Prevalence of cannabis use disorder among pregnant people who test positive for cannabis at time of delivery

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BACKGROUND: Cannabis use in pregnancy is common, but the reasons that some pregnant people continue use are unclear.

OBJECTIVE: This study aimed to assess the prevalence of cannabis use disorder and medicinal cannabis use among pregnant people who test positive for cannabis use at the time of delivery at a single institution.

STUDY DESIGN: A standardized questionnaire was administered to postpartum people who tested positive for cannabis use by urine toxicology at the time of admission to the obstetrical care unit at the University of Maryland Medical Center. The questionnaire included questions modeled after the National Survey on Drug Use and Health’s assessment of cannabis use disorder. The questionnaire also asked the respondent to indicate which symptoms, if any, they used cannabis to treat and whether cannabis had been recommended by a physician.

RESULTS: Of 46 study respondents, 12 (26.1%) met the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, criteria for cannabis use disorder. Among the 37 respondents who answered questions about physician recommendation and treatment of symptoms, 28 (75.7%) reported using cannabis for symptom control, most commonly nausea or vomiting. Of note, 2 respondents reported having been recommended cannabis by a physician before they became pregnant but not specifically after becoming pregnant. Moreover, 31 of 35 respondents (88.5%) indicated that they intended to stop using cannabis during pregnancy.

CONCLUSION: Here, a quarter of birthing people who tested positive for cannabis use at the time of delivery met the cannabis use disorder criteria. Further investigation is needed to identify barriers and unmet needs for substance use treatment.

Key words: addiction, cannabis use disorder, marijuana, pregnancy

Introduction

Research on the effects of cannabis exposure in utero is ongoing, and observational studies have reported associations with preterm birth, stillbirth, and lower birthweight1-3 and behavioral, learning, and cognitive neurodevelopmental problems.4,5 The American College of Obstetricians and Gynecologists (ACOG) recommends that people who are pregnant be encouraged to discontinue cannabis use. For people using cannabis for medicinal purposes, the ACOG recommends opting for therapies with better pregnancy-specific safety data.6 According to data from the National Survey on Drug Use and Health (NSDUH) between 2015 and 2018, the percentage of pregnant people who reported last month cannabis use increased from 3.4% to 7.1%, with increasing numbers reporting daily or almost daily use.7

Despite increasing rates of use, previous studies have shown that most people quit or cut back cannabis use during pregnancy.3,7 Approximately a quarter of people who use cannabis early in pregnancy will continue to use it. Among pregnant people who identify their use as
Why was this study conducted?
This study aimed to determine the frequency of cannabis use disorder (CUD) in pregnant people who continue to use cannabis during pregnancy.

Key findings
Approximately 1 in 4 pregnant people who continue to use cannabis throughout pregnancy have a CUD. Most pregnant people report using cannabis for symptomatic relief, most commonly nausea, mood, and pain, even though it was uncommon that it was recommended by a healthcare provider.

What does this add to what is known?
Nearly all pregnant people who continue to use cannabis throughout pregnancy have a use disorder or report that their use is for symptom relief; counseling and treatment focusing specifically on use disorders and nonrecreational use are needed.

Results
A total of 46 birth parents were enrolled in this study from May 2019 to July 2020. Of note, 6 eligible birth parents were approached but declined to participate (enrollment rate for approached individuals: 88.5%). Of the 46 enrolled participants, 31 were approached in person by a research team member, and 15 were enrolled by phone because of mandated social distancing guidelines.

Of the 46 respondents, 12 (26.1%) met the DSM-5 criteria for CUD. Responses to each of the questions assessing CUD during the 12 months before survey administration are summarized in Table 1. Of note, 34 of 46 respondents (73.9%) tried to set limits on the amount of cannabis used; only 2 of 34 respondents (5.9%) who tried to set limits indicated that they were unable to keep to their limits. Moreover, 37 of 45 respondents (82.2%) wanted to or tried to cut down on the amount of cannabis used (1 of 46 respondents did not answer this question). Among the 37 respondents who tried to cut down on the amount of cannabis used, 12 (32.4%) were unable to cut down or stop every time they tried. Of note, 17 of 46 respondents (37.0%) reported spending a lot of time getting or using cannabis, and 8 of 45 respondents (17.7%) reported a month or more when a lot of time was spent getting over the effects of cannabis. None of the respondents reported physical problems worsened by cannabis or hazardous use, questions used the NSDUH questions regarding substance use and use disorders. Missing responses to questions were excluded from calculations related to those parameters using an approach similar to that described in the 2016 NSDUH per its methodologic summary and definitions report. A criterion was met when a respondent gave one or more positive responses to the survey questions assessing the criterion. Participants were determined to have CUD if they exhibited ≥2 criteria for a use disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).10

Methods
This was a cross-sectional, observational study that implemented a standardized questionnaire modeled on the NSDUH questions assessing the criteria for CUD. Additional questions assessed whether subjects were recommended medical cannabis by a medical provider before or during their pregnancy, whether they were treating any symptoms with cannabis without a provider’s recommendation, and whether they intended to stop using cannabis during their pregnancy. The inclusion criteria were met by postpartum, English-speaking people, who tested positive for cannabis use on routine, universally performed urine toxicology testing at the time of admission to the obstetrical care unit at the University of Maryland Medical Center. As is standard clinical care at the participating institution, urine toxicology testing for tetrahydrocannabinol was performed using immunoassay testing, and the results were binary with a cutoff of 50 ng/mL. Patients <12 years old and those who did not speak English or were unable to provide consent were excluded. Eligible patients were contacted in person or via phone by a research team member who explained the study and that participation was anonymous and voluntary and that their answers to questions or their decision to not participate in the study would have no influence on the medical care they would receive. Researchers administering the questionnaire were blinded from respondents’ past medical history, including substance use history. Because of the COVID-19 pandemic and consequent social distancing measures, patient enrollment and survey completion after March 16, 2020, were conducted via phone call interviews instead of in person.

The results of the study were analyzed by calculating the proportions of responses to each survey question and using z or t scores to compute 95% confidence intervals based on the number of question respondents. The survey
neglect of major roles, activities given up, or legal problems.

Of the 46 respondents, 37 (80.4%) answered the questions about medicinal cannabis recommendation status and symptoms that they were attempting to treat with cannabis. Table 2 outlines the symptoms that women identified as their reasons for use during pregnancy, although without the recommendation of a healthcare provider. Of note, 28 of 37 respondents (75.7%) indicated that they were using cannabis to treat at least 1 symptom; the symptoms reported included nausea or vomiting (82.2%), anxiety (60.7%), pain (57.1%), headaches (32.1%), and “other symptoms” (46.4%) with free response descriptions, including loss of appetite, depression or mood, posttraumatic stress disorder, insomnia, and heartburn or reflux. Of the 12 respondents who met the DSM-5 criteria for CUD, 10 also reported using cannabis for symptom relief.

Of the 37 respondents, 2 (5.4%) reported receiving a cannabis recommendation from a physician through a state medical cannabis program before pregnancy, with indications, including anxiety, pain, headaches, and “other symptoms.” Of the 2 respondents, 1 reported that, during pregnancy, she also used cannabis to treat appetite, but without a doctor’s recommendation, which notably was not the reason for the initial recommendation. None of the respondents reported being recommended medicinal cannabis by a doctor during their pregnancy.

Among the 35 respondents who answered the question regarding the intention to quit, 31 (88.5%) indicated that they intended to stop using cannabis during pregnancy, and 4 (11.4%) reported that they did not. Among the 4 respondents who said that they did not intend to stop using cannabis, none met the criteria for substance use disorder (0%), 2 reported that they were using cannabis to treat symptoms without a healthcare provider’s recommendation (50%) and 2 did not endorse using cannabis to treat symptoms (50%).

### Discussion
This study found that approximately 1 in 4 birthing people who test positive for cannabis use at the time of delivery meet the criteria for a CUD. In addition, most, but not all, birthing people reported intentions to stop using cannabis during pregnancy, and most birthing people reported use for attempted treatment of

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**TABLE 1**

| Survey question                                                                 | Total “yes” answers/total responding to the question | Percentage (95% CI) |
|---------------------------------------------------------------------------------|------------------------------------------------------|---------------------|
| Questions 1–18 refer to the 12 mo before survey administration                  |                                                       |                     |
| 1. Month or more spending a lot of time getting or using                         | 17/46                                                | 37.0 (23.0–50.9)    |
| 2. Month or more spending a lot of time getting over the effects                | 8/45                                                 | 17.8 (6.6–29.0)     |
| 3. Tried to set limits                                                          | 34/46                                                | 73.9 (61.2–86.6)    |
| 3b. Often used more marijuana than intendeda                                    | 2/34                                                 | 5.9 (0.0–13.8)      |
| 4. Had to use more marijuana for same effect                                    | 3/46                                                 | 6.5 (0.0–13.7)      |
| 5. Same marijuana use had less effect                                            | 10/46                                                | 21.7 (9.8–33.7)     |
| 6. Want or try to cut down or stop using                                        | 37/45                                                | 82.2 (71.1–93.4)    |
| 6b. Able to cut down or stop using when trieda                                  | 9/37                                                 | 24.3 (10.5–38.2)    |
| 7. Had problems with emotions, nerves, and mental health caused by marijuana use disorder | 6/46                                                 | 13.0 (3.3–22.8)     |
| 7b. Continue to use despite problems with emotions, nerves, and mental healtha | 1/6                                                  | 16.7 (0–55.8)       |
| 8. Had physical health problems caused by marijuana use disorder                | 0/46                                                 | 0                   |
| 8b. Continue to use despite physical health problemsa                           | 0/0                                                  | 0                   |
| 9. Spend less time doing work, school, hobbies, or family                       | 0/46                                                 | 0                   |
| 10. Problems at home, work, or school                                           | 0/46                                                 | 0                   |
| 11. Physical danger while using                                                  | 0/46                                                 | 0                   |
| 12. Repeat trouble with the law                                                 | 0/46                                                 | 0                   |
| 13. Problems with family or friends                                             | 1/46                                                 | 2.2 (0.0–6.4)       |
| 13b. Continued use despite problems with family or friends                      | 0/1                                                  | 0                   |

CI, confidence interval.

a According to the survey skip logic, answers to “b” questions were only warranted when the answer to the previous question was affirmative.

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physical or mental health–related symptoms. This study evaluated the rate of CUD in birthing people who continued to use cannabis throughout pregnancy.

It has been documented that approximately one-quarter of people who use cannabis at the initiation of prenatal care will continue to use it through the third trimester of pregnancy. The reasons for continued use are not known. Our study highlighted the possibility that some people who continue to use cannabis during pregnancy may do so because of a use disorder. As has been observed in other studies, many participants in our study reported cannabis use for symptomatic relief. Further exploration of whether these pregnant people tried and failed standard of care treatment or chose to use cannabis rather than standard treatments is needed. Nausea or vomiting was the most common problem that participants in our study reported using cannabis to treat, although without the formal recommendation of a healthcare provider. A study of recently pregnant people in Hawaii found that those who reported severe nausea during pregnancy were significantly more likely to report using cannabis during pregnancy than those who did not and questioned whether cannabis treated or contributed to nausea and vomiting. Furthermore, as nausea and vomiting are most common in the first trimester of pregnancy, it is unknown if the reasons for use at the beginning of pregnancy change throughout pregnancy. Further exploration of trajectories of use and potential changes in reasons for use is needed.

If a neonate tests positive for cannabis metabolites after delivery, a report to child welfare services would be mandated given the Child Abuse Protection and Treatment Act guidelines regarding substance-exposed newborns and the federally illicit status of cannabis. Even in those respondents who met the DSM-5 criteria for a use disorder, the symptoms of use disorder that would be anticipated to cause disruptions to a family, such as neglecting major responsibilities, physical danger, and problems with family, were nearly absent. This calls into question the use of mandated reporting for cannabis exposure during pregnancy.

There were several limitations in this study. First, our survey was based on the 2018 NSDUH survey, which was based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, criteria for use disorders. Our team evaluated the responses to determine which participants met the DSM-5 criteria for CUD. However, neither our survey nor the 2018 NSDUH survey inquired about cravings, so it is possible that our study underdiagnosed the prevalence of CUD in our population. In addition, one could argue that any use of cannabis during pregnancy is hazardous, but we relied on self-reported answers and did not categorically categorize all use as hazardous. Our sample size was modest with generalizability potentially limited by the cohort being recruited from birthing people at a single tertiary care center in a state where medical cannabis use is legal and nonmedical use is decriminalized. The inclusion criteria included testing positive for cannabis at the time of admission, but self-report of the last date of use was not collected. Therefore, it is possible that some respondents had quit the use of cannabis before delivery, but their toxicology test remained positive. The survey responses and assessment of CUD drawn from them were the result of anonymous self-reporting and were not clinically verifiable. The data were also subject to recall bias and observer effect, as the presence of a study team member on the phone or in person may influence the responses. Studies estimating the prevalence of cannabis use during pregnancy are likely biased by birthing people underreporting use because of stigma or fear of consequences for themselves and their families. Similarly, this study was subject to response bias as participants may be inclined to give more socially desirable answers, such as overstating their intentions to quit or underreporting behaviors consistent with a use disorder. The study team tried to attenuate these concerns and response biases by making participation anonymous. In addition, 15 respondents participated in the study by phone survey because of social distancing restrictions after the onset of the COVID-19 pandemic in the United States. It is difficult to predict how or whether these events influenced individuals’ cannabis access or patterns of use or how telephone vs in-person recruitment may have affected the responses.

Previous studies have shown that most women with substance use disorders do not receive treatment. Work needs to be done to improve access to treatment and to understand barriers and unmet needs of pregnant and postpartum people with CUD.

### TABLE 2

| Symptom                  | Total “yes” answers/total responding to the question | Percentage (95% CI) |
|--------------------------|-----------------------------------------------------|---------------------|
| Nausea or vomiting       | 23/28                                               | 82.1 (68.0−96.3)    |
| Anxiety                  | 17/28                                               | 60.7 (42.6−79.0)    |
| Pain                     | 16/28                                               | 57.1 (38.8−75.5)    |
| Headaches                | 9/28                                                | 32.1 (14.8−49.4)    |
| Seizures                 | 0/28                                                | 0                   |
| Other reasons            | 13/28<sup>a</sup>                                   | 46.4 (28.0−65.0)    |

<sup>a</sup> Other reasons respondents used cannabis without a recommendation included appetite or eating (8), insomnia (1), depression or mood (3), posttraumatic stress disorder (1), heartburn or reflux (1), and no reason reported (1).

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Conclusion
The findings of this cross-sectional study of birthing people who tested positive for cannabis use at the time of delivery showed that approximately one-quarter of birthing people reported use that was consistent with CUD. Further research is needed to assess unmet treatment needs and improve treatment efficacy and access for the portion of pregnant people with CUD. Most participants self-reported that their cannabis use during pregnancy was to treat common symptoms of pregnancy, including nausea or vomiting, anxiety, and headaches. Further studies about the actual efficacy of cannabis for the treatment of these symptoms and the risks and benefits of cannabis use vs standard treatments are also needed.

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