Marijuana Use and Breastfeeding: A Survey of Newborn Nurseries

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abstract

BACKGROUND AND OBJECTIVES: Marijuana use has increased nationally and is the most common federally illicit substance used during pregnancy. This study aimed to describe hospital practices and nursery director knowledge and attitudes regarding marijuana use and breastfeeding and assess the association between breastfeeding restrictions and provider knowledge, geographic region, and state marijuana legalization status. We hypothesized that there would be associations between geography and/or state legalization and hospital practices regarding breastfeeding with perinatal marijuana use.

METHODS: A cross-sectional, 31-question survey was sent electronically to the 110 US hospital members of the Academic Pediatric Association's Better Outcomes through Research for Newborns (BORN) network. Survey responses were analyzed using descriptive statistics to report frequencies. For comparisons, χ^2 and Fisher exact tests were used to determine statistical significance.

RESULTS: Sixty-nine (63%) BORN nursery directors across 38 states completed the survey. For mothers with a positive cannabinoid screen at delivery, 16% of hospitals universally or selectively restrict breastfeeding. Most (96%) nursery directors reported that marijuana use while breastfeeding is "somewhat" (70%) or "very harmful" (26%). The majority was aware of the potential negative impact of prenatal marijuana use on learning and behavior. There were no consistent statistical associations between breastfeeding restrictions and provider marijuana knowledge, geographic region, or state marijuana legalization status.

CONCLUSIONS: BORN newborn clinicians report highly variable and unpredictable breastfeeding support practices for mothers with perinatal marijuana use. Further studies are needed to establish evidence-based practices and to promote consistent, equitable care of newborns with perinatal marijuana exposure.

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WHAT'S KNOWN ON THIS SUBJECT: Marijuana is the most common federally illicit substance used during pregnancy. Little is known about hospital practices regarding breastfeeding in the setting of perinatal marijuana use in US states with varying marijuana legalization status.

WHAT THIS STUDY ADDS: This cross-sectional survey study identifies opportunities for standardizing hospital practices regarding breastfeeding with perinatal marijuana use and explores potential drivers of practice variation including provider knowledge, geographic region, and marijuana legalization status.

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Across the United States, increasing state legalization of marijuana use has been associated with increased public perception that marijuana use is safe, including among pregnant women.[1] Some pregnant women view marijuana as a "safer alternative" to prescription medications for health symptom management.[2] Marijuana use has increased nationally and is the most common federally illicit substance used during pregnancy, affecting up to 10% of births in some states.[3,4] The psychoactive component of marijuana, tetrahydrocannabinol, is found in significant quantities in breastmilk[5] after both inhalation[6] and consumption of edibles,[7] and persists for up to 6 weeks after use.[8] The American College of Obstetricians and Gynecologists[9] and the American Academy of Pediatrics (AAP) advise against marijuana use during pregnancy and lactation.[10] Similarly, the Academy of Breastfeeding Medicine recommends counseling of breastfeeding mothers to reduce or eliminate marijuana use.[11]

Recommendations against marijuana use during lactation are based on the available evidence for adverse neurodevelopmental outcomes and other safety risks among exposed children. Previous research has demonstrated that prenatal marijuana use increases the risk of low birth weight,[12,13] sudden infant death syndrome,[5] and cognitive and behavioral problems in childhood.[14] Studies have found an association between prenatal marijuana use and reduced scores in verbal and memory domains on neuropsychological assessments at 4 years of age; decreased attention, increased hyperactivity, and greater impulsivity at 10 years of age; and lower scores in reading, math, and spelling at 14 years of age.[15] Postnatally, exposure to marijuana via breastmilk has been shown by some to negatively affect infant motor development.[15–17] Studies of older children suggest that marijuana use by preteens and adolescents is associated with lower intelligence quotients, impaired executive functioning, and slower cognitive function compared with healthy controls.[18] More recently, functional magnetic resonance imaging studies found evidence of altered brain function among adolescents with cannabis use disorder.[18] Collectively, these findings suggest that any marijuana use during pregnancy and while breastfeeding has the potential for short- and long-term adverse neurodevelopment among exposed children.

Clinicians caring for newborns and their families in the immediate postpartum period must navigate the complex intersection of clinical recommendations, cultural and political trends, and issues of patient autonomy and beneficence that surround breastfeeding with marijuana use. There are numerous health benefits of breastfeeding for mothers and infants, and breastfeeding during the birth hospitalization is an important milestone for bonding and promoting a beneficial family experience.[19] Thus, more research is needed to determine how newborn care leaders and clinicians weigh the risks of marijuana exposure through breastmilk against the benefits of breastfeeding, and how these considerations are implemented as hospital practices in US states with varying marijuana legalization.

The goals of this study were to (1) describe hospital practices and nursery director knowledge and attitudes related to marijuana use and breastfeeding, (2) assess the association between provider knowledge about marijuana and breastfeeding restrictions, and (3) determine whether geographic region and/or state marijuana legalization status affected breastfeeding restrictions. We hypothesized that there would be associations between geographic region and/or state legalization status and hospital practices regarding breastfeeding with perinatal marijuana use.

METHODS

Sample

This study was conducted through the Academic Pediatric Association's Better Outcomes through Research for Newborns (BORN) network, a group of nursery directors and clinicians who care for late preterm and term newborns at academic and community hospitals. At the time of the survey, the network consisted of 110 nursery sites located in 38 states caring for a total of ~400 000 newborns per year. Within each hospital, multiple clinicians may participate as BORN members although 1 individual (typically the nursery medical director) serves as the site representative and primary point of contact. For this study, only site representatives were recruited to participate. BORN receives support from an Academic Pediatric Association research manager and research assistant for meeting coordination, network membership management, listserv communications, and study proposal review and implementation.

Design and Study Variables

This was a cross-sectional survey administered electronically using a REDCap link sent to each BORN representative, who received up to 4 monthly reminders between February and December 2021 during the SARS-CoV-2 pandemic. The 31-item survey was investigator-developed with collaboration from BORN members with expertise in newborn care and perinatal substance use. Survey items were derived or adapted from existing, validated instruments whenever possible (full survey in Supplemental Information). Responses were multiple choice with additional free text options, when applicable. The first section on hospital characteristics and practices included questions on hospital type and setting, number of births per year, availability of International Board Certified Lactation Consultants, Baby Friendly hospital designation, perceived state marijuana legalization status, the hospital's drug screening practices for pregnant women,

drugs tested on routine urine drug screening, and the hospital's breastfeeding practices for mothers who test positive for cannabinoids at the time of delivery. Based on the institution for each site representative, actual state marijuana legalization status (not legal or unknown, legal for medical use only, or legal for medical plus recreational use) was determined. We confirmed legalization status at the time of survey completion based on the date of when legalization was signed into law and we considered marijuana to be legal for medical use if it was allowed for medical use in general (not just a single condition). The second section examined general and pediatric-specific knowledge and attitudes related to marijuana use. For knowledge, we asked questions regarding the known health effects of marijuana use in general and health effects for pregnant women, the fetus/newborn, and breastfed infants. For attitudes, we asked directors to describe the health effects of marijuana use on a 5-point Likert-like scale (ranging from "not very harmful" to "very harmful"). Because of our small sample size, we combined "somewhat" and "very harmful" for our data analyses. Finally, the third section on clinician sociodemographic characteristics included questions on the director's specialty, highest degree completed, and number of years in practice. We compiled geographic location based on the site's registration information with BORN and categorized states by US Census region (West, Midwest, Northeast, South). The study was approved by the University of Washington and Seattle Children's institutional review boards.

Analysis

Our primary outcome was hospital practice variation related to breastfeeding for mothers with perinatal marijuana use. We also examined whether resources for marijuana cessation were provided to mothers with a positive cannabinoid screen at the time of delivery. Bivariate comparisons tested for associations between our outcomes and US Census region as well as perceived and actual state legalization status. Finally, we tested the association between the primary outcome and clinician knowledge.

For bivariate comparisons, we dichotomized breastfeeding practices in 2 ways: (1) as "no restrictions" or "restrictions" if there were universal or selective restrictions on breastfeeding for mothers who tested positive for cannabinoids at the time of delivery; and (2) as whether breastfeeding was "encouraged" or "discouraged" (but not restricted, or restricted selectively or universally) for mothers who tested positive for cannabinoids at the time of delivery. Data were analyzed using standard descriptive statistics, and χ^2 and Fisher exact tests for bivariate comparisons. We performed analyses using Stata version 14 (Stata Corp, College Station, TX).

RESULTS

Hospital and Participant Characteristics

Of the 110 BORN nursery representatives, 69 (63%) across 38 US states completed the survey. This is a similar response rate as previously published BORN studies.[14,15] Hospital and participant characteristics are shown in Table 1. All 4 Census regions were represented. Most sites were university-affiliated (72%) and teaching hospitals (94%). The majority of directors were general pediatricians and/or hospitalists (87%) who were >10 years posttraining (68%).

Based on the date that legalization was signed into law, most participating sites at the time of the study were located in states with legal marijuana use (39% for medical use only; 42% for medical and recreational use). Most respondents correctly identified the legal status of marijuana use in their state (83% correct, 13% incorrect, 4% unknown). As expected, there was a strong association between US Census region and state legalization of marijuana ($P < .001$): the highest percentage of respondents from states with both medical and recreational legalization were in the West ($n = 16/16$, 100%), and the highest percentage without any legalization was in the South ($n = 9/17$, 53%). Nearly all hospitals (94%) include cannabinoids in their routine urine toxicology panel. Further details of routine toxicology screening practices are shown in Table 1.

Practices of Participating BORN Sites

The majority ($n = 63$, 91%) of hospitals reported a risk-based approach to maternal toxicology testing; of these, 63% ($n = 40$) cited a history of marijuana use as an indication for testing. For mothers with a positive cannabinoid screen at time of delivery, 16% ($n = 12$) of hospitals either universally or selectively restrict breastfeeding (Table 2). Most hospitals consult social work ($n = 52$, 76%) and more than one-third ($n = 25$, 36%) refer to child welfare services. A minority of hospitals ($n = 20$, 29%) provide resources for marijuana cessation (Table 2).

Clinician Knowledge and Perceived Harm Associated With Marijuana Use

The majority of directors (81%) were "confident" in their knowledge of marijuana's effects on health. The large majority of directors knew that marijuana use can cause poor judgment (96%), impaired driving (96%), is stored in fat tissue (90%), and can be found in the breastmilk of mothers who use (97%). Most (96%) directors reported that marijuana use while breastfeeding is "somewhat" (70%) or "very harmful" (26%), compared with daily alcohol use, for which only 65% of respondents felt use was somewhat (43%) or very harmful (22%; Table 3). Overall, knowledge was high, with the majority aware of the potential negative impact of prenatal marijuana use

TABLE 1 Characteristics of Participating BORN Hospitals and Newborn Nursery Directors ($N = 69$)

Hospital Characteristics	*N* (%)
Region	
West	16 (23)
Midwest	14 (20)
Northeast	22 (32)
South	17 (25)
State marijuana legalization	
Not legal for any use	10 (15)
Legal for medical use only	27 (39)
Legal for recreational and medical use	29 (42)
Unable to determine	3 (4)
Hospital toxicology screening	
Cannabinoid	65 (94)
Amphetamine	69 (100)
Opiate	68 (99)
Benzodiazepine	68 (99)
Barbiturate	65 (94)
Phencyclidine	52 (75)
Methadone	51 (74)
Buprenorphine	25 (36)
Oxycodone	46 (66)
Propoxyphene	12 (17)
Hospital description	
Community	15 (22)
University	50 (72)
Other	4 (6)
Hospital setting	
Rural	6 (9)
Suburban	17 (25)
Urban/metropolitan	46 (66)
Teaching hospital	65 (94)
Annual number of deliveries	
<1000	4 (6)
1000–1999	11 (16)
2000–4999	43 (62)
>5000	11 (16)
IBCLC availability	
7 d per week	52 (75)
3-6 d per week	17 (25)
Baby Friendly hospital designation	
Yes	40 (58)
No	22 (32)
In process	7 (10)
Nursery director characteristics	
Years posttraining	
<5	4 (6)
5–10	19 (28)
11–20	27 (39)
>20	19 (28)
Gender	
Female	56 (81)
Specialty	
General pediatrics	34 (49)
Hospital medicine	26 (38)
Neonatology	9 (13)

West: Arizona, California, Colorado, Idaho, Oregon, Utah, Washington. Midwest: Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Montana, Ohio, Wisconsin. Northeast: Connecticut, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont. South: Alabama, Arkansas, Florida, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia. BORN, Better Outcomes through Research for Newborns; IBCLC, International Board Certified Lactation Consultant.

on learning and behavior among exposed offspring (Fig 1). However, many did not know about other potential risks of in utero marijuana use on the developing child, including risks of preterm birth and low birth weight.

Bivariate Comparisons

After dichotomizing breastfeeding practices as "restricted" (12 sites) or "not restricted" (57 sites), the only statistical association was between breastfeeding restrictions and provider knowledge of marijuana's effect on short-term memory loss. Those who restricted breastfeeding were less likely than those who did not restrict to be aware that memory loss is an adverse effect of marijuana use (8/12 vs 54/57; $P = .02$). With dichotomization of breastfeeding practices as "encouraged" (41 sites) or "discouraged" (28 sites), there was a statistical association between breastfeeding encouragement and hospital setting (4/6 rural vs 15/17 suburban vs 22/46 urban sites encourage breastfeeding if there is a positive cannabinoid screen at time of delivery; $P = .01$). There were no other statistically significant associations, including none between breastfeeding practices and census region, legalization status, or child welfare referral. We also found no other statistical associations between provider specialty or provider knowledge and breastfeeding practices by either dichotomization.

DISCUSSION

Our survey of 69 BORN nursery directors from across the United States identified substantial variation in how

TABLE 2 Hospital Practices Regarding Mothers with Positive Marijuana Drug Screen at Time of Delivery ($N = 69$)

Hospital Practices	*N* (%)
Breastfeeding policy	
Encouraged to breastfeed	41 (59)
Discouraged but not restricted from breastfeeding	16 (23)
Restricted from breastfeeding	4 (6)
Depends on extent of marijuana use	3 (4)
Varies by provider or unknown	5 (8)
Social work consult	52 (76)
Automatic referral to child welfare	25 (36)
Resources for marijuana cessation provided	20 (29)

TABLE 3 Newborn Nursery Director Knowledge and Attitudes ($N = 69$)	
	N (%)
Confidence of knowledge of marijuana effects on health	
Very confident	12 (17)
Confident	44 (64)
Not confident	13 (19)
Marijuana (ie, tetrahydrocannabinol) is	
Found in breast milk	67 (97)
Stored in fat tissue	62 (90)
Known health effects of marijuana use	
Short-term memory loss	62 (90)
Loss of coordination	60 (87)
Poor judgment	66 (96)
Paranoia	54 (78)
Addiction	54 (78)
Impaired driving	66 (96)
Risk for mental illness	46 (66)
Effect of marijuana is "somewhat" or "very harmful" for	
Recreational use for adults	52 (75)
Use during pregnancy for a fetus	63 (91)
Maternal use for a breastfeeding baby	60 (87)
"Somewhat" or "very harmful" to a baby if mother breastfeeds and	
Drinks 1–2 alcoholic beverages daily	45 (65)
Drinks >5 alcoholic beverages at once	68 (98)
Smokes ≥1 pack of cigarettes daily	69 (100)
Smokes e-cigarettes or vapes daily	68 (98)
Uses marijuana 1–2 times a week	66 (96)

these providers approach breastfeeding and counseling for mothers with perinatal marijuana use. This variation was not associated with US region or state marijuana legalization status. Respondents' knowledge about the potential risks of perinatal marijuana use to the developing infant also varied and was overall not associated with reported breastfeeding support practices. There were no consistent statistical associations between breastfeeding restrictions and nursery directors' marijuana knowledge, geographic region, or state marijuana legalization status.

Variation in breastfeeding support after delivery fundamentally shapes the family experience after birth, may have lasting impact on child wellbeing, and contributes to uncertainty and confusion among clinicians and families. Practice variation may also exacerbate socioeconomic, racial, and ethnic inequalities in breastfeeding. Nursery directors play a crucial role in setting and updating policies. Black women in particular disproportionately experience barriers to breastfeeding, receive less lactation support, and have the lowest rates of breastfeeding initiation and continuation compared with all other racial or ethnic groups in the United States.[20,21] Previous research found an increased likelihood of toxicology testing for prenatal substances, reporting to child welfare services, and child separation because of prenatal substance use among Hispanic families, non-Hispanic Black families, and families living in poverty.[22–26] The intersection of race, poverty, and prenatal marijuana use represents an important focus for hospitals to implement safe policies and practices that promote rather than worsen health equity. Health and child welfare systems can promote health equity and reduce systemic racism by adopting strategies such as racial bias training, use of health equity assessment tools, and employing people representative of the population served.[27,28]

Contrary to the AAP's policy statement on breastfeeding, in which marijuana use is not a contraindication to breastfeeding,[13] mothers who test positive for marijuana are restricted or potentially restricted from breastfeeding at 16% of BORN hospitals. A qualitative study of 9 nurses in Washington state, where recreational marijuana use has been legal since 2012, reported "tension between advocating for breastfeeding versus counseling a patient to avoid breastfeeding if using cannabis."[29] Although the adverse effects of direct marijuana use on neurodevelopment in children and adolescents are well-established,[7] longer term effects from marijuana exposure in breastmilk are not currently well-studied. In contrast, the benefits of breastfeeding and breastmilk are well-known, including associated reductions in sudden infant death syndrome, hospitalizations for diarrhea and respiratory infections, and maternal postpartum depression.[13] Based on current available evidence, breastfeeding restrictions for mothers who test positive for marijuana may not be in the best interest of the mother or infant.

Routine toxicology screening of pregnant women and newborns remains controversial. American College of Obstetricians and Gynecologists cautions against punitive use of drug screening and recommends that testing only be done with the patient's consent. For mothers with positive cannabinoid screens, clinicians should carefully consider the 4 principles of medical ethics: (1) beneficence: to benefit patients and promote their welfare; (2) nonmaleficence: to weigh the benefits against the burdens of interventions and to avoid harm; (3) autonomy: to allow patients to make rational decisions and moral choices; and (4) justice: to treat persons fairly, equitably, and appropriately. An in-depth discussion on ethics as it pertains to marijuana use and lactation can be found in a 2022 review article.[30]

Both the AAP and Academy of Breastfeeding Medicine recommend counseling breastfeeding mothers about marijuana exposure through breastmilk.[10,11] However, only 30% of directors reported that resources for marijuana cessation are provided for mothers with positive marijuana drug screens. These results echo research from the outpatient obstetrical setting that found low rates of counseling to pregnant women who endorsed marijuana use.[21] In a qualitative study of obstetrics-gynecology providers, many "felt unprepared to have conversations about cannabis use with their patients."[31] In our study, many respondents were not aware

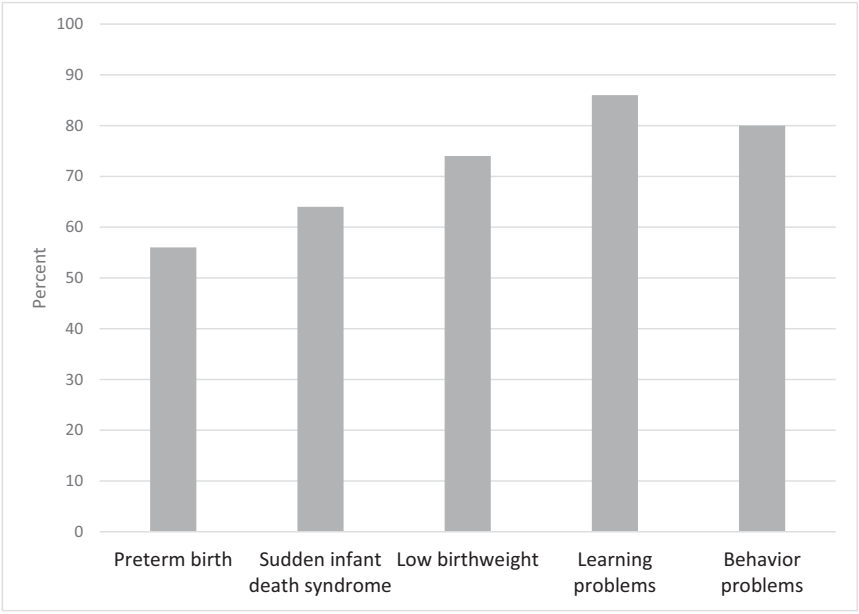

FIGURE 1
Nursery director knowledge of potential risks of in utero marijuana use on the developing child.

of some of the potential risks of perinatal marijuana exposure. These findings suggest that clinicians may need more information about marijuana and lactation to support more tailored and balanced counseling with families.[32] A number of written resources are available. For example, Colorado, 1 of the first 2 states to legalize recreational marijuana use in 2012, developed a factsheet on marijuana use while pregnant and/or breastfeeding, available in 7 languages.[33] In 2018, the Philadelphia Multi-Hospital Breastfeeding Task Force developed a city-wide factsheet on marijuana use and breastfeeding endorsed by all 6 maternity hospitals (available on request).

Though not directly addressed in our survey, some providers may also feel uncomfortable addressing marijuana use in the context of conflicting federal and state laws and potential mandated child welfare reports.[34,35] For example, Colorado law mandates reporting positive infant cannabinoid toxicology results to child protective services[36]; on the other hand, as of 2017, the Department for Children and Families in Vermont "no longer accepts reports where the sole concern is regarding marijuana use during pregnancy."[37] Data from this study may help clinicians benchmark their own hospital practices against the national landscape of care and identify where the nursery community needs to standardize practices.

One area of need is the standardization of patient education for mothers pre- and postnatally regarding marijuana use. Pregnant mothers have expressed wanting to better understand the impact of marijuana use on their baby, and when they did not receive enough information from medical providers, they turned to other sources such as employees of marijuana retailers.[2] Just as education about avoiding raw foods and alcohol are routinely provided to all pregnant women, we propose that education about the potential harms of marijuana use also routinely be provided, independent of reported marijuana use. Education for the general public may also be warranted because pregnant mothers may turn to family and friends for advice. Similarly, newborn providers should consider including education about marijuana exposure in routine postnatal counseling that addresses common topics such as feeding guidelines, safe sleep, and secondhand smoke.

This study has several limitations. First, we had a small sample size limited to BORN sites, most of which were university and teaching hospitals. Thus, the practices reported by these nursery directors may not be representative of all US hospitals that provide newborn care. Data on patient race and/or payer mix for participating hospitals were not obtained, precluding comparison of policies by sociodemographic characteristics. In addition, the responses of the BORN nursery director may not reflect the practice or knowledge of all of the nursery providers or other clinical staff at each BORN site. Second, fluidity of laws meant that, for some sites, there was a change in the legalization status of marijuana during the survey period, potentially affecting directors' responses. Third, some of the complexities and subtleties of marijuana hospital practices and knowledge may not have been sufficiently captured on a multiple-choice survey. Future research on this topic would benefit from qualitative and mixed methods data, particularly to explore decision-

making for the development and implementation of newborn feeding policies in the context of perinatal marijuana use. Such investigation should ideally include all perinatal patient care staff, including nurses and International Board Certified Lactation Consultants, and evaluate factors such as patient race and payer mix as potential drivers of policy variation.

CONCLUSIONS

Newborn nursery directors from BORN network hospitals differ in their approach to mothers with perinatal marijuana use. As a growing number of states legalize marijuana use, a more standardized, ethical, and family-centered approach to the care of newborns whose mothers use perinatal marijuana is needed to ensure health care equity. Further studies are needed to establish an evidence-based approach to the counseling of families and management of newborns with perinatal marijuana exposure.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
BORN: Better Outcomes through Research for Newborns

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