the design and results of research. A comparative analysis emphasizes the importance of understanding why a pregnant person might choose to use cannabis in order to foster dialogue about perceptions of benefit and strategies for risk mitigation.

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Key words: cannabis, pregnancy, lactation, systematic review, mixed-methods, integrative review

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#### Introduction:

Cannabis use in pregnancy and during lactation has been increasing over time <sup>1-3</sup>, driven by increasing use in the general population <sup>4-6</sup> and the likelihood of regular users to continue to use in pregnancy <sup>7, 8</sup>. It is difficult to establish a precise rate of cannabis use during pregnancy, with existing studies suggesting that 2-36% of pregnant people use cannabis<sup>1-3, 7, 9-12</sup> with variance related to the population studied, definition of use, and methodology. The prevalence of cannabis use during lactation is similarly unknown <sup>13, 14</sup>.

Pregnant and lactating people use cannabis for a variety of reasons, including to treat conditions which both pre-exist and are related to the perinatal period <sup>7, 8, 11, 15-19</sup>. Pregnant people report using cannabis to alleviate pregnancy-related conditions such as nausea, vomiting, pain and fatigue <sup>16, 17, 20</sup>. Others continue cannabis use for reasons which pre-existed pregnancy such as pain, anxiety, sleep, to control seizures, or for skin and hair treatment <sup>7, 8, 11, 15-18</sup>. 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 (e.g. opioids) <sup>21</sup>.

#### Health Outcomes of Cannabis Use During Pregnancy

For the pregnant or lactating person, negative health effects remain the same within and outside of pregnancy; harms include respiratory and cardiovascular disorders as well as mental health and addiction challenges <sup>22-27</sup>. There is evidence that pregnant cannabis users are at greater risk for anemia than non-pregnant users<sup>28</sup>.

Evidence about fetal harms of cannabis use during pregnancy is not yet clear. There have been contradictory findings on whether the use of cannabis during pregnancy has effects on birth weight, stillbirth or miscarriage, preterm birth and neonatal effects <sup>27-30</sup>. Meta-analyses have reported that some studies show a decrease in birth weight with cannabis use <sup>28, 31, 32</sup>, while others report no association <sup>27, 29</sup>. There are also inconsistencies about whether cannabis use increases the risk for preterm delivery <sup>28, 29, 32-34</sup>, or if it poses an increased risk for neonatal intensive care unit admission<sup>28, 29, 33</sup>. Prenatal exposure to cannabis may also affect longer term neurodevelopmental outcomes including attention, hyperactivity, impulsivity in early childhood <sup>34, 35</sup>, emotional and behaviour problems <sup>35</sup>, and autism spectrum disorder <sup>36</sup>. Very few studies have analyzed the harms of cannabis exposure through lactation; there is conflicting evidence about the potential for delays in infant motor development<sup>27, 37-39</sup>.

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 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. <sup>40, 41</sup> 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 (Table 1). A search for published literature was performed by a medical librarian on April 01-02, 2020 using the following databases: MEDLINE, APA PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Social Science Citation Index (SSCI), Social Work Abstracts, ProQuest Sociology Collection (including Sociological Abstracts). Grey literature searching was confined to theses, searched through the ProQuest Dissertation Abstracts database.

The search strategy (Appendix 1) comprised both controlled vocabulary and keywords and was peer-reviewed according to the PRESS checklist (Peer Review of Electronic Search Strategies). No limits to date or study design were applied. We also conducted a hand-search of eight relevant journals, described in Appendix 1.

Four reviewers (JP, AP, ST, MV) screened the titles and abstracts of all citations based on the eligibility criteria (Table 1). Full text articles were reviewed when more information was necessary to determine eligibility. Each article was screened independently by two 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. PRISMA diagram depicting article selection process is in Figure 1.

# Critical Appraisal

We conducted critical appraisal using the Mixed Methods Appraisal Tool (MMAT) <sup>42</sup>, selected as appropriate because it was designed to appraise studies with diverse designs and has been validated and reliability tested <sup>43, 44</sup>. Each study was appraised independently by two reviewers (JP, MV, ED 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 (Table 2). 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 <sup>45-47</sup>.

#### **Data Extraction and Collation**

We extracted two 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 was extracted into a standardized electronic form. This data was 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<sup>47, 48</sup>. 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 <sup>41, 48</sup>. These declarative statements are constructed to integrate findings with information about the study deemed most relevant to characterizing those findings (e.g., population, jurisdiction). The declarative statements were composed by one reviewer and verified by another (JP, AP, ST, MV) and recorded on a data extraction sheet for the individual study.

# **Data Analysis**

Results from all studies were analysed concurrently, following the convergent integrated approach in Hong's typology <sup>40</sup>. We treated the data in the "qualitized" declarative statements as qualitative data and used a staged constant comparative coding strategy adapted from Grounded Theory <sup>49</sup>, which we have previously used in integrative qualitative meta-synthesis<sup>45, 50, 51</sup>. This is an inductive approach to analysis which starts with initial rounds of coding to describe and condense the findings of individual studies. The analysts then proceed to generate categories from these descriptive codes and later move to a constant comparative analysis. During comparative analysis we paid attention to factors such as the legal status of cannabis, comparator substances, funding source, time of publication, sampling strategy, discipline of authors. Analysis was led by MV, JP, AP, ST. All analytic interpretations were negotiated during regular meetings with the whole research team.

# **Results:**

We identified 23 eligible studies in this review, involving 9474 pregnant people and 613 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 of America, where states have varying cannabis laws, but cannabis remains federally illegal.

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  $^{42}$ . As recommended, we present the rating for each criterion in Table 2 for the purposes of evaluating the strength of the conclusions of this synthesis. The included studies represent a variety of methodological approaches with roughly equal distribution of qualitative, quantitative, and mixed methods approaches (Table 4). The combined study populations of 10,087 were dominated by Oh et al 2017 <sup>52</sup> which had 7627 participants. No partners were included in these studies and none of the postpartum participants were sampled for their experience or perspectives on using cannabis while breastfeeding (Table 4). Accordingly, our review of partner perspectives and the perspectives of lactating people is empty.

Our initial analysis of the entire dataset identified divergent findings across papers, and this divergence was not associated with critical appraisal results. As we engaged in comparative analysis, we identified that much of the divergence was accounted for by the other substances included in the study. 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. Accordingly, we present findings according to comparator groups (Table 5). We present a synthesis of evidence on three main themes that emerged through our inductive analysis: the main decisions faced by participants in these studies; descriptions of risk and benefit; descriptions of how information was sought and used (Table 6).

#### **Cannabis-only**

There were 12 studies that examined perspectives on cannabis use in pregnancy in isolation from any other substances <sup>8, 20, 52-61</sup>. These studies were conducted in the US, Canada, and Jamaica, in jurisdictions where recreational cannabis was legal or decriminalized<sup>8, 20, 53, 54, 60</sup> as well as jurisdictions where it was illegal <sup>55-59</sup>.

Across these 12 papers, participants considered how to modulate their cannabis use to maximize benefit and minimize risk. Participants discussed changing the form of cannabis they used <sup>20, 55, 56</sup>, the amount <sup>20, 54, 56</sup>, or using cannabis at particular stages of pregnancy <sup>8, 60</sup> to attain the perceived benefits while minimizing perceived risk.

Perceptions of the risks of cannabis were broad. Participants were consistently concerned about the risk of potential harms to their baby, both from the consumption of cannabis but also from the cessation or replacement of cannabis with a substance they deemed to be more harmful<sup>8, 20, 53, 54, 56, 59, 60</sup>. It is relevant here that many participants evaluated cannabis to carry less risk than over-the-counter or prescribed pharmaceuticals <sup>20, 54, 55, 59</sup>. Participants also noted involvement with criminal justice or child welfare services as a risk of using cannabis <sup>8, 20, 53-55, 59-61</sup>.

This group of studies was unique in its description of the perceived benefits of cannabis use in pregnancy. These benefits included managing conditions that pre-existed pregnancy including anxiety, depression, bipolar disorder, substance use disorders, PTSD, insomnia, anemia, chronic pain, Helicobacter pylori, osteoarthritis, fibromyalgia<sup>20, 54, 61</sup>, or improving general health and mental, physical, and spiritual well-being <sup>56, 61</sup>. Benefits also included managing conditions related to pregnancy, including nausea and vomiting, weight gain, sleep, pain related to the physical toll of pregnancy or labour, stress related to pregnancy and parenting<sup>8, 20, 54-56, 60, 61</sup>.

Participant decisions about whether, when, and how to consume cannabis were also influenced by their pre-pregnancy habits or reasons for use including improving mood, providing pleasure, managing stress, and making difficult circumstances more tolerable <sup>20, 54-56</sup>. The financial implications of cannabis use were mentioned as influencing both decisions to use and cease using <sup>8, 57</sup>. Support or disapproval from friends, family, and healthcare professionals could also be influential <sup>8, 57</sup>.

The sources, types, and evaluation of information was a common topic in this group of papers. Pregnant

people sought information from healthcare providers <sup>53, 55</sup>, the internet <sup>20, 55, 59, 61</sup>, and friends and family <sup>55, 59</sup>, as well as cannabis retailers <sup>20, 53</sup>. Reconciling diverse and conflicting information was necessary, and participants described contradictions between what they heard from healthcare providers, read about online, and experienced personally or heard anecdotally from others <sup>20, 59</sup>. Participants in several studies expressed disappointment at the lack of clarity regarding the safety of using cannabis in pregnancy, describing the available information as confusing, inconsistent, and incomplete <sup>20, 54, 55, 57, 59</sup>.

# Cannabis, alcohol and tobacco

Three studies examined cannabis use in pregnancy alongside alcohol and tobacco in the US and Australia, where non-medical cannabis was illegal<sup>62-64</sup>. In these papers, the main decision participants considered was whether or not to cease or decrease their pre-pregnancy cannabis consumption rate during pregnancy  $^{62-64}$ . One paper also addressed resuming or changing patterns of use postpartum<sup>64</sup>.

The harms of cannabis use during pregnancy are a main focus of this research. Participants considered harm to the fetus as a primary concern, with harm to own health, addiction, stress and withdrawal symptoms from quitting also addressed  $^{62-64}$ . Few benefits of cannabis use were discussed, but individual participants in the studies mentioned using cannabis to treat depression and other medical problems  $^{63}$  or to manage stress and forget problems  $^{63, 64}$ .

When considering whether to stop or reduce use, social factors were important with the level of concern from family and friends mentioned as influential in all papers <sup>62-64</sup>. Intervention or counselling from healthcare providers was motivating for some participants <sup>64</sup>. Information-seeking was not mentioned in any article. Despite the fact that recreational cannabis was illegal in all jurisdictions where these studies were conducted, legal implications are not mentioned in these studies.

#### Cannabis and other illicit substances

Six studies discussed cannabis alongside other illicit substances<sup>65-70</sup>. These papers did not have defined groups of substances, but rather studied perspectives or experiences with substance use in pregnancy more generally, offering long lists of the substances that participants discussed. Five of these studies were conducted in the United States  $^{65, 66, 68-70}$ , and one in Canada  $^{67}$ . In this collection of studies, medical cannabis use was legal in all but one jurisdiction  $^{65}$  and recreational use was illegal in all but one jurisdiction.<sup>70</sup> Of these six articles, five sampled participants from perinatal substance abuse treatment programs  $^{65, 67-70}$ . One recruited from public agencies and community organizations  $^{66}$ . This collection of studies started from the assumption that abstaining from substance use was necessary and desirable, and examined the barriers and facilitators of quitting. Accordingly, the main decision posed to participants in these studies was not whether to quit but how .

Perceptions of the risks of substance use in pregnancy were frequently discussed. Participants discussed drugrelated arrests and criminal involvement, including fear that child protective services would take away their child  $^{66-70}$ . Participants also discussed perceptions of the harm to the fetus, and to their ability to parent other children, and their feelings of worry or guilt about this $^{66-70}$ . Some participants denied feeling worried about harming their baby, citing other children they knew to be prenatally exposed to similar substances without notable harm  $^{70}$ . Healthcare providers were often viewed as a source of punishment, rather than protection or resources  $^{68, 69}$ .

There was very little discussion of why participants chose to use substances, or what benefits they may have experienced. This topic is only present in the quotes from individual participants and not addressed by the authors. Relationships with other people who use substances was cited as a factor which normalized and made substances difficult to quit, although this was framed as a barrier to quitting rather than a benefit of use  $^{67, 69, 70}$ .

Because the main decision considered was *how* to quit, not*whether* to quit, the influential factors in this decision focused on available support and resources to quit, and perceptions of self-efficacy about quitting  $^{65-70}$ . Similarly, content about information use focused on the identification of resources to support cessation

and parenting <sup>67, 69, 70</sup>. Typically, these sources were related to the substance-abuse program the participants were enrolled in at the time of recruitment.

# Cannabis and herbal medicines

We identified two Canadian manuscripts describing a single group of participants who used herbal medicines in pregnancy <sup>71, 72</sup>. The main decision faced by participants in these studies was what to use to control pregnancy-related symptoms including nausea and vomiting. Cannabis was one herbal remedy considered and used by participants and was discussed alongside ginger, peppermint, and other herbal medicines. When making the decision about what to use to control nausea and vomiting, participants discussed risks to the fetus as a primary concern and efficacy of the herbal medicine as a secondary concern <sup>71, 72</sup>.

Information used to make the decision included prior knowledge, trusted sources of advice (friends, family, healthcare providers, herbalists, the internet) and intuition/instinct <sup>71</sup>. Participants were more comfortable using herbs than pharmaceutical drugs and would only turn to pharmaceutical products after herbal medicines had failed<sup>71</sup>. Medical cannabis was legal but recreational cannabis was illegal in this jurisdiction at the time of the research; legal implications are not discussed in these papers<sup>71, 72</sup>.

# Discussion

We identified 23 studies that describe the perspectives of just over 10,000 pregnant people about the reasons for, risks and benefits of, and available information about cannabis use during pregnancy. We did not identify any studies about the perspectives of lactating people about using cannabis during lactation, nor did we identify any studies about the perspectives of partners on the use of cannabis during pregnancy or lactation.

This review demonstrates the powerful nature of the study design on research findings. When cannabis is included as one illicit drug used by someone enrolled in a substance abuse treatment program, the considerations and priorities are very different than when it is included as an herbal medicine used by someone seeking a non-pharmaceutical remedy for nausea and vomiting in pregnancy. Many studies did not describe the reasons why a person may seek to use cannabis during pregnancy, or the benefits that users experience from this substance. Most studies focused on smoked cannabis, and do not investigate perceptions of risks other forms of cannabis products (e.g. oils, topical applications, low-THC products).

Concern with fetal harm from prenatal cannabis exposure is a common theme in this literature. Strikingly, cannabis is almost always compared by study authors to substances where strong evidence of fetal harm exists (e.g., alcohol, tobacco, methamphetamines, opioids). This comparison is carried through to public health and clinical materials which also commonly group cannabis with these substances, belying the emergent and equivocal nature of evidence of fetal harm. These common groupings illuminate the assumptions of researchers but make it difficult to see that pregnant people may not understand cannabis the same way. For example, in one included study, participants compared cannabis to caffeine and fast food, two substances which are sub-optimal, but fulfill important social and emotional functions for pregnant people <sup>20</sup>.

The precautionary principle holds that when evidence is uncertain, the appropriate course of action is to err on the side of caution<sup>73</sup>. Given the evidence showing the potential for deleterious effects of cannabis use during pregnancy and lactation, the ideal outcome would be to reduce or eliminate cannabis consumption during these periods. However, as participants in many of the included papers described, many receive benefits from using cannabis and fear that ceasing use may result in greater harm.

Clinicians working with pregnant people who are considering cannabis use may wish to adopt a harm reduction approach. Harm reduction is particularly relevant in obstetrical settings where the decision-maker is not the only person affected by choices about substance use. A harm reduction approach accepts the inevitability of drug use and works with users to minimize the associated harms <sup>74</sup>. Given the documented perceptions of benefit and the lack of certainty about harm of cannabis use in pregnancy, we encourage clinicians and researchers to inquire about *why* a person wishes to use cannabis, what benefits they receive from use. Discussions of risk and benefit should go beyond physiological impact and include the availability of support, personal care, agency, and emotional health <sup>75</sup>. A strong relationship between clinicians and

their pregnant clients will be beneficial in order to identify 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 <sup>74, 76</sup>.

# Areas for future research

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 no research on opinions, beliefs, or experiences of lactating people, or their partners about cannabis consumption.

# Strengths and Limitations

There are two existing systematic reviews on similar topics<sup>15, 19</sup>, each with fewer than 6 included studies. Our search strategy, including extensive hand-searching and citation list searching is a strength, yielding 23 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 cannabis users who have yet to become pregnant.

#### Conclusion

There is a growing body of evidence about the perspectives of pregnant people on cannabis use in pregnancy, but this literature does not yet include the perspectives of their partners, or perspectives about the use of cannabis during lactation. Many studies do not acknowledge that there are specific reasons that people choose to use cannabis during pregnancy, and a host of perceived benefits to this use. This gap may reflect the influence of the researcher's assumptions about cannabis use on the study design of existing evidence. 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.

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**Table 1:** Eligibility Criteria (suggest print #1)

	Inclusion	Exclus
Population	Pregnant or lactating people and/or their partners	Partici
Topic	Participant attitudes, perceptions, or beliefs about cannabis use during pregnancy and/or lactation	Genera
Methods	Any methods for gathering and analyzing primary, empirical data	Non-en
Language	English	Any ot
Date Range	Any	N/A

**Table 2:** Critical Appraisal Results - Quality evaluation of included studies using the Mixed Methods Appraisal Tool (2018 Version) (suggest print #2)

	Qualitative	Qualitative	Qualitative	Qualitative	Qualitative	Quantitative Descriptive
	1.1	1.2	1.3	1.4	1.5	2.1
Barbosa-Leiker <sup>20</sup> (2020)	Υ	Υ	Υ	Υ	Υ	
Bartlett <sup>53</sup> (2020)						Υ
$Beatty^{62}$ (2012)						Υ
$Chang^{54}$ (2019)	Υ	Υ	Υ	Υ	Υ	
$Curry^{55}$ (2002)	Υ	С	Ν	Ν	$\mathbf{C}$	
$Dreher^{56}$ (1988)	Υ	С	Υ	Υ	С	
$Gray^{57}$ (2017)	Υ	Υ	Υ	Υ	Υ	С
$Higgins^{65}$ (1995)	Υ	Υ	Υ	Υ	С	Υ
Holland <sup>58</sup> (2016)						С
$Hotham^{63}$ (2016)	Ν	Ν	Υ	Υ	Υ	
$Jarlenski^{59}$ (2016)	Υ	Υ	Υ	Υ	Υ	
$Klein^{66}$ (1997)						Y
$Latuskie^{67}$ (2018)	Ν	Ν	Υ	Υ	Υ	
$Mark^{8}$ (2017)						Y
$Morrison^{64}$ (1998)						Y
$Oh^{52}$ (2017)						Y
$Postonogova^{60}$ (2020)						Y
$Roberts^{68}$ (2010)	Υ	$\mathbf{C}$	Υ	Υ	Υ	
$Roberts^{69}$ (2011)	Υ	С	Υ	Υ	Υ	
Van Scoyoc <sup>70</sup> (2017)	Υ	Υ	Υ	Υ	Υ	
Westfall <sup>72</sup> (2004)	Υ	Υ	Υ	Ν	Ν	
Westfall <sup>71</sup> (2003)	Υ	Υ	Υ	Υ	Υ	
Young-Wolff <sup>61</sup> (2020)	Υ	Υ	Υ	Υ	Υ	Y

Y = Yes; N = No; C = Can't Tell. Detailed descriptions of each criterion are published elsewhere. (42)

Table 3: Description of each included study (organized by Comparator Group) (suggest online only b/c longer than 1 page)

Author	Publicatio
Barbosa-Leiker <sup>20</sup>	2020 (N/A)
$Bartlett^{53}$	2020 (2019)
$Chang^{54}$	2019 (2011-
Curry <sup>55</sup>	2002 (N/A)
$\rm Dreher^{56}$	1988 (N/A)
Gray <sup>57</sup>	2017 (2015)
Holland <sup>58</sup>	2016 (2011-
Jarlenski <sup>59</sup>	2016 (2012-
Mark <sup>8</sup>	2017 (2015-
$Oh^{52}$	2017 (2005-
Postogonova <sup>60</sup>	2019 (2018)
Young-Wolff <sup>61</sup>	2020 (2011-
Beatty <sup>52</sup>	2012 (N/A)
Hotham <sup>63</sup>	2016 (N/A)
Morrison <sup>64</sup>	1998 (1992-
Higgins <sup>65</sup>	1995 (1991-
Klein <sup>66</sup>	1997 (N/A)
Latuskie <sup>67</sup>	2018 (N/A)
Roberts <sup>68</sup>	2010 (2006)
Roberts <sup>69</sup>	2011 (2006)
Van Scoyoc <sup>70</sup>	2016 (N/A)
Westfall <sup>71</sup>	2003 (N/A)
Westfall <sup>72</sup>	2004 (N/A)
	on not specified *Multiple ju

Table 4 Body of Evidence by Methodology and Participants (suggest online)

Methodology	Number of Eligible Studies
Qualitative	
Ethnography	1
Grounded Theory	1
Qualitative Description	1
Qualitative not otherwise specified	8
Thematic Analysis	1
Quantitative	
Survey/Questionnaire	6
Descriptive	1
Mixed Methods	4
Type of Participants	Number of Participants
Pregnant Persons	9474
Pregnant and Postpartum Persons (including parenting persons)	122
Post-Partum Persons (no specification on breastfeeding status)	287
Unknown	204
TOTAL	10087

**Table 5:** Comparator Group (suggest print #3)

Group 1 - Cannabis only Group 2 - Cannabis, Alcohol, Tobacco Group 3 - Cannabis and other illicit sub

Barbosa-Leiker <sup>20</sup> Bartlett <sup>53</sup> Chang <sup>54</sup> Curru <sup>55</sup>	$\begin{array}{l} \text{Beatty}^{62} \\ \text{Hotham}^{63} \\ \text{Morrison}^{64} \end{array}$	Higgins <sup>65</sup> Klein <sup>66</sup> Latuskie <sup>67</sup> Roberts (2
$\frac{\text{Curry}^{56}}{\text{Grav}^{57}}$		Roberts (2 Van Scovo
Holland <sup>58</sup> Jarlenski <sup>59</sup>		
Mark <sup>8</sup> Oh <sup>52</sup>		
Postogonova <sup>60</sup> Young-Wolff <sup>61</sup>		

 $2010)^{68}$  $2011)^{69}$  $pc^{70}$ 

Table 6:	Main	themes	organized	by	comparator	group	(suggest	print	#4	.)
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Main Themes	Group 1 - Cannabis only	Group 2 - Cannabis, Alcohol, Tobacco	Group 3 - Cannabis and other illicit substances	Group 4 - Cannabis and herbal medicines
Main decision considered by participants	How to modulate cannabis use to maximize benefits and minimize risks	Whether or not to cease or decrease cannabis use in pregnancy.	How to quit substance use and the barriers and facilitators to quitting	Deciding which herbal remedy to use to control pregnancy-related symptoms
Descriptions of Risks and Benefits Considered	<b>Risks:</b> - Harm to fetus - Potential risks of pharmaceutical products versus cannabis - Involvement with criminal justice or child welfare services <b>Benefits:</b> - Management of pre-existing conditions and improving general overall health - Management of pregnancy related symptoms and conditions	<b>Risks:</b> - Harm to fetus - Maternal health, addiction, stress & withdrawal <b>Benefits:</b> - Minor mentions of benefits for depression and other medical problems	<b>Risks:</b> - Harm to fetus - Involvement with criminal justice or child welfare services - Compromised ability to parent other children - Feelings of guilt or worry - Deteriorated interaction with health care providers [2] <b>Benefits:</b> - Brief mentions in quotes about cost benefits and stress relief	Risks: -Harm to fetus Benefit: -Effective control of nausea and vomiting in pregnancy

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How Information Was Sought and Used	Sources of information: - Healthcare providers - Internet - Friends and Family - Cannabis retailers Appraisal of information: - Diverse and conflict- ing/contradictory - Lack of clarity around safety	Not mentioned	Sources of Information: related to quitting substance use and were acquired from substance-abuse programs	Sources of Information: - Prior knowledge - Trusted sources of advice (friends, family, healthcare providers, herbalists, the internet) - Intuition and instinct
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