

Pregnant Women Perceptions of Cannabinoid Use in Milwaukee, Wisconsin

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ABSTRACT

Introduction: There is an increased threat to pregnant women and their fetuses due to the lack of knowledge and current policies of cannabinoid use during pregnancy. Inconclusive evidence of cannabinoid use during pregnancy prevents the development of standard guidelines and education regarding risks on long-term maternal and child health outcomes. This observational study investigated pregnant women's attitudes and beliefs and the prevalence of clinician counseling on cannabinoid use during pregnancy.

Methods: A 45-item questionnaire was distributed to pregnant women receiving prenatal care at 2 obstetrics and gynecology clinics in Milwaukee, Wisconsin. Descriptive statistics were used to summarize pregnant women's attitudes and beliefs, sources of information, prevalence of cannabidiol (CBD) use, and prevalence of clinician counseling on tetrahydrocannabinol (THC) and CBD use during pregnancy.

Results: A total of 95 questionnaires were collected from pregnant women during prenatal care visits. The majority of participants were non-White (54%) with a high school diploma (30%) and average age of 29 years old. Pregnant women's beliefs related to the use of cannabinoids on their own physical, social, and emotional health was "somewhat better." In contrast, women's beliefs related to the impact of cannabinoids use on their fetus and on birth outcomes was negative. Participants reported a lack of knowledge of THC (55%) and CBD (77%) use during pregnancy. Since their first prenatal care visit, over 60% of participants reported that they did not receive counseling regarding cannabinoid use during pregnancy, and the internet was the preferred source for information on THC (73%) and CBD (80%) use during pregnancy.

Conclusions: Pregnant women lack informed guidance and education on the effect of cannabinoid use during pregnancy. The possibility of misinformation poses a risk to maternal and child health outcomes. Future research should focus on health communication and risk assessments on cannabinoid use during pregnancy for prevention and treatment.

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INTRODUCTION

The growing acceptance, accessibility, and use of cannabis and cannabis-derived molecules (cannabinoids) raise important public health concerns and a need to evaluate the health effects of cannabis use more thoroughly.¹ Policy changes in recent decades seem to have altered cannabis use patterns and perceived levels of risk. The relatively nascent status of cannabinoid uses also presents a public health concern for vulnerable populations, such as pregnant women and adolescents. There is mounting concern that, although cannabis could present therapeutic opportunities, developing fetuses could be affected by maternal use.^{2,3} Unlike other substances whose use may confer risk, such as alcohol or tobacco, no accepted standards exist to help guide individuals as they make choices regarding either recreational or therapeutic use of cannabis.^{1,4} Increasing legalization and use of cannabinoids coexist with mixed research on the risks and benefits. Given the presence of established therapeutic effects in adults, nuanced advice is necessary to ensure clear communication that cannabinoids are capable of imparting both risks and benefits to individuals.¹ Furthermore, the development of advice will serve as valuable contextualization to guide additional investigations on health effects by identifying priority areas, such as vulnerable populations, risk perceptions, and ethical considerations.

Potential Risk of Cannabinoid Use During Pregnancy

Despite widespread use of cannabinoids such as cannabidiol (CBD), there is limited research regarding their use during pregnancy.⁵ Pregnant mice models have been used to investigate the effects of cannabinoids on offspring development. Gestating mice exposure to tetrahydrocannabinol (THC) has been linked to adverse effects on the neurological development and functionality of offspring throughout adolescence and adulthood.⁶ Offspring can begin to experience abnormalities with emotional and cognitive functions, social behavior, and mobility. Furthermore, researchers who have used THC treatment with gestating mice reported a decrease in maternal and birth weights.⁷ Recent studies found that prenatal exposure to CBD in gestating mice resulted in dysregulation of their offspring, suggesting that early communication is disrupted by CBD exposure.⁸

There are very few studies that have investigated the effects of cannabis use in pregnant women due to several limitations, including inconsistency or underreporting of results, the potency level of cannabis being consumed, and controlling for additional factors known to have adverse pregnancy outcomes. For example, a study in California explored the relationship between maternal mental health diagnosis and symptoms and intimate partner violence with cannabis use during pregnancy. Pregnant women were screened for cannabis use either by urine sample or self-reported cannabis use during their first prenatal care visit, with average gestational age at 8 weeks pregnant. Results from this study concluded that pregnant women were more likely to use cannabis if they were experiencing depression, anxiety, and/or intimate partner violence. However, there were inconsistencies in urine drug screening (6%), self-reporting (0.9%), and confirmatory toxicology testing (3.4%) for THC use. Differences in cannabis screening can be due to the frequency of use by a participant, which often is not captured in primary data collection. Another important limitation to consider within self-reporting is the potential of perceived legal implications of cannabis use during pregnancy,⁹ as clinicians have reported discussing the legal implications of substance use for cessation efforts for pregnant women rather than counseling due to the lack of information regarding risks. Lastly, it is important to note that cannabis often is not used in isolation of other substances, alcohol, or tobacco, which have been associated with adverse pregnancy outcomes.⁹

Similar to mice models, studies investigating cannabis use for pregnant women have found significant associations with low birth weight, stillbirth, and long-term health consequences for their offspring. Despite limitations in self-reported cannabis use for pregnant women, one study found an association with a 50% likelihood of low birth weight while controlling for maternal age, education level, and tobacco use.¹⁰ Another study that explored a combination of prenatal cannabis and tobacco exposure found an increased risk of stillbirth in expectant mothers.¹¹ Additionally, the relationship between THC and tobacco

prenatal exposure increases the likelihood of offspring using combustible cigarettes during adolescence, eventually becoming addicted to tobacco in adulthood.¹²

Lack of informed guidance may contribute to inadequate or ineffective communication between clinicians and pregnant women regarding the risk of cannabinoid use during pregnancy.⁹ Currently, CBD is legalized in the state of Wisconsin, while THC is not. However, THC is accessible to Wisconsin residents through its neighboring state Illinois for individuals over the age of 21. It is important to recognize accessibility of cannabis products to increase the urgency of communicating risk to pregnant women to reduce adverse outcomes.

This observational study explored pregnant women's attitudes and knowledge about cannabinoids—specifically THC and CBD—in an urban city (Milwaukee, Wisconsin) to investigate whether they are receiving informed guidance and to gain insights into how to better inform pregnant women, especially those from vulnerable populations. This paper reports preliminary findings and baseline data to support further study, including educational interventions and clinician training.

METHODS

Setting

This observational study administered a 45-item written anonymous questionnaire in English and Spanish to pregnant women to learn about their perceptions regarding cannabinoid use—specifically THC and CBD. The questionnaire was administered at an academic medical setting and community health clinic. The community health clinic serves predominantly Spanish-speaking patients due to its location in the community. This project was reviewed and approved by the Medical College of Wisconsin Institutional Review Board (IRB).

Subjects

Subjects were recruited by medical assistants who asked patients who were seeing clinician about their pregnancy if they were interested in completing in the study questionnaire. Medical staff were not a part of the research team and did not share patient identifiable information with the research coordinators. Interested participants received a written informational letter for consent before the questionnaire was administered by a research coordinator. Participants could self-administer the questionnaire with the option to ask for more information and/or assistance from the research coordinator in the exam room. The questionnaire was translated before administration and approved by the Medical College of Wisconsin IRB for potential Spanish-speaking participants. In addition, medical interpreters were available to translate correspondence between Spanish-speaking participants and the research coordinator as needed to complete the questionnaire. All questionnaires were collected by the research coordinator and included in the analysis. Any questions that were not answered were analyzed as missing.

Table 1. Participant Demographics (N = 95)

Median age (range)	29 (18–45)
Mean age (SD)	29.09 (6.49)
Race, n (%)	
Black or African American	20 (21)
White	39 (41)
Other ^a	26 (27)
Ethnicity, n (%)	
Hispanic	43 (45)
Education, n (%)	
<High school graduate	17 (18)
High school graduate	28 (29)
Some college	25 (26)
College graduate	21 (22)

^aOther includes other unspecified race (n = 20), American Indian or Alaska Native (n = 1), Asian (n = 2), and multiracial (n = 2).

Survey Development

The survey was developed by a multidisciplinary translational research team with specialization in obstetrics, maternal fetal medicine, family medicine, cannabinoid neuroscience, community prevention coalitions, risk assessment and communication, substance use social services, and bioethics expertise in neuroethics and maternal/fetal ethics. The team developed the 45-item questionnaire by combining previously used survey tools and literature from similar studies.^{13–16} Team members collaborated to create new questions and reviewed previously used questions. The completed questionnaire consisted of pregnant women's demographic information, overall knowledge of cannabinoid use, sources of information of cannabinoid use, clinician counseling for cannabinoid use during pregnancy, and the frequency and prevalence of CBD use before and during pregnancy. In addition, participants were asked about their perceptions/attitudes regarding how cannabinoid use would affect them physically, emotionally, and socially during pregnancy and their birth outcome. Physical characteristics included a pregnant woman's ability to move, sleep, and to manage morning sickness and cravings during pregnancy. Emotional characteristics included a pregnant woman's ability to concentrate, relax, unwind, feel calm, feel creative, and control anger. Lastly, social characteristics focused on a pregnant woman's ability to get along with others. Results were summarized with percentages and central tendency measures using Stata version 16 (StataCorp LLC).

RESULTS

A total of 95 pregnant women completed questionnaires on their attitudes and knowledge about the cannabinoids THC and CBD. Participants were mostly White women 41% (n = 39) with a high school diploma 29% (n = 28) and average age of 29 years old (Table 1).

THC

Only 45% (n = 18) of participants endorsed discussing marijuana

Table 2. Knowledge of Cannabinoid Use During Pregnancy and Sources of Information

	THC, N (%)	CBD, N (%)
Knowledge of use during pregnancy		
Yes	40 (43)	20 (21)
No	52 (55)	72 (77)
I don't know	2 (2)	2 (2)
Source of information		
Family or friends	18 (45)	10 (50)
Health care professional	18 (45)	4 (20)
Internet	29 (73)	16 (80)
Other	9 (23)	2 (10)

Abbreviations: THC, tetrahydrocannabinol; CBD, cannabidiol.

Table 3. Perceptions and Attitudes on the Impact of Cannabinoids During Pregnancy and Birth Outcome

	THC, N (%)	CBD, N (%)
Maternal		
Better	16 (18)	14 (16)
Somewhat better	31 (35)	31 (34)
No change	20 (22)	22 (24)
Somewhat worse	8 (9)	6 (7)
Worse	14 (16)	17 (19)
Birth Outcome		
Better	5 (5)	8 (9)
Somewhat better	6 (6)	11 (12)
No change	21 (23)	38 (41)
Somewhat worse	21 (23)	7 (8)
Worse	40 (43)	28 (30)

Abbreviations: THC, tetrahydrocannabinol; CBD, cannabidiol.

(cannabis) use during pregnancy with professional health care workers such as nurses or social workers (see Table 2). In addition, 68% of participants had not been counseled about cannabis use during pregnancy by any clinician since their first prenatal visit. When asked about their perceptions of the impact of THC during pregnancy, 53% (n = 47) of participants responded that THC would be beneficial for their pregnancy physically, emotionally, and socially. On the contrary, when asked about the health of the baby during birth, 66% (n = 61) of participants said they perceived the outcome would be worse after THC use (Table 3). More than half of the participants had not heard, read, or learned any information about using THC during pregnancy. For those who stated they had knowledge regarding THC use during pregnancy, their main source of information was the internet, specifically social media. Participants said they would judge whether the information regarding cannabis use during pregnancy is trustworthy by asking further questions with clinician or searching for additional information on the internet.

CBD

Only 4% (n = 4) of respondents stated that they used CBD during pregnancy. Frequency of CBD use varied between less than 5 times

a year and weekly. However, 29% (n=27) of respondents stated that they have used CBD while not pregnant less than 5 times a year. Overall, 77% (n=72) of participants have not heard, read, or learned any information about using CBD products during pregnancy. Similar to results regarding THC use during pregnancy, participants' main source of CBD information was the internet and family or friends. Over 90% (n=80) of participants did not receive information or counseling regarding CBD use during pregnancy from health care workers at the facilities or any clinician who provided treatment since their first prenatal visit. At 50% (n=45), CBD use during pregnancy was perceived to be somewhat better physically, emotionally, and socially, such as relief from morning sickness, managing the ability to concentrate, and getting along with others. In addition, 41% (n=38) of participants stated that there would be no change to the birth outcome if CBD is used during pregnancy.

DISCUSSION

Overall, this observational study supports the concept that pregnant women lack knowledge of the potential effects of cannabinoid use. Pregnant women's attitudes and beliefs on cannabinoid use varied regarding the risk and benefits on maternal health physically and emotionally. This supports previous research on women who reported cannabis use during pregnancy.¹³ Some perceived THC as being more natural and safer than other illicit substances and prescribed medication. This can be an implication for women using cannabis to manage pregnancy symptoms, such as nausea and mood changes.¹⁴

Participants reported that their health care professionals did not provide counseling on the use of cannabinoids during pregnancy, which is consistent with previous studies investigating clinicians' counseling habits.⁹ The lack of information available and inconsistent counseling from clinicians can increase the risk of ongoing cannabinoid use in pregnant women.¹⁵ Inconsistent and potentially inaccurate sources of information regarding cannabinoid use during pregnancy pose a risk to patients' health literacy and violate bioethical protections for adverse outcomes for pregnant women and their offspring.

Like previous studies, pregnant women reported seeking medical information on cannabinoid use on the internet.¹⁶ Our preliminary data suggest that social media is the most-used internet source of information regarding cannabis use during pregnancy. However, patients in other studies have reported a preference for clinicians to confirm the trustworthiness of information on cannabinoid use during pregnancy from any source.¹⁷ This preference may be at odds with other research with pregnant women negatively reporting the quality of medical information from clinicians on cannabis use.¹³

In this study population, there was a low percentage of pregnant women who reported CBD use. Our study did not investigate cessation of cannabinoid use during pregnancy of previous

users. However, pregnant women reported a decrease in usage of CBD during pregnancy compared to previous use. Motivating factors for discontinued cannabinoid use were not investigated, but women have reported social bias influencing their decision rather than adhering to clinicians' informed guidance.¹⁸ Some pregnant women preferred to reduce cannabis use to manage risks of adverse pregnancy outcomes, which is consistent with our findings of pregnant women reporting that cannabinoid use will negatively impact birth outcomes.

This observational study has multiple limitations. First, we recognize sample bias, as participants who were recruited with linguistic needs were not recorded or addressed by staff when translating the questionnaire and assisting Spanish-speaking participants. Therefore, we cannot confirm participants' comprehension of information being translated. Second, self-reported data for cannabinoid use during pregnancy have been found to be underreported compared to collected urine samples.¹⁹ Also, we did not collect data on participants' current pregnancy term or frequency of prenatal visits, which could have been used to compare differences in responses about cannabinoid impact on maternal characteristics and counseling from health care professionals. Another limitation is recall bias: depending on participants' gestational age, counseling from a health professional regarding cannabinoid use may not have occurred yet.

CONCLUSIONS

Our study found that pregnant women lack knowledge on the maternal impact of THC and CBD use. However, most pregnant women are aware that they may experience a negative birth outcome after THC and/or CBD use. Pregnant women often used the internet as a source of information regarding THC and CBD use, while reporting the absence of counseling from a health professional. Future research should focus on interventions to improve health communication about cannabinoid use between clinicians and pregnant women. Contradictions in sources and trustworthiness of information highlight inaccessibility of medical information on cannabis use. Established risk assessment and health communication practices should be employed, along with bioethical examination, to summarize ongoing research and synthesize advice. It may be possible to establish risk benchmarks using sensitive endpoints, such as birth outcomes, if robust observational studies can establish reliable exposure estimates. All evidence-based advice should be developed in partnership with stakeholder engagement from affected communities to maximize health-promoting messaging.

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